Tree diversity and species identity effects on soil fungi, protists and animals are context-dependent

Leho Tedersoo[1]*, Mohammad Bahram[2], Tomáš Cajthaml[3,4], Sergei Põlme[1], Indrek Hiiesalu[2], Sten Anslan[2], Helery Harend[2], Franz Buegger[5], Karin Pritsch[5], Julia Koricheva[6], Kessy Abarenkov[1]

[1]Natural History Museum, University of Tartu, 14a Ravila, 50411 Tartu, Estonia.
[2]Institute of Ecology and Earth Sciences, University of Tartu, 14a Ravila, 50411 Tartu, Estonia.
[3]Institute of Microbiology AS CR, v.v.i., Vídeňská 1083, CZ-14220, Prague 4, Czech Republic.
[4]Institute for Environmental Studies, Faculty of Science, Charles University in Prague, Benátská 2, CZ-12801, Prague 2, Czech Republic.
[5]Helmholtz Zentrum München; Ingolstädter Landstr. 1; 85764 Neuherberg, Germany.
[6]School of Biological Sciences, Royal Holloway University of London, Egham, Surrey, TW20 0EX, United Kingdom.

*Corresponding author. E-mail: leho.tedersoo@ut.ee

Number of words (abstract): 197
Number of words (text, legends): 7585
Number of figures: 6
Number of Tables: 0
Number of supplements: 10
Number of references: 104

Abstract

Plant species richness and the presence of certain influential species (sampling effect) drive the stability and functionality of ecosystems as well as primary production and biomass of consumers. However, little is known about these floristic effects on richness and community composition of soil biota in forest habitats due to methodological constraints. We developed a DNA metabarcoding approach to identify the major eukaryote groups directly from soil with roughly species-level resolution. Using this method, we examined the effects of tree diversity and individual tree species on soil microbial biomass and taxonomic richness of soil biota in two experimental study systems in Finland and Estonia and accounted for edaphic variables and spatial autocorrelation. Our analyses revealed that the effects of tree diversity and individual species on soil biota are largely context-dependent. Multiple regression and structural equation modelling suggested that biomass, soil pH, nutrients and tree species directly affect richness of different taxonomic groups. The community composition of most soil organisms was strongly correlated due to similar response to environmental predictors rather than causal relationships. On a local scale, soil resources and tree species have stronger effect on diversity of soil biota than tree species richness *per se*.

Introduction

Plant interactions and feedbacks with soil biota determine ecosystem functioning and primary productivity in terrestrial habitats (Wardle *et al.*, 2004; van der Heijden *et al.*, 2006; Bagchi *et al.*, 2014; Wagg *et al.*, 2014). Soil micro-organisms and meiofauna (i.e., microfauna and mesofauna) play key roles in nutrient cycling. In particular, fungi act as obligate root symbionts, decomposers or pathogens of other organisms. Soil meiofauna and protists consume living organisms and dead organic material, and disperse these degradation products as well as fungal and bacterial propagules in soil (Wardle, 2002; Adl & Gupta, 2006).

Greater taxonomic and functional diversity of plants promotes ecosystem services and enhances stability (Cardinale *et al.*, 2011; Gamfeldt *et al.*, 2013). The plant diversity effects on these functions are more pronounced in stress conditions (Steudel *et al.*, 2012) and become stronger with time (Reich *et al.*, 2012). Through resource availability and niche differentiation, increase in plant biomass and species richness favours the accumulation of soil microbial and faunal biomass and abundance that accommodate greater number of species. Such bottom-up relationships among diversity of food-web organisms occur both aboveground and belowground, and are reflected along the trophic cascades (Scherber *et al.*, 2010; Eisenhauer *et al.*, 2013; but see Porazinska *et al.*, 2003). Recent studies on natural grassland plants showed that plant species richness is positively correlated with that of several major fungal groups on a local scale (Hiiesalu *et al.*, 2014; Pellissier *et al.*, 2014). Richness of free-living protists, meiofauna and saprotrophic fungi may similarly benefit from specialisation on different sources of food or substrate for decomposition.

Top-down relationships may also regulate ecosystem functioning. In experimental systems, more diverse communities of arbuscular mycorrhizal (AM) fungi promote plant diversity, productivity and nutrient uptake (van der Heijden *et al.*, 2006; Wagg *et al.*, 2011) that could be related to the mediation of interspecific competition (van der Heijden *et al.*, 2003) and differential benefits of phylogenetically distantly related fungi (Maherali & Klironomos, 2007). In ectomycorrhizal (EcM) symbiosis, fungal species provide differential benefits to their hosts (van der Heijden & Kuyper, 2003) and more diverse communities are more efficient in the uptake of organic phosphorus (Baxter & Dighton, 2005). Counter-intuitively, greater diversity of pathogens may also enhance plant richness by specifically suppressing dominants (Bagchi *et al.*, 2014) and reducing the yield in monospecific agroforestry systems (Cardinale *et al.*, 2011).

In addition to taxonomic and functional richness, certain component species may determine the efficiency of ecosystem processes, a phenomenon termed as (taxonomic) sampling effect (Cardinale *et al.*, 2006, 2011). Many of the pioneering ecological studies failed to separate sampling effect from the diversity effect *per se*, which requires optimising the experimental design (Huston, 1997; Wardle, 1999; Tedersoo *et al.*, 2014a). Sampling effect can be eliminated or accounted for by i) comparing species performance in monocultures and polycultures (Wardle, 1999) or ii) by using model selection or variation partitioning, incorporating component species as dummy variables (Healy *et al.*, 2008; Wagg *et al.*, 2011).

A vast majority of biodiversity studies have recorded short-term effects (but see Reich *et al.*, 2012) and focused on grassland ecosystems. However, ecosystems naturally dominated by woody plants cover nearly half of the land surface on the Earth. Compared with grassland plants, tree individuals may live for several centuries and they are more widely spaced, creating heterogeneous patches via stem flow and accumulation of root and leaf litter (Nadrowski *et al.*, 2010). Tree species differ substantially in the quality of their litter that determine the chemical composition and microbial biomass directly or indirectly by stimulating earthworm activity (Frouz *et al.*, 2013). Soil and litter quality affect degradation rates and community composition of saprotrophic and EcM fungi (Aponte *et al.*, 2010; Prescott and Grayston, 2013) and meiofauna (Ayres *et al.*, 2009). Tree species richness has usually a neutral (including unimodal relationships) or slightly positive effect on ecosystem processes (Nadrowski *et al.*, 2010). Due to great differences in physiology and ecological properties, tree species drive many of the biochemical and ecological processes in soils (Nadrowski *et al.*, 2010; Gamfeldt *et al.*, 2013). The few available studies so far suggest that tree diversity has a neutral effect on richness of herbs and arthropods on a local scale, but the effects of tree species composition predominate (Vehviläinen *et al.*, 2008; Ampoorter *et al.*, 2014). Plant communities may also correlate with communities of soil organisms such as fungi (Bahram *et al.*, 2012; Peay *et al.*, 2013), but the statistical methods explicitly addressing community-wise relationships and their underlying mechanisms are poorly validated in ecological literature.

Nearly all previous biodiversity studies have used traditional morphology-based identification methods to determine the richness of consumers (but see Hiiesalu *et al.*, 2014; Pellissier *et al.*, 2014). This approach requires substantial taxonomic expertise and long processing time given the large number of samples and individuals (Scherber *et al.*, 2010). Many microscopic taxa are comprised of cryptic species that potentially exhibit different ecological requirements, but they remain undetected due to the paucity of taxonomically informative morphological character states. The alternative DNA-based tools have been developed and increasingly used for identification of bacteria, protists and fungi since two decades ago. More recently, the massively parallel DNA metabarcoding technology has been adopted for large-scale community-level identification of fungi (Jumpponen & Jones, 2009), protists (Chariton *et al.*, 2010; Medinger *et al.*, 2010) and animals (Porazinska *et al.*, 2009). For meiofauna, metabarcoding studies have focused on specific order to phylum-level groups such as nematodes or certain arthropods (Porazinska *et al.*, 2009; Hajibabaei *et al.*, 2011). The Cytochrome I Oxidase (COI) gene, the standard barcode for animals, has proven to be suboptimal for metabarcoding analyses due to problems with primer coverage and large DNA insertions in certain taxa (e.g. Creer *et al.*, 2010; de Wit & Erseus, 2010; Deagle *et al.*, 2014; Zhan *et al.*, 2014). It has been outlined that multiple taxonomic groups should be addressed simultaneously for better documenting their relative abundance (Soininen *et al.*, 2013) and understanding of ecological and biogeographic processes (Coleman, 2009; Soininen, 2014). For these reasons, the Small Subunit of ribosomal DNA has been targeted following traditions in microbiology and kingdom-level phylogenetics (Bik *et al.*, 2012). However, there are multiple primer mismatches and/or this marker is too conservative for species-level resolution in nearly all groups of protists, fungi, plants and animals (Pawlowski *et al.*, 2012; Schoch *et al.*, 2012; Tang *et al.*, 2012; Lindahl *et al.*, 2013; Bachy *et al.*, 2013). As an alternative to these markers, the Internal Transcribed Spacer 2 (ITS2) has been proposed as a common species-level metabarcoding marker in eukaryotes, although taxonomic groups differ somewhat in length and there is some intra-individual variation inherent to all nuclear markers (Coleman, 2009; Koetschan *et al.*, 2010; Yao *et al*., 2010: Bengtsson-Palme *et al.*, 2013; Wang *et al.*, 2015). The ITS2 marker has been successfully used to target fungi (Clemmensen *et al.*, 2013), various protist groups (e.g. Arif *et al.*, 2014) and plants (De Barba *et al.*, 2014) in metabarcoding studies. Although a large number of animal ITS sequences have been deposited in public databases, this region has been hitherto overlooked in the DNA metabarcoding of meiofauna.

In this study, we first describe the development of a DNA metabarcoding method for identification of multiple eukaryotic organisms simultaneously at species-level resolution. We constructed multiple taxon-targeted primers for the ITS2 region in single PCR reactions to maintain ribosomal DNA-based proportions of organisms. By using the metabarcoding analysis of DNA extracted from pools of thousands of soil cores, we disentangled the relative roles of tree diversity, confounding sampling effects as well as spatial and edaphic variables on taxonomic richness and community composition of soil fungi, protists and meiofauna. We postulated the following alternative hypotheses: 1) tree diversity *per se* and taxonomic sampling effect influence microbial biomass and richness of soil biota; 2) the effect of these biotic variables is relatively stronger in biotrophic organisms compared with saprotrophs and trophically directly unrelated organisms; 3) vegetation has both direct effects, and indirect effects through altered soil chemistry and microbial biomass, on richness of soil biota; and 4) communities of soil biota shift in concordance mainly due to similar responses to the environment.

Materials and Methods

Experimental design and sampling

We selected two forest diversity experiments in Satakunta, Finland (61 °N; 22 °E) and Järvselja, Estonia (58 °N; 27 °E) to test our hypotheses. The Finnish experiment was established across three sites in a clear-cut boreal forest in 1999. We selected sites 1 and 3 for sampling, because these were the least damaged by moose (Ampoorter *et al.*, 2014). At the time of sampling, trees had reached a height of 5-11 meters and formed a closed canopy in most of the plots. The soils are podzols with a silty or sandy texture on granite bedrock. Seedlings of *Pinus sylvestris* L., *Picea abies* (L.) H. Karst*.*, *Larix sibirica* Ledeb., *Betula pendula* Roth. and *Alnus glutinosa* (L.) Gaertn. were planted as monocultures or equal combinations of two, three or five species in 400-m^2 square plots (Scherer-Lorenzen *et al.*, 2006). To avoid edge effects, we restricted our sampling to 300 m^2 in the centre of each plot by excluding the outermost row of trees.

Vegetation at the Estonian study system constitutes a remnant of a large-scale forest experiment established in early 1920s on clear-cut forested land. The soils are formed on post-glacial alluvial deposits and exhibit loamy or sandy texture. Certain forest quadrats were planted with trees, whereas others were left for natural regeneration. At the sapling stage, trees were selectively thinned and forest quadrats were deeply drained to stimulate tree growth and prevent waterlogging. In the second half of the 20th century, intensity of management declined and forest development was subjected to natural succession that was affected by sporadic selective cutting and differential moisture regime due to degradation of the ditch network. The combination of these treatments and processes resulted in the development of vegetation with different dominant trees (*P. abies, P. sylvestris, B. pendula, A. glutinosa*, *Tilia cordata* Mill. or *Populus tremula* L.)

and a range in tree richness (2-11 species; other subdominant EcM trees *Corylus avellana* L., *Quercus robur* L., *Salix caprea* L. and AM hosts *Ulmus glabra* Huds., *Fraxinus excelsior* L., *Acer platanoides* L. and *Sorbus aucuparia* L.). Because the original quadrats were of unequal size and shape, we established round 2500-m^2 plots in uniform patches of vegetation. For mature forests, greater plot size represents better the edaphic and floristic processes and the interacting biota (Bruelheide *et al.*, 2014).

In each plot, we determined the basal area (BA) of all tree species and coverage of understorey vascular plant species. In Finnish plots, we estimated the relative amount of birch coppice (cut in spring, 2010) in 10 abundance classes based on the number and size of stumps. For Estonian plots, we obtained additional information about productivity, volume and height of trees from the State Forest Management Centre (www.rmk.ee).

In summer, 2011, we collected samples from 43 Finnish plots (spread over two sites 10 km distant, each roughly 4 ha) and 41 Estonian (spread evenly across 1000 ha) plots. In Finland, we randomly selected 40 trees per plot to equally represent the composition of planted species. At ca. 0.5 m distance from the trunk of each tree individual, we collected a single soil core by hammering a PVC tube (5 cm diam.) to 5 cm depth. In Estonia, we similarly sampled 40 soil cores per plot, but we collected each pair of cores 1-1.5 m distant from each of 20 randomly selected trees (>10 cm diam. at breast height) located at least 8 m distant from each other to account for spatial autocorrelation range in soil biota (Bahram *et al.*, 2013). For Finnish and Estonian study areas, information about plant species composition and other metadata is given in Table S1, Data S1 and S2.

In both study areas, the cores nearly always comprised both the organic layer and top mineral soil and included roots. Although deep soil may comprise some unique organisms adapted to anoxic conditions and low nutrients, our sampling was limited to topsoil, because >50% of microbial biomass and its biological activity occurs in the topmost organic soil (Serna-Chavez *et al.*, 2013) and deeper sampling was impossible in Finnish soils due to great abundance of rocks. All 40 soil cores per plot were pooled, thoroughly mixed and air-dried at 30-40 °C for 24 h. Drying was selected as an alternative to deep freezing or fresh extraction because of improved options for pulverisation of large amounts of soil and necessity to standardize extractable material on a dry weight basis. Dried soil was stored air-tight in zip-lock plastic bags and ground into fine powder by heavy rubbing of the zip-lock bags followed by bead beating using 3-mm tungsten carbide balls in Mixer Mill MM400 (Retsch GmbH, Haan, Germany) at 30 Hz for 10 min for subsequent soil nutrient and molecular identification analyses.

Soil nutrients, Phospholipid Fatty Acids (PLFA) and ergosterol

Concentrations of C, N, ^{13}C and ^{15}N were measured from 2-70 mg of soil using an elemental analyzer (Eurovector, Milan, Italy) coupled with an isotope ratio mass spectrometer (MAT 253; Thermo Electron, Bremen, Germany) according to Tedersoo *et al.* (2012). Total phosphorus was extracted using ammonium lactate and determined using flow injection analysis. Potassium concentration was determined from the same extract by the flame photometric method (AOAC956.01). Exchangeable magnesium and calcium content were determined in ammonium acetate extract (pH=7.0).

Bacterial biomass was assessed using the PLFA analysis for which the samples were extracted with a mixture of chloroform–methanol–phosphate buffer (1:2:0.8; V/V) according to Bligh & Dyer (1959). Phospholipids were separated using solid-phase extraction cartridges LiChrolut Si60 (Merck, Whitehouse Station, NJ, USA), and the samples were subjected to mild alkaline methanolysis (Šnajdr *et al.*, 2008). The samples were analyzed with gas chromatography–mass spectrometry (450-GC, 240-MS; Varian, Palo Alto, CA, USA). Methylated fatty acids were identified according to their mass spectra using a mixture of chemical standards (Sigma, St. Louis, MO, USA). Actinobacterial biomass was estimated as the sum of 10Me-16:0, 10Me-17:0 and 10Me-18:0. Total bacterial biomass was determined on the basis of i14:0, i15:0, a15:0, i16:0, i17:0, a17:0, 16:1ω7, 18:1ω7, cy17:0, cy19:0, 16:1ω5, 10Me-17:0, 10Me-18:0, 10Me-16:0 (Šnajdr *et al.*, 2011).

Fungal biomass was estimated based on ergosterol concentration. Total ergosterol was extracted and analysed as described previously (Šnajdr *et al.*, 2008). Samples (0.5 g) were sonicated with 3 mL 10% KOH in methanol at 70 °C for 90 min. Distilled water (1 ml) was added and the samples were extracted three times with 2 ml cyclohexane, evaporated under nitrogen, redissolved in methanol and analysed isocratically using an HPLC system with methanol as a mobile phase at a flow rate of 1 ml min^{-1}. Ergosterol was quantified by UV detection at 282 nm. Saprotroph and EcM fungal biomass was calculated based on the proportion of sequences corresponding to each functional group, assuming that these two groups have equal ergosterol-to-ribosomal DNA ratio on average (Štursova *et al.*, 2014).

Molecular analyses

DNA was extracted from 2.0 g of soil per sample using the PowerMax Soil DNA Isolation kit (MoBio, Carlsbad, CA, USA) according to manufacurer’s protocols. PCR was performed using a mixture of 11 forward primers (ITS3tagmix1-11 in equimolar concentration) analogous to ITS3 and a degenerate reverse primer ITS4ngs analogous to ITS4 (the original primers are described in White *et al.*, 1990; Tedersoo *et al.*, 2014b, 2015a). Both primers were shortened and modified to perfectly match >99.5% of all Fungi (except Tulasnellaceae and Microsporidia; Table S2). The ITS3 primer mixes were designed to cover Cercozoa protists (amoebae from Rhizaria superkingdom), Ciliophora protists (Alveolata superkingdom), Chlorophyta (unicellular algae from Viridiplantae superkingdom), as well as soil animals (Acari, Nematoda, Collembola, Rotifera and Annelida (Metazoa). Based on a wide range of studies, these groups are the most abundant and species-rich eukaryote taxa in soil. For primer design, we downloaded available sequences from the International Nucleotide Sequence Databases Consortium (INSDC), and aligned the conserved 5.8S and LSU regions by classes or phyla by using MAFFT ver. 7 (Katoh & Standley, 2013). The primer annealing sites for ITS3 and ITS4 were visually examined to distinguish true mismatches from low-quality sequences and mitochondrial LSU sequences. We further checked primer matching by running BLASTn searches against targeted organisms in INSDC, setting the number of comparisons greater than the number of species available for that taxonomic group. The ITS4ngs primer was tagged with one of 110 identifier barcodes (10-12 bases) that were modified from those recommended by Roche to differ by >3 bases, to start only with adenosine and to comprise the proportion of adenosine and thymidine between 0.3 and 0.7 to equalize their affinities in an adapter ligation step. The PCR cocktail comprised 0.6 μl DNA, 0.5 μl each of the primers (20 μM), 5 μl 5xHOT FIREPol Blend Master Mix (Solis Biodyne, Tartu, Estonia) and 13.4 μl double-distilled water. PCR was carried out in four replicates in the following thermocycling conditions: an initial 15 min at 95 °C, followed by 30 cycles of 95 °C for 30 s, 55 °C for 30 s, 72 °C for 1 min, and a final cycle of 10 min at 72 °C. PCR products (typically 350-400 bp) were pooled and their relative quantity was estimated by running 2 μl DNA on 1% agarose gel for 15 min. DNA samples yielding no visible band or a strong band were re-amplified using 35 and 25 cycles instead. We also used negative (for DNA extraction and PCR) and positive controls (*Hydnoplicata whitei* specimen MURU5860) throughout the experiment. Amplicons were purified by use of exonuclease and Shrimp alkaline phosphatase enzymes (Fermantas, Kaunas, Lithuania) at 37 °C for 45 min and at 85 °C for 15 min. Purified amplicons were subjected to normalisation of quantity by use of SequalPrep Normalization Plate Kit (Invitrogen, Carlsbad, CA, USA) following manufacturer's instructions. Normalized amplicons were divided into two pools that were each subjected to 454 adaptor ligation, emulsion PCR and 454 pyrosequencing using the GS-FLX+ technology and Titanium chemistry as implemented in Beckman Coulter Genomics (Danvers, MA, USA).

Pyrosequencing resulted in 625,074 reads with a median length of 412 bases. By use of Acacia 1.52 (Bragg *et al.*, 2012), these sequences were re-assigned to samples based on the barcodes, and quality-trimmed (options: minimum average quality threshold=30, maximum k-mer distance=13; homopolymer significance threshold=-2) to exclude short and low-quality sequences. The resulting 564,305 sequences were subjected to removal of the flanking 5.8S and 28S rRNA genes for better resolution in clustering of ITS sequences, and removal of chimeric sequences by use of the ITSx software (Bengtsson-Palme *et al.*, 2013). We retained sequences of >99 bp in length to remove most of the partial sequences. We ran a second round of chimera checking using UCHIME (Edgar *et al.*, 2011). After these quality filtering steps, the 401,762 retained sequences were further clustered at 98.0% sequence similarity as implemented in CD-Hit 4.6.1 (Fu *et al.*, 2012). Compared with the routinely used 97%, this threshold is a better proxy at species level in several groups of fungi (Kõljalg *et al.*, 2013), protists (Litaker *et al.*, 2007) and animals (Noge *et al.*, 2005). Of 16,437 clusters, 6,823 (41.5%) were represented by a single sequence. These singletons were removed from further analyses, because these comprise a high proportion of technical artefacts (Tedersoo *et al.*, 2010). The longest sequence of each remaining

9,614 clusters was selected as a representative for BLASTn sequence similarity search (word size=7; penalties: gap=-1; gap extension=-2; match=1) against the INSDC and UNITE (Abarenkov *et al.*, 2010a) databases. In addition, we ran BLASTn searches against reference sequences of fungi in 99.0% similarity species hypotheses that include third-party taxonomic and metadata updates (Kõljalg *et al.*, 2013) as implemented in the PlutoF workbench (Abarenkov *et al.*, 2010b). For each query, we considered 10 best-matching references to annotate taxa as accurately as possible. If no taxonomy was reliably revealed, we ran manual BLASTn searches against INSDC with 500 best-matching sequences as output. We followed the regularly updated INSDC and Index Fungorum (www.indexfungorum.org) for higher-level taxonomy of eukaryotes and up to class-level taxonomy of fungi, respectively. We assigned each fungal genus, family or order to functional categories. If different lifestyles were present in specific genera, we chose the dominant group (>75% of species assigned to a specific category) or considered its ecology unknown (<75%). Taxa were considered to be EcM if they best matched to any sequences belonging to EcM lineages (Tedersoo & Smith, 2013) and exhibited sequence length / blast scores above pre-determined lineage-specific thresholds. Targeted groups of protists and soil animals were too poorly represented in INSDC to allow reliable trophic categorization. We selected 98.0% sequence similarity to represent roughly species-level discrimination of Operational Taxonomic Units (OTUs) in all taxa based on post-hoc determination of optimal metabarcoding thresholds (Põlme *et al.*, 2014; Tedersoo *et al.*, 2014c). Only for Collembola, we re-clustered all sequences at 94.0% sequence similarity, because this level distinguishes better among species (Anslan & Tedersoo, 2015).

Statistical analyses

We chose to analyse richness and community composition in groups that were represented by >50 OTUs (Cercozoa, Ciliophora, Chlorophyta, Collembola, Nematoda as well as EcM, saprotrophic, plant pathogenic fungi). For richness analyses of soil biota, we calculated the residuals of OTU richness in relation to square root of the number of obtained sequences to account for differences in sequencing depth. We excluded two outlier samples from Finland and four outliers from Estonia that were dominated by a few species of moulds (relative abundance of sequences belonging to Trichocomaceae >5%, Mortierellaceae >20%, or Mucoraceae >20%, that exceeds three times the mean + 3SD), which is indicative of substandard sample preservation (Tedersoo *et al.*, 2014b). By use of vegan package of R, "individual"-based rarefied OTU accumulation curves were constructed separately for functional groups of fungi and major taxa of animals and protists in the two study systems (Fig. S1).

Concentrations of soil nutrients and vegetation measurements were logarithm-transformed prior to analyses to improve the distribution of residuals and reduce non-linearity. To estimate taxonomic sampling effects, the relative BA of each tree species was log-ratio transformed (Szava-Kovats *et al.*, 2011). Besides species richness, we calculated both Shannon and Simpson indices of diversity for trees and understorey vascular plants (Magurran, 1988). To account for spatial autocorrelation that may arise from both spatially structured environmental factors and dispersal limitation, we calculated Principal Components of Neighbours Matrices (PCNM) spatial eigenvectors based on geographical coordinates of plots by using the vegan and packfor packages of R (R Core Development Team, 2014). These vectors represent spatial variation at different geographical scales over the study area and are used to control for spatial autocorrelation in ecological data sets (Legendre, 2008). To disentangle the effects of edaphic, floristic and spatial variables on residual richness of soil biota and biomass estimates, individual variables were subjected to multiple regression model selection based on the corrected Akaike information criterion (AICc). The components of best models were forward-selected to determine their adjusted coefficients of determination as implemented in the packfor package of R.

We used Structural Equation Models (SEM) to determine the direct and indirect paths between environmental predictors, biomass and richness of EcM fungi and saprotrophs. We also included bacterial biomass in these models for comparison. The initial SEM models were constructed based on the best models for these variables using Amos ver. 22 (SPSS, Chicago, IL, USA). We tested all direct and indirect relations among exogenous and endogenous variables, together with their error terms. Then, the fit of models was maximized based on both chi-square test and Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI). We followed a backward stepwise elimination approach to remove non-significant links to maximise model fit.

The relative effects of edaphic, spatial and floristic variables on communities of soil organisms were determined based on Hellinger dissimilarity, exclusion of OTUs occurring in a single sample and a multivariate model selection procedure as implemented in DISTLM function of Permanova+ (Anderson *et al.*, 2005). To obtain coefficients of determination (cumulative $R^2_{adjusted}$) and statistics (F_{pseudo}) for each variable, the components of best models were forward selected. We prepared Global Nonmetric Multidimensional Scaling (GNMDS) graphs in parallel, using the same options. Significant variables were fitted into the ordination space using the envfit function in the vegan package of R.

To test the correlation in community composition among soil biota, trees and herbs, we calculated the bidirectional Procrustes correlation coefficient using 4999 permutations as implemented in protest function in the vegan package of R. False discovery rate associated with multiple testing was reduced using the sharpened FDR procedure (Benjamini & Hochberg, 2000). To test whether intimately associated communities display more similar beta diversity and to recover any sampling biases (size of matrices, connectance), we added the relatively small communities of trees, herbs and fungal subgroups belonging to mycoparasites, flagellates (Chytridiomycota) and white rot decomposers to the correlation matrices. The effects of association intimacy as well as the size of matrices and connectance on $R_{Procrustes}$ were tested using multiple regression analyses separately for Estonian and Finnish data sets. To further test whether the correlations among communities are potentially causal or related to the shared driving mechanisms of environmental variables, we calculated partial Procrustes association metrics accounting for the environmental and spatial predictors (Lisboa *et al*., 2014).

Variation partitioning analyses were conducted on standardized biomass and OTU richness data and Hellinger-transformed community data using the packfor and vegan packages of R. Because of the limits of variation partitioning, we generated four components of variance including richness (tree and understorey richness and Shannon index), sampling effect (log ratio-transformed proportions of tree species), other floristic as well as edaphic characters (total BA, tree volume, productivity, herb and ericoid cover, soil pH and nutrients) and space (PCNM vectors). By using one-way ANOVAs, we further tested whether the groups of different mobility (mobile: actively moving organisms excluding amoeboid groups), body size (average cell diameter and organism diameter) and trophic strategies (biotrophic and non-biotrophic) exhibit significant differences in the relative importance of tree richness, individual tree species and space.

Results

Identification of soil biota

The metabarcoding approach enabled us to recover all targeted groups of eukaryotes from composite soil samples and identify them at different taxonomic levels (Data S1, S2). Across study systems, kingdom-level assignment of 1.0% of the recovered sequences and 3.9% OTUs remained unknown. Sequences and OTUs (98% similarity threshold) assigned to Fungi (81.1% of taxa), Alveolata (4.8%, mostly Ciliophora), Metazoa (4.8%, mostly Nematoda and Collembola) and Viridiplantae (4.0%, mostly Tracheophyta, Bryophyta and Chlorophyta) dominated among the soil eukaryote kingdoms both in Finland and Estonia (Fig. 1). Saprotrophs, EcM mutualists, and plant pathogens comprised 47.5%, 17.7% and 3.5% of all fungal OTUs, respectively. The higher-level taxonomic distribution of soil organisms was remarkably similar in Finnish and Estonian samples (Fig. 1). One of the negative controls produced two fungal sequences, whereas the two positive controls yielded six different fungal and oomycete sequences in addition to *H. whiteii*.

Richness and biomass

Tree species richness was positively correlated with richness of soil fungal groups in Estonia and EcM fungi in Finland, but it was poorly correlated with richness of protists and meiofauna (Fig. S2). Taxonomic sampling effect of plants and edaphic variables were usually among the best predictors of belowground richness depending on organisms and study systems (Figs. 2, 3, S3; Table S3). Richness of all fungi was most strongly affected by herb cover (positive effect: $F_{1,35}$=17.30; R^2_{adj}=0.289; P=0.001) and tree BA (negative effect: $F_{1,35}$=17.30; $R^2_{adj,partial}$=0.108;

P=0.007) in Finland. In Estonia, *Pinus sylvestris* BA ($F_{1,32}$=63.29; R^2_{adj}=0.644; P<0.001) and tree species richness ($F_{1,32}$=25.21; $R^2_{adj,partial}$=0.149; P<0.001) respectively had a negative and positive effect on fungal richness. Richness of EcM fungi was negatively affected by *Alnus glutinosa* BA ($F_{1,34}$=14.60; R^2_{adj}=0.289; P=0.003) but positively by increasing soil pH ($F_{1,34}$=16.98; $R^2_{adj,partial}$=0.217; P=0.001) and tree diversity (Shannon index: $F_{1,34}$=13.05; $R^2_{adj,partial}$=0.127; P=0.002) in Finland. In Estonia, BA of *P. sylvestris* ($F_{1,32}$=40.28; R^2_{adj}=0.522; P<0.001) and BA of *A. glutinosa* ($F_{1,32}$=11.35; $R^2_{adj,partial}$=0.109; P<0.003) had a strong negative effect on EcM fungal richness, explaining 63.1% of variation, but there was no significant tree diversity effect. Herb cover enhanced ($F_{1,34}$=30.16; R^2_{adj}=0.422; P<0.001), but increasing C/N ratio reduced ($F_{1,34}$=10.61; $R^2_{adj,partial}$=0.114; P=0.002), plant pathogen richness in Finland. Similarly, soil C/N ratio had a strong negative effect on plant pathogen richness in Estonia ($F_{1,30}$=40.28; R^2_{adj}=0.627; P<0.001). Richness of saprotrophic fungi was negatively influenced by total BA of trees ($F_{1,35}$=18.25; R^2_{adj}=0.301; P=0.001) and BA of *Picea abies* ($F_{1,35}$=9.94; $R^2_{adj,partial}$=0.117; P=0.004) in Finland. In Estonia, however, tree species richness *per se* had a strong positive effect on saprotroph richness ($F_{1,32}$=25.60; R^2_{adj}=0.406; P<0.001).

Richness of the Cercozoa amoebae was most strongly enhanced by herb cover ($F_{1,34}$=8.72; R^2_{adj}=0.162; P=0.006) and soil pH ($F_{1,34}$=9.46; $R^2_{adj,partial}$=0.149; P=0.010) in Finland, but negatively affected by C/N ratio ($F_{1,33}$=17.75; R^2_{adj}=0.318; P=0.001) and soil Ca concentration ($F_{1,33}$=17.75; $R^2_{adj,partial}$=0.151; P=0.003) in Estonia. Chlorophyta richness was reduced by increasing total tree BA in Finland ($F_{1,37}$=21.12; R^2_{adj}=0.335; P<0.001) but promoted by *A. glutinosa* BA in Estonia ($F_{1,31}$=5.41; R^2_{adj}=0.109; P=0.022). Ciliophora richness was favoured by the relative amount of cut birch coppice ($F_{1,35}$=32.57; R^2_{adj}=0.441; P<0.001) and understorey richness ($F_{1,35}$=12.05; $R^2_{adj,partial}$=0123; P=0.004) in Finland but by soil Ca concentration in Estonia ($F_{1,31}$=52.90; R^2_{adj}=0.590; P<0.001).

Of soil animals, the richness of Collembola was affected by soil C/N ratio ($F_{1,37}$=9.93; R^2_{adj}=0.182; P=0.002) and spatial eigenvectors in Finland ($F_{2,37}$=17.34; $R^2_{adj,partial}$=0.250; P=0.001) but driven only by spatial variables in Estonia ($F_{2,34}$=15.17; $R^2_{adj,cumul}$=0.288; P=0.001). Nematoda richness responded positively to *Larix sibirica* BA in Finland ($F_{1,38}$=9.93; R^2_{adj}=0.072; P=0.047), whereas soil C/N ratio had a negative effect on roundworms in Estonia ($F_{1,34}$=9.64; R^2_{adj}=0.196; P=0.003).

Although the Estonian and Finnish soils differed considerably in nutrient concentrations (Fig. S4), the biomass of microbial groups in both study systems was positively related to soil macronutrients (Fig. 2). Model selection indicated that the total microbial biomass and bacterial biomass were positively influenced by soil P concentration both in Finland and Estonia (Table S3). The biomass of Actinobacteria increased with soil P concentration in Finland ($F_{1,38}$=45.55; R^2_{adj}=0.527; P<0.001), but it responded positively to increasing proportion of *Alnus glutinosa* basal area (BA)($F_{1,33}$=14.43; R^2_{adj}=0.272; P=0.001) and soil Ca concentration ($F_{1,33}$=8.84; $R^2_{adj,partial}$=0.133; P=0.011) in Estonia. Fungal biomass including that of saprotrophs and EcM fungi was largely determined by N concentration in both study systems. The ratio of saprotrophs to EcM symbionts increased with the relative BA of *A. glutinosa* in both systems (Table S3). In addition, soil Ca concentration negatively affected the relative proportion of saprotrophs in Estonia ($F_{1,33}$=14.85; $R^2_{adj,partial}$=0.254; P=0.001).

Structural equation modelling revealed that site (PCNM1) had a strong effect on soil pH, N and P concentrations in Finland (Fig. 4a). All these variables as well as tree diversity (Shannon index) had a direct positive effect on EcM fungal richness, while *A. glutinosa* BA had a direct negative effect on both EcM fungal biomass and richness. Soil nitrogen concentration and total BA had respectively a direct positive and negative effect on the richness of saprotrophs. Saprotroph biomass positively influenced saprotroph richness and EcM fungal biomass, but the opposite paths were of minor importance ($P>0.1$). Similarly for the Estonian data set, SEM largely confirmed the results of model selection, emphasizing the direct positive effect of tree richness and EcM fungal biomass but negative effects of *A. glutinosa* BA and *P. sylvestris* BA on EcM fungal richness (Fig. 4b). According to SEM, EcM fungal biomass and richness had strong positive effects on saprotroph biomass and richness, respectively.

The variation partitioning analysis was generally consistent with model selection (Table S4; Fig. S3). There were no general differences in the relative strength of tree diversity or individual species effects on organisms with different mobility, body size or biotrophic associations ($P>0.2$). Variation partitioning analysis ascribed much of the environmental variation to a shared effect among space, soil and vegetation (Table S4), confirming the SEM results that much of the floristic effects are spatially and edaphically structured. Across all data sets, the effect of space was significantly greater in Finland than in Estonia ($F_{1,42}=7.90$; $P=0.007$). This could be ascribed to the arrangement of plots in two distinct blocks (sites) in Finland as opposed to a more uniform plot distribution in Estonia. Furthermore, the Estonian experiment was subjected to natural regeneration that may have been influenced spatially structured soil parameters.

Community composition

Communities of soil biota were generally driven by spatial vectors and soil variables in Finland and Estonia, respectively (Table S5; Figs. 5, 6). According to the best multivariate model, the total fungal community was driven by spatial variation in Finland ($F_{1,37}=8.09$; $R^2_{adj}=0.151$; $P<0.001$)

but by soil C/N ratio ($F_{1,33}$=7.08; R^2_{adj}=0.144; P<0.001) and Ca concentration ($F_{1,33}$=3.90; $R^2_{adj,partial}$=0.086; P=0.001) in Estonia. The community composition of EcM fungi was mostly affected by spatial structure ($F_{1,36}$=4.31; R^2_{adj}=0.076; P=0.001) and BA of *B. pendula* ($F_{1,36}$=4.37; $R^2_{adj,partial}$=0.073; P=0.001) in Finland. In Estonia, the EcM fungal community was mostly affected by the cover of Ericaceae ($F_{1,33}$=5.44; $R^2_{adj,partial}$=0.110; P<0.001). The community structure of plant pathogens was driven by spatial variation ($F_{1,38}$=4.10; $R^2_{adj,partial}$=0.072; P=0.001) in Finland. Pathogen community was most strongly influenced by soil N ($F_{1,34}$=5.37; R^2_{adj} =0.108; P<0.001) and Ca ($F_{1,34}$=3.87; $R^2_{adj,partial}$=0.068; P=0.001) concentration in Estonia. Finnish saprotroph communities were primarily affected spatial distance ($F_{1,38}$=11.47; R^2_{adj}=0.207; P<0.001), whereas Estonian saprotroph communites were influenced by soil C/N ratio ($F_{1,33}$=8.96; R^2_{adj}=0.181; P<0.001), N concentration ($F_{1,33}$=4.20; $R^2_{adj,partial}$=0.069; P=0.001) and pH ($F_{1,33}$=4.12; $R^2_{adj,partial}$=0.063; P=0.001).

In protists, community composition of Cercozoa was strongly influenced by soil pH both in Finland ($F_{1,39}$=3.33; R^2_{adj} =0.055; P=0.001) and in Estonia ($F_{1,34}$=4.88; R^2_{adj} =0.097; P=0.001), whereas the community structure of Chlorophyta was mainly affected by space in Finland ($F_{1,39}$=4.01; R^2_{adj} =0.071; P=0.001) and by herb cover in Estonia ($F_{1,35}$=2.71; R^2_{adj} =0.076; P=0.001). Community structure of Ciliophora responded most strongly to soil Ca concentration ($F_{1,36}$=7.83; R^2_{adj} =0.146; P=0.001) in Finland but to Ericaceae cover in Estonia ($F_{1,34}$=5.05; $R^2_{adj,partial}$=0.101; P<0.001).

Of soil animals, the community of Collembola was affected by spatial structure in Finland ($F_{2,38}$=5.53; $R^2_{adj,cumul}$=0.083; P=0.001) but by soil pH in Estonia ($F_{1,34}$=3.27; $R^2_{adj,partial}$=0.059; P=0.001). Nematode communities were weakly affected by soil P concentration in Finland

($F_{1,39}$=2.66; R^2_{adj} =0.040; P=0.005) but by soil N concentration in Estonia ($F_{1,32}$=4.78; R^2_{adj} =0.095; P=0.001).

Procrustes analysis revealed that communities of nearly all soil organisms and those of trees and herbs significantly correspond to each other in both study systems (Table S6). Further analysis revealed that $R_{Procrustes}$ was strongly linearly related to the logarithm of the size of the community matrix (Finland: t=10.6; R^2_{adj}=0.634; P<0.001; Estonia: t=7.9; R^2_{adj}=0.446; P<0.001), indicating that the Procrustes statistic may have inherent biases related to sampling depth and richness. Partial Procrustes tests revealed that strong and highly significant correlations between communities were lost after accounting for environmental and spatial predictors (Table S6). Consistent with our last hypothesis, these results suggest that the same spatial or environmental variables drive the community composition of different organisms convergently with no causal relationships among these groups.

Discussion

Taxonomic richness and biomass

Diversity and identity of trees exhibited context-dependent effects on taxonomic richness of soil biota, depending on the study system and taxonomic group, which only partly supports our first hypothesis. Nonetheless, tree diversity was an important driver of the richness of EcM fungi in Finland and saprotrophic fungi in Estonia, suggesting that richness of both mutualistic and free-living organisms may benefit from greater producer diversity in certain conditions. Consistent with previous research on understorey richness (Ampoorter *et al.*, 2014) and ecosystem services (Nadrowski *et al.*, 2010; Gamfeldt *et al.*, 2013), neutral effects of tree diversity prevailed in plant-soil biota relationships in both study systems. The low tree diversity impact contrasts with implications from grasslands, in which richness effects on functioning increase with ecosystem age (Hooper *et al.*, 2012; Reich *et al.*, 2012).

The effects of individual tree species were usually stronger than diversity effects on richness and biomass of soil biota, corroborating the relatively strong sampling effects on ecosystem services (Cardinale *et al.*, 2006; Nadrowski *et al.*, 2010; Gamfeldt *et al.*, 2013). Our results indicate that the magnitude and directionality of individual species effects are system-specific. For example, the increasing proportion of *P. sylvestris* strongly suppressed richness of all fungi and in particular that of saprotrophs in Estonia, but it had a slight but significant positive effect on these groups in Finland. The richness of Cercozoa and Chlorophyta responded to different tree species in the two study systems. By contrast, the relative abundance of *A. glutinosa* consistently suppressed EcM fungal richness in both study systems that corroborates with the low mycobiont range in *Alnus* spp. worldwide (Põlme *et al.*, 2013).

Taken together, negative and positive sampling effects were nearly equally represented, suggesting that both stimulating and suppressive species effects are common in tree-soil biota richness relationships. The positive effects are probably related to the abundance of a particularly suitable substrate or facilitation, whereas the negative effects may stem from low palatability, poor compatibility with mutualistic partners or strong defence mechanisms (such as allelochemicals) against soil biota. Variation partitioning further revealed that tree diversity and sampling effects did not differ between biotrophic (pathogens, mutualists) and free-living organisms, providing no support to our second hypothesis.

Both SEM and model selection revealed that soil pH and nutrient concentration were generally the strongest direct or indirect predictors for richness of soil biota in spite of great differences in vegetation. Consistent with the third hypothesis, soil N and P concentrations determined the biomass of bacteria and fungi, especially that of saprotrophs; biomass was the strongest direct predictor of saprotrophic fungal richness in Finland and EcM fungal richness in Estonia. The positive biomass effects are in agreement with studies in grasslands, in which the abundance of individuals or their biomass determines taxonomic richness of particular groups of meiofauna both above- and belowground (Scherber *et al.*, 2010; Borer *et al.*, 2012). Soil nutrient concentration or lower C/N ratio had a strong positive effect on richness of Ciliophora in Finland and that of plant pathogenic fungi, Cercozoa amoebae, Ciliophora and Nematoda in Estonia. Apart from nutrients, richness of EcM fungi and Cercozoa responded positively to increasing soil pH in Finland, which is consistent with the substantial pH effect on phylogenetic composition of soil microbes (Rousk *et al.*, 2010).

Community composition

Plant biodiversity experiments carried out so far have seldom addressed community composition of the responding biota. Understanding whether species composition of organisms in one trophic level affects the community structure of organisms in a linked trophic level enables ecologists to further shed light into biological processes shaping the communities of interacting organisms and into the stability of the interaction networks (Nuismer *et al.*, 2013). In our study systems, community composition of most groups of soil biota were related to edaphic variables, especially soil pH and Mg concentration in Finland but to soil pH, C/N ratio, Ca and N concentration in Estonia. Individual tree species had a minor effect at the community level, except that of *T. cordata* on EcM fungi and Nematoda; and ericoid plant cover on EcM fungi, Cercozoa, Ciliophora and Collembola in Estonia. Such sampling effects were fewer in Finland, but it could be due to the absence of *T. cordata* and paucity of Ericaceae in the Finnish plots. These two taxa transform the soil environment into extremities in terms of pH and C/N ratio (Frouz *et al.*, 2013; Read *et al.*, 2004).

Our results indicate that different environmental variables drive biomass, richness and community composition of soil organisms. Only site effect and soil pH were among the statistically significant shared determinants of both richness and community composition for groups of soil biota in Finland, whereas soil pH and soil Ca concentration sometimes determined both richness and community composition in Estonia. These results suggest that soil pH is universally related to both environmental filtering and niche differentiation that underlie richness and community development, respectively (Pärtel, 2002; Lauber *et al.*, 2009; Tedersoo *et al.*, 2014b).

Methodological advances

This is the first study to address organisms from multiple eukaryotic kingdoms simultaneously using a molecular marker with species-level resolution. The mixture of 11 forward primers designed to perfectly match Fungi, Viridiplantae, Ciliophora, Cercozoa, Straminipila and selected groups of Metazoa enabled us to recover the identity of all these target organisms in a metabarcoding analysis of a single PCR template. Our approach allows addition of further primer variants to capture additional taxonomic groups. Alternatively, different groups can be targeted in separate PCR reactions or using different markers followed by estimation of biomass or individuals by subsampling or quantitative PCR (Fierer *et al.*, 2005; de Barba *et al.*, 2014; Lentendu *et al.*, 2014). Multiple pairs of MID-tagged primers and preparing several metabarcoding libraries per sample dramatically enhance requirements for time and analytical costs. Our approach of simultaneous identification of multiple organism groups from soil offers a relatively cheap and powerful alternative. The drawback of this method is that it renders cost-effective MID-tagging the more conserved primer, but updated technologies exist for adding unique identifiers to templates before amplification (Lunderg *et al*., 2013). With further increase in sequence length (>700 bp), the full ITS region could be targeted as there are more universal eukaryote primer sites in the end of SSU (Tedersoo *et al.*, 2015a). Adding further degenerate positions to ITS4ngs primer (5´-tcctssgcttantdatatgc-3´) would render in universal to nearly all eukaryotes.

Previous studies have used ribosomal DNA SSU genes to target taxonomic composition of various protist kingdoms in soil and water (Moon-van der Staay *et al.*, 2001; Bates *et al.*, 2013). However, SSU offers poor species-level resolution in most eukaryote groups (Pawlowski *et al.*, 2012; Schoch *et al.*, 2012; Tang *et al.*, 2012) and the ‘universal’ SSU primers exhibit several mismatches to many large and important eukaryote kingdoms (Pawlowski *et al.*, 2012; Tedersoo *et al.*, 2015a,b). While SSU and COI have additional problems with multiple introns in several taxonomic groups, there is also considerable variation in length of the ITS sequences (e.g. Acari, many Insecta; Wang *et al.*, 2015). These biological phenomena cause exclusion of a small fraction of taxa from any metabarcoding data sets using a single marker (de Barba *et al.*, 2014).

Ecologists may argue that our strategy of metabarcoding composite soil samples is better suited to detect immobile organisms. Other studies of soil animals have typically relied on identification of organisms obtained from specifically extracted pools of individuals (Porazinska *et al.*, 2009; Hajibabaei *et al.*, 2011). That approach is more labour-intensive and enables to address only specific group(s) of soil biota, usually resulting in capturing the most mobile subset of the target species that respond to light or bait. Nonetheless, inclusion of only the active community members rather than eggs, dormant stages and pieces of cuticle may pose an advantage of that approach in certain cases. Alternatively, inactive community members can be discriminated against by targeting RNA instead of DNA (Baldrian *et al.*, 2012).

Based on our analysis of DNA and microbial biomass, the amount of cells and ribosomal DNA molecules of soil animals is in minority compared to that of bacteria and fungi, which is in agreement with previous studies targeting SSU and LSU (Baldwin *et al.*, 2013; Ramirez *et al.*, 2014; Tedersoo *et al.*, 2015a). The fungal dominance could be related to the actual differences in the number of cells and/or copies of ribosomal DNA (Medinger *et al.*, 2010; Vetrovsky & Baldrian, 2013). One gram of organic forest soil may comprise >10^3 m of hyphae that roughly translates into 10^8 cells (Leake *et al*., 2004). The same amount of soil harbours thousands of nematodes that altogether comprise 10^6-10^7 cells (Wardle, 2002). The estimated cell numbers of protists generally fall into the same orders of magnitude (Adl & Gupta, 2006). Deeper sequencing using the Illumina or forthcoming ultra-high throughput platforms are likely to provide more accurate richness estimates by exhaustively capturing taxonomic groups that are common, but exhibit a relatively low biomass or marker gene content (Smith & Peay, 2014).

Conclusions

Compared with the effects of individual species and soil parameters, tree diversity *per se* has generally relatively low influence on taxonomic richness of soil biota. Our results outline that biodiversity effects are context-dependent and that experiments and field studies should be replicated to secure representativeness and understand system-specificity (Vehviläinen *et al.*, 2008; Bruelheide *et al.*, 2014). Corresponding changes in beta diversity among vegetation and soil biota are largely explained by the convergent effect of environmental predictors, indicating that these variables must be accounted for in addressing community-wise relationships.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgements

The data are available as Data S1 and S2. Raw sequence data have been deposited in Short Read Archive under accession SRP043706. We thank I. Jussila, M. Mett and V. Veldre for assistance during sampling, M. Haugas for isotope sample preparation and L. Neuenkamp for discussion about Procrustes analysis. This project received support from the Estonian Science Foundation grants 9286, 171PUT; EMP265; RMK; and FIBIR.

Author contributions

LT and JK designed the experiments; LT, MB, SP, SA, IH performed sampling; HH, TC, FB and KP did part of the molecular work; LT, MB, KA and SP analysed the data; LT wrote the manuscript with input from other authors.

Supplementary Information accompanies this paper on The ISME Journal website (http://www.nature.com/ismej)

References

Abarenkov K, Nilsson RH, Larsson K-H, Alexander IJ, Eberhardt U, Erland S *et al.* (2010). The UNITE database for molecular identification of fungi – recent updates and future perspectives. *New Phytol* **186**: 281-285.

Abarenkov K, Tedersoo L, Nilsson RH, Vellak K, Saar I, Veldre V *et al.* (2010). PlutoF – a web based workbench for ecological and taxonomic research with an online implementation for fungal ITS sequences. *Evol Bioinform* **6**: 189-196.

Adl SM, Gupta VVSR. (2006). Protists in soil ecology and forest nutrient cycling. *Can J For Res* **36**: 1805-1817.

Adl SM, Simpson AGB, Lane CE, Lukes J, Bass D, Bowser SS. (2012). The revised classification of eukaryotes. *J Euk Microbiol* **59**: 429–493.

Ampoorter E, Baeten L, Koricheva J, Vanhellemont M, Verheyen K. (2014). Do diverse overstoreys induce diverse understoreys? Lessons learnt from an experimental -observational platform in Finland. *For Ecol Manage* **318**: 206-215.

Anderson MJ. (2005). PERMANOVA: a FORTRAN computer program for permutational multivariate analysis of variance. University of Auckland, New Zealand.

Anslan S, Tedersoo L. (2015). Performance of cytochrome c oxidase subunit I (COI), ribosomal DNA Large Subunit (LSU) and Internal Transcribed Spacer 2 (ITS2) in DNA barcoding of Collembola. *Eur J Soil Biol* **69**: 1-7.

Aponte C, García LV, Marañón T. (2013). Tree species effects on nutrient cycling and soil biota: a feedback mechanism favouring species coexistence. *For Ecol Manage* **309**: 36-46.

Arif C, Daniels C, Bayer T, Banguera-Hinestroza E, Barbrook A, Howe CJ *et al.* (2014). Assessing Symbiodinium diversity in scleractinian corals via next-generation-based genotyping of the ITS2 rDNA region. *Mol Ecol* **23**: 4418-4433.

Ayres E, Steltzer H, Berg S, Wallenstein MD, Simmons BL, Wall DH. (2009). Tree species traits influence soil physical, chemical, and biological properties in high elevation forests. *PLoS ONE* **4**: e5964.

Bachy C, Dolan JR, Lopez-Garcia P, Deschamps P, Moreira D. (2013). Accuracy of protist diversity assessments: morphology compared with cloning and direct pyrosequencing of 18S rRNA genes and ITS regions using the conspicuous tintinnid ciliates as a case study. *ISME J* **7**: 244-255.

Bagchi R, Gallery RE, Gripenberg S, Gurr SJ, Narayan L, Addis CE *et al.* (2014). Pathogens and insect herbivores drive rainforest plant diversity and composition. *Nature* **506**: 85-88.

Bahram M, Põlme S, Kõljalg U, Zarre S, Tedersoo L. (2012). Regional and local patterns of ectomycorrhizal fungal diversity and community structure along an altitudinal gradient in the Hyrcanian forests of northern Iran. *New Phytol* **193**: 465–473.

Baldrian P, Kolarik M, Stursova M, Kopecky J, Valaskova V, Vetrovsky T *et al.* (2012). Active and total microbial communities in forest soil are largely different and highly stratified during decomposition. *ISME J* **6**: 248–258.

Baldwin DS, Colloff MJ, Rees GN, Chariton AA, Watson GO, Court LN *et al.* (2013) Impacts of inundation and drought on eukaryote biodiversity in semi-arid floodplain soils. *Mol Ecol* **22**: 1746-1758.

Bates ST, Clemente JC, Flores GE, Walters WA, Wegener Parfrey L, Knight R, Fierer N. (2013). Global biogeography of highly diverse protistan communities in soil. *ISME J* **7**: 652–659.

Baxter JW, Dighton J. (2005). Phosphorus source alters host plant response to ectomycorrhizal diversity. *Mycorrhiza* **15**: 513-523.

Bengtsson-Palme J, Ryberg M, Hartmann M, Branco S, Wang Z, Godhe A, *et al.* (2013). Improved software detection and extraction of ITS1 and ITS2 from ribosomal ITS sequences of fungi and other eukaryotes for analysis of environmental sequencing data. *Meth Ecol Evol* **4**: 914-919.

Benjamini Y, Hochberg Y. (2000). On the adaptive control of the false discovery rate in multiple testing with independent statistics. *J Educ Behav Statist* **25**: 60-83.

Bik HM, Porazinska D, Creer S, Caporaso JG, Knight R, Thomas WK. (2012). Sequencing our way towards understanding global eukaryotic biodiversity. *Trends Ecol Evol* **27**: 233-243.

Bligh EG, Dyer WJ. 1959. A rapid method of total lipid extraction and purification. *Can J Biochem Phys* **37**: 911-917.

Borer ET, Seabloom EW, Tilman D. (2012). Plant diversity contrls arthropod biomass and temporal stability. *Ecol Lett* **15**: 1457-1464.

Bragg L, Stone G, Imelfort M, Hugenholtz P, Tyson GW. (2012). Fast, accurate error-correction of amplicon pyrosequences using Acacia. *Nature Meth* **9**: 425-426.

Bruelheide H, Nadrowski K, Assmann T, Bauhus J, Both S, Buscot F, *et al.* (2014). Designing forest biodiversity experiments: general considerations. illustrated by a new large experiment in subtropical China. *Methods Ecol Evol* **5**: 74-89.

Cardinale BJ, Matulich KL, Hooper DU, Byrnes JE, Duffy E, Gamfeldt L, *et al.* (2011). The functional role of producer diversity in ecosystems. *Am J Bot* **98**: 572-592.

Cardinale BJ, Srivastava DS, Duffy JE, Wright JP, Downing AL, Sankaran M, Jouseau C. (2006). Effects of biodiversity on the functioning of trophic groups and ecosystems. *Nature* **443**: 989-992.

Chariton AA, Court LN, Hartley DM, Coloff MJ, Hardy CM. (2010). Ecological assessment of estuarine sediments by pyrosequencing eukaryotic ribosomal DNA. *Front Ecol* **8**: 233-238.

China BOL Group. (2011). Comparative analysis of a large dataset indicates that internal transcribed spacer (ITS) should be incorporated into the core barcode for seed plants. *Proc Natl Acad Sci USA* **108**: 19641-19646.

Clemmensen KE, Bahr A, Ovaskainen O, Dahlberg A, Ekblad A, Wallander H, *et al.* (2013). Roots and associated fungi drive long-term carbon sequestration in boreal forest. *Science* **339**: 1615-1618.

Coleman AW. (2009). Is there a molecular key to the level of 'biological species' in eukaryotes? A DNA guide. *Mol Phyl Evol* **50**: 197-203.

Creer S, Fonseca VG, Porazinska DL, Giblin-Davis RM, Sung W, Power DM, *et al.* (2010). Ultrasequencing of the meiofaunal biosphere: practice, pitfalls and promises. *Mol Ecol* **19**: S4-S20.

de Barba M, Boyer MF, Rioux MD, Coissac E, Taberlet P. (2014). DNA metabarcoding multiplexing and validation of data accuracy for diet assessment: application to omnivorous diet. *Mol Ecol Res* **14**: 306-323.

de Wit P, Erseus C. (2010). Genetic variation and phylogeny of Scandinavian species of *Grania* (Annelida, Clitellata, Enchytraediae), with discovery of a cryptic species. *J Zool Syst Evol Res* **48**: 285-293.

Edgar RC, Haas BJ, Clemente JC, Quince C, Knight R. (2011). UCHIME improves sensitivity and speed of chimera detection. Bioinformatics **27**: 2194-2, 200.

Eisenhauer N, Dobies T, Cesarz S, Hobbie SE, Meyer RJ, Worm K, Reich PB. (2013). Plant diversity effects on soil food webs are stronger than those of elevated CO_2 and N deposition in a long-term grassland experiment. *Proc Natl Acad Sci USA* **17**: 6889-6894.

Fierer N, Jackson JA, Vilgalys R, Jackson RB. (2005). Assessment of soil microbial community structure by use of taxon-specific quantitative PCR assays. *Appl Environ Microbiol* **71**: 4117-4120.

Frouz J, Liveckova M, Albrechtova J, Chronakova A, Cajthaml T, Pizl V, *et al.* (2013). Is the effect of trees on soil properties mediated by soil fauna? A case study from post-mining sites. *For Ecol Manage* **309**: 87-95.

Fu L, Niu B, Zhu Z, Wu S, Li W. (2012). CD-HIT: accelerated for clustering the next-generation sequencing data. *Bioinformatics* **23**: 3150-3152.

Gamfeldt L, Snäll T, Bagchi R, Jonsson M, Gustafsson L, Kjellander P, *et al.* (2013). Higher levels of multiple ecosystem services are found in forests with more tree species. *Nature Commun* **4**: 1340.

Hajibabaei M, Shokralla S, Zhou X, Singer GC, Baird DJ. (2011). Environmental barcoding: a next-generation sequencing approach for biomonitoring applications using river benthos. *PLoS ONE* **6**: e17497.

Healy C, Gotelli NJ, Potvin C. (2008). Partitioning the effects of biodiversity and environmental heterogeneity for productivity and mortality in a tropical tree plantation. *J Ecol* **96**: 903-913.

Hiiesalu I, Pärtel M, Davison J, Gerhold P, Metsis M, Moora M, *et al.* (2014). Species richness of arbuscular mycorrhizal fungi: associations with grassland plant richness and biomass. *New Phytol* **203**: 233-234.

Hooper DU, Adair EC, Cardinale BJ, Byrnes JEK, Hungate BA, Matulich KA, *et al.* (2012). A global synthesis reveals biodiversity loss as a major driver of ecosystem change. *Nature* **486**: 105–108.

Huston MA., 1997. Hidden treatments in ecological experiments: re-evaluating the ecosystem function of biodiversity. *Oecologia* **110**: 449-460.

Jumpponen A, Jones KL. (2009). Massively parallel 454 sequencing indicates hyperdiverse fungal communities in temperate *Quercus macrocarpa* phyllosphere. *New Phytol* **184**: 438-448.

Katoh K, Standley DM. (2013). MAFFT multiple sequence alignment software version 7: improvements in performance and usability. *Mol Biol Evol* **30**: 772-780.

Koetschan C, Förster F, Keller A, Schleicher T, Ruderisch B, Schwarz R, *et al.* (2010). The ITS2 Database III - sequences and structures for phylogeny. *Nucl Ac Res* **38**: D275-D279.

Kõljalg U, Nilsson RH, Abarenkov K, Tedersoo L, Taylor AFS, Bahram M *et al.* (2013). Towards a unified paradigm for sequence-based identification of Fungi. *Mol Ecol* **22**: 5271–5277.

Lauber C, Hamady M, Knight R, Fierer N. (2009). Pyrosequencing-based assessment of soil pH as a predictor of soil bacterial community structure at the continental scale. *Appl Environ Microbiol* **75**: 5111-5120.

Leake J, Johnson D, Donnelly D, Muckle G, Boddy L, Read DJ. 2004. Networks of power and influence: the role of mycorrhizal mycelium in controlling plant communities and agroecosystem functioning. *Can J Bot* **82**: 1016–1045.

Legendre P (2008). Studying beta diversity: ecological variation partitioning by multiple regression and canonical analysis. *J Plant Ecol* **1**: 3-8.

Lentendu G, Wubet T, Chatzinotas A, Wilhelm C, Buscot F, Schlegel M. (2014). Effects of long-term differential fertilization on eukaryotic microbial communities in an arable soil: a multiple barcoding approach. *Mol Ecol* **23**: 3341-3355.

Lindahl BD, Nilsson RH, Tedersoo L, Abarenkov K, Carlsen T, Kjøller R, *et al.* (2013). Fungal community analysis by high-throughput sequencing of amplified markers – a user's guide. *New Phytol*, **199**: 288–299.

Lisboa FJG, Peres-Neto PR, Chaer GM, Jesus EdC, Mitchell RJ, *et al*. (2014). Much beyond Mantel: bringing procrustes association metric to the plant and soil ecologist's toolbox. *PLoS ONE* **9**: e101238.

Litaker RW, Vandersea MW, Kibler SR, Reece KS, Stokes NA, Lutzoni FM, *et al.* (2007). Recognizing dinoflagellate species using ITS rDNA sequences. *J Phycol* **43**: 344-355.

Lundberg DS, Yourstone S, Mieczkowski P, Jones CD, Dangl JL (2013). Practical innovations for high-throughput amplicon sequencing. *Nature Meth* **10**: 999–1002.

Magurran AE. (1988). Ecological diversity and its measurement. Princeton University Press, Princeton, NJ.

Maherali H, Klironomos JN. (2007). Influence of phylogeny on fungal community assembly and ecosystem functioning. *Science* **316**: 1746-1748.

Medinger R, Nolte V, Pandey RM, Jost S, Ottenwälder B, Schlötterer C, Boenigk J. (2010). Diversity in a hidden world: potential and limitation of next-generation sequencing for surveys of molecular diversity of eukaryotic microorganisms. *Mol Ecol* **19**: 32-40.

Moon-van der Staay SY, De Vachter R, Vaulot D. (2001). Oceanic 18S rDNA sequences from picoplankton reveal unsuspected eukaryotic diversity. *Nature* **409**: 607-610.

Nadrowski K, Wirth C, Scherer-Lorenzen M. (2010). Is forest diversity driving ecosystem function and service? *Curr Opin Environ Sustain* **2**: 75-79.

Noge K, Mori N, Tanaka C, Nishida R, Tsuda M, Kuwahara Y. (2005). Identification of astigmatid mites using the second internal transcribed spacer (ITS2) region and its application for phylogenetic study. *Exp Appl Acarol* **35**: 29-46.

Nuismer SL, Jordano P, Bascompte J. (2013). Coevolution and the architecture of mutualistic networks. *Evolution* **67**: 338-354.

Paquette A, Messier C. (2011). The effect of biodiversity on tree productivity: from temperate to boreal forests. *Glob Ecol Biogeogr* **20**: 170-180.

Pärtel M. (2002). Local plant diversity patterns and evolutionary history at the regional scale. *Ecology* **83**: 2361-2366.

Pawlowski J, Audic S, Adl S. (2012). CBOL Protist Working Group: barcoding eukaryotic richness beyond the animal, plant, and fungal kingdoms. *PLoS Biol* **10**: e1001419.

Peay KG, Baraloto C, Fine PVA. (2013). Strong coupling of plant and fungal community structure across western Amazonian rainforests. *ISME J* **7**: 1852–1861.

Pellissier L, Niculita-Hirzel H, Dubuis A, Pagni M, Guex N, Ndiribe C *et al.* (2014). Soil fungal communities in grasslands are environmentally structured at a regional scale in the Alps. *Mol Ecol* **23**: 4274-4290.

Põlme S, Bahram M, Kõljalg U, Tedersoo L. (2014). Global biogeography of *Alnus*-associated *Frankia* Actinobacteria. *New Phytol* **204**: 979–988.

Põlme S, Bahram M, Yamanaka T, Nara K, Dai YC, Grebenc T *et al.* (2013). Biogeography of ectomycorrhizal fungi associated with alders *(Alnus* spp.) in relation to biotic and abiotic variables at the global scale. *New Phytol* **198**: 1239–1249.

Porazinska DL, Bardgett RD, Blaauw MB, Hunt HW, Parsons AN, Seastedt TR, Wall DH. (2003). Relationships at the aboveground-belowground interface: plants, soil biota and soil processes. *Ecol Monogr* **73**: 377-395.

Prescott CE, Grayston SJ. (2013). Tree species influence on microbial communities in litter and soil: current knowledge and research needs. *For Ecol Manage* **309**: 19-27.

R Core Development Team. (2014). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. Available from http://www.R-project.org/.

Ramirez KS, Leff JW, Barberan A, Bates ST, Betley J, Crowther TW *et al*. (2014). Biogeographic patterns in below-ground diversity in New York City's Central Park are similar to those observed globally. *Proc R Soc B* **281**: 20141988.

Read D, Leake JR, Perez-Moreno J. (2004). Mycorrhizal fungi as drivers of ecosystem processes in heathland and boreal forest biomes. *Can J Bot* **82**: 1243-1263.

Reich PB, Tilman D, Isbell F, Mueller K, Hobbie SE, Flynn DFB, Eisenhauer N. (2012). Impacts of biodiversity loss escalate through time as redundancy fades. *Science* **336**: 589-592.

Rousk J, Baath E, Brokes PC, Lauber CL, Lozupone C, Caporaso JG *et al.* (2010). Soil bacterial and fungal communities across a pH gradient in an arable soil. *ISME J* **4**: 1340-1351.

Scherber C, Eisenhauer N, Weisser WW, Schmid B, Voigt W, Fischer M *et al.* (2010). Bottom-up levels of plant diversity on multitrophic interactions in a biodiversity experiment. *Nature* **468**: 553–556.

Scherer-Lorenzen M, Potvin C, Koricheva J, Schmid B, Hector A, Bornik Z, *et al.* (2006). The design of experimental tree plantations for functional biodiversity research. *Ecol Stud* **176**: 348-375.

Schoch CL, Seifert KA, Huhndorf S, Robert V, Spouge JL, Levesque CA *et al.* (2012). Nuclear ribosomal internal transcribed spacer (ITS) region as a universal DNA barcode marker for Fungi. *Proc Natl Acad Sci USA* **109**: 6241-6246.

Serna-Chavez H, Fierer N, van Bodegom PM. (2013). Global drivers and patterns of microbial abundance in soil. *Glob Ecol Biogeogr* **10**: 1162-1172.

Smith DP, Peay KG (2014). Sequence depth, not PCR replication, improves ecological inference from next generation DNA sequencing. *PLoS ONE* **9**: e90234.

Šnajdr J, Cajthaml T, Valášková V, Merhautová V, Petranková M, Spetz P *et al.* (2011). Transformation of *Quercus petraea* litter: successive changes in litter chemistry are reflected in differential enzyme activity and changes in the microbial community composition. *FEMS Microbiol Ecol* **75**: 291–303.

Šnajdr J, Valášková V, Merhautová V, Herinková J, Cajthaml T, Baldrian P. (2008). Spatial variability of enzyme activities and microbial biomass in the upper layers of *Quercus petraea* forest soil. *Soil Biol Biochem* **40**: 2068-2075.

Soininen EM, Zinger L, Gielly L, Bellemain E, Bråthen KA, Brochmann C *et al.* (2013). Shedding new light on the diet of Norwegian lemmings: DNA metabarcoding of stomach content. *Polar Biol* **36**:1069–1076.

Soininen J. (2014). A quantitative analysis of species sorting across organisms and ecosystems. *Ecology* **95**: 3284-3292.

Steudel B, Hector A, Friedl T, Löfke C, Lorenz M, Wesche M, Kessler M. (2012). Biodiversity effects on ecosystem functioning change along environmental stress gradients. *Ecol Lett* **15**: 1397-1405.

Štursova M, Šnajdr J, Cajthaml T, Barta J, Šantruckova H, Baldrian P. (2014). When the forest dies: the response of forest soil fungi to a bark beetle-induced tree dieback. *ISME J* **8**: 1920–1931.

Szava-Kovats RC, Zobel M, Pärtel M. (2011). The local-regional species richness relationship: new perspectives on the null-hypothesis. *Oikos* **121**: 321-326.

Tang CQ, Leasi F, Obertegger U, Kieneke A, Cbarraclough TG, Fontaneto D. (2012). The widely used small subunit 18S rDNA molecule greatly underestimates true diversity in biodiversity surveys of the meiofauna. *Proc Natl Acad Sci USA* **109**: 16208–16212.

Tedersoo L, Anslan S, Bahram M, Põlme S, Riit T, Liiv I *et al*. (2015a). Shotgun metagenomes and multiple primer pair-barcode combinations of amplicons reveal biases in metabarcoding analyses of fungi. *MycoKeys* **10**: 1-43.

Tedersoo L, Bahram M, Dickie IA. (2014a). Does host plant richness explain diversity of ectomycorrhizal fungi? Re-evaluation of Gao *et al.* (2013) data sets reveals sampling effects. *Mol Ecol* **23**: 992-995.

Tedersoo L, Bahram M, Põlme S, Anslan S, Riit T, Kõljalg U *et al*. (2015b). Analytical biases in microbial diversity studies. *Science* (in press).

Tedersoo L, Bahram M, Põlme S, Kõljalg U, Yorou NS, Wijesundera R *et al.* (2014b). Global diversity and geography of soil fungi. *Science* **346**: 1078.

Tedersoo L, Bahram M, Ryberg M, Otsing E, Kõljalg U, Abarenkov K. (2014c). Global biogeography of the ectomycorrhizal /sebacina lineage (Fungi, Sebacinales) as revealed from comparative phylogenetics analyses. *Mol Ecol* **23**: 4168–4183.

Tedersoo L, Naadel T, Bahram M, Pritsch K, Buegger F, Leal M, *et al.* (2012). Enzymatic activities and stable isotope patterns of ectomycorrhizal fungi in relation to phylogeny and exploration types in an afrotropical rain forest. *New Phytol* **195**: 832–843.

Tedersoo L, Nilsson RH, Abarenkov K, Jairus T, Sadam A, Saar I *et al.* (2010). 454 Pyrosequencing and Sanger sequencing of tropical mycorrhizal fungi provide similar results but reveal substantial methodological biases. *New Phytol* **188**: 291-301.

Tedersoo L, Smith ME. (2013). Lineages of ectomycorrhizal fungi revisited: foraging strategies and novel lineages revealed by sequences from belowground. *Fung Biol Rev* **27**: 83-99.

van der Heijden EW, Kuyper TW. (2003). Ecological strategies of ectomycorrhizal fungi of *Salix repens*: root manipulation versus root replacement. *Oikos* **103**: 668–680.

van der Heijden MGA, Streitwolf-Engel R, Riedl R, Siegrist S, Neudecker A, Ineichen K *et al.* (2006). The mycorrhizal contribution to plant productivity, plant nutrition and soil structure in experimental grassland. *New Phytol* **172**: 739–752.

van der Heijden MGA, Wiemken A, Sanders IR. (2003). Different arbuscular mycorrhizal fungi alter coexistence and resource distribution between co-occurring plant. *New Phytol* **157**: 569–578.

Vehviläinen H, Koricheva J, Ruohomäki K. (2008). Effects of stand tree species composition and diversity on abundance of predaory arthropods. *Oikos* **117**: 935-943.

Vetrovsky T, Baldrian P. (2013). The variability of the 16S rRNA gene in bacterial genomes and its consequences for bacterial community analyses. *PLoS One* **8**: e57923.

Wagg C, Bender SF, Widmer F, van der Heijden MGA. (2014). Soil biodiversity and soil community composition determine ecosystem multifunctionality. *Proc Natl Acad Sci USA* **111**: 5266-5270.

Wagg C, Jansa J, Schmid B, van der Heijden MGA. (2011). Belowground biodiversity effects of plant symbionts support aboveground productivity. *Ecol Lett* **14**: 1001-1009.

Wang X-C, Liu C, Huang L, Bengtsson-Palme J, Chen H, Zhang J-H *et al.* (2014). ITS1: a DNA barcode better than ITS2 in eukaryotes? *Mol Ecol Res*, in press.

Wardle DA, Bardgett RD, Klironomos JN, Setälä H, van der Putten WH, Wall DH. (2004). Ecological linkages between aboveground and belowground biota. *Science* **304**: 1629-1633.

Wardle DA. (1999). Is "sampling effect" a problem for experiments investigating biodiversity-ecosystem function relationships? *Oikos* **87**: 403-407.

Wardle DA. (2002). Communities and Ecosystems: Linking the Aboveground and Belowground Components. Princeton University Press, New York.

White TJ, Bruns TD, Lee S, Taylor J. (1990). Amplification and direct sequencing of fungal ribosomal RNA genes for phylogenetics. In: Innis MA, Gelfand DH. (eds). PCR Protocols: A Guide to Methods and Applications. Academic Press: London, pp. 315-322.

Yao H, Song J, Liu C, Luo K, Han J, Li Y *et al*. (2010). Use of ITS2 region as the universal DNA barcode for plants and animals. *PLoS ONE* **5**: e13102.

Zhan A, Bailey SA, Heath DJ, MacIsaac HJ. (2014). Performance comparison of genetic markers for high-throughput sequencing-based biodiversity assessment in complex communities. *Mol Ecol Res* **14**: 1049-1059.

Figure legends

Figure 1. Proportion of 98% sequence similarity level Operational Taxonomic Units (OTUs) belonging to fungal, protist and animal groups in (a) Finland and (b) Estonia. OM, other Metazoa

Figure 2. Linear regressions between the standardized residuals of richness of soil fungi and the strongest predictors as revealed from the best multiple regression models (Table S2): (a, b) all fungi; (c, d) ectomycorrhizal fungi; (e, f) plant pathogens; (g, h) saprotrophs.

Figure 3. Linear regressions between the standardized residuals of richness of soil protists or animals and the strongest predictors as revealed from the best multiple regression models (Table S2): (a, b) Cercozoa; (c, d) Chlorophyta; (e, f) Ciliophora; (g, h) Collembola; (i, j) Nematoda.

Figure 4. Structural equation models demonstrating the direct and indirect effects of spatial, environmental and floristic variables on biomass and species richness of ectomycorrhizal and saprotrophic fungi in (a) Finland and (b) Estonia. Black and red arrows indicate positive and negative relationships, respectively. Dashed arrows indicate connections through Error terms (Err). Numbers above arrows indicate standardized path coefficients. Numbers above variables indicate proportion of variation explained. BA, basal area; SH, Shannon diversity index.

Figure 5. Non-metric Multidimensional Scaling graphs of communities of soil fungal functional groups: (a, b) ectomycorrhizal fungi; (c, d) plant pathogens; and (e, f) saprotrophs. Left panes, Finland (different shades depict sites); right panes, Estonia. Only those variables with significant

fit (P<0.05) are indicated. Variables included in the best community models are underlined. BA, basal area.

Figure 6. Non-metric Multidimensional Scaling graphs of communities of soil protists and animals: (a, b) Cercozoa; (c, d) Chlorophyta; (e, f) Ciliophora; (g, h) Collembola; (i, j) Nematoda. Left panes, Finland (different shades depict sites); right panes, Estonia. Only those variables with significant fit (P<0.05) are indicated. Variables included in the best community models are underlined. BA, basal area.

Supplementary material

Table S1. Tree species composition of experimental plots.

Table S2. Sequences of primers and MID-tags used for identification of soil biota and primer mismatches.

Table S3. The best linear regression models for richness of soil biota.

Table S4. Variation partitioning of taxonomic sampling, biodiversity, spatial, vegetation and soil effects on biomass, richness and community composition of soil biota.

Table S5. The best multivariate models for community composition of soil biota.

Table S6. Symmetric Procrustes correlation coefficients among communities of soil biota.

Figure S1. Rarefied OTU accumulation curves for fungi, protists and animals in each sample

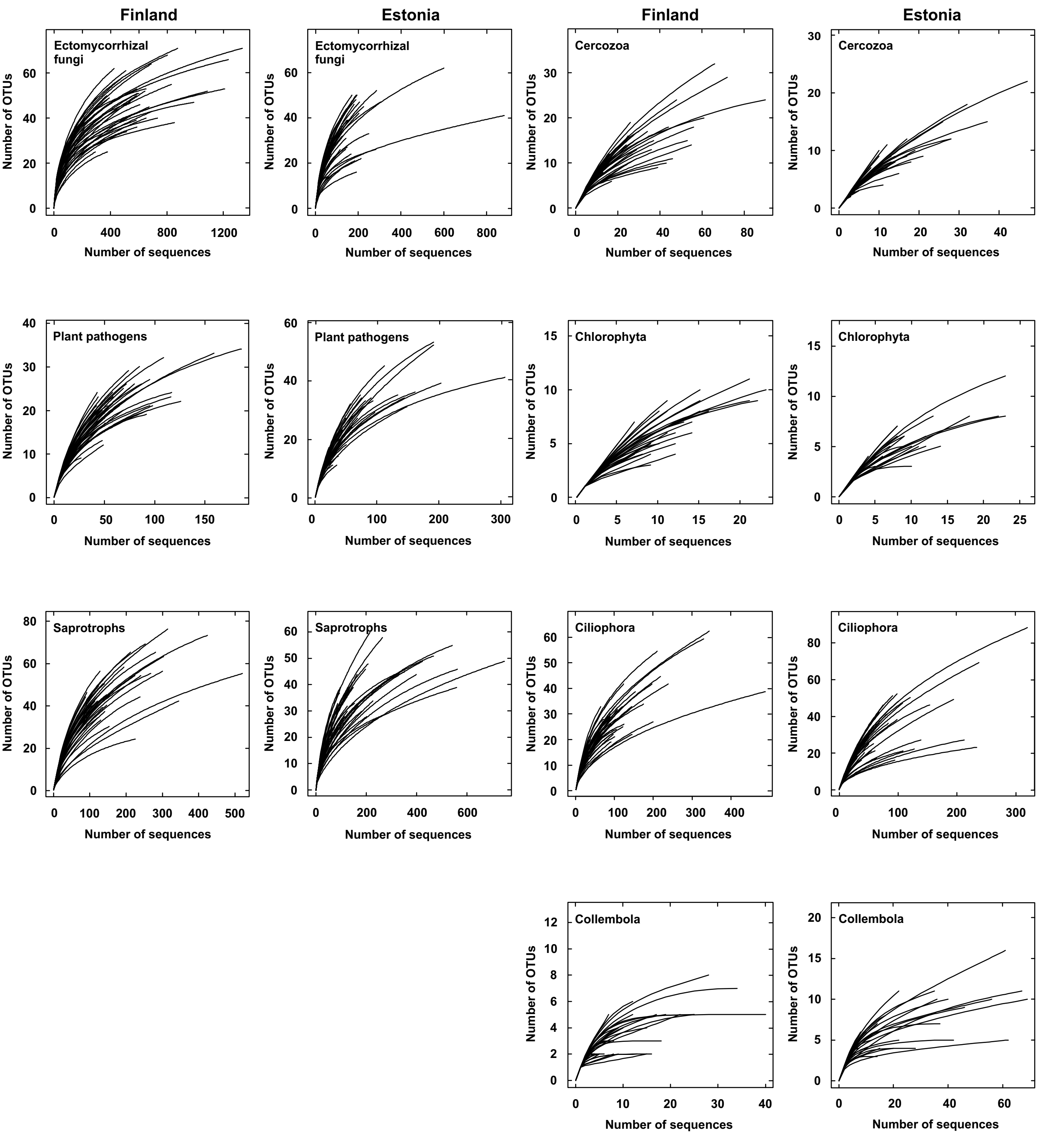
Figure S2. Pearson correlations between tree species richness and residual richness of soil biota accounting for differences in sequencing depth.

Figure S3. Unique and total effects of tree diversity, species composition, edaphic and floristic variables on taxonomic richness of soil biota.

Figure S4. Nutrient concentrations in the Estonian and Finnish sites.

Data S1. Distribution and identification of OTUs in Finland.

Data S2. Distribution and identification of OTUs in Estonia.



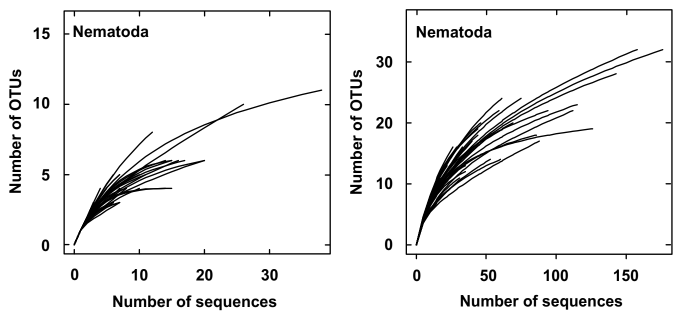


Figure S1. Rarefied accumulation curves for Operational Taxonomic Units (OTUs) of functional groups of soil fungi and taxonomic groups of protists and animals in pooled soil samples from Finland and Estonia. Note that global singletons were removed prior to analyses and sequencing depth was accounted for in downstream analyses.

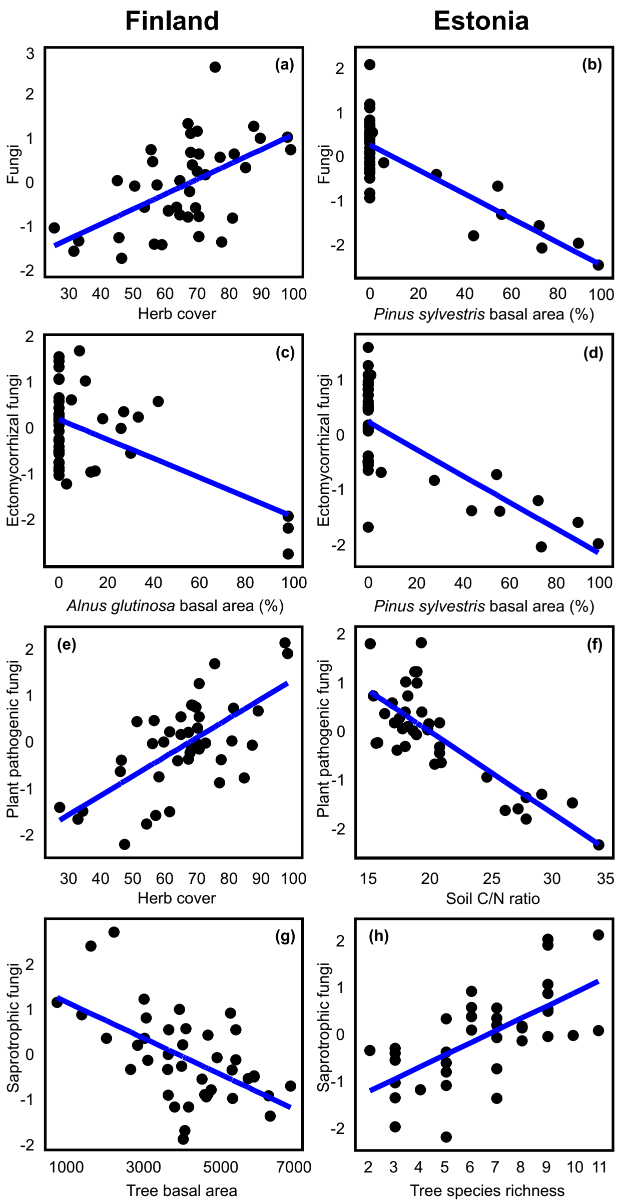
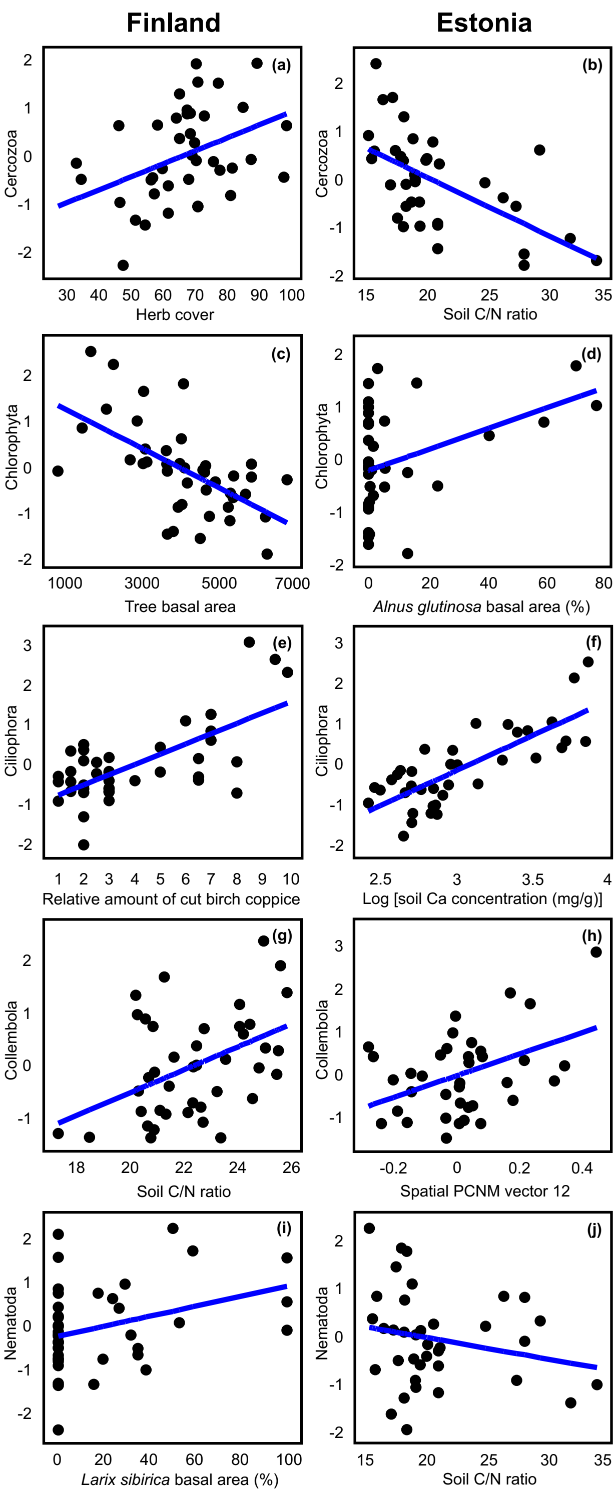
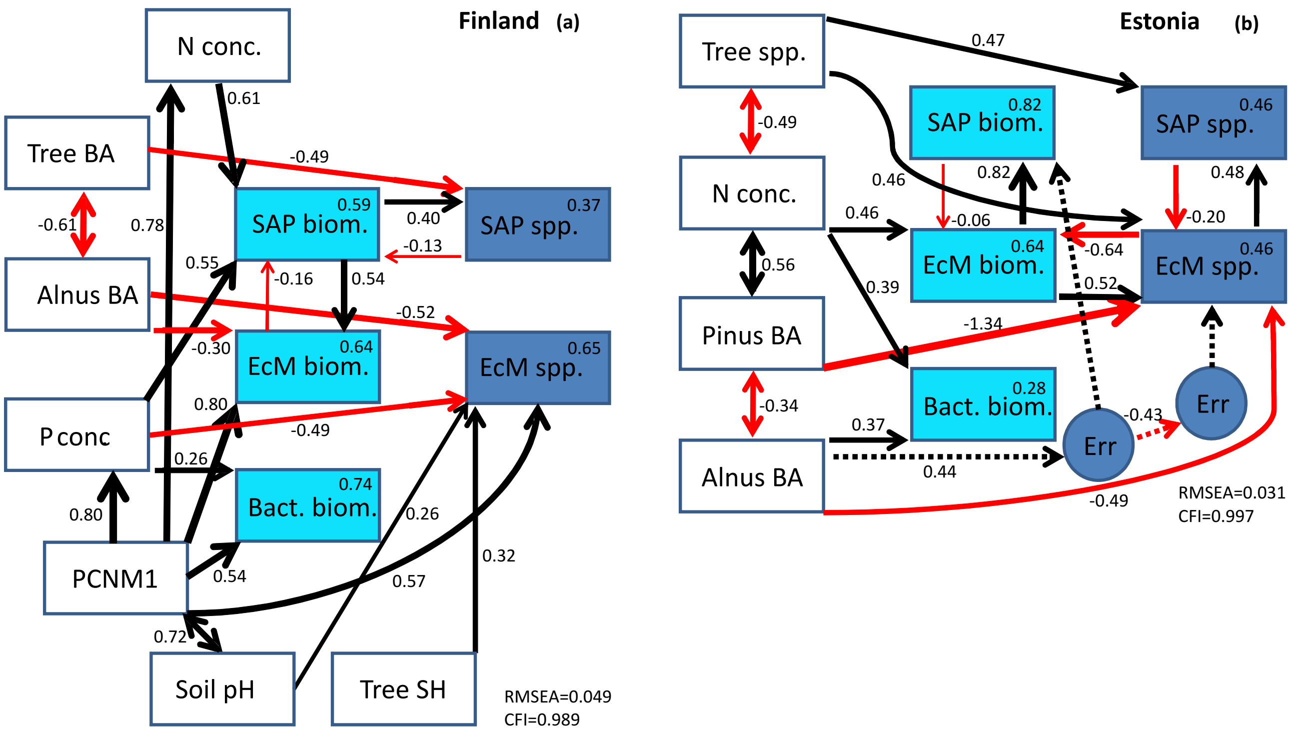

Finland
Estonia
(a)
Fungi
Herb cover
(b)
Fungi
Pinus sylvestris basal area (%)
(c)
Ectomycorrhizal fungi
Alnus glutinosa basal area (%)
(d)
Ectomycorrhizal fungi
Pinus sylvestris basal area (%)
(e)
Plant pathogenic fungi
Herb cover
(f)
Plant pathogenic fungi
Soil C/N ratio
(g)
Saprotrophic fungi
Tree basal area
(h)
Saprotrophic fungi
Tree species richness

Figure 2



Finland
Estonia
(a)
Cercozoa
Herb cover
(b)
Soil C/N ratio
(c)
Chlorophyta
Tree basal area
(d)
Alnus glutinosa basal area (%)
(e)
Ciliophora
Relative amount of cut birch coppice
(f)
Log [soil Ca concentration (mg/g)]
(g)
Collembola
Soil C/N ratio
(h)
Spatial PCNM vector 12
(i)
Nematoda
Larix sibirica basal area (%)
(j)
Soil C/N ratio

Figure 3



Finland (a)
N conc.
Tree BA
Alnus BA
P conc
PCNM1
Soil pH
Tree SH
SAP biom. 0.59
EcM biom. 0.64
Bact. biom. 0.74
SAP spp. 0.37
EcM spp. 0.65
0.61
-0.49
-0.61
0.78
0.55
0.40
-0.13
-0.16
0.54
-0.52
-0.30
0.80
-0.49
0.26
0.80
0.54
0.26
0.57
0.32
0.72
RMSEA=0.049
CFI=0.989
Estonia (b)
Tree spp.
N conc.
Pinus BA
Alnus BA
SAP biom. 0.82
EcM biom. 0.64
Bact. biom. 0.28
SAP spp. 0.46
EcM spp. 0.46
Err
Err
0.47
-0.49
0.46
0.46
0.82
-0.06
0.48
-0.20
-0.64
0.56
0.39
0.52
-1.34
-0.34
0.37
0.44
-0.43
-0.49
RMSEA=0.031
CFI=0.997

Figure 4

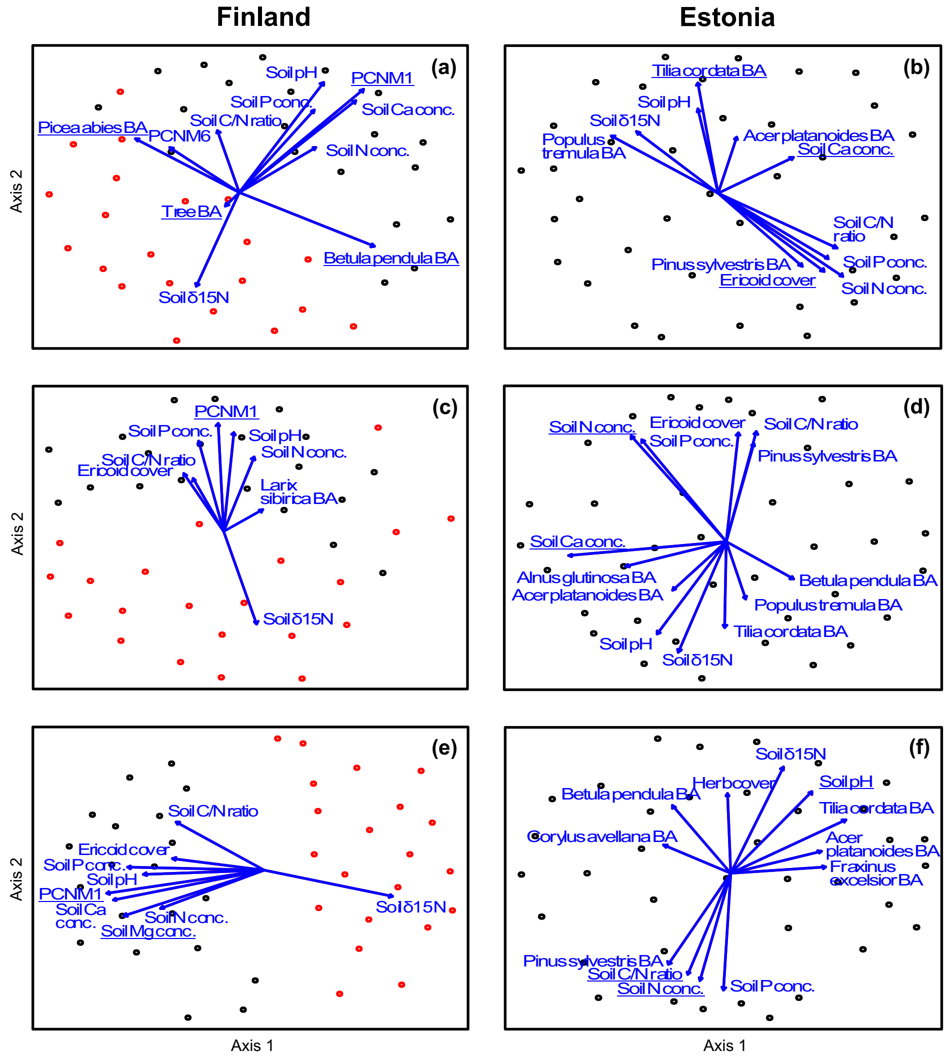
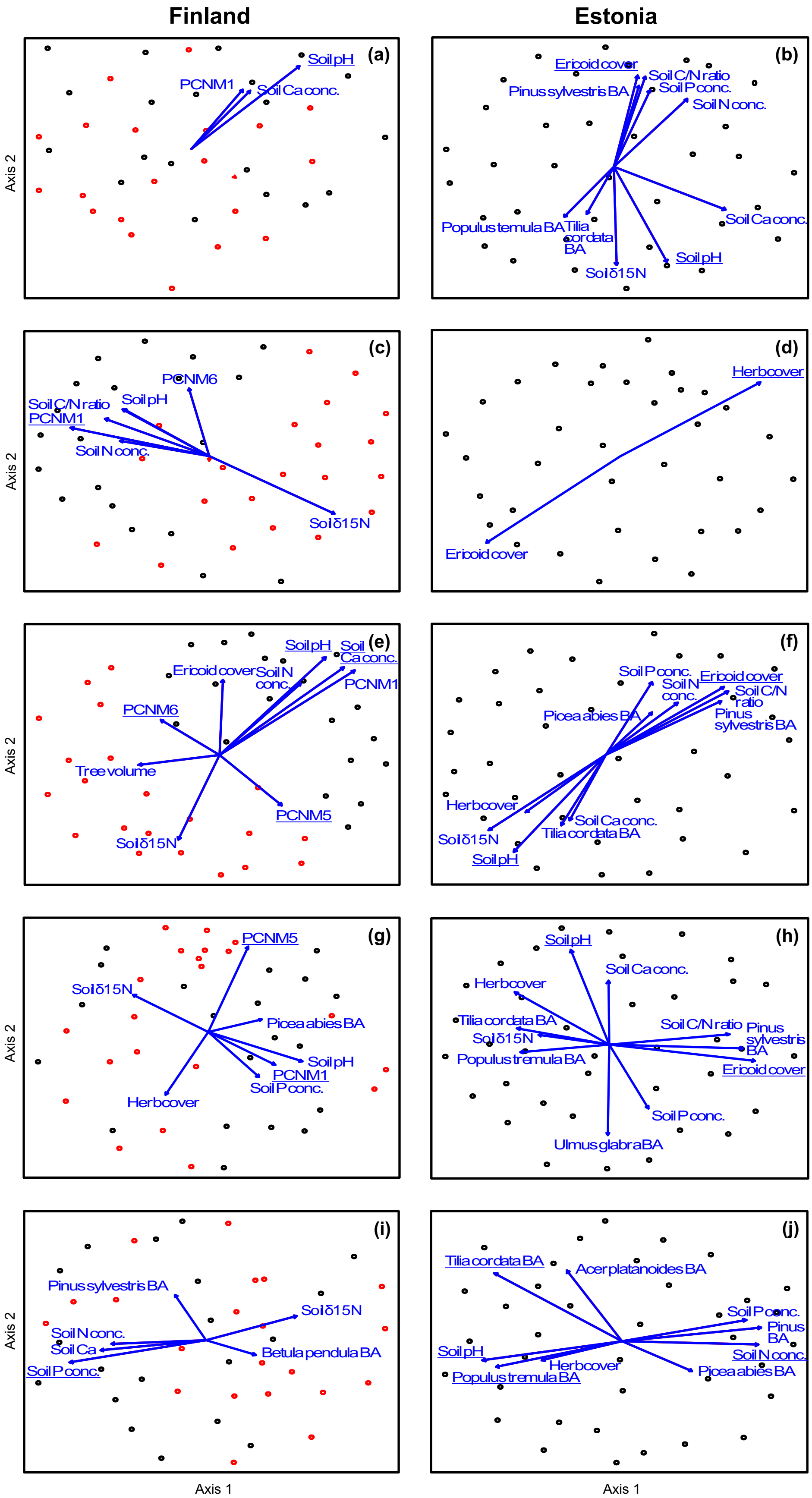

Finland
Estonia
(a)
Soil pH
PCNM1
Soil P conc.
Soil Ca conc.
Soil C/N ratio
Picea abies BA
PCNM6
Soil N conc.
Tree BA
Betula pendula BA
Soil δ15N
(b)
Tilia cordata BA
Soil pH
Soil δ15N
Acer platanoides BA
Populus tremula BA
Soil Ca conc.
Soil C/N ratio
Soil P conc.
Pinus sylvestris BA
Ericoid cover
Soil N conc.
(c)
PCNM1
Soil P conc.
Soil pH
Soil N conc.
Soil C/N ratio
Ericoid cover
Larix sibirica BA
Soil δ15N
(d)
Soil N conc.
Ericoid cover
Soil C/N ratio
Soil P conc.
Pinus sylvestris BA
Soil Ca conc.
Alnus glutinosa BA
Acer platanoides BA
Betula pendula BA
Populus tremula BA
Tilia cordata BA
Soil pH
Soil δ15N
(e)
Soil C/N ratio
Ericoid cover
Soil P conc.
Soil pH
PCNM1
Soil Ca conc.
Soil N conc.
Soil Mg conc.
Soil δ15N
(f)
Soil δ15N
Betula pendula BA
Herb cover
Soil pH
Tilia cordata BA
Corylus avellana BA
Acer platanoides BA
Fraxinus excelsior BA
Pinus sylvestris BA
Soil C/N ratio
Soil N conc.
Soil P conc.
Axis 2
Axis 1

Figure 5.



Finland
Estonia
(a)
Soil pH
PCNM1
Soil Ca conc.
Axis 2
(b)
Ericoid cover
Soil C/N ratio
Soil P conc.
Pinus sylvestris BA
Soil N conc.
Populus temula BA
Tilia cordata BA
Soil Ca conc.
Soil pH
Soil δ15N
(c)
PCNM6
Soil pH
Soil C/N ratio
PCNM1
Soil N conc.
Soil δ15N
(d)
Herb cover
Ericoid cover
(e)
Soil pH
Soil Ca conc.
Ericoid cover
Soil N conc.
PCNM1
PCNM6
Tree volume
PCNM5
Soil δ15N
(f)
Soil P conc.
Soil N conc.
Ericoid cover
Soil C/N ratio
Picea abies BA
Pinus sylvestris BA
Herb cover
Soil Ca conc.
Tilia cordata BA
Soil δ15N
Soil pH
(g)
PCNM5
Soil δ15N
Picea abies BA
Soil pH
PCNM1
Soil P conc.
Herb cover
(h)
Soil pH
Soil Ca conc.
Herb cover
Tilia cordata BA
Soil δ15N
Soil C/N ratio
Pinus sylvestris BA
Populus tremula BA
Ericoid cover
Soil P conc.
Ulmus glabra BA
(i)
Pinus sylvestris BA
Soil δ15N
Soil N conc.
Soil Ca
Betula pendula BA
Soil P conc.
Axis 1
(j)
Tilia cordata BA
Acer platanoides BA
Soil P conc.
Pinus BA
Soil pH
Soil N conc.
Herb cover
Picea abies BA
Populus tremula BA
Axis 1

Figure 6.

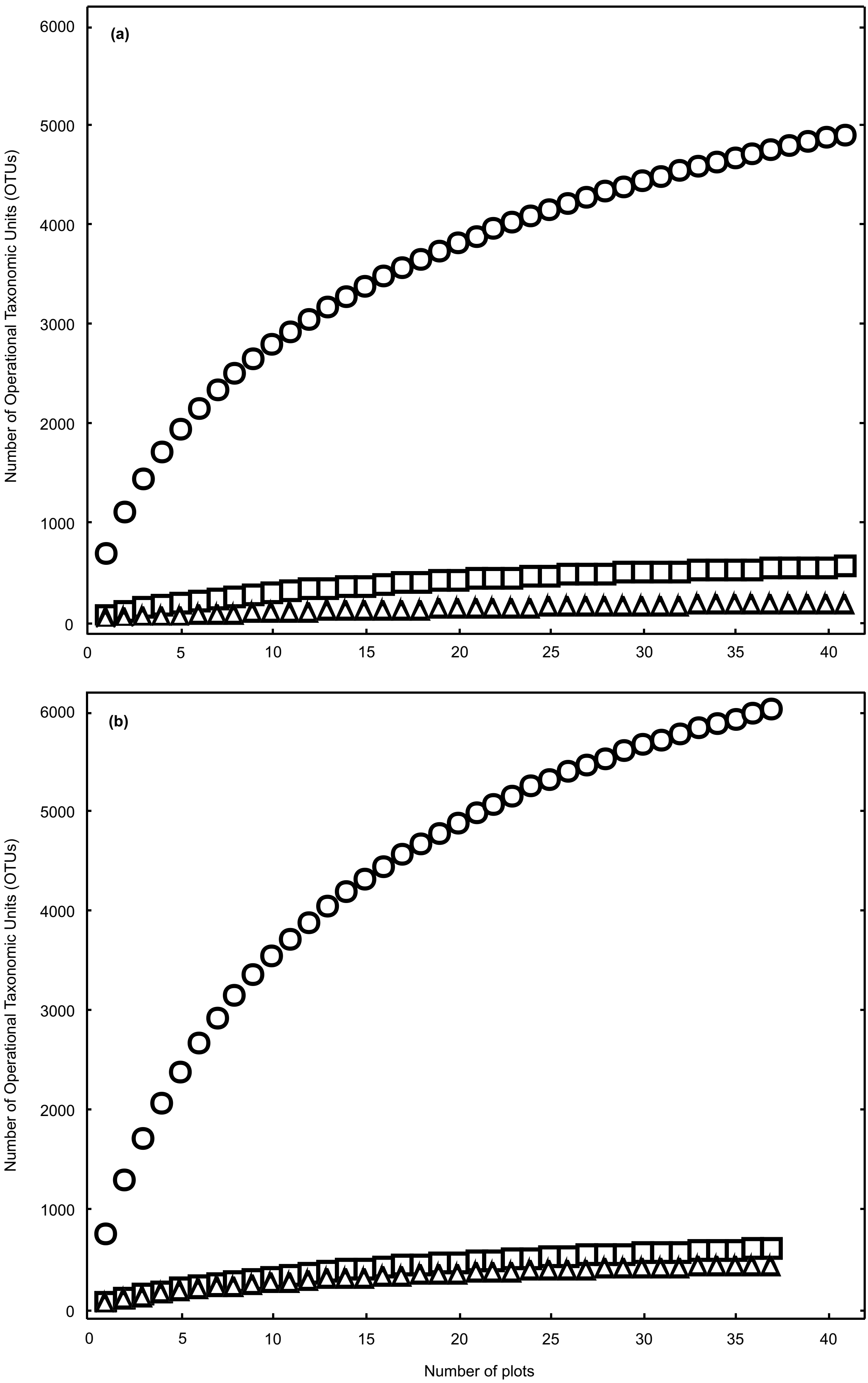


Figure S1. Rarefied accumulation curves for Operational Taxonomic Units (OTUs) of soil fungi (circles), protists (squares) and animals (triangles) in (a) Finland and (b) Estonia. Note that global singletons were removed from these analyses.

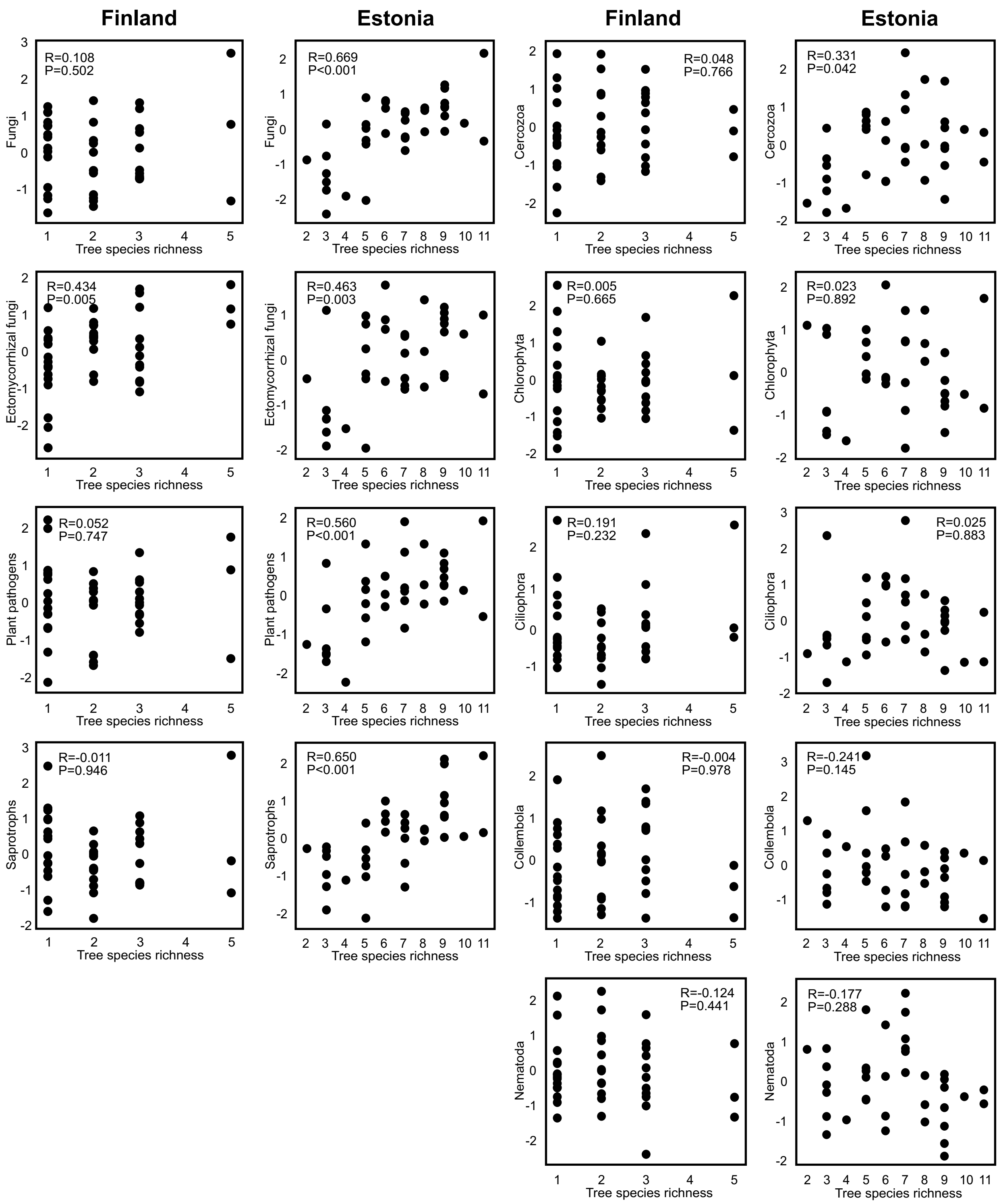


Figure S2. Pearson correlations between tree species richness and residual richness of soil biota accounting for differences in sequencing depth. The first and third columns represent samples from Finland, while the second and fourth column represent Estonian samples. Note that most of these relationships are non-significant after taking into account the strongest predictors based on model selection.

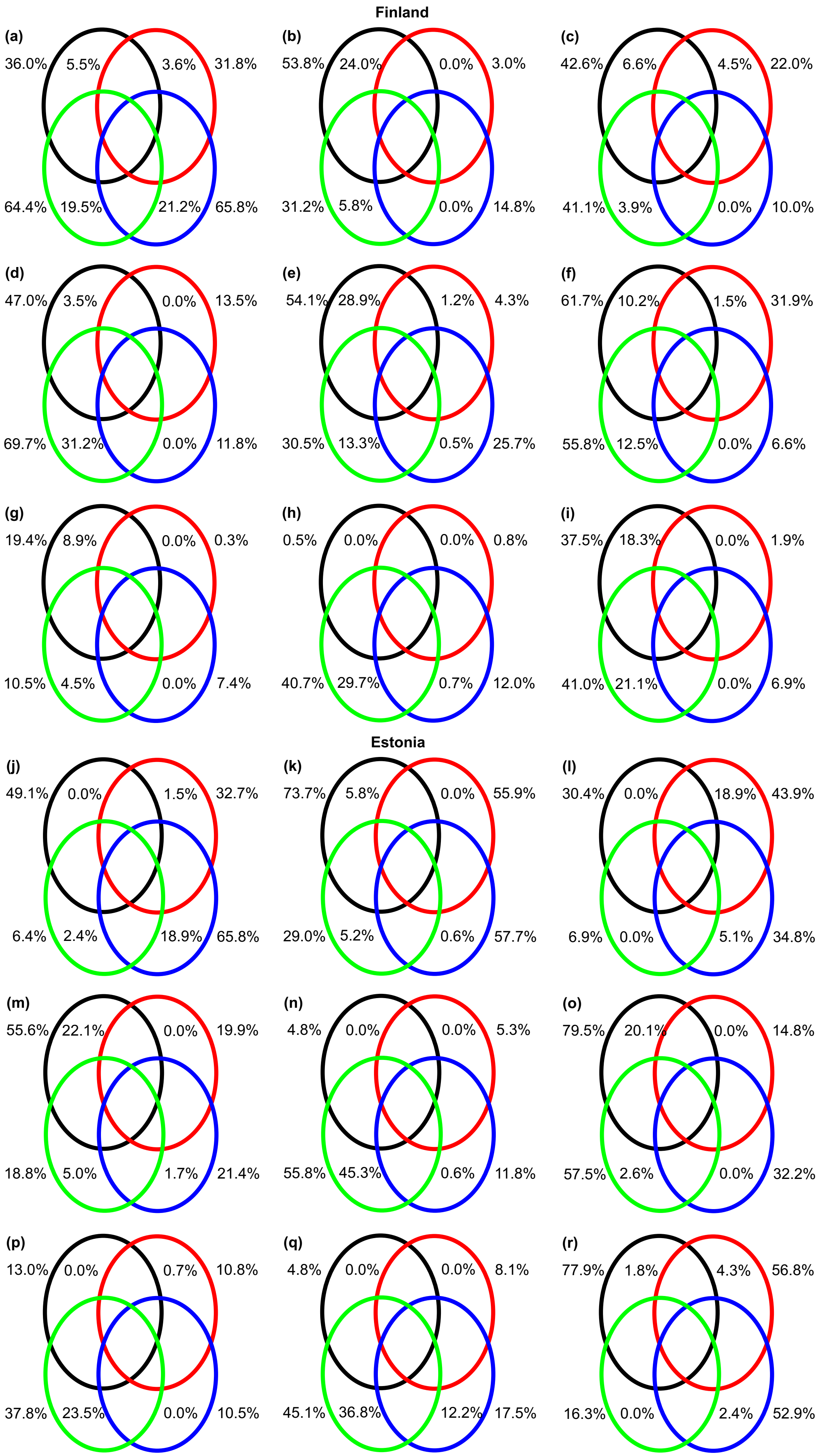


Figure S3. Variation partitioning analysis estimating unique (numbers in circles) and total (including shared; numbers outside circles) effects of vegetation and soil parameters combined (black circles), tree diversity (red circles), tree species (blue circles) and spatial structure (green circles) in Finland (a-i) and Estonia (j-r). (a, j) ectomycorrhizal fungi; (b, k) plant pathogenic fungi; (c, l) saprotrophic fungi; (d, m) Cercozoa; (e, n) Chlorophyta; (f, o) Ciliophora; (g, p) Collembola; (h, q) Nematoda; (i, r) understorey vegetation.

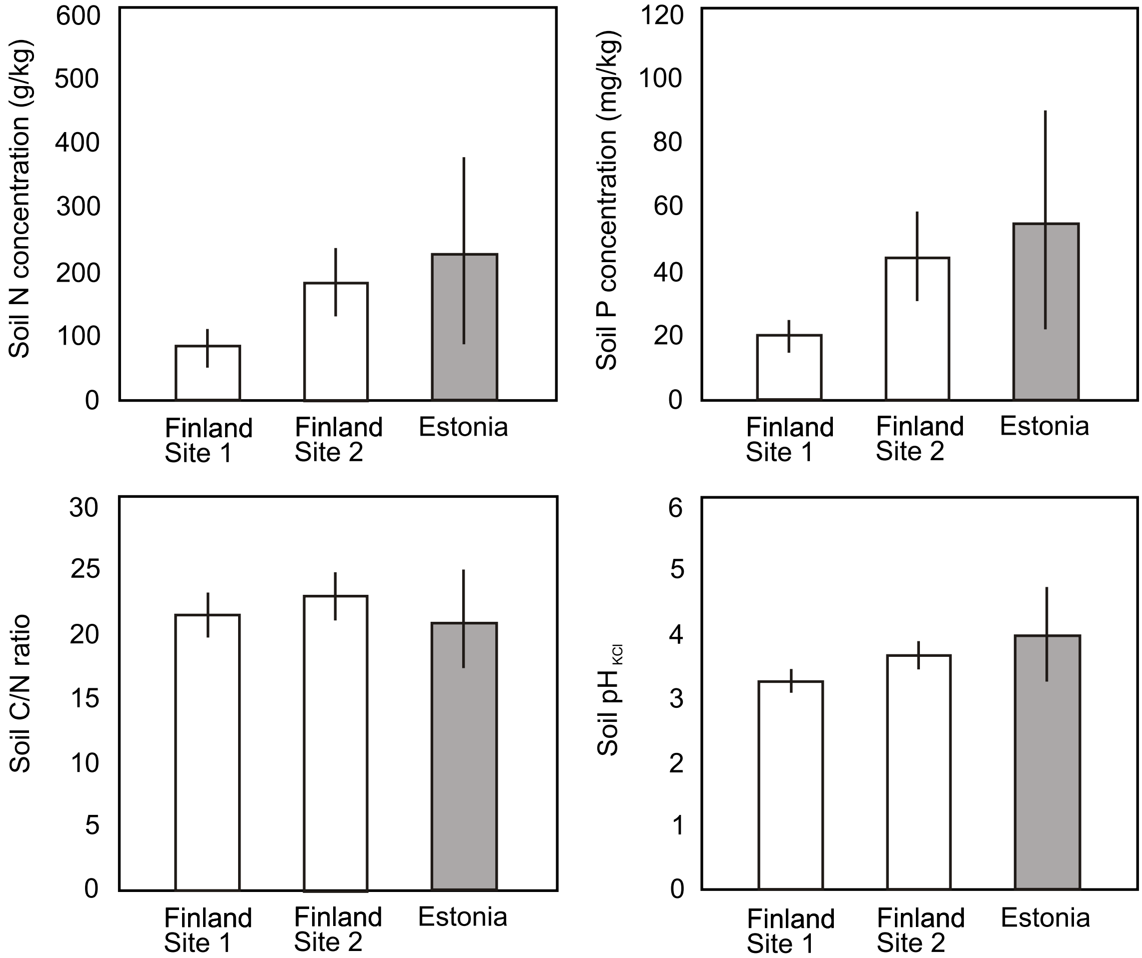


Figure S4. Average soil nutrient concentrations and pH in the two Finnish sites and in Estonia. Error bars denote standard deviation.

OMA	Citations	TBD	Schadt/Ros	Balint	Francis	Mycokeys		ECM morfotü	ECM jt seente	ECM dominandid	viljakeh
2015		y					Anslan S, Tedersoo L. 2015. Performance of cytochrome c oxidase subunit I (COI),				
							Waud M, Busschaert P, Ruyters S, Jacquemyn H, Lievens B. 2014. Impact of prime				
							Tedersoo L, Bahram M, Põlme S, Anslan S, Riit T, Kõljalg U, Nilsson RH, Hildebra				
		p/cd					Margulies M, Egholm M, Altman WE, Attiya S, Bader JS, Bemben LA and 50 other				
						x	Brown SP, Veach AM, Rigdon-Huss AR, Grond K, Lickteig SK, Lothamer K, Olive				
							Liu Z, DeSantis T, Andresen GL, Knight R. 2008. Accurate taxonomy assignments f				
		x					Tang CQ, Leasi F, Obertegger U, Kieneke A, Cbarraclough TG, Fontaneto D. 2012.				
							Dethlefsen L, Huse S, Sogin ML, Relman DA. 2008. The pervasive effect of an anti				
							Chariton AA, Court LN, Hartley DM, Colloff MJ, Hardy CM. 2010. Ecological asse				
							Darby BJ, Todd TC, Herman MA. 2013. High-throughput amplicon sequencing of r				
							Penton CR, St. Louis D, Col		seente BD ja kooslus Alaska tundras ja Oklaho		
							Shakya M, Gottel N, Castro		juurtes Populus deltoidesel bakterid ja seened:		
							Kubartova A, Ottosson E, D		puutüvedes seened ITS2-454. Ülemine külg lii		
							Leininger S, Urich T, Schloter M, Schwark L, Qi J, Nicol GW, Prosser JI, Schuster				
		x					Lentendu G, Wubet T, Chatz		454: eri praimerid ITS2 seentele, trnF plastiidid		
		x					Bragg L, Stone G, Imelfort M, Hugenholtz P, Tyson GW. 2012. Fast, accurate error				
		p/cd					Lumini E, Orgiazzi A, Borrielli R, Bonfante P, Bianciotto V. 2010. Disclosing arbus				
		x					Peay KG, Baraloto C, Fine P		Amazonias: seente kooslus ja puude kooslus or		
							Letendu G, Zinger L, Manel		seened Alpides ITS1 454 põhjal		
			5		x	x	Ihrmark K, Bödeker ITM, Cruz-Martinez K, Friberg H, Kubartova A, Schenk J, Stri				
							Pommier T, Neal PR, Gasol JM, Coll M, Acinas SG, Pedros-Alio C. 2010. Spatial p				
		p/cd					Acosta-Martinez V, Dowd S, Sun Y, Allen V. 2008. Tag-encoded pyrosequencing a				
		p/cd					Roesch L, Fulthorpe RR, Riva A, Casella G, Hadwin AKM, Kent AD, Daroub SH, (				
		p/cd					Huber JA, Mark Welch DB, Morrison HG, Huse SM, Neal PR, Butterfield DA, Sog				
		p/cd			x		Sogin ML, Morrison HG, Huber JA, Welch DM, Huse SM, Neal PR, Arrieta JM, H				
		p/cd					Uroz S, Buee M, Murat C, Frey-Klett P, Martin F. 2010. Pyrosequencing reveals a c				
							Hollister EB, Engledow AS, Hammett AJM, Provin TL, Wilkinson HH, Gentry TJ. 2				
							Coissac E, Riaz T, Puillandre N. 2012. Bioinformatic challenges for DNA metabarc				
							Andersson AF, Riemann L, Bertilsson S. 2010. Pyrosequencing reveals contrasting s				
							Kumar S, Carlsen T, Mevik B-H, Enger P, Blaalid R, Shalchian-Tabrizi K, Kauseruc				
		x					Deagle BE, Jarman SN, Coissac E, Pompanon F, Taberlet P. 2014. DNA metabarco				
			9				Deagle BE, Jarman SN, Coissac E, Pompanon F, Taberlet P. 2014. DNA metabarco				
			10				Geller J, Meyer C, Parker M, Hawk H. 2013. Redesign of PCR primers for mitocho				
							Shokralla S, Gibson JF, Nikbakht H, Janzen DH, Hallwachs W, Hajibabaei M. 2014				
							Wieczorek J, Bloom D, Guralnick R, Blum S, Döring M, Robertson V, Tieglais D. 2				
							Reeder J, Knight R. 2010. Rapidly denoising pyrosequencing amplicon reads by exp				
					x		Bengtsson J, Eriksson KM, Hartmann M, Wang Z, Shenoy BD, Grelet G-A, Abaren				
							Gihring TM, Green SJ, Schadt CW. 2012. Massively parallel rRNA gene sequencin				
		x					Hajibabaei M, Shokralla S, Zhou X, Singer GC, Baird DJ. 2011. Environmental barc				
		x					Medinger R, Nolte V, Pandey RM, Jost S, Ottenwälder B, Schlötterer C, Boenigk J.				
							Stoeck T, Bass D, Nebel M, Christen R, Jones MDM, Breiner H-W, Richards TA. 2				
		x					Creer S, Fonseca VG, Porazinska DL, Giblin-Davis RM, Sung W, Power DM, Pack				
		p/cd					Buee M, Reich M, Murat C,		eri puuliikideg Ceratobas, Cryptococcus, Lact s		
							Almeida P, Goncalves C, Teixeira S, Libkind D, Bontrager M, Masneuf-Pomarede I				
					x		Korsakovsky Pond S, Wadhawan S, Chairomonte F, Ananda G, Chung W-Y, Taylo				
							Pagni M, Niculita-Hirzel H, Pellissier L, Dubuis A, Xenarios I, Guisan A, Sanders I				
		y					Ramirez KS, Leff JW, Barberan A, Bates ST, Betley J, Crowther TW, Kelly EF, Ol				
							Nguyen NH, Smith D, Peay K, Kennedy P. 2014. Parsing ecological signal from noi				
						r	Caporaso JG, Lauber CL, Walters WA, Berg-Lyons D, Huntley J, Fierer N, Owens				
							Balint M, Schmidt P-A, Shar		FRA Quercus ilex vs horiz. Contact-tüüp oli sa		
							Kozich JJ, Westcott SL, Baxter K, Highlander SK, Schloss PD. 2013. Development				
		p/cd					Keijser BJF, Zaura E, Huse SM, van der Vossen JMBM, Schuren FHJ, Montijn RC,				
							Moora M, Berger S, Davison J, Öpik M, Bommarco R, Bruelheide H, Kühn I, Kunin				
							Merriman B, Ion Torrent R ja D Team, Rothberg JM. 2012. Progress in Ion torrent s				
							Bonito G, Reynolds H, Robe		Mullaseened: mulla päritolu seletab kooslust pa		
		x					Pellissier L, Niculita-Hirzel I		seentekooslused Sveitsis 700 km2 alal 200 alal		
			12			x	Daghino S, Murat C, Sizzano E, Girlanda M, Perotto S (2012) Fungal diversity is nc				
					x		McGuire KL, Payne SG, Pal		mullaseened parkides vs majade katustel NY: F		
						x	Op De Beeck M, Lievens B, Busschaert P, Declerck S, Vangronsveld J, Colpaert JV				
							Terhonen E, Sun H, Buee M		Phlebiopsis gigantea biokontroll ei mõjuta känd		
							Wallander H, Johansson U, S		SWE kuusikute Thelephora terrestris ja Wilcoxi		
							Brown SP, Jumpponen A. 20		Lyman liustiku alt vabanenud alad: enim Hypo		
							Fierer N, Hamady M, Lauber CL, Knight R. 2008. The influence of sex, handedness				
					x	x	Fonseca VG, Nichols B, Lallias D, Quince C, Carvalho GR, Power DM, Creer S. 20				
							Haas BJ, Gevers D, Earl AM, Feldgarden M, Ward DV, Giannoukos G, Ciulla D, T				
							Kauserud H, Kumar S, Brysting AK, Nordén J, Carlsen T. 2012. High consistency b				
		p/cd		x			Kunin V, Engelbrektson A, Ochman H, Hugenholtz P. 2009. Wrinkles in the rare bio				

p/cd	x			x		Jumpponen A, Jones KL. 2009. Massively parallel 454 sequencing indicates hyperdi
	x					Zhan A, Bailey SA, Heath DJ, MacIsaac HJ. 2014. Performance comparison of gene
						Lanzén A, Jørgensen SL, Huson DH, Gorfer M, Grindhaug SH, Jonassen I, Øvreås L
						McKenna P, Hoffmann C, Minkah N, Aye PP, Lackner A, Liu Z, Lozupone CA, Ha
						Ji Y, Ashton L, Pedley SM, Edwards DP, Tang Y, Nakamura A, Kitching R, Yu DW
						Critescu ME. 2014. From barcoding single individuals to metabarcoding biological c
						Luo C, Rodriguez LM, Johnston ER, Wu L, Cheng L, Xue K, Tu Q, Deng Y, He Z,
				x		Rodriguez LM, Konstantinidis KT. 2014. Estimating coverage in metagenomic data
				x		Huson DH, Mitra S, Ruscheweych H-J, Weber N, Schuster SC. 2011. Integrative ar
				x		Huson DH, Mitra S, Ruscheweyh H-J, Weber N, Schuster SC. 2011. Integrative ana
			a	a	r	Zhou J, He Z, Deng Y, Tringe SG, Alvarez-Cohen L. 2015. High-throughput metage
			a	a	a	Shakya M, Quince C, Campbell JH, Yang ZK, Schadt CW, Podar M. 2013. Compar
			a	a	z	Sunagawa
						Schneider T, Keiblinger KM, Schmid E, Sterflinger-Gleixner K, Ellersdorfer G, Ros
						Faircloth BC, Glenn TC. 2012. Not all sequence tags are created equal: designing ar
						Reeder J, Knight R. 2009. The 'rare biosphere': a reality check. Nature Methods 6: 6
				x		Schmidt P-A, Balint M, Greshake B, Bandow C, Römbke J, Schmitt I. 2013. Illumin
						Pinto AJ, Raskin L. 2012. PCR Biases distort bacterial and archaeal community stru
						Lindner DL, Carlsen T, Nilsson RH, Davey M, Schumacher T, Kauserud H. 2013. E
						Lauber CL, Zhou N, Gordon JI, Knight R, Fierer N. 2010. Effect of storage conditio
			x	x		Gaspar JM, Thomas WK. 2013. Assessing the consequences of denoising marker-ba
						Liggenstoffer AS, Youssef NH, Couger MB, Elshahed MS. 2010. Phylogenetic dive
						Shendure J, Li H. 2007. Next-generation DNA sequencing. Nature Biotechnol. 26: 1
						Rothberg J, Leamon H. 2008. The development and impact of 454 sequencing. Natu
						Shokralla S, Spall J, Gibson JF, Hajibabaei M. 2012. Next-generation sequencing te
						Martinez-Garcia LB, Richardson SJ, Tylianakis JM, Peltzer DA, Dickie IA. 2015. F
						Quick J, Quinlan AR, Loman NJ. 2014. A reference bacterial genome dataset genera
				x		Mikheyev AS, Tin MMY. 2014. A first look at the Oxford Nanopore MinION seque
	x					de Barba M, Boyer MF, Rioux MD, Coissac E, Taberlet P. 2014. DNA metabarcod
		7	x			Kittelmann S, Seedorf H, Walters WA, Clemente JC, Knight R, Gordon JI, Janssen
					z	Aird D, Ross MG, Chen W-S, Danielsson M, Dennell T, Russ C, Jaffe DB, Nusbau
	y					Smith DP, Peay KG. 2014. Sequence depth, not PCR replication, improves ecologic
p/cd				x	r	Gomez-Alvarez V, Teal TK, Schmidt TM. 2009. Systematic artifacts in metagenome
						Amend AS, Seifert KA, Bruns TD. 2010. Qunatifying microbial communities with 4
				x	z	Zhou X, Li Y, Liu S, Yang Q, Su X, Zhou L, Tang M, Fu R, Li J, Huang Q. 2013. U
	x					Lauber C, Hamady M, Knight R, Fierer N. 2009. Pyrosequencing-based assessment
						Taylor DL, Huston S. 2010. Sequence bioinformatics for analyses of fungal biodiver
						Parameswaran P, Jalili R, Tao L, Shokralla S, Gharizadeh B, Ronaghi M, Fire AZ. 2
						Jumpponen A, Jones KL, Blair J. 2010. Vertical distribution of fungal communities i
						Engelbrektson A, Kunin V, Wrighton KC, Zvenigorodsky N, Chen F, Ochman H, H
p/cd						Quince C, Lanzen A, Curtis TP, Davenport RJ, Hall N, Head IM, Read LF, Sloan W
						McDonald D, Clemente JC, Kuczynski J, Rideout JR, Stombaugh J, Wendel D et al
						Jumpponen A, Jones KL, Ma Quercus spp E maal: Tomentella spp, Sebacina
	x			x		Baldrian P, Kolarik M, Stursova M, Kopecky J, Valaskova V, Vetrovsky T, Zifcako
						Vetrovsky T, Baldrian P. 2013. Analysis of soil fungal communities by amplicon pyr
						Blaalid R, Carlsen T, Kumar liustiku äärealt Tom-thel, inoc, cort
	x					Rousk J, Baath E, Brokes PC, Lauber CL, Lozupone C, Caporaso JG, Knight R, Fie
						Ovaskainen O, Nokso-Koivisto J, Hottola J, Rajala T, Pennanen T, Ali-Kovero H, M
						Amend AS, Seifert KA, Samson R, Bruns TD. 2010. Indoor fungal composition is g
p/cd						Porazinska DL, Giblin-Davis RM, Faller L, Farmerie W, Kanzaki N, Morris K, Pow
						Zhan A, Hulak M, Sylvester F, Huang X, Adebayo AA, Abbott CL, Adamowicz SJ,
						Taylor DL, Booth MG, Mcfarland JW, Herriott IC, Lennon NJ, Nusbaum C, Marr T
p/cd						Liu Z, Lozupone C, Hamaday M, Bushman FD, Knight R. 2007. Short pyrosequenci
						Schloss PD, Gevers D, Westcott SL. 2011. Reducing the effects of PCR amplificatio
						MINSEQE: Minimum Information about a high-throughput Nucleotide SeQuencing
						Rung J, Brazma A. 2013. Reuse of public genome-wide gene expression data. Natur
	x					Arif C, Daniels C, Bayer T, Banguera-Hinestroza E, Barbrook A, Howe CJ, Lajeune
						Hamady M, Walker JJ, Harris JK, Gold NJ, Knight R. 2008. Error-correcting barcod
						Jumpponen A, Jones KL. 2010. Seasonally dynamic fungal communities in the *Quer*
						Behnke A, Engel M, Christen R, Nebel M, Klein RR, Stoeck T. 2011. Depicting mo
	x					Bik HM, Porazinska D, Creer S, Caporaso JG, Knight R, Thomas WK. 2012. Seque
	x					Soininen EM, Zinger L, Gielly L, Bellemain E, Bråthen KA, Brochmann C, Epp LS,
				x		Glenn TC. 2011. Field guide to next-generation DNA sequencers. Mol. Ecol. Res. 1
						Logares R, Haverkamp THA, Kumar S, Lanzen A, Nederbragt AJ, Quince C, Kause
						Sundquist A, Bigdeli S, Jalili R, Druzin ML, Waller S, PullenKM, El-Sayed YY, Ta
						Huse SM, Mark Welch D, Morrison HG, Sogin ML. 2010. Ironing out the wrinkles
						Dickie IA. 2010. Insidious effects of sequencing errors on perceived diversity in mo
p/cd						Huse SM, Huber JA, Morrison HG, Sogin ML, Mark Welch D. 2007. Accuracy and
						Gilles A, Meglecaz E, Pech N, Ferreira S, Malausa T, Martin J-F. 2011. Accuracy a

	2014	0					r	Bahram M, Harend H, Tedersoo L. 2014. Network perspectives of ectomycorrhizal
							r	Garrett KA, Thomas-Sharma S, Forbes GA, Nopsa JH. 2014. Climate change and pl
							r	Hiiesalu I. 2014. Mullaseente ja ripsloomade mitmekesisuse mustrid niiskusgradienc
	2013	2		x	11	x	r	Kõljalg U, Nilsson RH, Abarenkov K, Tedersoo L, Taylor AFS, Bahram M et al. 20
	2015	0	10				r	Mayor J, Bahram M, Henkel T, Buegger F, Pritsch K, Tedersoo L. 2015. Ectomycor
			p/cd			x	r	Öpik M, Metsis M, Daniell TJ, Zobel M, Moora M. 2009. Large-scale parallel 454 s
							r	Suzuki N, Rivero RM, Shulaev V, Blumwald E, Mittler R. 2014. Abiotic and biotic
	2015			y			r	Tedersoo L, Anslan S, Bahram M, Põlme S, Riit T, Liiv I, Kõljalg U, Kisand V, Nils
	2015						r	Tedersoo L, Bahram M, Cajthaml T, Põlme S, Hiiesalu I, Anslan S, Harend H, Bueg
	2014	8	1		Tedersoo, I	x	r	Tedersoo L, Bahram M, Põlme S, Kõljalg U, Yorou NS, Wijesundera R, Villarreal-l
x							r	Tedersoo L, Naadel T. 2011. Trühvleid kasvab ka Eestis [Truffles that grow in Estor
	2010	234	3	x	x	x	r	Tedersoo L, Nilsson RH, Abarenkov K, Jairus T, Sadam A, Saar I, Bahram M, Becl
				x			r	Wardle DA. 2002. Communities and Ecosystems: Linking the Aboveground and Bel
	2010	89		x		x	x	Abarenkov K, Nilsson RH, Larsson K-H, Alexander IJ, Eberhardt U, Erland S, Høil
							x	Arfi Y, Buee M, Marchand C mangroovide lehtedes ja koores 454 baasil NC:
							x	Bellemain E, Carlsen T, Brochmann C, Coissac E, Taberlet P, Kauserud H. 2010. IT
				x		x	x	Bengtsson-Palme J, Ryberg M, Hartmann M, Branco S, Wang Z, Godhe A, de Wit l
							x	Benita J, Oosting RS, Lok MC, Wise MJ, Humphery-Smith J. 2003. Regionalized G
							x	Bhattacharya D, Lutzoni F, Reeb V, Simon D, Nason J, Fernandez F. 2000. Widesp
							x	Blaalid R, Kumar S, Nilsson RH, Abarenkov K, Kirk PM, Kauserud H. 2013. ITS1
							x	Blackwell M. 2011. The Fungi: 1, 2, 3 … 5.1 million species? Am. J. Bot. 98: 426-4
							x	Borneman J, Hartin RJ. 2000. PCR primers that amplify fungal rRNA genes from en
						x	x	Castro HF, Classen AT, Aus seened vs CO_2, temp tõus, induts põud: ohtrus
							x	Cavender-Bares J, Hozak KH, Fine PVA, Kembel SW. 2009. The merging of comm
				x	x		x	Colwell RK. 2013. EstimateS: Statistical estimation of species richness and shared s
				x			x	Edgar RC, Haas BJ, Clemente JC, Quince C, Knight R. 2011. UCHIME improves s
				x		x	x	Fu L, Niu B, Zhu Z, Wu S, Li W. 2012. CD-HIT: accelerated for clustering the next
							x	Hildebrand F, Tadeo R, Voigt AY, Bork P, Raes J. 2014. LotuS: an efficient and use
			p/cd				x	Hopple JS, Vilgalys R. 1994. Phylogenetic relationships among coprinoid txa and al
						x	x	Kohout P, Sudova R, Janouskova M, Ctvrtlikova M, Hejda M, Pankova H, Slavikov
							x	Kopylova E, Noé L, Touzet H. 2012. SortMeRNA: Fast and accurate filtering of rib
			p				x	Larsson K-H, Larsson E, Kõljalg U. 2004. High phylogenetic diversity among cortic
							x	Livermore JA, Mattes TE. 2013. Phylogenetic detection of novel Cryptomycota in a
							x	Masella AP, Bartram AK, Truszkowski JM, Brown DG, Neufeld JD. 2012. PANDA
			p/cd				x	Nilsson RH, Ryberg M, Abarenkov K, Sjökvist E, Kristiansson E. 2009. The ITS re
							x	Nilsson RH, Tedersoo L, Ryberg M, Kristiansson E, Hartmann M, Unterseher M, Po
	2015					x	x	Oja J, Bahram M, Tedersoo L, Kull T, Kõljalg U. 2015. Temporal patterns of orchid
							x	Olesen JM, Jordano P. 2002. Geographic patterns in plant-pollinator mutualistic netw
	2014			x		x	x	Põlme S, Bahram M, Kõljalg U, Tedersoo L. 2014. Global biogeography of *Alnus* -a
						x	x	Porras-Alfaro A, Liu K-L, Kuske CR, Xie G. 2014. From genus to phylum: large sul
							x	Quast C, Pruesse E, Yilmaz P, Gerken J, Schweer T, Yarza P, Peplies J, Glöckner F
			p/cd				x	Schloss PD, Westcott SL, Ryabin T, Hall JR, Hartmann M, Hollister EB, Lesniewsk
	2012	211				x	x	Schoch CL, Seifert KA, Huhndorf S, Robert V, Spouge JL, Levesque CA, Chen W,
							x	Taylor DL, Hollingsworth Tl Alaskal. Seente ja taimede suhe konstantselt 17
	2008	103					x	Tedersoo L, Jairus T, Horton BM, Abarenkov K, Suvi T, Saar I, Kõljalg U. 2008. St
	2013	0		x		x	x	Tedersoo L, Smith ME. 2013. Lineages of ectomycorrhizal fungi revisited: foraging
						x	x	Wang Q, Garrity GM, Tiedje JM, Cole JR. 2007. Naive Bayesian classifier for rapid
				x		x	x	Wang X-C, Liu C, Huang L, Bengtsson-Palme J, Chen H, Zhang J-H, Cai D, Li J-Q
			1	x		x	x	White TJ, Bruns TD, Lee SB, Taylor JW. 1990. Amplification and direct sequencing
							y	Turenne CY, Sanche SS, Hoban DJ, Karlowsky JA, Kabani AM. 1999. Rapid identi
							y	Turner S, Pryer KM, Miao VPW, Palmer JD. 1999. Investigating deep phylogenetic
								Li YC, Feng B, Yang ZL. 2011. *Zangia* , a new genus of Boletaceae supported by r
								Aanen DK, Kuyper TW, Boekhout T, Hoekstra EF. 2000. Phylogenetic relationships
			j					Aanen DK, Kuyper TW, Hoekstra RF. 2001. A widely distributed ITS polymorphism
			cd					Aanen DK, Kuyper TW, Mes THM, Hoekstra RF. 2000. The evolution of reproduct
			cd					Aanen DK, Kuyper TW. 2004. A comparison of the application of a biological and p
			p/cd					Abadie J-C, Püttsepp Ü, Gebauer G, Faccio A, Bonfante P, Selosse M-A. 2006. *Cep*
	2010	31		x				Abarenkov K, Tedersoo L, Nilsson RH, Vellak K, Saar I, Veldre V, Parmasto E, Pro
								Abraham W-R, Hesse C. 2003. Isotope fractionations in the biosynthesis of cell com
			p/cd					Acinas S, Klepac-Ceraj V, Hunt SE, Pharino C, Ceraj I, Distel DL, Polz MF. 2004.
			p/cd					Ackerly DD, Schwilk DW, Webb CO. 2006. Niche evolution and adaptive radiation
			p					Acsai J, Lar 55 morfotüübi kirjeldused: Arctostaphylos, Arbutus
			cd					Adamczyk J, Hesselsoe M, Iversen N, Horn M, Lehner A, Nielsen PH, Schloter M,
								Adams DH, Roth LF. 1967. Demarcation lines in paired cultures of Fomes cajanderi
			p/cd					Adams F, Reddell P, Webb MJ, Shipton WA. 2006. Arbuscular mycorrhiz Põhja-AU
			p/cd					Addy HD, Piercey MM, Currah RS. 2005. Microfungal endophytes in roots. Can. J.
			p					Adis J. 1984. 'Seasonal igapó' forests od Central Amazonian black-water rivers and
				x				Adl MS, Gupta VVSR. 2006. Protists in soil ecology and forest nutrient cycling. Ca
				x				Adl SM, Simpson AGB, Lane CE, Lukes J, Bass D, Bowser SS. 2012. The revised c

	cd		Adriaensen K, van der Lelie D, van Laere A, Vangronsveld J, Colpaert J. 2004. A z
	B		Aerts R. 2002. The Role of Various Types of Mycorrhizal Fungi in Nutrient Cycling
	cd		Agami M, Eshel A, Waisel Y. 1998. Plant recolonization after severe degradation: a
			Agerer R (ed). 1987-2006. Colour Atlas of Ectomycorrhizae. Einhorn-Verlag, Schw
			Agerer R K Piceirhiza nigra Piceirhiza nigra
	n		Agerer R, B Polyporoletus sublividus
	p		Agerer R, B Descomyces EcM -sarn Descolea ja Setchelliogaster -RM pole ja peaga
	p/cd		Agerer R, B Gomphus clavatus
			Agerer R, Beenken L. 1998. *Geastrum fimbriatum* Fr. + *Fagus sylvatica* L. Descr.
	n		Agerer R, B Lyophyllum decastes
	p		Agerer R, Bougher NL. 2001. *Amaurodon aquicoeruleus* (Thelephoraceae, Hymen
	p		Agerer R, B Tomentella brunneorufa eukalüptil: plektenh mantel ja tomentelloidsed l
	p		Agerer R, Bougher NL. 2001. *Tomentella subamyloidea* sp. Nov. And *T. radiosa* (
			Agerer R, Christan J, Mays C, Hobbie EA. 2012. Isotopic signatures and trophic sta
	j		Agerer R, Göttlein A. 2003. Correlations between projection area of ectomycorrhiza
	j		Agerer R, Grote R, Raidl S. omavaheline asetus, mikroskaalas, konkurents, kooselu
			Agerer R, K Hydnum 2 sp kirjeldus
	n		Agerer R, C Bankera fuligineo-alba
			Agerer R, V Entoloma saepium
			Agerer R. 1989. Impacts of artificial acid rain and liming on fruitbody form vs väetis
	p		Agerer R. 1 Chroogomphus helveticus and C. Rutilus võivad mood EcM l
			Agerer R. 1991. Characterization of ectomycorrhiza. In: Norris JR, Read DJ, Varma
			Agerer R. 1991. Characterization of ectomycorrhiza. In: Norris JR, Read DJ, Varma
	n		Agerer R. 1 Sarcodon imbricatus
	p		Agerer R. 1 Gomphidius roseus ja G. Glutinosus võivad mood EcM koos
	n		Agerer R. 1 Phellodon niger
	n		Agerer R. 1 Boletopsis leucomelaena
	n		Agerer R. 1 Hydnellum peckii
			Agerer R. 1994. *Pseudotomentella tristis* (Thelephoraceae): Eine Analyse von Fruc
			Agerer R. 1996. *Albatrellus ovinus* (Schaeff.: Fr.) Kotl. & Pouz.+*Picea abies* (L) K
			Agerer R. 1 T. albomarginata
			Agerer R. 1996. *Ramaria aurea* (Schaeff.: Fr.) Que´ l.+*Fagus sylvatica* L. Descr. E
			Agerer R. 1999. *Gyroporus cyanescens* (Bull.: Fr.) Que´ l.+*Pinus sylvestris* L. Des
			Agerer R. 1999. *Rozites caperatus* (Pers.: Fr.) Karst.+*Pinus sylvestris* L. Descr. Ec
			Agerer R. 2 klassifikatsioon risomorfide ja hüüfide järgi
	j		Agerer R. 2 EcM anatoomia põhine seente fülogenees. Kõigi kirjelduste loetelu ja tu
	cd		Agnelli A, Ascher J, Corti G bakterid ja seened. DGGE. Bakterid väga mitmeklesise
			Agueda B, I Boletus aereus, edulis, reticulatus Cistus sp-l
			Ahlich K, Sieber TN. 1996. The profusion of dark septate endophytic fungi in non-e
	cd		Ahonen-Jonnarth U, Göransson A, Finlay RD. 2003. Growth and nutrient uptake of
	cd		Aikio S, Ruotsalainen AL. 2002. The modelled growth of mycorrhizal and non-myco
	p/cd		Aime MC, Henkel TW, Ryvarden L. 2003. Studies in neotropical polypores 15: new
	p/cd		Akasaka M, Tsuyuzaki S, Hase A. 2007. Annual growth of invasive Larix kaempfer
			Al Abras K, vananemine
	p		Al Sayegh-I mustad morfotüübid: leiti 4 tk kaevanduspinnalt -arv. Tomentellad
			Albee SR, Mueller GM, Kropp BR. 1996. Polymorphisms in the large intragenic spa
	p/cd		Albee-Scott S. 2007. The phylogenetic placement of Leucogastrales, including *Myco*
	p/cd		Albee-Scott SR. 2007. Does secotioid inertia drive the evolution of false-truffles? M
			Albinsson C. 1997. Niche relations and association analysis of southern Swedish mi
			Albrecht C, Burgess T, Dell B, Lapeyrie F. 1994. Chitinase and peroxidase activities
	p/cd		Aldrich-Wolfe L. 2007. Distinct mycorrhizal communities on new and established ho
	p		Alexander C, Alexander IJ, Hadley G. 1984. Phosphate uptake by Goodyera repens
	p		Alexander C, Hadley G. 1983. Variation in symbiotic activity of Rhizoctonia isolate
	p/cd		Alexander IJ, Ahmad N, Lee SS. 1992. The role of mycorrhizas in the regeneration o
			Alexander IJ, Ahmad N, Lee SS. 1992. The role of mycorrhizas in the regeneration o
			Alexander IJ, Bigg WL. 1981. Light microscopy of ectomycorrhizas using glycol me
			Alexander I Hartigi vorgustik toestatud
	p/cd		Alexander IJ, Lee SS. 2005. Mycorrhizas and ecosystem processes in tropical rain fo
	VIITED		Alexander IJ. 1989. Mycorrhizas in tropical forests. In: Proctor J (ed). Mineral nutri
			Alexander IJ. 1989. Systematics and ecology of ectomycorrhizal legumes. Monogr.
	p/cd		Alexander IJ. 2006. Ectomycorrhizas - out of Africa? New Phytol. 172: 589-591.
	cd		Alfaro ME, Zoller S, Lutzoni F. 2003. Bayes or bootstrap? A simulation study comp
	j		Ali NA, Jackson RM. 1989. Stimulation of germination of spores of some ectomyco
			Allen AP, Gillooly JF, Savage VM, Brown JH. 2006. Kinetic effects of temperature
			Allen EB, Allen MF, Helm D ECM ja AM ning peremeestaimede diversiteet globaal
	cd		Allen MF et al. 2003. Ecology of mycorrhizae: a conceptual framework for complex
	j		Allen MF, C vigased peale vulk-suktsessiooni
			Allen MF, I Adenostoma (Rosaceae): arbutoid-like, DS, AM
	cd	x	Allen TR, Millar T, Berch SM, Berbee ML. 2003. Culturing and direct DNA extract

cd		Allendorf FW, Leary RF, Spruell P, Wenburg JK. 2002. The problems with hybrids:
p/cd		Allison SD, Czimczik CI, Tr NH4NO3 mõjı NH4NO3 mõju mullam NH4NC
		Allison SD, Martiny JHB. 2008. Resistance, resilience, and redundancy in microbial
cd		Allmer J, Vasiliauskas R, Ihı saproobsetel seentel kändudes, peentes okste saproobs
p		Allsopp N, Stock WD. 1993. Mycorrhizal status of plants growing in the Cape Flori
cd		Alm EW, Oerther DB, Larsen N, Stahl DA, Raskin L. 1996. The oligonucleotide pro
cd		Alm EW, Zheng D, Raskin L. 2000. The presence of humic substances and DNA in
		Almeida-Neto M, Guimaraes PR, Guimaraes PR, Loyola RD, Ulrich W. 2008. A co
		Almeida-Neto M, Guimaraes PR, Lewinsohn TM. 2007. On nestedness analyses: re
		Altizer S, Ostfeld RS, Johnson PTJ, Kutz S, Harewll CD. 2013. Climate change and
		Altschul SF, Madden TL, Schäffer AA, Zhang J, Zhang Z, Miller W, Webb DJ. 199
		Alvarado P, Manjon JL, Matheny PB, Estve-Raventos F. 2010. *Tubariomyces,* a ne
		Alvarado P, Moreno G, Manjon JL, Gelpi C, Kaounas V, Konstantinidis G, Barsegh
		Alvarado P, Moreno G, Manjon JL. 2012. A new Tuber without spore ornamentatio
p		Alvarez AJ, Khanna M, Toranzos GA, Stotzky G. 1998. Amplification of DNA bou
j		Alvarez IF, Parlade J, Trappe JM, Castellano MA. 1993. Hypogeous myc Hispaania
		Alvarez IF, Parladé J. 1992. *Loculotuber gennadii* gen. et comb. nov. and *Tuber mı*
p		Alvarez IF, Rowney DL, Cobb FW. 1979. Mycorrhizae and growth of white fir seec
		Alvarez M, Huygens D, Diaz LM, Villanueva CA, Heyser W, Boeckx P. 2012. The
		Alverson WS, Whitlock BA, Nyffeler R, Bayer C, Baum DA. 1999. Phylogeny of th
		Alzetta C, Scattolin L, Scope Tilia ITA, Padc tom-thel, palju Pezizales
cd		Amann R, Ludwig W. 2000. Ribosomal RNA-targeted nucleic acid probes for studie
		Amaranthus M, Trappe JM, Bednar L, Arthur D. 1994. Hypogeous fungal maaalust
		Amaranthus MP, Li CY, Per maasikapuu inokı Rhizopogon
		Amaranthus MP, Perry DA. 1994. The functioning of ectomycorrhizal fungi in the fi
		Amarasinghe V, Brown GS, Mank JE, Carlson JE. 2002. Microsatellite DNA loci fo
		Amend A, Garbelotto M, Fang Z, Keeley S. 2010. Isolation by landscape in populat
p/cd		Amend A, Keeley S, Garbelotto M. 2009. Forest age correlates with fine-scale spati
		Amend AS, Oliver TA, Amaral-Zettler LA, Boetius A, Fuhrman JA, Horner-Devine
		Amicucci A, Guidi C, Zambonelli A, Potenza L, Stocchi V. 2000. Multiplex PCR fo
		Amicucci A, Zambonelli A, Giomaro G, Potenza L, Stocchi V. 1998. Identification
p		Amicucci A Pulvinula constellatio + Quercus pubescens -plektenh õhuke mantel, no
		Ammarellou Terfezia boudieri obs EcM Kobresial
p/cd		Ammirati J, Garnica S, Halling RE, Mata M, Mueller GM, Carranza J. 2007. New C
	x	Ampoorter E, Baeten L, Koricheva J, Vanhellemont M, Verheyen K. 2014. Do diver
p/cd		Anderberg AA, Swenson U. 2003. Evolutionary lineages in Sapotaceae (Ericales): a
p		Anderberg AA. 1994. Cladistic analysis o Enkianthus with notes on the early diversi
p/j		Andersen TF. 1996. A comparative taxonomic study of Rhizoctonia sensu lato empl
p/cd		Anderson IC, Cairney JWG. seene mütseel mullas: PCR-põhine -ülevaade
p/cd		Anderson IC, Cairney JWG. 2007. Ectomycorrhizal fungi: exploring the mycelial fro
cd		Anderson IC, Campbell CD, mullaseened raba Penicillium sp, Verticillium sp, cf Ph
cd		Anderson IC, Campbell CD, Prosser IJ. 2003.Potential bias of fungal 18S rDNA and
j		Anderson IC, Chambers SM, Cairney JWG. 1998. Use of molecular meth Pisolithus
j		Anderson IC, Chambers SM, Cairney JWG. 2001. Characteristics of glutamine upta
j		Anderson IC, Chambers SM, Cairney JWG. 2001. Distribution and persist Pisolithus
		Anderson IC, Chambers SM, Cairney JWG. 2001. Variation in nitrogen source utilis
p/cd		Anderson MJ, Willis TJ. 2003. Canonical analysis of principal coordinates: a useful
p/cd		Anderson MJ. 2001. A new method for non-parametric multivariate analysis of varia
	x	Anderson MJ. 2005. PERMANOVA: a FORTRAN computer program for permutati
cd		Anderson Rs, Ashe JS. 2000 mardikate ja põrnaikate BD Honduurases ekstrapoleeri
p/cd		Andersson AF, Lindberg M, Jakobsson H, Bäckhed F, Nygren P, Engstrand L. 2008
cd		Andrade ACS, Queiroz MH, Hermes RAL, Oliveira VL. 2000. Mycorrhizal status c
		Andres-Alpuente A, Sanchez S, Martin M, Aguirre AJ, Barriuso JJ. 2014. Comparat
p/cd		Andrew C, Lilleskov EA. 2009. Productivity and community structure of e CO2 sti
		Andrews JH, Harris RF. 1997. Dormancy, germination, growth, sporulation and disp
cd		Andrews JH, Harris RF. 2000. The ecology and biogeography of microorganisms or
		Antibus RK, Croxdale JG, Miller OK, Linkins AE. 1981. Ectomycorrhizal fungi of S
		Antoninka A, Wolf JE, Bowker M, Classen AT, Johnson NC. 2009. Linking above-
		Aponte C, García LV, Marañón T, Gardes M. 2010. Indirect host effect on ectomyc
	x	Aponte C, García LV, Marai tammeliigid omavad erinevalt varise kvaliteeti
		Archibald FS. 1992. A new assay for lignin-type peroxidases employing the dye azu
		Arfi Y, Marchand C, Wartel mangroovisetete seened anaeroobses kks: 454 p
p/cd		Arita HT, Vazquez-Dominguez E. 2008. The tropics: cradle, museum or casino? A c
p		Armstrong W, Read DJ. 1972. Some observations on Oxygen transport in conifer se
		Arnebrant K, Baath E, Söderström B, Nohrstedt H-Ö. 1996. Soil microbial activity i
		Arnebrant K, Ek H, Finlay RD, Söderström B, 1993. Nitrogen translocation betweer
p/cd		Arnold AE, Henk DA, Eells lehe-endofüüdid: kultuuripõhine vs otse PCR+kloneeri
p/cd		Arnold AE, Lutzoni F. 2007. lehe-endofüüdid: Troopikas OTUdest Sordariomycetes
p/cd		Arnold AE, Miadlikowska J, Higgins KL, Sarvate SD, Gugger P, Way A, Hofstetter

	p/cd		Arnold AE. 2007.Understanding the diversity of foliar endophytic fungi: progress, cl
	cd		Arnold AE. 2008. Endophytic fungi: hidden components of tropical community ecolo
			Arnolds E. 1991. Decline of langus vs VK diversiteet Lääne-Euroopas 19: langus Lä
	j		Arnolds E. 1995. Conservation and management of natural populations of Lääne-Eu
			Arnolds EJM. 1997. Biogeography and Conservation. In: Wicklow & Söd muutused
			Arocena JM Piloderma croceum
	p/cd		Arocena JM, Göttlein A, Raidl S. 2004. Spatial changes of soil solution and mineral
			Arora D. 1986. Mushrooms demystified, 2nd Edn. Ten Speed Press, Berkeley, CA.
	cd		Arora DS, Chander M, Gill PK. 2002. Involvement of lignin peroxidase,manganese
	cd		Arora DS, Gill PK. 2001. Comparison of two assay procedures for lignin peroxidase
	p/cd		Artz, RRE, Anderson IC, Ch EmH turbaväljad EmH turbaväljadel: domin kottseene
	p		Ashford AE Pisonia grandis-Thelephorales must tüüp: EcM esmakirjeldus: Hartig ne
	p		Ashford AE Pisonia grandis-Thelephorales must tüüp ja pruun tüüp: EcM morfoloog
	cd		Ashford AE, Allaway WG. 2002. The role of the motile tubular vacuole system in m
	p/cd		Ashkannejhad S, Horton TR. metsas (rohkem) metsas: Suillus spp, Rhizopogon spp
	p		Ashton DH. 1975. Studies of litter in *Eucalyptus regnans* forests. Aust. J. Bot. 23: 4
	p		Ashton DH. 1975. The root and shoot development of *Eucalyptus regnans* . Aust. J.
	p		Ashton DH. Eucalyptus regnansil: Cort purpurascens (ka Pomaderrisel). Ektendo-tüi
			Ashton PS, Gunatilleke CVS. 1987. New light on the plant geography of Ceylon.I. J
	p/cd		Ashton PS. 1988. Dipterocarp biology as a window to the understanding of tropical
	p/cd		Aspray TJ, Frey-Klett P, Jones JE, Whipps JM, Garbaye J, Bending GD. 2006. Myc
			Auckland Fungus Group. 2009. New Zealand Fungi. http://www.fungi.co.nz/
			Auguet J-C, Barberan A, Casamayor EO. 2010. Global ecological patterns in uncult
			Averill C, Finzi A. 2011. Increasing plant use of organic nitrogen with elevation is re
			Averill C, Turner BL, Finzi AC. 2014. Mycorrhiza-mediated competition between p
			Averill C. 2014. Divergence in palnt and microbial allocation strategies explains con
	cd		Aviram S, Roth-Bejerano N, Kagan-Zur V. 2004. Two ITS forms co-inhabiting a sin
	p/cd		Avis PG, Branco S, Tang Y, EcM seenekoosluste uurimisel: Vkde segust era
	p/cd		Avis PG, Charvat I. 2005. Tl inokpot Minnesot kontroll: Russula spp, Thel spp, Cort
	p/cd		Avis PG, Dickie IA, Mueller GM. 2006. A `dirty` business: testing the limitations of
	cd		Avis PG, McLaughlin DJ, D tamme puisniit 3 kontroll: Cenoc, Cort1, To kõrge N:
			Avis PG, Mueller GM, Luss Chicago, IL, In IND kontr: Cenoc spp, Xeroc ru
	p		Awameh M, Alsheikh A. 1980. Features and analysis of spore germination in the bro
			Ayres DL, Darling A, Zwickl DJ, Beerli P, Holder MT, Lewis PO and 6 others. 201
			Ayres E, Dromph KM, Bardgett RD. 2006. Do plant species encourage soil biota tha
			Ayres E, Steltzer H, Berg S, Wall DH. 2009. Soil biota accelerate decomposition in
		x	Ayres E, Steltzer H, Berg S, Wallenstein MD, Simmons BL, Wall DH. 2009. Tree s
	p		Azul AM, A Quercirhiza ectendotrophica arv kottseen, mood haustoreid. Mantel tüü
			Azzouzi K, Vekemans X, Meerts P, Lefebvre C. 1997. Allozyme variation in calcico
			Ba AM, Duponnois R, Moyersoen B, Diedhiou AG. 2012. Ectomycorrhizal symbios
	p		Ba AM, Garbaye J, Dexheim Afzelia africanal inokul metsamullaga kolonis 4
	p		Ba AM, Thoen D. 1990. First syntheses of ectomycorrhizas between Afzelia africar
			Baar H, Ho xxx, 1 a peale metsap loduslikud noored männid peale põl
	cd		Baar J, Bastiaans T, van de Coevering MA, Roelofs JGM. 2002. Ectomycorrhizal ro
	j		Baar J, Comini B, Elferink MO, Kuyper TW. 1997. Performance of four ectomycorr
	p		Baar J, de Vries FW. 1995. I ECM vs huumus huumuse lisades vaid Laccaria ja ITE
			Baar J, Elferink MO. 1996. Ectomycorrhizal development on Scots pine (*Pinus sylve*
			Baar J, Horton TR, Kretzer AM, Bruns TD. 1999. Mycorrhizal colonization of *Pinu*
			Baar J, Ozinga WA, Sweers IL, Kuyper TW. 1994. Stimulatory and inhibitory effect
			Baar J, Stanton NL. 2000. Ectomycorrhizal fungi challenged by saprotrophic basidio
			Baar J, van Groenendael JM, Roelofs JGM. 2000. Are ectomycorrhizal fu Lepa Ec
	p		Baar J. 1996. The ectomycorrhizal flora of primary and secondary stands c suurem 1
			Baas Becking LGM. 1934. Geobiologie of inleiding tot de milieukunde. W.P. van St
	cd		Baath E, Nilsson LO, Göransson H, Wallander H. 2004. Can the extent of degradati
			Baath E. 2001. Estimation of fungal biomass in soil using 14C-acetate incorporation
	cd		Baath E. 2001. Estimation of fungal growth rates in soil using 14C acetate incorpora
			Babikova Z, Gilbert L, Bruce TJA, Birkett MA, Caulfield JC, Woodcock C, Pickett
		x	Bachy C, Dolan JR, Lopez-Garcia P, Deschamps P, Moreira D. 2013. Accuracy of p
	p/cd		Baciarelli-F Tuber spp: rufur Tuber melanospo Tuber melanosporum, Tuber 5 spp, F
	p/cd		Backeus I, Pettersson B, Strömquist L, Ruffo C. 2006. Tree communities and structu
	p		Backeus I, Rulangaranga ZK, Skoglund J. 1994. Vegetation changes on formerly ov
	p/cd		Backéus I. 1992. Distribution and vegetation dynamics of humid savannas in Africa
			Badali H, Gueidan C, Najafzadeh MJ, Bonifaz A, Gerrits van den Ende AHG, de Ho
	cd		Baek J-M, Kenerley CM. 1997. Detection and enumeration of a genetically modified
	p		Baer SG, Kitchen DJ, Blair JM, Rice CW. 2002. Changes in ecosystem structure an
		x	Bagchi R, Gallery RE, Gripenberg S, Gurr SJ, Narayan L, Addis CE, Freckleton RP
			Bagchi R, Press MC, Scholes JD. 2010. Evolutionary history and distance dependen
	p/cd		Bagley SJ, Orlovich DA. 2004. Genet size and distribution of Amanita muscaria in a
2013	0		Bahram M, Kõljalg U, Courty P-E, Diedhiou A, Kjøller R, Põlme S, Ryberg M, Vel

2013	5		Bahram M, Kõljalg U, Kohout P, Mirshahvaladi S, Tedersoo L. 2012. Ectomycorrhi
2015	0	9	Bahram M, Peay KG, Tedersoo L. 2015. Local-scale biogeography and spatiotempo
2011	17	9b	Bahram M, Põlme S, Kõljalg U, Tedersoo L. 2011. A single European aspen (*Popul*
2012	17	x	Bahram M, Põlme S, Kõljalg U, Zarre S, Tedersoo L. 2012. Regional and local patte
		p/cd	Baier R, Ingenhaag J, Blasch sügavuti kuusikus domin Cenoc, Tomentella, Lact, Seb
			Bainard LD, Klironomos JN, Hart MM. 2010. Differential effect of sample preserva
			Baker J. 2000. Methods in Ecology. Blackwell Publishing: Oxford, UK.
		cd	Baker WJ et al. 1998. Patterns of distribution of Malesian vascular plants. In: Hall R
			Bakshi DK. 1957. Occurence of mycorrhiza on some Indian conifers. Mycologia 49:
			Bala A, Murphy PJ, Osunde AO, Giller KE. 2003. Nodulation of tree legumes and t
			Baldrian P, Gabriel J. 2002. Variability of laccase activity in the white rot basidiomy
			Baldrian P, Valaskova V. 2008. Degradation of cellulose by basidiomycetous fungi.
			Baldrian P, Vetrovsky T, Cajthaml T, Dobiasova P, Petrankova M, Snajdr J, Eichler
		p/cd	Baldrian P. 2006. Fungal laccases -occurrence and properties. FEMS Microbiol. Rev
			Baldrian P. 2009. Ectomycorrhizal fungi and their enzymes in soils: is there enough
			Baldwin BG, Markos S. 1998. Phylogenetic utility of the external transcribed spacer
		y	Baldwin DS, Colloff MJ, Rees GN, Chariton AA, Watson GO, Court LN, Hartley D
		p/cd	Balogh-Brunstad Z, Keller CK, Dickinson JT, Stevens F, Li CY, Bormann BT. 2008
		p/cd	Banda T, Schwartz M, Caro T. 2006. Woody vegetation structure and composition a
		p/cd	Banda T, Schwartz MW, Caro T. 2006. Woody vegetation structure and compositio
			Bandala VM, Montoya L, Horak E. 1998. New data on the genus *Phaeocollybia* ba
		p/cd	Bandou E, Lebailly F, Muller F, Dulormne M, Toribio A, Chabrol J, Cortecuisse R,
		p	Bannister P, Strong GL. 2001. Carbon and nitrogen isotope ratios, nitrogen content a
			Barberan A, Ramirez KS, Leff JW, Bradford MA, Wall DH, Fierer N. 2014. Why ar
		cd	Barbieri E, Riccioni G, Pisano A, Sisti D, Zeppa S, Agostini D, Stocchi V. 2002. Co
		p/cd	Barbour MM, Hanson DT. 2009. Stable carbon isotopes reveal dynamics of respirat
		cd	Bardgett RD et al. 1999. Plant species and nitrogen effects on soil biological propert
		cd	Bardgett RD, Bowman WD, Kaufmann R, Schmidt SK. 2005. A temporal approach
		cd	Bardgett RD, Lovell RD, Hobbs PJ, Jarvis SC. 1999. Seasonal changes in soil micro
		p/cd	Bardgett RD, Smith RS, Shiel RS, Peacock S, Simkin JM, Quirk H, Hobbs PJ. 2006
		cd	Bardgett RD, Walker LR. 2004. Impact of coloniser plant species on the developme
			Bärlöcher F, Charette N, Letourneau A, Nokolcheva LG, Sridhar KR. 2010. Sequen
		e	Barr DP, Aust SD. 1994. Mechanisms white rot fungi use to degrade pollutants. Env
		p/cd	Barraclough TG, Nee S. 2001. Phylogenetics and speciation. Trends Ecol. Evol. 16:
			Barrett LG, Heil M. 2012. Unifying concepts and mechanisms in the specificity of p
		p/cd	Barroetavena C, Cazares E, Rajchenberg M. 2007. Ectomycorrhizal fungi ebatsuuga
			Barroetavena C, Pildain MB ARG Pinus ponderosa juured: 8 liiki, sh Hebelo
		p	Barroetavena C, Rajchenberg Patagoonia männi istandikes: eri paigus 7-17 Patagoon
		p	Barroetavena C, Rajchenberg Patagoonia ebatsuuga istandikes: eri paigus 6-11 morfo
			Barron GL, Thorn RG. 1987. Destruction of nematodes by species of Pleurotus. Can
		cd	Barrow JR, DSE anatoomia, pildid
			Barrow JR, Osuna P. 2002. Phosphorus solubilization and uptake by dark septate fu
		cd	Barrow JR. DSE/Bouteloua. DSE v mitmekesise morfoloogiaga, kolonisatsioonivor
		p	Barry D, Jaillard B, Staunton S, Callot G. 1995. Translocation and metabolism of ph
		p/cd	Barthlott W, Lauer W, Placke A. 1996. Global distribution of species diversity in va
		p/cs	Bartish IV, Swenson U, Munzinger J, Anderberg AA. 2005. Phylogenetic relationsh
			Barto EK, Antunes PM, Stinson K, Koch AM, Klironomos JN, Cipollini D. 2013. D
			Bartram AK, Lynch MDJ, Stearns JC, Moreno-Hagelsieb G, Neufeld JD. 2011. Ger
			Bascompte J, Jordano P, Melian C, Olesen JM. 2003. The nested assembly of plant-
			Bascompte J, Jordano P, Olesen JM. 2006. Asymmetric coevolutionary networks fa
			Bascompte J, Jordano P. 2007. Plant-animal mutualistic networks: the architecture o
			Bascompte J. 2009. Disentangling the web of life. Science 325: 416-419.
			Baselga A, Fujisawa T, Crampton-Platt A, Bergsten J, Foster PG, Monaghan MT, V
			Basset Y, Cizek L, Cuenoud P, Didham RK, Guilhaumon F, Missa O and 32 others.
		p/cd	Bastias BA, Anderson IC, X mullaseened; RNA vs DNA; Pinus vs Eucalyptus: mets
		p/cd	Bastias BA, Huang Z, Blumf mullaseened Austraalias, vs korduvpõletamine; 0-10 cr
		p/cd	Bastias BA, Xu Z, Cairney J EmH QLD, AUS Kokku: Inoc1; Russ1; Pisol1; Thel1;
			Bastolla U, Fortuna MA, Pascual-Garcia A, Ferrera A, Luque B, Bascompte J. 2009
			Bates ST, Berg-Lyons D, Ca Archaea üle Ameerikate: keskm 2% prokarüoo
		x	Bates ST, Clemente JC, Flores GE, Walters WA, Wegener Parfrey L, Knight R, Fier
		p/cd	Batzli JM, Dawson JO. 1997. Physiological and morphological responses of red ald
			Bauer GA, Gebauer G, Harrison AF, Högberg P, Högbom L, Schinkel H, Taylor AF
		cd	Baum C, Weih M, Verwijst ' paju: 3 morfot
		cd	Bavykin SG, Akowski JP, Zakhariev VM, Barsky VE, Perov AN, Mirzabekov AD.
			Baxter JW, Dighton J. 2001. ECM diversiteedi suurendamise mõju taime kasvule ja
		b	Baxter JW, Dighton J. 2005. antropogeenne saaste vähendab BD; arv et EcM seente
		p/cd x	Baxter JW, Dighton J. 2005. Phosphorus source alters host plant response to ectomy
			Baxter JW, xxx, tammel linnas vs maal, tammel (maal BD suurem, ECM% suur
			Bayer C, Fay MF, De Bruijn AY, Savolainen V, Morton CM, Kubitzki K, Alverson

p/cd		Bayman P, Lebron LL, Tremblay RL, Lodge DJ. 1997. Variation in endophytic fung
		Beakes GW, Glockling SL, Sekimoto S. 2011. Th evolutionary phylogeny of the oo
p/cd		Beauchamp VB, Stromberg JC, Stutz JC. 2006. Arbuscular mycorrhizal fungi associ
		Beaumont LJ, Pitman A, Perkins S, Zimmermann NE, Yoccoze NG, Thuiller W. 20
cd		Becerra A, I Cortinarius helodes ja Gyrodon monticola (iseäralikud tsüstiidid) lepal
p/cd		Becerra A, Pritsch K, Arrigo Alnus acuminata Tomentella3, Tomentella1, Lact omp
cd		Becerra A, Zak MR, Horton Alnus acuminata Tomentella3, Tomentella1, Lact omp
p/cd		Becerra AG, Nouhra ER, Sil Salix humbold Tomentella sp, Inocybe sp
p/cd		Becerra-LopezLavalle LA, Saleeba JA, Lyon BR. 2005. Molecular identification of
1		Bechem EET, Alexander IJ. 2009. Inoculum production and inoculation of *Gnetum*
1		Bechem EET, Alexander IJ. Gnetum: Aafrikas 3 Scleroderma fülotüüpi. Ük
1		Bechem EET, Alexander IJ. 2012. Phosphorus nutrition of ectomycorrhizal *Gnetum*
		Bechem EET. 2004. Mycorrhizal Status of *Gnetum* spp. in Cameroon: Evaluating D
1		Bechem EET. 2011. Growth and in vitro phosphate solubilising ability of *Scleroder*
p		Beckjord PR, McIntosh MS. 1984. Growth and fungal persistence by Quercus rubra
		Beckjord PR, Melluish JH, McIntosh MS. 1985. Effects of nitrogen and phosphorus
		Becklin KM, Hertweck KI, J seened risosfääris: eri taimedel erinev SSU koo
		Beeching JR et al. 1989
		Beeli M. 1928. Fungi Goossensiani. Contribution A L' Etude De La Flore Mycologi
		Beenken L. 2004. Die Gattung Russula. Untersuchungen zu ihrer Systematik anhan
	x	Begerow D, Nilsson RH, Unterseher M, Maier W. 2010. Current state and perspect
cd		Beguiristain T, Lapeyrie F. 1997. Host plant stimulates hypaphorineaccumulation in
cd		Behrens S, Rühland, Ignacio J, Huber H, Fonseca A, Spencer-Martins I, Fuchs BM,
p/cd		Beiler KJ, Durall DM, Simar Pseudotsuga Ühel puul tuvastati max 8 R vesic
		Beiler KJ, Simard SW, Lemay V, Durall DM. 2012. Vertical partitioning between si
		Belfiori B, Riccioni C, Temp ITA, Quercus pubescens muld vs juured; vs Tu
		Bell CD, Soltis DE, Soltis PS. 2010. The age and diversification of angiosperms re-
p/cd		Bell T, Ager D, Song J-I, Newman JA, Thompson IP, Lilley AK, van der Gast CJ. 2
		Bellemain E, Davey ML, Ka igijääs: madal BD, esindatud erinevad rühmad.
		Bellemare J, Motzkin G, Foster DR. 2002. Legacies of the agricultural past in the fo
p		Bellgard SE. 1991. Mycorrhizal associations of plant species in Hawkesbury sandst
		Bencivenga M, Di Massimo G, Donnini D Tanfulli M. 1995. Micorrize inquinanti f
		Bending GD, Read DJ. 1995. The structure and function of the vegetative mycelium
cd		Bending GD, Read DJ. 1996. Effects of the soluble polyphenol tannic acid on the ac
cd		Bending GD, Read DJ. 1996. Nitrogen mobilization from protein-polyphenol compl
j		Bending GD, Read DJ. 1997. Lignin and soluble phenolic degradation by ectomyco
p/cd		Bending GD. 2007. What are the mechanisms and specificity of mycorrhization help
x		Benjamini Y, Hochberg Y. 2000. On the adaptive control of the false discovery rate
p/cd		Bennett KD, Tzedakis PC, Willis KJ. 1991. Quaternary refugia of North European t
p/cd		Benson DR, Clawson ML. 2000. Evolution of the actinorhizal plant symbioses. In: T
p/cd		Benson DR, Vanden Heuvel BD, Potter D. 2004. Actinorhizal symbioses: diversity
		Bent E, Kiekel P, Brenton R, Taylor DL. 2011. Root-associated ectomycorrhizal fu
		Bent E, Taylor DL. 2010. Direct amplification of DNA from fresh and preserved ect
cd		Benton MJ, Ayala FJ. 2003. Dating the tree of life. Science 300: 1698-1700.
		Benton MJ. 1995. Diversification and extinction in the history of life. Science 268: 5
		Benucci GMN, Raggi L, Alb Tuber aestivun tom-thel, tuber spp
cd		Berbee ML, Carmean DA, Winka K. 2000. Ribosomal DNA and resolution of branc
		Berbee ML, Taylor JW. 1993. Dating the evolutionary radiations of the true fungi. C
p		Berbee ML, Taylor JW. 2001. Fungal molecular evolution: gene trees and geologic t
		Berbee ML, Taylor JW. 2010. Dating the molecular clock in fungi – how close are v
		Berbee ML. 1996. Loculoascomycete origins and evolution of filamentous ascomyc
cd		Berch SM, Allen TR, Berbee ML. 2002. Molecular detection, community structure a
		Berch SM, Roth AL. 1993. I ebatsuuga seemikud: inokuleeritud Rhizopogoniga vs r
		Berch SM. 1983. *Endogone pisiformis* : axenic culture and associations with *Sphagn*
		Béreau M, Gazel M, Garbaye J. 1997. Les symbioses mycorhiziennes des Lõuna-A
cd		Berg G, Zachow C, Lottman mullaseente kultuuripõhine + BOX-PCR + sekv divers
p/cd	x	Bergemann SE, Douhan GW, Garbelotto M, Miller SL. 2006. No evidence of popul
p/cd		Bergemann SE, Garbelotto M Lithocarpus dens EcM domin Cenoc, Lactarius sp, Ma
cd		Bergemann SE, Miller SL. 2002. Size, distribution and persistence of gene genetid k
cd		Bergero R, Girlanda M, Bello F, Luppi AM, Perotto S. 2003. Soil persistence and b
		Bergero R, Perotto S, Girlanda M, Vidano G, Luppi AM. 2000. Ericoid mycorrhizal
		Bergius N, Danell E. 2000. The Swedish matsutake (Tricholoma nauseosum syn. T.
		Berglund H, Jonsson BG. 2001. Predictability of plant and fungal species r haruldase
		Bergman B, Rain AN, Rasmussen U. 2007. Cyanobacterial associations. In: Elmeric
		Bergsten J, Bilton DT, Fujisawa T, Elliott M, Monaghan MT, Balke M, Hendrich L,
p/cd		Bergström CT, Lachmann M. 2003. The red king effect: when the slowest runner wi
p		Berliner R, Torrey JG. 1989. Studies on mycorrhizal associations in Harvard forest,
cd		Berman JT, x tammik, tammehorendik, kultuurpinnas: metsa-ja horer
j		Bermingham S, Maltby L, Cooke RC. 1995. A critical assessment of the validity of

		Berndt R, K valgel nulul mineraalmullas kottseened (3). Ühe seenmantlil kurrulised s
p		Berndt R, C mõned kottseened Abies albal: septade ultrastr
cd		Bertault G, Raymond M, Berthomieu A. 1998. Trifling variation in truffles. Nature 3
p		Bertault G, Rousset F, Fernandez D, Berthomieu A, Hochberg ME, Callot G, Raymo
cd		Bertilsson S, Cavanaugh CM, Polz MF. 2002. Sequencing-independent method to ge
cd		Bertini L, Amicucci A, Agostini D, Polidori E, Potenza L, Guidi C, Stocchi V. 1999
cd		Bertolino S, Vizzini A, Wauters LA, Tosi G. 2004. Consumption of hypogeous and
p/cd		Bethlenfalvay GJ, Dakessian S, Pacovsky RS. 1984. Mycorrhizae in a southern Cal
		Bever JD, Dickie IA, Facelli E, Facelli JM, Klironomos J, Moora M, Rillic MC, Sto
		Bever JD, Richardson SC, Lawrence BM, Holmes J, Watson M. 2009. Preferential a
		Bever JD. 2002. Host-specif AM diversiteet: peremeheeelistus läbi 2 polvkonna
		Bever JD. 2002. Negative feedback within a mutualism: host-specific growth of myc
cd		Bever JD. 2003. Soil community feedback and the coexistence of competitors: conce
		Bezemer TM, Fountain MT, Barea M, Christensen S, Dekker SC, Duyts H, van Hal
		Bidartondo xxx Pinus longaeva: regeneratsioon potti viidud pinnasel
		Bidartondo MI, Bruns TD, Weiss M, Sergio C, Read DJ. 2003. Specialized cheating
cd		Bidartondo MI, Bruns TD. 2 mükoheterotroofsetel monotropoididel
p/cd		Bidartondo MI, Burghardt B, Gebauer G, Bruns TD, Read DJ. 2004. Changing partn
p/cd		Bidartondo MI, Duckett JG. 2010. Conservative ecological and evolutionary pattern
		Bidartondo MI, Ek H, Wallander H, Söderström B. 2001. Do nutrient additions alter
		Bidartondo MI, Kretzer AM, Pine EM, Bruns TD. 2000. High root concentration an
		Bidartondo xxx Monotropoid vs kõrval none
		Bidartondo MI, Read DJ, Tr algeliste maismaataimede risoidides: paljudes r
		Bidartondo MI, Read DJ. 2008. Fungal specificity bottlenecks during orchid germina
		Bidartondo MI, Redecker D, AM diversiteet-epiparasiidid spetsialiseerunud kindlale
p/cd		Bidartondo MI. 2005. The evolutionary ecology of mycoheterotrophy. New Phytol.
	x	Bidartondo MI. 2008. Preserving accuracy in GenBank. Science 319: 1616.
b		Bidrtondo MI, Gardes M. 2005. Fungal diversity in molecular terms: profiling, ident
p/cd		Bidrtondo MI. 2005. The evolutionary ecology of myco-heterotrophy. New Phytol. 1
		Bilan MV. 1971. Some Aspects of Tree Root Distribution. In: Hacskaylo E (ed.). M
		Bills GF, Holtzman GI, Miller OK. 1986. Comparison of ectomycorrhizal- kuusikus
p		Bills GF, Polishook JD. 199 mikroseente diversiteedi võrdlemine rarefactioni abil
p/cd		Binder M, Bresinsky A. 2002. Deviation of a polymorphic lineage of Gasteromycete
cd		Binder M, Hibbett DS, Larsson K-H, Larsson E, Langer E, Langer G. 2005. The phy
cd		Binder M, Hibbett DS. 2002. Higher level phylogenetic relationships of Homobasidi
p/cd		Binder M, Hibbett DS. 2006. Molecular systematics and biological diversification of
		Bininda-Emonds ORP, Cardillo M, Jones KE, MacPhee RDE, Beck RMD, Grenyer
cd		Bininda-Emonds ORP, Gittleman JL, Steel MA. 2002. The (super)tree of life: proce
p/cd		Bjelland T, Ekman S. 2005. mikroseente diversiteet kõvas kivis Ophioparma-sambl
1		Bjorbækmo MFM, Carlsen T, Brysting A, Vrålstad T, Høiland K, Ugland KI, Geml
		Björkman E. 1944. The effect of strangulation on the formation of mycorrhiza in pin
		Björkman E. 1945. Über die bedingungen der Mycorrhizabildnung bei Kiefer und Fi
		Björkman E. 1949. The ecological significance of the ectotrophic mycorrhizal assoc
		Blaalid R, Davey ML, Kause Bistorta vivipara; Svalbard vs latitude: pooluse
e		Blanchette RA, Abad AR, Farrell RL, Leathers TD. 1989. Detection of lignin peroxi
e		Blanchette RA, Obst JR, Hedges JI, Weliky K. 1988. Resistance of hardwood vesse
p		Blanchette RA. 1983. An unusual decay pattern in brown-rotted wood. Mycologia 7
j		Blanchette RA. 1995. Degradation of the lignocellulose complex in wood. Can. J. B
		Blanchette RA. 2001. Fungus ashes and tobacco: the use of Phellinus igniarius by th
p		Blaschke H. Tuber puberulum
		Blaschke H. 1991. Distribution, Mycorrhizal Infection, and Structure of Roots of Ca
		Blasius D, Kottke I, Oberewinkler F. 1990. Spatial and seasonal dynamics of ectom
		Blaudez D, Botton B, Chalot M. 2000. Effects of heavy metals on nitrogen uptake b
j		Blaudez D, Jacob C, Turnau K, Colpaert JV, Ahonen-Jonnarth U, Finlay R, Botton B
x		Bligh EG, Dyer WJ. 1959. A rapid method of total lipid extraction and purification.
		Bliss T, Powers TO, Brassil CE. 2010. The spatial influence of aboveground diversi
		Blomberg SP, Garland T, Ives AR. 2003. Testing for phylogenetic signal in compara
cd		Blum JD, Klaue A, Nezat CA, Driscoll CT, Johnson CE, Siccama TG, Eagar C, Fah
		Blüthgen N. 2010. Why network analysis is often disconnected from community eco
		Boag B, Yeates GW. 1998. Soil nematode biodiversity in terrestrial ecosystems. Bio
p/cd		Boaler SB, Sciwale KC. 1966. Ecology of a miombo site, Lupa North Forest Reserv
		Boddy L, Büntgen U, Egli S, Gange AC, Heegaard E, Kirk PM, Mohamm kliiman
		Boddy L. 2000. Interspecific combative interactions between wood-decaying basidio
		Bödeker ITM, Nygren CMR, Taylor AFS, Olson A, Lindahl B. 2009. Class II perox
cd		Bodensteiner P, Binder M, Moncalvo J-M, Agerer R, Hibbett DS. 2004. Phylogenet
cd		Bodrossy L, Stralis-Pavese N, Murrell JC, Radajewski S, Weilharter A, Sessitsch A
		Boeckx P, Paulino L, Oyarzun C, van Cleemput O, Godoy R. 2005. Soil d15N patte
		Boehm EWA, Mugambi GK, Miller AN, Huhndorf SM, Marincowitz S, Spatafora J
cd		Boerner REJ, DeMars BG, Leicht PN. 1996. Spatial patterns of mycorrhizal infectiv

				Bogar KM, Kennedy PG. 20 Alnus vs Betula: ühe taime kohalolu mõjutab te
				Bogar LM, Dickie IA, Kenn NZL Alnus glutinosa, Salix fragilis. Mõlemal n
	cd			Bogeat-Triboulot M-B, Bartoli F, Garbaye J, Marmeisse R, Tagu D. 2004. Fungal ec
	cd			Bohannan BJM, Hughes J. 2 mikroobide diversiteedi mõõtmise alternatiivid: parame
	p/cd			Bois G, Piche Y, Fung MYP väga madal kaeva vaid Laccaria, Sebacina, Wilcoxina,
	p			Bokor R. 1958. Viszgalatok a tölgyek valodi mykorrhiza gombainak meghatarozasa
				Bokulich NA, Mills DA. 2013. Improved selection of Internal Transcribed Spacer-sp
				Bokulich NA, Subramanian S, Faith JJ, Gevers D, Gordon JI, Knight R, Mills DA, C
				Bollen WB. Lu KC. 1968. Nitrogen transformations in soils beneath red alder and co
	cd			Bomberg M, Jurgens G, Saano A, Sen R, Timonen S. 2003. Nested PCR detection c
	cd			Bonch-Osmolovskaya EA, Miroshnichenko ML, Lebedinsky AV et al. 2003. Radioi
	p/cd			Bond WJ, Woodward FI, Midgley GF. 2005. The global distribution of ecosystems i
2013	5			Bonito G, Smith ME, Nowak M, Healy RA, Guevara G, Cazares E et al. 2013. Histo
				Bonito GM, Brenneman T, V Carya istandus Tuber 36, Tuber lyonii (K 50%)
				Bonito GM, Gryganskyi AP, Trappe JM, Vilgalys R. 2010. A global meta-analysis o
				Bonito GM, Smith ME, Brer kuivatatud Car inokpot domin Pezizaceae ja Py
	cd			Bonkowski M, Jentschke G, Scheu S. 2001. Contrasting effects of microbial partner
	p/cd			Bonnardeaux Y, Brundrett M, Batty A, Dixon K, Koch J, Sivasithamparam K. 2007
	p/cd			Booth MG. 2004. Mycorrhizal networks mediate overstorey-understorey competitio
				Borcard D, Legendre P, Drapeau P. 1992. Partialling out the spatial component of ec
				Borcard D, Legendre P. 2002. All-scale spatial analysis of ecological data by means
				Borchers SL, Perry DA. 1990. Growth and ectomycorrhiza formation in Douglas-fir
		x		Borer ET, Seabloom EW, Tilman D. 2012. Plant diversity contrls arthropod biomass
	p/cd			Boström B, Comstedt D, Ekblad. 2008. Can isotopic fractionation during respiration
				Botnen S, Vik U, Carlsen T, Svalbard: Drya Svalbard: /inocybe, tomentella-t
	p			Bouchet P, Jaffre T, Veillon. 1995. Plant extinction in New Caledonia: protection of
	p/cd			Bouckim H, Plassard C. 2003. Juvenile nitrogen uptake capacities and root architect
	p			Bougher NL, Fuhrer BA, Horak E. 1994. Taxonomy and biogeography of Australian
	p			Bougher NL, Grove TS, Malajczuk N. 1990. Growth and phosphorus acquisition of
	p			Bougher NL, Lebel T. 2001. Sequestrate (truffle-like) fungi of Australia ar AUS ja N
	p			Bougher NI Descolea: lühikesed suure nupuga tsüstiidid
	p			Bougher NL, Malajczuk N. 1990. Effects of high soil moisture on formation of ecto
	p			Bougher NL, Thiers HD. 1991. An indigenous species of Leccinum (Boletaceae) fro
	p			Bougher NL. 1995. Diversity AUS EcM seente BD on u 6500 liiki, arvesta AUS EcM
				Bougoure DS, Cairney JWG. 2005. Assemblages of ericoid mycorrhizal and other ro
				Bougoure DS, Cairney JWG. 2005. Fungi associated with hair roots of Rhododendro
	p/cd			Bougoure DS, Cairney JWG. 2006. Chitiniolytic activities of ericoid mycorrhizal an
	p/cd			Bougoure DS, Parkin PI, Cai ErM
	p/cd			Bougoure JJ, Bougoure DS, Cairney JWG, Dearnaley JDW. 2009. ITS-RFLP and se
				Bougoure JJ, Brundrett MC, Grierson PF. 2010. Carbon and nitrogen supply to the u
	cd			Bougure DS, Cairney JWG. 2005. Assemblages of ericoid mycorrhizal and other roo
	cd			Bougure DS, Cairney JWG. ErM seened Rhododendronil Austraalias: 3 taime: dom
	p			Boulinier T, Nichols JD, Sau lindude liigirikkuse modelleerimine eri jackknife meeto
				Boullard B, Dominik T. 1960. Recherches comparatives entre le mycotrophisme du
				Boullard B, Dominik T. 1960. Recherches comparatives entre le Mycotrophisme du
	p/cd			Boullard B. 1957. Etude des mycorhizes dans le genre *Cerdus* . Premiere contributio
				Bourett TM, Sweigard JA, Czymmek JK, Carroll A, Howard RJ. 2002. Reef coral fl
				Bowers RM, McLetchie S, Knight R, Fierer N. 2011. Spatial variability in airborne b
	p/cd			Bowling DR, Pataki DE, Randerson JT. 2008. Carbon isotopes in terrestrial ecosyst
				Boyle CD, Hellenbrand K-E. 1991. Assessment of the effect of mycorrhizal fungi or
	p			Boysen M, Borja M, del Moral C, Salazar O, Rubio V. 1996. Identification at strain
				Bradbury SI xxx, kirjelduste 3 noort vs 3 vana metsa vs ECM:
				Bradbury SI xxx raiesmikul; suktsе Kokku: Pilod byssinum, Pilod fallax,
	p/cd			Bradford MA, Jones TH, Bardgett RD et al. 2002. Impacts of soil faunal community
				Bragazza L, Bardgett RD, Mitchell EAD, Buttler A. 2014. Linking soil microbial co
			x	Branco S, Ree RH. 2010. Se Serpentiin vs n Tom-thel, russ, inoc
				Branco S. 2010. Serpentine s Serpentiin vs mitteserp mullal Quercus: transpl
	p			Brand F, Ag Fagirhiza tubulosa -kottseen sarn L488; Fagirhiza cystidiophora -sarn T
	p			Brand F. 19 Genea hispidula
				Brandt A, de Kroon H, Reynolds HL, Burns JH. 2013. Soil heterogeneity generated
	cd			Brandt O, Feldner J, Stephan A, Schröder M, Schnölzer M, Arlinghaus HF, Hoheise
	cd			Brandtberg P-O, Bengtsson J, Lundkvist H. 2004. Distributions of the capacity to tal
				Brasier C. 2000. The rise of the hybrid fungi. Nature 405: 134-135.
	p			Brasier CM. 1997. Fungal species in practice: identifying species units in fungi. In: C
	cd			Bratek Z, Ja Terfezia terfezioides + Robinia pseudoacacia -mantli ja hartigi võrgustil
	cd			Braun-Lüllemann A, Hüttermann A, Majcherczyk A. 1999. Screening of ectomycorr
	cd			Brazma A, Hingamp P, Guackenbush J et al. 2001. Minimum information about a m
	cd			Brearley FQ, Press MC, Sch vs lehekõdu kontroll: Inocybe spp, Cenococcum;

			Brearley FQ, Scholes JD, Lee SS. 2005. Nitrogen nutrition and isotopic discriminati
			Brearley FQ, Scholes JD, Pr Dipteroc Hopea seemikutel EcM str sõltub puu
p/cd			Brearley FQ. 2006. Differences in the growth and ectomycorrhizal community of Dr
			Brearley FQ. 2008. The importance of ectomycorrhizas for the growth of dipterocar
			Brearley FQ. 2011. The Importance of Ectomycorrhizas for the Growth of Dipteroca
			Brearley FQ. 2012. Ectomycorrhizal associations of the Dipterocarpaceae. Biotropic
cd			Bremer B, Bremer K, Heidari N, Erixon P, Olmstead RG, Anderberg AA, Källersjö
p/cd			Brenn N, Menkis A, Grünig CR, Sieber TN, Holdenrieder O. 2008. Community stru
			Bresinsky A, Jarosch M, Fischer M, Schönberger I, Wittmann-Bresinsky B. 1999. P
			Brevik A, Moreno-Garcia J, Wenelczyk J, Blaalid R, Bronken Eidesen P, Carlsen T
cd			Bridge P, SpoonerB. 2001. Soil fungi: diversity and detection. Plant Soil 232: 147–1
p/cd			Bridge PD, Newsham KK. 2 mullaseened Antarktikas: v erinevad, dominant
			Bridge PD, Spooner BM. 20 Antarktika seened: ülevaade BD, ökoloogia, bi
p/cd			Briggs JC. 2003. The biogeographic and tectonic history of India. J. Biogeogr. 30: 3
p/cd			Briggs JC. 2004. The ultimate expanding earth hypothesis. J. Biogeogr. 31: 855-857
p/cd		x	Brock PM, Döring H, Bidartondo MI. 2009. How to know unknown fungi: the role
cd			Brodie E, Edwards S, Clipson N. 2003. Soil fungal community structure in a temper
			Broeckling CD, Broz AK, Bergelson J, Manter DK, Vivanco JM. 2008. Root exuda
cd			Bronstein JL. 2001. The exploitation of mutualisms. Ecol. Lett. 4: 277-287.
p/cd			Brown GK, Udovicic F, Ladiges PY. 2001. Molecular phylogeny and biogeography
cd			Brown JH, Whitham TG, Er Pinus edulis poolkõrb: kottseened; stepp: kandsee
			Brown JH, Woods Jr, Woods FW. 1968. Root extension of trees in surface soils of t
		x	Brown SP, Callaham MA, O Ion Torrent: seened ITS1: 3M sekventsi keskm
			Browning MHR, Whitney RD. 1993. Infection of containerizes jack pine and black
	x		Bruelheide H, Nadrowski K, Assmann T, Bauhus J, Both S, Buscot F, Chen XY, Din
			Brun A, Chalot M, Finlay RD, Söderström B. 1995. Structure and function between
p/cd			Brundrett MC, Abbott LK. 1991. Roots of jarrah forest plants. I. Mycorrhizal assoc
p/cd			Brundrett MC, Abbott LK. 1994. Mycorrhizal fungus propagules in the jarrah forest
p/cd			Brundrett MC, Abbott LK. 1995. Mycorrhizal fungus propagules in the jarrah forest
			Brundrett MC, Ashwath N, Jasper DA. 1996. Mycorrhizas in the Kakadu region of
			Brundrett MC, Bougher N, Dell B, Grove T, Malajczuk N. 1996. Working with myc
			Brundrett MC, Kendrick B. 1987. The relationship between and the ash bolete (*Bole*
			Brundrett MC, Kendrick B. 1988. The mycorrhizal status, root anatomy, and phenol
			Brundrett M anatoomia eripuudel
j			Brundrett MC. 2002. Coevolution of roots and mycorrhizas of land plants. New Phy
			Brundrett MC. 2004. Diversity and classification of mycorrhizal associations. Biol.
			Brundrett MC. 2004. Diversity and classification of mycorrhizal associations. Biol.
			Brundrett M Gnetum vs Coniferales: erinev EcM struktuuri -gnetumil HN
			Brundrett MC. Malajczuk N, Mingqin G, Daping X, Snelling S, Dell B. 2005. Nurse
p			Bruneau A, Forest F, Herendeen PS, Klitgaard BB, Lewis GP. 2001. Phylogenetic re
			Brunner F, Brunner I. 1990. A new method to produce numerous uncontaminated al
			Brunner I, Brodbeck S, Büchler U, Sperisen C. 2001. Molecular identification of fin
			Brunner I, Brunner F, Laursen GA. 1992. Characterization and comparisor 2*2 erilii
cd			Brunner I, Ruf M, Lüscher P, Sperisen C. 2004. Molecular markers reveal extensive
			Brunner I, Scheidegger C. 1992. Ontogeny of synthesized Picea abies-Hebeloma cru
			Brunner I, Scheidigger C. 1994. Effects of high nitrogen concentrations on ectomyco
p/cd			Brunner I. 1989. Two new species of *Russula* (stirps *Atropurpurea*) associated with
			Brunner I. 1 Hebeloma sp võrdlus eri in vitro tehnikate vahel-erinevused minimaalse
cd			Bruns MA, Stephen JR, Kowalchuk GA, Prosser JI, Paul EA. 1999. Comparative di
cd			Bruns T, Tan J, Bidartondo M, SzaroT, Redecker D. 2002. Survival of Sui Suillus p
p/cd			Bruns TD, Arnold AE, Hughes KW. 2008. Fungal networks made of humans: UNIT
p/cd			Bruns TD, Baar J, Grogan P, enne ja peale p peale põlengut mood ec peale põ
p/cd			Bruns TD, Baar J, Grogan P, enne ja peale põl peale põlengut mood ecM peale põl
cd			Bruns TD, Bidartondo MI, Taylor DL. 2002. Host specificity in ectomycorrhizal co
			Bruns TD, Peay KG, Boynton PJ, Grubisha LC, Hynson NA, Nguyen NH, Rosenst
cd			Bruns TD, Read DJ. 2000. In vitro germination of nonphotosynthetic, myco-heterotr
p/cd			Bruns TD, Shefferson RP. 2004. Evolutionary studies of ectomycorrhizal fungi: rece
			Bruns TD. 1995. Thoughts o väikeses skaalas: keskkond, interaktsioonid väikeses
			Bruns TD; Szaro TM, Gardes M, Cullings KW, Pan JJ, Taylor DL, Horton TR, Kre
cd			Brussaard L, Kuyper TW, de Goede RGM. 2001. On the relationships between nem
			Bryan WC, Zak B. 1961. Synthetic culture of mycorrhizae of southern pines. For. Sc
			Bryant JA, Lamanna C, Morlon H, Kerkhoff A, Enquist BJ, Green JL. 2008. Microb
			Bubner B, Fladung M, Lentz pöök: eri indiviididel ei tuvastatud erinevusi se
			Bucci G, Menozzi P. 2002. Spatial autocorrelation and linkage of Mendelian RAPD
cd			Buchan A, Newell SY, Moreta JIL, Moran MA. 2002. Analysis of internal transcrib
p/cd			Buchanan PK, Ryvarden L. 2000. An annotated checklist of polypore and Uus-Mer
p/cd			Buchanan PK. 2001. Aphyllophorales in Australasia. Aust. Syst. Bot. 14: 417-437.
cd			Bücking H, Heyser W. 1997. Elemental composition and function of polyphosphates

cd	Bücking H, Heyser W. 2001. Microautoradiographic localization of phosphate and c
	Buckley HL, Miller TE, Ellison AM, Gotelli NJ. 2003. Reverse latitudinal trends in
	Buckley LB, Davies TJ, Ackerley DD, Kraft NJB, Harrison SP, Anacker BL, Corne
p/cd	Buee M, Courty PE, Mignot D, Garbaye J. 20(NE FRA tammikus: domin Tomentel
	Buee M, De Boer W, Martin F, van Overbeek L, Jurkevich E. 2009. The rhizospher
cd	Buée M, Vairelles D, Garbay Fagus sylvatica; v Clavulina, Lactarius, Tomentella; hõ
	Buee M, Vairelles D, Garbaye J. 2005. Year-round monitoring of diversity and pote
p	Bujakiewicz AM. 1989. Macrofungi in the alder and alluvial forests in var märgades
p/cd	Bullerwell CE, Lang F. 2005. Fungal evolution: the case of the vanishing mitochond
	Bulman SR, Visnovsky SB, I NZL sissetoodud Tuber: 5 liiki Euroopa puudel
cd	Bultman TL, McNeill MR, Goldson SL. 2003. Isolate-dependent impacts of fungal e
cd	Bultman TL,Bell G, Martin WD. 2004. A fungal endophyte mediates reversal of wo
	Büntgen U, Kauserud H, Egli S. 2012. Linking climate variability to mushroom prod
p	Burdsall HF, Dorworth EB. 1994. Preserving cultures of wood-decaying Basidiomyc
	Burdsall HH. 1968. A revision of the genus *Hydnocystis* (Tuberales) and of the hyp
p/cd	Burgess N, D'Amico Hales J, Underwood E, Dinerstein E. 2004. Terrestrial Ecoreg
	Burgess TI, Malajczuk N, Grove TS. 1993. The ability of 16 ectomycorrhizal fungi t
	Burgess, T, Pisolithus kirjeld Pisolithus ECM moodustamise võime
	Burke DJ, Dunham SM, Kretzer AM. 2008. Molecular analysis of bacterial commun
p/cd	Burke DJ, Kretzer AM, Rygi Pinus taeda väet väet: Piloderma sp, Tomentella, kont
p/cd	Burke DJ, Lopez-Gutierrez JC, Smemo KA, Chan CR. 2009. Vegetation and soil en
p/cd	Burke DJ, Martin KJ, Rygiewicz PT, Topa MA. 2005. Ectomycorrhizal fungi identif
p	Burke DJ, Martin KJ, Rygiev Pinus taeda istandik (8a): 120st proovist vaid 34 liiki
	Burke RM, Cairney JWG. 1998. Carbohydrate oxidases in ericoid and ectomycorrhi
cd	Burke RM, Cairney JWG. 2002. Laccases and other polyphenol oxidases in ecto-an
p/b	Burnett JH. 2003. Fungal populations and species. Oxford University Press, New Yo
p/cd	Burnham RJ, Johnson KR. 2004. South American palaeobotany and the origins of ne
	Burrill EA, Worrall JJ, Wargo PM, Stehman SV. 1999. Effects of defoliation and cu
	Buscardo E, Rodriguez-Echeverria S, Martin MP, de Angelis P, Pereira JS, Freitas H
	Buscardo E, Rodriguez-Eche Medit põlenguala: Pinus, Cistaceae ja Arbutus
p	Buscot F, K Morchella rotunda kuusel: koloniseerib nii juuretippe kui ka suberiseeru
p	Buscot F, W Cylindrocarpon destructans vs Paxillus involutus, Laccaria laccata. Pub
	Buscot F. 1994. Ectomycorrhizal types and endobacteria associated with ectomycor
	Butler EJ. 2008. The Fungi Of India. Daya Publishing House: Delhi.
p/cd	Butler MJ, Day AW. 1998. Fungal melanins: a review. Can. J. Microbiol. 44: 1115-
	Buttigieg PL, Ramette A. 2014. A guide to statistical analysis in microbial ecology: a
	Buyck B, Duhem B, Eyssartier F, Ducousso B. 2012. *Podoserpula miranda* sp. nov
	Buyck B, Eyssartier G. 1999. Two new species of Inocybe (Cortinariaceae) from A
p/cd	Buyck B, Hofstetter V, Eberhardt U, Verbeken A, Kauff F. 2008. Walking the thin l
p/cd	Buyck B, Horak E. 1999. New species of Russula (Basidiomycotina) associated wit
p/cd	Buyck B, Thoen D, Watling R. 1996. Ectomycorrhizal fungi in the Congo- Aafrika k
p/cd	Buyck B, Verbeken A, Eberhardt U. 2007. The genus Lactarius in Madagascar. Myc
p/cd	Buyck B. 2008. The edible mushrooms of Madagascar: an evolving enigm Madaga
	Buyk B , Eyssartier G, Kivaisi A. 2000. Addition to the inventory of the genus Cantl
	Byrd KB, P. xxx basidio vs asco (v noorendikus Cenococcum, Suilloid1,
	Cadiz RT, Florido HB. 2001. Bago. *Gnetum gnemon* Linn. Research Information S
	Cadotte MW. 2013. Experimental evidence that evolutionarily diverse assemblages r
	Cahill JF, Kembel SW, Lamb EG, Keddy PA. 2008. Does phylogenetic relatedness r
	Cairney JWG, Alexander IJ. 1992. A study of ageing of spruce (Picea sitchensis) ec
p/cd	Cairney JWG, Bastias B. 2007. Influences of fire on soil fungal ommunities. Can. J.
	Cairney JWG, Burke RM. 1996. Physiological heterogeneity within fungal mycelia:
	Cairney JWG, Clipson NJW. 1991. Internal structure of rhizomorphs of Trechispora
	Cairney JWG, Jennings DH, Veltkamp CJ. 1989. A scanning electron microscope st
cd	Cairney JWG, Meharg A. 2002. Interactions between ectomycorrhizal fungi and soil
cd	Cairney JWG, Meharg AA. 2003. Ericoid mycorrhiza: a partnership that exploits ha
p	Cairney JW Pisonia grandise mükobiont Pisonial (transfer-rakkudega ektomükoriisa
p/cd	Cairney JWG. 1999. Intraspecific physiological variation: implications for understan
	Cairney JWG. 2012. Extramatrical mycelia of ectomycorrhizal fungi as moderators o
	Cakan H, Karatas C. 2006. Interactions between mycorrhizal colonization and plant
	Caldwell B, Jumpponen A, Trappe JM. 2000. Utilization of major detrital substrates
cd	Call DR, Borucki MK, Loge FJ. 2003. Detection of bacterial pathogens in environm
cd	Call DR, Brockman FJ, Chandler DP. 2001. Detecting and genotyping Escherichia c
cd	Callaway RM et al. 2004. SOIL FUNGI ALTER INTERACTIONS BETWEEN TH
cd	Callaway RM, Thelen GC, Rodriguez A, Holben WE. 2004. Soil biota and exotic pl
p/cd	Calsbeek R, Thompson JN, Richardson JE. 2003. Patterns of molecular evolution ar
p/cd	Calvaruso C, Turpault M-P, Leclerc E, Frey-Klett P. 2007. Impact of ectomycorrhiz
	Calvo-Bado LA, Challen MP, Thurston CF, Elliott TJ. 2001. RAPD characterization

p		Calwell BA, Jumpponen A, Trappe JM. 2000. Utilization of major detritial substrate
cd		Camarero S, Ruiz-Duenas FJ, Sarkar S, Martinez MJ, Martinez AT. 2000. The clon
cd		Camarero S, Sarkar S, Ruiz-Duenas FJ, Martinez MJ, Martinez AT. 1999. Descripti
		Cameron DD, Bolin FJ. 2010. Isotopic evidence of partial mycoheterotrophy in the (
p/cd		Cameron DD, Johnson I, Read DJ, Leake JR. 2008. Giving and receving: measuring
p/cd		Cameron DD, Leake JR, Read DJ. 2006. Mutualistic mycorrhiza in orchids: evidenc
p/cd		Cameron DD; Preiss K, Gebauer G, Read DJ. 2009. The chlorophyll-containing orc
p/cd		Cameron KM. 2004. Utility of plastid psaB gene sequences for investigating intrafar
p		Camp WH. 1940. Aphyllous forms in Pyrola. Bull. Torr. Bot. Club 67: 453-465.
p/cd		Campbell BM, Angelsen A, Cunningham A, Katerere Y, Sitoe A, Wunder S. 2007.
cd		Campbell RN. 1996. Fungal transmission of plant viruses. Annu. Rev. Phytopathol.
		Caporaso JG, Bittinger K, Bushman F, DeSantis TZ, Andersen GL, Knight R. PyNa
cd		Carafa A, Duckett JG, Ligrone R. 2003. Subterranean gametophytic axes in the prim
		Cardillo M. 1999. Latitude and rates of diversification in birds and butterflies. Proc.
	x	Cardinale BJ, Matulich KL, Hooper DU, Byrnes JE, Duffy E, Gamfeldt L, Balvanera
p/cd x		Cardinale BJ, Srivastava DS, Duffy JE, Wright JP, Downing AL, Sankaran M, Jouse
p/cd		Carfrae JA, Skene KR, Shep noor kuusik Sotir N saaste suurendab domin Tylospora
		Carleton TJ, Read DJ. 1991. Ectomycorrhizas and nutrient transfer in conifer-feathe
		Carlsen T, Aas AB, Lindner D, Vrålstad T, Schumacher T, Kauserud H. 2012. Don't
t		Carlsen TA. 2002. Molecular diversity of root endophytes in an alpine Bistorta vivip
		Carninci P, Shibata Y, Hayatsu N, Itoh M, Shiraki T, Hirozane T, Watahiki A, Shiba
p		Carpenter SR. 1996. Microcosm experiments have limited relevance for community
p		Carpenter SR. 1999. Microcosm experiments have limited relevance for community
		Carriconde F, Gardes M, Jargeat P, Heilmann-Clausen J, Mouhamadou B. Gryta H.
		Carriconde F, Gardes M, Jargeat P, Heilmann-Clausen J, Mouhamadou B. Gryta H.
p		Carroll G. 1995. Forest endophytes: pattern and process. Can. J. Bot. 73: S1316-S13
j		Carroll G. 1995. Forest endophytes: pattern and process. Can. J. Bot. 77 (Suppl. 1):
		Carson JK, Gonzales-Quinones V, Murphy DV, Hinz C, Shaw JA, Gleeson DB. 20
cd		Carter JP, Spink J, Cannon F mikroseened odra ja nisujuurtes erineva maakasutusega
		Caruso T, Rillig MC, Garlaschelli D. 2012. On the application of network theory to
cd		Casarin V, Plassard C, Hinsinger P, Arvieu J-C. 2004. Quantification of ectomycorr
p		Castellano MA, Trappe JM, Lodge DJ. 2007. *Mayamontana coccolobae* (Basidiom
		Castellano MA, Trappe JM. 1985. Ectomycorrhizal formation and plantation perforn
p		Castellano MA, Trappe JM. 1985. Mycorrhizal associations of five species of Monc
		Castellano MA, Trappe JM. 1992. Australasian truffle-like fungi. VI. *Gigasperma* (
p/cd		Castellano MA, Trappe JM. 1992. Australian truffle-like fungi. V. Nomenclatural bi
p		Castellano MA. 1995. NATS truffle and truffle-like fungi 4: *Amogaster viridigleba*
p/cd		Cavender-Bares J, Izzo A, R Quercus 2 spp: Pezizales: / liiki, Tomentella 3 l
p		Cazares E, Garcia J, Castillo J, Trappe JM. 1992. Hypogeous fungi from r Genea, H
		Cazares E, Smith JE. 1996. Occurrence of vesicular-arbuscular mycorrhizae in Pseu
		Cazares E, Trappe JM. 1993. Vesicular endophytes in roots of the Pinaceae. Mycor
p/cd		CBOL Plant Working Group. 2009. A DNA Barcode for land plants. Proc. Natl. Ac
cd		Ceresini PC, Shaw HD, Vilgalys RJ, Cubeta MA. 2002. Genetic diversity of Rhizoc
p/cd		Cerling TE, Hart JA, Hart TB. 2004. Stable isotope ecology in the Ituri forest. Oeco
p		Ceruti A, Bı Xeroc subtoment, Russula grisea, Hysterangium clathroides T
		Cervinkova H. 1990. Mycorrhizae and control of root pathogen Heterobasidion annc
	x	Chaffron S, Rehrauer H, Pernthaler J, von Mering C. 2010. A global network of coe
		Chagnon P-L, Bradley RL, Klironomos JN. 2012. Using ecological network theory t
		Chaia EE, Wall LG, Huss-Danell K. 2010. Life in soil by the actinorhizal nodule end
cd		Chakravarty A. 1999. Population genetics—making sense out of sequence. Nature C
		Chalot M, Brun A. 1998. Physiology of organic nitrogen acquisition by ectomycorrh
cd		Chalot M, Javelle A, Blaudez D, Lambilliote R, Cooke R, Sentenac H, Wipf D, Bot
j		Chalot M, Kytöviita MM, Brun A, Finlay RD, Söderström B. 1995. Factors affecting
		Chambers SM, Burke RM, Brooks PR, Cairney JWG. 1999. Molecular and biochen
p/cd		Chambers SM, Curlevski NJ endof AUS
1		Chambers SM, Hitchcock C. Pisonia grandis: 2 2 liiki Thelephoraceae 7 Australia k
		Chambers S Pisonia-thelephoroid
cd		Chandler DP, Newton GJ, Small JA, Daly DS. 2003. Sequence versus structure for t
p/j		Chapela IH, Garbelotto M. 2004. Phylogeography and evolution in matsutake and cl
		Chapela IH, Osher LJ, Horto Pinus radiata plar Suillus luteus Suillus vi
		Chapman B, Xiao G. 2000. Inoculation of stumps with Hypholoma fasciculare as a p
p		Chapman WK, Berch SM, Ballard TM. 1990. In vitro growth of ectomycorrhizal fun
		Chase MW, Fay M. 2009. Barcoding of plants and fungi. Science 325: 682-683.
p/cd		Chatarpaul L, Chakravarty P, Subramaniam P. 1989. Studies in tetrapartite symbiose
		Chaudhary VB, Walters LL, Bever JD, Hoeksema JD, Wilson GWT. 2010. Advanc
cd		Chen DM, Bastias BA, Taylor AFS, Cairney JWG. 2003. Identification of laccase-li
j		Chen DM, Cairney JWG. 20 ECM seente EMI enne põlengut: EcM seened: Theleph
		Chen DM, Ellul S, Herdman K, Cairney JWG. 2001. Influence of salinity of biomass

			Chen DM, Taylor AFS, Burke RM, Cairney JWG. 2001. Identification of genes for
			Chen J-H, Sun H, Wen J, Yang Y-P. 2010. Molecular phylogeny of Salix L. (Salicac
			Chen L, Liu J, Yao G, Yan W. 2008. Genetic diversity of Frankia strains in root nod
			Chen S, Yao H, Han J, Liu C, Song J, Shi L, Zhu Y, Ma X, Gao T, Pang X, Luo K,
			Chen YL, Brundrett MC, Dell B. 2000. Effects of ectomycorrhizas and vesicular-arb
p/cd			Chen YL, Kang LH, Malajczuk N, Dell B. 2006. Selecting ectomycorrhizal fungi fo
p/cd			Chen YL, Liu S, Dell B. 200 Eukalüpti istandil Scleroderma , Pisolithus, li Scleroder
p/cd			Chen Z, Li J. 2004. Phylogenetics and biogeography of Alnus (Betulaceae) inferred
			Chen Z-D, Manchester SR, Sun H-Y. 1999. Phylogeny and evolution of the Betulac
cd			Cheung VG, Morley M, Aguilar F, Massimi A, Kucherlapati R, Childs G. 1999. Ma
p/cd			Chidumayo E, Gambiza J, Grundy I. 1996. Managing miombo woodlands. In: Camp
p/cd			Chidumayo EN, Kwibisa L. 2003. Effects of deforestation on grass biomass and soil
cd			Chidumayo EN. 2002. Changes in miombo woodland structure under different land
			Chilvers GA, Burdon JJ. 1983. Further studies on a native Australian aucalypt forest
			Chilvers GA, Lapeyrie FF, Horan DP. 1987. Ectomycorrhizal vs endomycorrhizal fu
p			Chilvers GA eukalüpti juurte ja mükoriisade ülesehitus. MR tek er paksu huumuse vo
p			Chilvers GA terminid synanchyma, felt ja net prosenchyma. Eukalüpi EcM 8 morfotü
p			Chilvers GA. 1972. Tree root pattern in a mixed eucalypt forest. Aust. J. Bot. 20: 22
p			Chilvers GA. 1973. Host range of some eucalypt mycorrhizal fungi. Aust. J. Bot. 21
p/cd			Chilvers GA Eukalüpidel ülevaade
x			China BOL Group. 2011. Comparative analysis of a large dataset indicates that inter
p			Chittibabu CV, Parthasarathy N. 2001. Liana diversity and host relationships in a tro
cd			Cho J-C, Tiedje JM. 2001. Bacterial species determination from DNA-DNA hybridi
			Chow C-E T, Kim DY, Sachdeva R, Caron DA, Fuhrman JA. 2014. Topp-down cor
			Chow CET, Kim DY, Sachdeva R, Caron DA, Fuhrman JA. 2014. Top-down contro
			Christan J, Hahn Ch. 2005. Zur Systematik der Gattung Ramaria (Basidiomycota, G
p			Christoph H. 1921. Untersuchungen über die mykotrophen Verhältnisse der "Ericale
2			Christy EJ, 6 tüüpi CWDst CWDs Cenococcum, Piloderma
			Chu H, Fierer N, Lauber CL, Caporaso JG, Knight R, Grogan P. 2010. Soil bacteria
			Chu-Chou M, Grace LJ. 1979. Endogone flammicorona as a mycorrhizal symbiont c
			Chu-Chou M Hydnangium carneum EcM obs eukalüptil ja Nothofagusel N
			Chu-Chou M Tuberi identifitseerimine juurtel puhaskultuuri baasil (NZL P:
p			Chu-Chou M, Grace LJ. 1985. Comparative efficiency of the mycorrhizal fungi Lac
cd			Chu-Chou M Tuber ja Endogo Tuber Uus-Meremaal eriti sage taimlates
p/cd			Chung H, Zak DR, Lilleskov mullaseened haavikus Co2 ja O3 tõusu mõju: CO2: ko
p			Chung MG, Kang SK. 1996. Allozyme genetic and clonal diversity within populatio
			Chutima R, Dell B, Vessabutr S, Bussaban B, Lumyong S. 2011. Endophytic fungi f
cd			Claridge AW, Cork SJ, Trappe JM. 1999. Diversity and habitat relationshi maasises
p			Claridge AW, Tanton MT, S EcM seened potoroo sitas: palju liike, eriti kandseened
b			Claridge AW, Trappe JM. 2005. Sporocarp mycophagy: Nutritional, behavioral, evo
p/cd			Claridge AW. Trappe JM, Castellano MA. 2001. Australian truffle-like fungi. X. *Gy*
			Clark DA, Brown S, Kicklighter DW, Chambers JQ, Thomlinson JR, Ni J. 2001. Me
	x		Clarke KR. 1993. Non-parametric multivariate analysis of changes in community str
p			Clemmensen KA, Michelsen Salix herbacea x Tom stuposat palju rohkem peale väe
x		x	Clemmensen KE, Bahr A, O SWE, HUUMUSKIHIS sügavuti 1 m: ül 5 cm :
			Clemmensen KE, Finlay RD, sügavuti org-h seenekooslused muutuvad süga
p/cd			Clemmensen KE, Michelsen A, Jonasson S, Shaver GR. 2006. Increased ectomycor
			Clemmensen KE, Sorensen PL, Michelsen A, Jonasson S, Ström L. 2008. Site-deper
p/cd			Cline E, Vinyard B, Edmond Pseudotsuga seer Läh: Russ. Nigricans, Rhiz Rudus, R
p/cd			Cline ET, Ammirati JF, Edm Pseudotsuga: noo taimla: Tuber sp., Rhizopogon rudus,
p/cd			Cline ET. 2004. Mycorrhizal Pseudotsuga 3 säilikpuul eri aladel 10 proovis:
			Cline MS, Smoot M, Serami E, Kuchinsky A, Landys N, Workman C and 26 others
			Co-David D, Langeveld D, Noordeloos ME. 2009. Molecular phylogeny and spore e
cd			Cohan FM. 2002. What are bacterial species? Annu. Rev. Microbiol. 56: 457–487.
			Cohen R, Hadar Y, Yarden O. 2001. Transcript and activity levels of different Pleur
			Coince A, Cael O, Bach C, I mullaproovidest analüüs on sama efektiivne ku
			Coince A, Cordier T, Lengelle J, Defossez E, Vacher C, Robin C, Bueé M, Marcais
			Cole JR, Wang Q, CardenasE, Fish J, Chai B, Farris RJ, Kulam-Syed-Mohideen AS
cd			Cole L, Orlovich DA, Ashford AE. 1998. Structure, function, and motility of vacuol
x		x	Coleman AW. 2009. Is there a molecular key to the level of 'biological species' in eu
			Colgan W, Carey AB, Trappe JM, Molina R, Thysell D. 1999. Diversity a hüpogeili
p			Colgan W, Castellano MA, Bougher NL. 1995. NATS truffle and truffle-like fungi 2
			Colinas C, Molina R, Trappe metsaistandikus Thelephora, Rhizopogon, Cenococcu
p/cd			Collier FA, Bidartondo MI. 2 Betula ja Pinus Betula: Lacc proxima, Thel terr
			Collins Johnson N, Wilson GWT, Miller RM, Bowker MA. 2015. Mycorrhizal pher
			Collins RA, Cruickshank RH. 2013. The seven deadly sins of DNA barcoding. Mol.
cd			Colpaert JV, Muller LAH, Lambaerts M, Adriaensen K, Vangronsveld J. 2004. Evo
			Colpaert JV, van Assche JA, Luijtens K. 1992. The growth of extramaricial myceliu

Colpaert JV, van Laere A. 1996. A comparison of the extracellular enzyme activities
Colpaert JV, van Tichelen KK, van Assche JA, van Laere A. 1999. Short-term phos
Colpaert JV, van Tichelen KK. 1996. Decomposition, nitrogen and phosphorus mine
Colpaert JV, Vandenkoornhuyse P, Adriaensen K, Vangronsveld J. 2000. Suillus: li
p/cd Colwell RK, Lees DC. 2000. The mid-domain effect: geometric constraints on the g
x Colwell RK, Mao CX, Chang J. 2004. Interpolating, extrapolating, and comparing in
Colwell RK. 2006. EstimateS: statistical estimation of species richness and shared s
p/cd Comadini O, Contu M, Rinaldi AC. 2006. An overview of Cistus ectomyc Cistus: E
p Comadini O Tuber himalayense, T. Indicum tammel (sünt eostega). EcM eristamatu
Comandini O, Rinaldi AC, Kuyper TW. 2010. Measuring and estimating ectomycor
Comandini O, Rinaldi AC, Kuyper TW. 2012. Measuring and estimating ectomycor
cd Combier J-P, Melayah D, Raffer C, Gay G, Marmeisse R. 2003. Agrobacterium tum
p/cd Comes HP. 2004. The Mediterranean region -a hotspot for plant biogeographic resea
Condit R, Lao S, Singh S, Esufali A, Dolins S. 2013. Data and database standards fo
Condit RJ, Ashton P, Balslev A, Brokaw N, Bunyavejchewin S, Chuyong G. 2003.
Conn C, Dighton J. 2000. Litter quality influen erinev eritüüpi kõduga kottides. Suill
p Contreras-Medina R, Vega IL. 2002. On the distribution of gymnosperm genera, the
cd Cook KL, Layton AC, Dionisi HM, Fleming JT, Sayler GS. 2004. Evaluation of a pl
cd Cook KL, Sayler GS. 2003. Environmental application of array technology: promise
Cook LG, Crisp MD. 2005. Not so ancient: the extant crown group of Nothofagus r
Cooke DEL, Drenth A, Duncan JM, Wagels G, Brasier CM. 2000. A molecular phy
p/cd Cooke JC, Lefor MF. 1998. The mycorrhizal status of selected plant species from C
Cooper JA, Leonard P. 2012. *Boletopsis nothofagi* sp. nov. associated with Nothofa
Cooper KM. 1976. A field survey of mycorrhizas in New Zealand ferns. N. Z. J. Bo
Cooper N, Jetz W, Frecleton RP. 2010. Phylogenetic comparative approaches for st
Cordier T, Robin C, Capdev lehtel/s kasvavatel seentel kooslusi mõj söögi i
p Cork SJ, Nutritional value of hypogeous fungus for a forest-dwelling ground squirrel
p/cd Corlett RT, Primack RB. 2006. Tropical rainforests and he need for cross-continenta
p/cd Cornelissen JHC, Aerts R, Cerabolini B, Werger MJA, van der Heijden MGA. 200
Cornelissen JHC. 1996. An experimental comparison of leaf decomposition rates in
p Corner EJH. 1966. Clavarioid genera and Thelephora from the Congo. Bull. Jard. Bo
p Corner EJH. 1966. Species of Ramaria (Clavariaceae) without clamps. Trans. Br. M
p Corner EJH. 1969. Notes on cantharelloid fungi. Nova Hedw. 18: 783–818.
Corradi N, Croll D, Colard A, Kuhn G, Ehinger M, Sanders IR. 2007. Gene copy nu
Correa A, Gurevitch J, Martins-Loucao MA, Cruz C. 2012. C allocation to the fung
Corsaro D, Walochnik J, Venditti D, Steinmann J, Müller K-D, Michel R. 2014. Mi
cd Cottenie K, de Meester L. 2003. Comment to Oksanen (2001): reconciling Oksanen
Cotton TEA, Fitter AH, Miller RM, Dumbrell AJ, Helgason T. 2015. Fungi in the fu
Courty PE, Bréda N, Garbaye J. 2007. Relation between oak tree phenology and the
Courty P-E, Bueé M, Diedhiou AG, Frey-Klett P, Le Tacon F, Rineau F, Turpault M
Courty P-E, Franc A, Garbay Fagus
Courty P-E, Franc A, Pierrat FRA tammikus O: Tom sublil, Lact quietus, To
Courty P-E, Labbe J, Kohler A, Marcais B, Bastien C, Churin JL, Garbaye J, Le Tac
p/cd Courty P-E, Pouysegur R, Buee M, Garbaye J. 2006. Laccase and phosphatase activ
p/cd Courty P-E, Pritsch K, Schloter M, Hartmann A, Garbaye J. 2005. Activity profiling
Courty P-E, Walder F, Boller T, Ineichen K, Wiemken A, Roustea A, Selosse M-A.
Coutts MP, Nicoll BC. 1990. Growth and survival of shoots, roots, and mycorrhizal
Coutts MP, Nicoll BC. 1990. Waterlogging tolerance of roots of Sitka spruce clones
Coutts MP, Philipson JJ. 1978. Tolerance of tree roots to waterlogging. I. Survival o
Coutts MP, Philipson JJ. 1978. Tolerance of tree roots to waterlogging. II. Adaptatio
Coutts MP. 1982. Tolerance of tree roots to waterlogging. V. Growth of woody root
Covacevich F. 2010. Molecular Tools for Biodiversity and Phylogenetic Studies in M
Covain R, Dray S, Fisch-Muller S, Montoya-Burgos JI. 2008. Assessing phylogenet
Cowden CC, Peterson CJ. 2(USA, GE: Pinus strobus: vs metsavabad laigud
p/cd Cozzolino S, Widmer A. 2005. Orchid diversity: an evolutionary consequence of de
p/cd Craine JM, Elmore AJ, Aidar MPM, Bustamante M, Dawson TE, Hobbie EA and 1
Crane PR. 1996. The fossil history of the Gnetales. Int. J. Plant. Sci. 157: S50-S57.
Cripps CL, Eddington LH. 2005. Distribution of mycorrhizal types among Alpine va
p/cd Cripps CL, Horak E. 2008. Checklist and ecology of the Agaricales, Russu USA Ko
Cripps CL, x
p Cripps CL. 2004. Ectomycor Populus sp. Isole Inocybe lacera, Paxillus vernalis, Lac
p/cd Crisci JV, Sala OE, Katinas L, Posadas P. 2006. Bridging historical and ecological a
Crisp MD, Arroyo MTK, Cook LG, Gandolfo MA, Jordan GJ, McGlone MJ, Westo
Crisp MD, Burrows GE, Cook LG, Thornhill AG, Bowman DMJS. 2011. Flammabl
p/cd Crisp MD, Cook L, Steane D. 2004. Radiation of the Australian flora: what can com
p/cd Crisp MD, Cook LG. 2003. Molecular evidence for definition of genera in the Oxylo
Crisp MD, Cook LG. 2011. Cenozoic extinctions account for the low diversity of ex
Crisp MD, Cook LG. 2012. Phylogenetic niche conservatism: what are the underlyin

p/cd	Crisp MD, Laffan S, Linder HP, Monro A. 2001. Endemism in the Australian flora.
cd	Crisp MD. 2001. Historical biogeography and patterns of diversity in plants, algae a
	Crosby LD, Criddle CS. 2003. Understanding bias in microbial community analysis
	Crowther TW, Boddy L, Jones TH. 2011. Species-specific effects of soil fauna on fu
	Crowther TW, Maynard DS, Seente ja bakterite Shannon BD suurem rohum
	Cruz D, Suarez JP, Kottke I, Piepenbring M, Oberwinkler F. 2011. Defining species
	Cubero OF, Crespo A, Fatehi J, Bridge PD. 1999. DNA extraction and PCR amplifi
p/cd	Cuenoud P, Savolainen V, Chatrou LW, Powell M, Grayer RJ, Chase MW. 2002. M
p	Cui M, Caldwell MM. 1996. Facilitation of plant phosphate acquisition by arbuscula
p	Cui M, Caldwell MM. 1996. Facilitation of plant phosphate acquisition by arbuscula
cd	Cullen DW, Hirsch PR. 1998. Simple and rapid method for direct extraction of micr
	Cullings K, Courty P-E. 2009. Saprotrophic capabilities as functional traits to study
	Cullings K, Ishkhanova G, Henson J. 2008. Defoliation effects on enzyme activities
p/cd	Cullings K, Raleigh C, New EMH kuuse ja mä Tylospora1, Tylospora2, Piloderma,
p/cd	Cullings K, Raleigh C, Vogle kontroll: Cortinarius sp; infektsiooniga: Russula aff vin
p	Cullings K. 2000. Peassessment of the phylogenetic relationships of some members
cd	Cullings KV, Makhija S. 200 Pinus contorta; vs kuumaveeallikate ala: Dermocybe, In
cd	Cullings KV, Vogler DR, Pa Pinus contorta, Pi Russula sp, Inocybe sp, Cort1, Cort2
cd	Cullings KV, Vogler DR. 1998. A 5.8S nuclear ribosomal RNA gene sequence data
cd	Cullings KW, New MH, Ma Pinus contorta; vs muidu: Suillus granulatus, Cortinaria
p	Cullings KW, Szaro TM, Bru seenlillelistel: Pterospora andromedea: Rhizopogon sul
cd	Cullings KW, Vogler DR, Pa männi-kuuse sega kontroll: Inocybe, Cortinarius; nylitu
	Cullings KW, Vogler DR. 1998. A 5.8S nuclear ribosomal RNA gene sequence data
	Cullings KW. 1992. Design and testing of a plant-specific primer for ecological and
	Cullings KW. 1996. Single phylogenetic origin of ericoid mycorrhizae within the Eri
p	Cunningham GH. 1948. New Zealand Polyporaceae. 6. The genus Coltrici Coltricia-
	Curlevski N, Chambers SM, Anderson IC, Cairney JWG. 2009. Identical genotypes
	Curlevski NJA, Xu ZH, And seened AUS mullas: DGGE (59 OTU), RFLP (
p	Currah RS, Smreciu EA, Hambleton S. 1990. Mycorrhiza and mycorrhizal fungi of t
	Currah RS, Zelmer C. 1992. A key and notes to the genera of fungi mycorrhizal with
cd	Currie CR, Wong B, Stuart AE, Schultz TR, Rehner SA, Mueller UG, Sung G-H, Sp
	Currie DJ, Mittelbach GG, Cornell HV, Field R, Guegan JF, Hawkins BA, Kaufman
p/cd	Curtis TP, Sloan WT, Scann prokarüootide BD arvutamine toetudes lognormaalsele
	Daft MJ, Okusanya BO. 1973. Effect of Endogone mycorrhiza on plant growth. V. I
	Dahlberg A, xxx, kattuvus profiil, laanekuus kokku: Pilod fallax, Cenoc, xxx, 6 a j
j	Dahlberg A, Nikolova I, Johanson KJ. 1997. Intraspecific variation in 137Cs activity
	Dahlberg A, xxx mänd; vs 2 raium Piloderma sp, Cortinarius c loetletud
	Dahlberg A, Stenlid J. 1990. Population structure and dynamics in Suillus bovinus as
	Dahlberg A. 1990.Effect of s istutuseelselt vs istutusjärgselt lageraiealale
	Dahlberg A. 1997. Population ecology of Suillus variegatus in old Swedish Suillus va
	Dahlberg A. ülevaade, viited ülevaade, viited ülevaade,
	Dahlgren RA, Singer MJ, Huang, X. 1997. Oak tree and grazing impacts on soil pro
cd	Dahllöf I. 2002. Molecular c erinevad PCR-l põhinevad metoodikad -limitatsioonid,
cd	Dahlman M, Danell E, Spatafora JF. 2000. Molecular systematics of Craterellus: cla
	Dahlström J Morchella spp: puhaskultuuris ektendoMR õhukese mantli ja pooliku ha
	Dähne J, Klingelhöfer D, Ott M, Rothe GM. 1995. Liming induced stimulation of th
p	Dalpe Y. 1989. Ericoid mycorrhizal fungi in the Myxotrichaceae and Gymnoascacea
	Danell E, Fr Cantharellus sp
	Danell E. 19 Cantharellus cibarius
	Danielsen L, Thürmer A, Me Populus hybr seened mullas vs juurtes. Juurte s
p	Danielson RM, Griffiths CL, Parkinson D. 1984. Effects of fertilization on the grow
	Danielson R x Picea glauca linna E-strain, Hebeloma (ainus lihakaid vi
p	Danielson R Männil ja kuu männi-ja kuuse Alnus crispa: domin Alpova dip
	Danielson R x kaevanduspinnas seente suktsessioon eelinokuleeritud
	Danielson RM, Visser. 1990 taimlates eritaimlates ja eriokaspuudel väga er
	Danielson R x Picea glauca, turvas, karjäär
j	Danielson RM. 1979. Hypogeous ascomycetes in Alberta, Canada with tw maasises
p	Danielson R Wilcoxina-ektendoMR mänd kultuuritunnused: jaotas klamüdospooride
p	Danielson R Sphaerosporella brunnea õhuke ECM enamusel puudel nii steriilses kui
	Danielson R EcM lühikirjeldu vs teeserv vs põle sh Coltricia, Tricholoma ec vs teeserv
	Danielson R kaevanduspinna kuusk vs mänd, ii 1,2 a: Thelephora, E-strain; 4a-Hebel
	Dannemiller KC, Reeves D, Bibby K, Yamamoto N, Peccia J. 2013. Fungal high-thr
	Davey CB. 1971. Nonpathogenic Organisms Associated with Mycorrhizae. In: Hacs
	Davey M, Heegaard E, Halv sammaldes seened vs altituud: liigirikkusele po
p/cd	Davey ML, Currah RS. 2006. Interactions between mosses (Bryophyta) and fungi. C
	Davey ML, Currah RS. 2007. A new species of *Cladophialophora* (hyphomycetes)
	Davey ML, Heegaard E, Hal sammaldel seened: sõltub v palju liigist, koest j
	Davies DM, Graves JD. 1998. Interactions between arbuscular mycorrhizal fungi an

		Davies J, Briarty LG, Rieley J. 1973. Observations on the swollen lateral roots of th
p/cd		Davies TJ, Barraclough TG, Savolainen V, Chase MW. 2004. Environmental causes
cd		Davis CC, Bell CD, Mathews S, Donoghue MJ. 2002. Laurasian migration explains
cd		Davis CC, Webb CO, Wurdack KJ, Jaramillo CA, Donoghue MJ. 2005. Explosive I
p/cd		Davis EC, Franklin JB, Shaw AJ, Vilgalys R. 2003. Endophytic Xylaria (Xylariacea
		Davis EC, Shaw J. 2008. Biogeographic and phylogenetic patterns in diversity of liv
p/cd		Dawson TE, Mambelli S, Plamboeck A, Templer PH, Tu KP. 2002. Stable isotopes
p/cd		Dayanandan S, Ashton PS, Williams SM, Primack RB. 1999. Phylogeny of the tropi
		de Aragon FM, Fischer C, Bonet JA, Olivera A, Oliach D, Colinas C. 2012. Econon
		de Carcer DA, Denman SE, McSweeney C, Morrison M. 2011. Evaluation of subsa
cd		De Deyn GB, van der Putten WH. 2005. Linking aboveground and belowground div
cd		De Deyn GD, Raaijmakers CE, Zoomer HR, Berg MP, de Ruiter PC, Verhoef HA, I
		De Kesel A. 2001. A Mushroom dryer for the travelling mycologist. Field Mycology
		de la Bastide PY, Kropp BR, Piche Y. 1995. Vegetative interactions among mycelia
cd		De Luis M, Garcia-Cano MF, Cortina J, Raventos J, Gonzales-Hidalgo JC, Sanches
		De Meijer AAR. 2001. Mycological work in the Brazilian state of Parana. Brasiilia
p		de Miguel AM, de Roman M trühvli istanduste Tuber väh 6 spp; Hymenog trühvli ist
p		de Miguel A Tuber spp, Tomentella galzinii, Tom subtestacea
p		de Queiroz A. 2005. The resurrection of oceanic dispersal in historical biogeography
p		De Roman I Quercirhiza cumulosa = Tomentella sp
p		De Roman I Quercirhiza stellata = Tomentella sp
p/cd		de Roman M, Boa E, Woodward S. 2006. Wild-gathered fungi for health and rural l
		de Roman M, Claveria V, de Miguel AM. 2005. A revision of the descriptions of ec
		de Vries FT, Liiri ME, Bjornlund L, Bowker MA, Christensen S, Setälä H, Bardgett
	x	de Wit P, Erseus C. 2010 Genetic variation and phylogeny of Scandinavian species
		de Wit R, Bouvier T. 2006. 'Everything is everywhere, but, the environment selects';
p		Deacon JW, Donaldson SJ, Last FT. 1983. Sequences and interactions of mycorrhiz
p		Deacon JW, Fleming LV. Interactions of Ectomycorrhizal Fungi.
		DeAngelis KM, Wu CH, Beller HR, Brodie EL, Chakraborty R, DeSantis TZ, Ande
p/cd		Dearnaley JDW, Brocque AF. 2006. Molecular identification of the primary root fur
		Dearnaley JDW, Martos F, Selosse M-A. 2012. Orchid mycorrhizas: Molecular eco
p/cd		Dearnaley JDW. 2007. Further advances in orchid mycorrhizal research. Mycorrhiza
		Deasjardin DE. 2003. A unique ballistosporic hypogeous sequestrate *Lactarius* fron
p		Debaud JC, Gay D. 1987. In vitro fruiting under controlled conditions of the ectomy
		Debaud JC, Hebeloma: mono vs dikaarüonid-sama
		Debaud JC, Marmeisse R, Gay G. 1995. Intraspecific genetic variation and populati
p/cd		DeBellis T, Kernaghan G, Bı segametsas Kana Liikidest domin Piloderma1, Pilo2, P
p/cd		DeBellis T, Widden P, Messier C. 2002. Effects of selective cuts on the mycorrhiza
p/cd		DeBellis T, Widden P. 2006. Diversity of the small subunit ribosomal RNA gene of
		Degreef J, De Kesel A. 2008. Chalciporus africanus, a new bolete species from Afri
		Degreef J, Eyindong H. 2007. *Gerronema hongo* , a comb. nov. for a poorly known
		Degreef J, Malaisse F, Rammeloo J, Baudart E. 1997. Edible mushrooms of the Zan
		Deharveng L. 2004. Recent advances in Collembola systematics. Pedobiologia 48: 4
p/cd		Dehlin H, Nilsson M-C, Wardle DA, Shevtsova A. 2004. Effects of shading and hur
p/cd		Dell B, Lumyong SR, Lumyong S. 2005. Ectomycorrhizal fungi in dry and Diptero
p		Dell B, Mal Pisolithus ja Scleroderma sobivad Allocasuarina ja Eukalyptusega, ent e
p/cd		Dell B, Mal Mesophellia, Castorium: mükoriisad viljakehades ja mullas samasuguse
cd		Dell B, Mal Pisolithus Eukalüptil Hiinas. Eukalypti tyved, sissetoodud, mc Eukalüpt
		Delmont TO, Robe P, Cecillon S, Clark IM, Constancias F, Simonet P, Hirsch PR, V
p		Delwiche CC, Zinke PJ, Johnson CM, Virginia RA. 1978 Nitrogen isotope distribut
p/cd		Den Bakker HC, Zuccarello G, Kuyper TW, Noordeloos ME. 2007. Phylogeograph
cd		den Bakker HC, Zuccarello GC, Kuyper YW, Noordeloos ME. 2004. Evolution and
		Deng Y, Jiang Y-H, Yang Y, He Z, Luo F, Zhou J. 2012. Molecular ecological netw
		Dennis RWG. 1955. Fungi from Sierra Leone: Pezizales and Helotiales. Kew Bull. 1
p		Dennis RWG. 1970. Fungus flora of Venezuela and adjacent countries. Ke Venezuel
		Dennis RWG. 1974. New or interesting British microfungi, III. Kew Bull. 30: 345-3
		Denny HJ, Ridge I. 1995. Fungal slime and its role in the mycorrhizal amelioration c
		Denny HJ, Wilkins DA. 1987. Zinc tolerance in Betula spp. III. Variation in respons
		Dentinger BTM, Ammirati JF, Both EE, Desjardin DE, Halling RE, Henkel TW, Mc
		Dentinger BTM, Didukh Mym Moncalvo J-M. 2011. Comparing COI and ITS as DI
		der van Linde S, Alexander I, Anderson IC. 2008. A PCR-based method for detectin
		DeSantis TZ, Hugenholtz P, Larsen N, Rojas M, Brodie EL, Keller K, Huber T, Dal
		DeSantis, T. Z., P. Hugenholtz, K. Keller, E. L. Brodie, N. Larsen, Y. M. Piceno, R
		DeSantis, T. Z., P. Hugenholtz, N. Larsen, M. Rojas, E. L. Brodie, K. Keller, T. Hu
		Desdevises Y, Legendre P, Azouzi L, Morand S. 2003. Quantifying phylogenetically
		Desiro A, Duckett JG, Press Hornworts Bryophyta: juurtes nii GlomeroM ku
		Desjardin DE, Binder M, Roekring S, Flegel T. 2009. *Spongiforma* , a new genus of
		Desjardin DE, Wilson AW, Binder M. 2008. *Durianella* , a new gasteroid genus of l

			Deslippe JR, Hartmann M, N Betula nana Al soojendamine: Cort tõuseb, Rus
			Deslippe JR, Simard SW. 2011. Below-ground carbon transfer among Betula nana n
	p/cd		Desmarais E, Lanneluc I, Lagnel J. 1998. Direct amplification of length polymorphis
			Desneux N, Blahnik R, Delebecque C, Heimpel G. 2012. Host phylogeny and specia
			Desprez-Loustau M-L, Robin C, Buee M, Courtecuisse R, Garbaye J, Suffert F, Sac
			Dettman JR, van den Kamp B. 2001. The population structure of Armillaria ostoyae
			Dexheimer . Helianthemum-Terfezia-kultuuris mantlita ECM
	p		Dhillion SS, Gardsjord TL. 2004. Arbuscular mycorrhizas influence plant diversity,
			Dhillon S. 1994. Ectomycorrhizae, arbuscular mycorrhizae, and Rhizoctonia sp. of a
	j		Di Battista C, Selosse M-A, Bouchard D, Stenström E, Le Tacon F. 1996. L.b.S238
			Di Marino E, Kõljalg U, Agerer R. 2007. The ectomycorrhizae of *Pseudotomentella*
	p/cd		Di Pietro M, Churin J-L, Garbaye J. 2007. Differential ability of ectomycorrhizas to
			Diagne N, Thioulouse J, San EcM seente suurem BD suurendab Acacia man
	cd		Dias PC. 1996. Sources and sinks in population biology. Trends Ecol. Evol. 11: 326
	cd		Diaz EC, Tagu D, Martin F. 1997. Ribosomal DNA internal transcribed spacers to e
	cd		Diaz EG, Tagu D, Martin F. 1997. Ribosomal DNA internal transcribed spacers to e
			Dickie IA, Bolstridge N, Coo NZL: sissetoodud mändidel vs Nothofagusel; v
			Dickie IA, Davis M, Carswell FE. 2012. Quantification of mycorrhizal limitation in
			Dickie IA, Dentinger BTM, Avis PG, McLaughlin DJ, Reich PB. 2009. Ectomycorr
	p/cd		Dickie IA, FitzJohn RG. 2007. Using terminal restriction fragment length polymorph
			Dickie IA, Fukami T, Wilkie JK, Allen RB, Buchanan P. 2012. Do assmbly history
	cd		Dickie IA, Guza RC, Krazev Helianthemum Cenococcum
	p/cd		Dickie IA, I x tamm: tamme elu Cenococcum mittemükoriissete taime
			Dickie IA, Martínez-García LB, Koele N, Grelet G-A, Tylianakis JM, Peltzer DA, F
	p/cd		Dickie IA, Oleksyn J, Reich PB, Karolewski P, Zytkowiak R, Jagodzinski AM, Tur
	p/cd		Dickie IA, Reich PB. 2005. I Quercus spp: 1 a Cenoc, Russula1, Russula2, Astraeus
	p/cd		Dickie IA, Richardson SJ, W Nothofagus; vs raie (madalam eriti haruldaste l
	p/cd		Dickie IA, Schnitzer SA, Reich PB, Hobbie SE. 2007. Is oak establishment in old fi
		x	Dickie IA, Xu B, Koide RT. EMH baasil männi istandikus horisonditi
			Dickie IA, Yeates GW, St. John MG, Stevenson BA, Scott JT, Rillig MC, Peltzer D
	cd		Dickie IA, Avis PG, McLaughlin DJ, Reich PB. 2003. Good-Enough RFLP Matche
	p/cd		Dickie IA. 2007. Host preference, niches and fungal diversity. New Phytol. 174: 230
			Diedhiou A, Selosse M-A, Galiana A, Diabate M, Dreyfus B, Ba A, de Faria S, Ben
	cd		Diedhiou AG, Ba AM, Sylla Afzelia africana r Tomentella sppp; Scleroderma spp
	p/cd		Diedhiou AG, Gueye O, Diabate M, Prin Y, Duponnois R, Dreyfus B, Ba AM. 2005
	cd		Diedhiou AG, Verpillot F, Gueye O, Dreyfus B, Duponnois R, Ba AM. 2004. Do co
			Diefendorf AF, Mueller KE, Wing SL, Koch PL, Freeman KH. 2010. Global pattern
			Diez J, Anta B, Manjon JL, Honrubia M. 2001. Genetic variability of Piso Pisolithus
	p/j		Diez J, Manjon JL, Martin F. 2002. Molecular phylogeny of the mycorrhizal desert t
	p/cd		Diez J. 2005. Invasion biolo Eucalyptus spp H Hydnangium carneum, Hymenogaste
			Dighton J, Thomas ED, Latter PM. 1987. Interactions between tree roots, mycorrhiz
	cd		Dighton J, Tuininga AR, Gra mänd; vs N saast N saastudes Russula sp jt identifitsee
	p/cd		Dijkstra P, LaViolette CM, Coyle JS, Doucett RR, Schwartz E, Hart SC, Hungate B
			Dijkstra P, Williamson C, Menyailo R, Doucett R, Koch G, Hungate BA. 2003. Nitr
	p/cd		Dilly O, Bach H-J, Buscot F Lepp: must kuiv vähem liike; Lact ja Cort pole. Mõl. D
	cd		Dilly O, Bloem J, Vos A, Mu bakterite diversiteet, liigirikkus, ühtlus DGGE bändide
			Ding Q, Liang Y, Legendre I Pinus vs Quercus: potis metsamullainokulumil
			Diniz-Filho JAF, Bini LM, Hawkins BA. 2003. Spatial autocorrelation and red herri
			Diniz-Filho JAF, Bini LM, Rangel TF, Morales-Castilla I, Olalla-Tarraga MA, Rodr
			Diniz-Filho JAF, de Sant'Ana CER, Bini LM. 1998. An eigenvector method for estir
			Diniz-Filho JAF, Rangel TF, Santos T, Bini LM. 2012. Exploring patterns of intersp
			Diniz-Filho JAF, Rangel TFLVB, Bini LM. 2008. Model selection and information t
2013	0		Disney H, Kurina O, Tedersoo L, Cakpo Y. 2013. Scuttle flies (Diptera: Phoridae) r
	p/j		Dissing H, Korf RP. 1980. Preliminary studies in the genera *Ruhlandiella, Sphaeros*
			Dissing H, Lange M. 1962. Gasteromycetes of Congo. Bull. Jard. Bot. l' Etat 32: 32
	cd		Dittmann J, Heyser W, Bucking H. 2002. Biodegradation of aromatic compounds by
			Dixon RK, Rao MV, Garg VK. 1993. Salt stress affects in vitro growth and in situ s
			Doak KD. 1934. Fungi that produce ectotrophic mycorrhizae of conifers. Phytopatho
			Doak KD. 1955. Pine root reaction in sterile culture to mycorrhizal and other fungi.
	p		Dolan JR. 2006. Microbial biogeography? J. Biogeogr. 33: 199-200.
			Doledec S, Chessel D, Gimaret-Carpenter C. 2000. Niche separation in community a
	p/cd		Dominguez Arachnitis uniflora mykoriisa morf koos AM seentega; juurte sigipungad
			Dominguez LS, Melville L, Sérsic A, Faccio A, Peterson RL. 2009. The mycoheterc
	p/cd		Dominguez Nunez JA, Selva Serrano J, Rodriguez Barreal JA, Saiz de Omenaca Go
			Dominik T, Nespiak A, Pachlewski R. Badanie mykotrofizmu roslinnosci zespolow
			Dominik T, Nespiak A, Pachlewski R. Badanie mykotrofizmu zespolow roslinnych
			Dominik T, Nespiak A. 1953. Badanie mykotrofizmu zespolow roslinnych krainy ko
			Dominik T, Pachlewski R. 1956. Badanie mykotrofizmu zespolow roslinnych regla

			Dominik T. 1935. Zagadnienie mykorhizy w swietle historji badan. Odbitka.pp. 127
			Dominik T. 1948. Przyczynek do znajomosci mykorhizy u wiaza polnego. Acta Soc
			Dominik T. 1948. Wystepowanie mykorhizy u dzikich drzew owocowych rosnacyc
			Dominik T. 1950. Badania mykotrofizmu dzikich grusz na terenie Polski z uwzgledı
			Dominik T. 1950. Modrzew w lasach czerniejewskich pod Gnieznem i dynamika ro
			Dominik T. 1951. Badanie mykotrofizmu roslinnosci wydm nadmorskich i srodlado
			Dominik T. 1957. Badania mykotrofizmu zespolow buka nad Baltykiem. Ekol. Pols
			Dominik T. EcM klassifitseerimine subtüüpidesse ja edasi perekondadess
			Dominik T. Morfotüpiseerimise põhialused perekonnad a-p ja alajaotused
cd			Domisch T, Finer L, Lehto T, Smolander A. 2002. Effect of soil temperature on nutr
			Donatti CI, Guimaraes PR, Galetti M, Pizo MA, Marquitti FMD, Dirzo R. 2011. An
cd			Donnelly DP, Boddy L, Leake JR. 2004. Development, persistence and regeneration
			Donnelly DP, Boddy L. 1998. Developmental and morphological responses of myce
			Donnelly DP, Boddy L. 2001. Mycelial dynamics during interactions between Strop
			Donnelly PK, Fletcher JS. 1995. PCB metabolism by ectomycorrhizal fungi. Bull. E
cd			Donnison LM, Griffith GS, I PLFA: mikroobide biomass, seente/bakterite osakaal s
cd			Donoghue MJ, Bell CD, Li J. 2001. Phylogenetic patterns in northrn hemisphere pla
p/cs			Donoghue MJ, Smith SA. 2004. Patterns in the assembly of temperate forests aroun
			Donoghue MJ. 2008. A phylogenetic perspective on the distribution of plant diversit
p/cd			Dormann C. 2007. Effects of incorporating spatial autocorrelation into the analysis c
			Dormann CF, McPherson JM, Araùjo MB, Bivand R, Bolliger J, Carl G, Davies RG
			Dormann CF. 2007. Effects of incorporationg spatial autocorrelation into the analysi
			Dössing L, 1992. Naucoria. In: Hansen L. Knudsen H (eds). Nordic Macromycetes
			Dosskey MG, Boersma L, Linderman RG. 1990. Role of the photosynthate demand
			Dosskey MG, Linderman RG, Boersma L. 1990. Carbon-sink stimulation of photosy
p			Dosskey MG, Linderman RG, Boersma L. 1990. Carbon-sink stimulation of photosy
p		x	Doudrick RL, Raffle VL, Nelson CD, Furnier GR. 1995. Genetic analysis of homok
p/cd			Doughty RW. 2000. The *Eucalyptus* . A natural and commercial history of the gum
p/cd			Douglas AE. 2008. Conflict, cheats and the persistence of symbioses. New Phytol. 1
p/cd			Douglas NA, Manos PS. 2007. Molecular phylogeny of Nyctaginaceae: taxonomy,
p/cd			Douglas RB, Parker VT, Cul Pinus contorta vs Pinus+Picea+Abies okassegamets. P
p/cd			Douhan GW, Martin DP, Rizzo DM. 2007. Using the putative asexual fungus *Ceno*
p/j			Douhan GW, Rizzo DM. 2003. Amplified fragment length microsatellites (AFLM) r
cd			Douhan GW, Rizzo DM. 2005.Phylogenetic divergence in a local population of the
		x	Douhan GW, Vincenot L, Gryta H, Selosse M-A. 2011. Population genetics of ecto
			Downes GM, Alexander IJ, Cairney JWG. 1992. A study of ageing of spruce ectom
p			Dowson CG, Rayner ADM, Boddy L. 1989. Spatial dynamics and interactions of th
			Doyle JA. 1996. Seed plant phylogeny and the relationships of Gnetales. Int. J. Plan
			Drakare S, Lennon JJ, Hillebrand H. 2006. The imprint of the geographical, evolutio
			Dray S, Legendre P, Blanchet G. 2009. packfor: Forward Selection with Permutatio
	y		Dray S, Legendre P, Peres-Neto PR. 2006. Spatial modelling: a comprehensive fram
p			Drenner RW, Mazumder A. 1999. Microcosm experiments have limited relevance f
			Druebert C, Lang C, Valtanen K, Polle A. 2009. Beech carbon productivity as drive
			Drummond AJ, Suchard MA, Xie D, Rambaut A. 2012. Bayesian phylogenetics wit
			Duan X, Neuman DS, Reiber JB, Green CD, Saxton AM, Auge RM. 1996. Mycorrh
j			Duchesne LC, Anderson JB. 1990. Location and direction of transcription of the 5S
e			Duchesne LC, Ellis BE, Peterson RL. 1989. Disease suppression by ectomycorrhiza
			Duchesne P, Bernatchez L. 2002. ALFPOP: a computer program for simulated and r
p/cd			Ducic T, Berthold D, Langer Pseudotsuga m Atheliaceae sp, Lacc lacc, Wilc
p			Duckett JG, Treubia -algelisimaid maksasamblaid on v keerulises assotsiatsioonis A
			Duckett JG, maksasammalde ja kottseente-endofüütide visualiseerimine
			Duckett JG, Read DJ. 1995. Ericoid mycorrhizas and rhizoid-ascomycete associatio
			Duckett JG, maksasammalde ja kottseente-endofüütide morfoloogia
cd			Ducousso M et al. 2005. Relative infectivity of two Pisolithus spp. strains inoculate
p/cd			Ducousso M, Bena G, Bourgeois C, Buyck B, Eyssartier G, Vincelette M, Rabavoh
p			Ducousso M, Contesto C, Cossegal M, Prin Y, Rigault F, Eyssartier G. 2004. Canth
p/cd			Ducousso M, Ramanankierana H, Duponnois R, Rabevohitra R, Randrihasipara L,
p			Ducousso M, Thoen D. 1991. Les types mycorhiziens des Acacieae. In: Riedacker
p			Ducousso M; Ba AM, Thoen D. 2003. Les champignons ectomycorhiziens Senegali
			Duddridge JA, Finlay RD, Read DJ, Söderström B. 1988. The structure and functio
			Duddridge J Monotropa MR ultrastr, termin 'Monotropoid MR'
			Duddridge J Suillus grevillei eri peremeestel
			Duddridge J Suillus grevillei eri peremeestel
p			Dufrene M, Legendre P. 1997. Species assemblages and indicator species: the need
			Dufrenoy J. 1917. The endotrophic mycorhiza of Ericaceae. New Phytol. 16: 222-2
			Dumbrell AJ, Nelson M, Helgason T, Dytham C, Fitter AH. 2010. Idiosyncrasy and
			Dumbrell AJ, Nelson M, Helgason T, Dytham C, Fitter AH. 2010. Relative roles of
p			Dunabeitia I Boletus pinophilus, Gautieria othii, Hebeloma longicaudum, Russula sa

cd			Dunabeitia MK, Rodrıguez N taimlast istutatud ja inokuleeritud kase, pöög Sclerodei
cd			Dunbar J, Barns SM, Ticknor LO, Kuske CR. 2002. Empirical and theoretical bacte
cd			Dunham SM, Kretzer A, Pfrender ME. 2003. Characterization of Pacific golden cha
p/cd			Dunstan WA, Dell B; Malajc männiistandikus \ Thelephora terrestris, Tom männiista
cd			Duplessis S, Courty P-E, Tagu D, Martin F. 2005. Transcript patterns associated wi
			Duponnois R, Garbaye J, Bo istandikus: vs Laccaria-inokuleeritud + MHB (teisi väh
			Duponnois R, Kisa M, Prin Y, Ducousso M, Plenchette C, Lepage M, Galiana A. 20
b			Durall DM, Jones MD, Lewis KJ. 2005. Effects of forest management on fungal cor
			Durall DM, Jones MD, Wrig ebatsuuga vs mär Thelephora (männil 6x rohl vs metsat
			Durall DM, Hebeloma, Laccaria
			Durall DM, Todd AW, Trappe JM. 1994. Decomposition of 14C-labelled substrates
p			Dutilleul P, Legendre P. 1993. Spatial heterogeneity against heteroscedasticity: an e
			Dutilleul P. 1993. Spatial heterogeneity and the design of ecological field experimen
e			Dutton MV, Evans C, Atkey PT, Wood DA. 1993. Oxalate production by basidiomy
e			Dutton MV, Evans C. 1996. Oxalate production by fungi: its role in pathogenicity ar
cd			Duur K. Aanen1*, Thomas W. Kuyper2, Alfons J. M. Debets AJM, Hoekstra RF. 20
cd			Dynesius M, Jansson R. 2000. Evolutionary consequences of changes in species' ge
			Dzwonko Z, Loster S. 1998. Dynamics of species richness and composition in a lim
			Eastwood DC, Floudas D, Binder M, Majcherczyk A, Schneider P, Aerts A and 42
cd			Eaton GK, Ayres MP. 2002. Plasticity and constraint in growth and protein minerali
			Eberhardt U Lactarius
			Eberhardt U Tylospora
j			Eberhardt U Russula, Lactarius: ülevaade, areng
			Eberhardt U. 2010. A constr ITS soovit seente DNA barcoding geeniks
p/cd			Eckburg PB, Bik EM, Berns bakteritel inimese soolestiku eripiirkondades: suurim e
			Eckenwalder JE, 1996. Systematics and Evolution of Populus. In: Stettler RF, Brads
p/cd			Eckert AJ, Hall BD. 2006. Phylogeny, historical biogeography and patterns of diver
cd			Edel-Hermann V, Dreumont C, Perez-Piqueres A, Steinberg C. 2004. Terminal restr
			Edgar RC. 2010. Search and clustering orders of magnitude faster than BLAST. Nuc
		x	Edgar RC. 2013. UPARSE: highly accurate OTU sequences from microbial amplico
			Edgcomb VP, Beaudoin D, (ookeanisetted: eukarüootidest domin seened, e
cd			Edman M, Gustafsson M, Stenlid J, Ericson L. 2004. Abundance and viability of fur
j			Edman M, Gustafsson M. 2003. Wood-disk traps provide a robust method for study
p/cd			Edwards IP, Cripliver JL, Gi N-väetamise mõju: polevat
j		x	Edwards IP, Turco RF. 2005. Inter-and intraspecific resolution of nrDNA TRFLP as
			Edwards IP, Zak DR, Kellner H, Eisenlord SD, Pregitzer KS. 2011. Simulated atmo
			Edwards IP, Zak DR. 2011. CO2 ja O3 vs peremees ja mulla horisont:: Mu
			Edwards PJ. 1988. Effects of the fairy ring fungus Agaricus arvensis on nutrient ava
cd			Edwards SG, Fitter AH, Young JPW. 1997. Quantifcation of an arbuscular mycorrh
			Egerton-Warburton L, Allen MF. 2001. Endo-and ectomycorrhizas in Quercus agrif
p			Egger KN, Danielson RM, Fortin JA. 1991. Taxonomy and population structure of F
p/cd			Egger KN, Hibbett DS. 2004. The evolutionary implications of exploitation in myco
			Egger KN, Paden JW. 1986. Biotrophic associations between lodgepole pine seedlir
p			Egger KN, Paden JW. 1986. Pathogenicity of postfire ascomycetes (Pezizales) on se
p			Egger KN. 1986. Substrate hydrolysis patterns of postfire ascomycetes (Pezizales).
j			Egger KN. 1995. Molecular analysis of ectomycorrhizal fungal communities. Can. J.
			Egger KN. 1996. Molecular systematics of E-strain mycorrhizal fungi: *Wilcoxina* ar
p/cd			Egger KN. 2006. The surprising diversity of ascomycetous mycorrhizas. New Phytc
			Ehrenfeld JG et al. 1997. JAMA. Ecology 78: 348-362.
p/cd			Ehrenfeld JG. 2003. Effects of exotic plant invasions on soil nutrient cycling process
			Eichorst SA, Kuske CR. 2012. Geographically and edaphically different Bacterial ar
p/cd			Eidesen PB, Carlsen T, Molau U, Brochmann C. 2007. Repeatedly out of Beringia:
			Eidesen PB, Ehrich D, Bakkestuen V, Alsos IG, Gilg O, Taberlet P, Brochmann C.
			Eilers KG, Debenport S, Anderson S, Fierer N. 2012. Digging deeper to find unique
cd			Einsmann JC, Jones RH, Pu M, Mitchell RJ. 1999. Nutrient foraging traits in 10 co-
	x		Eisenhauer N, Dobies T, Cesarz S, Hobbie SE, Meyer RJ, Worm K, Reich PB. 201
			Ek H, Andersson S, Arnebrant K, Söderström B. 1994. Growth and assimilation of N
cd			Ek H, Andersson S, Söderström B. 1996. Carbon and nitrogen flow in silver birch ar
			Ek H. 1997. The influence of nitrogen fertilization on the carbon economy of Paxillu
p/cs			Ek RC. 2003. Checklist of plants of the Mabura hill area, Central Guyana.
p			Ekblad A, Högberg P. 2001. Natural abundance of 13C in C02 respired from forest
			Ekblad A, Huss-Danell K. 1995. Nitrogen fixation by *Alnus incana* and nitrogen tra
cd			Ekblad A, Nyberg G, Högberg P. 2002. 13 C-discrimination during microbial respira
			Ekblad A, V vananemine
cd			Ekelund F, Rönn R, Christensen S. 2001. Distribution with depth of protozoa, bacte
			Eklöf A, Jacob U, Kopp J, Bosch J, Castro-Urgal R, Chacoff NP et al. 2013. The di
			Ekschmitt K, Griffiths BS. 1998. Soil biodiversity and its implications for ecosysten
j			El Abyad MSH, Webster J. 1968. Studies on pyrophilous discomycetes. I. Compara

j		El Abyad MSH, Webster J. 1968. Studies on pyrophilous discomycetes. II. Competi
cd		El Fantroussi S, Urakawa H, Bernhard AE, Kelly JJ, Noble PA, Smidt H, Yershov C
		El Karkouri K, Martin F, Mc Pinus pinea Rhizopogon rubescens
cd		El Karkouri K, Selosse M-A, Mousain D. 2006. Molecular markers detecting an ect
cd		Eldredge LE, Miller SE. 1995. How many species are there in Hawaii? http://www.b
		Elkington TT. 1958. Biological flora of the British Isles. J. Ecol. 59: 887-905.
p/cd		Elliott JC, Smith JE, Cromac Pseudotsuga men Russ-Lact (13), Piloderma (10) , Tor
		Ellison A. 1996. An introduction to Bayesian inference for ecological research and e
		Ellison CE, Hall C, Kowbel D, Welch J, Brem RB, Glass NL, Taylor JW. 2011. Pop
p		Ellstrand NC, Roose ML. 1987. Patterns of genotypic diversity in clonal plant specie
p/cd		Emmerton KS, Callaghan TV, Jones HE, Leake JR, Michelsen A, Read DJ. 2001. A
p/cd		Emmerton KS, Callaghan TV, Jones HE, Leake JR, Michelsen A, Read DJ. 2001. A
		Englander L, Hull RJ. 1980. Reciprocal transfer of nutrients between ericaceous plan
p		English JT, Ploetz RC, Barnard RL. 1986. Seedling blight of longleaf pine caused by
		Englund G, Cooper SD. 2003. Scale effects and extrapolation in ecological experime
		Enquist BJ, Haskell JP, Tiffney BH. 2002. General patterns of taxonomic and bioma
		Enquist BJ, Niklas KJ. 2001. Invariant scaling relations across tree-dominated comm
		Entry JA, Rose CL, Cromack K. 1991. Litter decomposition and nutrient release in e
		Epstein S, Lopez-Garcia P. 2008. "Missing" protists: a molecular perspective. Biodi
		Eriksson O, Kainulainen K. 2011. The evolutionary ecology of dust seeds. Persp. Pla
p		Eriksson O. 1993. The species-pool hypothesis nad plant community diversity. Oiko
cd		Eriksson O. 2000. Functional roles of remnant plant populations in communities and
		Erland S, Finlay R, Söderström B. 1991. The influence of substrate pH on carbon tra
j		Erland S, Finlay R. 1992. Effects of temperature and incubation time on the ability o
		Erland S, Henrion B, Martin F, Glover LA, Alexander IJ. 1994. Identification of the
		Erland S, Jo xxx, vastavus IT 2 kuusikus Cenococcum, Thelephora, Tylospora
		Erland S, Söderström B, Andersson S. 1990. Effects of liming on ectomycorrhizal fu
p		Erland S, Söderström B. 1990. Effects of liming on ectomycorrhizal fungi infecting P
		Erland S, Ta tomentelloidid
j		Erland S. 19 Tylospora Tylospora domin
		Ernst WHO. 1988. Seed and seedling ecology of *Brachystegia spiciformis* , a predo
p/cd		Erös-Honti . Pachyphloeus spp
p/cd		Erös-Honti . Humaria ja Genea erinevate klaadide EcM vahel on rakkude suuruses st
cd		Escudero A, Albert MJ, Pita JM, Perez-Garcia F. 2000. Inhibitory effects of Artemis
cd		Escudero A, Somolinos RC, Olano JM, Rubio A. 1999. Factors controlling the estab
p		Etayo ML, de Miguel AM, d eri trühvliga nakat taimedel eri ecm kontaminandid 4 a
p		Etayo ML, (Tuber spp,
cd		Ettema CH, Wardle DA. 2002. Spatial soil ecology. Trends Ecol. Evol 17: 177-183.
		Evans D. 2007. Soil nitrogen isotope composition. In: Michener R, Lajtha (eds). Sta
cd		Evans RC, Campbell SC. 2002. The origin of apple subfamily (Maloideae, Rosaceae
		Ewaze JO, Al-Naama MM, Studies on nitrogen metabolism of Terflezia spp. and Tir
cd		Excoffier L. 2004. Patterns of DNA sequence diversity and genetic structure after a
		Exell AW. 1973. Angiosperms of the islands of the Gulf of Guinea (Fernando Po, Pr
		Eyssartier G, Buyck B. 1998. Contribution a La Systematique du Genre Cantharellus
p		Eyssartier G, Buyck B. 2001. Notes on the Australian species described in the genus
cd		Faeth SH, Fagan WF. 2002. Fungal endophytes: common host plant symbionts but u
		Faeth SH. 2002. Are endophytic fungi defensive plant mutualists? Oikos 98: 25-36.
		Fahey TJ. 1992. Mycorrhizae and forest ecosystems. Mycorrhiza 1: 83-89
		Faith DP. 1992. Conservation evaluation and phylogenetic diversity. Biol. Conserv.
		Faith JJ, Guruge L, Charbonneau M, Subramanian S, Seedorf H, Goodman AL, Clem
		Farrelly V, Rainey FA, Stackebrandt E. 1995. Effect of genome size and rrn gene co
p		Fassi B, de ' Amphinema byssoides, Hebeloma hiemale, Tuber maculatum
j		Fassi B, Fontana A, Trappe JM. 1969. Mycorrhizae formed by *Endogone* Endogone
p		Fassi B, Fo Julbernardia ser Julbernardia seretiil Kongos 10 tüüpi. Eritüübid domin
p		Fassi B, Fo Caesalpiniaceae-l Kongos
p		Fassi B, Fo Thelephora terrestris, Laccaria laccata et Hebeloma mesophaeum Pinus
p		Fassi B, Fontana A. 1967. Sintesi micorrizica tra *Pinus strobus* e *Tuber maculatum*
1		Fassi B. 1957. Ectomycorrhizes chez le *Gnetum africanum* Welw. Due a . Gnetum
	x	Faust K, Raes J. 2012. Microbial interactions: from networks to models. Nature Rev
cd		Favis R, Day JP, Gerry NP, Phelan C, Narod S, Barany F. 2000. Universal DNA arr
p/cd		Fazekas AJ, Burgess KS, Kesanakurti PR, Graham SW, Newmaster SG, Husband B
cd		Feibelmann TP, Doudrick RL, Cibula WG, Bennett JW. 1997. Phylogenetic relation
cd		Fell JW, Boekhout T, Fonseca A, Scorzetti G, Statzell-Tallman A. 2000. Biodiversit
		Fellbaum CR, Gachomo EW, Beesetty Y, Choudhari S, Strahan GD, Pfeffer PE, Kie
ecd		Fenice M, Giovannozzi G, Federici F, D´Annibale A. 2003. Submerged and solid-sta
		Ferdinandsen C, Winge Ö. 1925. Cenococcum Fr. A monographic study. Kgl. Veter
p/cd		Ferdinandse Cenococcum graniforme: käsitlus läbi ajaloo. Peetud fossiilid
j		Ferdman Y, Aviram S, Roth-Bejerano N, Trappe JM, Kagan-Zur V. 2005. Phylogen
p/cd		Fernandes DN, Sanford RL. 1994. Effects of recent land-use practices on soil nutrie

p/cd			Fernandez-Toiran LM, Agueda B. 2007. Fruitbodies of Cenococcum geop Cenococ
p			Fernando AA, Currah RS. 1995. *Leptodontidium orchidicola* (*Mycelium radicis atr*
			Fernando AA, Currah RS. 1996. A comparative study of the effects of the root endo
ecd			Ferraz A, Córdova AM, Machuca A. 2003. Wood biodegradation and enzyme produ
			Ferreira dos Santos N. 1941. Elementos para estudo das micorrizas ectendotróficas (
p/cd			Ferreira LV. 1997. Effects of the duration of flooding on species richness and florist
			Ferris R, Peace AJ, Newton AC. 2000. Macrofungal communities in lowla kuuse-ja
p/cd			Field R, Hawkins BA, Cornell HV, Currie DJ, Diniz-Filho AF, Guegan J-F, Kaufma
			Fierer N, Bradford MA, Jackson RB. 2007. Toward an ecological classification of s
p/cd			Fierer N, Breitbart M, Nulton J, Salamon P, Lozupone C, Jones R, Robeson M, Edw
			Fierer N, Grandy AS, Six J, Paul EA. 2009. Searching for unifying principles in soil
	x		Fierer N, Jackson JA, Vilgalys R, Jackson RB. 2005. Assessment of soil microbial c
p/cd			Fierer N, Jackson RB. 2006. The diversity and biogeography of soil bacterial commu
			Fierer N, Ladau J, Clemente JC, Leff JM, Owens SM, Pollard CS, Knight R, Gilbert
		x	Fierer N, Lauber CL, Ramire N-väetamisel on bakterite BD-le alast sõltuv ef
		x	Fierer N, Leff JW, Adams BJ, Nielsen U, Bates ST, Lauber CL, Owens S, Gilbert J.
			Fierer N, Lennon JT. 2011. The generation and maintenance of diversity in microbia
			Fierer N, Liu Z, Rodriguez-H organismide (prok, euk) BD tolmus: domin bak
			Fierer N, McCain CM, Meir P, Zimmermann M, Rapp JM, Silman MR, Knight R. 2
			Fierer N, Morse JL, Berthrong ST, Bernhardt ES, Jackson RB. 2007. Environmental
cd			Fierer N, Schimel JP, Holden PA. 2003. Variations in microbial community compos
			Fierer N, Strickland MS, Liptzin D, Bradford MA, Cleveland CC. 2009. Global patt
			Fierer N. 2008. Microbial biogeography: patterns in microbial diversity across space
			Figueiredo E. 1994. Diversity and endemism of angiosperms in the Gulf of Guinea is
			Figueiredo E. 1994. Diversity and endemism of angiosperms in the Gulf of Guinea is
cd			Filion M, Hamelin RC, Bern bakterid, seened, 18S (seentele NS1, NS2) + kloneerin
cd			Filion M, St-Arnaud M, Jabaji-Hare SH. 2003. Direct quantification of fungal DNA
p/cd			Findlay RH, Yeates C, Hullar MAJ, Stahl D, Kaplan LA. 2008. Biome-Level Biogeo
			Findley K, Oh J, Yang J, Cor seente ja bakterite elurikkus nahal: sõltuvalt pii
cd			Finlay BJ. 2002. Global disp heterotroofsete protistide BD on v madal globaalselt. K
			Finlay RD, Ek H, Odham G, Söderström B. 1988. Mycelial uptake, translocation an
			Finlay RD, Read DJ. 1986. The structure and function of vegetative mycelium of ect
			Finlay RD. 1989. Functional aspects of phosphorus uptake and carbon translocation
			Finlay RD. 1990. Functional aspects of incompatible ectomycorrhizal associations. A
p/cd			Finlay RD. 2008. Ecological aspects of mycorrhizal symbiosis: with special emphasi
p/cd			Finlay RD. 2008. Ecological aspects of mycorrhizal symbiosis: with special emphasi
			Fiore-Donno A-M, Martin F. 2001. Populations of ectomycorrhizal Laccaria amethy
			Fiore-Donno AM, Nikolaev SI, Nelson M, Pawlowski J, Cavalier-Smith T, Baldauf
			Fisk MC, Yanai RD, Fierer N. 2010. A molecular approach to quantify root commun
p			Fitter AH, Moyersoen B. 1996. Evolutionary trend in root-microbe symbioses. Phil.
			Fitter AH. 2005. Darkness visible: reflections on underground ecology. J. Ecol. 93: 2
			FitzJohn RG, Maddison WP, Otto SP. 2009. Estimating trait-dependent speciation a
			Fitzpatrick KA, Kersh GJ, Massung R. 2010. Practical method for extraction of PCR
p/cd			Fleischmann K, Heritier P, Meuwly C, Küffer C, Edwards PJ. 2003. Virtual gallery o
p			Fleming LV. 1983. Successic kase istikutel vanade puude ümber: isoleeritud: Hebelo
p/cd			Fleming LV. 1984. Effects of soil trenching and coring on the formation of ectomyco
			Floudas D, Binder M, Riley R, Barry K, Blanchette RA, Henrissat B et al. 2012. The
p/cd			Floyd R, Abebe E, Papert A, Blaxter M. 2002. Molecular barcodes for soil nematod
			Flynn D, Newton AC, Inglet kuuse seemikutel Tylospora fibrillosa 72-97%
			Fogel R, Trappe JM. 1985. *Destuntzia*, a new genus in the hymenogastraceae (Basi
b			Fomina M, Burford EP, Gadd GM. 2005. Toxic metals and fungal communities. In:
cd			Fomina M, Gadd GM. 2003. Metal sorption by biomass of melanin-producing fungi
			Fontaine C, Guimaraes PR, Kefi S, Loeuille N, Memmott J, van der Putten WH, van
			Fontaine C, Thebault E, Dajoz I. 2009. Are insect pollinators more generalist than in
p			Fontana A, Elaphomyces muricatus, Genea klotzschii, Rhiz rubescens, Hymenogast
p			Fontana A, Tuber brumale sünt Pinus nigral -cys olemas
p			Fontana A, Giovanetti G. 1980. Osservazioni su *Stephensia bombycina* in coltura. A
			Fontana A, Giovanetti G. 1987. The anamorph of *Stephensia bombycina*. Mycotaxo
p			Fontana A, Luppi AM. 1966. Funghi saprofiti isolati da ectomicorrize. Allionia 12: 3
			Fontana A. Lepista nuda ja Populus hybrida ning Populus monilifera, nig
p			Fontana A. Salixi 14 liigi Salixi 14 liigil erītüübid Dominiki perek kaupa
			Fontana A. 1985. Vesicular-Arbuscular mycorrhizas of ginkgo biloba L. in natural an
VIITED			Fontana A. 1998. The role of mycorrhizas in proper management of productive wood
p			Forest F, Savolainen V, Chase MW, Lupia R, Bruneau A, Crane PR. 2005. Teasing
p/cd			Forsyth GG, Richardson GM, Brown PJ, van Wilgen BW. 2004. A rapid assessmen
p			Fortas Z, Chevalier G. 1992. Effet les conditions de culture sur la mycorhization de l
p			Fortin JA, Piche Y, Godbout C. 1983. Methods for synthesizing ectomycorrhizas an
p			Fortin JA, Piche Y, Lalonde M. 1980. Technique for the observation of early morpho

p		Fortin JA. 1966. Synthesis of mycorrhizae on explants of the root hypocotyl of *Pinu*
		Fortuna MA, Stouffer DB, Olesen JM, Jordano P, Mouillot D, Krasnov BR, Poulin I
		Foster RC. 1981. Mycelial strands of Pinus radiata: ultrastructure and histochemistry
		Foster SD, Dunstan PK. 2010. The analysis of biodiversity using rank aundance dist
cd		Founoune H, Duponnois R, Ba AM, Sall S, Branger I, Lorquin J. Neira M, Chotte JI
p		Fox FM. 1983. Role of basidiospores as inocula of mycorrhizal fungi of birch. Plant
p/cd		Fracchia S, Aranda A, Gopar A, Silvani V, Fernandez L, Godeas A. 2009. Mycorrh
VIITED		France RC; Cline ML; Reid CPP. 1979. Recovery of ectomycorrhizal fungi after exp
p/cd		Franciosa G, Tartaro S, Wedell-Neergaard C, Aureli P. 2001. Characterization of Li
		Francis R, Read DJ. 1994. The contributions of mycorrhizal fungi to the determinati
		Francis R, Read DJ. 1995. Mutualism and antagonism in the mycorrhizal symbiosis,
		Frank B. 1885. Ueber die auf Wurzelsymbiose beruhende Ernährung gewiser Bäum
		Frank B. 1887.Ueber neue Mycorhiza-Formen. Ber. Deut. Bot. Ges. 5: 395-409.
		Frank B. 1888. Ueber die physiologische Bedeutung der Mycorhiza. Ber. Deut. Bot.
		Frank B. 1892. Lehrbuch der Botanik nach dem gegemwärtigen Stand der Wissensc
p/cd		Frank B. 2005. On the nutritional dependence of certain trees on root symbiosis with
		Frank JL, Anglin S, Carrington E, Taylor DS, Viratos B, Southworth D. 2009. Rode
		Frank JL, Barry S, Southworth D. 2006. Mammal mycophagy and dispersal of mycc
		Frankland J, Harrison AF. 1985. Mycorrhizal infection of Betula pendula nad Acer p
j		Frankland JC, Poskitt JM, Howard DM. 1995. Spatial development of populations o
cd		Frankland JC. 1998. Fungal succession -unravelling the unpredictable. Mycol. Res.
		Franklin JF, Pechanec AA. 1968. Comparison of vegetation in adjacent alder, conife
		Franklin JF, Pechanec AA. Comparison of vegetation in adjacent alder, conifer, and
		Franklin JF, Pechanec AA. Comparison of vegetation in adjacent alder, conifer, and
p/cd		Fransson PMA, Anderson IC, Alexander IJ. 2007. Does carbon partitioning in ecton
p/cd		Fransson PMA, Anderson IC, Alexander IJ. 2007. Ectomycorrhizal fungi in culture r
		Fransson PN xxx vs väetis (BD väl Amphinema, Cenococcum, Piloderm
		Freckleton RP, Cooper N, Jetz W. 2011. Comparative methods as a statistical fix: th
		Freckleton RP, Jetz W. 2009. Space versus phylogeny: disentangling phylogenetic a
		Freckleton RP. 2009. The seven deadly sins of comparative analysis. J. Evol. Biol. 2
p/cd		Freudenstein JV, van den Berg C, Goldman DH, Kores PJ, Molvray M, Chase MW.
p		Freudenstein JV. 1999. Relationships and character transformation in Pyroloideae (E
p		Freudenstein JV. 1999. Relationships and character transformation in Pyroloideae (E
cd		Frey B, Zierold H, Brunner I. 1997. Extracellular complexation of Cd in the Hartig n
cd		Frey-Klett P, Chavatte M, Clausse M-L, Courrier S, Le Roux C, Raaijmakers J, Mai
		Frey-Klett P, Churin J-L, Pierrat J-C, Garbaye J. 1999. Dose effect in the dual inocu
p/cd		Frey-Klett P, Garbaye J, Tarkka M. 2007. The mycorrhiza helper bacteria revisited.
p		Fries N, Mueller GM. 1984. Incompatibility systems, cultural features and species c
		Fries N, Swedjemark G. 1986. Specific effects of tree roots on spore germination in
p		Fries N. 1942. Einspormyzelien Einiger Basidiomyceten als Mykorrhizabildner von
		Fries N. 1978. Basidiospore germination in some mycorrhiza-forming hymenomycet
p		Fries N. 1983. Spore germination, homing reaction, and intersterility groups in Lacca
p		Fries N. 1987. Somatic incompatibility and field distribution of the ectomycorrhizal
	x	Fries N. 1987. Somatic incompatibility and field distribution of the ectomycorrhizal
cd		Friis EM, Pedersen KR, Crane PR. 2005. When Earth started blooming: insights fro
		Frioni L, Minasian H, Volfovicz R. 1999. Arbuscular mycorrhizae and ectomycorrh
cd		Fritze H, Perkiömäki J, Saarela U, Katainen R, Tikka P, Yrjälä K, Karp M, Haimi J,
		Fröhlich J, Hyde KD, Petrini O. 2000. Endophytic fungi associated with palms. Myc
p/cd		Fröhlich-Nowoisky J, Picker seeneeosed õhus: enamasti saproobsed kandsee
cd		Fröslev TG, Aanen DK, Lässöe T, Rosendahl S. 2003. Phylogenetic relationships of
cd		Froslev TG, Matheny PB, Hibbett DS. 2005. Lower level relationships in the mushro
p/cd		Frost P. 1996. The ecology of miombo woodlands. In: Campbell B, ed. The Miombo
		Frostegard A, Tunlid A, Baath E. 2011. Use and misuse of PLFA measurements in s
x		Frouz J, Liveckova M, Albrechtova J, Chronakova A, Cajthaml T, Pizl V, Hanel L,
		Fu S, Zou X, Coleman D. 2008. Highlights and perspectives of soil biology and ecol
p		Fuchs J. 1911. Über die Beziehungen von Agaricineen und anderen humusbeiwohne
p/cd		Fuhrman JA, Steele JA, Hewson I, Schwalbach MS, Brown MV, Green JL, Brown J
		Fujimura KE, Egger KN, He Kliima soojenemine ei mõjutanud juureseente l
cd		Fujimura Kl Geopora, Wilco põlenud männime sh Wilcoxina rehmii, Geopora 2 spp
		Fujita K, Furuya S, Kohno M viinapuuistandike mullas
cd		Fukuda M, Nakashima E, Hayashi K, Nagasawa E. 2003. Identification of the biolog
cd		Fukushima M, Kakinuma K, Hayashi H, Nagai H, Ito K, Kawaguchi R. 2003. Detec
p/cd		Funk, D.T. 2005. *Alnus glutinosa* (L.) Gaerth. European alder. USDA Forest Servic
		Furrer R, Nychka D, Sain S. 2010. Fields: tools for spatial data. R package version 6
		Fusconi A. tsistusel normaalne ECM teke
cd		Gabor EM, de Vries EJ, Janssen DB. 2003. Efficient recovery of environmental DN
		Gadd GM. 2007. Geomycology: biogeochemical transformations of rocks, minerals,
		Gadgil RL, Gadgil PD. 1975. Suppression of litter decomposition by mycorrhizal ro

p/cd		Gafur A, Schützendübel A, Langenfeld-Heyser R, Fritz E, Polle A. 2004. Compatibl
p/cd		Gagne A, Jany J-L, Bousque EcM seentega inc Ala1: Thelephora terrestris (49%), A
p		Gagnon J, Langlois CG, Fortin JA. 1988. Growth and ectomycorrhiza formation of c
		Galante TE, Horton TR, Swaney DP. 2011. 95% of basidiospores fall within 1 m of
		Gallo ME, Porras-Alfaro A, saproobid Pinus, Populus ja Juniperus kõdus: r
p/cd		Galtier N, Gouy M, Gautier C. 1996. Seaview and Phylo_Win: two graphic tools for
p/cd		Gamage DT, de Silva MP, Inomata N, Yamazaki T, Szmidt AE. 2006. Comprehensi
x		Gamfeldt L, Snäll T, Bagchi R, Jonsson M, Gustafsson L, Kjellander P, Ruiz-Jaen M
		Gange AC, Brown VK, Farmer LM. 1990. A test of mycorrhizal benefit in an early s
p/cd		Gange AC, Gancge EG, Sparks TH, Boddy L. 2007. Rapid and recent cha seente vi
		Ganley R, Newcombe G. 2007. Fungal endophytes in seeds and needles of *Pinus m*
		Ganzhorn JU, Goodman SM, Vincelette M. 2007. Biodiversity, Ecology and Conser
		Gao C, Shi N-N, Liu Y-X, Peay KG, Zheng Y, Ding Q, Mi X-C, Ma K-P, Wubet T,
		Gao C, Zhang Y, Shi N-N, Z CHN vanuserеas: kooslus noortes metsades erin
		Gao Q, Yang ZL. 2010. Ectc Kobresia spp. ' Selget dominanti pole: Tom-the
		Gao Z, Johnson ZI, Wang G ookeani veemassis ssened: domin PuccinioM (1
cd		Garbaye J, Churin J-L. 1997. Growth stimulation of young oak plantations with the e
		Garbaye J, Duponnois R. 1992. Specificity and function of mycorrhization helper ba
cd		Garbaye J. 2000. The role of ectomycorrhizal symbiosis in the resistance of forests t
		Garbelotto MM, Lee HK, Slaughter G, Popenuck T, Cobb FW, Bruns TD. 1997. He
p		Garbelotto MM, Lee HK, Slaughter G, Popenuck T, Cobb FW, Bruns TD. 1997. He
		Garbelotto MM, Lee HK, Slaughter G, Popenuck T, Cobb FW, Bruns TD. 1997. He
		Garcia C, Hernandez T, Roldan A, Albaladejo J, Castillo V. 2000. Organic amendm
cd		Garcia LV. 2004. Escaping the Bonferroni iron claw in ecological studies. Oikos 10:
		Garcia-Barreda S, Reyna S. Tuber melanosp istandikus morfot
p/cd		Garcia-Mor Tuber melanosporum, Tuber indicum ja pseudoexcavatum on
		Garcia-Palacios P, Vandegehuchte ML, Shae EA, Dam M, Post KH, Ramirez KS, S
	x	Gardes M, Bruns TD. 1993. ITS primers with enhanced specificity for basidiomycet
	x	Gardes M, l x profiil, vs viljakel ECM: Russ amoenolens, B vs ECM
		Gardes M, Dahlberg A. 1996 ECM-taimed arktilises ja alpiinses vöötmes
	x	Gardes M, White TJ, Fortin JA, Bruns TD, Taylor JW. 1991. Identification of indige
p		Gardner JH, Malajczuk N. 1988. Recolonization of rehabilitated bauxite mine sites i
		Gareth Jones EB, Pang K-L. 2012. Tropical aquatic fungi. Biodiv. Conserv. In press
p		Gargas A, DePriest PT, Grube M, Tehler A. 1995. Multiple origins of lichen symbic
		Garibay-Orijel R, Morales-M MEX kuivatatı palju Pezizales ja Hebeloma liik
		Garnica S, Riess K, Bauer R Sebacinales B: erikooslustes ja kõrgusvöötmete
		Garnica S, Weib M, Oberwinkler F. 2002. New *Cortinarius* species from *Nothofag*
		Garnica S, Weiss M, Oertel B, Oberwinkler F. 2005. A framework for a phylogenet
p/cd		Garnica S, Weiss M, Walther G, Oberwinkler F. 2007. Reconstructing the evolution
		Garrido N. 1986. Survey of ectomycorrhizal fungi associated with exotic f CHL: K
p		Garrido N. 1988. Agaricales s.l. Und ihre Mykorrhizen in den *Nothofagus* Kesk-T
		Garten CT. 1993. Variation in foliar 15N abundance and the availability of soil nitro
p/cd		Gartlan JS, Newbery DM, Thomas DW, Waterman PG. 1986. The influence of topo
cd		Gastine A, Scherer-Lorenzen M, Leadley PW. 2003. No consistent effects of plant d
		Gaston KJ. 2000. Global patterns in biodiversity. Nature 405: 220-227.
p/cd		Gates GM, Ratkowsky DA, Grove SJ. 2005. A comparison of macrofungi Tasmaan
		Gay G, Marmeisse M, Fouillet P, Bouletreau M, Debaud JC. 1993. Genotype / nutri
		Gazis R, Rehner S, Chaverri P. 2011. Species delimitation in fungal endophyte diver
		Ge Z-W, Smith ME, Zhang (Keteleeria CHI russ-lact
		Ge Z-W, Smith ME. 2012. Phylogenetic analysis of rDNA sequences indicates that
p		Gebauer G, Dietrich P. 1993. Nitrogen isotope ratios in different compartments of a
cd		Gebauer G, Mayer M. 2003. 15N and 13C natural abundance of autotrophic and my
p/cd		Gebauer G, Meyer M. 2003. 15N and 13C natural abundance of autotrophic and my
		Gebauer G, Taylor AFS. 1999. 15N natural abundance in fruit bodies of different fun
p/cd		Gebhardt S, Neubert K, Wöl Quercus rubra ist Cenoc, Boletus aestivalis, Tricholom
		Gebhardt S, Wöllecke J, Mü Quercus rubra GER: ruumiline jaotus mullas: 3
		Gehring CA, Bennett A. 2009. Mycorrhizal fungal-plant-insect interactions: the impo
p/cd		Gehring CA, Connell JH. 2006. Arbuscular mycorrhizal fungi in tree seedlings of tw
p/cd		Gehring CA, Mueller RC, Whitham TG. 2006. Environmental and genetic effects on
		Gehring CA, Theimer TC, W liivane (niiskem, põlenud: Geopora cooperi, võrdlus ja
cd		Gehring CA, Whitham TG. 1994. Interactions between aboveground herbivores and
		Gehring CA, Whitham TG. 1995. Duration of herbivore removal and environmental
p/cd		Geiser DM, Gueidan C, Miadlikowska J, Lutzoni F, Kauff F, Hofstetter V, Fraker E
		Geml J, Laursen GA, Herriot Russula ALASKAl: VK andmed ja mu Russula
cd		Geml J, Laursen GA, O´Neill K, Nusbaum CA, Taylor DL. 2006. Beringian origins
p/cd		Geml J, Laursen GA, Timling I, McFarland JM, Booth MG, Lennon N, Nu Lactariu
		Geml J, Timling I, Robinson CH, Lennon N, Nusbaum HC, Brochmann C, Noordelo
p/cd		Geml J, Tulloss RE, Laursen GA, Sazanova NA, Taylor DL. 2008. Evidence for stro

	Generation of RAPD-PCR primers for the identification of isolates of Glomus mosse
	Genet P, Pr Lactarius subdulcis, L. blennius
cd	Genney DR, Alexander IJ, Hartley SE. 2000. Exclusion of grass roots from soil orga
cd	Genney DR, Alexander IJ, Killham K, Meharg AA. 2004. Degradation of the polycy
p/cd	Genney DR, Anderson IC, A sügavuti (20*20c EcM: Cenoc, Sistotr, Lact ruf, Melin
	Genney DR, Hartley SH, Alexander IJ. 2001. Arbuscular mycorrhizal colonization i
	Gentry AH. 1982. Neotropical floristic diversity: phytogeographical connections bet
	Gerhold P, Pärtel M, Liira J, Zobel K, Prinzing A. 2008. Phylogenetic structure of lo
cd	Gernandt DS, Liston A, Pinero D. 2001. Variation in the nrDNA ITS of Pinus Subse
p	Gernandt DS, Platt JL, Stone JK, Spatafora JW, Holst-Jensen A, Hamelin RC, Kohn
ecd	Gettemy JM, Li D, Alic M, Gold MH. 1997. Truncated-gene reporter system for stu
	Ghannoum M, Jurevic RJ, M seened süljes: SaccharoMycetales, Cladosporiu
	Gherbi H, Delaruelle C, Selosse M-A, Martin F. 1999. High genetic divers Laccaria
	Ghiglione J-F, Galand PE, Pommier T et al. 2012. Pole-to-pole biogeography of surf
	Giachini AJ, Hosaka K, Nouhra K, Spatafora J, Trappe JM. 2010. Phylogenetic rela
cd	Giachini AJ, Souza LAB, Oliveira VL. 2004. Species richness and seasona eukalüpti
	Gibbs JN. 1967. A study of the epiphytic growyh habit of Fomes annosus. Ann. Bot
	Gibbs JN. 1967. The role of host vigour in the susceptibility of pines to Fomes anno
	Gibson F, Deacon JW. 1990. Establishment of ectomycorrhizas in aseptic culture: ef
	Gibson G. 2002. Microarrays in ecology and evolution: a preview. Mol. Ecol. 11: 17
	Gilbert GS, Webb CO. 2007. Phylogenetic signal in plant pathogen-host range. Proc
p/cd	Gilkey HM. 1961. New species and revisions in the order Tuberales. Mycologia 53:
	Gill WM, L Tricholoma matsutake
cd	Gillespie TW, Jaffre T. 2003. Tropical dry forests in New Caledonia. Biodiv. Conse
	Gillman L, Keeling JD, Ross HA, Wright SD. 2009. Latitude, elevation and the temp
cd	Giomaro G, Tuber brumale: mükoriisa morf erinev tammel ja pärnal: eri tsüstiidi pik
p	Giovanetti (Tuber macrosporum sünt Corylus ja Quercus spp. Cys asemel imelikult
	Giovanetti G, Fontana A. 1982. Mycorrhizal synthesis between Cistaceae and Tuber
p	Giovanetti (Tuber albidum, brumale, aestivum, rufum
	Giovanetti M, Loi A. 1990. The mycorrhizal status of Arbutus unedo in relation to c
p/cd	Giraud T, Refregier G, Gac Le M, Vienne DM, Hood ME. 2008. Speciation in fung
	Girlanda M, Ghignone S, Luppi AM. 2002. Diversity of sterile root-associated fungi
	Girlanda M, Luppi-Mosca AM. 1995. Microfungi associated with ectomycorrhizae c
	Girlanda M, Segreto R, Cafasso D, Liebel HT, Rodda M, Ercole E, Cozzolino S, Gc
p	Girlanda M, Selosse M-A, Cafasso D, Brilli F, Fabbian DR, Ghignone S, Pinelli P, S
cd	Girvan MS et al. 2004. AEM bakterid, seened, AM-seened; 18S RT-PCR+DGGE +
p/cd	Givnish TJ, Renner SS. 2004. Tropical intercontinental disjunctions: Gondwana brea
	Gladish S, Frank J, Southwo serpentiinmullal EcM liigirikkus madalam kui
p/cd	Glass L, Rasmussen C, Roca MG, Read ND. 2004. Hyphal homing, fusion and myc
	Glassman SI, Peay KG, Talb resistant propagule vs muld (liigirikkam); erine
p	Gleason FH, McGee PA. 2001. Septal pore cap ultrastructure of fungi identified as I
p	Gleixner G, Danier H-J, Werner RA, Schmidt H-L. 1993. Correlations between the
p/cd	Glen M, Bougher NL, Colqu xxx Cortinarius3, Cort2 W-AUS
	Glen M, Tommerup IC, Bougher NL, O´Brien P. 2001. Interspecific and intraspecifi
	Glen M, Tommerup IC, Bougher NL, O´Brien P. 2001. Specificity, sensitivity and d
dd	Glen M, Tommerup IC, Bougher NL, O´Brien Sebacinade arvukus Austraalias
	Gobert A, Plassard C. 2002. Differential NO3-dependent patterns of NO3-uptake in
	Gobet A, Quince C, Ramette A. 2010. Multivariate cutoff level analysis (MultiCoLa
p/cd	Godbold DL, Hoosbeek MR, Lukac M et al. Mycorrhizal hyphal turnover as a domi
	Godbout C, lepal: vaid Alpo .
p	Godbout C, Hebeloma, Cort, Tricholoma, Scleroderma, Pisol, Pax, Laccaria, Aman
p	Godbout C, Fortin JA. 1990. Cultural control of basidiome formation in Laccaria bic
	Godoy O, Kraft NB, Levine JM. 2014. Phylogenetic relatedness and the determinan
p	Godoy R, Romero R, Carrillo R. 1994. Estatus micotrofico de la flora vascular en b
	Göker M, Garcia-Blazquez G, Voglmayr H, Telleria T, Martin MP. 2009. Molecula
	Göker M, Grimm GW. 2008. General functions to transform associate data to host d
	Gold SE, Garcia-Pedrajas MD, Martinez-Espinoza AD. 2001. New (and used) appr
cd	Goldblatt P. 1997. Floristic diversity in the Cape flora of South Africa. Biodiv.Cons
p	Golldack J, Pinirhiza granulosa = Russula sp
	Gomez JM, Verdu M, Perfectti F. 2010. Ecological interactions are evolutionarily co
	Gomez-Aparicio L, Ibanez B, Serrano MS, De Vita P, Avila JM, Perez-Ramos IM,
p	Goncalves CR. 1940. Observaciones sobre *Pseudococcus comstocki* atacando *Citru*
p/j	Gonzales D, Carling DE, Kuninaga S, Vilgalys R, Cubeta MA. 2001. Ribosomal DN
p/cd	Gonzales D, Cubeta MA, Vilgalys R. 2006. Phylogenetic utility of indels within ribo
	Gonzales P, Labarére J. 1998. Sequence and secondary structure of the mitochondri
	Gonzales P, Labarere J. 1998. Sequence and secondary structure of the mitochondri
cd	González-Ochoa AI, de las Heras J, Torres P, Sánchez-Gómez E. 2003. Mycorrhiza
	Goodman DM, Durall DM, Trofymow JA, Berch SM (eds). 1996-2000. A Manual c

		Goodman D xxx vana vs 90 a: ei erine
2		Goodman D xxx CWD vs O vs A; CWD: Cenoc, Piloderma, muu orgaa
		Goodman SM, Benstead JP. 2003. The Natural History of Madagascar. The Univers
p/cd		Göransson H, Wallander H, Ingerslev M, Rosengren U. 2006. Estimating the relativ
		Gordon GJ, Gehring C. 2011 Pezizales ARIzona kuivades männikutes on pr
		Gorissen A, Kuyper TW. 2000. Fungal species-specific responses of ectomycorrhiza
p		Goroshina TK, Zabotina LN, Kiseleva TM, Pruzhina EG. 1982. Characteristics of le
		Gorzelak MA, Hambleton S, Massicotte HB. 2012. Community structure of ericoid
		Goslee SC, Urban DL. 2007. The Ecodist package for dissimilarity-based analysis o
		Gotelli NJ, Anderson MJ, Arita HT, Chao A, Colwell RK, Connolly SR and 15 othe
cd	x	Gotelli NJ, Colwell RK. 200 rarefaction: indiviidi ja ala baasil, teisendused; liigirikk
		Gotelli NJ, Entsminger GL. 2009. EcoSim: Null models software for ecology. Versi
	x	Gotelli NJ. 2000. Null models analysis of species co-occurrence patterns. Ecology 8
p/cd		Goto BT, Maia LC. 2006. Contribution to the study of Endogonales in Brazil: the fir
p/cd		Göttlicher SG, Taylor AFS, Grip H, Betson NR, Valinger E, Högberg MN, Högberg
p/cd		Götz M, Nirenberg H, Krause S et al. 2006. Fungal endophytes in potato roots studi
p/cd		Götz M, Nirenberg H, Kraus Kartulijuurtes. 2 s Kartulijuured: Verticillium dahliae, C
		Gouy M, Guindon S, Gascuel O. 2010. SeaView version 4 : a multiplatform graphic
p		Gower ST, Krankina O, Olson RJ, Apps M, Linder S, Wang C. 2001. Net primary p
		Grace JB, Anderson TM, Olff H, Scheiner SM. 2010. On the specification of structu
		Graf F, Bru xxx: Salix herbacea Salix herl
		Graham PH. 2008. Ecology of the root-nodule bacteria of legumes. In: Dilworth MJ
p/cd		Grand LF, Vernia CS. 2005? Biogeography and hosts of poroid decay fung Hymenoc
		Grand LF. 1971. Tuberculat Photinia glabra moodusrab ECM Cenococcumiga ja tu
p/cd		Graur D, Martin W. 2004. Reading the entrails of chickens: molecular timescales of
cd		Gray ND, Head IM. 2001. Linking genetic identity and function in communities of u
p/cd		Grebenc T, Rupnik M, Hacin J, Janc M, Kraigher H. 1999. A contribution to the stu
p/cd		Green J, Bohannan BJ. 2006. Spatial scaling of microbial biodiversity. Trends Ecol.
		Green JL, Bohannan BJM, Whitaker RJ. 2008. Microbial biogeography: from taxon
cd		Green JL, Holmes AJ, West kottseente BD ITS1 pikkuse pol põhjal -on seot pindal
		Green Tringe S, von Mering C, Kobayashi A, Salamov AA, Chen K, Chang HW, Po
		Grelet G-A, Johnson D, Paterson E, Anderson IC, Alexander IJ. 2009. Reciprocal ca
		Grelet G-A, Johnson D, Vralstad T, Alexander IJ, Anderson IC. 2010. New insights
		Grelet G-A, Meharg AA, Duff EI, Anderson IC, Alexander IJ. 2009. Small genetic d
p		Grenville DJ, Peterson RL, Ashford AE. 1986. Synthesis in growth puches of mycor
p/cd		Grgurinovic CA. 2001. Agaricales in Australasia. Aust. Syst. Bot. 14: 395-406.
p		Griffith G. 2004. The use of stable isotopes in fungal ecology. Mycologist 18: 177-1
p/cd		Griffith GW, Easton GL, Jones AW. 2002. Ecology and diversity of waxcap (*Hygro*
p		Griffith NT, Barnett HL. 1967. Mycoparasitism by Basidiomycetes in culture. Myco
cd		Griffiths RI, Whiteley AS, O´Donnell AG, Bailey MJ. 2000. Rapid method for coex
		Griffiths RP seenematid: Gaultieria, Hysterangium
		Griffiths RP, Castellano MA, Caldwell BA. 1991. Ectomycorrhizal mats formed by
		Grigoriev IV, Nikitin R, Haridas S, Kuo A, Ohm R, Otillar R, Riley R, Salamov
		Grigoriev IV, Nordberg H, Shabalov I, Aerts A, Cantor M et al. 2012. The genome p
j		Grogan HM, Adie BAT, Gaze RH, Challen MP, Mills PR. 2003. Double-stranded R
		Grogan P, Baar J, Bruns TD. põlendikel; tuhk v põlet lihtsalt: Russ1, Tuber, Wilcoxin
		Gronbach E. 1988. Charakterisierung und Identifizierung von Ektomykorrhizen in ei
j		Grönberg H, Paulin L, Sen R. 2003. ITS probe development for specific detection o
p		Grossnickle SC, Reid CPP. 1983. Ectomycorrhiza formation and root development p
p/cd		Grubisha LC, Bergemann SE, Bruns TD. 2007. Host islands within the California N
p/cd		Gruhn CM, Gruhn AV, Miller OK. 1992. *Boletinellus merulioides* alters root morpl
p/cd		Grünig CR, Duo A, Sieber TN. 2006. Population genetic analysis of Phialocephala f
cd		Grünig CR, Linde CC, Sieber TN, Rogers SO. 2003. Development of single-copy R
cd		Grünig CR, McDonald BA, Sieber TN, Rogers SO, Holdenrieder O. 2004. Evidence
p/cd		Grünig CR, Queloz V, Duó A, Sieber TN. 2009. Phylogeny of Phaeomollisia piceae
p/cd		Grünig CR, Queloz V, Sieber TN, Holdenrieder O. 2008. Dark septate endophytes (
cd		Grünig CR, Sieber TN, Holdenrieder O. 2001. Characterisation of dark septate endo
cd		Grünig CR, Sieber TN, Rogers SO, Holdenrieder O. 2002. Genetic variability amon
cd		Grünig CR, Sieber TN, Rogers SO, Holdenrieder O. 2002. Spatial distribution of da
p		Grünig CR, Sieber TN. 2005. Molecular and phenotypic description of the widespre
		Gryndler M, Cerna L, Bukovska P, Hrselova H, Jansa J. 2014. *Tuber aestivum* asso
		Gryndler M, Egertova Z, Soukupova L, Gryndlerova H, Borovicka J, Hrselova H. 20
p/cd		Gryta H, Carriconde F, Charcosset J-Y, Jargeat P, Gardes M. 2006. Population dyna
		Gryta H, Debaud J-C, Marmeisse R. 2000. Population dynamics of the syr Hebelom
		Gueidan C, Villasenor CR, de Hoog GS, Gorbushina AA, Untereiner WA, Lutzoni F
		Guerin-Laguette A, Conventi S, Ruiz G, Plassard C, Mousain D. 2003. The ectomyc
cd		Guerin-Laguette A, Matsushita K, Kikuchi N, Iwase K, Lapeyrie F, Suzuk matsutak
		Guerin-Laguette A, Plassard C, Mousain D. 2000. Effects of experimental condition
cd		Guerin-Laguette A, Shindo K, Matsushita N, Suzuki K, Lapeyrie F. 2004. The myco

				Guerin-Laguette A, Vaario L-M, Gill WM, Lapeyrie F, Matsushita N, Suzuki K. 20(
j				Guerin-Laguette A, Vaario L-M, Matsushita K, Shindo K, Suzuki K, Lapeyrie F. 20
cd				Gugerli F, Sperisen C, Büchler U, Brunner I, Brodbeck S, Palmer JD, Qiu Y-L. 200
p/cd				Guidot A, Debaud J-C, Effosse A, Marmeisse R. 2003. Below-ground distribution a
				Guidot A, Debaud J-C, Marr liigisisene vs viljakehad: sarnane, ent ECMst Hebelom
cd				Guidot A, Debaud J-C, Marmeisse R. 2002. Spatial distribution of the bel(vs ECM
cd				Guidot A, Johannesson H, Dahlberg A, Stenlid J. 2003. Parental tracking i Daldinia
cd				Guidot A, Lumini E, Debaud IGS RFLP meetod geneti määramiseks ECMs
p/cd				Guidot A, Verner M-C, Debaud J-C, Marmeisse R. 2005. Intraspecific variation in ι
		x		Guillot G, Rousset F. 2013. Dismantling the Mantel tests. Meth. Ecol. Evol. 4: 336–
				Guimaraes PR, Jordano P, Thompson JN. 2011. Evolution and coevolution in mutua
				Guimaraes PR, Rico-Gray V, Furtado dos Reis S, Thompson JN. 2006. Asymmetrie
				Guinberteau J, Ducamp M, Poitou N, Mamoun M, Olivier JM. 1990. Ecol männil, n
				Guindon S, Lethiec F, Duroux P, Gascuel O. 2005. PhyML Online - a web server fo
cd				Gulis V, Suberkropp K. 2003. Effect of inorganic nutrients on relative contributions
				Gunasekara RGA, Wijekoon R. 2005. Mushroom Story. Fungi of Sri Lanka. Univer
				Gunatilleke CVS, Ashton PS. 1987. New light on the plant geography of Ceylon.II.
				Gunter LE, kochert G, Giannasi DE. 1994. Phylogenetic relationships of the Jugland
				Guo C, Dannenmann M, Gasche R, Zeller B, Papen H, Polle A, Rennenberg H, Sim
p/cd				Guo D, Mitchell RJ, Withington JM, Fan P-P, Hendricks JJ. 2008. Endogenous and
p/cd				Guo LD, Hyde KD, Liew CY. 2000. Identification of endophytic fungi from Livistor
				Gurgel EE, Silva BDB, Baseia IG. 2008. New records of Scleroderma from Northea
cd				Guschin D, Yershov G, Zaslavsky A, Gemmell A, Shick V, Proudnikov D, Arenkov
cd				Guschin DY, Mobarry BK, Proudnikov D, Stahl DA, Rittmann BE, Mirzabekov AD
				Gutierrez A, del Rio JC, Martinez MJ, Martinez AT. 2001. The biotechnological co
cd				Gutierrez A Terfezia ja Picoa + Helianthemum: ektendomükoriisa mantliga või ilma.
p/cd				Guzman B, Vargas P. 2005. Systematics, character evolution, and biogeography of (
1				Guzman G, Miller OK, Lodge DJ, Baroni TJ. 2004. *Scleroderma stellatum* vs. *Scle*
ecd				Ha H-C, Honda Y, Watanabe T, Kuwahara M. 2001. Production of manganese pero
				Haber E, Cruise JE. Generic limits in the Pyroloideae (Ericaceae). Can. J. Bot. 52: 8
				Haber E. 1984. A comparative study of Pyrola minor x Pyrola asarifolia (Ericaceae)
				Hacquard S, Tisserant E, Brun A, Legue V, Martin F, Kohler A. 2013. Laser microd
				Hacskaylo E, Bruchet G. 1972. Hebelomas as mycorrhizal fungi. Bull. Torr. Bot. Cl
				Hacskaylo E, Palmer JG. 1955. Hymenomycetous species forming mycorrhizae with
				Hacskaylo E. 1953. Pure culture syntheses of pine mycorrhizae in Terra-Lite. Mycol
				Hacskaylo E. 1965. *Thelephora terrestris* and mycorrhizae of Virginia pine. For. Sc
				Hacskaylo E. 1972. Mycorrhiza: The Ultimate in Reciprocal Parasitism? BioScience
				Hacskaylo E. 1973. Dependence of mycorrhizal fungi on hosts. Bull. Torr. Bot. club
				Haegeman B, Hamelin J, Moriarty J, Neal P, Dushoff J, Weitz JS. 2013. Robust esti
				Haeskaylo E. 1972. Mycorrhiza: The ultimate in reciprocal parasitism? Proc. Am. In
				Hagemann S. 2002. An improved land surface parameter dataset for global and regio
				Hagerberg D, Wallander H. 2002. The impact of forest residue removal and wood as
cd				Hagerman SM, Durall DM. : juurtega inokul el Wilcoxina, DSE
				Hagerman S xxx, põhiliste ki vs lageraie 3 a jooksul
				Hagerman SM, Jones MD, E raiesmiku gradier mets: Hebeloma, Cenoc, Amphinema
				Hagerman SM, Sakakibara S väidavad, et mitn Cenococcum ja Piloderma sp, Amph
p/cd				Hahn C, Christian J. 2002. Ramaria chocoensis sp. Nov., a gomphoid men Colombia
				Hahn Ch, Agerer R, Wanner G. 2000. Anatomische and ultrastrukturelle Analyse vo
				Hahn D. 2008. Polyphasic taxonomy of the genus Frankia. In: Pawlowski K, Newto
				Haimi J, Huhta V, Bouchelam M. 1992. Growth increase of birch seedlings under th
p/cd				Hajibabaei M, Janzen DH, Burns JM, Hallwachs W, Hebert PDN. 2006. DNA barc
j				Halasz K, Bratek Z, Szegö D, Rudnoy S, Racs I, Lastity D, Trappe JM. 2005. Tests
(cd)				Hall IR, Yun W, Amicucci A. 2003. Cultivation of edible ectomycorrhizal mushroom
				Hall JB. 1973. Vegetational zones on the Southern slopes of Mount Camerooon. Ve
				Hall RB, Mc Nabb, Jr. HS, Maynard CA, Green TL. 1979. Toward Development of
				Halldorsson G, Sverrisson H, Eyjolfsdottir GG, Oddsdottir ES. 2000. Ectomycorrhiz
				Hallen HE, Bougher NL, Lebel T. 2004. Phylogenetic placement of *Ammarendia* ar
				Hallenberg N, Küffer N. 2001. Long-distance spore dispersal in wood-inhabiting Ba
p/cd				Halling RE, Baroni TJ, Binder M. 2007. A new genus of Boletaceae from Eastern N
				Halling RE, Mitchell J, Nuhn B, Osmundson T, Fechtner N, Trappe JM, Soytong K,
				Halling RE, Nuhn M, Fechner NA, Osmundson TW, Soytong K, Arora D, Hibbett D
p/cd				Halling RE, Osmundson TW, Neves M-A. 2008. Pacific boletes: Implications for bi
p/cd		x	x	Hamady M, Lozupone C, Knight R. 2010. Fast Unifrac: facilitating high-throughput
cd				Hambleton S, Sigler L. 2005. *Meliniomyces*, a new anamorph genus for root-associ
				Hammarlund VC. 1923. *Boletus elegans* Schum. und *Larix*-Mykorrhiza. Bot. Not.
p				Hammel B, Burger WG. 1991. Neither oak nor alder, but nearly: the history of Ticoo
p/cd				Hamzeh M, Dayanandan S. 2004. Phylogeny of *Populus* (Salicaceae) based on nucl
				Hamzeh´ee B, Naqinezhad A, Attar F, Ghahremann A, Assadi M. 2008. Phytosociol

		Handa T, Aerts R, Berendse F, Berg MP, Bruder A, Butenschoen O, Chauvet E, Ge
		Handley LL, Austin AT, Robinson D, Scrimgeour CM, Raven JA, Heaton THE, Sch
p		Handley LL, Brendel O, Scrimgeour CM, Schmidt S, Raven JA, Turnbull MH, Stew
p		Handley LL, Daft MJ, Wilson J, Scrimgeour CM, Ingleby K, Sattar MA. 1993. Effe
p		Handley LL, Odee D, Scrimgeour CM. 1994. D15N and D13C patterns in savanna v
		Handsaker RE, van Doren V, Berman JR, Genovese G, Kashin S, Boettger LM, Mc
cd		Hanif M, Pardo AG, Gorfer M, Raudaskoski M. 2002. T-DNA transfer and integrat
		Hansen RA. 2000. Effects of habitat complexity and composition on a diverse litter
		Hansen J, Sato M, Russell G, Kharecha P. 2013. Climate sensitivity, sea level and a
p		Hansen K, Laessøe T, Pfister DH. 2001. Phylogenetics of the Pezizaceae, with an er
cd		Hansen K, Lässö T, Pfister DH. 2001. Phylogenetic diversity in the core group of *Pe*
p/cd		Hansen K, LoBuglio KF, Pfister DH. 2005. Evolutionary relationships of the cup-fur
		Hansen K, Perry BA, Dranginis AW, Pfister DH. 2013. A phylogeny of the highly d
p/cd		Hansen K, Pfister DH. 2006. Systematics of the Pezizomycetes - the operculate disc
		Hansen L. Knudsen H (eds), 1992. Nordic Macromycetes vol. 2. Polyporales, Boleta
		Hansen L. Knudsen H (eds), 1997. Nordic Macromycetes vol. 3. Heterobasidioid, A
	x	Hanson CA, Allison SD, Bradford MA, Wallenstein MD, Treseder KK. 2008. Funga
		Hanson CA, Fuhrman JA, Hormer-Devine MC, Martiny JBH. 2012. Beyond biogeo
	x	Hao X, Jiang R, Chen T. 2011. Clustering 16S rRNA for OTU prediction: a method
cd		Hare MP. 2001. Prospects for nuclear gene phylogeography. Trends Ecol. Evol. 16:
		Harkin JM, Larsen JM, Obst JR. 1974. Use of syringaldazine for detection of laccas
		Härkönen M, Niemelä T, Mwasumbi L. 2003.Tanzanian mushrooms: Edible, harmfu
		Harley JL, Harley EL, 1987. A check-list of mycorrhiza in the British flora. New Ph
		Harmon LJ, Weir J, Brock C, Glor R, Challenger W, Hunt G. 2009. geiger: a packag
p		Harney SK, Rogers SO, Wang CJK. 1997. Molecular characterization of dematiaceo
j		Harrington FA, Pfister DH Potter D, Donoghue MJ. 1999. Phylogenetic studies with
p		Harrington MG, Edwards KJ, Johnson SA, Chase MW, Gadek PA. 2005. Phylogene
		Harrington TJ, Mitchell DT. 2002. Colonization of root systems of *Carex flacca* an
p/cd		Harrington TJ, Mitchell DT. Dryas 3 kasvukol Craterellus lutescens, Tomentella sp,
1		Harrington TJ, Mitchell DT. Dryas 2 plotis 7 ε Sagedus: Tomentella, Craterellus lute
cd		Harris DJ. 2003. Can you bank on GenBank? Trends Ecol. Evol. 18: 317-319.
p/cd		Harrison S, Cornell H. 2008. Toward a better understanding of the regional causes o
		Harry M, Jusseaume N, Gambier B, Garnier-Sillam E. 2001. Use of RAPD markers
		Hart SC, Gehring CA, Selmants PC, Deckert RJ. 2006. Carbon and nitrogen elemen
		Hart TB. 1995. Seed, seedling and sub-canopy survival in monodominant and mixed
		Hartley J, Cairney JWG, Meharg AA. 1997. Do ectomycorrhizal fungi exhibit adapt
		Hartley J, Cairney JWG, Meharg AA. 1999. Cross-colonization of Scots pine (Pinus
	x	Hartmann M, Howes CG, Abarenkov K, Mohn WW, Nilsson RH. 2010. V-Xtractor
		Hartmann M, Howes CG, Va Metsaharimine vs seened ja bakterid mullas: al
		Hartmann M, Lee S, Hallam SJ, Mohn WW. 2009. Bacterial, archaeal and eukaryal
2		Harvey AE, Jurgensen MF, I väga vaähene
		Harvey AE, Jurgensen MF, Larsen MJ. 1981. Organic reserves: importance to ectom
p		Harvey AE, Larsen MJ, Jurgensen MF, Jones EA. 1989. Nitrogenase activity associ
2		Harvey AE, unknown, Cenococcum, Rhizopog unknown, Cenococcum, Rhizopogon
2		Harvey AE, unknown, Cenococcum, Rhizopog unknown, Cenococcum, Rhizopogon
		Harvey AE, Page-Dumroese eri istutusmeetodid. Neg mõjutab rohtude hulk. Mändi
		Harvey AE, 4tk vs eri istutusmeetodid; mineraal vs huumus vs CWD ki
e		Haselwandter K, Bobleter O, Read DJ. 1990. Degradation of 14C-labelled lignin an
		Hashimoto Y, Fukukawa S, Kunishi A, Suga H, Richard F, Sauve M, Selosse M-A.
p/cd		Hashimoto Y, Higuchi R. 20 Chosenia arbutifolia ja Salix sachalinensis jagasid sama
		Hashimoto Y, Hyakumachi M kask mujalt voetu igal mullal erinevad, mullal kus kask
		Hashimoto Y xxx erodeeritud nõlva MRA
		Hashimoto Y, Hyakumachi M. 2001. Effects of isolates of ectomycorrhizal fungi and
p/cd		Haskins KE, Gehring CA. 20 Pinus edulis: kasv Pezizales, häiringukohtadesse lisandu
		Haskins KE, Gehring CA. 2005. Evidence for mutalist limitation: the impacts of con
		Hasselquist NJ, Douhan GW, Allen MF. 2011. First report of the ectomycorrhizal s
e		Hatakka A. 2001. Biodegradation of lignin. In: Hofrichter M, Steinbüchel A (eds). B
		Hatch AB, Doak KD. 1933. Mycorrhizal and other features of the root systems of *P*
		Hatch AB, Hatch TC. 1933. Some hymenomycetes forming mycorrhizae with *Pinus*
		Hatch AB. 1 Mycelium radicis nigrostrigosum = Cenococcum geophilum:
		Hättenschwiler S, Coq S, Barantal S, Handa IT. 2011. Leaf traits and decomposition
		Hättenschwiler S, Tiunov AV, Scheu S. 2005. Biodiversity and litter decomposition
p		Hattori T, Ohta A, Itaya M, Shimada M. 2003. The ability of ectomycorrhizal fungi
		Haug I, Lempe J, Homeier J, Weib M, Setaro S, Oberwinkler F, Kottke I. 2004. *Gr*
p		Haug I, Obe kuusel, sh mitteauguliste parentosoomidega cf Tulasnella; +ultrastr
		Haug I, Wel tuberkulaatse anatoomia, kägistamistsoon jms, Engelhardtial eripärane E
p		Haug I, Wel 10 kirjeldust: kandseened
cd		Haug I, Weiß M, Homeier J, Nyctaginaceae Ec Nea1: Russula, Lact, Tomentella1,2

		Haug I. 198 Hygrophorus, Piceirhiza gelatinosa: meristeemivahele tungivad hüüfid
		Hawkes CV, Kivlin SN, Rocca JD, Huguet V, Thomsen MA, Blake Suttle K. 2011.
		Hawkins BA, Albuquerque FS, Araujo MB, Beck J, Bini LM, Cabrero-Sanudo FJ an
		Hawkins BA, Diniz-Filho JAF, Bini LM, De Marco P, Blackburn TM. 2007. Red he
		Hawkins BA, Field R, Cornell HV, Currie DJ, Guegan J-F, Kaufman DM, Kerr JT,
p/cd		Hawkins BE, Porter EE. 2003. Does herbivore diversity depend on plant diversity?
b		Hawksworth DL, Mueller Gl seente diversiteedi probleemid. Arv kandseeni mõj enin
cd		Hawksworth DL. 2001. The magnitude of fungal diversity : the 1.5 million kõigi see
		Hawley GL, Dames JF. 2004. Mycorrhizal status of indigenous tree species in a for
p/cd		Hawley GL, Taylor AFS, Da Pinus Patula Cape istandik: 9 liiki
		Hayward JA, Horton TR. 2012. Edaphic factors do not govern the ectomycorrhizal
		He Q, Bertness MD, Altieri AH. 2013. Global shifts towards positive species intera
		He T, Pausas JG, Belcher CM, Schwilk DW, Lamont BB. 2012. Fire-adapted traits
p/cd		He X, Bledsoe C, Zasoski RJ, Southworth D, Horwath WR. 2006. Rapid nitrogen tr
cd		He X, Critchley C, Ng H, Bledsoe C. 2004. Reciprocal N ($^{15}NH_4^+$ or $^{15}NO_3^-$) tra
cd		He X, Critchley C, Ng H, Bledsoe C. 2005. Nodulated N_2-fixing Casuarina cunning
p/cd		He XH, Horwath WR, Zasoski RJ, Aanderud Z, Bledsoe CS. 2007. Nitrogen sink st
p/cd		Heads M. 2005. Towards a panbiogeography of the seas. Biol. J. Linn. Soc. 84: 675
p/cd		Heads M. 2006. Panbiogeography of Nothofagus (Nothofagaceae): analysis of the m
p/cd		Heads MJ. 2006. Seed plants of Fiji: an ecological analysis. Biol. J. Linn. Soc. 89: 4
	x	Healy C, Gotelli NJ, Potvin C. 2008. Partitioning the effects of biodiversity and envi
		Healy RA, Bonito G, Trappe JM. 2009. Calongea, a new genus of truffles in the Pez
		Healy RA, Smith ME, Bonito GM, Pfister DH, Ge Z-W, Guevara GG, Williams G ,
		Heaton L, Obara B, Grau V, Jones N, Nakagaki T, Boddy L, Fricker MD. 2012. An
		Hebert PDN, Cywinska A, Ball SL, deWaard JR. 2003. Biological identifications th
		Hebert PDN, deWaard JR, Landry J-F. 2010. DNA barcodes for 1/1000 of the anim
		Hebert PDN, Stoeckle MY, Zemlak TS, Francis CM. 2004. Identification of birds th
cd		Heckman DS, Geiser DM, Eidell BR, Stauffer RL, Kardos NL, Hedges SB. 2001. M
p/cd		Hedh J, Johansson T, Tunlid A. 2009. Variation in host specificity and gene content
		Hedh J, Samson P, Erland S, Tunlid A. 2008. Multiple gene genealogies and species
p/cd		Hedh J, Wallander H, Erland S. 2008. Ectomycorrhizal mycelial species compositio
cd		Hedlund K, Gormsen D. 2002. Mycorrhizal colonization of plants in set-aside agricu
cd		Hedlund K, Santa Regina I, v põllumaa rekultveerimine: külvati 4 vs 15 taimeliiki: m
cd		Hedlund K. 2002. Soil microbial community structure in relation to vegetation mana
		Heffner RA, Butler MJ, Reilly CK. 1996. Pseudoreplication revisited. Ecology 77: 2
		Heim R. 1927. Observations sur la flore mycologique malgache. Trois bolets gigante
		Heim R. 1955. Les Lactaires D´Afrique Intertropicale (Congo Belge et Afrique Noi
		Heinemann P. 1958. Champignons Recoltes au Congo Belge Par Madame M. Goos
		Heinemann. Cantharellineae du Katanga. Bull. Jard. Bot. L'Etat 335-352.
		Heinemeyer A, Hartley IP, Evans SP, Carreira de la Fuente JA, Ineson P. 2007. Fo
cd		Heinonsalo J, Frey-Klett P, F Laccaria-inokul e Rhizopogon, Cenococcum, Laccaria
cd		Heinonsalo J, Hurme K-R, Sen R. 2004. Recent ^{14}C-labelled assimilate allocation t
		Heinonsalo makromorf klass micocosm: O vs I O: (rohkem liike) Suillus, Thelephora
p/cd		Heinonsalo J, Koskiahde I, S 1-4 a männi seemikutel istutatud enne ja pärast lageraie
		Heinonsalo J, Pumpanen J, Rasilo T, Hurme K-R, Ilvesniemi H. 2010. Carbon par
p		Heinrich PA, Patrick JW. 1986. Phosphorus acquisition in the soil-root system of Eu
		Helander M, Ahlholm J, Sieber TN, Hinneri S, Saikkonen K. 2007. Fragmented env
	x	Helgason T, Daniell T, Husband R, Fitter AH, Young JPW. 1999. Ploughing up the
		Helgason T, Daniell TJ, Husband R, Fitter AH, Young JPW. 1998. Ploughing up the
		Helgason T, Fitter AH, Young JPW. 1999. Molecular diversity of arbuscular mycorrh
		Hellweger FL, van Sebille E, Frederick ND. 2014. Biogeographic patterns in ocean
		Helm A. 2003. Spatiotemporal dynamics of Saaremaa and Muhu alvar communities.
		Helm DJ, Allen EB, Trappe J primaarse suktsessiooni ala: liustiku taganemine: ühtlus
		Helm DJ, Carling DE. 1993. lepp vs haab: haa .
p/cd		Helmus MR, Savage K, Diebel MW, Maxted JT, Ives AR. 2007. Separating the det
		Hempel S, Götzenberger L, Kühn I, Michalski SG, Rillig MC, Zobel M, Moora M.
cd		Hendolin PH, Paulin L, Koukila-Kähkölä P, Anttila V-J, Malmberg H, Richardson M
p/cd		Hendricks JJ, Mitchell RJ, Kuehn KA, Pecot SD, Sims SE. 2006. Measuring externa
		Hendrickson OQ. 1991. Abundance and activity of N_2-fixing bacteria in decaying w
		Henkel TW, Aime MC, Chin MML, Miller SL, Vilgalys R, Smith ME. 20 Guyana
p/cd		Henkel TW, Aime MC, Mehl H, Miller SL. 2006. *Cantharellus pleurotoides* , a new
p		Henkel TW, Aime MC, Miller SL. 2000. Systematics of pleurotoid Russul Russula
p/cd		Henkel TW Pseudotulostoma Dicymbel
p/cd		Henkel TW, Meszaros R, Aime MC, Kennedy A. 2005. New Clavulina species from
j		Henkel TW, Terborgh J, Vilgalys R. 2002. Ectomycorrhizal fungi and thei Guajaana
p/cd		Henkel TW. 2003. Monodominance in the ectomycorrhizal *Dicymbe corymbosa* (C
cd		Henn MR, Chapela IH. 2001. Ecophysiology of ^{13}C and ^{15}N isotopic fractionation
cd		Henn MR, Chapela IH. 2004. Isotopic fractionation during ammonium assimilation

p/cd		Henn MR, Gleixner G, Chapela IH. 2002. Growth-dependent stable carbon isotope
		Henrion B, Chevalier G, Martin F. 1994. Typing truffle species by PCR amplificatio
		Henrion B, Di Battista C, Bouchard D, Vairelles D, Thompson BD, Le Tacon F, Ma
	x	Henrion B, Le Tacon F, Martin F. 1992. Rapid identification of genetic variation of
		Henry LK. 1932. Mycorhizas of trees and shrubs. Bot. Gaz. 94: 791-800.
p/cd		Herendeen PS, Bruneau A, Lewis GP. 2003. Phylogenetic relationships in caesalpini
		Herr JR, Öpik M, Hibbett DS. 2015. Towards the unification of sequence-based clas
p/cd		Herre EA, Meija LC, Kyllo DA, Rojas E, Maynard Z, Butler A, van Bael SA. 2007.
		Herrera J, Khidir HH, Eudy DM, Porras-Alfaro A, Natvig DO, Sinsabaugh RL. 201
		Herrera J, Poudel R, Khidir HH. 2011. Molecular characterization of coprophilous f
		Herrmann S, Munch J-C, Buscot F. 1998. A gnotobiotic culture system with oak mi
		Heslin MC, Blasius D, McEl Pitcea sitchensis: Euroopas madal ECM BD · Sitka kuu
		Hesselman H. 1900. Mykorrhizabildningar. Bih. Kongl. Sv. Vet.-Akad. Handl. 26:
p/cd		Hewitt GM. 2004. Genetic consequences of climatic oscillations in the Quaternary.
		Hewitt RE, Bent E, Hollings Põlengu intens Russula decolorans, Russ-lact
p/cd		Hibbett DS, Binder M, Bischoff J and 64 others. 2007. A higher-level phylogenetic
cd		Hibbett DS, Binder M. 2002. Evolution of complex fruiting-body morphol mt, nu LS
cd		Hibbett DS, Donoghue MJ. 2001. Analysis of character correlations among wood de
		Hibbett DS, Gilbert L-B, Do evolutsiooniline
		Hibbett DS, Matheny PB. 2009. The relative ages of ectomycorrhizal mushrooms an
		Hibbett DS, Ohman A, Glotzer D, Nuhn M, Kirk P, Nilsson RH. 2011. Progress in
		Hibbett DS, Ohman A, Kirk PM. 2009. Fungal ecology catches fire. New Phytol. 18
cd		Hibbett DS, Pine EM, Langer E, Langer G, Donoghue MJ. 1997. Evolution of gilled
		Hibbett DS, Taylor JW. 2013. Fungal systematics: is new age of enlightenment at ha
cd		Hibbett DS. 1996. Phylogenetic evidence for horizontal transmission of group I intr
cd		Hibbett DS. 2001. Shiitake mushrooms and molecular clocks: historical biogeograph
p/j		Hietala AM, Korhonen K, Sen R. 2003. An unknown mechanism promotes somatic
p		Hietala AM, Vahala J, Hantula J. 2001. Molecular evidence suggests that *Ceratobas*
p/cd		Higgins KL, Arnold AE, Mia endofüüdid lehte endofüüdid lehtedes: domin liikide p
p/cd		Higgins SI, Nathan R, Cain ML. 2003. Are long-distance dispersal events in plants
		Hiiesalu I, Öpik M, Metsis M, Lilje L, Davidson J, Vasar M, Moora M, Zobel M, W
x		Hiiesalu I, Pärtel M, Davison J, Gerhold P, Metsis M, Moora M, Öpik M, Vasar M,
p/cd		Hileman LC, Vasey MC, Parker TV. 2001. Phylogeny and biogeography of the Arb
p/cd		Hill MJ. 200? Assessing Conservation value of islands in the central Seychelles. Atc
		Hill RS. 2001. Biogeography, evolution and palaeoecology of Nothofagus (Nothofa
p/cd		Hill RS. 2004. Origins of the southeastern Australian vegetation. Phil. Trans. R. Soc
		Hill SB, Kotanen PM. 2010. Phylogenetically structured damage to Asteraceae: susc
p/cd		Hillebrand H. 2004. On the generality of the Latitudinal diversity gradient. Am. Nat.
p/cd		Hilszczanska D, Sierota Z. 2006. Persistence of ectomycorrhizas by *Thelephora ter*
cd		Hinsinger P, Plassard C, Tang C, Jaillard B. 2002. Origins of root-mediated pH char
p		Hintikka V, Niemi K. 1999. Aseptic culture of slowly growing mycorrhizal Russula
		Hiol Hiol F, Dixon RK, Curl EA. 1994. The feeding preference of mycophagous col
cd		Hirose D, Kikuchi J, Kanzak Pinus sp Jaapanis Suillus pictus igas mullaho Suillus pi
		Hjortstam K. 1970. Studies in The Swedish species of the genus Tomentella (Thelep
		Hjortstam K. 1974. Studies in The Swedish species of the genus Tomentella (Thelep
p/cd		Hobbie EA, Agerer R. 2010. Nitrogen isotopes in ectomycorrhizal sporocarps corre
		Hobbie EA, Colpaert JV, White MW, Ouimette AP, Macko SA. 2008. Nitrogen for
cd		Hobbie EA, Colpaert JV. 2003. Nitrogen availability and colonization by mycorrhiz
cd		Hobbie EA, Colpaert JV. 2003. Nitrogen availability and mycorrhizal colonization i
		Hobbie EA, Hobbie JE. 2008. Natural abundance of 15N in nitrogen-limited forests
		Hobbie EA, Hofmockel KS, van Diepen LTA, Lilleskov EA, Ouimette AP, Finzi AC
		Hobbie EA, Högberg P. 2012. Nitrogen isotopes link mycorrhizal fungi and plants to
		Hobbie EA, Horton TR. 2007. Evidence that saprotrophic fungi mobilize carbon and
		Hobbie EA, Jumpponen A, Trappe J. 2005. Foliar fungal 15 N:14 N ratios reflect de
		Hobbie EA, Macko SA, Shugart HH. 1999. Insights into nitrogen and carbon dynam
		Hobbie EA, Ouimette AP. 2009. Controls of nitrogen isotope patterns in soil profiles
		Hobbie EA, Sanchez FS, Rygiewicz PT. 2012. Controls of isotopic patterns in sapro
		Hobbie EA, Sanchez S, Rygiewicz. 2004. Carbon use, nitrogen use, and isotopic fra
		Hobbie EA, van Diepen LT, Lilleskov EA, Ouimette AP, Finzi AC, Hofmockel KS.
		Hobbie EA, Watrud LS, Maggard S, Shiroyama T, Rygiewicz PT. 2003. Carbohydr
cd		Hobbie EA, Weber NS, Trappe JM, van Glinken GJ. 2002. Using radiocarbon to de
		Hobbie EA, Weber NS, Trappe JM. 2001. Mycorrhizal vs saprotrophic status of fun
		Hobbie EA. 2005. Assessing Functions of Soil Microbes with Isotopic Measuremen
b		Hobbie EA. 2005. Using isotopic tracers to follow carbon and nitrogen cycling of fu
p/cd		Hobbie EA. 2006. Carbon allocation to ectomycorrhizal fungi correlates with below
p/cd		Hobbie JE, Hobbie EA, Drossman H, Conte M, Weber JC, Shamhart J, Weinrobe M
p/cd		Hobbie JE, Hobbie EA. 2006. 15N in symbiotic fungi and plants estimates nitrogen
		Hobbie SE, Oleksyn J, Eissenstat DM, Reich PB. 2010. Fine root decomposition rat

p	Hobson KA, Welch HE. 1992. Determination of trophic relationships within a high
p	Hodge A, Campbell CD, Fitter AH. 2001. An arbuscular mycorrhizal fungus acceler
cd	Hodge A. 2003. Plant nitrogen capture from organic matter as affected by spatial dis
cd	Hodkinson ID, Webb NR, Coulson SJ. 2002. Primary community assembly on land
	Hoeksema JD, Chaudhary VD, Gehring CA, Johnson NC, Karst J, Koide RT, Pringl
	Hoeksema JD, Hernandez J\ MEX ja Calif: Pinus radiata resistant propagule
cd	Hoeksema JD, Kummel M. 2 ECM seente biod nulg varjus: Cenococcum, valguses:
	Hoeksema JD, Piculell BJ, Thompson JN. 2009. Within-population genetic variabilit
cd	Hoeksema JD, Schwartz MW. 2003. Expanding comparative-advantage biological r
p/cd	Hoeksema JD, Thompson JN. 2007. Geographic structure in a widespread plant-my
	Hoeksema JD. 2010. Ongoing coevolution in mycorrhizal interactions. New Phytol.
	Hoff JA, Kloppenstein NB, McDonald GI, Tonn JR, Kim M-S, Zambino PJ, Hessbu
cd	Hoffland E, Giesler R, Jongmans AG, van Breemen N. 2003. Feldspar tunneling by
cd	Hoffland E, Giesler R, Jongmans T, van Breemen N. 2002. Increasing feldspar tunn
cd	Hoffman MT, Arnold AE. 2008. Geographic locality and host identity shape fungal
	Hoffman MT, Arnold AE. 2010. Diverse bacteria inhabit living hyphae of phylogene
e	Hofrichter M, Vares T, Kalsi M, Galkin S, Scheibner K, Fritsche W, Hatakka A. 19
e	Hofrichter M, Ziegenhagen D, Vares T, Friedrich M, Jäger MG, Fritschke W, Hatak
e	Hofrichter M. 2002. Review: lignin conversion by manganese peroxidase. Enzyme.
p/cd	Hofstetter V, Clemencon H, Vilgalys R, Moncalvo J-M. 2002. Phylogenetic analyse
cd	Högberg MN, Baath E, Nordgren A, Arnebrant K, Högberg P. 2003. Contrasting eff
	Högberg MN, Briones MJI, Keel SG, Metcalfe DB, Campbell C, Midwood AJ, Tho
p/cd	Högberg MN, Högberg P, M boreaalse metsakõrgusgradient põhjustab N, pH jms gr
p/cd	Högberg MN, Högberg P. 2002. Extramatrical ectomycorrhizal mycelium contribute
	Högberg P, Alexander IJ.1995. Roles of root symbioses in African woodland and fo
p	Högberg P, Högberg MN, Quist ME, Ekblad A, Näsholm T. 1999. Nitrogen isotope
	Högberg P, Högbom L, Schinkel H, Högberg M, Johannisson C, Wallmark H. 1996.
p	Högberg P, Högbom, Schinkel H, Högberg M, Johannisson C, Wallmark H. 2004. 1
cd	Högberg P, Nordgren A, Ågren GI. 2002. Carbon allocation between tree root grow
	Högberg P, Nordgren A, Buchmann N, Taylor AFS, Ekblad A, Högberg M väheneb
p/cs	Högberg P, Piearce GD. 1986. Mycorrhizas in Zambian trees in relation to host taxo
	Högberg P, Plamboeck AH, Taylor AFS, Fransson PAM. 1999. Natural 13 ECM vs
p/cd	Högberg P, Read DJ. 2006. Towards a more plant physiological perspective on soil
	Högberg P. 1982. Mycorrhizal associations in some woodland forest trees and shrul
p/cd	Högberg P. 1986. Nitrogen-fixation and nutrient relations in savanna woodland trees
	Högberg P. 1989. Root symbioses of trees in savannas. In: Proctor J. (ed). Mineral
	Högberg P. 1990. 15N natural abundance as a possible marker of the ectomycorrhiz
p/cd	Högberg P. 1992. Root symbioses of trees in African dry tropical forests. J. Veg. Sc
p/cd	Högberg P. 1997. 15N natural abundance in soil-plant systems. New Phytol. 137: 17
	Hoiland K, Holst-Jensen A. 2000. *Cortinarius* phylogeny and possible taxonomic in
cd	Hold GL, Schwiertz A, Aminov RI, Blaut M, Flint HJ. 2003. Oligonucleotide probes
cd	Holder M, LewisPO. 2003. Phylogeny estimation: traditional and Bayesian approach
	Holmer L, Nitare L, Stenlid J. 1994. Population structure and decay patter Phellinus
	Holmer L, Stenlid J. 1993. The importance of inoculum size for the competitive abili
	Holmer L, Stenlid J. 1997. Competitive hierarchies of wood decomposing basidiomy
cd	Holst-Jensen A, Vaage M, Schumacher T, Johansen S. 1999. Structural characteristi
p/cd	Holt RD, Lawton JH, Polis GA, Martinez ND. 1999. Trophic rank and the species-a
cd	Hönig K, Riefler M, Kottke I. 2000. Survey of Paxillus involutus (Batsch) ECM ja
x	Hooper DU, Adair EC, Cardinale BJ, Byrnes JEK, Hungate BA, Matulich KA, Gon
	Hopkins MS, Reddell P, Hewett RK, Graham AW. 1996. Comparison of root and m
p/cd	Hopkins NA. 1987. Mycorrhizae in a California serpentine grassland community. C
cd	Hopple JS, Vilgalys R. 1999. Phylogenetic relationships in the mushroom genus Cop
n	Horak E, Moser M. 1965. Fungi austroamericani VIII. Über neue Gastroboletaceae
p	Horak E, Wood AE. 1990. Cortinarius Fr. (Agaricales) in Australasia. 1. Subgen. M
p	Horak E. 1967. Remarques critiques sur quelques champignons du Congo (Afrique).
	Horak E. 1971. Contributions to the knowledge of the Agaricales s.l. (fungi) of New
p	Horak E. 1971. Studies on the genus *Descolea* Sing. Persoonia 6: 231-248.
	Horak E. 1975 Boletellus and Porphyrellus in Papua New Guinea. Kew Bull. 31: 64
p	Horak E. 1977. New and rare boletes from Chile. Boletin Sociedad Argentina de Bo
p	Horak E. 1979. Astrosporina (Agaricales) in Indomalaya and Australasia. Persoonia
p	Horak E. 1979. Three new genera of Agaricales from Papua New Guinea. Sydowia
p/cd	Horak E. 1983. Mycogeography in the South Pacific region: Agaricales, B Agaricale
p	Horak E. 1990. Monograph of the New Zealand Hygrophoraceae. N. Z. J. Bot. 28:
	Horak E. 1991. New records of Phaeocollybia from Colombia. Mycologia 83: 464-4
	Horak E. Entoloma in South America. I. Institut Spezielle Botanik, ETHZ, CH-8092
p	Horan DP, Chilvers GA, Lapeyrie FF. 1988. Time sequence in the infection process
p	Horan DP, Chilvers GA. 1990. Chemotropism -the key to ectomycorrhizal formation
	Horn S, Caruso T, Verbruggen E, Rillig MC, Hempel S. 2014. Arbuscular mycorrhi

		p/cd				Horner-Devine MC, Bohannan BJM. 2006. Phylogenetic clustering and overdispersi
						Horner-Devine MC, Carney KM, Bohannan BJM. 2004. An ecological perspective o
		cd				Horner-Devine MC, Lage M taimede ja bakterite liigi-pindala kõver soolasoos on er
						Horner-Devine MC, Leibold MA, Smith VA, Bohannan BJM. 2003. Bacterial divers
				x		Horner-Devine MC, Silver JM, Leibold MA, Bohannan BJM, Colwell RK, Fuhrman
		cd				Horner-Divine C, Carney KM bakterite üld-BD: 10e10 liiki, 4-6 x 10e30 rakku. Tähti
		p/cd				Hortal S, Pera J, Parlade J. 2008. Tracking mychorrhizas and extraradical mycelium
		p/cd				Hortal S, Pera J, Parlade J. 2009. Field persistence of the edible ectomycorrhizal fun
						Hortal S, Trocha LK, Murat C, Chybicki IJ, Buee M, Trojankiewicz M, Burczyk J, I
						Horton BM, Glen M, Davidson NJ, Ratkowsky D, Close DC, Wardlaw TJ, Moham
						Horton TR, xxx leesikas vs ebatsu Pseudotsuga: Russ1, Russ2 RFLP ?
		p/cd				Horton TR, x ebatsuuga vs mär Kokku Tomentella sublilacina, Tom s
					x	Horton TR, Bruns TD. 2001. ülevaade, viited vs ECM
		p/cd				Horton TR, Molina R, Hood ebatsuuga vs nulg Biomass: 40-a ebatsuuga: Clavulinoi
		cd				Horton TR. 2002. Molecular approaches to ectomycorrhizal diversity studies: variat
		p/cd				Hosaka K, Bates ST, Beever RE and 10 others. 2006. Molecular phylogenetics of th
		p/cd				Hosaka K, Castellano MA, Spatafora JW. 2008. Biogeography of Hysterangiales (P
						Hosaka K, Castellano MA. 2008. Molecular phylogenetics of Geastrales with specia
						Hosen MI, Feng B, Wu G, Zhu XT, Li YC, Yang ZL. 2013. Borofutus, a new genu
						Hothorn T, Müller J, Schröder B, Kneib T, Brandl R. 2011. Decomposing environm
		cd				Hovenkamp P. 1997. Vicariance events, not areas, should be used in biogeographica
						Howard RA. 1961. Studies in the genus Coccoloba, X. New Species and a summary
						Howard RA. 1992. Collected notes on Coccoloba L. (Polygonaceae). Brittonia 44(3
		p				Howard TM. 1973. Studies on the ecology of Nothofagus cunninghamii. I. Natural r
						Hrynkiewicz K, Baum C, Le energiavõsa Populus x nigra ja Salix viminalis,
		p/cd				Hrynkiewicz K, Baum C, Le Salix polaris 4 Cenoc, ???
		p/cd				Hrynkiewicz K, Haug I, Baum C. 2008. Ectomychorrizal community structure under
		p/cd				Hrynkiewicz K, Haug I, Bau Salix caprea: EcM Tomentella atramentaria
						Hrynkiewicz K, Toljander Y Salix istandustes vs loodluslikult: BD madalam
						Hua Z, Shao-liang C, Cun-fu L, Rui-gang W, Song-xiang D, Hui-juan Z, Yun-xia Z,
		p				Huber O. 2006. Herbaceous ecosystems on the Guayana Shield, a regional overview
						Huber T, Faulkner G, Hugenholtz P. 2004. Bellerophon; a program to detect chimeri
		p/cd				Hubert NA, Gehring CA. 2008. Neighboring trees affect ectomycorrhizal fungal con
		cd				Huelsenbeck JP, Ronquist F. 2001. MRBAYES: Bayesian inference of phylogenetic
						Huffnagle GB, Noverr MC. 2 mikrobioom inimese: normaalselt Candida, Ma
		cd				Hugenholtz P, Huber T. 2003. Chimeric 16S rDNA sequences of diverse origin are a
		cd				Hughes JB, Hellmann JJ, Ric biodiversiteedi arvutamine: rarefaction, parameetrilisec
						Hughes KW, Petersen RH, Lickey EB. 2009. Using heterozygosity to estimate a per
						Hughes KW, Petersen RH. 2001. Apparent recombination or gene conversion in the
						Hughes Martiny JB, Bohannan BJM, Brown JH, Colwell RK, Fuhrman JA, Green JI
						Hughes Martiny JB, Eisen JA, Penn K, Allison SD, Horner-Devine MC. 2011. Drive
		p				Hughes RG. 1986. Theories and models of species abundance. Am. Nat. 128: 879-8
						Huh MK, Chung SD, Huh HW. 1998. allozyme variation and population astructure o
		p/j				Humpert AJ, Muench EL, Giachini AJ, Castellano MA, Spatafora JW. 2001. Molec
						Hung L-L, Molina R. 1996. Use of the ectomycorrhizal fungus Laccaria laccata in fo
						Hung L-L, Trappe JM. 1983. Growth variation within and between species of ectom
		p				Hunt DR. 1961. Nyctaginaceae. Kew Bull. 28: 251.
		cd				Hunt J, Boddy L, Randerson seente diversiteet 2 rohumaal: 18 rDNA kloonide RFLI
						Hunt R, Hope-Simpson JF. 1990. Growth of Pyrola rotundifolia ssp. maritima in rela
						Huntingford C, Jones PD, Livina VN, Lenton TM, Cox PM. 2013. No increase in gl
		cd				Hur I, Chun J. 2004. A method for comparing multiple bacterial community structure
		p/cd				Hurd TM, Raynal DJ, Schwinzer CR. 2001. Symbiotic N^2 Fixation of *Alnus incana*
						Hurlbert AH, Stegen JC. 2014. When should species richness be energy limited, and
		cd				Hurlbert SH, Meilkle WG. 2003. Pseudoreplication, Fungi, and Locusts. J. Econ. En
		p/cd		x		Hurlbert SH. 1984. Pseudoreplication and the design of ecological field experiments
		cd				Hurlbert SH. 2004. On misinterpretations of pseudoreplication and related matters: a
		cd				Hurt RA, Qiu X, Wu L, Roh Y, Palumbo AV, Tiedje JM, Zhou J. 2001. Simultaneo
						Husband R, Herre EA, Turner SL, Gallery R, Young JPW. 2002. Molecular diversit
			x			Huston MA. 1997. Hidden treatments in ecological experiments: re-evaluating the ec
		p				Hutchison LJ, Piché Y. 1995. Effects of exogenous glucose on mycorrhizal coloniza
						Hutchison LJ. 1988. Notes on *Limacella Illinita* in pure culture. Mycologia 80: 111
						Hutchison LJ. 1989. Absence of conidia as a morphological character in ectomycorr
						Hutchison LJ. 1990. Studies on the systematics of ectomycorrhizal fungi in axenic cu
						Hutchison LJ. 1992. Host range, geographical distribution and probable ecological s
						Huynh TT, Thomson R, McLean CB, Lawrie AC. 2009. Functional and genetic dive
		p				Hwang S-K, Kim J-G. 1998. Small subunit ribosomal DNA of an ectomycorrhizal fu
					x	Hyde KD, Nilsson RH, Alias SA, Ariyawansa HA, Blair JE, Cai L, de Cock AWAM
2013	3				x	Hyde KD, Udayanga D, Manamgoda DS, Tedersoo L, Larsson E, Abarenkov K, Be

				Hynes MM, Smith ME, Zasc CAL Quercus EMH: domin risomorfidega liigi
	1			Hynson N, Bruns TD. 2010. Fungal hosts for mycoheterotrophic plants: a non-exclu
				Hynson N, Merckx VSFT, P Hawaii mändic Suillus, Wilcoxina, Tomentella,
		p/cd		Hynson NA, Bruns TD. 200 Pyrola aphylla Piloderma , Phialocephala
				Hynson NA, Mambelli SA, Amend AS, Dawson TE. 2012. Measuring carbon gains
				Hynson NA, Weiß M, Preiss K, Gebauer G, Treseder KK. 2013. Fungal host specifi
				Hyodo F, Kohzu A, Tayasu I. 2010. Linking aboveground and belowground food we
		p/cd		Iason GR, Lennon JJ, Pakeman RJ, Thoss V, Beaton JK, Sim DA, Elston DA. 2005
				Illyes Z, Ouanphanivanh N, Rudnoy S, Orczan AK, Bratek Z. 2010. The most recen
		p/cd		Illyez Z, Halasz K, Rudnoy S, Ounphanivanh N, Garay T, Bratek Z. 2010. Changes
		p/cd		Imamura A, Yumoto T. 2008. Dynamics of fruit-body production and mycorrhiza of
		p		Imhof S. 2006. Two distinct fungi colonize roots and rhizomes of the myco-heterotr
				Ingelby K. 1999. *Scleroderma sinnamarense* Mont. + Gnetum africanum Welw. De
				Ingleby K, Last FT, Mason P 1 -30 cm, söekae ülakihis Paxillus, alakihis Scleroderm
				Ingleby K, Mason PA, Last FT, Fleming LV. 1990. Identification of Ectomycorrhiza
		p		Ingleby K, Thelephora terrestris eukalüptil
		cd		Ingleby K, Riessia -Shoreal Shorea parviflora kõikjal Riessia, metsas ja raiealal eri
		p		Innis MA, Gelfand DH. 1990. Optimization of PCRs. In: Innis MA, Gelfand DH. (e
				Iosifidou P, Raidl S. 2006. *Clavariadelphus pistillaris* + *Fagus sylvatica* . Descr. E
		cd		Iotti M, Amicucci A, Stocchi V, Zambonelli A. 2002. Morphological and molecular
				Iotti M, Lancellotti E, Hall I Truffiere: Pinu Tom-thel, Inoc, Russ
		cd		Irie T, Honda Y, Watanabe T, Kuwahara T. 2000. Homologous expression of recom
				Irwin MJ, Bougoure JJ, Dearnaley JDW. 2007. Pterostylis nutans (Orchidaceae) ha
		p/cd		Ishida TA, Nara K, Hogetsu segametsades (2) Cenococcum, Sebacina1, AscoM8 (F
		p/cd		Ishida TA, Nara K, Ma S, Ta Salix lineariste Tomentella 3 spp; Geopora 1 do
				Ishida TA, Nara K, Tanaka M, Kinoshita A, Hogetsu T. 2008. Germination and infe
				Ishida TA, Nordin A. 2010. No evidence that nitrogen enrichment affect fungal com
		p		Isogai N, Yamamura Y, Mariko S, Nakano T. 2003. Seasonal pattern of photosynthe
		p		Ives AR, Foufopoulos J, Klopfer ED, Klug JL, Palmer TM. 1996. Bottle or big-scale
				Ives AR, Godfray ACJ. 2006. Phylogenetic analysis of trophic associations. Am. Na
				Iwamoto K, Kitayama K. 20 Borneo Mt Kinabalu mööda kõrgusgradienti: 7
		p/cd		Iwanski M, Rudawska M. 2(huumus (palju liil Huumuspinnas: Cadophora finlandica
		VIITED		Iwase K. 1992. Induction of basidiospore germination by gluconic acid in the ectom
		p/cd		Izumi H, Anderson IC, Alexander IJ, Killham K, Moore ERB. 2006. Diversity and e
		p/cd		Izumi H, Moore ERB, Killham K, Alexander IJ, Anderson IC. 2006. Characterisatio
		p/cd		Izzo A, Agbowo J, Bruns TI Abies spp Sierra Cenococcum, Wilcoxina, Lactarius, I
		p/cd		Izzo A, Canright M, Bruns T Pinus jeffreyi: mu kontr: Wilcoxina, Rhizop roseolus, C
		p/cd		Izzo A, Meyer M, Trappe JN leidsid juurtel palju maasiseste viljakehadega v palju lii
		p		Izzo A, Nguyen DT, Bruns T kuivatatud mullal mänd: Wilcoxina rehmii, Rhiz roseol
		p/cd		Jablonski D, Roy K, Valentine AW. 2006. Out of the tropics: evolutionary dynamics
				Jablonski D, Sepkoski JJ. 1996. Paleobiology, community ecology, and scales of eco
		cd		Jackson CR et al. 1997. A Simple, efficient method for the separation of humic subs
				Jacobs A, Coetzee MPA, Wingfield BD, Jacobs K, Wingfield MJ. 2003. Phylogene
		p		Jacobs BF. 2004. Palaeotropical studies from tropical Africa: relevance to the evolut
				Jacobson KM, Miller OK, Turner BJ. 1993. Randomly amplified polymor Suillus gr
		p		Jacobson KM, Miller OK. 1992. Physiological variation between tree-associated po
				Jacquemyn H, Brys R, Honnay O, Roldan-Ruiz I, Lievens B, Wiegand T. 2012. Nor
				Jacquemyn H, Deja A, De hert K, Bailarote BC, Lievens B. 2012. Variation in myco
				Jacquemyn H, Honnay O, Cammue BPA, Brys R, Lievens B. 2010. Low specificity
				Jacquemyn H, Merckx V, Brys R, Tyteca D, Cammue BPA, Honnay O, Lievens B.
				Jäderlund. 2001. Bilberry (Vaccinum myrtillus L.) in a boreal forest ecosystem -effe
		p		Jaffee PA. 1996. Soil microcosms and the population biology of nematophagous fun
2011	9			Jairus T, Mpumba R, Chinoya S, Tedersoo L. 2011. Invasion potential and host shif
		p/cd		Jakobsen I. 2004. Hyphal fusion to plant species connections -giant mycelia and con
		p		Jakucs E, B Genea verrucosa
		p/cd		Jakucs E, Erös-Honti Z. 200 Tomentella spp. jt Tomentelloidsed morfotüübi
		p		Jakucs E, K Tomentella stuposa 2 alatüüpi, mis morf poolest veidi erinevad [voib-ol
		p/cd		Jakucs E, K Tomentella ferru Ungari tasandiku vaid Tomentella analüüsitud: enamas
		p		Jakucs E. 1 Fagirhiza vermiculariformis = Lactarius sp
		cd		James SE, Pärtel M, Wilson SD, Peltzer DA. 2003. Temporal heterogeneity of soil n
		p		James TJ, Moncalvo J-M, Li S, Vilgalys R. 2001. Polymorphism at the ribosomal D
				James TY, Berbee ML. 2011. No jacket required - new fungal lineage defies dress c
		p/cd		James TY, Kauff F, Schoch CL and 68 others. 2006. Reconstructing the early evolut
				Janos DP. 1980. Mycorrhizae and tropical succession. Biotropica QQQ: 56-64.
			x	Jansa J, Mozafar A, Banke S, McDonald BA, Frossard E. 2002. Intra- and interspor
		p/cd		Jansa J, Smith FA, Smith SE. 2008. Are there benefits of simultaneous root coloniza
				Janse JM. 1897. Les endophytes radicaux de quelques plantes javanaises. Ann. Jard
				Jansson R, Rodriguez-Castaneda G, Harding LE. 2013. What can multiple phylogen

cd		Jany J-L, Bousquet J, Khasa DL. 2003. Microsatellite markers for Hebeloma species
j		Jany J-L, Garbaye J, Martin Cenococcum: liigisisene: yhes proovis väga erinevag g
cd		Jany J-L, Martin F, Garbaye J. 2003. Respiration activity of ectomycorrhizas from C
		Janzen DH. 1970. Herbivores and the number of tree species in tropical forests. Am
p/cd		Jaramillo C, Rueda MJ, Mora G. 2006. Cenozoic plant diversity in Neotropics. Scie
		Jargeat P, Martos F, Carriconde F, Gryta H, Moreau P-A, Gardes M. 2010. Phyloge
		Jarosch M, Bresinsky A. 1999. Speciation and phylogenetic distances within Paxillu
		Jarvis S, Woodward S, Alex Scotland Pinus Clavulinaceae sp; linidzitest Co
cd		Jasalavich CA, Ostofsky A, Jellison J. 2003. Detection and identification of decay fu
p/cd		Jeandroz S, Murat C, Wang Y, Bonfante P, Le Tacon F. 2008. Molecular phylogeny
		Jentschke G, Godbold DG. 2000. Metal toxicity and ectomycorrhizas. Physiol. Plan
		Jetz W, McPherson JM, Guralnick RP. 2012. Integrating biodiversity distribution kn
		Jetz W, Thomas GH, Joy JB, Hartmann K, Mooers AO. 2013. The global diversity o
p/cd		Jha DK, Sharma GD, Mishra RR. 1993. Mineral nutrition in the tripartite interaction
		Jiang L-Q, O'Connor SA, Arzayus KM, Kozyr A, Parsons AR. 2015. A metadata te
		Johannesson H, Stenlid J. 1999. Molecular identification of wood-inhabiting fungi in
p/cd		Johanson A, Turner HC, McKay GJ, Brown AE. 1998. A PCR-based method to dis
cd		Johansson JF, Paul LR, Finlay RD. 2004. Microbial interactions in the mycorrhizosp
cd		Johansson J x segamets Põhja-F kuusk: Russula, Tylospora; mänd: Ty
p/cd		Johansson T. 2000. Biomass equations for determining fractions of common and gre
		John R, Dalling JW, Harms KE, Yavitt JB, Stallard RF, Mirabello M and 5 others. 2
p/cd		Johnsen K, Maier C, Kress L. 2005. Quantifying root lateral distribution and turnove
		Johnson CN. 1996. Interactions between mammals and ectomycorrhizal fungi. Trend
		Johnson D, Anderson IC, Williams A, Whitlock R, Grime JP. 2010. Plant genotypic
cd		Johnson D, Booth RE, White bakterite liigirikkus RT-PCR-DGGE bändide põhjal kõ
p/cd		Johnson D, Ijdo M, Genney DR, Anderson IC, Alexander IJ. 2005. Hoe do plants re
		Johnson D, Leake JR, Read DJ. 2001. Novel in-growth core system enables function
cd		Johnson D, Leake JR, Read DJ. 2002. Transfer of recent photosynthate into mycorrh
		Johnson D, Martin F, Cairney JWG, Anderson IC. 2012. The importance of individu
cd		Johnson D, Vandenkoornhuyse PJ, Leake JR, Gilbert L, Booth RE, Grime JP, Youn
		Johnson DJ, Beaulieu WT, Bever JD, Clay K. 2012. Conspecific negative density d
		Johnson JB, Omland KS. 2004. Model selection in ecology and evolution. Trends Ec
		Johnson NC, Angelard C, Sa globaalsetele kliimamuutustele reageerimine: ü
		Johnson NC, Graham JH, Smith FA. 1997. Functioning of mycorrhizal associacions
		Johnson NC, Wilson GWT, Bowker MA, Wilson JA, Miller RM. 2010. Resource li
		Jombart T, Balloux F, Dray S. 2010. adephylo: new tools for investigating the phylo
p/cd		Joner EJ, Leyval C, Colpaert JV. 2006. Ectomycorrhizas impede phytoremediation o
		Joner EJ, Leyval C. 2003. Phytoremediation of organic pollutants using mycorrhizal
		Jones CM, Hallin S. 2010. Ecological and evolutionary factors underlying global and
cd		Jones DL, Dennis PG, Owen AG, van Hees PAW. 2003. Organic acid behavior in so
cd		Jones MD, Durall DM, Cairn raiesmik vs mets. raiesmik vs mets.ülevaade
		Jones MD, xxx, kask vs eba kask vs ebatsuuga; raiesmikul vs kasvuhoones samal ra
		Jones MD, Durall DM, Tinker PB. 1991. Fluxes of carbon and phosphorus between
cd		Jones MD, Durall DM, Tinker PB. 1998. A comparison of arbuscular and ectomyco
p/cd		Jones MD, Grenon F, Peat H, Fitzgerald M, Holt L, Philip LJ, Bradley R. 2009. Diff
		Jones MD, Hagerman SD, G raiesmik amphinema, thelephora, Wilcoxina
		Jones MD, Phillips LA, Treu R, Ward V, Berch SM. 2012. Functional responses of
p/cd		Jones MD, Smith SE. 2004. Exploring functional definitions of mycorrhizas: Are my
p/cd		Jones MD, Twieg BD, Dural CAN metsatukka Cenoc; linidzitest Cort (13), Russ-La
		Jones MD, Twieg BD, Ward Pseudotsuga menziesii seemikud CAN raiutud,
	x	Jones MDM, Forn I, Gadelha C, Egan MJ, Bass D, Massana R, Richards TA. 2011.
p		Jones RI. 2000. Mixotrophy in planktonic protists: an overview. Freshw. Biol. 45: 2
p/cd		Jones RT, Martin AP. 2006. Testing for differentiation in microbial communities usi
		Jonsson L, 1 4 gruppi: valge, kuusk: norm vs l Cenococcum, Phialocephal kuusk: n
		Jonsson L, Dahlberg A, Brandrud T-E. 2000. Spatiotemporal distribution of an ecton
		Jonsson L, 1 x noored vs vanad Cenococcum, Piloderma, S domin Ru
		Jonsson L, 1 x 4 noort vs 4 vana Cenococcum, Suillus varie 4 noort v
p/cd		Jonsson L, Nylund JE. 1979. Favolaschia dybowskyana (Aphyllophorales), a new or
cd		Jonsson LM, Dighton J, Luss vs "huckleberry" dominandid erinevad. PCA põhjal va
		Jonsson LM, Nilsson M-C, V 1,2,4,8 liiki: ei suurenda taime biomassi vrd üksikliigi e
		Jonsson T, 1 loobuti kuusk; Kontroll v Kontroll: Thel terrestris, Ty xxx (Rus
		Joppa LN, Bascompte J, Montoya JM, Sole RV, Sanderson J, Pimm SL. 2009. Reci
		Jordan GE, Piel WH. 2008. PhyloWidget: web-based visualizations for the tree of li
		Jordano P. 1987. Patterns of mutualistic interactions in pollination and seed dispersa
		Jordy MN, Azemar-Lorentz S, Brun A, Botton B, Pargney JC. 1998. Cytolocalizatio
cd		Jouquet P, Mamou L, LePage M, Velde B. 2002. Effect of termites in tropical soils:
		Jousset A, Schmid B, Scheu S, Eisenhauer N. 2011. Genotypic richness and dissimil
		Jousset A, Schulz W, Scheu S, Eisenhauer N. 2011. Intraspecific genotypic richness

p		Jülich W. 1¹ Riessia, Riessiella koos suure ümara kuni nelja-pallise tipuga tsüstiidide
p/cd		Julou T, Burghardt B, Gebau Cephalanthera da OrM: Cephalanthera damasonium rol
p/cd		Julou T, Burghardt B, Gebauer G, Berveiller D, Damesin C, Selosse M-A. 2005. Mi
b		Jumpponen A, Egerton-Warburton LM. 2005. Mycorrhizal fungi in successional env
p		Jumpponen A, Högberg P, Huss-Danell K, Mulder CPH. 2002. Interspecific and spa
p/cd		Jumpponen A, Johnson LC. : seened mullas vs EmH: domin. Kottseened, juurtes sul
		Jumpponen A, Jones KL. 20 preeriamullas vs kõrgendatud temp ja madalam
j		Jumpponen A, Newsham KK, Neises DJ. 2003. Filamentous ascomycetes inhabiting
p		Jumpponen A. 1999. Spatial distribution of discrete RAPD phenotypes of a root end
		Jumpponen Dark septate
cd		Jumpponen A. 2003. Soil fungal community assembly in a primary success seente Bl
p/cd		Jumpponen A. 2007. Soil fungal communities underneath willow canopies on a prim
		Jun Sul W, Oliver TA, Ducklow HW, Amaral-Zettler LA, Sogin ML. 2013. Marine
p		Junk WJ. 1984. Ecology of the vàrzea, floodplain of Amazonian white-water rivers.
p		Jurgensen MF, Graham RT, Larsen MJ, Harvey AE. 1992. Clear-cutting, woody res
p		Jurgensen MF, Harvey AE, Graham RT, Page-Dumroese DS, Tonn JR, Larsen MJ, .
		Kadowaki K, Sato H, Yamamoto S, Tanabe AS, Hidaka A, Toju H. 2014. Detection
cd		Kagan-Zur V, Freeman S, Lu Tammeistandus ir 4 a jooksul mitmed uued seened, sam
cd		Kagan-Zur V, Kuang J, Tabak S, Taylor FW, Roth-Bejerano N. 1999. Potential veri
		Kaiser C, Kilburn MR, Clode PL, Fuchslueger L, Koranda M, Cliff JB, Solaiman ZM
		Kaiser C, Koranda M, Kitzler B, Fuchslueger L, Schenker J, Schweiger P, Rasche F
		Kalamees R, Zobel M. 2002. The role of the seed bank in gap regeneration in a calc
		Kaldorf M, xxx transgeenses haav unknown
p/cd		Kaldorf M, haava kloonide (haava kloonide d Tomentella ellisii, Phialocephala, Lac
		Kanagawa T. 2003. Bias and artifacts in multitemplate polymerase chain reactions (I
		Kanchanaprayudh J, Lian C, Zhou Z, Hogetsu T, Sihanonth P. 2002. Polymorphic m
		Kanchanaprayudh J, Zhou Z, Eucalyptus car Eucalyptus camaldulensis TAIs
		Kanchanaprayudh J, Zhou Z, Yomyart S, Sihanonth P, Hogetsu T. 2003. Molecular
		Kaneko N, Salamanca E. 1999. Mixed leaf litter effects on decomposition rates and
	x	Kang S, Mansfield MA, Park B, Geiser DM, Ivors KL, Coffey MD, Grünwald NJ, M
cd		Kang SS, Chung MG. 1997. Spatial genetic structure in populations of Chimaphila j
		Kanunfre CC; Zancan GT. 1998. Physiology of exolaccase production by Thelephor
		Kaounas V, Assyov B, Alvarado P. 2011. New data on hypogeous fungi from Greec
		Kardol P, Bezemer TM, van der Putten WH. 2006. Temporal variation in plant-soil :
		Karen O, Högberg N, Dahlberg A, Jonsson L, Nylund J-E. 1997. Inter-anc RFLP: lii
cd		Karlsson M, Olson Å, Stenlid J. 2003. Expressed sequences from the basidiomyceto
		Karpati AS, Handel SN, Dig Quercus seemikutel: NJ USA linnas vs maal: m
		Karpouzas DG, Rousidou C, Papadopoulou KK, Bekris F, Zervakis GI, Singh BK, I
		Karst J, Jones MD, Turkington R. 2008. Ectomycorrhizal colonization and intraspec
p/cd		Karst J, Marczak L, Jones MD, Turkington R. 2008. The mutualism-parasitism cont
		Kartzinel T, Trapnell DW, Shefferson RP. 2013. Highly diverse and spatially hetero
		Kasesalu A, 1993. Nature Reserve District Stands and Their Dynamics in Järvselja.
p/cd		Kaspari M, Yanoviak SP. 2008. Biogeography of litter depth in tropical forests: eval
p/cd		Kasuya MCM, Igarashi T. 1996. In vitro ectomycorrhizal formation in *Picea glehnii*
p/cd		Kataoka R, Taniguchi T, Ooshima H, Futai K. Pinus thunbergii: Cenoc, Amphinema
p		Katenin AE. 1972. Mikoriza rastenii severo-vostoka evropeiskoi chasti USSR. Izd. .
cd		Kathriarachchi H, HoVmann P, Samuel R, Wurdack KJ. 2005. Molecular phylogene
		Katoh K, Frith MC. 2012. Adding unaligned sequences into an existing alignment us
		Katoh K, Kuma K, Toh H, Miyata T. 2005. MAFFT version 5: improvement in accu
x		Katoh K, Standley DM. 2013. MAFFT multiple sequence alignment software versio
p/cd		Katoh K, Toh H. 2008. Recent developments in the MAFFT multiple sequence align
		Kauff F, Cox CJ, Lutzoni F. 2007. WASABI: an automated sequence processing sys
		Kauffman C Cortinarius mood EcM tammega kui jälgida risomorfe (väide
		Kauserud H, Heegaard E, Halvorsen R, Boddy L, Hoiland K, Stenseth NC. 2010. M
		Kauserud H, Mathiesen C, Olson M. 2008. High diversity of fungi associated with li
p		Kauserud H, Schumacher T. 2002. Population structure of the endangered wood dec
j		Kauserud H, Schumacher T. 2003. Genetic structure of Fennoscandian pop Fomitops
j		Kauserud H, Schumacher T. 2003. Regional and local population structure of the pio
p		Kauserud H, Schumacher T. 2003. Ribosomal DNA variation, recombination and inh
p/cd		Kauserud H, Svegarden IB, DeCock C, Hallenberg N. 2007. Hybridization among c
		Kauserud H, Svegarden IB, Decock T, Hallenberg N. 2007. Hybridization among cr
j		Kawai M. 1997. Artificial ectomycorrhiza formation of roots of air-layered Pinus de
		Kawai M. 1997. Artificial ectomycorrhiza formation on roots of air-layered *Pinus de*
p		Keating KA, Quinn JF. 1998 liigirikkuse modelleerimine Michaelis-Menteni kõvera
		Keller G. 1996. Utilization of organic and inorganic nitrogen sources by high-alpine
p/cd		Kellermann J, Udovicic F, Ladiges PY. 2005. Phylogenetic analysis and generic limi
		Kellner H, Vandenbol M. 2010. Fungi unearthed: transcripts encoding lignocelluloly
		Kembel SW, Cowan PD, Helmus MR, Cornwell WK, Morlon H, Ackerly DD, Blon

p/cd		Kembel SW, Hubbell SP. 2006. The phylogenetic structure of a neotropical forest tr
		Kembel SW, O´Connor TK, Arnold HK, Hubbell SP, Wright SJ, Green JL. 2014. Re
		Kembel SW. 2009. Disentangling niche and neutral influences on community asseml
cd		Kemp PF, Aller JY. 2004. B bakterid: erinevate BD arvutavate progede võrdlus: eri
		Kendrick B. 1992 The fifth kingdom. Focus Information Group, Newburyport, Mass
p/cd		Kendrick WB. 1961. The *Leptographium* complex. *Phialocephala* gen. Nov. Can. .
		Kennedy AH, Taylor DL, Watson LE. 2011. Mycorrhizal specificity in the fully myc
p/cd		Kennedy N, Edwards S, Clip seened ja bakterid T-RFLP ja ARISA
		Kennedy P. 2010. Ectomycorrhizal fungi and interspecific competition: species inter
p/cd		Kennedy PG, Bruns TD. 2006. Priority effects determine the outcome of ectomycorr
		Kennedy PG, Garibay-Orijel R, Higgins LM, Angeles-Arguiz R. 2011. Ectomycorrh
p/cd		Kennedy PG, Hill LT. 2010. Alnus rubra 4 ı Alnicola spp, Tomentella ellisii
p/cd		Kennedy PG, Hortal S, Bergemann SE, Bruns TD. 2007. Competitive interactions ar
cd		Kennedy PG, Izzo AD, Brun igihaljas Pseudots domin laia peremeesringiga; ebatsuug
		Kennedy PG, Matheny PB, Ryberg KM, Henkel TW, Uehling JK, Smith ME. 2012.
p/cd		Kennedy PG, Peay KG, Bruns TD. 2009. Root tip competition among ectomycorrhiz
p/cd		Kennedy PG, Peay KG. 2007. Different soil moisture conditions change the outcome
		Kennedy PG, Smith DP, Hor Arbutus menziesii vs Pseudotsuga OR: sarnane
p/cd		Kennedy TA, Naeem S, Howe KM, Knops JMH, Tilman D, Reich P. 2002. Biodive
		Kernaghan G, Currah RS, Bayer RJ. 1997. Russulaceous ectomycorrhizae of *Abies*
cd		Kernaghan G, Harper KA. 2(subarktika…arkti arktikas ysna omapärane k k.a. Tom
		Kernaghan G, Patriquin G. 2 Cenoc-assotsieerunud kultiveeritud seentel: pal
cd		Kernaghan G, Sigler L, Khas seemikute istandi ECM: eripaigus eridominandid: Ala1
cd		Kernaghan G, Widden P, Be segamets: kask, r Cenococcum, eriti haaval
		Kernaghan (subalpi vöötmes: Tomentella spp, Inocybe spp, Cortinarius sp subalpi v
p/cd		Kernaghan G. 2005. Mycorrhizal diversity: cause and effect? Pedobiologia 49: 511-5
p		Khan AG. 1972. Mycorrhizae in the Pakistan Ericales. Pak. J. Bot. 4: 183-194.
		Khetmalas MB, Egger KN, Massicotte HB, tackaberry LE, Clapperton J. 2002. Bac
p/cd		Khidir HH, Eudy DM, Porras-Alfaro A, Herrera J, Natvig DO, Sinsabaugh RL. 2010
		Kianmehr H. 1978. The response of Helianthemum chamaecistus to mycorrhizal infe
		Kieliszewsk kuju põhised
p/cd		Kier G, Matke J, Dinerstein E, Ricketts TH, Küper W, Kreft H, Barthlott W. 2005. (
		Kiers RT, Duhamel M, Beesetty Y, Mensah JA, Franken O, Verbruggen E, Fellbaur
p/cd		Kiessling W. 2005. Long-term relationships between ecological stability and biodive
p/cd		Kikuchi K, Matsushita N, Suzuki K, Hogetsu T. 2007. Flavonoids induce germinatic
		Kikuchi T, Karim N, Masuya H, Kubono O, Kubono T. 2008. An inexpensive high-t
p		Killeen TJ, Jardim A, Mamani F, Rojas N. 1998. Diversity, composition and structu
p/j		Kimbrough JW, Curry KJ. 1996. Septal structures in apothecial tissues of taxa in the
p/j		Kimbrough JW, Curry KJ. 1996. Septal structures in apothecial tissues of the tribe A
		Kimbrough JW. 1994. Septal ultrastructure and Ascomycete systematics. In: Hawks
p/cd		King AN, Ferris C. 1998. Chloroplast DNA phylogeography of *Alnus glutinosa* . Mo
cd		Kingsley MT, Straub TM, Call DR, Daly DS, Wunschel SC, Chandler DP. 2002. Fi
		Kinoshita A, Sasaki H, Nara K. 2011. Phylogeny and diversity of Japanese truffles (
		Kinoshita A, Sasaki H, Nara K. 2012. Multiple origins of sequestrate basidiomes wi
		Kipfer T, Egli S, Ghazoul J, vs mulla kuumutamine lühiajaliselt 45-70 kraad
		Kipfer T, Moser B, Egli S, W Pinus sylv Alpides; vs põlengud: 2-5 a põlengu
		Kipfer T, Wohlgemuth T, va EcM liigirikkus suurendab männi kasvu vaid S
p/cd		Kirk PM. 2000. World catalogue of 340 K fungal names on-line. Mycol. Res. 104: 5
e		Kirk TK, Croan S, Tien M, Murtagh KE, Farrell RL. 1986. Production of multiple li
p/cd		Kisa M, Sanon A, Thioulouse J, Assigbetse K, Sylla S, Spichiger R, Dieng L, Berthe
		Kissling WD, Dormann CF, Groeneveld J, Hickler T, Kühn I, McInerny GJ. 2012. T
		Kitayama K, Iwamoto K. 2001. Patterns of natural 15N abundance in the leaf-to-soil
		Kivlin SN, Hawkes CV. 2011. Differentiating between the effects of invasion and di
p		Kjoller R, Bruns TD. 2003. Rhizopogon spore bank communities within and among
p/cd		Kjoller R, Clemmensen KE. lupjamine BD lubi mänd: Tyl aster, Elaph mur
		Kjoller R, Nilsson L-O, Hans DEN 15-a kuusikus N-depositsiooni gradiendil
		Kjoller R, Olsrud M, Michelsen A. 2010. Co-existing ericaceous plant species in a s
	x	Kjoller R, Rosendahl S. 2000. Detection of arbuscular mycorrhizal fungi (Glomales)
p/cs		Kjoller R. 2006. Disproporti pöögik: EcM vs I EmH: Xerocomus pruinatus, Toment
cd		Klamer M, Hedlund K. 2004 T-RFLP (ARDRA): ITS1F-ITS4 -mahajäetud põllumaj
		Klamer M, Roberts MS, Lev seente BD tammikus vs elevCO2 -vahet pole; kvantitat
		Klaubauf S, Inselbacher E, Z Põllumullas seened: domin Tetracladium 4 spp
p/cd		Klepac-Ceraj V, Bahr M, Crump BC, Teske AP, Hobbie JE, Polz MF. 2004. High o
		Klironomos J, Zobel M, Tibbett M, Stock WD, Rillig MC, Parrent JL, Moora M, Ko
cd		Klironomos JN, Hart MM. 2001. Animal nitrogen swap for plant carbon. Nature 410
		Klironomos JN. 2002. Feedback with soil biota contributes to plant rarity and invasi
p		Kljushnik P Hebeloma crustulinif, Scleroderma aurantium, Pisolithus aren
		Kluber LA, Tinnesand KM, Caldwell BA, Dunham SM, Yarwood RR, Bottomley P.

			Kluger CG, Dalling JW, Gallery RE, Sanchez E, Weeks-Galindo C, Arnold AE. 200
			Knights D, Kuczynski J, Charlson ES, Zaneveld J, Mozer MC, Collman RG, Bushm
		p/cd	Knowles LL, Maddison WP. 2002. Statistical phylogeography. Mol. Ecol. 11: 2623-
			Knowles LL. 2009. Statistical phylogeography. Annu. Rev. Ecol. Evol. Syst. 40: 593
		p	Knudsen JT, Mogens Olesen J. 1993. Buzz-pollination and patterns in sexual traits i
		cd	Ko KS, Jung HS. 2002. Three nonorthologous ITS1 types are present in a polypore
			Kobayashi I Entoloma clypeatum on Rosa: taimerakud lüüsuvad ja ka hüü
		p/cd	Kobayashi I Entoloma clypeatum risomorfid ja klamüdospoorid
			Koehler H, Warrelmann J, Frische T, Behrend P, Walter U. 2002. In-situ phytoreme
			Koele N, Dickie IA, Oleksyn J, Richardson SJ, Reich PB. 2012. No globally consis
		p/cd x	Koetschan C, Förster F, Keller A, Schleicher T, Ruderisch B, Schwarz R, Müller T,
		p/cd	Kohn LM, Stasovski E. 1990. The mycorrhizal status of plants at Alexandra fiord, E
		p/cd	Kohn LM, S Neocudoniella radicella kuusejuurtel. Liigikirjeldus ja EcM-n
		p/cd	Kohn LM. 2005. Mechanisms of fungal speciation. Annu. Rev. Phytopathol. 43: 279
2011	13		Kohout P, Sýkorová Z, Bahram M, Hadincová V, Albrechtová J, Tedersoo L, Vohn
		cd	Kohzu A, Miyajima T, Tateishi T, Watanabe T, Takahashi M, Wada E. 2005. Dynar
			Kohzu A, Yoshioka T, Ando T, Takahashi M, Koba K, Wada E. 1999. Na 15N ja 13
		cd	Koide RT, Dickie IA. 2002. Effects of mycorrhizal fungi on plant populations. Plant
			Koide RT, Dickie IA. 2002. Kit-based low-toxicity method for extracting and purify
			Koide RT, Fernandez CW, Peoples MS. 2011. Can ectomycorrhizal colonization of
			Koide RT, Kabir Z. 2001. Nutrient economy of red pine is affected by interactions b
		p/cd	Koide RT, Sharda JN, Herr JR, Malcolm GM. 2008. Ectomycorrhizal fungi and the
		p/cd	Koide RT, Shumway DL, Xu Hüüfidena EcM seened eriaegadel eri rohkusega, ent a
		cd	Koide RT, Shumway DL. 2000. On variation of forest floor thickness across four re
		p	Koide RT, Suomi L, Stevens CM, McCormick L. 1998. Interactions between needle
		cd	Koide RT, Wu T. 2003. Ectomycorrhizas and retarded decomposition in a Pinus res
		p/cd	Koide RT, Xu B, Sharda J, L tammesavannis EMH: Cenoc, Clavulina, J10, Russul
		cd	Koide RT, Xu B, Sharda J. 2 65 a männi istand EMH: Cenococcum, Clavulina, jori 1
		p	Koizumi H, Oshima Y. 1985. Seasonal changes in photosynthesis of four understore
		cd	Koizumi Y, Kelly JJ, Nakagawa T, Urakawa H, El-Fantroussi S, Al-Muzaini S, Fuk
			Kõljalg U, 1992. Mycorrhiza formed by basidiospores of *Tomentella crinalis* on *Pi*
			Kõljalg U, 1996. Tomentella (Basidiomycota) and Related Genera in Temperate Eur
		2	Kõljalg U, I 1987
			Kõljalg U, J Tomentella 3 sp
2005	229		Kõljalg U, Larsson K-H, Abarenkov K, Nilsson RH, Alexander IJ, Eberhardt U, Erl
			Kõljalg U, Renvall P. 2000. Hydnellum gracilipes – a link between stipitate and resu
			Kõljalg U, T 3 (TOE) 2
			König S, Wubet T, Dormann CF, Hempel S, Renker C, Buscot F. 2010. TaqMan Re
			Konno M, Iwamoto S, Seiwa K. 2011. Specialization of a fungal pathogen on host t
		p	Kope HH, V Angianthus, Waitzia (Asteraceae), Poranthera (Euphorbiaceae), Stylidiu
		p/cd	Koricheva J, Gange AC, Jones T. 2009. Effects of mycorrhizal fungi on insect herbi
		p/cd	Korkama T, Fritze H, Pakka EmH vs EcM: va aeglased: Thelephora terr jt., Kottsee
		p/cd	Korkama T, Pakkanen A, Pe kuuseistandik eri Tylospora asterophora, Thel terr, Pil
			Korkama-RajalaT, Mueller MM, Pennanen T. 2008. Decomposition and fungi of nee
			Korotaev AA. 2000. Biodiversity of mycorrhiza and health condition of sp väheneb
			Koske RE, Gemma JN, Flynn T. 1992. Mycorrhizae in Hawaiian angiospserms: A s
			Koske RE, Sutton JC, Sheppard BR. 1975. Ecology of Endogone in lake Huron sand
		cd	Kosola KR, Durall DM, Rob hübriidhaaval vs Hebeloma crustuliniforme, Tuber spp
		p/cs	Kost G. 2002. Contributions to tropical fungi I. Ecology and distribution o Keenia e
			Kotiranta H, Larsson K-H, Saarenkoksa R, Kulju M. 2011. *Tretomyces gen. novum,*
		p	Kotter MM, Farentinos RC. 1984. Formation of Ponderosa pine mycorrhizae after in
		j	Kottke I, Beiter A, Weiss M, Haug I, Oberwinkler F, Nebel M. 2003. Heterobasidic
			Kottke I, Guttenberger M, Hampp R, Oberwinkler F. 1987. An in vitro method for e
		p/cd	Kottke I, Haug I, Setaro S, S Ecuadoris: Maksasamblad ja orhideed: Tulasnellales se
			Kottke I, Holopainen T, Alanen E, Turnau K. 1995. Deposition of nitrogen in vascul
			Kottke I, Oberwinkler F. 1988. Compararive studies of mycorrhization of Larix deci
			Kottke I, Pargney JC, Qian XM, Le Disquet I. 1995. Passage and deposition of solu
		cd	Kottke I, Qian XM, Pritsch I funktsionaalne erinevus erimikro-ja makroelementide k
			Kottke I, Suarez JP, Herrera P, Cruz D, Bauer R, Haug I, Garnica S. 2010. Atractiel
			Kottke I, Weber R, Ritter T, Oberwinkler F. 1995. Vitality of mycorrhizas and healt
			Kourtev PS, Ehrenfeld JG, Häggblom M. 2003. Experimental analysis of the effect o
			Kovacs GM, Balazs TK, Calonge FD, Martin MP. 2011. The diversity of Terfezia d
		p/cd	Kovacs GM Mattirolomyces terfezioides: kolonis juuri, kus mood sõlmekesi, ümber
		p/cd	Kovacs GM Tuber spp: rufur Tuber spp -EcM-dest tuleb palju viljakehadele mitteva
		p/cd	Kovacs GM, Trappe JM, Alsheikh AM, Bóka K, Elliott TF. 2008. *Imaia* , a new tru
			Kovacs GM, Trappe JM, Alsheikh AM, Hansen K, Healy RA, Vagi P. 2011. *Terfez*
		p/cd	Kovacs GM Terfezia ja Helianthemumi suhe pole EcM, kuigi seda väidetakse. Terfe
		p	Kovacs GM Helianthemirhiza hirsuta: dolipooridega kandseen, imelik mantel

cd		x	Kowalchuk GA, Gerards S, Woldendorp JW. 1997. Detection and characterization c
cd			Kowalchuk GA, Os GJ, Aar DGGE bändid: bakterid ja seened -liigirikkus suurem k
			Kraft NJB, Comita LS, Chase JM, Sanders NJ, Swenson NG, Crist TO and 10 other
p/cd			Kraft NJB, Cornwell WK, Webb CO, Ackerly DD. 2007. Trait evolution, communit
p/cd			Kraft NJB, Valencia R, Ackerly DD. 2008. Functional traits and niche-based tree c
			Krahulec F, Rosen E, van der Maarel E. 1986. Preliminary classification and ecolog
p			Kraigher H, Lactarius lignyotus-L. Picinus sektsioon on EcM morf poolest eristamat
p			Kraigher H, Batic F, Agerer kuusikus: saastatu reostus: Paxillus, Piceir inflata, Xero
p			Kramar U. 1901. Studie über die mykorriza von Pirola rotundifolia L. Bull. Int. Acad
			Kranabetter JM, Durall DM, metsa laial pro Cortinarius spp
cd			Kranabetter viited morfotyyp taimlast taimlasse taimlas: Thelephora, MRA
			Kranabetter xxx Ku vs Mä vs Nulg; RM vs Non-RM-seened
			Kranabetter JM, MacKenzie WH. 2010. Contrasts among mycorrhizal plant guilds in
			Kranabetter JM, Stoehr MU, Pseudotsuga ökotüüpide mõju EcM seente liigi
			Kranabetter JM, Wylie T. 19 raiesmiku gradier Kokku: Cenoc, Lactarius, Hebeloma
			Kranabetter x vs raiesmik; vs se Lageraie seemnepuudega: Cenoc, Le
p/cd			Kranabetter x ECM: metsas (suurem liigirikku ja BD) ja lageraielang
p			Kranabetter JM. 2005. Unde tsuuga ja kuuse n kuusel Amphinema, Laccaria laccata
			Krasnov BR, Fortuna MA, Mouillot D, Khokhlova IS, Shenbrot GI, Poulin R. 2012.
			Krasnov BR, Mouillot D, Shenbrot GI, Khokhlova IS, Vinarski MV, Korallo-Vinars
			Krasnov BR, Poulin R, Mouillot D. 2011. Scale-dependence of phylogenetic signal i
			Krasowski MJ, Owens JN, Tackaberry LE, Massicotte HB. 1999. Above-and below
			Krause C, Garnica S, Bauer R, Nebel M. 2011. Aneuraceae (Metzgeriales) and tulas
			Kreft H, Jetz W. 2007. Global patterns and determinants of vascular plant diversity.
p			Kreisel H. 1970. El papel de los hongos en la veetacion forestal de Cuba. Bol. Soc.
cd			Kretzer AM, Bidartondo MI, Sarcodes sanguin Rhizopogon ellenae ainult
cd			Kretzer AM, Bruns TD. 1999. Use of atp6 in fungal phylogenetics: an example from
p/cd			Kretzer AM, Dunham S, Molina R, Spatafora JW. 2004. Microsatellite markers reve
j			Kretzer AM, Li Y, Szaro T, Bruns TD. 1996. Internal transcribed spacer sequences
j			Kretzer AM, Luoma DL, Molina R, Spatafora FW. 2003. Taxonomy of the Rhizopo
cd			Kristiansen KA, Freudenstein JV, Rasmussen FN, Rasmussen HN. 2004. Molecular
			Kristiansen KA, Taylor DL, Dactylorhiza majalis: Laccaria like, Tulasnella sp.
cd			Kroes, I, Lepp PW, Relman hambasodist leiti väga palju eribaktereid 16S rDNA se
			Kron KA, Judd WS, Stevens PF, Crayn DM, Anderberg AA, Gadek PA, Quinn CJ,
cd			Kropf S, Heuer H, Grüning M, Smalla K. 2004. Significance test for comparing com
			Kropp BR, Albee-Scott S, Castellano MA, Trappe JM. 2012. Cryptolepiota, a new s
			Kropp BR, Albee-Scott S. 2010. Inocybe tauensis, a new species from the Samoan a
			Kropp BR, Albee-Scotte S, Castellano MA, Trappe JM. 2012. *Cryptolepiota,* a nev
			Kropp BR, Fortin JA. 1988. The incompatibility system and relative ectomycorrhiza
p			Kropp BR, Hutchison LJ. 1996. *Gigasperma americanum* , a new hypogeous memb
p			Kropp BR, Trappe JM. 1982. Ectomycorrhizal fungi of *Tsuga heterophylla* . Mycolo
2			Kropp BR. 1982. Fungi from decayed wood as ectomycorrhizal symbionts ECM CV
p/cd			Krpata D, Mühlmann O, Kul Arctostaphylos u Cortinarius (12), Tomentella (8), huv
			Krpata D, Peintner U, Langer I, Fitz WJ, Schweiger P. 2008. Ectomycorrhizal comn
cd			Krsek M, Wellington EMH. 1999. Comparison of different methods for the isolation
cd			Krüger A et al. 2004. Identification of premycorrhiza-related plant genes in the assoc
			Krüger M, Krüger C, Walker C, Stockinger H, Schüssler A. 2012. Phylogenetic refe
		x	Krüger M, Stockinger H, Krüger C, Schüssler A. 2009. DNA-based species level de
p			Krupa S, Fries N. 1971. Studies on ectomycorrhizae of pine: Production of organic v
			Kuan I-C, Tien M. 1993. Stimulation of Mn peroxidase activity: A possible role for
	x		Kuczynski J, Liu Z, Lozupone C, McDonald D, Fierer N, Knight R. 2010. Microbia
p/cd			Kueffer C, Schumacher E, Fleischamann, Edwards PJ, Dietz H. 2007. Strong below-
p			Kuek C, Tommerup IC, Malajczuk N. 1992. Hydrogel bead inocula for the producti
			Kühdorf K, Leotia lubrica arbutoidne mükoriisa Comarostaphylosel
			Kühn I, Nobis MP, Durka W. 2009. Combining spatial and phylogenetic eigenvecto
			Kuikka K, Härmä E, Markkola A, Rautio P, Roitto M, Saikkonen K, Ahonen-Jonnar
cd			Kulikov PV, Filippov EG. 2001. Specific features of mycorrhizal symbiosis formatic
			Kull K, Zobel M. 1991. High species richness in an Estonian wooded meadow. J. Ve
cd			Kull T, Kukk T, Leht M, Krall H, Kukk Ü, Kull K, Kuusk V. 2002. Distribution trer
			Kummel M, Lostroh P. 2011 valgusallika tugevus mõjutab kahe seeneliigi pı
p/cd			Kuninaga S, Natsuaki T, Takeuchi T, Yokosawa R. 1997. Sequence variation of the
p			Kuninaga S, Nicoletti R, Lahoz E, Naito S. 2000. Ascription of Nt isolates of Rhizoc
p/cd			Küper W, Sommer JH, Lovett JC, Mutke J, Linder HP, Beentje HJ, van Rompaey R
cd			Kuske CR, Ticknor LO, Busch JD, Gehring CA, Whitham TG. 2003. The pinyon rh
j			Kuyper TW, Veschoor BC. 1995. Enhancement of nitrification rates in vitro by inter
p/cd			Kuyper TW. 2008. Rhizosphere studies from the nanoscale to the globe. New Phyto
p			Kwak TJ, Zedler JB. 1997. Food web analysis of southern California coastal wetlan
cd			Kwasna H. 2004. Natural sh risosfääri seened tammel vs 2 a peale langetamist. Oidi

cd		Kytöviita M-M. 2000. Do symbiotic fungi refresh themselves by incorporating their
		Laaka -Lindberg S. 1999. Asexual reproduction in a population of a leafy hepatic sp
		Laaksovirta K, Lodenius M. 1979. Mercury content of fungi in Helsinki. Ann. Bot. F
p		Lacourt I, Duplessis S, Abba S, Bonfante P, Martin F. 2002. Isolation and character
		Ladau J, Sharpton TJ, Finucane MM, Jospin G, Kembel SW, O'Dwyer J, Koeppel A
p/cd		Ladiges PY, Kellermann J, Nelson G, Humphries CJ, Udovicic F. 2005. Historical b
p/cd		Ladiges PY, Udovicic F, Nelson G. 2003. Australian biogeographical connections an
p/cd		Ladiges PY, Udovicic F. 2005. Comment on molecular dating of the age of eucalypt
		Læssøe T, Hansen K. 2007. Truffle trouble: what happened to the Tuberales. Mycol
		Læssøe T, Petersen JH. 2008. Svampe livet på ækvator. Svampe 58: 1-52.
p/cd		Laiho O, Mikola P. 1964. Studies on the effect of some eradicants on mycorrhizal de
p		Laiho O. 1965. Further studies on the ectendotrophic mycorrhiza. Ann. For. Fenn. 79
p		Laiho O. 1970. *Paxillus involutus* as a mycorrhizal symbiont of forest trees. Acta Fo
		Laliberte E, Zemunik G, Turner BL. 2014. Environmental filtering explains variation
		Lam TY, Maguire DA. 2012. Structural Equation Modeling: theory and applications
		Lamarche J, Stefani FOP, Seguin A, Hamelin RC. 2011. Impact of endochitinase-tra
		Lamarche J, Stefani FOP, Se mullaseened vs endokitinaas-transform Picea ri
p/cd		Lamb Frye AS, Kron KA. 2003. rbcL phylogeny and character evolution in Polygon
p		Lamb RJ, Richards BN. 1974. Inoculation of pines with mycorrhizal fungi in natural
p		Lamb RJ, Richards BN. 1974. Inoculation of pines with mycorrhizal fungi in natural
p		Lamb RJ, Richards BN. 1974. Survival potential of sexual and asexual spores of ect
		Lambers H, Raven JA, Shaver GA, Smith SE. 2008. Plant nutrient-acquisition strate
cd		Lamhamedi MS, Bernier PY, Fortin JA. 1992. Growth, nutrition and response to wa
cd		Lamhamedi MS, Bernier PY, Fortin JA. 1992. Hydraulic conducttince and soil wate
		Lamhamedi MS, Fortin JA, Kope HH, Kropp BR. 1990. Genetic variation in ectomy
		Lamhamedi MS, Fortin JA. 1991. Genetic variations of ectomycorrhizal fungi: extra
		Lamhamedi MS, Godbout C, Fortin JA. 1994. Dependence of Laccaria bicolor basic
p		Lamont BB, Lange BJ. 1976. 'Stalagmiform' roots in limestone caves. New Phytol. 7
p/cd		Lamont BB, Ralph CS, Christensen PES. 1985. Mycophagous marsupials as dispers
		Lancellotti E, Franceschini A Sardiinia Quer Domin Cenoc; tom 12, rula 8, in
		Landeweert R, Hoffland E, Finlay RD, Kuyper TW, van Breemen N. 2001. Linking
cd		Landeweert R, Leeflang P, K männikus EMH s O: Cortinarius acutus, Russula decol
p/cd		Landeweert R, Leeflang P, S ektomükoriisa vs mulla DNA: liiga vähe proove, sarnan
cd		Landeweert R, Veenman C, Kuyper TW, Fritze H, Wernars K, Smit E. 2003. Quant
		Landhäusser SM, Stadt KJ, Lieffers VJ. 1997. Photosynthetic strategies of summerg
p/cd		Landim MF. 2003. Brasilian Atlantic rain forest remnants and mycorrhizal symbiosi
p		Landvik S, Egger KN, Schumacher T. 1997. Towards a subordinal classification of t
		Lane D. 1991. 16S/23S rRNA sequencing, p. 115–175. In E. Stackebrandt and M. G
p		Lanfranco L, Arlorio M, Matteucci A, Bonfante P. 1995. Truffles: their life cycle an
p		Lanfranco L, Garnero L, Delpero M, Bonfante P. 1995. Chitin synthase homologs in
		Lang C, Polle A. 2011. Ectom Saksa Fagus-Tilia-Fraxinus: ei sõltu puude liigi
		Lang C, Seven J, Polle A. 20 GER lehtmetsas Tilia vs Fagus Vs Carpinus: er
		Langeley JA, Hungate BA, Mycorrhizal controls on belowground litter quality. Ecol
p/cd		Langenfeld-Heyser R, Gao J, Ducic T, Tachd P, Lu CF, Fritz E, Gafur A, Polle A. 2
		Langenheder S, Bulling MT, Solan M, Prosser JI. 2010. Bacterial biodiversity-ecosy
p/cd		Langer I, Krpata D, Peintner U, Wenzel WW, Schweiger P. 2008. Media formulatio
p/cd		Langley JA, Chapman SK, Hungate BA. 2006. Ectomycorrhizal colonization slows r
cd		Langley JA, Dijkstra P, Drak medit tammevõsa Cenococcum
	x	Langrell SRH, Lung-Escarmant B, Decroocq S. 2001. Isolation and characterization
e		Lapeyrie F, Chilvers GA, Bhem CA. 1987. Oxalic acid synthesis by the mycorrhizal
e		Lapeyrie F. 1988. Oxalate synthesis from soil bicarbonate by the mycorrhizal fungus
		Lapeyrie FF, Bruchet G. 1985. Some factors influencing viability of ectomycorrhizal
		Lapeyrie FF, Bruchet G. 1986. Calcium accumulation by two strains, calcicole and c
		Lapeyrie FF, Chilvers GA. 1985. An endomycorrhiza-ectomycorrhiza succession ass
		Lara E, Belbahri L. 2011. SSU rDNA reveals major trends in oomycete evolution. F
		Lara E, Mitchell EAD, More turbaraba eukarüoodid: domin seened, eriti seen
		Lara E, Moreira D, Lopez-Garcia P. 2010. The environmental clade LKM11 and *Ro*
		Largent DL, Sugihara N, Wishner C. 1980. Occurrence of mycorrhizae on ericaceou
cd		Larget B, Simon DL. 1999. Markov chain Monte Carlo algorithms for the Bayesian
p		Larsen MJ, Smith JE, McKay D. 1997. On Piloderma bicolor and the close Piloderm
		Larsson E, 2002. Phylogeny of Corticoid Fungi with Russuloid Characteristics. PhD
t		Larsson E, Larsson K-H. 2003. Phylogenetic relationships of russuloid basidiomycet
t		Larsson E, Larsson K-H. Taxonomy of *Gloeocystidiellum* sensu stricto. Unpublishe
		Larsson E, Sundberg H. 2011. Lyophyllum shimeji, a species associated with lichen
		Larsson K-H, Parmasto E, Fischer M, Langer E, Nakasone KK, Redhead SA. 2006.
		Larsson K-H. 2007. Re-thinking the classification of corticioid fungi. Mycol. Res. 11
p		Last FT, Dighton J, Mason PA. 1987. Successions of sheathing mycorrhiza peremees
		Latalova K, Balaz M. 2010. Carbon nutrition of mature green orchid Serapias stictifl

p		Latham RE, Ricklefs RE. 1993. Continental comparisons of temperate-zone tree spe
cd		Latta RG. 2003. Gene flow, adaptive population divergence and comparative popula
p/cd		Launonen TM, Ashton DH, l vs eri vanustel põlenud muldadel bioassay: punaseks p
		Lavelle P, Lattaud C, Trigo D, Barois I. 1995. Mutualism and biodiversity in soils. F
p/cd		Lavin M, Herendeen PS, Wojciechowski MF. 2005. Evolutionary rates analysis of L
p/cd		Lavin M, Schrire BP, Lewis G, Pennington RT, Delgado-Salinas A, Thulin M, Hugh
p/cd		Lavin M. 2005. Floristic and geographical stability of discontinuous seasonally dry f
p/cd		Lawrey JD, Binder M, Diederich P, Molina MC, Sikaroodi M, Ertz D. 2007. Phylog
		Lawrynowicz M. 1990. Chorology of the European Hypogeous Ascomycetes. II. Tu
p		Lawrynowicz M. 2003. Threats to hypogeous fungi. In: ??? maasises
p/cd		Lawton RM. 1964. The ecology of the Marquesia acuminata evergreen forests and t
p		Lawton RM. 1978. A study of the dynamic ecology of Zambian vegetation. J. Ecol.
p/cd		Le Calvez T, Burgaud G, Ma ookeanisügavustes: v vähe, sh Chytridiomycota
cd		Le Quere A, Schützendübel A, Rajashekar B, Canback B, Hedh J, Erland S, Johanss
cd		Le Quere, A, Johansson T, Tunlid A. 2002. Size and complexity of the nuclear geno
p/cd		Leake J, Johnson D, Donnelly D, Muckle G, Boddy L, Read DJ. 2004. Networks of
B		Leake JR, Donnelly DP, Boddy L. 2002. In: van der Heijden MGA, Sanders IR (eds
		Leake JR, Donnelly DP, Saunders EM, Boddy L, Read DJ. 2001. Rates and quantiti
		Leake JR, Duran AL, Hardy KE, Johnson I, Beerling DJ, Banwart SA, Smits MM. 2
cd		Leake JR, McKendrick SL, Bidartondo MI, Read DJ. 2004. Symbiotic germination
		Leake JR, Read DJ. 1990. Chitin as a nitrogen source for mycorrhizal fungi. Mycol.
VIITED		Leake JR. 1994. The biology of myco-heterotrophic ("saprophytic") plants. New Ph
		Leake JR. 2004. Myco-heterotroph/epiparasitic plant interactions with ectomycorrhi
p/cd		Lebel T, Castellano M. 2002. Type studies of sequestrate Russulales II. Australian a
		Lebel T, Catcheside PS. 2009. The truffle genus *Cribbea* (Physalacriaceae, Agarica
		Lebel T, Orihara T, Maekawa N. 2012. The sequestrate genus Rosbeeva T.Lebel &
		Lebel T, Tonkin JE. 2007. Australasian species of *Macowanites* are sequestrate spe
		LeDuc SD, Lilleskov EA, Ho Michigan Pinu noormates metsades Thel terr ja
		Lee C, Lee S, Shin SG, Hwang S. 2003. Real-time PCR determination of rRNA gen
		Lee J, Lee S, Young PW, 2008. Improved PCR primers for the detection and identif
p		Lee KJ, Lee H. 2004. Fungal diversity and fruit-body production in relatio Quercus
cd		Lee MR, Parsons I. 1999. Biomechanical and biochemical weathering of lichen-encr
p		Lee SB, Taylor JW. 1990. Isolation of DNA from fungal mycelia and single spores.
cd		Lee SL Ale: Shorea leprosula Russula, Tomentella, Riessia, Riessiella jt Shorea le
		Lee S-L, Ng KK-S, Saw L-G, Norwati A, Salwana MHS, Lee C-T, Norwati M. 200
p/cd		Lee SS, Alexander IJ. 1994. The response of seedlings of two dipterocarp species to
p		Lee SS, Alexander IJ. 1996. Shorea leprosula: Fagirhiza fusca, Riessiella sp, Russul
p/cd		Lee SS, Patahayah M, Chong WS, Lapeyrie F. 2008. Successful ectomycorrhizal in
		Lee SS, Thi BK, Patahayah M. 2010. An ectomycorrhizal thelephoroid fungus of Ma
p		Lee SS, Watling R, Turnbull E. 1995. Ectomycorrhizal fungi as possible b varase st
p		Lee SS, Watling R, Turnbull E. 2003. Diversity of putative ectomycorrhiz Malaysia
p/cd		Lee SS. 1998. Root symbiosis and nutrition. In: Appanah S, Turnbull J, eds. A Revi
		Legendre P, Fortin M-J. 2010. Comparison of the Mantel test and alternative approa
	x	Legendre P, Gallagher ED. 2001. Ecologically meaningful transformations for ordin
		Legendre P, Mi X, Ren H, Ma K, Yu M, Sun F, He F. 2009. Partitioning beta divers
	y	Legendre P. 2008. Studying beta diversity: ecological variation partitioning by multi
		Legrand P, Ghahari S, Guillaumin J-J. 1996. Occurrence of genets of Arm Armillari
		Lehto T. 1992. Effect of drought on Picea sitchensis seedlings inoculated with myco
		Leibold MA, Economo EP, Peres-Neto P. 2010. Metacommunity phylogenetics: sep
p/cd		Lekberg Y, Koide RT, Rohr JR, Aldrich-Wolfe L, Morton JB. 2007. Role of niche r
		Lekberg Y, Schnoor T, Kjoller R, Gibbons SM, Hansen LH, Al-Soud WA, Sorensen
cd		Lemmon AR, Milinkovitch MC. 2002. The metapopulation genetic algorithm: an eff
		Leonardi M, Paolocci F, Rubini A, Simonini G, Pacioni G. 2005. Assessment of inte
		LePage BA, Currah RS, Stockey RA, Rothwell GW. 1997. Fossil ectomycorrhizae f
p/cd		LePage BA. 2003. The evolution, biogeography and palaeoecology of the Pinaceae b
		Lepp H. 2009 Australian Fungi Website. http://www.anbg.gov.au/fungi/
cd		Lerat S, Lapointe L, Gutjahr S, Piché Y, Vierheilig H. 2003. Carbon partitioning in a
p/cd		Lesaulnier C, Papamichail D, McCorkle S, Olliver B, Skiena S, Taghavi S, Zak D, I
		Leski T, Aucina A, Skridaila Pinus sylvestris 5 klooni eri taimlates: BD sarn
		Leski T, Pietras M, Rudawsk Quercus spp P(Pezizales mitmed liigid, Scleroc
p/cd		Leski T, Rudawska M, Auci Larix bare-root Wilcoxina mikolae, Suillus grev
		Leski T, Rudawska M. 2012 POL. Larix see Ala 1: Hydnotrya; Ala2 ja nurse
cd		Letowski J, Brousseau R, Masson L. 2004. Designing better probes: effect of probe
		Leuschner C, Jungkunst HF, Fleck S. 2009. Functional role of forest diversity: pros a
		Levesque CA. 2011. Fifty years of oomycetes - from consolidation to evolutionary a
cd		Levin DA. 2003. The ecological transition in speciation. New Phytol. 161: 91–96.
		Levisohn I. 1953. Aberrant root imfections of pine and spruce seedlings. QQQ 284-2
		Levisohn I. 1958. Physiological and ecological factors inflencing the effects of mycc

Levy-Booth DJ, Campbell RG, Gulden RH, Hart MM, Powell JR, Klironomos JN, I

Lewinsohn D, Nevo E, Wasser SP, Hadar Y, Beharav A. 2001. Genetic diversity in

cd Lewis PO. 2001. Phylogenetic systematics turns over a new leaf. Trends Ecol. Evol.

Li AR, Guan KY. 2008. Arbuscular mycorrhizal fungi may serve as another nutrient

Li A-R, Guan K-Y. 2008. Arbuscular mycorrhizal fungi may serve as another nutrie

Li CY, Massicotte HB, Moore LVH. 1992. Nitrogen-fixing Bacillus associated with

Li D-W. 2005. Release and dispersal of basidiospores from Amanita muscaria var. A

cd Li L, Yang A, Zhao Z. 2005. Seasonality of arbuscular mycorrhizal symbiosis and d

Li R-Q, Chen Z-D, Lu A-M, Soltis DE, Soltis PS, Manos PS. 2004. Phylogenetic re

Li YC, Feng B, Yang ZL. 2011. *Zangia* , a new genus of Boletaceae supported by m

cd Lian C, Miwa M, Hogetsu T. 2001. Outcrossing and paternity analysis of Pinus dens

Lian C, Nara K, Nakaya H, Zhou Z, Wu B, Miyashita N, Hogetsu T. 2001. Develop

p/cd Lian C, Narimatsu M, Nara I Tricholoma matsı Ringi sees Rhizopogon sp, Russ sp, T

Lian C, Zhou Z, Hogetsu T. 2001. A simple method for developing microsatellite ma

p/cd Liang Y, Guo L-D, Du X-J, Ma K-P. 2007. Spatial structure and diversity EcM puu

Lichstein JW. 2007. Multiple regression on distane matrices: a multivriate spatial an

Liebel HT, Bidartondo MI, Preiss K, Segreto R, Stöckel M, Rodda M, Gebauer G. 2

Liebel HT, Gebauer G. 2010. Stable isotope signatures confirm carbon and nitrogen

Liepina L. 2012. Occurrence of fungal structures in bryophytes of the boreo-nemoral

Lievens B, Kerckhove S, Juste A, Cammue BOA, Honnay O, Jacquemyn H. 2010. F

Ligrone R, I Aneuria ja Cryptothallus kandseentest endofüüdid: koloniseerivad vaid

p Lihnell D. 1940. Untersuchu kadakal arbuskulaarne MR ja DSE, kahest kohast leiti

p Lihnell D. 1 Cenococcum: mantel

p Lihnell D. 1943. Keimungsversuche mit Pyrolasamen. Symbolae Botanicae Upsalien

Liira J, Zobel K. 2000. The species richness -biomass relationship in herbaceous pla

cd Liiri M, Setälä, Haimi J, Pen mikrolülijalgsete BD mullas ei mõjuta seente BD DGG

p Lilja A, Rikala R. 2000. Effect of uninucleate Rhizoctonia on the survival of outplan

Lilleskov EA, Bruns TD, Dawson TE, Camacho FJ. 2009. Water sources and contro

p/cd Lilleskov EA, Bruns TD, Horton TR, Taylor DL, Grogan P. 2004. Detection of fores

p/cd Lilleskov EA, Bruns TD. 2003. Root colonization dynamics of two ectomycorrhizal

p Lilleskov EA, Bruns TD. 2005. Spore dispersal of aresupinate ectomycorrhizal fung

Lilleskov E. xxx kuusik: N-gradieı kõrge N: Lact theiogalus, F kuusik: N

p Lilleskov EA, Fahey TJ, Lovett GM. 2001. Ectomycorrhizal fungal aboveg kahaneb

cd Lilleskov EA, Hobbie EA, Fahey TJ. 2002. Ectomycorrhizal fungal taxa differing in

Lilleskov EA, Hobbie EA, Horton TR. 2011. Conservation of ectomycorrhizal fungi

p/cd Lilleskov EA, Parrent JL. 2007. Can we develop general predictive models of mycoı

Lilleskov EA; Bruns TD. 2003. Root colonization dynamics of two ectomycorrhizal

cd Lim S, Notley-McRobba L, Lim M, Carter DA. 2004. A comparison of the nature ar

Lim SR, Berbee ML. 2013. I Vancouver IS, fülogeneetiline struktuur LSU p

Lindahl B, Finlay R, Olsson S. 2001. Simultaneous, bidirectional translocation of 32

b Lindahl B, Finlay RD, Cairney JWG. 2005. Enzymatic activities of mycelia in myco

p/cd Lindahl B, Finlay RD. 2006. Activities of chitinolytic enzymes during primary and s

p/cd Lindahl B, Ihrmark K, Bober metsamulla erikil värskes kõdus Helotiales, Mycena-M

Lindahl B, Stenlid J, Finlay R. 2001. Effects of resource availability on mycelial inte

Lindahl B, Stenlid J, Olsson S, Finlay R. 1999. Translocation of 32P between intera

Lindahl B, Taylor AFS, Finlay RD. 2002. Defining nutritional constraints on carbon

Lindahl B, Tunlid A. 2015. Ectomycorrhizal fungi – potential organic matter decomp

Lindahl B. 2000. Ectomycorrhizal fungi raid saprotrophic ones. Mycol. Res. 104: 38

Lindahl BD, de Boer W, Fin mullaseened; vs girdling, SWE: EcM seened as

2013 5 x 8 x x Lindahl BD, Nilsson RH, Tedersoo L, Abarenkov K, Carlsen T, Kjøller R, Kõljalg U

Lindahl BD, Taylor AFS. 2004. Occurrence of N-acetylhexosaminidase-encoding ge

p/cs Linder HP, Hardy CR. 2004. Evolution of the species-rich Cape flora. Phil. Trans. R

cd Linder HP. 2001. Plant diversity and endemism in sub-Saharan tropical Africa. J. Bio

Linder RC, Goertzen LR, Vanden Heuvel B, Francisco-Ortega J, Jansen RK. 2000. T

Lindner DL, Banik MT. 2009. Effects of cloning and root-tip size on observations o

Lindner DL, Banik MT. 2011. Intragenomic variation in the ITS rDNA region obscu

Lindner M, Maroschek M, Netherer S, Kremer A, Barbati A, Garcia-Gonzalo J, Sei

Lindquist VB. 1939. Die Fichtenmykorrhiza im Lichte der modernen Wuchsstoffors

cd Lindsley MD, Hurst SF, Iqbal NJ, Morrison CJ. 2001. Rapid identification of dimorp

cd Lindstrom SC. 2001. The Bering Strait connection: dispersal and speciation in borea

cd Lipshutz RJ, Fodor SPA, Gingeras TR, Lockhart DJ. 1999. High density synthetic o

cd Lipson DA, Schadt CW, Schmidt SK, Monson RK. 1999. Ectomycorrhizal transfer o

cd Lipson DA, Schadt CW, Sch mikroobikoosluste struktuur on erinev ühel talvel, keva

Lipus A, Kennedy PG. 2011. Frankia assemblages associated with Alnus rubra and A

x **x** Lisboa FJG, Peres-Neto PR, Chaer GM, Jesus EdC, Mitchell RJ, et al. 2014. Much

cd Liston A, Robinson WA, Pinero D, Alvarez-Buylla ER. 1999. Phylogenetics of Pinu

x Litaker RW, Vandersea MW, Kibler SR, Reece KS, Stokes NA, Lutzonia FM, Yon

Litchman E. 2010. Invisible invaders: non-pathogenic invasive microbes in aquatic a

		Litchman E. 2010. Invisible invaders: non-pathogenic invasive microbes in aquatic a
	x	Liti G, Carter DM, Moses AM, Warringer J, Parts L, James SA and 20 others. 2010
		Litton CM, Raich JW, Ryan MG. 2007. Carbon allocation in forest ecosystems. Glo
p		Liu G, Chambers SM, Cairney JWG. 1998. Molecular diversity of ericoid mycorrhiz
		Liu H, Luo Y, Liu H. 2010. Studies of mycorrhizal fungi of Chinese orchids and thei
p/cd		Liu JJ, Hall BD. 2004. Body plan evolution of ascomycetes, as inferred from an RN
		Liu K, Raghavan S, Nelesen S, Linder CR, Warnow T. 2009. Rapid and accurate la
		Liu K-L, Porras-Alfaro A, Kuske CR, Eichorst SA, Xie G. 2012. Accurate, rapid tax
cd		Liu W-T, Mirzabekov AD, Stahl DA. 2001. Optimization of an oligonucleotide micr
		Liu X, Liang M, Etienne RS, Wang Y, Staehelin C, Yu S. 2012. Experimental evide
p/cd		Liu Y, Leigh JW, Brinkmann H, Cushion M, Rodriguez-Espeleta N, Philippe H, Lar
cd		Liu YJ, Whelen S, Hall BD. 1999. Phylogenetic relationships among ascomycetes: e
		Lobanov NB. 1971. Mikotrofnost drevesnych rastenii. Izdatelstvo Lesnaja Promyshl
		LoBuglio KF, 1999. *Cenococcum.* In: Cairney JWG, Chambers SM (eds). Ectomyc
cd		LoBuglio KF, Berbee ML, Taylor JW. 1996. Phylogenetic origins of the asexual my
		LoBuglio KF, Taylor JW. 2002. Recombination and genetic differentiation in the my
p		LoBuglio KF, Wilcox HE. 1988. Growth and survival of ectomycorrhizal and ectend
		Lockwood JL, Hoopes MF, Marchetti MP. 2007. Invasion Ecology. Blackwell Publ
		Lodge DJ, \ 6 mantlitüüpi
		Lodge DJ. 1989. The influence of soil moisture and flooding on formation of VA-en
p		Lodge DJ. 1996. Microorganisms. In: Reagan DP, Waide RB, eds. The fo Puerto R
p/cd		Lodge DJ. 2003. Basidiomycetes of the Greater Antilles, especially the Luquillo LT
b		Lomolino MV, Riddle BR, Brown JH. 2006. Biogeography. 3rd Edn. Sinauer Assoc
p		Londono AC, Alvarez E, Forero E, Morton CM. 1995. A new genus and species of
p		Longino JT, Coddington J, C liigirikkuse ekstrapoleerimine lihtsate matemaatiliste fu
		Lopez-Quintero CA, Straatsma G, Franco-Molano AE, Boekhout T. 2012. COL Ar
cd		Lorang JM, Tuori RP, Martinez JP, Sawyer TL, Redman RS, Rollins JA, Wolpert T
cd		Lord NS, Kaplan CW, Shank P, Kitts CL, Elrod SL. 2002. Assessment of fungal div
		Loreau M, Hector A. 2001. Partitioning selection and complementarity in biodiversit
		Loreau M, Hector A. 2001. Partitioning selection and complementarity in biodiversit
p/cd		Loreau M, Naeem S, Inchausti P et al., Biodiversity and ecosystem functioning: curr
cd		Loreau M. 2000. Biodiversit liigirikkus-ökosüs prod, stab suhe: nishi efekt, selectio
p/cd		Loree MAJ, Lumme I, Niemi M, Tormala T. 1989. Inoculation of willows (*Salix* sp
		Losos JB. 1996. Phylogenetic perspectives on community ecology. Ecology 77: 134
		Losos JB. 2008. Phylogenetic niche conservatism, phylogenetic signal and the relati
p		Louis I. 198 Shorea parvifolia ECM ja ektendoMR on mõl sagedased EEMR on kau
		Louis I. 1990. A mycorrhizal survey of plant species colonizing coastal reclaimed la
		Louzan R, Wilson AW, Binder M, Hibbett DS. 2007. Phylogenetic placement of *Di*
p/cd		Lovelock CE, Ewel JJ. 2005. Links between tree species, symbiotic fungal diversity
p/cd		Lovett JC, Marshall AR, Carr J. 2006. Changes in tropical forest egetation along an
		Lovett JC. 1996. Elevational and latitudinal changes in tree associations and diversit
cd		Lowell JL, Klein DA. 2001. 18S diversiteet S.
p/cd		Lowore J. 2003. Miombo woodlands and rural livelihoods in Malawi. CIFOR report
cd		Loy A, Lehner A, Lee N, Adamczyk J, Meier H, Ernst J, Schleifer K-H, Wagner M.
		Löytynoja A, Goldman N. 2008. Phylogeny-aware gap placement prevents errors in
p/cd		Lozupone C, Knight R. 2005. UniFrac: a new phylogenetic method for comparing m
		Lozupone C, Lladser ME, Knights D, Stombaugh J, Knight R. 2011. Unifrac: an eff
		Lozupone CA, Hamady M, Cantarel BL, Coutinho PM, Henrissat B, Gordon JI, Kni
p/cd	x	Lozupone CA, Hamady M, Kelley, ST, Knight R. 2007. Quantitaive and qualitative
p/cd		Lozupone CA, Hamady M, Knight R. 2006. UniFrac-An online tool for comparing r
p/cd		Lozupone CA, Knight R. 2007. Global patterns in bacterial divesity. Proc. Natl. Aca
	x	Lozupone CA, Knight R. 2008. Species divergence and the measurement of microbi
p/cd		Lu G, Cannon PF, Reid A, Simmons CM. 2004. Diversity and molecular relationshi
p/cd		Lu X, Malajczuk N, Brundrett M, Dell B. 1999. Fruiting of putative ectom Eucalypt
p/cd		Lu X, Malajczuk N, Dell B. 1998. Mycorrhiza formtion and growth of *Eucalyptus g*
cd		Lucas EJ, S.R.Belsham2, E.M. NicLughadha1, D. A.Orlovich2, C.M. Sakuragui3,M
		Lucas RW, Casper BB. 2008. Ectomycorrhizal community and extracellular enzyme
p		Lück R. 1941. Zur Keimung der heimischen Pirola-Arten. Flora (Jena) 135: 1-5.
p/cd		Ludley KE, Robinson CH, Jickells S, Chamberlain PM, Whitaker J. 2008. Different
p/cd		Ludley KE, Robinson CH. 2008. 'Decomposer' Basidiomycota in Arctic and Antarc
p/cd		Luis P, Kellner H, Zimdars E lakaasigeenide m geenidest nii ülal kui all domin Russu
cd		Luis P, Walther G, Kellner F kandseente lakaasi geenide diversiteet mulla eri horisoo
p/cd		Lukac M, Calfapietra C, Godbold DL. 2003. Production, turnover and mycorrhizal c
p/cd		Lumbsch HT, Buchanan PK, May TW, Mueller GM. 2008. Phylogeography and bio
p/cd		Lumbsch HT, Schmitt I, Palice Z, Wiklund E, Ekman S, Wedin M. 2004. Supraordi
p/cd		Lumbsch T, Huhndorf SM. 2007. Notes on ascomycete systematics. Outline of Asco
p		Lumley TC, Farquhar ML, Peterson RL. 1995. Ectomycorrhiza formation between P
		Lundberg DS, Lebeis SL, Paredes SH, Yourstone S, Gehring J, Malfatti S, Tremblay

y		Lundberg DS, Yourstone S, Mieczkowski P, Jones CD, Dangl JL. 2013. Practical in
cd		Lunt PH, Hedger JN. 2003. Effects of organic enrichment of mine spoil on growth a
j		Luoma DL, Frankel RE. 1991. Fruiting of hypogeous fungi in Oregon Dou hüpogeili
p/cd		Luoma DL, Stockdale CA, N osaliselt raiutud aladel: kokku 108 liiki. Kasvamajäetud
		Lupatini M, Chondrogaster angustisporus BRA Eukulaptidel
p		Luppi AM, Byssocorticium atrovirens, Cortinarius multiformis, Lact chry
p		Lusk DE. 1987. *Pseudaleuria quinaultiana* , a new genus and species of operculate
p		Lüttge U, Haridasan M, Fernandes GW, de Mattos EA, Trimborn P, Franco AC, Ca
p		Lutzoni F, Kauff F, Cox CJ and 41 others. 2004. Assembling the fungal tree of life:
		Lutzoni F, Pagel M, Reeb V. 2001. Major fungal lineages are derived from lichen sy
cd		Lutzoni F, Pagel M. 1997. Accelerated evolution as a consequence of transitions to
		Lyman DR, Hoyle RH, Newman JP. 2006. The perils of partialling. Assessment 13:
p/cd		Lynch MDJ, Thorn RG. 200 mullaseened põllul: klaadidest domin Clavariac
		Lyons JI, Alber M, Hollibaugh JT. 2010. Ascomycete fungal communities associate
cd		Lyons KG, Schwartz MW. 2001. Rare species loss alters ecosystem function -invasi
cd		M. Guttenberger 1 ,H.Zick,H.Thelen,T.Wallendaand R.Hampp. 1998. The effect of
		Ma L-J, van der Does HC, Borkovich KA, Coleman JJ, Daboussi MJ, Di Pietro A.
cd		Ma M, Tan TK, Wong SM. 2003. Identification and molecular phylogeny of Epulorl
		Mabru et al. 2001. Rapid molecular typing method for the reliable detection of Asiat
cd		MacGregor BJ, Brüchert V, Fleischer S, Amann R. 2002. Isolation of small-subunit
p/cd		Macia-Vicente JG, Jansson H-B, Abdullah SK, Descals E, Salinas J, Lopez-Llorca I
		Maddison WP, Maddison DR. 2005. Mesquite: A modular system for evolutionary a
cd		Madrid VM, Aller JY, Aller bakterid ja arhed Pr Guajaana setetes: pms proteobakte
cd		Madrid VM, Taylor GT, Scanton MI, Chistoserdov AY. 2001. Phylogenetic diversit
		Maeda M. 1954. The meaning of mycorrhiza in regard to systematic botany. Kumar
		Maestre FT, Quero JL, Gotelli NJ, Escudero A, Ochoa V, Delgado-Baquerizo M. 20
p/cd		Maeta K, Ochi T, Tokimoto K, Shimomura N, Maekawa N, Kawaguchi N, Nakaya
p		Maguire B, Ashton PS, de Zeeuw C, Giannasi DE, Niklas KJ. 1977. Pakaraimoidea
x		Magurran AE, 1988. Ecological diversity and its measurement. Princeton University
cd		Magurran AE, Henderson PA. 2003. Explaining the excess of rare species in natural
n		Magyar L, Beenken L, Jakucs E. 1999. I*nocybe heimii + Fumana procumbens.* De
		Mah K, Tackaberry LE, Egg vana vs raiutud v vana mets: Russula, Thelephora, Heb
	x	Mahé S, Duhamel M, Le Calvez T, Guillot L, Sarbu L, **Bretaudeau A, Colline**t O.
		Maherali H, Klironomos J. 2012. Phylogenetic and trait-based assembly of arbuscula
x		Maherali H, Klironomos JN. 2007. Influence of phylogeny on fungal community ass
		Mahmood S, Finlay RD, Erl koristatud mets v Cortinarius, Thelephora, Lactarius th
cd		Mahmood S, Finlay RD, Fransson A-M, Wallander H. 2003. Effects of hardened wo
		Mahmood S, Finlay RD, Wa muld vs tuhagraa Kontroll: Cortinarius sp3, Tylospora
cd		Mahmood S. 2003. Colonisation of spruce roots by two interacting ectomycorrhizal
p/j		Maia LC, Yano AM, Kimbrough JW. 1996. Species of Ascomycota forming ectomy
		Maier E, Tollrian R, Nürnberger B. 2001. Development of species-specific markers
		Maijala P, Fagerstedt KV, Raudaskoski M. 1991. Detection of extracellular cellulol
		Maitland TD, Wakefield EM.1917. Notes on Uganda fungi. Royal Botanic Gardens,
p/cd		Makana J-R, Thomas SC. 2006. Impacts of selective logging and agricultural clearin
p/cd		Makana J-R. 2005. Effects of light gaps and litter removal on the seedling performan
		Malajczuk N, Dell B, Bougher NL. 1987. Ectomycorrhiza formation in *Eucalyptus* .
		Malajczuk N, Hartney VJ. 1986. Procedure for inoculation of micropropagated plan
p		Malajczuk N Eucalyptus marg Eucalyptus marginata EcM tüüpide Ohtrus sõltub aasta
p		Malajczuk N, McComb AJ, Loneragan JF. 1975. Phosphorus uptake and growth of
		Malajczuk N sünteesitud euka sünteesitud eukalüptidel vs mänd
		Malajczuk N, Molina R, Trappe JM. 1984. Ectomycorrhiza formation in *Eucalyptus*
p		Malajczuk N 4 tüüpi Eucalyptus marginata, E calophylla: mantli str, peremehespets. T
p/cd		Malloch D, Malloch B. 1982. The mycorrhizal status of boreal plants: additional spe
		Malloch D, Thorn RG. 1985. The occurrence of ectomycorrhizae in some species of
p		Malloch D. 1987. The evolution of mycorrhizae. Can. J. Plant Pathol. 9: 398-402.
VIITED		Malloch DW, Pirozynski KA, Raven, PH. 1980. Ecological and evolutionary signific
		Mamoun M, Oliver JM. 199 vs steriilne pinnas vs Festuca ovina
		Mamoun M, Olivier JM. 1993. Competition be Tuber melanosporum vs T. brumale (
cd		Mamoun M, Olivier J-M. 19 tuberiga inokulee Tuber vanadel juurtel, noorematel ju
p/cd		Mandyam K, Jumpponen A. 2005. Seeking the elusive function of root-colonizing da
p/cd		Manefield M, Whiteley AS, Griffiths RI, Bailey MJ. 2002. RNA stable isotope prob
		Manerkar MA, Seena S, Bärlocher F. 2008.Q-RT-PCR for Assesing Archaea, Bacte
		Mangan SA, Schnitzer SA, Herre EA, Mack KLM, Valencia MC, Sanchez EI, Beve
cd		Manian S, Sreenivasaprasad S, Bending GD, Mills PR. 2001. Genetic diversity and
		Manley SAM, Ledig T. 1979. Photosynthesis in black and red spruce and their hybr
		Manner HI, Elevitch CR. 2006. *Gnetum gnemon* (gnetum). In: Elevitch CR, ed. Spe
cd		Manos PS, Doyle JJ, Nixon KC. 1999. Phylogeny, biogeography, and processes of m
p/cd		Manos PS, Stanford AM. 2001. The historical biogeography of Fagaceae: tracking t

cd	Mansur M, Suarez T, Fernandez-Larrea JB, Brizuela MA, Gonzalez AE. 1997. Iden
cd	Mansur M, Suarez T, Gonzales AE. 1998. Differential gene expression in the laccas
	Manter DK, Weir TL, Vivanco JM. 2010. Negative effects of sample pooling on PC
	Manzoni S, Schimel JP, Porporato A. 2012. Responses of soil microbial communitie
	Maraun M, Erdmann G, Schulz G, Noton RA, Scheu S, Domes K. 2009. Multiple c
	Maraun M, Schatz H, Scheu S. 2007. Awesome or ordinary? Global patterns of orib
cd	Marcais B, Martin F, Delatour C. 1997. Structure of Collybia fusipes popu Collybia
cd	Marcial Gomes NC, Fagbola maisi risosfäär Brasiilias: 20 p vs 90p, risosf vs eemal:
	Marek SM, Hansen K, Romanish M, Thorn RG. 2009. Molecular systematics of the
p/cd	Maremmani A, Bedini S, Matosevic I, Tomei PE, Giovanetti M. 2003. Type of myc
cd	Marincovich L, Gladenkov AY. 1999. Evidence for an early opening of the Bering S
b	Markgraf V, Romero E, Villagran C. 1996. History and paleoecology of South Ame
	Markham JH. 2008. Population size effects on germination, growth and symbiotic ni
	Markham JH. 2008. Variability of nitrogen-fixing Frankia on Alnus species. Botany
cd	Markkola A Kuikka K, Rautio P, Härmä E, Roitto M, Tuomi J. 2004. Defoliation in
cd	Markkola AM, Ahonen-Jonr Lapimaa männiku Suilloid-tüüp, hoolimata katsest
	Markkola AM, Ohtonen R, Tarvainen O, Ahonen-Jonnarth U. 1995. Estimates in fu
cd	Marlowe EM, Hogan JJ, Hindler JF, Andruszkiewicz I, Gordon P, Bruckner DA. 20
p	Maron JL, Jeffries RL. 2001. Restoring enriched grasslands: effects of mowing on s
	Marr CD. 1979. Laccase and tyrosinase oxidation of spot test reagents. Mycotaxon
p	Marshall JD, Ehleringer JR. 1990. Are xylem-trapping mistletoes partially heterotro
	Martel A, Blooi M, Adriaensen C, van Rooij P, Beukema W, Fisher MC et al. 2014.
cd	Martin AP. 2002. Phylogenetic approaches for describing and comparing the diversi
cd	Martin F, Delaruelle C, Ivory M. 1998. Genetic variability in intergenic spacers of ri
j	Martin F, Diez J, Dell B, Delaruelle C. 2002. Phylogeography of the ectomycorrhiza
	Martin F, Duplessis S, Ditengou F, Lagrange H, Voiblet C, Lapeyrie F. 2001. Devel
	Martin F, Kohler A, Murat C, Balestrini R, Coutinho PM, Jaillon O et al. 2010. Peri
	Martin F, Nehls U. 2009. Harnessing ectomycorrhizal genomics for ecological insig
p/cd	Martin F, Selosse M-A, Le Tacon F. 1999. The nuclear rDNA intergenic spacer of t
p/cd	Martin KJ, Rygiewicz PT. 2005. Fungal-specific PCR primers developed for analysi
p/cd	Martin MP, Raidl S, Telleria MT. 2004. Molecular analyses confirm the relationship
p	Martin MP, Rocabruna A. 1999. The taxonomic boundaries between Naucoria rheo
	Martinelli LA, Piccolo MC, Townsend AR, Vitousek PM, Cuevas E, McDowell W,
cd	Martin-Laurent F, Philippot L, Hallet S, Cahussod R, Germon JC, Soulas G, Catrou
j	Martino E, Turnau K, Girlanda M, Bonfante P, Perotto S. 2000. Ericoid mycorrhizal
p/cd	Martin-Pinto P, Vaquerizo H, Penalver F, Olaizola J, Orie-de-Rueda JA. 2 põlengud
p/cd	Martos F, Dulormne M, Pailler T, Bonfante P, Faccio A, Fournel J, Dubois M-P, Se
	Martos F, Munos F, Pailler T, Kottke I, Gonneau C, Selosse M-A. 2012. The role o
p	Marx DH, Bryan WC, Grand LF. 1970. Colonization, isolation, and cultural descrip
	Marx DH, Hatch AB, Mendicino JF. 1977. High soil fertility decreases sucrose cont
p	Marx DH, Jarl K, Ruehle JL, Bell W. 1984. Development of Pisolithus tinctorius ect
	Marx DH, Kenney DS, ???. Pages 131-146. Production of Ectomycorrhizal Fungus
p	Marx DH, Ross EW. 1970. Aseptic synthesis of ectomycorrhizae on Pinus taeda by
	Marx DH, Ross EW. 1970. Aseptic synthesis of ectomycorrhizae on Pinus taeda by
	Marx DH, Rowan SJ. 1981. Fungicides influence growth and development of specif
	Marx DH. 1971. Ectomycorrhizae as Biological Deterrents to Pathogenic Root Infec
	Marx DH. 1973. Mycorrhiza ECM rohkus, mitmekesisus vs patogeenid
	Mason PA, Ibrahim K, Ingleby K, Munro RC, Wilson J. 2000a. Mycorrhizal develo
	Mason PA, Ingleby K, Munro RC, Wilson J, Ibrahim K. 2000b. Interactions of nitro
	Mason PA, Ingleby K, Munro RC, Wilson J, Ibrahim K. 2000c. The effect of reduce
p	Mason PA, Last FT, Pelham J, Ingleby K. 1982. Ecology of some fungi as arukask
p	Mason PA, Wilson J, Last FT. 1983. The concept of succession in relation to the sp
	Massicotte ECM anatoomia eri lehtpuudel-sarnane, juure paksus sõltus koloniseeri
p	Massicotte Alpova-Alnus; eri lepa liigid: Hartigi võrgustiku sissekasved erinevad
	Massicotte Kobresia, Polygonum: üldanatoomia
	Massicotte Rhizopogon vs Truncocolumella sünt ja EcM SEM kirjeldus
	Massicotte HB, Melville LH, Peterson RL, Unestam T. 1999. Comparative studies o
p	Massicotte Laccaria bicolor viljakehade tekke anatoomia: sõlmekesed, tihenenud p
	Massicotte Pyrola, Chimaphila, Orthilia, Moneses: mantel hästi arenenud
	Massicotte Rhizopogon jt maasisesed
	Massicotte xxx, kirjeldused eri puuliikidel sama inokulumiga mullal
p	Massicotte Alpova-Alnus; vs mittemükor juur
	Massicotte Cenococcum: sklerootsiumid
	Masui K. 1926. A Study of the Ectotrophic mycorrhiza of Alnus. Memoirs Alnus ja
	Masui K. 19 Tricholoma männil, Cortinarius männil, haaval, Gomphus flo
	Materials and Methods
	Matheny PB, Aime MC, Bougher NL, Buyck B, Desjardin D, Horak E, Kropp BR,
j	Matheny PB, Aime MC, Henkel TW. 2003. New species of Inocybe from Dicymbe

	p/cd	Matheny PB, Bougher NL. 2006. The new genus *Auritella* from Africa and Australi
	p/cd	Matheny PB, Curtis JM, Hofstetter V and 22 others. 2006. Major clades of Agarical
	p/cd	Matheny PB, Gossmann JA, Zalar P, Arun Kumar TK, Hibbett DS. 2007. Resolving
	cd	Matheny PB, Liu YJ, Ammirati JF, Hall BD. 2002. Using RPB1 sequences to impro
	p/cd	Matheny PB, Wang Z, Binder M and 24 others. 2007. Contributions of rpb2 and tef
	cd	Matheny PB. 2005. Improving phylogenetic inference of mushrooms with RPB1 and
		Mathur J, Bizzoco RW, Ellis DG, Lipson DA, Poole AW, Levine R, Kelley ST. 200
		Matsuda Y, Hijii N. 1999. Characterization and identification of *Strobilomyces conf*
	cd	Matsuda Y, Hijii N. 2004. E nulg Abies firma seemikutel ja vanadel puudel Russula
		Matsuda Y, Noguchi Y, Ito S Pinus thunbergii: 1-5 aastastel seemikutel sukts
		Matsui M, Fowler JH, Walling LL. 2007. Leucine aminopeptidases: diversity in stru
	p	Matthies D. 1996. Interactions between the root hemiparasite Melampyrum arvense
		Mattirolo O. 1887. Sul parassitismo dei Tartufi e sulla quistione delle Mycorhizae. M
	cd	Mattison EHA, Norris K. 2005. Bridging the gaps between agricultural policy, land-
	p/cd	Maury-Lechon G, Curtet L. 1998. Biogeography and evolutionary systematics of Di
		May TW, Dunk C, Lebel T. 2006. Austral ectomycorrhizas overlooked. Mycol. Res
	p	May TW, Simpson JA. 1997. Fungal diversity and ecology in eucalypt ecosystems.
	p	May TW. 2001. Documenting the fungal biodiversity of Australasia: from 1800 and
	p	May TW. 2002. Where are the short-range endemics among western Australian mac
	cd	Mayaux P, Bartholome E, Fritz S, Belward A. 2004. A new land-cover map of Afric
	p/cd	Mayor JR, Henkel TW. 2006. Do ectomycorrhizas alter leaf-litter decomposition in
		Mayor JR, Schuur EAG, Henkel TW. 2009. Elucidating the nutritional dynamics of
		Mayor JR, Schuur EAG, Mack MC, Hollingsworth TN, Baath E. 2012. Nitrogen iso
		McAfee BJ, Fortin JA, The influence of pH on competitive interactions of ectomyco
	p	McAfee BJ, Fortin JA. 1986. Competitive interactions of ectomycorrhizal mycobion
	p/cd	McArdle BH, Anderson MJ. 2001. Fitting multivariate models to community data: a
	cd	McCaig AE, Glover LA, Pro bakterid 16S rDNA majandatud vs majandamata rohun
	cd	McCaig AE, Glover LA, Prosser JI. 2001. Numerical analysis of grassland bacterial
		McCormick MK, Taylor DL, Juhaszova K, Burnett RK, Whigham DF, O'Neill JP. 2
	cd	McCormick MK, Whigham I OrM: Cephalanthera austineae (MHP): Tomentella spp
		McCormick MK, Whigham DF, O'Neill JP, Becker JJ, Werner S, Rasmussen HN, B
	p/cd	McCormick MK, Whigham DF, Sloan D, O'Malley K, Hodkinson B. 2006. Orchid-f
		McCune B, Mefford MJ, 1999. Multivariate Analysis of Ecological Data Ver. 4.01.
		McCune B, Mefford MJ. 2006. PC-ORD. Multivariate Analysis of Ecological Data.
	1	McDonald KR, Pennell J, Fr Cercocarpus vs Pezizales, Inoc, Tom-thel
		McDougall WB, Jacobs MC. 1927. Tree mycorhizas from the central Rocky Mount
		McDougall WB, Liebtag C.1928. Symbiosis in a deciduous forest. Bot. Gaz. 86: 22
		McDougall Russula, Cortinarius, Leccinum scabrum , Scleroderma mükc
		McDougall. 1928. Mycorhizas from North Carolina and Eastern Tennessee. Bot. Ga
	p/cd	McFadden B. 2006. Extinct mammalian biodiversity of the ancient New World tropi
	p/cd	McGee PA, Bullock S, Summerell BA. 1999. Structure of mycorrhizae of the Wolle
	p/cd	McGee PA, Ceratopetalum apetalum: VAM ja 1-rakukihise mantliga ilma HN-ta Ec
	p	McGee PA, Trappe JM. 2002. The Australian zygomycetous mycorrhizal fungi. II. F
	p/cd	McGee PA. 1986. Mycorrhizal associations of plant species in a semiarid communit
	p	McGee PA. 1988. Growth response to and morphology of mycorrhizas of Thysanot
		McGee PA. 1988. Growth response to and morphology of mycorrhizas of Thysanot
	p	McGee PA. Densospora (Endogonaceae) -EcM seened seigseente hulgas. Densospo
		McGuire KL, Bent E, Borneman J, Majumder A, Allison SD, Treseder KK. 2010. F
		McGuire KL, Fierer N, Bate seente liigirikkus kõdus (SSU!!!) ei sõltu taime
	p/cd	McGuire KL, Henkel TW, Cerda IG, Villa G, Edmund F, Andrew C. 2008. Dual my
		McGuire KL, Zak DR, Edwards IP, Blackwood C, Upchurch R. 2010. Slowed deco
	p/cd	McGuire KL. 2007. Common ectomycorrhizal networks may maintain monodomina
	p/cd	McGuire KL. 2007. Recruitment dynamics and ectomycorrhizal colonization of Dicy
	p/cd	McHugh TA, Gehring CA. 2 Pinus edulis Arizo Pinus edulis Arizonas: 5 liiki Geopor
		McKendrick SL, Leake JR, Read DJ. 2000. Symbiotic germination and developmen
	cd	McKendrick SL, Leake JR, Taylor DL, Read DJ. 2000. Symbiotic germination and d
	cd	McKendrick SL, Leake JR, T Neottia 2 Sebacina spp
	p/cd	McKenzie EHC, Buchanan PK, Johnston PR. 2000. Checklist of fungi on Uus-Mer
		McLaughlin DJ. 1974. Fruitbody formation by Tylopilus Felleus in axenic culture. M
		McLoughlin S. 2001. The breakup history of Gondwana and its impact on pre-Ceno
	p	McMullan-Fisher SJM, May TW, Keane PJ. 2002. The macrofungal comm eukalüpti
	p	McNabb RFR. 1961. Mycorrhiza in the New Zealand Ericales. Aust. J. Bot. 9: 57-6
		McNabb RFR. 1967. The Boletaceae of New Zealand. N. Z. J. Bot. 6: 137-176.
		McNabb RFR. 1967. The Strobilomycetaceae of New Zealand. N. Z. J. Bot. 5: 532-
	p/cd	McVean DN. 1955. Ecology of *Alnus glutinosa* (L.) Gaertn. IV. Root system. J. Ec
	p/cd	McVean DN.1955. Ecology of Alnus glutinosa (L.) Gaertn. III. J. Ecol. 43: 195-218
	p/cd	Medail F, Diadema K. 2009. Glacial refugia influence plant diversity patterns in the
	p/cd	Medardi G. 2005. Un rare ascomycete recolté en Italie *Sowerbyella crassisculptura*

		Meerts P. 1999. The evolution of spore size in agarics: do big mushrooms eose suu
cd		Meharg AA. 2003. The mechanistic basis of interactions between mycorrhizal assoc
		Meier CL, Bowman WD. 2008. Links between plant litter chemistry, species diversi
		Meier IC, Avis PG, Phillips Pinus USA: seenekoosluse mõju eksudatsiooni
		Mei-ling X, Jiao-jun Z, Hong-zhang K, Ai-hua X, Jin-xin Z, Feng-qin L. 2008. Optin
		Meinhardt K, Gehring CA. 2 Populus fremontii; vs Tamarix: invasiivne tama
		Meiser A, Balint M, Schmitt I. 2014. Meta-analysis of deep-sequenced fungal comm
p		Mejstrik V, Benecke U. 1969. The ectotrophic mycorrhizas of Alnus viridis and thei
		Mejstrik V. Cenococcum Nothofagus solandril ja Pinus radiatal
		Mejstrik V. xxx. Lepa J EcM mantli paksus varieerus eri paikades ja süga
cd		Mejstrik V. Nothofagusel U EcM tüüpidel sesoonne varieeruvus minimaalne
		Mejstrik V. Nothofagus solandri NZL. Üldiselt domin samad tüübid, mis
		Mejstrik V. 1975. The effect of mycorrhizal infection of *Pinus sylvestris* and *Picea*
		Mejstrik V. 1976. The ecology of mycorrhiza in plants from peat bog areas of the T
		Melin E, Nilsson H, Hacskaylo E. 1958. Translocation of cations to seedlings of pin
		Melin E. 1921. Über die mykorrhizenpilze von *Pinus silvestris* L. und *Picea abies* (
		Melin E. 1922. Untersuchungen über die *Larix*-Mykorrhiza. I. Synthese der mykorr
		Melin E. 1923. Experimentelle Untersuchungen über die Birken-und Espenmykorrhi
		Melin E. 1923. Experimentelle Untersuchungen über die Konstitution und Ökologie
		Melin E. 1924. Über den Einfluss der Wasserstoffionenkonzentration auf die Viruler
		Melin E. 1924. Zur Kenntnis der Mykorrhizapilze von *Pinus montana* Mill. Bot. No
		Melin E. 1925. *Betula nana* och *Boletus scaber*. Bot. Not. 5: 63-65.
		Melin E. 1925. Untersuchungen über die *Larix*-Mykorrhiza II. Zur weiteren kenntni
		Melin E. 1936. Methoden der Experimentellen Untersuchung mykotropher Pflanzen
p		Melin E. 1946. Der einfluss von waldstreuextrakten auf das wachstum von bodenpil
		Melin E. 1954. Growth factor requirements of mycorrhizal fungi of forest trees. Sver
cd		Mello A, Cantisani A, Vizzini A, Bonfante P. 2002. Genetic variability of Tuber unc
p		Mello A, Fc Tuber magnatum -esinevad tsüstiidid, mida varasemad uurijad pole tähe
		Mello A, Garnero L, Bonfante P. 1999. Specific PCR-primers as a reliable tool for t
p		Mello A, Nosenzo C, Meotto F, Bonfante P. 1998. Rapid typing of truffle mycorrhiz
p		Mello A, Vizzini A, Longato S, Rollo F, Bonfante P, Trappe JM. 2000. Tuber borch
cd		Melo AS, Pereira RAS, Sant liigirikkuse ekstrapoleerimine proovipõhistel andmetel
		Melville LH, Massicotte HB, Peterson RL. 1987. Ontogeny of early stages of ectom
		Memmott J, Waser NM. 2002. Integration of alien plants into a native flower-pollina
cd		Mendgen K, Hahn M. 2002. Plant infection and the establishment of fungal biotroph
cd		Menkis A, Allmer J, Vasiliau DSE juuretippudes, lagujuurtes, kändudes, elusjuurtes,
		Menkis A, Uotila A, Arhipov Picea abies raielankidel: kändude ja sodi eemal
	2	Menkis A, Urbina H, James TY, Rosling A. 2014. Archaeorhizomyces borealis sp. n
		Menkis A, Vasaitis R. 2011. Pinus LIT taim Hebeloma, Suillus, Wilcoxina, r
p		Menkis A, Vasiliauskas R, T juurega seotud se mänd: Unkn, Thelephora, Hymenosc
p/cd		Menkis A, Vasiliauskas R, T inokuleeritud ja istutatud kuused: A. byssoides
		Menkis A, Vasiliauskas R, Taylor AFS, Stenlid J, Finlay RD. 2005. Fungal commun
		Menkis,A., Uotila,A., Arhipova,N. and Vasaitis,R.; Effects of stump and slash remo
p/cd		Menoyo E, Becerra AG, Renison D. 2007. Mycorrhizal associations in Polylepis wo
p		Meotto F, N Tuber magnatum, albidum, brumale -mood cys; T. Melanosporum, aesti
p/cd		Merckx V, Bidartondo MI 2008. Breakdown and delayed cospeciation in the arbusc
p/cd		Merckx V, Bidartondo MI, Hynson NA. 2009. Myco-heterotrophy: when fungi host
		Merckx VSFT, Janssens SB, Hynson NA, Specht CD, Bruns TD, Smets EF. 2012. M
p		Mexal J, Reid CPP. 1973. The growth of selected mycorrhizal fungi in response to i
	x	Meyer F, Paarmann D, D'Souza M, Olson R, Glass EM, Kubal M, Paczian T, Rodri
		Meyer U. 1991. Feinwurzelsysteme und Mykorrhizatypen als Anpassungsmechanis
p/cd		Miadlikowska J, Kauff F, Hofstetter V, Fraker E, Grube M, Hafellner J, Reeb V, Ho
		Michelangeli FA, Penneys DS, Giza J, Soltis D, Hills MH, Dan Skean Jr. J. 2004. A
		Michelitsch A, Zelling K, Baumeister A, Schubert-Zsilavecz, Likussar W. 1997. Gel
j		Michelot D, Melendez-Howell LM. 2003. Amanita muscaria: chemistry, biology, to
p		Michelsen A, Quarmby C, Sleep D, Jonasson S. 1998. Vascular plant 15N abundanc
		Michelsen A, Schmidt IK, Jo alpitaimede MR
(cd)		Midgley DJ, Chambers SM, Cairney JWG. 2002. Spatial distribution of fungal endo
cd		Midgley DJ, Chambers SM, ErM seened Woolsia ja Leptospermum terves juurestik
p/cd		Midgley DJ, Saleeba JA, Ste mulla kandseente Ceratobasidium, Thelephorales jp sa
j		Mihail JC, Bruhn JN, Leininger TD. 2002. The effects of moisture and oxygen avail
p/cd		Mihail JD, Bruhn JN, Bonello P. 2007. Spatial and temporal patterns of morel fruitir
		Mikola J, Setäla H. 1998. Relating species diversity to ecosystem functioning: mech
p		Mikola P, Laiho O, Erikäinen J, Kuvaja K. 196 peale põletamist ilmub esimesena Wi
		Mikola P. 1948. On the physiology and ecology of *Cenococcum graniforme*. Forest
		Mikola P. 1955. Artificial inoculation of mycorrhizal fungi. Arch. Soc. Zool. Bot. Fe
		Mikola P. 1958. Liberation of nitrogen from alder leaf litter. Acta For. Fenn. 1-10.
p		Mikola P. 1 Wilcoxina-ektendoMR kuusk vs mänd; N-väetades rakusis kolonis vähe

	Mikola P. 1969. Afforestation of treeless areas. Unasylva 23: S1-S20.
p	Mikola P. 1969. Mycorrhizal fungi of exotic forest plantations. Karstenia 1 introduts
	Mikola P. 1973. Application kasulikkus, erinevad omadused, kasvatus
	Mikola P. 1 ektendo vs ekto sõltuvalt taimeliigist, kk-st, seenetüvest
	Milcu A, Manning P. 2011. All size classes of soil fauna and litter quality control th
p/cd	Miller AN, Huhndorf SM. 2005. Multi-gene phylogenies indicate ascomal wall morp
cd	Miller DN, Bryant JE, Madsen EL, Ghiorse WC. 1999. Evaluation and optimization
cd	Miller DN. 2001. Evaluation of gel filtration resins for the removal of PCR-inhibitor
p/cd	Miller GH, Fogel ML, Magee JW, Gagan MK, Clarke SJ, Johnson BJ. 2005. Ecosy
p/cd	Miller JT, Bayer RJ. 2003. Molecular phylogenetics of Acacia subgenera Acacia an
p/cd	Miller JT, Bayer RJ. 2004. Molecular phylogenetics of Acacia:.. Am. J. Bot. 88: 697
p/cd	Miller JT, Grimes JW, Murphy DJ, Bayer RJ, Ladiges PY. 2003. A phylogenetic an
p/cd	Miller OK, Henkel TW, James TY, Miller SL. 2001. *Pseudotulostoma* , a remarkabl
p/cd	Miller OK, Lodge DJ, Baroni TJ. 2000. New and interesting ectomycorrhi Kariibi n
	Miller OK. 1973. A new gastroid genus related to *Gomphidius.* Mycologia 65: 226-
p/cd	Miller OK. 1983. Ectomycorrhizae in the Agaricales and Gasteromycetes. Can. J. B
	Miller OK. 2003. The Gomphidiaceae revisited: a worldwide perspective. Mycologi
p	Miller RM. 2005. The non-mycorrhizal root -a strategy for survival in nutrient-impo
	Miller SL, K xxx, pikad kirjeldused: lepal Alpova, Lactarius, Laccaria, Thelephora, F
	Miller SL, K xxx inokulumi potents inokulumi potentsiaal: lepp .
p/cd	Miller SL, Larsson E, Larsson K-H, Verbeken A, Nuytinck J. 2006. Perspectives in
p	Miller SL, Torres P, McClean TM. 1994. Persistence of basidiospores and sclerotia
p/cd	Milligan MJ, Williams PG. 1987. Orchidaceous rhizoctonias from roots of nonorchi
p/cd	Mitchell CE, Agrawal AA, Bever JD, Gilbert GS, Hufbauer RA, Klironomos JN and
p/cd	Mitchell JT, Zuccaro A. 2006. Sequences, the environment and fungi. Mycologist 20
	Mittelbach GG, Schemske DW, Cornell HW, Allen AP, Brown JM, Bush MS, Harr
	Miyamoto Y, Sakai A, Hatto JPN kõrgusgradient: kliima roll on tähtsam kui
cd	Mleczko P. kirjeldavad Zn kaevanduse pinnaselt, sh kottseen, 2 Tomentel kaevandu
p	Mleczko P. Rhodocollybia butyracea EcM, identif PCR-RFLP baasil
	Moalic Y, Desbruyeres D, Duarte CM, Rozenfeld AF, Bachraty C, Arnaud-Haond S
p	Modess O. 1939. Experimentelle untersuchungen über hymenomyceten und gasteror
p	Modess O. 1941. Zur kenntnis der mykorrhizabildner von kiefer und fichte. Symb. B
cd	Moffett BF, Nicholson FA, U bakterite liigirikkus ja BD suurem kontroll vs Zn-reostu
cd	Mogg RJ, Bond JM. 2003. A cheap, reliable and rapid method of extracting high-qu
	Mohan JE, Cowden CC, Baas P, Dawadi A, Frankson PT, Helmick K, Hughes E, K
	Mohatt K, Cripps CL, Lavin Pinus albicauli Cenoc; linidzitest Suill Pinus al
cd	Möhlenhoff P, Müller L, Gorbushina AA, Petersen K. 2001. Molecular approach to
1	Molina R, Massicotte H, Trappe JM. 1992. Specificity phenomena in mycorrhizal sy
	Molina R, Palmer JG, ??? Pages 115-129. In: Isolation, Maintenance and Pure Cultu
p	Molina R, Pilz D, Smith J, Dunham S, Dreisbach T, O´Dell T, Castellano M. 2003.
	Molina R, Smith JE, McKay D, Melville LH. 1997. Biology of the ectomycorrhizal
	Molina R, T Arctostaphylos, Arctostaphylos, Arbutus
	Molina R, T sünteesitud okas sünteesitud okaspuudel
	Molina R, Trappe JM. 1984. istandikes
	Molina R. 1 sünteesitud puna sünteesitud punasel lepal
1	Molina R. 1 sünteesitud lepp sünteesitud leppadel
	Molofsky J, Bever JD, Antonovics J, Newman TJ. 2002. Negative frequency depen
	Molofsky J, Bever JD. 2002. A novel theory to explain species diversity in landscap
	Monaghan MT, Wild R, Elliot M, Fujisawa T, Balke M, Inward DJG, Lees DC, Ran
p/cd	Moncalvo J-M, Nilsson RH, Koster B and 13 others. 2006. The cantherelloid clade:
	Moncalvo J-M, Vilgalys R, Redhead SA et al. 2002. One hundred and seventeen cla
p/j	Moncalvo J-M, Wanh H-H, Hseu R-S. 1995. Phylogenetic relationships in Ganoderm
	Moniz MBJ, Kaczmarska I. 2010. Barcoding of diatoms: nuclear encoded ITS revisi
	Monreal M, Berch SM, Berbee M. 1999. Molecular diversity of ericoid mycorrhizal
	Monte A, Lovisolo C, Schubert A. 2000. Effect of drought stress on growth and wat
	Montechi A, Sarasini M. 2000. Funghi ipogei d'Europa. Associazione Micologica Br
	Montesinos-Navarro A, Segarra-Moragues JG, Valiente-Banuet A, Verdu M. The ne
	Montgomery HJ, Monreal CM, Young JC, Seifert KA. 2000. Determination of soil f
x	Moon-van der Staay SY, De Vachter R, Vaulot D. 2001. Oceanic 18S rDNA seque
	Moon-van der Staay SY, Tz eukarüoodid 30-50 a vanast kuivatatud mullast
	Moora M, Öpik M, Zobel M. 2004. Performance of two Centaurea species in respon
p	Moore RT. 1978. Taxonomic significance of septral ultrastructure with particular ref
ecd	Morais H, Ramos C, Forgacs E, Cserhati T, Olivieira J. 2002. Using spectrophotom
cd	Moran MD. 2003. Arguments for rejecting the sequential Bonferroni in ecological st
p/cd	Moreau CS, Bell CD, Vila R, Archibald B, Pierce NE. 2006. Phylogeny of the ants:
	Moreau P.-A. 2005. A nomenclatural revision of the genus *Alnicola* (Cortinariaceae
p/cd	Moreau P-A Alnicola cholea Bistorta viviparal. Peavad Becerra A. Escharioidese kir
p/cd	Moreau P-A, Peintner U, Gardes M. 2006. Phylogeny of the ectomycorrhizal mushr

2012	1		Moreau P-A, Rochet J, Bizio E, Deparis L, Peintner U, Senn-Irlet B, Tedersoo L, G
			Moreau P-A, Rochet J, Richard F, Chassagne F, Manzi S, Gardes M. 2011. Taxono
		cd	Moreira MT, Feijoo G, Lema JM. 2000. Manganese peroxidase production by Bjerk
		cd	Moreira MT, Torado A, Lema JM. 2000. Manganese peroxidase production by Bjer
		p/cd	Morel M, Jacob C, Kohler A, Johansson T, Martin F, Chalot M, Brun A. 2005. Iden
			Moreno-Arroyo B, Gómez J, Pulido E. 2000. Ecología de los hongos hipogeos de A
			Morgado LN, Semenova T, \ kliima soojenemine tundras: nniiskes tundras E
			Morgenstern I, Klopman S, Hibbett DS. 2008. Molecular evolution and diversity of
			Morlon H, Chuyong G, Condit R, Hubbell S, Kenfack D, Thomas D, Valencia R, G
			Morris B. 1988. Common Mushrooms of Malawi. Oslo, Norway.
			Morris B. 1990. An annotated check-list of the macrofungi of Malawi. Department c
		p/cd	Morris MH, Perez-Perez MA S-Mex pilveme Tom-Thel 6; Russ-Lact 7; Inocy
		p/cd	Morris MH, Perez-Perez MA, Smith ME, Bledsoe CS. 2009. Influence of host speci
		p/cd	Morris MH, Smith ME, Rizz 2 tammeliiki: sam Tomentella (35liiki +2 fibrosat), Inoc
			Morris RJ, Gripenberg S, Lewis OT, Roslin T. 2014. Antagonistic interaction netwo
		cd	Morris SA, Radajewski S, Willison TS, Murrell JC. 2002. Identification of the funct
		cd	Morrison DA, Ellis JT. 2003. The design and analysis of microarray experiments: ap
		cd	Morte A, Diaz G, Rodriguez P, Alarcon JJ, Sanchez-Blanco MJ. 2001. Growth and
			Morte MA, Cano A, Honrubia M, Torres P. 1994. In vitro mycorrhization of microp
			Morte MA, Honrubia M,1992. in vitro propagation of Helianthemum almariense (Ci
		p	Morton A, Tabrett AM, Carder JH, Barbara DJ. 1995. Sub-repeat sequences in the r
		p/cd	Mosca E, Montecchio L, Scattolin L, Garbaye J. 2007. Enzymatic activities of three
			Moser AM, Frank JL, D`Allı Quercus garrya Tuber candidum, Cenoc, Tomen
		p	Moser AM, Petersen CA, D' serpentiin vs kont morfot
		p/cd	Moser M. 1986. Cortinarius Fr. Subgen. Cortinarius in the SW Pacific area. Sydowi
			Moser M. 2001. Some aspects of Cortinarius associated with Alnus. J. des J.E.C. 3:
			Moser M. Die künstliche Mykorrhizaimpfung an Forstpflanzen. Forstwiss. Centralbl
		p	Moser MM. 2004. Subalpine conifer forests in the Alps, the Altai and the Altai vs A
			Motomura H, Selosse M-A, Martos F, Kagawa A, Yukawa T. 2011. Mycoheterotro
			Möttönen M, Lehto T, Aphalo P. 2001. Growth dynamics and mycorrhizas of Norw
			Mouhamadou B, Molitor C, Baptist F, Sage L, Clement J-C, Lavorel S, Monier A, C
			Mouquet N, Devictor V, Meynard C, Munoz F, Bersier L-F, Chave J and 16 others.
		cd	Moyersoen B, Becker P, Alexander IJ. 2001. Are ectomycorrhizas more abundant th
		cd	Moyersoen B, Beever RE, Martin F. 2003. Genetic diversity of *Pisolithus* in New Z
		cd	Moyersoen B, Fitter AH. 1999. Presence of arbuscular mycorrhizas in typically ecto
	1		Moyersoen Lõuna-Venezuela Caatinga EcM taimed on Neea, Guapira, Al Venezue
		p	Moyersoen Pakaraimeal: Cl Pakaraimea
			Moyersoen B. 2012. Dispers Pakaraimea Ve domin tom-thel, bol, cort , russ-
			Mueller GM, Pine EM. 1994. DNA data provide evidence on the evolutionary relati
			Mueller GM, Schmit JP, Leacock PR, Buyck B, Cifuentes J, Desjardin DE, Halling
		cd	Mueller GM, Wu Q-X, Huang Y-Q, Guo S-Y, Aldana-Gomez R, Vilgalys Aasia vs
		p/cd	Mueller RC, Gehring CA. 2(Pinus edulis ARI: parasiidiga: pms kottseened, mis oma
			Mueller UG, Gerardo NM, Aanen DK, Six DL, Schultz TR. 2005. The evolution of
		p/cd	Mühlmann O, Bacher M, Pei Polygonum vivip: Sebacina incrustans, Cenococcum ge
		p/cd	Mühlmann (Lactarius deterrimus kuusel ja leesikal
		p/cd	Mühlmann O, Peintner U. 2(Kobresia mysu Cenococcum , Tomentella spp
		p/cd	Mühlmann O, Peintner U. 2(Salix herbacea: m Tomentella=Cortinarius=Inocybe (5)
		p/cd	Muhsin TM, Zwiazek JJ. 2002. Colonization with Hebeloma crustuliniforme increas
		j	Muhsin TM, Zwiazek JJ. 2002. Ectomycorrhizas increase apoplastic water transport
		cd	Muller LAH, Lambaerts M, Vangronsveld J, Colpaert JV. 2004. AFLP-based assess
		p/cd	Muller LAH, Lambaerts M, Vangronsveld J, Colpaert JV. 2006. Isolation and chara
		j	Müller WH, Stalpers JA, van Aelst AC, de Jong MDM, van der Krift TP, Boekhout
		p/cd	Mulombwa J 1998. Non-wood forest products in Zambia. In: FAO, ed. Data collecti
		p/cd	Mummey DL, Rillig MC. 2007. Evaluation of LSU rRNA-gene PCR primers for ana
			Mundra S, Halvorsen R, Kau Arktikas . Seenekooslused ja taimekooslused o
			Münkemüller T, Lavergne S, Bzeznik B, Dray S, Jombart T, Schiffers K, Thuiller W
		cd	Munos J, Felicisimo AM, Cabezas F, Burgas AR, Martinez I. 2004. Wind as a long-
		p/cd	Münzenberger B, Bubner B, Wöllecke J, Sieber TN, Bauer R, Fladung M, Hüttle RI
		cd	Münzenberger B, Golldack J ligniidi kaevandu Amphinema, Wilcoxina, Tuber puber
			Münzenberger B, Metzler B, Kottke I, Oberwinkler F. 1986. Morphologische und an
			Münzenberger B, Otter T, Wüstrich D, Polle A. 1996. Peroxidase and laccase activi
			Münzenberger B, Schneider B, Nilsson RH, Bubner B, Larsson K-H, Hüttl R. 2012.
		p	Murai S. 1963. Phytotaxonomical and geobotanical studies on so-called genus Alnus
		cd	Murat C, Diez J, Luis P, Delaruelle C, Dupre C, Chevalier G, Bonfante P, Martin F.
			Murat C, Rubini A, Riccioni C, de la Varga H, Akrouome E, Belfiori B, Guaragno M
		p/cd	Murat C, Vizzini A, Bonfant produktiivses vs ı Thelephoraceae, Pezizales (sh 3 Tub
		p/cd	Murat C, Zampieri E, Vizzini A, Bonfante P. 2008. Is the Perigord black truffle threa
			Murat C. 2015. Forty years of inoculating seedlings with truffle fungi: past and futur

cd	Murata H, Ohta A, Yamada A, Narimatsu M, Futamura N. 2005. Genetic mosaics ir
	Murata M, Kinoshita A, Nar Pseudotsuga ja russula-lactarius, /boletus, /cort
p/cd	Murphy DJ, Miller JT, Bayer RJ, Ladiges PY. 2003. Molecular phylogeny of Acacia
	Murphy EA, Mitchell DT. 2001. Interactions between Tricholomopsis rutilans and e
p/cd	Muthukumar T, Senthilkumar M, Rajangam M, Udaiyan K. 2006. Arbuscular mycor
p/cd	Muthukumar T, Sha L, Yang X, Cao M, Tang J, Zheng Z. 2003. Mycorrhiza of plan
cd	Muthukumar T, Udaiyan K, Shanmughavel P. 2004. Mycorrhiza in sedges—an over
	Muyzer G, de Waal EC, Uitterlinden AG. 1993. Profiling of complex microbial popu
p/cd	Myers N, Mittermeier R, Mittermeier CG, de Fonseca GAB, Kent J. 2000. Biodiver
p	Nadelhoffer K, Shaver G, Fry B, Giblin A, Johnson L, McKane R. 1996. 15N natura
	Nadelhoffer KJ, Fry B. 1988. Controls on natural nitrogen-15 and carbon-13 abunda
x	Nadrowski K, Wirth C, Scherer-Lorenzen M. 2010. Is forest diversity driving ecosy
	Naeem S, Hakansson K, Lawton JH, Crawley MJ, Thompson LJ. 1996. Biodiversity
	Naeem S, Li S. 1997. Biodiversity enhances ecosystem reliability. Nature 390: 507-5
cd	Naeole CK, Haymer DS. 2003. Use of oligonucleotide arrays for molecular taxonom
	Nagano Y, Nagahama T, Ha ookeanisetete seened: Vaikne ookean eri süg: e
	Nagano Y, Nagahama T. 201 meresügavustes Chytr, EurotioM, SacchM, Do
	Nagy LG, Petkovits T, Kovacs G, Voigt K, Vagvölgyi C, Papp T. 2011. Where is th
p/cd	Nakashizuka T. 2001. Species coexistence in temperate, mixed deciduous forests. T
	Nantel P, Neumann P. 1992. Ecology of ectomycorrhizal-basidiomycete cc eri metsa
p/cd	Napoli C, Mello A, Borra A, Tammikute mu Tom-thel
p/cd	Naqinezhad A, Hamzeh`ee B, Attar F. 2008. Vegetation-enviroment relationships in
p/cd	Nara K, Hogetsu T. 2004. Ec ECM: Salix reinii seemik (Inocybe lacera, Sclerodrma
cd	Nara K, Nakaya H, Hogetsu T. 2003. Ectomycorrhizal sporocarp successi mt Fuji: c
cd	Nara K, Nakaya H, Wu B, Z paju vastavalt suk noor: Laccaria laccata, L. A noored: I
cd	Nara K. 2006. Ectomycorrhizal networks and seedling establishment during early pr
p/cd	Nara K. 2006. Pioneer dwarf prim sukts: Salix Betula: Lacc amethystina, Tomentell
p/cd	Nara K. 2009. Spores of ectomycorrhizal fungi: ecological strategies for germination
	Narisawa K, Hambleton S, Currah RS. 2007. *Heteroconium chaetospira* , a dark sep
	Narisawa K, Kawamata H, Currah RS, Hashiba T. 2002. Suppression of *Verticillium*
	Näsholm T, Högberg P, Franklin O, Metcalfe D, Keel SG, Campbell C, Hurry V, Li
	Nassonova E, Smirnov A, Fahrni J, Pawlowski J. 2010. Barcoding Amoebae: Comp
p	Natarajan K, Mohan V, Ingle Indias Pinus patu 3 a: Laccaria, Thelephora, 3a: Thel
p/cd	Natarajan K, Senthilarasu G, Kumaresan V, Riviere T. 2005. Diversity in c EcM seen
p/cd	Nathan R. 2006. Long-distance dispersal in plants. Science 313: 786-788.
p/cd	Navarro E, Bousquet J, Moiroud A, Munive A, Piou D, Normand P. 2003. Molecula
p	Neal JL, Lu KC, Bollen WB, Trappe JM. 1968. A comparison of rhizosphere micro
p	Neal JL, Tra Lepal 3 morfotüüpi: 1)Alnicola-moodi; 2) Tomentella (jäme k
	Neher DA, Weicht TR, Bates ST, Leff JW, Fierer N. Changes in bacterial and funga
cd	Nehls U, Mikolajewski S, Magel E, Hampp R. 2001. Carbohydrate metabolism in ec
p	Nei M. 1973. Analysis of gene diversity in subdivided populations. Proc. Natl. Acad
p	Nei M. 1978. Estimation of average heterozygosity and genetic distance from a smal
cd	Nelson BP, Liles MR, Frederick KB, Corn RM, Goodman RM. 2002. Label-free de
	Nelson G, Ladiges PY. 2001. Gondwana, vicariance biogeography and the New Yo
	Nemergut DR, Costello EK, Hamady M, Lozupone C, Jiang L, Schmidt SK, Fierer N
	Nemergut DR, Schmidt SK, Fukami T, O' Neill SP, Bilinski S, Stanish LF, Knelman
	Nerg A-M, Kasurinen A, Holopainen T, Julkunen-Tiitto R, Neuvonen S, Holopainen
	Nespiak A. 1953. Badanie mykotrofizmu roslinnosci alpejeskiej ponad granica kosc
	Ness JH, Rollinson EJ, Whitney KD. 2011. Phylogenetic distance can explain susce
p/cd	Neubert K, Mendgen K, Brir endofüüdid pilliroo juurtes, risoomides, vartes
	New M, Lister D, Hulme M, Makin I. 2002. A high-resolution data set of surface cli
p/cs	Newbery DM, Alexander IJ, Rother JA. 1997. Phosphorus dynamics in a lowland A
VIITED	Newbery DM, Alexander IJ, Thomas DW, Gartlan JS. 1988. Ectomycorrhizal rainfo
p	Newbery DM, Campbell EJF, Lee YF, Ridsdale CE, Still MJ. 1992. Primary lowlan
p/cs	Newbery DM, Chuyong GB, Zimmermann L. 2006. Mast fruiting of large African ra
p/cd	Newbery DM, Gartlan JS, McKey DB, Waterman PG. 1986. The influence of draina
	Newell K. 1984. Interaction wetween two decomposer basidiomycetes and a collem
p/cd	Newman EI, Reddell P. 1987. the distribution of mycorrhizas among families of vas
p	Newton AC, Haigh JM. 1998. Diversity of ectomycorrhizal fungi in Britain Britannia
p	Newton AC, Pigott CD. 1991. Mineral nutrition and mycorrhizal infection of seedlin
p	Newton AC, Pigott CD. 1991. Mineral nutrition and mycorrhizal infection of seedlin
p	Newton AC. 1991. Mineral r kask vs tamm (ro Kokku 41 liiki, mis väga paljud spets
	Newton AC. 1992. Towards a functional classification of ectomycorrhizal fungi. My
	Nezzar-Hoc Tricholoma tridentinum
p/cd	Nguyen HDT, Seifert KA. 2008. Description and DNA barcoding of three new spec
	Niederer M, Pankov W, Wiemken A. 1992. Seasonal changes in soluble carbohydra
	Nielsen A, Bascompte J. 2007. Ecological networks, nestedness and sampling effort
p/j	Nielsen KB, Kjoller R, Olsson PA, Schweiger PF, Andersen FO, Rosendahl S. 2004

					Niemi K, Salonen M, Ernstsen A, Heinonen-Tanski H, Häggman H. 1999. Applicati
					Niemi K, Vuorinen T, Ernstsen A, Häggman H. 2002. Ectomycorrhizal fungi and ex
		p/cd			Niemi RM, Vepsäläinen M, Erkomaa K, Ilvesniemi H. 2007. Microbial activity duri
		p/cd			Nieto MP, Carbone SS. 2009 Pinus pinaster: Tomentella sublilacina, Theleph
		p			Nikolcheva LG, Bärlöcher F ojas lagunevatel lehtedel: pms kottseened
		cd			Nikolcheva LG, Cockshutt AM, Bärlocher F. 2003. Determining diversity of freshw
		cd			Nilsen P, Børja I, Knutsen H, Brean R. 1998. Nitrogen and drought effects on ectom
		cd			Nilsson LO, Giesler R, Baath E, Wallander H. 2005. Growth and biomass of mycorr
		cd			Nilsson LO, Wallander H. 2003. Production of external mycelium by ectomycorrhiz
					Nilsson MC, Högberg P, Zackrisson O, Fengyou W, 1993. Allelopathic effects of E
					Nilsson M-C, Wardle DA, Dahlberg A. 1999. Effects of plant litter species composi
					Nilsson RH, Abarenkov K, Veldre V, Nylinder S, de Wit P, Brosche S, Alfredsson J
					Nilsson RH, Bok G, Ryberg M, Kristiansson E, Hallenberg N. 2009. A software pip
2014				x	Nilsson RH, Hyde KD, Pawłowska J, Ryberg M, Tedersoo L, Aas AB, Alias SA, A
		p/cd			Nilsson RH, Kristiansson E, Ryberg M, Hallenberg N, Larsson K-H. 2008. Intraspe
		cd			Nilsson RH, Kristiansson E, Ryberg M, Larsson K-H. 2005. Approaching the taxon
		p/cd			Nilsson RH, Larsson K-H, Larsson E, Kõljalg U. 2006. Fruiting body-guided molecu
		p/cd		x	Nilsson RH, Ryberg M, Kristiansson E, Abarenkov K, Kõljalg U. 2006. Taxonomic
2012	5			x	Nilsson RH, Tedersoo L, Abarenkov K, Ryberg M, Kristiansson E, Hartmann M, Sc
2011	12				Nilsson RH, Tedersoo L, Lindahl B, Kjoller R, Carlsen T, Quince C, Abarenkov K,
					Nilsson RH, Veldre V, Hartmann M, Unterseher M, Amend A, Bergsten J, Kristians
					Nilsson RH, Veldre V, Wang Z, Eckart M, Branco S, Hartmann M, Quince C, Godh
					Nisber E, Dlugokencky EJ, Bousquet P. 2014. Methane on the rise - again. Science
					Nishizawa T, Zhaorigetu, Kc põllumullas seened: domin Cryptococcus
					Noack F. 18 Cortinarius spp -tamm ja Kuusk, Lactarius piperatus -tammel
					Noetzli K, Graf F, Böll A, Sieber TN, Holdenrieder O. 2008. Influence of decay fun
			x		Noge K, Mori N, Tanaka C, Nishida R, Tsuda M, Kuwahara Y. 2005. Identification
		p			Nommik H, Pluth DJ, Larsson K, Mahendrappa MK. 1994. Isotopic fractionation ac
					Nontachaiyapoom S, Sasirat S, Manoch L. 2010. Isolation and identification of Rhiz
					Norden B, Appelquist T, Lindahl B, Henningsson M. 1999. Cubic rot fung kuusekän
2010	1				Norghauer JM, Newbery DM, Tedersoo L, Chuyong GB. 2010. Do fungal pathogen
					Norgren O, Elfving B, Olsson O. 1995. Non-destructive biomass estimation of tree s
					Norkrans B. 1944. Om mykorrhizabildande och rent saprofystika Tricholoma-arters
					Norkrans B. 1949. Some mycorrhiza-forming *Tricholoma* species. Svensk Bot. Tids
		b			Norkrans B. 1950. Studies in growth and cellulolytic enzymes in *Tricholoma* with s
		p			Normand P, Lalonde M. 1982. Evaluation of Frankia strains isolated from provenan
		cd			Normark BB, Judson OP, Moran NA. 2003. Genomic signatures of ancient asexual l
		p/cd			Noroozi J, Akhani H, Breckle S-W. 2008. Biodiversity and phytogeography of the a
					Norvell LL, Redhead SA. 2000. Phaeocollybia in western North America 2: the vern
2013	1				Nouhra E, Urcelay C, Longo S, Tedersoo L. 2013. Ectomycorrhizal fungal commun
					Nouhra E. Urcelay C, Becerra A, Dominguez L. 2008. Mycorrhizal status *Phlebopu*
		cd			Nouhra ER, Ramaria: ampuljalt paksenenud hüüfid septade juurest, matid
					Nouhra ER, Urcelay C, Longo MS, Fontenla S . 2012. Differential hypogeous sporo
					Nuhn M, Binder M, Taylor AFS, Halling RE, Hibbett DS. 2013. Phylogenetic overv
			x		Nuismer SL, Jordano P, Bascompte J. 2013. Coevolution and the architecture of mu
					Nunez MA, Hayward J, Horton TR, Amico GC, Dimarco R, Barrios-Gracia MN, Si
		p/cd			Nunez MA, Horton TR, Sim Pseudotsuga, P Thelephoraceae 4 spp, Suill-Rh
					Nurfadilah S, Swarts ND, Dixon KW, Lambers H, Merritt DJ. 2013. Variation in nu
					Nurmiaho-Lassila E-L, Timonen S, Haahtela H, Sen R. 1997. Bacterial colonization
		p/cd			Nuytinck J, Verbeken A. 2007. Species delimitation and phylogenetic relationships i
					Nuzzo V. 1986. Extent and status of Midwest oak savanna: presettlement and 1985.
					Nygren CMR, Edqvist J, Elfstrand M, Heller G, Taylor AFS. 2007. Detection of ext
					Nylander JAA. 2004. *MrModeltest 2.2.* Program distributed by the author. Evolutio
					Nylund J-E, Wallander H, Sundberg B, Gay G. 1994. IAA overproducer mutants of
					O,Neill JJM, Mitchell DT. 2000. Effects of benomyl and captan on growth and myc
					O´Dell TE, Ammirati JF, Schreiner EG. 1999. Species richness and abund Tsuga: ku
		j			O´Donnell K, Cigelnik E, Benny GL. 1998. Phylogenetic relationships among the Ha
		j			O´Donnell K, Cigelnik E, Weber NS, Trappe JM. 1997. Phylogenetic relationships a
		cd			O´Donnell K, Cigelnik E. 1997. Two divergent intragenomic rDNA ITS2 types with
		j			O´Donnell K. 2000. Molecular phylogeny of the Nectria haematococca-Fusarium so
		j			O´Donnell, Lutzoni FM, Ward TJ, Benny GL. 2001. Evolutionary relationships amo
					Obase K, Cha JY, Lee JK, L KOREA Pinus russ-lact, tomentella; liikidest R
					Obase K, Tamai Y, Yajima T, Miyamoto T. 2008. Mycorrhizal colonization status c
		p/cd			Obase K, Tamai Y, Yajima T, Miyamoto T. 2008. Mycorrhizal synthesis of four ect
					Oberwinkler F, Reiss K, Bauer R, Selosse M-A, Weiss M, Garnica S, Zuccaro A. 20
					Oberwinkler F, Riess K, Bauer R, Garnica S. 2014. Morphology and molecules: the
					Oberwinkler F, Riess K, Bauer R, Kirschner R, Garnica S. 2013. Taxonomic re-eval
		p/cd			O'Brien HE, Parrent JL, Jack eukaryootide mitu Russula min-mullas, Mycena koduki

				O'Brien MJ, Gomola CE, Horton TR. 2011. The effect of forest soil and community
		cd		Odds FC, Brown AJP, Gow NAR. 2003. Antifungal agents: mechanisms of action. T
				Ødegaard F, Diserud OH, Østbye K. 2005. The importance of plant relatedness for h
				O'Donnell K, Rooney AP, Mills GL, Kuo M, Weber NS, Rehner SA. 2011. Phyloge
		B		Ogden J, Stewart GH, Allen RB. 1996. Ecology of New Zealand Nothofagus forests
		p/cd		Ogura-Tsujita Y, Gebauer G, Hashimoto T, Umata H, Yukawa T. 2009. Evidence fo
				Ogura-Tsujita Y, Yokoyama J, Miyoshi K, Yukawa T. 2012. Shifts in mycorrhizal f
		p/cd		Ogura-Tsujita Y, Yukawa T. 2008. *Epipactis helleborine* shows strong mycorrhizal
		cd		Oh SK, Kamdem DP, Keathley DE, Han K-H. 2003. Detection and species identific
				O'Hanlon R, Harrington TJ. 2 Picea, Pinus, istandused vs Quercus IRL: BD sa
				Ohenoja E. 1978. Mushrooms and mushroom yields in fertilized forests. A vs N-väe
				Ohga S, Wood DA. 2000. Efficacy of ectomycorrhizal basidiomycetes on Japanese l
		cd		Ohta A, Fujiwara N. 2003. Fruit-body production of an ectomycorrhizal fungus in ge
				Ohta A. 1994. Production of fruit-bodies of a mycorrhizal fungus, Lyophyllum shime
				Ohta A. 1998. Fruit-body production by two ectomycorrhizal fungi in the genus Heb
				Okayama M, Yamato M, Yagame T, Iwase K. 2012. Mycorrhizal diversity and spec
				Oksanen J, Blanchet FG, Kindt R, Legendre P, Minchin PR, O'Hara RB, Simpson G
		cd		Oksanen L. 2001. Logic of experiments in ecology: is pseudoreplication a pseudoiss
		cd		Oksanen L. 2004. The devil lies in details: reply to Stuart Hurlbert. Oikos 104: 598-6
				Okuda A, Yamato M, Iwase K. 2011. The mycorrhiza of Schizocodon soldanelloide
				Olariaga I, Jugo BM, Garcia-Etxebarria, Salcedo I. 2009. Species delimitation in the
				Olesniewicz KS, Thomas RB. 1999. Effects of mycorrhizal colonization on biomass
				Olson A, Aerts A, Asiegbu F, Belbahri L, Bouzid O, Broberg A and 47 others. 2012
		cd		Olson A, Stenlid J. 2001. Mitochondrial control of fungal hybrid virulence. Nature 4
				Olson A, Stenlid J. 2002. Pathogenic fungal species hybrids infecting plants. Microb
				Olson DM, Dinerstein E, Wikramanayake ED, Burgess ND, Powell GWN, Underwo
		cd		Olson LE, Yoder AD. 2002. Using secondary structure to identify ribosomal numts:
		cd		Olsrud M, Melillo JM, Christensen TR, Michelsen A, Wallander H, Olsson PA. 200
		B		Olsson PA, Jakobsen I, Wallander H. 2002. Foraging and Resource Allocation Strat
		j		Olsson PA, Suillus+Gomphidius
		cd		Olsson PA, Wallander H. 1998. Interactions between ectomycorrhizal fungi and the
				Olsson PA, Wallander H. 1998. Interactions between ectomycorrhizal fungi and the
				Olsson PA, Wallander H. 1998. Interactions between ectomycorrhizal fungi and the
				Onguene NA, Kuyper TW. 2001. Importance of the ectomycorrhizal network for see
		p/cd		Onguene NA, Kuyper TW. 2001.Mycorrhizal associations in the rain forest of South
		1		Onguene NA. 2000. Diversity and dynamics of mycorrhizal associations in Kamerun
			x	Öpik M, Davison J, Moora M, Zobel M. 2014. DNA-based detection and identificat
		dd		Öpik M, Moora M, Kõljalg U AM diversiteet 2 Pulsatilla liigil erikasvukohtades vs in
				Öpik M, Moora M, Liira J, Kõljalg U, Zobel M, Sen R. 2003. Divergent arbuscular
		p/cd		Öpik M, Moora M, Liira J, Zobel M. 2006. Composition of root-colonizing arbuscu
				Öpik M, Moora M, Zobel M, Saks Ü, Wheatley R, Wright F, Daniel T. 2008. High
				Öpik M, Vanatoa A, Vanatoa E, Moora M, Davison J, Kalwij JM, Reier Ü, Zobel M
				Öpik M, Zobel M, Cantero JJ, Davison M, Facelli JM, Hiiesalu I, Jairus T, Kalwij J
				Orgiazzi A, Dunbar MB, Panagos P, de Groot GA, Lemanceau P. 2015. Soil biodive
				Orihara T, Sawada F, Ikeda S, Yamato M, Tanaka C, Shimomura N, Hashiya M, Iw
				Orihara T, Smith ME, Shimomura N, Iwase K, Maekawa N. 2012. Diversity and sys
		p/cd		Orlovich DA, Cairney JWG. 2004. Ectomycorrhizal fungi in New Zealand NZL: See
				Osono T. 2006. Role of phyllosphere fungi of forest trees in the development of deco
				Osono T. 2006. Role of phyllosphere fungi of forest trees in the development of deco
				Ostle NJ, Bol R, Petzke KJ, Jarvis SC. 1999. Compound specific d15N% values: an
2011	17			Ostonen I, Helmisaari H-S, Borken W, Tedersoo L, Kukumägi M, Bahram M, Lindro
		cd		Ostonen I, I ECM mantli, korteksi ja steeli läbimõõt kuusel on eri aladel erinev, sõltu
2009	10			Ostonen I, Tedersoo L, Suvi T, Lõhmus K. 2009. Does a fungal species drive ectom
				Otero JT, Ackerman JD, Bayman P. 2002. Diversity and host specificity of endophy
		p/cd		Otero JT, Ackerman JD, Bayman P. 2004. Differences in mycorrhizal preferences be
		cd		Ott T, Fritz E, Polle A, Schützendübel A. 2002. Characterisation of antioxidative sys
		p/cd		Outerbridge RA, Trofymow vana mets vs noo Rhizopogon, Cenoc, Tom=Piceirhiza
		p/cd		Outerbridge RA, Trofymow Pseudotsuga istutatud raiesmikule eri kaugusel
				Ovaskainen O, Hottola J, Siitonen J. 2010. Modeling species co-occurrenc kooseks
		cd		Øvreas L, Daae FL, Torsvik bakterite ja arhede BD hüpersaliinses (kuni 32%) vees.
		cd		Ovreas L. 2000. Community mikroobide BD mõõtmise põhjused ja mõõtmismeetod
		bd		Ozinga WA, van Andel J, McDonnell-Alexander MP. 1997. Nutritional soil heterog
				Paal J, 1997. Classification of Estonian Vegetation Site Types. 297 pp. UNEP, Talli
		p		Pachlewski R, Chrusciak E. 1980. Aktywnosc enzymatyczna mikoryzowych. II. Act
				Pachlewski Quercus robur: eri EcM tüübid, sh Tuber
		p		Pachlewski R, Kermen J, Chrusciak E, Trzcinska M. 1991. Studies on pine ectendo
				Pachlewski Larix: eri EcM tüübid
				Pachlewski R. 1967. Investigations of pure culture of mycorrhizal fungi of pine (*Pin*

				Pacioni G, Sharp C. 2000. Mackintoshia, a new sequestrate basidiomycete genus fro
	p/cs			Packham JM, May TM, Brown MJ, Wardlaw TJ, Mills AK. 2002. Macrof Tasmaan
	p/cd			Pagel M, Venditti C, Meade A. 2006. Large punctuational contribution of speciation
	p/cd			Pagel M. 1999. Inferring the historical patterns of biological evolution. Nature 401: 8
				Paijmans K. 1976. New Guinea vegetation. Australian National University Press, Ca
	cd			Paillet FL. 2002. Chestnut: history and ecology of a transformed species. J. Biogeog
	p			Palenzona M Tuber brumale, T. Melanosporum, T. Rufum -süntees ja kirjeldused Co
	p			Palfner G, A Balsamia alba ektendomükoriisamännil: õhuke mantel, rakusisene kolon
	p			Palfner G, A Leucangium carthusianum EcM ebatsuugal: sarn Disciotis mükoriisale;
	p/cd			Palfner G, Canseco MI, Casa Nothofagus alp mõl. Descolea antarctica, Cenoc
	p			Palfner G. 2 Cortinarius, Thaxterogaster, Stephanopus, Descolea, Austropa
				Palm ME. S Suillus spp sünt ja kirjeld 2 männiliigil
	cd			Palme AE, Su Q, Rautenberg A, Manni F, Lascoux M. 2003. Postglacial recolonizat
	p/cd			Palmer JG etal. 1994. .. Mycorrhiza 4: 93-104.
				Palmer JM, Lindner D, Volk Castanea denta Russ-Lact (10), Tom-Thel (6), S
				Palmer JM, Lindner DL, Vol Castanea Denta Taksonitest domin Russula-Lac
				Palmer MW. 1992. The coexistence of species in fractal landscapes. Am. Nat. 139:
				Panaccione DG, Sheets NL, Cenococcum liigisisene
				Pandey M, Sharma J, Taylor DL, Yadon VL. 2013. A narrowly endemic photosynth
				Pantidou ME. 1962. Cultural studies of Boletaceae. Carpophores of *Phlebopus ligni*
	cd			Paolocci F, Rubini A, Riccioni C, Topini F, Arcioni S. 2004. Tuber aestivum and Tu
		x		Paquette A, Messier C. 2011. The effect of biodiversity on tree productivity: from te
	p/cd			Paradi I, Baar J. 2006. Myco Salix alba, üleuju Kokku 12 liiki juurtel: Tuber 5 spp, I
				Paradis E, Claude J, Strimmer K, 2004. APE: Analyses of Phylogenetics and Evolut
	cd			Pardo AG, Hanif M, Raudaskoski M, Gorfer M. 2002. Genetic transformation of ec
				Pardo LH, Nadelhoffer K. 2010. Using nitrogen isotope ratios to assess terrestrial ec
				Pardo LH, Templer PH, Goodale CL. 2006. Regional assessment of N saturation usi
				Parducci L, Jorgensen T, Tollefsrud MM, Elverland E, Alm T, Fontana SL et al. 201
	p/cd			Parfitt D, Ainsworth AM, Simpson D, Rogers HJ, Boddy L. 2007. Molecular and m
				Parfrey LW, Grant J, Tekle YI, Lasek-Nesselquist E, Morrison HG, Sogin ML, Patt
	cd			Paris F, Bonnaud P, Rangers J, Robert M, Lapeyrie F. 1995. Weathering of calcium-
			x	Park B, Park J, Cheong K-C, Choi J, Jung K, Kim D, Lee Y-H, Ward TJ, O'Donnel
				Park K-H. 2009. Molecular biological study on speciation and phylogeny of the orde
				Parke JL, Linderman RG, Trappe JM. 1983. Effect of root zone temperature on ecto
	p			Parke JL, Linderman RG, Trappe JM. 1983. Effects of forest litter on mycorrhiza de
	cd			Parladé J, Álvarez IF, Pera J. 2004. Ability of native ectomycorrhizal fungi from nor
				Parlade J, Cohen M, Doltra J, Luque J, Pera J. 2001. Continuous measurement of ste
	cd			Parlade J, Pera J, Luque J. 2004. Evaluation of mycelial inocula of edible Lactarius s
				Parolin P, Adis P, Rodrigues WA, Amaral I, Piedade MTF. 2004. Floristic study of a
	p/cd			Parolin P, De Simone O, Haase K, Waldhoff D, Rottenberger S, Kuhn U and 5 other
	p			Parrent JL, Morris WF, Vilga Pinus taeda; vs C Kontr: Russ1, Tylosp1*, Cort mucos
				Parrent JL, Peay K, Arnold E, Coms LH, Avis P, Tuininga A. 2010. Moving from pa
	p/cd			Parrent JL, Vilgalys R. 2007 EmH vs ECM: sa EmH vs EcM; vs CO2, N väet: domi
				Parry RA, McLean CB, Alderton MR, Coloe PJ, Lawrie AC. 2000. Polyclonal antis
	cd			Pärtel M, Kalamees R, Zobel M, Rosen E. 1998. Restoration of species-rich limesto
				Pärtel M, Kalamees R, Zobel M, Rosen E. 1999. Alvar grasslands in Estonia: variati
				Pärtel M, Laanisto L, Zobel M. 2007. Contrasting plant productivity-diversity relatio
	cd			Pärtel M, Moora M, Zobel M. 2001. Variation in species richness within and betwe
				Pärtel M, Zobel M. 1995. Small-scale dynamics and species richness in successiona
	p			Pärtel M, Zobel M. 1999. Small-scale plant species richness in clacareous grassland
		x		Pärtel M. 2002. Local plant diversity patterns and evolutionary history at the regiona
				Pärtel M. 2006. Data availability for macroecology: how to get more out of regular e
2013	0			Parts K, Tedersoo L, Lõhmus K, Kupper P, Rosenvald K, Sõber A, Ostonen I, 2013
				Pasonen H-L, Lu J, Niskanen Betula pendula FIN: vs transgeensed Chit IV ta
				Pavoine S, Bonsall MB. 2011. Measuring biodiversity to explain community assemb
				Pavoine S, Vela E, Gachet S, Belair S, Bonsall MB. 2011. Linking patterns in phylo
	cd			Pavoine S. Et al. 2004. From dissimilarities among species to dissimilarities among c
	cd			Pawlowska TE, Taylor JW. 2004. Organization of genetic variation in individuals of
		x		Pawlowski J, Audic S, Adl S. 2012. CBOL Protist Working Group: barcoding eukar
				Pawluczyk M, Weiss J, Links ME, Aranguren ME, Wilkinson MD, Egea-Cortines M
				Peabody RB, Peabody DC. 1987. Haploid monokaryotic basidiocarp tissues in spec
				Peakall R, Ruibal M, Lindenmayer DB. 2003. Spatial autocorrelation analysis offers
				Pearson AA. 1950. Cape Agarics and Boleti. Trans. Br. Mycol. Soc. 33: 276-316.
				Pease EA, Tien M. 1992. Heterogeneity and regulation of manganese peroxidases fr
	p/cd			Peat HJ, Clarke A, Convey P. 2007. Diversity and biogeography of the Antarctic flo
	p/cd			Peay K, Garbelotto M, Bruns Kuumutamine Kuumutamine: Wilcoxina, Rhiz
				Peay KG, Bidartondo MI, Arnold AE. 2010. Not every fungus is everywhere: scalin
				Peay KG, Bruns RD. 2014. Spore dispersal od basidiomycete fungi at the landscape

p/cd		Peay KG, Bruns TD, Kennec EcM seente liigir Suillus pungens, Rhiz salebrosus, Rh
		Peay KG, Garbelotto M, Bruns TD. 2010. Evidence of dispersal limitation in soil mi
	x	Peay KG, Kennedy PG, Bruns TD. 2008. Fungal community ecology: a hybrid beast
1		Peay KG, Kennedy PG, Dav Borneo 2 alal: kokku: Russ(30),Bol (14); Tom
		Peay KG, Schubert MG, Nguyen NH, Bruns TD. 2012. Measuring ectomycorrhizal
		Pechanec AA., Franklin JF. 1968. Comparison of vegetation in adjacent alder, conif
		Pedersen CT, Sylvia DM, Shilling GS. 1999. Pisolithus arhizus ectomycorrhiza affe
		Pegler DN, Boddy L, Ing B, Kirk PM. 1993. Fungi of Europe: Investigation, Record
		Pegler DN, Fiard JP. 1978. Taxonomy and ecology of Lactarius(Agricales) in the L
p		Pegler DN, Rayner RW. ??? A contribution to the Agaric flora of Kenya. I Keenias:
		Pegler DN. 1966. Tropical African Agaricales. Persoonia 4: 73-124.
		Pegler DN. 1968. Studies on African Agaricales: I. Kew Bull. 21: 499-533.
		Pegler DN. 1969. Studies on African Agaricales: II. Kew Bull. 23: 219-249.
		Pegler DN. 1981. Agaricoid and boletoid fungi (Basidiomycota) from Malawi and Z
1		Pegler DN. 1983. Agaric flora of the Lesser Antilles. Kew Bull. Add Ser I Väikeste
		Pegler DN. 1986. Agaric Flora of Sri Lanka. HMSO: London
		Pegler DN. 1987. A revision of the Agaricales of Cuba 1. Species described by Berk
		Pegler DN. 1987. A revision of the Agaricales of Cuba 2. Species described by Earl
		Pegler DN. 1988. A revision of the Agaricales of Cuba 3. Keys to families, genera a
p		Pegler DN. 1996. Agarics described from the Cape province, South Africa Kapimaa
cd		Peintner U, Bougher NL, Castellano M-A, Moncalvo J-M, Moser MM, Trappe JM,
		Peintner U, Horak E, Moser MM, Vilgalys R. 2002.Phylogeny of *Rozites* , *Cuphocy*
p/cd		Peintner U, Iotti M, Klotz P, puhas Castanea n EcM: Cenococcum, Russ rosea, Lact
		Peintner U, Moncalvo J-M, Vilgalys R. 2004. Toward a better understanding of the
j		Peintner U, Moser MM, Thomas A, Manimohan P. 2003. First records of ectomycor
		Peltzer DA. 2001. Plant responses to competition and soil origin across a prairie-fore
		Peña L, Seguin A. 2001. Recent advances in genetic transformation of trees. Trends
		Pena R, Offermann C, Simor Koorimine-girc Cenoc, Tomentella 2tk, Lact ble
		Pena R, Tejedor J, Zeller B, eri-seened omastavad märgistatud varisest eri t
		Pennanen T, Liski J, Baath E, Kitunen V, Uotila J, Westman CJ, Fritze H. 1999. Str
		Pennanen T, Paavolainen L, Hantula J. 2001: Rapid PCR-based method for the direc
		Pennington HG, Bidartondo Eucalyptus ENG: Lacc lateritia, Scleroderma sp
p		Pennington Boletus speciosus tammel aeti taga risomorfe VKst mükoriisa
p/cd		Pennington RT, Lavin M, Ireland H, Klitgaard B, Preston J, Hu J-M. 2001. Phyloge
p/cd		Pennington RT, Lavin M, Oliveira-Filho A. 2009. Woody plant diversity, evolution a
p/cd		Pennington RT, Lavin M, Prado DE, Pendry CA, Pell SK. 200X. Climate change an
p/cd		Pennington RT, Richardson JE, Lavin M. 2006. Insights into the historical construct
		Pennisi E. 2008. Proposal to 'Wikify' GenBank meets stiff resistance. Science 319:
cd		Peplies J, Glöckner FO, Amann R. 2003. Optimization strategies for DNA microarra
p		Pera J, Alvarez IF. 1995. Ectomycorrhizal fungi of *Pinus pinaster* . Mycorrhiza 5: 1
cd		Percudani R, Trevisi A, Zambonelli A, Ottonello S. 1999. Molecular phylogeny of tr
p		Pereira OL, Kasuya MCM, Borges AC, de Araujo EF. 2005. Morphological and mo
		Peres-Neto PR, Jackson JA. 2001. How well do multivariate data sets match? The a
	x	Peres-Neto PR. 2004. Patterns of the co-occurrence of fish species in streams: the ro
		Peres-Neto R, Legendre P, Dray S, Borcard D. 2006. Variation partitioning of speci
p/cd		Perez-Garcia EA, Meave JA. 2006. Coexistence and divergence of tropical dry fores
cd		Perez-Moreno J, Read DJ. 2001. Exploitation of pollen by mycorrhizal mycelial sys
cd		Perez-Moreno J, Read DJ. 2001. Nutrient transfer from soil nematodes to plants: a d
		Perez-Moreno J, Read, Dj. 2000. Mobilization and transfer of nutrients from litter to
		Perkins DN, Pappin DJC, Creasy DM, Cottrell JS. 1999. Probability-based protein i
		Perotto S, Actis-Perino E, Perugini J, Bonfante P. 1996. Molecular diversity of fung
		Perotto S, Girlanda M, Martino E. 2002. Ericoid mycorrhizal fungi: some new persp
p/cd		Perrier N, Amir H, Colin F. 2006. Occurrence of mycorrhizal symbioses in the meta
p		Perrin R, Garbaye J. 1983. Influence of ectomycorrhizae of Pythium-infested soils a
		Perrin RM, Wigge PA. 2001. Biotic interactions. Web alert. Curr. Opin. Plant Biol.
p/cd		Perry BA, Hansen K, Pfister DH. 2007. A phylogenetic overview of the family Pyro
p/cd		Perry BA, Pfister DH. 2008. Chaetothiersia vernalis, a new genus and species of Pyr
		Perry DA, Amaranthus MP, Borchers JG, Borchers SL, Brainerd RE. 1989. Bootstra
p		Perry DA, Bell T, Amaranthus MP. 1992. Mycorrhizal fungi in mixed-species forest
		Perry DA, Borchers JG, Borchers SL, Amaranthus MP. 1990. Species migrations an
		Perry DA, Margolis H, Choquette C, Molina R, Trappe JM. 1989. Ectomycorrhizal
		Perry DA, Molina R, Amaranthus MP. 1987. Mycorrhizae, mycorrhizospheres, and
		Perry DA. 1995. Self-organizing systems across scales. Trends Ecol. Evol. 10: 241-:
		Perry DA. 1998. A movable feast: the evolution of resource sharing in plant-fungus c
		Pertea G, Huang X, Liang F, Antonescu V, Sultana R, Karamycheva S, Lee Y, Whit
cd		Petchey OL, Hector A, Gaston KJ. 2004. How do different measures of functional d
p/cd		Peter M, Ayer F, Cudlin P, E vs surevates kuus Tylospora fibrillosa nii looc Cortinari
		Peter M, Ayer F, Egli S, Hor 3 Shveitsi kuusik EcM: Amphinema, Cenoc, vs ECM

		Peter M, Ay xxx vs viljakehad; vs N-väetis vs ECM
	cd	Peter M, Bü Arcangeliella borziana
	cd	Peter M, Courty P-E, Kohler A, Delaruelle C, Martin D, Tagu D, Frey-Klett P, Dupl
	cd	Petersen JE, Hastings A. 2001. Dimensional approaches to scaling experimental eco
	p	Petersen PM. 1967. Studies on the ecology of some species of Pezizales. I Pezizales
	p	Petersen PM. 1970. Changes in fungus flora after treatment with various cl CaCO3 (
	p	Petersen PM. 1970. Danish fireplace fungi. Dansk Botanisk Arkiv. 27.3. lõkkeplat
	p	Petersen PM. 1971. The macromycetes in a burnt forest area in Denmark. Põlenud i
	p	Petersen PM. 1975. Fireplace fungi in an arctic area: Middle West Greenla Gröönima
	p	Petersen PM. 1978. The phenology of some soil inhabiting Pezizales. Fries Pezizales
	p/cd	Petersen R, Hughes K. 2009. Names, names, names: when nomenclature meets mole
	p	Petersen RH, Hughes KW. 1999. Species and speciation in mushrooms. Bioscience
		Petersen RH. 1987. Notes on Clavarioid Fungi. XXI. New Zealand taxa of Tremello
		Petersen RH. 1988. Notes on Clavarioid Fungi. XXII. Three Interesting South Amer
	p	Peterson RL, Ashford AE, Allaway WG. 1985. Vesicular-arbuscular mycorrhizal as
	p/cd	Peterson RI SLAIDID, erimükoriisatüübid. Monotropoidse mükoriisa "fungal peg" f
		Peterson RI DSE morfoloogia. Phialocephala fortinii mood HN männiga,
		Peterson TA ErM: nii kottseened kui kandseened (arv Clavaria)
	p/cd	Petit RJ, Aguinagalde I, de Beaulieau J-L and 14 others. 2003. Glacial refugia: hotsp
		Peynorel B. 1920. Sulla normale presenza di micorize nel grano. Bol. Staz. Pat. Veg
		Peyronel B. vaatas viljakehi puude all ja tegi tarka nägu
		Peyronel B. 1920. Alcuni casi di rapporti micorizici tra boletinee ed essenze arboree
		Peyronel B. Amanitopsis vaginata, Russula pseudofallax, laricif, montana
		Peyronel B. Gomphidius, Amanita, Xerocomus, Byssocorticium, Gyropor
		Peyronel B. Amanita, Xerocomuse, Cortinariuse, Gyroporus, Byssocortici
		Peyronel B. Hydnotrya tulasnei + Larix, Suillus caviper + Larix; Russula -
		Peyronel B. Cortinarius ja Russula VK viidi EcMni
		Peyronel B. Cortinariuse ja Russula mütseeli jälgimine Vkdest EcMni
	p	Pfister DH, Kimbrough JW. 2001. Discomycetes. In: McLaughlin DJ, McLaughlin E
	p/cd	Pfister DH, Slater C, Hansen K. 2008. Chorioactidaceae: a new family in the Peziza
	j	Pfister DH. Genea, Humaria, Jafneadelphuse viljakeha periidiumi rakkude morf on s
	cd	Pfunder M, Holzgang O, Frey JE. 2004. Development of microarray-based diagnost
		Pham N-DH, Yamada A, Shimizu K, Noda K, Dang L-AT, Suzuki A. 2012. A sheat
		Philipson JJ, Coutts MP. 1978. Tolerance of tree roots to waterlogging. IV. Oxygen
	p	Phillips DL, Gregg JW. 2001. Uncertainty in source partitioning using stable isotope
	p	Phillips DL, Koch PL. 2002. Incorprating concentration dependence instable isotope
	p	Phillips DL. 2001. Mixing models in analyses of diet using multiple stable isotopes:
	p/cd	Phillips RP, Fahey TJ. 2006. Tree species and mycorrhizal associations influence the
		Phillips RP, Meier IC, Bernhardt ES, Grandy AS, Wickings K, Finzi AC. 2012. Roo
		Phosri C, Martin MP, Watling R, Jeppson M, Sihanonth P. 2009. Molecular phyloge
2012	9	Phosri C, Põlme S, Taylor AFS, Kõljalg U, Suwannasai N, Tedersoo L. 2012. Diver
	p	Piche Y, Ac Wilcoxina mikolae männil (P resinosa)sünteesitud: katkendlik mantel, k
		Piche Y, Fo männil dihhotomiseerimise vaatlemine
	p/cd	Pickles BJ, Genney DJ, Anderson IC, Alexander IJ. 2009. Spatial ecology of ectomy
		Pickles BJ, Genney DR, Pott Pinus sylvestris Cenococcum, Mel bic; ruumilir
		Piculell BJ, Hoeksema JD, Thompson JN. 2008. Interactions of biotic and abiotic en
	cd	Piercey MM, Graham SW, Currah RS. 2004. Patterns of genetic variation in *Phialoc*
	cd	Piercey MM, Thormann MN, Currah RS. 2002. Saprobic characteristics of three fun
		Pigott CD, Huntley JP. 1981. Factors controlling the distribution of Tilia cordata at t
	p	Pigott CD. 1 Cenococcum pärnal: hartigi võrgustiku rakud taimel radiaalselt pikenem
	p	Pigott CD. 1982. Survival of mycorrhiza formed by Cenococcum geophilum Fr. In d
		Pilat A. 193 Albatrellus confluens VK ja EcM viidi kokku mööda myc
	p	Pilat A. 1965. Hrib drevozijny-*Pulveroboletus lignicola* (Kallenbach) comb. nov. na
	p	Pilat A. 1969. Buchwaldoboletus genus novum Boletacearum. Friesia 9: 217-218.
	p/cd	Pilz D, McLain R, Alexander S, Villarreal-Ruiz L, Berch S, Wurtz TL, Parks CG, M
	cd	Pilz D, Weber NS, Carter MC, Parks CG, Molina R. 2004. Productivity and diversit
		Pinheiro J, Bates D, DebRoy S. 2011. nlme: Linear and Nonlinear Mixed Effects Mo
	j	Pinkas Y, Maimon M, Shabi E, Elisha S, Shmulewich Y, Freeman S. 2000. Inoculat
	p/cd	Piotrowski JS, Lekberg Y, Harner MJ, Ramsey PW, Rilling MC. 2008. Dynamics o
		Pirotta R, A Terfezia obs EcM
		Pirozynski KA, Malloch DW. 1975. The origin of land plants :a matter of mycotropl
	p/cd	Pirozynski KA. 1983. Pacific mycogeography: an appraisal. Aust. J. Bot. 1 seened A
		Pirrung M, Kennedy R, Caporaso JG, Stombaugh J, Wendel D, Knight R. 2011. Top
	p	Plaan V. 2004. Mechanisms and tempo of evolution in the African Guineo-Congolia
	p	Plattner I, Hall IR. 1995. Parasitism of non-host plants by the mycorrhizal fungus Tu
		Plett JM, Martin F. 2011. Blurred boundaries: lifestyle lessons from ectomycorrhizal
		Plomion C et al. 1999. Developing SSCP markers in two Pinus species. Mol. Breed.
		Pocock MJO, Evans DM, Memmott J. 2012. The robustness and restoration of a net

(j) Põder R, Scheuer C. 1994. Moserella radicicola gen et sp. nov. , a new hy Moserell
cd Podila GK, Zheng J, Balasubramanian S, Sundaram S, Hiremath S, Brand JH, Hyme
e Pointing SB. 2001. Feasibility of bioremediation by white-rot fungi. Appl. Microbiol
Poisot T, Canard E, Mouillot D, Mouquet N, Gravel D. 2012. The dissimilarity of sp
Polidori E, Agostini D, Zeppa S, Potenza L, Palma F, Sisti D, Stocchi V. 2001. Iden
p/cd Pollmann W. 2003. Stand structure and dendroecology of an old-growth Nothofagus
2013 0 x Põlme S, Bahram M, Yamanaka T, Nara K, Dai YC, Grebenc T, Kraigher H, Toivon
Pommier T, Canbäck B, Riemann L, Boström Hagman K, Simu K, Lundberg P, Tun
p/cd Pommier T, Canbäck B, Riemann L, Boström-Hagman K, Simu K, Lundberg P and
p/cd Ponsard S, Arditi R. 2000. What can stable isotopes (d15N and d13C) tell about the
Poole EJ, Bending GD, Whipps JM, Read DJ. 2001. Bacteria associated with Pinus
p Pope EJ, Carter DA. 2001. Phylogenetic placement and host specificityof mycorrhiz
Poptsova MS. 2014. Genome Analysis. Calister Academic Press, Norfolk, UK.
x Porazinska DL, Bardgett RD, Blaauw MB, Hunt HW, Parsons AN, Seastedt TR, W
Porras-Alfaro A, Bayman P. 2007. Mycorrhizal fungi of *Vanilla* : diversity, specifici
p/cd Porras-Alfaro A, Herrera J, Sinsabaugh RL, Odenbach KJ, Lowery T, Natvig DO. 2
Porter TM, Golding GB. 2011. Are similarity- or phylogeny-based methods more ap
p/cd Porter TM, Schadt CW, Rizv mullaseened: kõikjal mullas sage kottseen on evol-puul
p/cd Porter TM, Skillman JE, Mo CAN: Ontario Tsuga, EmH: 185 liiki k CAN: C
cd Posada D, Buckley TR. 2004. Model selection and model averaging in phylogenetic
p/cd Posada D, Crandall KA, Templeton AR. 2000. Geodis: a program for the nested cla
cd Posada D, Crandall KA. 1998. MODELTEST: testing the model of DNA substitutio
cd Posada D, Crandall KA. 2001. Intraspecific gene genealogies:trees grafting into netw
Posada D. 2008. jModelTest: phylogenetic model averaging. Mol. Phyl. Evol. 25: 12
p Post DM. 2002. Using strable isotopes to estimate trophic position: models, methods
p/cd Postma JWM, Olsson PA, Falkengren-Grerup U. 2007. Root colonisation by arbusc
cd Potter D et al. 2002. Phylogenetic relationships in Rosaceae.. Pl. Syst. Evol. 231: 77
p/cd Potter D, Eriksson T, Evans RC, Oh S, Smedmark JEE, Morgan DR, Kerr M, Rober
Poulin R, Krasnov BR, Mouillot D, Thieltges DW. 2011. The comparative ecology a
Poulin R, Krasnov BR, Mouillot. 2011. Host specificity in phylogenetic and geograp
Poulin R. 2010. Decay of similarity with host phylogenetic distance in parasite fauna
x Powell JR, Monaghan MT, Öpik M, Rillig MC. 2011. Evolutionary criteria outperfo
Powell JR, Parrent JL, Hart MM, Klironomos JN, Rillig MC, Maherali H. 2009. Phy
p/cd Power ME, Mills LS. 1995. The keystone cops meet in Hilo. Trends Ecol. Evol. 10:
Poznanovic SK, Lilleskov EA CWD Betula ja Lactarius tabidus, Tomentella s
Preheim SP, Perrotta A, Martin-Platero AM, Gupta A, Alm EJ. 2013. Distribution-b
Preiss K, Adam IKU, Gebauer G. 2010. Irradiance governs exploitation of fungi: fin
x Prescott CE, Grayston SJ. 2013. Tree species influence on microbial communities in
p/cd Press MC, Phoenix GK. 2005. Impacts of parasitic plants on natural communities. N
p Press MC, Shah N, Tuohy JM, Stewart GR. 1987. Carbon isotope ratios demonstrat
p Press MC. 1998. Dracula or Robin Hood? A functional role for root hemiparasites in
Pressel S, Ligrone R, Duckett JG. 2008. The ascomycete Rhizoscyphus ericae elicits
cd Preston-Mafham J, Boddy L, Randerson PF. 2002. Analysis of microbial community
Pretzsch H, Rötzer T, Matyssek R, Grams TEE, Häberle K-H, Pritsch K, Kerner R,
Price MN, Dehal PS, Arkin AP. 2009. FastTree: Computing large minimum evolutio
Price RA. 1996. Systematics of the Gnetales: a review of morphological and molecu
p/cd Pringle A, Adams RI, Cross HB, Bruns TD. 2009. The ectomycorrhizal fungus Ama
p/cd Pringle A, Bever JD, Gardes M, Parrent JL, Rillig MC, Klironomos JN. 2009. Myco
dd Pringle A, Tyler JW. 2002. The fitness of filamentous fungi. Trends in Microbiol. ??
p/cd Pringle A, Vellinga EC. 2006. Last chance to know? Using literature to explore the l
p/cd Prinzig A, Reiffers R, Braakhekke WG, Hennekens SM, Tackenberg O, Ozinga WA
2010 4 Pritsch K, Becerra A, Põlme S, Tedersoo L, Schloter M, Agerer R. 2010. Descriptio
1 Pritsch K, B mustal lepal + k mustas lepikus: väike; 50% kattus viljakehad mustas le
Pritsch K, Courty PE, Churin J-L, Cloutier-Hurteau B, Ali MA, Damon C, Duchemi
Pritsch K, Garbaye J. 2011. Enzyme secretion by ECM fungi and exploitation of mi
cd Pritsch K, M must lepp: detailsed kirjeldused ja määraja
Pritsch K, M Alnirhiza cystidiobrunnea: v sarnane Th terrestrisele ja T sublilacinale
Pritsch K, Raidl S, Marksteiner E, Blaschke H, Agerer R, Schloter M, Hartmann A.
b Pritsch K. 1996. Untersuchungen zur Diversität und Ökologie von Mykorrhizen der
Procter AC, Ellis JC, Fay PA CO2 tõus. Glomeromycota arv tõuseb ühel mul
p/cd Promputtha I, Lumyong S, Dhanasekaran V, McKenzie EHC, Hyde KD, Jeewon R.
p/cd Prosser JI, Bohannan BJ, Curtis TP, Ellis RJ, Firestone MK, Freckleton RP, Green J
cd Prosser JI. 2002. Molecular and functional diversity in soil micro-organisms. Plant S
Prosser JI. 2010. Replicate or lie. Environ. Microbiol. 12: 1806-1810.
Pruesse E, Quast C, Knittel K. 2007. SILVA: a comprehensive online resource for q
Pruett G, Bruhn J, Mihail J. 2 Tuber aestivun Tuber aestivum püsis väga häst
Pryor A, Boelen MG. 1987. A double-stranded RNA mycovirus from the maize rust
p Pucko M, G pöögil pöögi eri päritolu Fagirhiza fusca = Tomentella, Cenoc

	x	Puillandre N, Lambert A, Brouillet S, Achaz G. 2012. ABGD, Automatic Barcode C
		Püttsepp Ü, Rosling A, Tayl Salix viminalis Cadophora finlandica, Cortinari
p/cd		Pyare S, Longland WS. 2002. Interrelationships among northern flying squirrels, tru
		Qian H, Chen S, Mao L, Ouyang Z. 2013. Drivers of beta-diversity along latitudinal
p/cd		Qian H, Ricklefs R. 2004. The taxon richness and climate in angiosperms: is there a
cd		Qian H, Ricklefs RE. 2000. Large-scale processes and the Asian bias in species dive
p/cd		Qian H, Ricklefs RE. 2008. Global concordance in diversity patterns of vascular pla
p/cd		Qian H, Song J-S, Krestov P, Guo Q, Wu Z, Shen X, Guo X. 2003. Large-scale phy
		Qian H, Wang X, Zhang Y. 2012. Comment on 'Disentangling the drivers of beta div
		Qian H. 2009. Beta diversity in relation to dispersal ability for vascular plants in No
cd		Qian XM, El Ashker A, Kottke I, Oberwinkler F. 1998. Studies of pathogenic and a
cd		Qian XM, K fluorestseerimine hindamaks vitaalsust
cd		Qian XM, K fluorestseerimin variabiilne ajas ja Tylospora, Russula, Tomentella sp.
		Qiang X, Weiss M, Kogel K-H, Schäfer P. 2012. Piriformospora indica - a mutualist
cd		Quackenbush J. 2002. Microarray data normalization and transformation. Nature Ge
		Queloz V, Grünig CR, Berndt R, Kowalski T, Sieber TN, Holdenrieder O. 2011. Cr
p/cd		Queloz V, Grünig CR, Sieber TN, Holdenrieder O. 2005. Monitoring the spatial and
		Queloz V, Sieber TN, Holdenrieder O, McDonald BA, Grünig CR. 2011. No biogeo
cd		Querejeta JI, Egerton-Warburton LM, Allen MF. 2003. Direct nocturnal water trans
p/cd		Querejeta JI, Egerton-Warburton LM, Allen MF. 2003. Hydraulic lift may buffer rhi
		Querejeta JI, Egerton-Warburton LM, Allen MF. 2009. Topographic position modu
		Querejeta JI, Roldan A, Alba männiistandikus Suillus, Pisolithus, Thelephora
p/cd		Quoreshi AM, Khasa DP. 2008. Effectiveness of mycorrhizal inoculation in the nurs
		Quoreshi AM, Piche Y, Khasa DP. 2008. Field performance of conifer and hardwoo
		Quoreshi AM, Timmer VR. 1998. Exponential fertilization increases nutrient uptake
		Quoreshi M, Timmer VR. 2000. Growth, nutrient dynamics and ectomycorrhizal dev
x		R Core Development Team. 2014. R: A Language and Environment for Statistical C
		Radajewski S, Ineson P, Parekh NR, Murrell JC. 2000. Stable-isotope probing as a
p/cd		Radajewski S, McDonald IR, Murrell JC. 2003. Stable-isotope probing of nucleic ac
		Rademaker JLW, Louws FJ, de Bruijn FJ. 1998. Characterization of the diversity of
	x	Raes J, Letunic I, Yamada T, Jensen LJ, Bork P. 2011. Toward molecular trait-base
		Rahbek C, Graves GR. 2001. Multiscale assessment of patterns of avian species ricl
n		Raidl S, Hal Porphyrellus porphyrosporus
n		Raidl S. 19 Chamonixia caespitosa
cd		Rains KC, Nadkarni NM, Bledsoe CS. 2003. Epiphytic and terrestrial mycorrhizas i
	x	Rajala T, Peltoniemi M, Hantula J, Mäkipää R, Pennanen T. 2011. RNA reveals a su
		Rajala T, Peltoniemi M, Pen lagutüvedel: BD kasvab lagunemisastmetega; a
p/cd		Rajchenberg M. 1995. New polypores from the *Nothofagus* forests of Argentina. M
p/cd		Ramanankierana N, Ducousso M, Rakotoarimanga N and 7 others. Arbusc Madagas
		Ramette A, Tiedje JM. 2007. Multiscale responses of microbial life to spatial distan
p/cd		Ramette A. 2007. Multivariate analyses in microbial ecology. FEMS Microbiol. Eco
p/cd		Ramirez SR, Gravendeel B, Singer RB, Marshall CR, Pierce NE. 2007. Dating the c
p/cd		Ran J-H, Wei X-X, Wang X-Q. 2006. Molecular phylogeny and biogeography of Pi
p/cd		Rangel TFLVB, Diniz-Filho JAF, Bini LM. 2006. Towards an integrated computatio
cd		Ranjard L, Poly F, Lata J-C, bakterite (IGS) ja seente (ITS) ARISA=ARDRA
cd		Rao AV, Tak R. 2001. Influence of mycorrhizal fungi on the growth of different tree
p		Rapior S, Andary C, Mousain D. 1987. Cortinarius section Orellani: isolation and cu
j		Rasanayagam S, Jeffries P. 1992. Production of acid is responsible for antibiosis by
p/cd		Rasmussen HN, Rasmussen FN. 2009. Orchid mycorrhiza: implications of a mycoph
p		Rasmussen HN, Whigham DH. 1993. Seed ecology of dust seeds in situ: a new stud
p		Rasmussen HN, Whigham DH. 1998. Importance of woody debris in seed germinati
p		Rasmussen HN, Whigham DH. 1998. The underground phase: a special challenge in
p/cd		Ratkowsky DA, Gates GM. 2005. An inventory of macrofungi observed in Tasmaan
		Ratnasingham S, Hebert PDN. 2013. A DNA-based registry for all animal species: t
		Rayner ADM, Boddy L. 1988. Fungal decomposition of wood. Its biology and ecolo
		Rayner ADM, Ramsdale M, Watkins ZR. 1995. Origins and significance of genetic
		Rayner MC. 1926. Tree mycorrhiza. The J. Ecol. 14: 164-167.
p/cd x		Read D, Leake JR, Perez-Moreno J. 2004. Mycorrhizal fungi as drivers of ecosyster
p		Read DJ, Armstrong W. 1972. A relationship between Oxygen transport and the for
cd		Read DJ, Duckett JG, Francis R, Ligrone R, Russell A. 2000. Symbiotic fungal asso
		Read DJ, H Cenococcum: Kobresia, Polygonum, Dryas, Helianthemum
		Read DJ, K Cenococcum: H AM vs ECM: Helianthemum
cd		Read DJ, Perez-Moreno J. 2003. Mycorrhizas and nutrient cycling in ecosystems – a
p		Read DJ. 19 Ericales: erikoidne, arbutoidne, monotropoidne MR. Pyrolatel mantli ol
p		Read DJ. 1989. Mycorrhizas and nutrient cycling in sand dune ecosystems. Proc. Ro
B		Read J, Brown MJ. 1996. Ecology of Australian Nothofagus forests. In: Veblen TT,
p		Read J, Hill RS. 1988. The dynamics of some rainforest associations in Tasmania. J.
		Read J, Hill RS. 1995. Photosynthetic responses to light of Australian and Chilean s

p/cd			Read J, Jaffre T, Hope GS, Veillon J-M. 2000. Structural and floristic characteristics
p			Readhead SA, Ammirati JF, Walker GR, Norvell LL, Puccio MB. 1994. Squamanita
p/cd			Reche I, Pulido-Villena E, M bakterite BD suurem suuremates Hisp mägijärvedes; li
p			Reddell P, Bowen GD,Robson AD. 1986. Nodulation of Casuarinaceae in relation to
p/cd			Reddell P, Gordon V, Hopkins MS. 1999. Ectomycorrhizas in *Eucalyptus* Põhja-AU
			Reddell P, Hopkins MS, Graham AW. 1996. Functional association between apoge
p			Reddell P, Malajczuk N. 1984. Formation of mycorrhizae by jarrah (Eucalyptus mar
p			Reddell P, M Acacia EcM ei tek Hartigi võrgustikku, eukalüptil tihti ektendoMR; Ery
p			Reddell P, Spain AV. 1991. Earthworms as vectors of viable propagules of mycorrh
p/cd			Reddell P, Yun Y, Shipton WA. 1997. Cluster roots and mycorrhizae in *Casuarina*
cd			Reddy MS, Natarajan K. 1997. Coinoculation efficacy of ectomycorrhizal fungi on I
cd			Redecker D, Kodner R, Graham LE. 2000. Glomalean fungi from the Ordovician. Sc
cd			Redecker D, Morton JB, Bruns TD. 2000. Ancestral lineages of arbuscular mycorrh
p/cd			Redecker D, Raab P, Oehl F, Camacho FJ, Courtecuisse R. 2007. A novel clade of s
p/cd			Redecker D, Raab P. 2006. Phylogeny of the Glomeromycota (arbuscular mycorrhiz
			Redecker D, Schüssler A, Stockinger H, Stürmer SL, Morton JB, Walker C. 2013. A
		x	Redecker D, Szaro TM, Bowman RJ, Bruns TD. 2001. Small genets of Lactarius xa
cd			Redecker D. 2002. Molecular identification and phylogeny of arbuscular mycorrhiza
			Redford AJ, Bowers RM, Knight R, Linhart Y, Fierer N. 2010. The ecology of the p
p			Redhead JF. 1968. Mycorrhizal associations in some Nigerian forest trees. Trans. B
			Redhead S, Malloch DW. 1985. The genus *Phaeocollybia* (Agaricales) in eastern C
			Redhead S. 1989. A biogeographical overview of the Canadian mushroom flora. Car
			Redhead SA, Smith JD. 1981. A North American isolate of Coprinus kubickae asso
			Redhead SA. 1979. Mycological observations: 1, on *Cristulariella*; 2, on *Valdensin*
			Redhead SA. 1981. Parasitism of bryophytes by agarics. Can. J. Bot. 59: 63-67.
			Redman RS, Dunigan DD, Rodriguez RJ. 2001. Fungal symbiosis from mutualism to
cd			Redman RS, Sheehan KB, Stout RG, Rodriguez RJ, Henson JM. 2002. Thermotoler
cd			Reeb V, Lutzoni F, Roux C. 2004. Contribution of RPB2 to multilocus phylogenetic
			Rees M. 1880. Über den Parasitismus von *Elaphomyces granulatus*. Bot. Zeit. 38: 7
cd			Reeves C, de Wit M. 2000. Making ends meet in Gondwana: retracing the transform
			Rehner SA, Buckley E. 2005. A *Beauveria* phylogeny inferred from nuclear ITS and
		x	Reich M, Kohler A, Martin F, Buée M. 2009. Development and validation of an olig
			Reich PB, Oleksyn J, Modrzynski J, Mrozinski P, Hobbie SE, Eissenstat DM, Chor
	x		Reich PB, Tilman D, Isbell F, Mueller K, Hobbie SE, Flynn DFB, Eisenhauer N. 20
			Reich PB, Tjoelker MG, Walters MB, Vanderklein DW, Buschena C. 1998. Close a
			Reid DA. 1975. Type studies of the larger Basidiomycetes described from Kapima
			Reid DA.1975. Type studies of the larger Basidiomycetes described from Southern A
j			Reid ID. 1995. Biodegradation of lignin. Can. J. Bot. 73: S1011-S1018.
			Reid. CPP. 1971. Transport of C14-labeled Substances in Mycelial Strands of Thele
			Reinhart KO, Tytgat T, van der Putten WH, Clay K. 2010. Virulence of soil-borne p
			Reinhart KO, Wilson GWT, Rinella MJ. 2012. Predicting plant responses to mycorr
p			Reinsvold RT, Reeves B. 1986. The mycorrhizae of Juniperus osteosperma: Identity
p/cd			Remigi P, Faye A, Kane A, Deruaz M, Thioulouse J, Cissoko M, Prin Y, Galiana A,
			Renker C, Otto P, Schneider K, Zimdars B, Maraun M, Buscot F. 2005. Oribatid mi
p/cd			Renner SS, Foreman DB, Murray D. 2000. Timing transantarctic disjunctions in the
p/cd			Renner SS. 2004. Plant dispersal across the tropical Atlantic by wind and sea curren
p/cd			Renner SS. 2005. Relaxed molecular clocks for dating historical plant dispersal even
			Reshef DN, Reshef YA, Finucane HK, Crossman SR, McVean G, Turnbaugh PJ, La
			Reverchon F, del Pilar Orteg MEX Pinus mc Domin Amphinema sp, rühmad
p			Reynolds HL, Hungate BA, Chapin III SF, D´Antonio CM. 1997. Soil heterogeneity
			Rezende EL, Jordano P, Bascompte J. 2007. Effects of phenotypic complementarity
			Rezende EL, Lavabre J, Guimaraes PR, Jordano P, Bascompte J. 2007. Non-random
p/j			Rice AV, Currah RS. 2002. New perspectives on the niche and holomorph of the my
p/cd			Richard C, Fortin J-A. 1973. The identification of *Mycelium radicis atrovirens* (*Phi*
p/cd			Richard F, Millot S, Gardes Korsikal Quercus tamm: Cenococcum; Russula decipie
p/cd			Richard F, Moreau P-A, Selosse M-A, Gardes M. 2004. Diversity and frui Korsika
			Richard F, Roy M, Shahin O Quercus ilex F tom-thel; kooslust mõj nõrgalt r
p/cd			Richardson DM, Allsopp N, D'Antonio C, Milton SJ, Rejmanek M. 2000. Plant inva
p/cd			Richardson DM, Pysek P, Rejmanek M, Barbour MG, Panetta FD, West CJ. 2000.
p/cd			Richardson DM, Rejmanek M. 2004. Conifers as invasive aliens: a global survey an
p/cd			Richardson DM, van Wilgen BW. 2004. Invasive alien plants in South Africa: how
p/cd			Richardson DM. 1997. Forestry trees as invasive aliens. Conserv. Biol. 12: 18-26.
cd			Richardson JE, Fay MF, Cronk QCB, Bowman D, Chase MW. 2000. A phylogeneti
			Richardson JML, Richards RH. 2008. A randomisation program to compare species
			Richter DL, Bruhn JN. 1989. Field survival of containerized red and jack pine seedli
			Richter DL, Boletus parasiticus!!!, Astraeus, Scleroderma spp, Thelephora sünt. Ja k
			Richter DL, Zuellig TR, Bagley ST, Bruhn JN. 1989. Effect of red pine (Pinus resino
p/cd			Ricklefs RE, Bermingham E. 2002. The concept of taxon cycle in biogeography. Glo

			Ricklefs RE, Renner SE. 1994. Species richness within families of flowering plants.
		p	Ricklefs RE, Schluter D. 1993. Species diversity: Regional and historical perspectiv
			Ricklefs RE. 2004. A compehensive framework for global patterns in biodiversity. E
		p/cd	Ricklefs RE. 2006. Evolutionary diversification and the origin of the diversity-enviro
		p	Ridgway KP, Marland LA, F Frankia
		p	Ridley GS. 1993. Limacella macrospora Stevenson and L. Wheroparaonea, a new sp
			Riess K, Oberwinkler F, Bauer R, Garnica S. 2013. High genetic diversity at the reg
			Rietkerk M, Ketner P, Wilde de JJFE. 1995. Caesalpinioideae and the study of fores
		p	Riffle JW, Tinus RW. 1982. Ectomycorrhizal characteristics, growth, and survival o
			Riffle JW. 1971. Effect of Nematodes on Root-Inhabiting Fungi. In: Hacskaylo E (ed
		p	Riffle JW. 1 Amanita muscaria, A pantherina, Lactarius deliciosus
			Rigou L, Mignard E, Plassard C, Arvieu JC, Remy JC. 1995. Influence of ectomyco
			Riley R, Salamov AA, Brown DW, Nagy LG, Floudas D, Held BW et al. 2014. Ext
		cd	Rillig MC, Maestre FT, Lamit LJ. 2003. Microsite differences in fungal hyphal lengt
		p/cd	Rillig MC, Mummey DL. 2006. Mycorrhizas and soil structure. New Phytol. 171: 4
		B	Rillig MC, Treseder KK, Allen MF. 2002. Global Change and Mycorrhizal Fungi. In
			Rinaldi AC, Comandini O, Kuyper TW. 2008. Ectomycorrhizal fungal diversity: sep
			Rincon A, Alvarez IF, Pera J. 2001. Inoculation of containerized Pinus Pinea L. seed
			Rincon A, de Felipe MR, Fernandez-Pascual M. 2007. Inoculation of *Pinus halepen*
			Rincon A, Pueyo JJ. 2010. E Pinus ESP, vs : Wilcoxina, Rhiz. Lut, Tom sp. I
		p/cd	Rineau F, Courty P-E, Uroz S, Buee M, Garbaye J. 2008. Simple microplate assays
			Rineau F, Courty P-E. 2011. Secreted enzymatic activities of ectomycorrhizal fungi
			Rineau F, Garbaye J. 2009. Does forest liming impact the enzymatic profiles of ecto
			Rineau F, Shah F, Smits MM, Persson P, Johansson T, Carleer R, Troein C, Tunlid
		p	Riviere T, Diabaté M, Ducou Lõuna Guineas eri peremeestaimede all (Uap Lõuna G
		p/cd	Riviere T, Diedhiou AG, Diabate M, Senthilar Guinea Caesalp-metsad do India ja (
		p/cd	Riviere T, Natarajan K, Dreyfus B. 2006. Spatial distribution of ectomycorrhizal bas
		b	Rizzo DM. 2005. Exotic species and fungi: interactions with fungal, plant, and anim
		p/cd	Roalson EH, Columbus T, Friar E. 2001. Phylogenetic relationships in Cariceae (Cy
		p	Roberts P. 1998. Ceratobasidium obscurum: an atypical Thanatephorus species, mis
			Roberts P. 1999. Clavarioid fungi from Korup National Park, Cameroon. Kew Bull.
		p	Roberts P. 2000. Corticioid fungi from Korup National Park, Cameroon. Kew Bull.
			Roberts P. 2001. Amphinema angustispora: a new corticoid fungus from the Conser
			Roberts P. 2001. Heterobasidomycetes from Korup National Park, Cameroon. Kew
			Robertson I Pyrola: puudub : Pyrola Hysterangium, Cenococcumit polnd
			Robertson GP. 1987. Geostatistics in ecology: interpolating with known variance. E
			Robertson NF. 1953. Studies on the mycorrhiza of *Pinus sylvestris* I.The pattern of
		p	Robertson SJ, Tackaberry Ll Picea mariana niiskus ja taimekoosluste gradiendil: liig
			Robeson MS, King AJ, Freeman KR, Birky WC, Martin AP, Schmidt SK. 2011. Soi
			Robinson CH. 2001. Cold adaptation in Arctic and Antrarctic fungi. New Phytol. 15
			Robinson D, Fitter A. 1999. The magnitude and control of carbon transfer between p
		p/cd	Robinson D. 2001. Delta15N as an integrator of the nitrogen cycle. Trends Ecol. Ev
		p	Robinson RM, Bougher NL. 2003. The response of fungi to fire in Jarrah (põlendike
			Robinson RM, Mellican AE, Smith RH. 2008. Epigeous macrofungal succ W-AUS
			Robinson RM, Tunsell VL. 2007. A list of macrofungi recorded in burnt ai Cortinar
			Rochet J, Moreau P-A, Manzi S, Gardes M. 2011. Comparative phylogenies and ho
			Rodrigues da Silva NR, Cristina da Silva M, Fonseca Genevois V, Esteves AM, de
		cd	Rodriguez RJ, White JF, Arnold AE, Redman RS. 2009. Fungal endophytes: diversi
			Rodriguez-Echeverria S. 2010. Rhizobial hitchhikers from down under: invasional m
			Roger A, Colard A, Angelard C, Sanders IR. 2013. Relatedness among arbuscular m
		(cd)	Romantschuk M, Sarand I, Petänen T, Peltola R, Jonsson-Vihanne M, Koivula T, Y
			Romell L-G. 1921. Parallelvorkommen gewisser boleten und nadelbäume. Svensk B
			Romell L-G. 1930. Blodriskan, en granens följesvamp. Svensk Bot. Tidskr. 24: 524-
			Romell L-G. 1938. A trenching experiment in spruce forest and its bearing on proble
			Romell L-G. 1939. The ecological problem of mycotrophy. Ecology 20: 163-167.
		cd	Ronquist F, Huelsenbeck JP. 2003. MrBayes 3: Bayesian phylogenetic inference und
			Ronquist F, Teslenko M, van der Mark P, Ayres D, Darling AD, Höhna S, Larget B
		p/cd	Rooney AP, Ward TJ. 2005. Evolution of a large ribosomal RNA multigene family:
		cd	Roose-Amsaleg C, Byrgoo Y kottseened troopikas termiidikuhilates vs mullas: kõrge
			Roper M, Pepper RE, Brenner MP, Pringle A. 2008. Explosively launched spores of
		p	Rosado SCS, Kropp BR, Piche Y. 1994. Genetics of ectomycorrhizal symbiosis. I. H
			Rosado SCS, Kropp BR, Piche Y. 1994. Genetics of ectomycorrhizal symbiosis. II.
		p	Rose SL, Perry DA, Pilz D, Schoeneberger MM. 1983. Allelopathic effects of litter
			Rose SL. 1980. Mycorrhizal associations of some actinomycete nodulated nitrogen-
		p/cd	Rosendahl S. 2008. Communities, populations and individulas of arbuscular mycorrh
2013	2		Rosenvald K, Ostonen I, Uri V, Varik M, Tedersoo L, Lõhmus K. 2013. Tree age ef
			Rosenzweig M. L. 1995 - Species diversity in space and time - Cambridge Univ. Pre
		p/cd	Roshan U, Livesay DR. 2006. Probalign: multiple sequence alignment using partition

	1	Rosling A, Cox F, Cruz-Martinez, Ihrmark K, Grelet G-A, Lindahl BD, Menkis A, J
cd		Rosling A, Landeweert R, Li männikus, sügavu Piloderma reticulatum; Suillus luteus
cd		Rosling A, Lindahl BD, Finlay RD. 2004. Carbon allocation to ectomycorrhizal root
cd		Rosling A, Lindahl BD, Taylor AFS, Finlay RD. 2003. Mycelial growth and substra
cd		Roth-Bejerano N, Li Y-F, Kagan-Zur V. 2004. Homokaryotic and heterokaryotic hy
		Roux C, Sejalon-Delmas N, Martins M, Parguey-Leduc A, Dargent R, Becard G. 19
cd		Roxburgh SH et al. 2004. THE INTERMEDIATE DISTURBANCE HYPOTHESIS
		Roy M, Dubois M-P, Proffit M, Vincenot L, Desmarais E, Selosse M-A. 2008. Evid
p/cd		Roy M, Watthana S, Stier A, Richard F, Vessabutr S, Selosse M-A. 2009. Mycohet
		Roy M, Yagame T, Yamato M, Iwase K, Heinz C, Faccio A, Bonfante P, Selosse M
		Roy S, Khasa DP, Greer CW. 2007. Combining alders, frankiae, and mycorrhizae fo
cd		Rubina A, Topini F, Riccioni C, Paolocci F, Arcioni S. 2004. Isolation and characte
		Rubini A, Belfiori B, Passeri V, Baciarelli Falini L, Arcioni S, Riccioni C, Paolocci
		Rubini A, Belfori B, Riccioni C, Arcioni S, Martin F, Paolocci F. 2011. Tuber melan
p/cd		Rudawska M, Leski T, Trocl kuusel metsataim Sagedasimad Wilcoxina mikolae, eri
		Rudawska ML, Kieliszewska-Rokicka B. 1997. Mycorrhizal formation by Paxillus i
cd		Rudi K, Skulberg OM, Skulberg R, Jakobsen KS. 2000. Application of sequence-sp
cd		Ruess L, Tiunov A, Haubert D, Richnow HH, Häggblom MM, Scheu S. 2005. Carb
cd		Rühm W, Kammerer L, Hier 137Cs/134Cs erinevus mullas näitab seente mütseeli pa
cd		Rull V. 2005. Biotic diversification in the Guayana highlands: a proposal. J. Biogeog
cd		Rumberger MD, Münzenber mitmes vanuses p männil eripaigus: Russula ochroleuca
		Rungjindamai N, Sakayaroj J, Plaingam N, Somrithipol S, Jones EBG. 2008. Putativ
		Runion GB, Mitchell RJ, Ro polnud oluline
		Ruotsalainen AL, Väre H, Vestberg M. 2002. Seasonality of root fungal colonizatio
p/cd		Rusca TA, Kennedy PG, Bru eri männiliikidel Rhizopogon: mõnel idaneb rohkem lii
		Rusch G, Fernandez-Palacios JM. 1995. The influence of spatial heterogeneity on re
cd		Russell AJ, Bidartondo MI, Butterfield BG. 2002. The root nodules of the Podocarp
		Russo RO. 2005. Nitrogen-fixing trees with actinorhiza in forestry and agroforestry.
		Rust J, Singh H, Rana RS, McCann T, Singh L, Anderson K, Sarkar N, Nascimbene
		Ruzicka J, Hansen EH. 1981. Flow injection analysis. New York, NY, USA: Wiley
		Ryberg M, Andreasen M, Björk RG. 2010. Weak habitat specificity in ectomycorrhi
		Ryberg M, Kristiansson E, Sjökvist E, Nilsson Geenipank: annoteerimata: Tom
		Ryberg M, Larsson E, Jacobsson S. 2010. An evolutionary perspective on morpholo
1		Ryberg M, Larsson E, Molau Dryas octopeta Cenoc; Tom-thel, Seb (sh 2 har
		Ryberg M, Matheny PB. 2011. Dealing with incomplete taxon sampling and diversif
		Ryberg M, Matheny PB. 2012. Asynchronous origins of ectomycorrhizal clades of A
		Ryberg M, Matheny PB. 2012. Asynchronous origins of ectomycorrhizal clades of A
p/cd		Ryberg M, Nilsson RH, Kristiansson E, Töpel M, Jacobsson S, Larsson E. 2008. M
p/cd		Rydin C, Raunsgaard Pedersen K, Friis EM. 2004. On the evolutionary history of Ep
		Rygiewicz PT, Johnson MG, Ganio LM, Tingey DT, Storm MJ. 1997. Lifetime and
		Ryser P. 1993. Influences of neighbourging plants on seedling establishment in limes
p		Ryvarden L, Johansen I. 1980. A preliminary polypore flora of East Africa Coltricia-
p/cd		Saari SK, Campbell CD, Rus männi eri isendite Russula dimeia, Suillus flavidus, unk
		Saavedra S, Stouffer DM, Uzzi B, Bascompte J. 2011. Strong contributors to netwo
p/cd		Sagara N, Ooyama J, Koyama M. 2008. New casual animal for the growth of *Hebel*
j		Sagara N. 1995. Association of ectomycorrhizal fungi with decomposed ar Hebelom
		Saikkonen I mega mänd; vs okastes okaste rookides asendusid risomorfir
cd		Saikkonen K, Wäli P, Helander M, Faeth SH. 2004. Evolution of endophyte–plant sy
cd		Sait M, Hugenholtz P, Janssen PH. 2002. Cultivation of globally distributed soil bac
j		Sakakibara vs RFLP: kattusid enamasti kergelt tuntavate liikide puhul, ent ei eristan
		Salo K. 1979. Mushrooms and mushroom yield on transitional peatlands ir eri sooko
p		Salonen V, Setälä H, Puustinen S. 2000. The interplay between Pinus sylvestris, its r
		Salonen V, Vestberg M, Vauhkonen M. 2001. The effect of host mycorrhizal status
p/cd		Saltonstall K. 2001. A set of primers for amplifying noncoding regions of chloroplas
		Sampo S, Bergero R, Buffa (mikroseened mullas Alnus all: tamede vanus (a
		Samson J, F Suilluse ja Boletinuse sünt. EcM Larix laricinal
p/cd		Samuel R et al. 2005. Molecular phylogenetics of Phyllanthaceae:.. Am. J. Bot. 92:
p/cd		Sanchez A, Kron KA. 2008. Phylogenetics of Polygonaceae with an emphasis on the
cd		Sanchez F, Honrubia M, Torres P. 2001. Effects of pH, water stress and temperature
		Sanchez Marquez S, Bills GF, Dominguez Acuna L, Zabalgogeazcoa I. 2010. Endop
		Sanders IR, Croll D. 2010. Arbuscular mycorrhiza: the challenge to understand the g
p/cd		Sanders IR. 2004. Plant and AM BD uurimiseks sobib paremini molekulaarne vs ec
cd		Sanderson MJ, Doyle JA. 2001. Sources of error and confidence intervals in estimat
cd		Sanderson MJ, Driskell AC. 2003. The challenge of constructing large phylogenetic
cd		Sanderson MJ, Shaffer HB. 2002. Troubleshooting molecular phylogeny analyses. A
		Sanderson MJ. 2002. Estimating absolute rates of molecular evolution and divergenc
cd		Sandhu GS, Kline BC, Stockman L, Roberts GD. 1995. Molecular probes for diagno
		Sang T, Crawford DJ, Stuessy TF. 1997. Chloroplast DNA phylogeny, reticulate evo

cd		Sangtiean T, Schmidt S. 2002. Growth of subtropical ECM fungi with different nitro
p/cd		Sanmartin I, Enghoff H, Ronquist F. 2001. Patterns of animal dispersal, vicariance a
p/cd		Sanmartin I, Mark P, Ronquist F. 2008. Inferring dispersal: a Bayesian approach to p
p/cd		Sanmartin I, Ronquist F. 2004. Southern Hemisphere biogeography inferred by even
p/cd		Sanon KB, Ba AM, Delaruelle C, Duponnois R, Martin F. 2009. Morphological and
cd		Sanon KB, Ba AM, Dexheimer J. 1997. Mycorrhizal status of some fungi Burkina
p/cd		Sapp J. 2004. The dynamics of symbiosis: an historical overview. Can. J. Bot. 82: 1(
		Sappa F. 1940. Ricerche biologiche *Tuber magnatum* Pico. Nuovo Gior. Bot. Ital. 4
		Sarand I, Haario H, Jorgensen K, Romantschuk M. 2000. Effect of inoculation of a T
		Sarand I, Timonen S, Nurmiaho-Lassila E-L, Koivula T, Haahtela K, Romantschuk I
		Saravesi K, Markkola A, Rautio P, Roitto M, Tuomi J. 2008. Defoliation causes par
		SAS Institute. 1989–1999. JMP. SAS Institute, Inc., Cary, North Carolina, USA.
p/cd		Sati SC, Belwal M. 2005. Aquatic hyphomycetes as endophytes of riparian plant roo
		Sato H, Morimoto S, Hattori T. 2012. A thirty-year survey reveals that ecc saproob
p/cd		Sato H, Murakami N. 2008. Reproductive isolation among cryptic species in the ecto
		Sato H, Tsujino R, Kurita K, Yokoyama K, Agata K. 2012. Modelling the global dis
		Sato H, Yumoto T, Murakami N. 2007. Cryptic species and host specificity in the ec
		Savage JA. 2010. An ecological and evolutionary perspective on functional diversity
		Savoie J-M, Largeteau ML. 2011. Production of edible mushrooms in forests: trends
		Savolainen V et al. 2000. Phylogenetics of flowering plants based on combined anal
		Savolainen V et al. 2000. Phylogeny of the eudicots: a nearly complete familial analy
		Savolainen V, Cuenoud P, Spichiger R, Martinez MDP, Crevecoeur M, Manen JF, I
		Savolainen V, Manen JF, Douzery E, Spichiger R. 1994. Molecular phylogeny of fa
		Sawyer NA, Chambers SM, Cairney JWG. 1999. Molecular investigation Cortinari
		Sawyer NA, Chambers SM, Cairney JWG. 2001. Distribution and persiste A. musca
		Sbissi I, Neffati M, Boudabous A, Murat C, Gtari M. 2010. Phylogenetic affiliation
p		Scales PF, I Wilcoxina mikolae ECM kuusel (P mariana) ja kasel (B alleghaniensis)
p/cd		Scanlan PD, Marchesi JR. 2(mikroseente ja teiste mikroeukarüootide mitme
		Scattolin L , Alzetta C , Bolz Tilia cordata Padovas (ITA): kahjustuse klassic
		Scattolin L, dal Maso E, Mu ITA Castanea s Phytophthora: EcM kooslused e
		Scattolin L, Lancellotti C, Fr Sardiinia, Quercus ilex: vs altituud: mõjutab kc
		Scattolin L, Montecchio L, M Sügavuti ekspl OF: Cenoc, Sarcodon imbic, Ar
		Scattolin L. 2006. Variations of the ectomycorrhizal community in high mountain No
cd		Schabereiter-Gurtner C, Pina mikroseened vanal klaasivärvil: Pleosporales, Onygena
cd	x	Schadt CW, Martin AP, Lips uued kottseente harud tundramullas. Märgatavad erinev
		Schadt CW, Mullen RB, Schmidt SK. 2001. Isolation and phylogenetic identification
	4	Schadt CW, Rosling A. 2015. Global diversity and geography of soil fungi: minus at
		Schaefer I, Norton RA, Scheu S, Maraun M. 2010. Arthropod colonization of land -
p/cd		Schardl CL, Craven KD, Speakman S, Stromberg A, Lindstrom A, Yoshida R. 2008
cd		Schardl CL, Craven KD. 2003. Interspecific hybridization in plant-associated fungi a
cd		Schardl CL, Leuchtmann A, Chung K-R, Penny D, Siegel MR. 1997. Coevolution by
		Schatz B, Geoffroy A, Dainat B, Bessiére J-M, Buatois B, Hossaert-McKey M, Selo
		Schelkle M, Peterson RL. 1996. Suppression of common root pathogens by helper b
		Schemske DW, Mittelbach GG, Cornell HV, Sobel JM, Roy K. 2009. Is There a lat
x		Scherber C, Eisenhauer N, Weisser WW, Schmid B, Voigt W, Fischer M and 34 oth
x		Scherer-Lorenzen M, Potvin C, Koricheva J, Schmid B, Hector A, Bornik Z, Reynol
p		Scheu S, Fa
p/cd		Scheu S, Schlitt N, Tiunov AV, Newington JE, Jones TH. 2002. Effects of the prese
cd		Scheu S, Simmerling F. 2004. Growth and reproduction of fungal feeding Collembol
p/cd		Scheublin TR, Ridgway KP, Young JPW, van der Heijden MGA. 2004. Nonlegume
		Schirkonyer, U. , Bauer, C. and Rothe, G. (2013) Ectomycorrhizal diversity at five d
cd		Schlaepfer MA, Runge MC, Sherman PW. 2002. Ecological and evolutionary traps.
		Schleuning M, Ingmann L, Strauss R, Fritz SA, Dalsgaard B, Dehling DM, Plein M,
p/cd		Schloss PD, Handelsman J. 2005. Introducing DOTUR, a computer program for def
p/cd		Schloss PD, Larget BR, Handelsman J. 2004. Integration of microbial ecology and s
p/cd		Schloss PD. 2008. Evaluating different approaches that test whether microbial comn
p		Schluter D, Ricklefs RE. 1993. Convergence and the regional component of species
cd		Schluter D. 2001. Ecology and the origin of species. Trends Ecol. Evol. 16: 372-380
		Schmid M, Hartmann A. 2007. Molecular phylogeny and ecology of root associated
		Schmidt O, Moreth U. 1998. Characterization of indoor rot fungi by RAPD analysis
		Schmidt S, Denison WC, Moss GJ, Stewart GR. 2004. Nitrogen ecophysiology of H
		Schmidt S, Handley LL, Sangtiean T. 2006. Effects of nitrogen source and ectomyco
p		Schmidt S, Stewart GR. 1997. Waterlogging and fire impacts on nitrogen availability
		Schmidt S, Stewart GR. 1997. Waterlogging and fire impacts on nitrogen availability
		Schmidt S, Stewart GR. 2003. δ15N values of tropical savanna and monsoon forest
		Schmidt S. Dennison WC, Moss GJ, Stewart GR. 2004. Nitrogen ecophysiology of
		Schmidt TSB, Rodrigues JFM, von Mering C. 2014. Ecological Consistency of SSU
p		Schmit JP, Murphy JF, Mueller GM. 1999. Macrofungal diversity of a tem 3 aastal +

				Schmit JP, Murphy JF, Mueller GM. 1999. Macrofungal diversity of a tem	ECM vs
	cd			Schneider K, Renker C, Maraun M. 2005. Oribatid mite (Acari, Oribatida) feeding c	
				Schoch CL, Crous PW, Groenewald JZ, Boehm EWA, Burgess TI, de Gruyter J and	
2014			x	Schoch CL, Robbertse B, Robert V, Vu D, Cardinali G, Irinyi L, Kõljalg U, Tederso	
		x		Schoch CL, Seifert KA, Huhndorf S, Robert V, Spouge JL, Levesque CA, Chen W,	
	p/cd			Schoch CL, Shoemaker RA, Seifert KA, Hambleton S, Spatafora JW, Crous PW. 20	
	p/cd			Schoch CL, Sung G-H, Lopez-Giraldez F and 61 others. The Ascomycota tree of life	
				Schoch CL, Wang Z, Townsend JP, Spatafora JW. 2009. Geoglossomycetes cl. Nov	
	p			Scholes RJ, Dowty PR, Caylor K, Parsons DAB, Frost PGH, Shugart HH. 2002. Tre	
				Schramm JR. 1966. Plant colonization studies on black wastes from anthracite minir	
	p/cd			Schrire BD, Lavin M, Lewis GP. 2005 Global distribution patterns of the Leguminos	
	cd			Schubert R, Raidl S, Funk R, Bahnweg G, Müller-Starck G, Agerer R. 2003. Quanti	
				Schulz B, Boyle C, Draeger S, Römmert A-K, Krohn K. 2002. Endophytic fungi: a s	
				Schulz B, Boyle C. 2005. The endophytic continuum. Mycol. Res. 109: 661-686.	
				Schulz B, Sucker J, Aust HJ, Krohn K, Ludewig K, Jones PG, Döring D. 1995. Biol	
				Schulz BJE, Boyle CJC, Sieber TN. 2006. Microbial root endophytes. Springer, Ber	
	p			Schulze E-D, Lange OL, Ziegler H, Gebauer G. 1991. Carbon and nitrogen isotope r	
	cd			Schüsler. 2002. Molecular evolution, taxonomy and phylogeny of Geosiphon pyrifor	
				Schüßler A, Walker C. 2010. The Glomeromycota: a species list with new families a	
				Schuster CE. Stephenson RE, Evenden W.1944. Mycorhizas of Filber and walnut tr	
	p/cd			Schwartz MW, Hoeksema JD, Gehring CA, Johnson NC, Klironomos JN, Abbott L	
	cd			Schwartz MW, Hoeksema JD. 1998. Specialization and resource trade: biological m	
				Schwarze FWMR, Engels J, Mattheck C, 2000. Fungal Strategies of Wood Decay in	
				Schweitzer JA, Bailey JA, Fischer DG, LeRoy CJ, Lonsdorf EV, Whitham TG, Hart	
				Schweitzer JA, Bailey JA, Hart SC, Whitham TG. 2005. Nonadditive effects of mixi	
	cd			Schwiertz A, Le Blay G, Blaut M. 2000. Quantification of different Eubacterium spp	
	cd			Scmalenberger A, Schweiger F, Tebbe CC. 2001. Effect of primers hybridizing to di	
	cd			Scmalenberger A, Tebbe CC. 2003. Bacterial diversity in maize rhizospheres: conclu	
	p/cd			Scotland RW, Wortley AH. 2003. How many species of seed plants are there? Taxo	
				Scotti I, Soranzo N, Ferrario S, Binelli G. 1998. Genetic variation in Norway spruce	
	p/cd			Seaver F. 1914. North American species of Aleuria nad Aleurina. Mycologia 6: 273-	
	p/cd			Seberg O. 1991. Biogeographic congruence in the South Pacific. Aust. Syst. Bot. 4:	
	p/cd			See LS, Alexander IJ. 1994. The response of seedlings of two dipterocarp species to	
				Segre H, Ron R, De Malach N, Henkin Z, Mandel M, Kadmon R. 2014. Competitiv	
	p/cd			Seguritan V, Rohwer F. 2001. FastGroup: A program to dereplicate libraries of 16S	
	p/cd			Seifert E, Bever JD, Maron JL. 2009. Evidence for the evolution of reduced mycorrh	
	p			Seifert KA, Gams W. 2001. The taxonomy of anamorphic fungi. In: McLaughlin DJ,	
				Seitzman B, Ouimette A, Mixon RL, Hobbie EA, Hibbett DS. 2011. Conservation o	
				Selby C, Kennedy SJ, Harvey BMR. 1992. Adventitious root formation in hypocotyl	
	cd			Selmants PC, Hart SC, Boyle SI, Stark JM. 2005. Red alder (Alnus rubra) alters con	
	dd			Selosse M-/ Sebacina spp	
	cd			Selosse M-A, Costa G, Di Battista C, Le Tacon F, Martin F. 1996. Meiotic segregat	
	p/cd			Selosse M-A, Dubois M-P, Alvarez N. 2009. Do Sebacinales commonly associate w	
	cd			Selosse M-A, Faccio A, Scap Epipactis microphylla: Tuber spp, Pezizales spp, Russu	
				Selosse M-A, Jacquot D, Bouchard D, Martin F, Le Tacon F. 1998. Temp	Laccaria
				Selosse M-A, Le Tacon F. 1998. The land flora: a phototroph-fungus partnership? T	
				Selosse M-A, Martin F, Le Tacon F. 1999. Survival of an introduced ector	MCH ITS
				Selosse M-A, Martin F, Le Tacon F. 2001. Intraspecific variation in fruitin	Laccaria
	p/cd			Selosse M-A, Richard F, He X, Simard S. 2006. Mycorrhizal networks: des liaisons	
				Selosse M-A, Roy M. 2009. Green plants that feed on fungi: facts and questions abo	
	p/cd			Selosse M-A, Schardl CL. 2007. Fungal endophytes of grasses: hybrids rescued by v	
				Selosse M-A, Setaro S, Glatard F, Richard F, Urcelay C, Weiss M. 2007. Sebacinal	
	p/cd			Selosse M-A, Vohnik M, Chauvet E. 2008. Out of the rivers: are some aquatic hyph	
	dd			Selosse M-A, Weiss M, Jany J-L, Tillier A. 2002. Communities and populations of s	
	cd			Selosse M-A. 2003. Founder effect in a small Leccinum duriusculum (Schu	Leccinum
	p/cd			Selosse M-A. 2005. Are liverworts imitating mycorrhizas? New Phytol. 165: 345-34	
				Semenova TA, Morgado LN, Welker JM, Walker MD, Smets E, Geml J. 2015. Lon	
				Sen DN. 1961. Root ecology of *Tilia europea* L. -I. On the morphology of mycorrh	
				Sen R, Hietala AM, Zelmer CD. 1999. Common anastomosis and internal transcribe	
				Sen R. 1990. Intraspecific variation in two species of Suillus from Scots pine (Pinus	
				Sen R. 2000. Budgeting for the wood-wide web. New Phytol. 145: 161 – 165.	
				Sen R. 2001. Multitrophic interactions between a Rhizoctonia sp. and mycorrhizal fu	
				Senior E, Smith JE, Watson-Craik IA, Tosh JE. 1993. Ectomycorrhizae and landfill	
				Senn-Irlet B, Bieri G. 1999. Sporocarp succession in soil-inhabiting macro	noores (n
	cd			Sequerra J et al. 1997. Taxonomic position and intraspeciÆc variability of the nodul	
		x		Serna-Chavez H, Fierer N, van Bodegom PM. 2013. Global drivers and patterns of m	
	p/cd			Sessitsch A, Hackl E, Wenzl P, Kilian A, Kostic T, Stralis-Pavese N, Tankouo Sand	
				Setälä H, Berg MP, Jones TH. 2005. Trophic structure and functional redundancy in	

cd		Setälä H. 2000. Reciprocal interactions between Scots pine and soil food web struct
		Setaro S, Garnica S, Herrera PI, Suarez JP, Göker M. 2012. A clustring optimizatior
p/cd		Setaro S, Ko Ericaceae: Vaccinioideae ja Cavendishioideae Ecuadori mägimetsades:
p/cd		Setaro S, W Cavendishia + S Cavendishia nobilis: vaid Sebacinales B klaadist
		Seviour RJ, Willing RR, Chilvers GA. 1973. Basidiocarps associated with ericoid m
		Shahin O, Martin-St. Paul N, Rambal S, Joffre R, Richard F. 2013. Ectomycorrhizal
		Shamekh S, Grebenc T, Leisola M, Turunen O. 2014. The cultivation of oak seedlin
p		Shan XC, Liew ECY, Weatherhead MA, Hodgkiss IJ. 2002. Characterization and ta
		Shannon P, Markiel A, Ozier O, Baliga NS, Wang JT, Ramage D, Amin N, Schwiko
		Sharma R, Rajak RC, Pandey AK. 2009. Ectomycorrhizal mushrooms in I India se
p/cd		Sharon M, Kuninaga S, Hyakumachi M, Naito S, Sneh B. 2008. Classification of Rh
p/cd		Sharon M, Kuninaga S, Hyakumachi M, Sneh B. 2006. The advancing identifiction a
		Sharp C, Piearce G. 1999. Some interesting gasteroid fungi from Zimbabwe. Kew B
p		Sharples JM, Cairney JWG. 1997. Assimilation of inorganic nitrogen by a mycobion
cd		Sharples JM, Cairney JWG. 1997. Organic nitrogen utilization by an unidentified my
		Sharples JM, Chambers SM, Meharg AA, Cairney JWG. 2000. Genetic diversity of
j		Shaw PJA, Lankey K, Jourdan A. 1996. Factors affecting yield of Tuber melanospor
		Shaw TM, Dighton J, Sanders FE. 1995. Interactions between ectomycorrhizal and s
		Shefferson RP, Cowden CC, McCormick MK, Yukawa T, Ogura-Tsujita Y, Hashim
p/cd		Shefferson RP, Kull T, Tali K. 2008. Mycorrhizal interactions of orchids colonizing
cd		Shefferson RP, Weiss M, Ku Cypripedium spp orhideed Eestis ja USAs -kõik seotu
		Shemakhanova NM. 1956. *Hebeloma crustuliniforme* - mikorizo-obrazovatel duba.
p		Shemakhan pealiskaudne tumepr Tomentella morfotüüpide kirjeldus
		Sherwood S, Bony S, Dufresne J-L. 2014. Spread in model climate sensitivity traced
		Sherwood S, Fu Q. 2014. A drier future? Science 343: 737-739.
cd		Shi L, Gutte x pöök: vs poud poud ei mojutanud: Lactarius subdul
		Shiembo PN, Newton AC, Leakey RRB. 1996. Vegetative propagation of Gnetum a
e		Shimada M, Akamatsu Y, Tokimatsu T, Mii K, Hattori T. 1997. Possible biochemic
p/cd		Shimura H, Sadamoto M, Matsuura M, Kawahara T, Naito S, Koda Y. 2009. Chara
		Shinohara M, LoBuglio KF, Cenococcum sp isolaadid
		Shinohara M, LoBuglio KF, Cenococcum-taksonisisene üle maailma vs rDNA 2D s
		Sieber TN, Grünig CR. 2006. Biodiversity of fungal root-endophyte communities an
p/cd		Sieber TN. 2007. Endophytic fungi in forest trees: are they mutualists? Fung. Biol. R
		Siebert BD et al., An improved PCR method for walking in uncloned genomic DNA
		Sigler L, Allen T, Lim SR, Berch S, Berbee M. 2005. Two new Cryptosporiopsis sp
		Sigüenza C, Espejel I, Allen EB. 1996. Seasonality of mycorrhizae in coastal sand d
p/cd		Silvani VA, Fracchia S, Fernandez L, Pergola M, Godeas A. 2008. A simple methoc
p/cd		Silvertown J, Dodd M, Gowing D, Lawson C, McConway K. 2006. Phylogeny and
cd		Silvertown J, Dodd M, Gowing D. Phylogeny and the niche structure of meadow pla
		Silvertown JW. 1981. Micro-spatial heterogeneity and seedling demography in spec
		Simard SW, Beiler KJ, Bingham MA, Deslippe JR, Philip LJ, Teste FP. 2012. Myco
		Simard SW, Durall DM, Jones MD. 1997. Carbon allocation and carbon transfer bet
		Simard SW, Jones MD, Durall DM, Perry DA, Myrold DD, Molina R. 1997. Recipr
B		Simard SW, Jones MD, Durall DM. 2002. Carbon and Nutrient Fluxes Within and B
		Simard SW, Martin K, Vyse A, Larson B. 2013. Meta-networks of fungi, fauna and
		Simard SW, Perry DA, Jones MD, Myrold DD, Durall DM, Molina RM. 1997. Net
cd		Simard SW, ebatsuugal ebatsuuga istikute ebatsuugal: läbikaevatud juurtega (tr
p/cd		Simard SW, Radosevich SR, Sachs DL, Hagerman SM. 2006. Evidence for competi
	x	Simon C, Daniel R. 2011. Metagenomic analyses: past and future trends. Appl. Envi
p		Simon L et al. 1993. Origin and diversification of endomycorrhizal fungi and coincid
	x	Simon L, Lalonde M, Bruns TD. 1992. Specific amplification of 18S fungal ribosom
		Simon MF, Grether R, de Queiroz LP, Skema C, Pennington RT, Hughes CE. 2009.
		Simon UK, Weiss M. 2008. Intragenomic variation of fungal ribosomal genes is high
		Sims K, Watling R, de la Cruz R, Jeffries P. 1997. Ectomycorrhizal fungi (Filipiini
		Sims KP, Sen R, Watling R, Jeffries P. 1999. Species and population structures of P
p		Singer R, Araujo Aguiar I. 1986. Litter decomposing and ectomycorrhizal Manause
1		Singer R, Araujo I, Ivory MH. 1983. The ectotrophically mycorrhizal fung Lõuna-A
p		Singer R, Digilio APL. 1951. Prodromo de la flora agaricina Argentina. Li Lõuna-A
		Singer R, Morello JH. 1960. Ecotrophic forest tree mycorrhizae and forest communi
p		Singer R, Moser M. 1964. Forest mycology and forest communities in Sou CHL: E
p/cd		Singer R. 1944. Genera of fungi. Mycologia 36: 358-368.
p/cd		Singer R. 1948. New genera of fungi-IV. Mycologia 40: 262-264.
		Singer R. 1952. Russulaceae of Trinidad and Venezuela. Kew Bull. 7: 295-301.
p/cd		Singer R. 1953. Four years of mycological work in southern South Americ Lõuna-A
		Singer R. 1962. Monographs of South American Basidiomycetes, especially those o
p		Singer R. 1964. Boletes and related groups in South America. Nova Hedw Lõuna-A
p		Singer R. 1968. Sand dune inhabiting fungi of the South Atlantic coast fro liivaluide
p		Singer R. 1970. New agarics from South America. Nova Hedw. 20: 785-792.

	Singer R. 1971. Forest Mycology and Forest Communities in South America. II. My
p	Singer R. 1971. Forest mycology and forest communities in South Americ Nothofag
p/cd	Singer R. 1981. New genera of Agaricales. Mycologia 73: 500-510.
p	Singer R. 1984. Adaptation of higher fungi to Vàrzea conditions. Amazoni Manause
p	Singer R. 1984. The role of fungi in Amazonian forests and in reforestation. Monog
p	Singer R. 1984. Tropical Russulaceae II. Lactarius section Panuoidei. Nova Hedw. 4
	Singer R. 1986. The Agaricales in modern taxonomy. 4th edn. Sven Koeltz Scientifi
	Singh BK, Nunan N, Ridgway KP, McNicol J, Young JPW, Daniell T, Prosser JI, M
p	Singh P, Carew GC. 1990. Inland spruce cone rust of black spruce: effect on cone a
	Singh P, Raghukumar C, Ve ookeanisetete seened: India ookean 5 km süg: e
cd	Singleton DR, Furlong MA, Rathbun SL, Whitman WB. 2001. Quantitative compari
	Sinsabaugh RL, Lauber CL, Weintraub MN, Ahmed B, Allison SD, Crenshaw C an
p	Sioli H. 1984. The Amazon. Limnology and landscape ecology of a mighty tropical r
p/cd	Sirikantaramas S, Sugioka N Sarawakis (4 ala) domin Thelephorioid, Boletoid (sh S
p	Sisti D, Gio Tuber borchii: 2 gen seotud tüve toodavad mükoriisasid eri epidermoids
	Sisti D, Giomaro G, Rossi I, Ceccaroli P, Citterio B, Benedetti PA, Zambonelli A. 1
	Six J, Feller C, Denef K, Ogle SM, de Morales Sa JC, Albrecht A. 2002. Soil organi
	Skrede I, Engh IB, Binder M, Carlsen T, Kauserud H, Bendiksby M. 2011. Evolutio
	Slankis V. 1971. Formation of Ectomycorrhizae of Forest Trees in Relation to Light,
cd	Small J, Call DR, Brockman FJ, Straub TM, Chandler DP. 2001. Direct detection o
p/cs	Smedmark JEE, Swenson U, Anderberg AA. 2006. Accounting for variation of subs
	Smit E, Leeflang P, Glandorf B, van Elsas JD, Wernars K. 1999 Analysis of fungal d
cd	Smit E, Veenman C, Baar J. vs kõdu eraldami k: Russulaceae; kõdu erald EMH vs
cd	Smith AG. 1999. Gondwana: its shape, size and position from Cambrian to Triassic
p/cd	Smith AH, Reid DA. 1962. A new genus of the Secotiaceae. Mycologia 54: 98-104.
	Smith AH, Trappe JM. 1972. The higher fungi of oregon`s cascade head experiment
	Smith AH, Trappe JM. 1972. The higher fungi of Oregon´s cascade head experimen
p/cd	Smith AH. 1966. A note on *Psiloboletinus*. Mycologia 58: 332-336.
	Smith AH. 1971. Taxonomy of Ectomycorrhiza-Forming Fungi. In: Hacskaylo E (ed
	Smith JE, Johnson KA, Cazares E. 1998. Vesicular mycorrhizal colonization of seed
	Smith JE, McKay D, Brenne Pinaceae mix: Cenoc, Pilod sp, Rhizop sp, Wi
p/cd	Smith JE, McKay D, Niwa C mänd 3 aastal; vs biomass: Cortinarius 44, Inocybe21,C
	Smith JE, M Piloderma P.fallax vs metsa vanus vs CWD
	Smith JE, M kanarbikulistel e kanarbikulistel vrd männilistel
	Smith ME, Bonito GM. 2013. Systematics and ecology of edible ectomycorrhizal m
	Smith ME, Douhan GW, Fremier AK, Rizzo DM. 2009. Are true multihost fungi the
p/cd	Smith ME, Douhan GW, Riz Quercus douglasi Quercus: Tomentella/Thel Tomentel
p/cd	Smith ME, Douhan GW, Rizzo DM. 2007. Intra-specific and intra-sporocarp ITS va
	Smith ME, Gryganskyi A, Bonito G, Nouhra E, Moreno-Arroyo B, Benny G. 2013.
p/cd	Smith ME, Healy RA. 2009. *Otidea subterranea* sp. Nov.: *Otidea* goes below grou
1	Smith ME, Henkel TW, Aime MC, Fremier AK, Vilgalys R. 2011. Ectomycorrhizal
	Smith ME, Henkel TW, Uehling JK, Fremmier AK, clarke HD, Vilgalys R. 2013. Tl
	Smith ME, Pfister DH. 2009. Tuberculate ectomycorrhizae of Angiosperms: the inte
	Smith ME, Schell KJ, Castellano MA, Trappe MJ, Trappe JM. 2013. The enigmatic
	Smith ME, Schmull M. 2011. Tropical truffles: English translation and critical review
	Smith ME, Trappe JM, Rizzo DM, Miller SL. 2006. *Gymnomyces xerophilus* sp. n
p/cd	Smith ME, Trappe JM, Rizzo DM. 2006. *Genea*, *Genabea* and *Gilkeya* gen. nov.:
	Smith ME. Jaffee BA. 2008. PCR Primers with enhanced specificity for nematode-tr
	Smith SA, Donoghue MJ. 2008. Rates of molecular evolution are linked to life histo
	Smith SE, Read DJ, 1997. Mycorrhizal Symbiosis, 2nd edn. 605 pp. Academic Pres
	Smith SE, Read DJ, 2008. Mycorrhizal Symbiosis, 3rd edn. 787 pp. Academic Press
cd	Smith SE, Smith FA, Jakobsen I. 2004. Functional diversity in arbuscular mycorrhiz
cd	Smith VC, Bradford MA. 2003. Do non-additive effects on decomposition in litter-m
	Smith ZF, James EA, McLean CB. 2010. Mycorrhizal specificity of Diuris fragrantis
p	Smits WTM. 1983. Dipterocarps and mycorrhiza: an ecological adaptation and a fac
	Smolander A, Kitunen V. Comparison of tree species effects on microbial C and N t
x	Šnajdr J, Cajthaml T, Valášková V, Merhautová V, Petranková M, Spetz P, Leppan
x	Šnajdr J., Valášková V., Merhautová V., Herinková J, Cajthaml T., Baldrian P (200
cd	Soberon JM, Llorente JB. 19 liigirikkuse ekstrapoleerimine lihtsate matemaatiliste fu
cd	Soden DM, Dobson ADW. 2001. Differential regulation of laccase gene expression
p	Söderström BE. 1979. Seasonal fluctuations of active fungal biomass in horizons of
cd	Sodhi NS, Koh LP, Brook BW, Ng PKL. 2004. Southeast Asian biodiversity: an imp
	Soininen J, Korhonen JJ, Luoto M. 2013. Stochastic species distributions are driven
	Soininen J, McDonald R, Hillebrand H. 2007. The distance decay of similarity in ec
x	Soininen J. 2014. A quantitative analysis of species sorting across organisms and ec
	Soltis PS, Soltis DE, Savolainen V, Crane PR, Barraclough TR. 2002. Rate heteroge
	Sommer J, Pausch J, Brundrett MC, Dixon KW, Bidartondo MI, Gebauer G. 2012. I
p/cd	Sonnenberg ASM, de Groot PWJ, Schaap PJ, Baars JJP, Visser J, van Griensven LJ

t		Sonstebo JE jamps Bistorta vivipara Tomentella, Inocybe, Sebacina
p/cd		Southworth D, Carrington E, Quercus garrya taimla: Laccaria sp, Tuber sp; v
		Southworth D, Donohue J, F Pinus-Quercus Tom-thel
cd		Spain AV, Gordon V, Reddell P, Correll R. 2004. Ectomycorrhizal fungal spores in
p/cd		Spatafora JW, Johnson D, Sung G-H, Hosaka K, O'Rourke B, Serdani M, Spotts R,
		Spatafora JW, Owensby CA, Douhan GW, Boehm EWA, Schoch CL. 2012. Phylog
p/cd		Sprent JI. 2007. Evolving ideas of legume evolution and diversity: a taxonomic persp
cd		Sprent JL, James UK. 2007. Legume evolution: where do nodules and mycorrhizas f
		Sridhar KR, Beaton M, Bärl amfipoodide sitast seente DNA määramine: 18
		St. Hilaire LR, Leopold DJ. 1995. Conifer seedling distribution in relation to micros
p		St. John H. 1951. The distribution of Pisonia grandis (Nyctaginaceae). Webbia 8: 22
		St. John TV, Uhl C. 1983. Mycorrhizae in the rain forest at San Carlos de Rio Negr
1		St. John TV. 1980. A survey of mycorrhizal infection in an amazonian rain forest. A
cd		Stach JEM, Maldonado LA, Masson DG, Ward AC, Goodfellow M, Bull AT. 2003.
cd		Staddon PL, Bronk Ramsey C, Ostle N, Ineson P, Fitter AH. 2003. Rapid turnover o
p/cd		Stadenrausch S, Kaldorf M, kask uraanikaeva kaevandus: Lactarius decipiens, Mel
		Stahl E. 1900. Der Sinn der Mycorhizenbildung. Jahrb. Wissenscaftl. Bot. 34: 539-6
		Stajich JE, Berbee ML, Blackwell, Hibbett DS, James TY, Spatafora JW, Taylor JW
1		Stamatakis A, Hoover P, Rougemont J. 2008. A rapid bootstrap algorithm for the RA
		Stamatakis A. 2006. RAxML-VI-HPC: maximum likelihood-based phylogenetic ana
p/cd		Stanford AM, Harden R, Parks CR. 2000. Phylogeny and biogeography of Juglans (
p		Stanton NL. 1988. The underground in grasslands. Annu. Rev. Ecol. Syst. 19: 573-5
		Starast M, Kõljalg U, Karp K, Vool E, Noormets M, Paal T. 2006. Mycorrhizal colo
p/cd		Stark C, Babik W, Durka W. 2009. Fungi from the roots of the common terrestrial o
		Stark NM. 1971. Mycorrhizae and Nutrient Cycling in the Tropics. Hacskaylo E (ed
p/cd		Starr JR, Harris SA, Simpson DA. 2004. Phylogeny of the unispicate taxa in Cypera
		StatSoft, Inc., 2001. STATISTICA (data analysis software system), version 6. www
p/cd		Steane DA, Wilson KL, Hill RS. 2003. Using matK sequence data to unravel the phy
cd		Stears RL, Martinski T, Schena M. 2003. Trends in microarray analysis. Nature Med
		Steele JA, Countway PD, Xia L, Vigil PD, Beman JM, Kim DY, Chow CET, Sach
		Stefani FOP, Berube JA. 2006. Biodiversity of foliar fungal endophytes in white spru
		Stefani FOP, Hamelin RC. 2010. Current state of genetically modified plant impact o
		Stefani FOP, Jones RH, May TW. 2014. Concordance of seven gene genealogies co
		Stefani FOP, Moncalvo J-M, Seguin A, Berube JA, Hamelin RC. 2009. Impact of an
		Stein A, Fortin JA. 1990. Enhanced rooting of Picea mariana cuttings by ectomycorr
		Stein A, Fortin JA. 1990. Pattern of root initiation by an ectomycorrhizal fungus on l
cd		Steiner M, Linkov I, Yoshida S. 2002. The role of fungi in the transfer and cycling o
j/cd		Stendell ER, Horton TR, Bru Pinus ponderosa: kontroll: Russula, Rhizopogon, Tom
		Stenlid J, Gustafsson M. 2001. Are rare wood decay fungi threatened by inability to
		Stenlid J, Rayner ADM. 1989. Tansley review No. 19. Environmental and endogeno
		Stenlid J, Rayner ADM. 1991. Patterns of nuclear migration and heterokaryosis in p
		Stenlid J. 1985. Population structure of Heterobasidion annosum as determined by so
cd		Stenlid J. 2000. Variation with and without sex in mycorrhizal fungi. Oikos 90: 609-
p		Stenström E. 1991. The effects of flooding on the formation of ectomycorrhizae in P
		Stergios BD, Aymard GA. 2008. A striking new species of Aldina (Fabaceae-Swartz
		Stern RF, Andersen RA, Jameson I, Küpper FC, Coffroth M-A, Vaulot D. 2012. Eva
x		Steudel B, Hector A, Friedl T, Löfke C, Lorenz M, Wesche M, Kessler M. 2012. Bi
		Stevens GC. 1989. The latitudinal gradient in geographical range: how so many spec
p/cd		Stevenson G. 1962. The Agaricales of New Zealand: IV. Kew Bull. 16: 373-384.
		Stewart GH, Rose AB, Veblen TT. 1991. Forest development in canopy gaps in old-
		Stewart-Oaten. 1995. Rules and judgements in statistics: three examples. Ecology 76
		Stielow B, Bubner B, Hensel G, Münzenberger B, Hoffmann P, Klenk H-P, Göker M
		Stielow B, Hensel G, Strobelt D, Makonde HM, Rohde M, Dijksterhuis J, Klenk H-
p/cd		Stinson KA, Campbell SA, Powell JR, Wolfe BE, Callaway RM, Thelen GC, Hallet
		Stobbe U, Stobbe A, Sproll L, Tegel W, Peter M, Büntgen U, Egli S. 2013. New ev
		Stocker TF, Qin D, Plattner K, Tignor MMB, Allen SK, Boschung J, Nauels A, Xia
	x	Stockinger H, Krüger M, Schüssler A. 2010. DNA barcoding of arbuscular mycorrh
	x	Stockinger H, Peyret-Guzzon M, Koegel S, Bouffaud M-L, Redecker D. 2014. The
		Stockinger H, Walker C, Schüßler A. 2009. 'Glomus intraradices DAOM197198', a
		Stoll P, Prati D. 2001. Intraspecific aggregation alters competitive interactions in exp
p		Stone EL, Kalisz PJ. 1991. On the maximum extent of tree roots. For. Ecol. Manage
		Straatsma G, Ayer F, Egli S. 2001. Species richness, abundance, and phen xxx, 21a
		Straatsma G, Konings RNH, van Griensven LJLD. 1985. A strain collection of the n
cd		Stralis-Pavese N, Sessitsch A metanotroofidel ARRAY põhjal
cd		Straub TM, Daly DS, Wunshel S, Rochelle PA, DeLeon R, Chandler DP. 2002. Ger
p		Strauss SY. 2001. Benefits and risks of biotic exchange between Eucalyptus plantati
		Strickland MJ, Osburn E, Lauber C, Fierer N, Bradford MA. 2009. Litter quality is i
		Strickland MS, Lauber C, Fierer N, Bradford MA. 2009. Testing the functional signi

					Strullu DG, Grellier B, Marciniak D, Letouze R. 1986. Micropropagation of chestnu
					Strzelczyk E, Kampert M, Pachlewski R. 1994. The influence of pH and temperatur
					Stubbe D, Nuytinck J, Verbeken A. 2010. Critical assessment of the *Lactarius gera*
				x	Stukenbrock EH, Christiansen FB, Hansen TT, Dutheil JY, Schierup MH. 2012. Fus
	cd				Stukenbrock EH, Rosendahl S. 2005. Development and amplification of multiple co
		x			Stursova M, Snajdr J, Cajthaml T, Barta J, Santruckova H, Baldrian P. 2014. When
	cd				Su JC et al. 2004. Beyond species richness: community similarity as a measure of cr
	p/cd				Suarez JP, Weib M, Abele A, Oberwinker F, Kottke I. 2008. Members of Sebacinal
	cd				Sulkava P, Huhta V. 1998. Habitat patchiness affects decomposition and faunal dive
					Summerbell RC. 1987. The inhibitory effect of *Trichoderma* species and other soil
					Summerbell RC. 1988. Benomyl-tolerant microfungi associated with mycorrhizae of
	cd				Summerbell RC. 1989. Microfungi associated with the mycorrhizal mantle and adjac
	cd				Summerell BA, Leslie JF. 2004. Genetic diversity and population structure of plant-
	cd				Sun G, Dilcher DL, Zheng S, Zhou Z. 1998. In search of the first flower: a Jurassic a
					Sun Y-P, Fries N. 1992. The effect of tree root exudates on the growth rate of ectom
	cd				Sun Y-P, Unestam T, Lucas SD, Johanson KJ, Kenne L, Finlay RD. 1999. Exudatio
	cd				Sundaram S, Brand JH, Hymes MJ, Hiramath S, Podila GK. 2003. Isolation and ana
					Sunderland T, Walters G, Issembe Y. 2004. A preliminary vegetation assessment of
			6		Supplementary information
					Šutara J. 2008. Xerocomus s. l. in the light of the present state of knowledge. Czech
					Sutara J. 2008. *Xerocomus* s. l. in the light of the present state of knowledge. Czech
	p				Sutherland JR, Hopkinson SJ, Farris SH. 1984. Inland spruce cone rust, Chrysomyxa
2010	13				Suvi T, Tedersoo L, Abarenkov K, Gerlach J, Beaver K, Kõljalg U. 2010. Mycorrhi
					Suz LM, Barsoum N, Benhai Kesk-Euroopa Kontakt-tüüp ja Scleroderma oh
					Suz LM, Martin MP, Colinas C. 2006. Detection of Tuber melanosporum DNA in s
					Suzek BE, Huang H, McGarvey P, Mazumder R, Wu CH. 2007. UniRef: comprehen
					Suzuki R, Shimodaira H. 2006. Pvclust: an R package for assessing the uncertainty i
					Swarts ND, Sinclair EA, Francis A, Dixon KW. 2010. Ecological specialization in m
					Swaty R, Gehring CA, van Ert M, Theimer TC, Keim P, Whitham TG. 1998. Tempo
	cd				Swaty RL, Deckert RJ, Whit põuakahj ALADE puudel madalam liigirikkus, diversit
					Swedjemark G, Stenlid J. 2001. A high diverse population of Heterobasidion annosu
					Sweeney M, Harmey MA, Mitchell DT. 1996. Detection and identification of Lacca
	p/cd				Swenson NG, Enquist BJ, Pither J, Thompson J, Zimmerman JK. 2006. The problen
	p/cd				Swenson U, Backlund A, McLoughlin S, Hill RS. 2001. Nothofagus biogeography r
					Swofford DL. 2002. PAUP*. Phylogenetic Analysis Using Parsimony (*and Other M
					Sykes WR. 1982. Checklist of dicotyledons naturalized in New Zealand 15. N. Z. J.
					Sykes WR. 1987. The parapara, *Pisonia brunoniana*. N: Z. J. Bot. 25: 459-466.
	p/cd				Sylvia DM, Chellemi DO. Interactions among Root-Inhabiting Fungi and Their Impl
					Sylvia DM, Sinclair WA. 1983. Suppressive influence of Laccaria laccata on Fusariu
					Symonds MRE, Moussali A. 2011. A brief guide to model selection, multimodel inf
	p/cd				Sytsma KJ, Litt A, Zjhra ML, Pires JC, Nepokroeff M, Conti E, Walker J, Wilson P
		x			Szava-Kovats RC, Zobel M, Pärtel M. 2011. The local-regional species richness rela
					Tagu D, Rampant PF, Lapeyrie F, Frey-Klett P, Vion P, Villar M. 2001. Variation in
	p/cd				Talbot JM, Allison SD, Treseder KK. 2008. Decomposers in disguise: mycorrhizal f
					Talbot JM, Bruns TD, Taylo USAs Pinaceae: Mänd mujal vs Picea Alaskal.
	p/cd				Tallantire PA. 1974. The palaeohistory of grey alder (*Alnus incana*) and black alder
	p/cd				Tallents LA, Lovett JC, Hall JB, Hamilton AC. 2005. Phylogenetic diversity of fores
					Tammi H, T suillus bov, ts su mikrokosmoses metsahuumusel
	p/cd				Taniguchi T, Kanzaki N, Tai JPN, vs Robiniag Robinia vähe: Cenoc, unkn. Russula
					Tarkka M, Nyman TA, Kalkkinen N, Raudaskoski M. 2001. Scots pine expresses sh
	cd				Taroncher-Oldenburg G, Griner EN, Francis CA, Ward BB. 2003. Oligonucleotide m
					Tata HL, van Noordwijk M, kummiistandik Tomentella spp, Pisolithus, Scle
					Tate JA, Simpson BB. 2003. Paraphyly of Tarasa (Malvaceae) and diverse origins o
					Tautz D, Arctander P, Minelli A, Thomas RH, Vogler AP. 2003. A plea for DNA ta
	j				Taylor AFS Russula aeruginea
					Taylor AFS Tylospora fibrillosa=Piceirhiza guttata
	p/cd				Taylor AFS, Alexander IJ. 2005. The ectomycorrhizal symbiosis: life in the real wor
					Taylor AFS, Finlay RD. 200 dolomiit (BD san Kontroll: Tylospora fibrill, Hygroph
	p/cd				Taylor AFS, Fransson PMA, Högberg P, Högberg MN, Plamboeck AH. 2003. Spec
	p/cd				Taylor AFS, Gebauer G, Read DJ. 2004. Uptake of nitrogen and carbon from doubl
	p/cd				Taylor AFS, Högbom L, Högberg M, Lyon AJE, Näsholm T. 1997. Natural 15N abu
					Taylor AFS xxx 4 kuusikut, 4 pöö pöök: Russula ochroleuca; 4 kuusiku
					Taylor AFS. 2002. Fungal di probleemid, arutelu, valemid, suhted vs ECM:
	p/cd				Taylor AFS. 2008. Missing links-δ13C anomalies between substrates and consumers
					Taylor AFS. 2008. Recent advances in our understanding of fungal ecology. Coolia
	B				Taylor DL, Bruns TD, Leake orhideedel, seenlillelistel: ülevaade
	(cd)				Taylor DL, Bruns TD, Szaro orhidee Hexalecti Sebacina spp varieteetidel erinevad h
				x	Taylor DL, Bruns TD. 1997. Independent, specialized invasions of ectomycorrhizal

						Taylor DL, xxx vana männik: kih vana: Tomentella sublil, Russula brev
			p/cd		x	Taylor DL, Herriott IC, Long J, O' Neill K. 2007. TOPO TA is A-OK: a test of phyl
			p/cd		x	Taylor DL, McCormick MK. 2008. Internal transcribed spacer primers and sequenc
			p/cd			Taylor DL. 2004. Myco-heterotroph-fungus marriages -is fidelity over-rated? New P
						Taylor HR, Harris WE. 2012. An emergent science on the brink of irrelevance: a rev
			p			Taylor JW, Jacobson DJ, Fisher MC. 1999. The evolution of asexual fungi: reproduc
			p			Taylor JW, Jacobson DJ, Kroken S, Kasuga T, Geiser DM, Hibbett DS, Fisher MC.
						Taylor JW, Turner E, Townsend JP, Dettman JR, Jacobson D. 2006. Eukaryotic mic
			p/cd			Taylor JW, Turner E, Townsend JP, Dettman JR, Jacobson D. 2006. Eukaryotic mic
			p/cd			Taylor TN, Kerp H, Hass H. 2005. Life history biology of early land plants: deciphe
			p/cd			Tchouto Mbatchou GP. 2004. Plant diversity in Central African rain forests: implica
	2011	7				Tedersoo L, Abarenkov K, Nilsson RH, Schüßler A, Grelet G-A, Kohout P, Oja J, B
						Tedersoo L, Anslan S, Bahram M, Põlme S, Riit T, Kõljalg U, Kisand V, Nilsson RH
						Tedersoo L, Anslan S, Bahram M, Põlme S, Riit T, Kõljalg U, Nilsson RH, Hillebra
	2013	3				Tedersoo L, Arnold AE, Hansen K. 2013. Novel aspects in the life cycle and biotrop
	2014	2	x			Tedersoo L, Bahram M, Dickie IA. 2014. Does host plant richness explain diversity
	2011	37	7			Tedersoo L, Bahram M, Jairus T, Bechem E, Chinoya S, Mpumba R, Leal M, Randr
				3		Tedersoo L, Bahram M, Põlme S et al. 2014. Global diversity and geography of soil
	2014		5 x		x	Tedersoo L, Bahram M, Ryberg M, Otsing E, Kõljalg U, Abarenkov K. 2014. Globa
	2012	78	4			Tedersoo L, Bahram M, Toots M, Diédhiou AG, Henkel TW, Kjøller R, Morris MH
	2009	13				Tedersoo L, Gates G, Dunk C, Lebel T, May TW, Dunk C, Lebel T, Kõljalg U, Jair
	2006	94				Tedersoo L, Hansen K, Perry BA, Kjøller R. 2006. Molecular and morphological di
	2014					Tedersoo L, Harend H, Buegger F, Pritsch K, Saar I, Kõljalg U. 2014. Stable isotop
	2003	192			x	Tedersoo L, Kõljalg U, Hallenberg N, Larsson K-H. 2003. Fine scale distribution of
	2010	240	2			Tedersoo L, May TW, Smith ME. 2010. Ectomycorrhizal lifestyle in fungi: global di
	2013	18	8			Tedersoo L, Mett M, Ishida TA, Bahram M. 2013. Phylogenetic relationships among
	2012	7	x			Tedersoo L, Naadel T, Bahram M, Pritsch K, Buegger F, Leal M, Kõljalg U, Põldma
	2010	53				Tedersoo L, Nara K. 2010. General latitudinal gradient of biodiversity is reversed in
	2009	26				Tedersoo L, Pärtel K, Jairus T, Gates G, Põldmaa K, Tamm H. 2009. Ascomycetes a
	2007	61				Tedersoo L, Pellet P, Kõljalg U, Selosse M-A. 2007. Parallel evolutionary paths to m
	2012	0				Tedersoo L, Põlme S. 2012. Infrageneric variation in partner specificity: multiple ect
	2010	67				Tedersoo L, Sadam A, Zambrano M, Valencia R, Bahram M. 2010. Low diversity a
	2007	74				Tedersoo L, Suvi T, Beaver K, Kõljalg U. 2007. Ectomycorrhizal fungi of the Seych
	2007	15				Tedersoo L, Suvi T, Beaver K, Saar I. 2007. Ectomycorrhizas of *Coltricia* and *Colt*
	2008	40				Tedersoo L, Suvi T, Jairus T, Kõljalg U. 2008. Forest microsite effects on communit
	2009	28				Tedersoo L, Suvi T, Jairus T, Ostonen I, Põlme S. 2009. Revisiting ectomycorrhizal
	2006	72				Tedersoo L, Suvi T, Larsson E, Kõljalg U. 2006. Diversity and community structure
x						Tedersoo L. 2007. Ectomycorrhizal fungi: diversity and community structure in Esto
	2015	0				Tedersoo L. 2014. Mycorrhizal symbiosis in forest ecosystems. In: Peh K, Corlett R
						Teklehaimanot Z, Mmolotsi RM. 2007. Contribution of red alder to soil nitrogen inp
			p/cd			Telford RJ, Vandvik V, Birks HJB. 2006. Dispersal limitations matter for microbial
						Templer PH, Arthur MA; Lovett GM, Weathers KC. 2007. Plant and soil natural abu
			p/cd			Templeton AR. 1998. Nested clade analyses of phylogeographic data: testing hypoth
			p/cd			Tennakoon MMD, Gunatilleke IAUN, Hafeel KM, Seneviratne G, Gunatilleke CVS
			p			ter Braak CJF, Schaffers AP. 2004. Co-correspondence analysis: a new ordination m
						ter Braak CJF, Šmilauer P. 2002. CANOCO reference manual and CanoDraw for W
			p/cd			ter Seege H, Pitman CA, Phillips OL, Chave J, Sabatier D, Duque A et al. 2006. Co
			p/cd			ter Seege H. ??? Flora, vegetation, endemism and altitudinal gradients in the Guayan
			p/cd			ter Seege H. 1998. The use of forest inventory data for a national protected area stra
			p/cs			ter Seege H. Jansen-Jacobs MJ, Datadin VJ. 2000. Can botanical collections assist i
						Terborgh J, Andresen E. 1998. The composition of Amazonian forests: patterns at lo
			p			Terborgh J, Mathews J. 1999. Partitioning of the understorey light environment by t
						Termorshuizen A, Schaffers A. 1991. The decline of carpophores of ectom Ecm-seen
						Termorshuizen AJ, Ket PC. 1991. Effects of ammonium and nitrate on mycorrhizal s
						Termorshuizen AJ. 1991. Succession of mycorrhizal fungi in stands of Pinu ECM-see
						Terribile LC, Diniz-Filho JAF, Lima-Ribeiro MDS, Rodriguez MA. 2012. Integratin
			p			Terwilliger J, Pastor J. 1999. Clethrionomys-nä mai: Gymnomyces, Rhizopogon, Hys
						Tesitelova T, Jersakova J, Roy M, Kubatova B, Tesitel J, Urfus T, Travnicek P, Sud
						Tesitelova T, Kotilinek M, Jersakova J, Joly F-X, Kosnar J, Tatarenko I, Selosse M-
						Tesitelova T, Tesitel J, Jersakova J, Rihova G, Selosse M-A. 2012. Symbiotic germi
						Teste F, Simard SW. 2008. Mycorrhizal networks and distance from mature trees alt
						Teste FP, Simard SW, Durall DM, Guy RD, Berch SM. 2010. Net carbon transfer b
						Teste FP, Simard SW, Dural suurtel puudel Vanadel ja noortel sama: Wilco
						Tester M, Smith SE, Smith FA. 1987. The phenomenon of "nonmycorrhizal" plants.
						Thebault E, Fontaine C. 2010. Stability of ecological communities and the architectu
			p/cd			Theodorou C, Bowen GD. 1969. The influence of pH and nitrate on mycorrhizal ass
			p			Theodorou C, Bowen GD. 1971. Influence of temperature on the mycorrhizal associ
			p			Theodorou C, Bowen GD. 1973. Inoculation of seeds and soil with basidiospores of

p		Theodorou C, Reddell P. 1991. In vitro synthesis of ectomycorrhizas on C Allocasu
		Theuerl S, Buscot F. 2010. Laccases: toward disentangling their diversity and functi
n		Thiers HD. 1979. New and interesting hypogeous and secotioid fungi from Californi
j		Thiers HD. 1984. The secotioid syndrome. Mycologia 76: 1-8. põhjused
		Thiers HD. 1989. *Gastroboletus* revisited. Mem. New York Bot. Gard. 49: 355-35
p/cd		Thiet RK, Boerner REJ. 2007. Spatial patterns of ectomycorrhizal fungal inoculum i
cd		Thirup J, Johansen A, Windi bakterite ja aktinobakterite suktsessioon juurtel ja mull
p		Thoen D, B Senegalis Uapaca guineensise ja Afzelia africana puistutes: lü Senegalis
p		Thoen D, D kohalikel puudel Senegalis EcM palju jamedam kui sissetoodu Senegali
		Thoen D, Ducousso M. 1989. Mycorrhizal habit and sclerogenesis of *Phlebopus suc*
		Thoen D. 1974. Premieres indications sur les mycorrhizes et les champignos mycorr
p/cd		Thoen D. 1993. Looking for ectomycorrhizal trees and ectomycorrhizal fungi in trop
cd		Thomas CD and 18 others. Extinction risk from climate change. Nature 427: 145-14
		Thomas GW Thelephora terrestris, Laccaria laccata jpt tundmatute seente I
		Thomas KA, Peintner U, Moser MM, Manimohan P. 2002. *Anamika*, a new mycorr
p/cd		Thomas SE, Crozier J, Aime MC, Evans HC, Holmes KA. 2008. Molecular characte
p/cd		Thomazini LI. 1973. Mycorrhiza in plants of the 'Cerrado'. Plant Soil 41: 707-711.
		Thompson JN. 2009. The coevolving web of life. Am. Nat. 173: 125-140.
		Thompson W, Rayner ADM. 1982. Spatial structure of a population of Tricholomop
		Thomson BD, Hardy GES, M muutused peale väljaistutamist: inokuleeritud seene väl
		Thrall PH, Burdon JJ. 2002. Evolution of gene-for-gene systems in metapopulations:
p/cd		Thrall PH, Burdon JJ. 2003. Evolution of virulence in a plant host-pathogen metapop
		Thrall PH, Hochberg ME, Burdon JJ, Bever JD. 2007. Coevolution of symbiotic mu
cd		Tian C, He X, Zhong Y, Chen J. 2003. Effect of inoculation with ecto-and arbuscula
j		Tibbett M, Sanders FE, Minto SJ, Dowell M, Cairney JWG. 1998. Utilization of erg
		Tibbett M, Sanders FE. 2002. Ectomycorrhizal symbiosis can alter plant nutrition th
cd		Tiffney BH, Manchester SR. 2001. The use of geological and palaeontological evide
		Tilman D, Reich PB, Isbell F. 2012. Biodiversity impacts ecosystem productivity as
p/cd		Tilman D, Reich PB, Knops JMH. 2006. Biodiversity and ecosystem stability in a de
p		Tilman D. 1994. Competition and biodiversity in spatially structured habitats. Ecolo
p		Tilman D. 1996. Biodiversity: population versus ecosystem stability. Ecology 77: 35
p/cd		Tilman D. 1999. The ecological consequences of changes in biodiversity: a search fo
p/cd		Timberlake J. 2000. Biodiversity of the Zambezi basin. Occasional Publications in B
		Timling I, Dahlberg A, Walk Kanda ja Alaska arktikas; Dryas vs Salix; erine
		Timling I, Dahlberg A, Walker DA, Gardes M, Charcoussset JY, Welker JM, Taylor I
		Timling I, Walker DA, Nusb mullaseened Kanadas NAAT transektil: EcM se
cd		Timms R, Read AF. 1999. What makes a specialist special? Trends Ecol. Evol. 14: 3
		Timonen S, Kauppinen P. 20 Tilia sp linnas Tuber 3 spp, Russula
		Timonen S, Sen R. 1998. Heterogeneity of fungal and plant enzyme expression in in
		Timonen S, Tammi H, Sen R. 1997. Characterization of the host genotype and funga
		Timonen S, Tammi H, Sen R. 1997. Outcome of interactions between genets of two
cd		Timoney KP, Peterson G, Wein R. 1997. Vegetation development in boreal riparian
		Tittensor DP, Mora C, Jetz W, Lotze HK, Ricard D, Vanden Berghe E, Worm B. 20
		Tiunov AV, Scheu S. 2005. Facilitative interactions rather than resource partitioning
		Tixier M-S, Guichou S, Kreiter S. 2010. Assessment of the usefulness of eight DNA
p/cd		Tjorve E, Kunin WE, Polce C, Calf Tjorve KM. 2008. Species-area relationship: sep
		Toftegaard T, Iason GR, Ale Pyrola media ju Suillus var, Amph, Russ, Pilod
	x	Toju H, Guimaraes PR, Olesen JM, Thompson JN. 2014. Assembly of complex plan
		Toju H, Sato H, Tanabe AS. JPN segametsas eri puuliikidel: AM-taimedel p
		Toju H, Tanabe AS, Yamamoto S, Sato H. 2012. High-coverage ITS primers for the
p/cd		Toljander JF, Eberhardt U, T okasmetsas Põhja seente kooslused gradiendi eri osade
p		Tommerup IC, Bougher NL. 1999. The role of ectomycorrhizal fungi in nutrient cyc
p		Tonkin CM, Malajczuk N, McComb JA. 1989. Ectomycorrhizal formation by micro
e		Tornberg K, Olsson S. 2002. Detection of hydroxyl radicals produced by wood-deco
cd		Torres Aquino M, Plassard C. 2004. Dynamics of ectomycorrhizal mycelial growth a
p		Torres P, Honrubia M. 1994. Inoculation of containerized Pinus halepensis seedlings
p/cd		Torti SD, Coley PD, Kursar T. 2001. Causes and consequences of monodominance
		Torti SD, Coley PD. 1999. Tropical Monodominance: A Preliminary Test of the Ect
p/cd		Trapnell CG. 1959. Ecological results of woodland burning experiments in Northern
		Trappe J, Molina R, Luoma D, Cazares E, Pilz D, Smith JE and 4 others. 2009. Dive
		Trappe JM, 1987. Phylogenetical and ecological aspects of mycotrophy in the angios
p/cd		Trappe JM, Bougher NL. 2002. Australasian sequestrate (truffle-like) fungi. XI. *Gu*
p		Trappe JM, Bushwell W, Castellano MA. 1997. NATS truffle and truffle-like fungi
		Trappe JM, Castellano MA, Halling RE, Osmundson TW, Binder M, Fechner N, Ma
		Trappe JM, Martellia medlockii sünt ja kirjeldus
		Trappe JM, Castellano MA. 2000. New sequestrate Ascomycota and Basidiomycota
p/cd		Trappe JM, Claridge AW, Arora D, Smit WA. 2008. Desert truffles of the African K
p/cd		Trappe JM, Claridge AW, Claridge DL, Liddle L. 2008. Desert truffles of the Austra

		b	Trappe JM, Claridge AW. 2005. Hypogeous fungi: evolution of reproducti arv maas
		p/cd	Trappe JM, Kovacs GM, Claridge AW. 2009. Comparative taxonomy of desert trufl
			Trappe JM, Kovács GM, Claridge AW. 2009. Comparative taxonomy of desert trufl
			Trappe JM. 1962. Fungus associates of ectotrophic mycorrhizae. Bot. Rev. 28: 538-
		p	Trappe JM. 1964. Mycorrhizal hosts and distribution of Cenococcum graniforme. Ll
			Trappe JM. 1967. Pure culture synthesis of Douglas fir mycorrhizae with species of
		j	Trappe JM. 1971. A synopsis of the Carbomycetaceae and Terfeziaceae (Tuberales)
			Trappe JM. 1971. Mycorrhiza-forming Ascomycetes. In: Hacskaylo E (ed.). Mycor
		p/cd	Trappe JM. 2005. A.B. Frank and mycorrhizae: the challenge to evolutionary and ec
			Trappe MJ, Trappe JM, Bonito GM. 2010. *Kalapuya brunnea* gen. & sp. nov. and
		cd	Treseder KK, Allen MF, Ruess RW, Pregitzer KS, Hendrick RL. 2005. Lifespans of
		p/cd	Treseder KK, Cross A. 2006. Global distributions of arbuscular mycorrhizal fungi. E
			Treseder KK, Czimczik CI, Trumbore SE, Allison SD. 2008. Uptake of an amino ac
			Treseder KK, Maltz M, Hawkins BA, Fierer N, Stajich JE, McGuire KL. 2014. Evo
			Treseder KK, Maltz MR, Hawkins BA, Fierer N, Stajich JE, McGuire KL. 2014. Ev
		cd	Treseder KK, Masiello CA, Lansing JL, Allen MF. 2004. Species-specific measuren
		p/cd	Treseder KK, Torn MS, Masiello CA. 2006. An ecosystem-scale radiocarbon tracer
		p/cd	Treseder KK, Turner KM, Mack MC. 2007. Mycorrhizal responses to nitrogen ferti
		cd	Treseder KK. 2004. A meta-analysis of mycorrhizal responses to nitrogen, phosphor
		p	Treu R. 2004. Notes on fungi from the eastern highlands of Papua New Gu PNG eri
			Triptahi SKM. 2012. The systematics and evolutionary perspectives of fossil fungi. I
			Triptahi SKM. 2012. The systematics and evolutionary perspectives of fossil fungi. I
			Trocha LK, Kalucka I, Stasi eri puuliikide istandikes. Männiliigid olid omav
			Trocha LK, Mucha J, Eissenstat DM, Reich PB, Oleksyn J. 2010. Ectomycorrhizal i
		p/cd	Trocha LK, Oleksyn J, Turz punakivitellisel k Lactarius pubescens, Hebeloma meso
		p/cd	Trocha LK, Rudawska M, L kuusel metsataim Sagedasimad Wilcoxina mikolae, Ca
		cd	Troesch A, Nguyen H, Miyada CG, Desvarenne C, Gingeras TR, Kaplan PM, Cros
		e	Trojanowski J, Hüttermann A. 1987. Screening of wood-inhabiting fungi for their ca
		p	Trost T, Ag uute morfotüüpi kuusikus: vana vs vana: Tylospora, Cenococcum, Pinirl
		cd	Trowbridge J, Jumpponen A Salix liustiku ääre Sordariaceae 3spp, Russula fragilis, I
		p/cd	Trudell SA, Rygiewicz PT, Edmonds RL. 2003. Nitrogen and carbon stable isotope
		p/cd	Trudell SA, Rygiewicz PT, Edmonds RL. 2004. Patterns of nitrogen and carbon stab
			Truszkowska W. 1951. Badania nad mykotrofizmem nizinnego zespolu lakowego n
			Truszkowska W. 1953. Mykotrofizm olesow Bialowieskiego Parku Narodowego i I
		p	Truu J, Truu M, Lõhmus K, Ostonen I, Ivask M, Kanal A. 2001. Structure and activ
			Tulasne L-R, Tulasne C. 1845. Memoire pour servir a l'histoire des chamignons hyp
		p/cd	Tulasne L-R, Tulasne C. 1943. Champignons hypogés de la famille des Lycoperdace
			Turgeman T, Asher JB, Roth-Bejerano N, Kagan-Zur V, Kapulnik Y, Sitrit Y. 2011.
			Turjaman M, Tamai Y, Segah H, Limin SH, Cha JY, Osaki M, Tawaraya K. 2005. I
			Turnau K, Berger A, Loewe A, Einig W, Hampp R, Chalot M, Diezengremel P, Kot
			Turnau K, Przybylowicz WJ, Mesjasz-Przybylowicz J. 2001. Heavy metal distributi
		cd	Turner H, Hovenkamp P, van Welzen PC. 2001. Biogeography of Southeast Asia an
			Turner S, Pryer KM, Miao VPW, Palmer JD. 1999. Investigating deep phylogenetic
			Turner TR, James EK, Poole RS. 2013. The plant microbiome. Genome Biol. 14:20
		p/cd	Twieg B, Durall DM, Simard CAN Pseudotsug Domin Thelephoraceae (21), Cortina
			Tyler G. 1992. Tree species affinity of decomposer and ectomycorrhizal m tamm vs
			Tylianakis JM, Tscharntke T, Lewis OT. 2007. Habitat modification alters the struct
			Tzean SS, Barron L. 1983. A new predatory hyphomycete capturing bdelloid rotifers
			Uecker FA. 1967. *Stephensia shanori*. I. Cytology of the ascus and other observatio
			Uehling JK, Henkel TW, Vilgalys R, Smith ME. 2012. *Membranomyces* species are
		p	Uetake Y, F OrM: Ceratobasidium vs Spiranthes: morf ja aktiini paigutus mykoriisa
		cd	Ugawa S, F vedelkultuuris kasvatatud puudel olemasoleva EcMde mantlid hävineva
			Ugolini FC. 1968. Soil development and alder invasion in a recently deglaciated area
			Ugolini FC. Soil development and alder invasion in a recently deglaciated area of Gl
			Uhl M, Agerer R. 1987. Studies on ectomycorrhizae XI. Mycorrhizae formed by *De*
			Uibopuu A, Moora M, Saks Ü, Daniell T, Zobel M, Öpik M. 2009. Differential effe
			Ulbrich E. 1937. Ergebnisse neurer Forschungen õber die Mykorrhiza. Ges. Naturfo
			Ulrich W, Almeida-Neto M, Gotelli NJ. 2009. A consumer's guide to nestedness an
			Ulrich W, Gotelli NJ. 2007. Disentangling community patterns of nestedness and sp
			Ulrich W, Piwczynski M, Maestre FT, Gotelli NJ. 2012. Null model tests for niche c
			Umata H. 2000. Germination and growth of Erythrorchis ochobiensis (Orchidaceae)
			Unestam T, hüdrofoobsus vs hüdrofiilsus-mütseel
			Unestam T. 1991. Water repellency, mat formation, and leaf-stimulated growth of sc
			Untereiner WA, Angus A, Réblova M, Orr M-J. 2008. Systematics of the *Phialopho*
2011	34		Unterseher M, Jumpponen A, Öpik M, Tedersoo L, Moora M, Dormann CF, Schnitt
		p/cd	Upson R, Read DJ, Newsham KK. 2007. Widespread association between the erico
		cd	Urakawa H, El Fantroussi S, Smidt H, Smoot JC, Tribou EH, Kelly JJ, Noble PA, S
		cd	Urakawa H, Noble PA, El Fantroussi S, Kelly JJ, Stahl DA. 2002. Single-base-pair

p/cd		Urban A, Neuner-Plattner I, Krisai-Greilhuber I, Haselwandter K. 2004. Molecular s
p/cd		Urban A, Puschenreiter M, S Austria serpent EcM: Cantharellus lutescens, C
j		Urban AU, Sebacina spp: ülemine väga krobeline mantlikiht ja alumised p arv Sebac
p/cd		U'Ren JM, Dalling JW, Gallery R, Maddison DR, Davis EC, Gibson CM, Arnold A
		U'Ren JM, Lutzoni F, Miadlikowska J, Laetsch AD, Arnold EA. 2012. Host and geo
		U'ren JM, Lutzonia F, Miadlikowska J, Arnold AE. 2010. Community analysis revea
p/cd		Uri V, Tullus H, Lõhmus K. 2002. Biomass production and nutrient accumulation in
p		Ursic M, Peterson RL, Husb 2-3 a istanduse m Wilcoxina, punaneAsco, Hebeloma,
p		Ursic M, Pe Phialophora finlandia (ist: EEMR, sünt ECM; kollakas, EMH hüal + tug
		Usuki F, Abe JP, Kakishima M. 2003. Diversity of ericoid mycorrhizal fungi isolated
p/cd		Usuki F, Narisawa K. 2005. Formation of structures resembling ericoid mycorrhizas
		Vaario L-M, Fritze H, Spetz P, Heinonsalo J, I Tricholoma matsutake dominer
		Vaario L-M, Guerin-Laguette A, Gill WM, Lapeyrie F, Suzuki K. 2000. Only two w
		Vaario L-M, Guerin-Laguette A, Matsushita N, Suzuki K, Lapeyrie F. 2002. Saprob
		Vaario L-M, Pennanen T, Sarjala T, Savonen E-M, Heinonsalo J. 2010. Ectomycorr
		Vaario L-M, Tervonen A, Ha Picea abies tai samad: Thel terr, Amphinema
		Vainio EJ, Hantula J. 2000. Direct analysis of wood-inhabiting fungi using denaturin
cd		Vajda V, McLoughlin S. 2003. Fungal Proliferation at the Cretaceous-Tertiary Boun
		Valencia R, Condit R, Foster RB, Romoleroux K, Villa Munos G, Svenning J-C, Ma
		Valencia R, Foster RB, Villa G, Condit R, Svenning JC, Hernandez C, Romoleroux
p		Valentine LL, Fiedler TL, Ha Quercus garryana Cenococcum, Tomentella sp, Tuber s
		Valentini A, Pompanon F, Taberlet P. 2009. DNA barcoding for ecologists. Trends E
p		Valenzuela E, Moreno G, Garnica S, Godoy R, Ramirez C. 1999. Mycoso Tsiili No
cd		Valinsky L, Della Vedova G põllumullas: mikroarray: ainult kott-ja kandseened
p/cd	x	Vamosi SM, Heard SB, Vamosi C, Webb CO. 2009. Emerging patterns in the comp
cd		Van Breemen N, Finlay R, Lundtröm U, Jongmans AG, Giesler R, Olsson M. 2000.
p/cd		van der Berg C, Goldman DH, Freudenstein JV, Pridgeon AM, Cameron KM, Chas
p/cd		van der Gast CJ, Ager D, Lilley AK. 2008. Temporal scaling of bacterial taxa is infl
p/cd		van der Gast CJ. 2008. Islands shaping thought in microbial ecology. Adv. Appl. Mi
		van der Heijden EW, de Vrie Salix; vs kk-tingi Laccaria, Hebeloma, Inocy Salix: vs
		van der Heijden EW, Kuyper TW. 2001. Does origin of mycorrhizal fungus or myco
cd	x	van der Heijden EW, Kuyper TW. 2003. Ecological strategies of ectomycorrhizal fu
		van der Heijden EW, Vosatk vs AM diversiteet: Salix; vs kk-tingimused, vs aastaaja
		Van der Heijden EW. 2001. Differential benefits of arbuscular mycorrhizal and ecto
p/cd		van der Heijden MGA, Bardgett RD, van Straalen NM. 2008. The unseen majority:
		van der Heijden MGA, Boller T, Wiemken A, Sanders IR. 1998. Different arbuscula
		van der Heijden MGA, Horton TR. 2009. Socialism in soil? The importance of myco
		van der Heijden MGA, Kliro AM diversiteet tõstab taimede BDd, biomassi, P sisald
p/cd x		van der Heijden MGA, Streitwolf-Engel R, Riedl R, Siegrist S, Neudecker A, Ineich
cd	x	van der Heijden MGA, Wiemken A, Sanders IR. 2003. Different arbuscular mycorrh
		van der Putten WH, Klironomos JN, Wardle DA. 2007. Microbial ecology of biolog
p/cd		van der Putten WH, Kowalchuk GA, Brinkman EP, Doodeman GTA, van der Kaaij
		van der Putten WH, Macel M, Visser ME. 2010. Predicting species distribution and
cd		Van der Putten WH, Vet LEM, Harvey JA, Wäckers FL. 2001. Linking above-and b
		van der Puttern WH, Bardgett RD, de Ruiter PC, Hol WHG, Meyer KM, Bezemer T
p/cd		van Driel KGA, Humbel BM, Verkeleij AJ, Stalpers J, Müller WH, Boekhout T. 200
p/cd		van Elsas, Turner S, Bailey MJ. 2003. Horizontal gene transfer in the phytosphere. N
		Van Geel M, Busschaert P, Honnay O, Lievens B. 2014. Evaluation of six primer pa
cd		van Hees PAW, Godbold DL, Jentschke G, Jones DL. 2003. Impact of ectomycorrh
p/cd		van Hees PAW, Rosling A, Essen S, Godbold DL, Jones DL, Finlay RD. 2006. Oxa
p/cd		van Schöll L, Hoffland E, van Breemen N. 2006. Organic anion exudtion by ectomyc
p/cd		van Schöll L, Smits MM, Hoffland E. 2006. Ectomycorrhizal weathering of the soil
		Van Tuinen D, Jacquot E, Zhao B, Gollotte A, Gianinazzi-Pearson V. 1998. Charac
		van Velzen R, Weitschek E, Felici G, Bakker FT. 2012. DNA Barcoding of Recentl
cd	x	Vandenkoornhuyse P, Baldauf SL, Leyval C, Straczek J, Young JPW. 2002. Extens
	x	Vandenkoornhuyse P, Mahé 13C rikastatud süsinikuga taimedest RNA ekst
cd		Vandenkoornhuyse P, Ridgway P, Watson IJ, Fitter AH, Young JPW. 2003. Co-exis
p/cd		Vanderklift MA, Ponsard S. 2003. Sources of variation in consumer-diet d15N enric
p		Vardavkis E. 1992. Mycorrhizal Endogonaceae and their seasonal variations in a Gr
		Väre H, Ohtonen R, Ahonen-Jonnarth U, Tarvainen O, Markkola A-M, Jalkanen R.
p		Väre H, Vestberg M, Eurola S. 1992. Mycorrhiza and root-associated fung Teravmä
		Väre H. 1989. Effect of nitrogen on the growth of Suillus variegatus and on mycorrh
		Väre H. 1989. Influence of d istandikes Thelephora
		Väre H. 1989. The mycorrhizal condition of w esinesid Thelephora, Cenococcum
		Väre H. 1990. Aluminium polyphosphate in the ectomycorrhizal fungus Suillus varie
cd		Varela E, Martinez AT, Martinez MJ. 2000. Southern blot screening for lignin perox
p		Vares A, Lõhmus K, Truu M, Truu J, Tullus H, Kanal A. 2004. Productivity of blacl
j		Varese GC, Gonthier P, Nicolotti P. 2003. Long-term effects on other fungi are stud

					Vasco-Palacios AM, Franco-Molano AE, Lopez-Quintero CA, Boekhout T. 2005. M
		p/cd			Vasiliauskas R, Menkis A, Finlay RD, Stenlid J. 2007. Wood-decay fungi in living r
		cd			Vazquez DP, Aizen MA. 2004. ASYMMETRIC SPECIALIZATION: A PERVASI
					Vazquez DP, Aizen MA. 2006. Community-wide patterns of specialization in plant-
					Vazquez DP, Chacoff NP, Cagnolo L. 2009. Evaluating multiple determinants of the
					Vazquez DP, Melian CJ, Williams NM, Blüthgen N, Krasnov BR, Poulin R. 2007. S
		cd			Veerkamp MT, De Vries BWL, Kuyper TW. 1997. Shifts in species comp saprotroc
			x		Vehviläinen H, Koricheva J, Ruohomäki K. 2008. Effects of stand tree species comp
2013	2			x	Veldre V, Abarenkov K, Bahram M, Martos F, Selosse M-A, Tamm H, Kõljalg U, T
					Veldre V. 2009. Molecular phylogeny of *Ceratobasidium* and *Thanatephorus*, and
					Vellend M. 2008. Effects of diversity on diversity: consequences of competition and
					Vellend M. 2010. Conceptual synthesis in community ecology. Quart. Rev. Biol. 85
		j			Vellinga EC, de Kok RPJ, Bruns TD. 2003. Phylogeny and taxonomy of Macrolepic
		p/cd			Vellinga EC, Wolfe BE, Pringle A. 2009. Global patterns in ectomycorrhizal inocula
					Velmala S, Rajala T, Heinonsalo J, Taylor AFS, Pennanen T. 2013. Profiling functic
					Velmala SM, Rajala T, Haapanen M, Taylor AFS, Pennanen T. 2013. Genetic host-
		p			Verbeken A, Horak E. 1999. Lactarius (Basidiomycota) in Papua New Guinea. 1. sp
		p/cd			Verbeken A, Walleyn R. 1999. Is *Pterygellus* mycorrhizal with a euphorbia? Myco
		p/cd			Verboom GA, Dreyer LL, Savolainen V. 2009. Understanding the origins and evolu
		p/cd			Verhoeven KJF, Simonsen KL, McIntyre LM. 2005. Implementing false discovery r
					Verkley GJM, Zijlstra JD, Summerbell RC, Berendse F. 2003. Phylogeny and taxon
		p/j			Verma S, Varma A, Rexer K-H, Hassel A, Kost G, Sarbhoy A, Bisen P, Bütehorn B
		p			Vermeij G. 1993. The biological history of a seaway. Science 260: 1603-1604.
		p/cd			Veselkin DV. 200?. Ectomy EcM morfotüüpide suht arvukus ei erine metsapinnasel
					Veselkin DV. 2008. Diversity and Anatomic Structure of Ectomycorrhizas of Picea
		p/cd			Vetaas OR. 1992. Microsite effects of trees and shrubs in dry savannas. J. Veg. Sci.
			x		Vetrovsky T, Baldrian P. 2013. The variability of the 16S rRNA gene in bacterial ge
		j			Viaud M, Pasquier A, Brygoo Y. 2000. Diversity of soil fungi studied by PCR-RFLI
					Vilcinskas A, Stoecker K, Schmidtberg H, Röhrich CR, Vogel H. 2013. Invasive ha
		p			Vilgalys R, Cubeta MA. 1994. Molecular systematics and population biology of Rhi
					Vilgalys R, Gonzales D. 1990. Organization of ribosomal DNA in the basidiomycete
		p/cd			Vilgalys R, Hester M. 1990. Rapid genetic identification and mapping of enzymatica
		p			Vilgalys R, Sun BL. 1994. Ancient and recent patterns of geographic speciation in tl
		p			Vilhar U, St kuusel kuusik Rhytidiad Tylospora spp (39%), Elaphomyces s
					Villarreal-Ruiz L, Anderson IC, Alexander IJ. 2004. Interaction between an isolate f
					Villarreal-Ruiz L, Neri-Luna C, Anderson IC, Alexander IJ. 2012. In vitro interactio
					Villeneuve N, Grandtner MM, Fortin JA. 1989. Frequency and diversity of lehtmets-
					Villeneuve N, Le Tacon F, B istandikus: vs Laccaria-inokuleeritud (teisi vähem, L. b
2012	8				Vincenot L, Nara K, Sthultz C, Labbe J, Dubois M. Tedersoo L, Martin F, Selosse M
2009	17				Vincenot L, Tedersoo L, Richard F, Horcine H, Kõljalg U, Selosse M-A. 2009. Fun
		p/cd			Vincens A, Garcin Y, Buchet G. 2007. Influence of rainfall seasonality on African lo
					Vines T, Andrew RL, Bock DG, Franklin MT, Gilbert KJ, Kane NC, Moore J-C, M
					Visser S, Maynard D, Danie haab: lageraie: pu Cenococcum, Cortinarius, Russula, T
					Visser S. 19 xxx mikroskoop põleng, männime noor: Suillus, MRA, Cenoc noor: Sui
		cd			Vitousek PM. 1994. Beyond global warming: ecology and global change. Ecology 7
					Vivanco L, Austin AT. 2008. Tree species identity alters forest litter decomposition
					Vizzini A, Angelini C, Ecole E. 2012. A new *Neopaxillus* species (Agaricomycetes)
		p/cd			Vogelsang KM, Reynolds HL, Bever JD. 2006. Mycorrhizal fungal identity and rich
					Vohnik M, Sadowsky JJ, Lukesova T, Albrechtovà J, Vosatka M. 2012. Inoculation
					Voiblet C, Duplessis S, Encelot N, Martin F. 2001. Identification of symbiosis-regul
				x	Voigt K, Kirk PM. 2011. Recent developments in the taxonomic affiliation and phyl
		cd			Volokhov D, Chizhikov V, Chumakov K, Rasooly A. 2003. Microarray-based ident
		cd			Volokhov D, Rasooly A, Chumakov K, Chizhikov V. 2002. Identification of Listeria
					von Cräutlein M, Korpelainen H, Pietiläinen M, Rikkinen J. 2011. DNA barcoding:
		p/cd			von Mering C, Hugenholtz P bakteritel eri kesk kondades: shotgun sekveneerimine. I
		cd			von Wintzingerode F, Göbel UG, Stackebrandt E. 1997. Determination of microbial
		cd			Voris HK. 2000. Maps of Pleistocene sea levels in Southeast Asia: shorelines, river
					Voriskova J, Baldrian P. 201 kõdu lagunemine tammel: endofüüdid asenduv
					Voriskova J, Brabcova V, Ca aastaaegadel horisonditi: suured muutused rühı
					Vozzo JA, I Amanita, Boletus, Tylopilus, Gyroporus, Russula, Sclerodern
					Vozzo JA, Hacskaylo E. 1964. Anatomy of mycorrhizae of selected eastern forest tı
		p			Vozzo JA, Hacskaylo E. 1974. Endo-and ectomycorrhizal associations in five Popu
					Vozzo JA. 1971. Field Inoculations with Mycorrhizal Fungi. In: Hacskaylo E (ed.).
					Vralstad T, Piceirhiza vs Hymenoscyphus (ericoid)
					Vralstad T, Holst-Jensen A, Schumacher T. 1998. The post-fire discomycete *Geopy*
					Vralstad T, Myhre E, Schumacher T. 2002. Molecular diversity and phylogenetic af
					Vralstad T, Meliniomyces bicolor

p/cd	Vralstad T. 2004. Are ericoid and ectomycorrhizal fungi part of a common guild? N
	Vralstad. 2001. Mol. Ecol. of root-associated mycorrhizal and non-mycorrhizal asco
	Vreeland P, Lugaski T, Vreeland H, Kleiner E. 1981. A new isotope injection prode
	Vu TD, Eberhardt U, Szöke S, Groenewald M, Robert V. 2012. A laboratory inform
	Vujanovic V, Hamelin RC, Bernier L, Vujanovic G, St-Arnaud M. 2007. Fungal div
p/cd	Wadud MA, Lian CL, Nara K, Ishida TA, Hogetsu T. 2005. Development of micros
x	Wagg C, Bender SF, Widmer F, van der Heijden MGA. 2014. Soil biodiversity and
x	Wagg C, Jansa J, Schmid B, van der Heijden MGA. 2011. Belowground biodiversit
p/cd	Wagg C, Pautler M, Massicotte HB, Peterson L. 2008. The co-occurrence of ectomy
	Wagner HH, Holderegger R, Werth S, Gugerli F, Hoebee SE, Scheidegger C. 2005.
p/cd	Wagner T, Fischer M. 2002. Proceedings towards a natural classification of the wor
p/cd	Walbert K, Ramsfield TD, R NZL Pinus (pa Rhizopogon 4 spp, Inoc 3 spp,
cd	Waldrop MP, Firestone MK. 13C PLFA: olulisim puisniidul puu all vs eemal; vähe r
p/cd	Waldrop MP, Zak DR, Blacl mullaseente (attii Domin Epicoccum sp, Capronia sp,
	Walker JF, Aldrich-Wolfe L, Riffel A, Barbare H, Simpson NB, Trowbridge J, Jump
p/cd	Walker JF, Miller Jr. OK, Horton JL. 2008. Seasonal dynamics of ectomycorrhizal f
p/cd	Walker JF, Miller OK, Horto Quercus spp 1-2 Cenococcum, Tuber aff borchii, Lac
	Walker JF, Miller OK, Lei T, Semones S, Nilsen E, Clinton BD. 1999. Suppression
p	Walker JF, Parrent JL. 2004. Molecular phylogenetic evidence for the mycorrhizal s
	Walker JKM, Cohen H, Higg Lepp vs Pseudotsuga WA: kattuvaid liike 3, en
	Walker JKM, Ward V, Paterson C, Jones MD. 2012. Coarse woody debris retention
	Walker RF, Geisinger DR, Johnson DW, Ball JT. 1997. Elevated atmospheric CO2
	Wallander H, Ekblad A, Bergh J. 2011. Growth and carbon sequestration by ectomy
cd	Wallander H, Göransson H, Rosengren U. 2004. Production, standing biomass and n
	Wallander H, Johansson L, Pallon I. 2002. PIXE analysis to estimate the elemental c
cd	Wallander H, Mahmood S, Hagerberg D, Johansson L, Pallon J. 2003. Elemental co
	Wallander H Russula, Lactarius, tuberculate, Piloderma, pink
	Wallander H, Nilsson LO, Hagerberg D, Baath E. 2001. Estimation of the biomass a
	Wallander H, Nylund J-E, Sundberg B. 1994. The influence of IAA, carbohydrate an
	Wallander H, Nylund J-E. 1991. Effects of excess nitrogen on carbohydrate concent
	Wallander H. 2000. Uptake of P from apatite by Pinus sylvestris seedlings colonised
	Wallander H. 2000. Use of strontium isotopes and foliar K content to estimate weatl
p/cd	Wallenstein MD, McMahon tundramullas seen Seened: Leotiomycetes, Dothideomy
	Wallenstein MD, Weintraub MN. 2008. Emerging tools for measuring and modeling
cd	Waltert B, Wiemken V, Rusterholz H-P, Boller T, Baur B. 2002. Disturbance of for
	Walting R, Turnbull E. 1994. Boletes from South and East Central Africa -II. Edinb.
p	Wang B, Qiu Y-L. 2006. Phylogenetic distribution and evolution of mycorrhizas in l
	Wang B, Yeun LH, Xue J-Y, Liu Y, Ane J-M, Qiu Y-L. 2010. Presence of three my
	Wang CJK, Wilcox HE. 1985. New species of ectendomycorrhizal and pseudomyco
	Wang C-Y, Wang Y. 1996. The frequency of chimeric molecules as a consequence
	Wang Q, Gao C, Guo L-D. 2 Castanopsis fa Lact sp, Russula sp
	Wang Q, Guo L-D. 2010. Ec Pinus CHN no Amphinema sp, Lact delic, Tom
	Wang Q, He XH, Guo L-D. 2012. Ectomycorrhizal fungus communities of Quercus
cd	Wang R-F, Beggs ML, Robertson LH, Cerniglia CE. 2002. Design and evaluation o
p/cd	Wang W, Tsuneda A, Gibas CF, Currah RS. 2007. Cryptosporiopsis species isolted
p/cd	Wang X-Q, Tank DC, Sang T. 2000. Phylogeny and divergence times in Pinaceae: e
	Wang X-R, Szmidt AE. 2001. Molecular markers in population genetics of forest tre
p/cd	Wang Y, Hall IR. 2004. Edible ectomycorrhizal mushrooms: challenges and achieve
p/cd	Wang Z, Binder M, Schoch CL, Johnston PR, Spatafora JW, Hibbett DS. 2006. Evo
p/cd	Wang Z, Johnston PR, Takamatsu S, Spatafora JW, Hibbett DS. 2006. Toward a ph
cd	Wang Z, Johnston PR, Yang ZL, Townsend JP. 2009. Evolution of reproductive mo
	Wang Z, Nilsson RH, Lopez-Giraldez F, Zhuang W-Y, Dai Y-C, Johnston PR, Tow
p	Warcup JH, McGee PA. 1983. The mycorrhizal associations of some Australian As
p	Warcup JH, Talbot PHB. 1967. Perfect states of Rhizoctonias associated with orchi
p/j	Warcup JH, Muciturbo: hüpogeiliste viljakehadega ECM Pezizales: teleomorfi ja an
p	Warcup JH. 1971. Specificity of mycorrhizal association in some Australian orchids
	Warcup JH. 1980. Ectomycorrhizal associations of Australian indigenous plants. Ne
p	Warcup JH. 1981. The mycorrhizal relationships of Australian orchids. New Phytol.
	Warcup JH. 1985. Ectomycorrhiza formation by *Glomus tubiforme* . New Phytol. 9
	Warcup JH. 1985. *Rhizanthella gardneri* (Orchidaecea), its *Rhizoctonia* endophyte
p	Warcup JH. 1988. Mycorrhizal associations and seedling development in Australian
	Warcup JH. 1988. Mycorrhizal associations of isolates of *Sebacina vermifera* . New
p/j	Warcup JH. 1990. Occurrence of ectomycorrhizal and saprophytic discom eukalüpt
	Warcup JH. Endogone ja Sclerogone spp -mantel õhuke kuni paks, rakusis kolonis p
p	Warcup JH. 1990. The mycorrhizal associations of Australian Inuleae (Asteraceae).
p/j	Warcup JH. 1991. The fungi eukalüpti mets pö domin kottseened 70-95% (s.h. Ruhl
p/j	Warcup JH. 1991. The *Rhizoctonia* endophytes of *Rhizanthella* (Orchidaceae). My
p	Warcup JH. Symbiotic germination of some Australian terrestrial orchids. New Phyt

cd			Ward BB. 2002. How many bakterite diversiteet: lühiülevaade, Curtis2002 kommer
			Wardle DA et al. 1999. Plant removals in perennial grassland: vegetation dynamics,
	x		Wardle DA, Bardgett RD, Klironomos JN, Setälä H, van der Putten WH, Wall DH. 2
			Wardle DA, Bonner KI, Nicholson KS. 1997. Biodiversity and plant litter: experime
			Wardle DA, Lindahl BD. 2014. Disentangling global soil fungal diversity. Science 3
			Wardle DA, Yeates GW, Barker GM, Bonner KI. 2006. The influence of plant litter
cd			Wardle DA, Yeates GW, Williamson W, Bonner KI. 2003. The response of a three
cd			Wardle DA, Zackrisson O, Hörnberg G, Gallet C. 1997. The influence of island area
p	x		Wardle DA. 1999. Is "sampling effect" a problem for experiments investigating biod
p/cd			Wardle DA. 2006. the influence of biotic interactions on soil biodiversity. Ecol. Lett
			Wariishi H, Valli K, Gold MH. 1992, Manganese (II) oxidation by manganese perox
			Waring BG, Averill C, Hawkes CV. 2013. Differences in fungal and bacterial physio
			Warren JM, Brooks JR, Meinzer FC, Eberhart JL. 2008. Hydraulic redistribution of
p/cd			Warren JM, Brooks JR, Meinzer FC, Eberhart JL. 2008. Hydraulic redistribution of
			Waterman RJ, Bidartondo MI, Stofberg J, Combs JK, Gebauer G, Savolainen V, Ba
p/cd			Waterman RJ, Bidartondo MI. 2008. Deception above, deception below: linking pol
p/cd			Watling R, Lee SS. 1995. Ectomycorrhizal fungi associated with members Malaisia
p/cd			Watling R, Lee SS. 1998. Ectomycorrhizal fungi associated with members Malaisia
p/cd			Watling R. 2001. Australian boletes: their diversity and possible origins. Aust. Syst.
p			Watling R. 2001. The relationships and possible distributional patterns of boletes in
b			Watling R. 2005. Fungal conservation: some impressions -a personal view. Exotic sp
p/cd			Watling R. 2006. The sclerodermatoid fungi. Mycoscience 47: 18-24.
cd			Watve MG, Gangal RM. 1996. Problems in measuring bacterial diversity and a poss
			Webb CO, Ackerly DD, Kembel SW. 2008. Phylocom: Software for the Analysis of
			Webb CO, Ackerly DD, McPeek MA, Donoghue MJ. 2002. Phylogenies and comm
			Webb CO, Cannon CH, Davies SJ. 2008. Ecological organization, biogeography, an
p/cd			Webb CO, Gilbert GS, Donoghue MJ. 2006. Phylodiversity-dependent seedling mor
cd		x	Webb CO. 2000. Exploring the phylogenetic structure of ecological communities: A
			Weber A. Karst J, Gilbert B, Kimmins JP. 2004. Thuja plicata exclusion in ectomyco
			Weber AT, Pawlowski J. 2013. Can Abundance of Protists Be Inferred from Sequen
cd			Weber J, Díez J, Selosse M-A, Tagu D, Le Tacon F. 2002. SCAR markers to detect
			Weber MG, Agrawal AA. 2012. Phylogeny, ecology, and the coupling of comparativ
p/cd			Weden C, Danell E, Camacho FJ, Backlund A. 2004. The population of the hypogeo
p/cd			Weden C, Danell E, Tibell L. 2005. Species recognition in the truffle genus Tuber -t
			Weden C, Ericsson L, Danell E. 2001. Tryffelnyheter fran Gotland. Svensk Bot. Tid
			Weden C, Pettersson L, Danell E. 2009. Truffle cultivation in Sweden: results from
cd			Wedin M, Döring H, Gilenstam G. 2004. Saprotrophy and lichenization as options f
			Wei J, Agerer R. 2011. Two sebacinoid ectomycorrhizae on Chinese pine. Mycorrhi
			Wei J, Perso Humaria, Trichophaea vf woolhopeia, Geopora, Geopora-Tric
p/cd			Weiblen GD, Webb CO, Novotny V, Basset Y, Miller SE. 2006. Phylogenetic dispe
j			Weidemann HN. 1998. Pavisning av *Helvella* ektomykorrhiza hos *Dryas* og *Salix*
p			Weir JR. 1921. *Thelephora terrestris, T. fimbriata* , and *T. caryophyllea* on forest t
			Weir JT, Schluter D. 2007. The latitudinal gradient in recent speciation and extinctio
j			Weiss M, Oberwinkler F. 2001. Phylogenetic relationships within Auriculariales and
p/j			Weiss M, Selosse M-A, Rexer K-H, Urban A, Oberwinkler F. 2004. Sebacinales: a
			Weiss M, Sykorova Z, Garnica S, Riess K, Martos F, Krause C, Oberwinkler F, Bau
			Wells JM, Boddy L, Donnelly DP. 1998. Wood decay and phosphorus translocation
p/cd			Wells K, Oberwinkler F. 1982. *Tremelloscypha gelatinosa* , a apecies of a new fami
p/cd			Wells K. 1975. Studies of some Tremellaceae. V. A new genus, *Efibulobasidium* . N
p/cd			Welsh AK, Dawson JO, Gottfried GJ, Hahn D. 2009. Diversity of Frankia in root no
			Wen Z, Murata M, Xu Z, Ch Pseudotsuga si RuLa, Seb, Tom-thel; spetsiifili
			Wenkart S, Roth-Bejerano N, Mills D, Kagan-Zur V. 2001. Mycorrhizal association
			Went FW. 1973. Rhizomorphs in soil not connected with fungal fruiting bodies. Am
			Werner RA, Brand WA. 2001. Referencing strategies and techniques in stable isotop
			Wesser SD, Armbruster WD. 1991. Species distribution controls across a forest-step
p/cd			Westoby M. 2006. Phylogenetic ecology at world scale, a new fusion between ecolo
p/cd			Wheeler CT, Tilak M, Scrimgeour CM, Hooker JE, Handley LL. 2000. Effects of sy
p			Whigham DF, O'Neill J, McCormick M, Smith C, Rasmussen H, Caldwell B, Danie
p			Whipps JM. 2004. Prospects and limitations of mycorrhizas in biocontrol of root pat
			Whitaker RJ, Grogan DW, Taylor JW. 2003. Geographic barriers isolate endemic po
p/cd			Whitby CB, Hall G, Pickup R, Saunders JR, Ineson P, Parekh NR, McCarthy A. 200
			White JR, Navlakha S, Nagarajan N, Ghodsi M-R, Kingsford C, Pop M. 2010. Alig
p/cd			White MM, James TY, O'Donnell K, Cafaro MJ, Tanabe Y, Sugiyama J. 2006. Phy
p/cd			White P. 2006. The 20th NZ fungal foray, Westport. Available at: www.. NZL for
			Whitlock MC, McPeek MA, Rausher MD, Rieseberg L, Moore AJ. 2010. Data arch
			Whitlock MC. 2011. Data archiving in ecology and evolution: best practices. Trends
			Whittaker RH, 1975. Communities and Ecosystems. 2nd edn. Macmillan, New York
			Whittaker RJ. 2010. Mega-analyses and mega-mistakes: calling time on meta-analys

		Wicklow DT. 1979. Competitive hierarchy in post-fire Ascomycetes. Mycologia 71:
n		Wiedmer E, Melanogaster broomeianus lepal
p/cd		Wiegand T, Gunatilleke CSV, Gunatilleke IAUN, Huth A. 2007. How individual sp
		Wiegand T, Huyh A, Getzin S, Wang X, Hao Z, Gunatilleke CVS, Gunatilleke IAU
		Wiemers M, Fiedler K. 2007. Does the DNA barcoding gap exist? – a case study in
cd		Wiemken V, Boller T. 2002. Ectomycorrhiza: gene expression, metabolism and the
		Wiens JJ, Ackerly DD, Allen AP, Anacker BL, Buckley LB, Cornell HV, Damschen
p/cd		Wiens JJ, Donoghue MJ. 2004. Historical biogeography, ecology and species richne
		Wiens JJ, Graham CH. 2005. Niche conservatism: integrating evolution, ecology and
		Wiklund K, Nilsson L-O, Jacobsson S. 1995. Effect of irrigation, fertilizati muutub k
		Wikström N, Savolainen V, Chase MW. 2001. Evolution of the angiosperms: calibra
cd		Wilberforce EM, Boddy L, Griffiths R, Griffith GW. 2003. Agricultural managemen
p		Wilcox HE, Wilcoxina: mutut tüüpi klamüdosp kultuuris, ektendoMR klamüdospoor
		Wilcox HE, 2 eritüüpi ektendomükoriisat -toen. Wilcoxina ja phialophora
		Wilcox HE, ektendomükoriisa, toen Phialophora -rakusisesed hüüfid tungisid isegi p
p		Wilcox HE, Phialocephala dimorphospora (pms rakkudevah H, paiguti paks mantel)
		Wilcox HE. 1971. Morphology of Ectendomycorrhizae in Pinus resinosa. In: Hacska
		Wilde SA. 1971. Studies of Mycorrhizae in Socialist Republics of Europe. In: Hacsk
		Wilkinson A, Alexander IJ, Johnson D. 2011. Species richness of ectomycorrhizal h
		Wilkinson A, Solan M, Taylor AFS, Alexander IJ, Johnson D. 2010. Intraspecific di
		Wilkinson DM. 1998. Mycorrhizal fungi and Quaternary plant migrations. Glob. Ec
p		Wilkinson DM. 1998. The evolutionary ecology of mycorrhizal networks. Oikos 82:
p		Wilkinson DM. 1999. Mycorrhizal networks are best explained by plurality of mech
cd		Wilkinson DM. 2001. Horizontally acquired mutualisms, an unsolved problem in ec
cd		Wilkinson DM. 2001. Mycorrhizal evolution. Trends Ecol. Evol. 16: 64-65.
p/cd		Wilkinson DM. 2001. What is the upper size limit for cosmopolitan distribution in fr
		Wilkinson HT. 1987. Association of Trechispora alnicola with yellow ring disease o
cd		Wilkinson SC et al. 2002. Pl laguneval kuuse ja männiokastel. Männil domin seenel
p/cd		Will KW, Rubinoff D. 2004. Myth of the molecule: DNA barcodes for species cann
		Willerslev E, Davison J, Moora M, Zobel M, Coissac E, Edwards ME et al. 2014. F
		Williams AF, Chambers SM, Davies PW, McLean CB, Cairney JWG. 2004. Molecu
		Williams END, Todd NK, Rayner ADM. 1981. Spatial development of populations
j		Williams PG, Roser DJ, Seppelt RD. 1994. Mycorrhizas of hepatics in continental A
		Williams SE. 1979. Vesicular-arbuscular mycorrhizae associated with Actinomycete
		Willig MR, Kaufman DM, Stevens RD. 2003. Latitudinal gradients of biodiversity.
p/cd		Wills C and 37 others. Nonrandom processes maintain diversity in tropical forests. S
p/cd		Wilmé L, Goodman SM, Ganzhorn JU. 2006. Biogeographic evolution of Madagasc
		Wilson AD. 1991. Somatic incompatibility in dikaryotic-monokaryotic and dikaryoti
		Wilson AW, Binder M, Hibbett DS. 2012. Diversity and evolution of ectomycorrhiz
		Wilson AW, Binder M, Hibbett DS. 2012. Effects of gasteroid fruiting body morpho
		Wilson AW Calostoma cinnabarinum on pisolithuse ja sclerodermaga ühe
p/cd		Wilson BJ, Addy HD, Tsune Kanada arktikas paljudel EcM ja AM taimedel: dominl
cd	x	Wilson KH, Wilson WJ, Radosevich JL, DeSantis TZ, Viswanathan VS, Kuczmarsk
		Wilson MJ, Certini G, Campbell CD, Anderson IC, Hillier S. 2008. Does the prefere
p/cd		Wilson PG, O´Brien MM, Gadek PA, Quinn CJ. 2001. Myrtaceae revisited: a reasse
		Wilson SD. 1993. Belowground competition in forest and prairie. Oikos 68: 146-150
cd		Wilson WJ, Strout CL, DeSantis TZ, Stilwell JS, Carrano AV. 2002. Sequence-spec
		Wingate L, Ogée J, Burlett R, Bosc A, Devaux M, Grace J, Loustau D, Gessler A. 2
p		Wingfield MJ, Slippers B, Roux J, Wingfield BD. 2001. Worldwide movement of ex
		Wingler A, Wallenda T, Hampp R. 1996. Mycorrhiza formation on Norway spruce (
cd		Winka K. 2000. Phylogenetic relationships within the Ascomycota based on 18S rD
p/cd		Winkworth RC, Wagstaff SJ, Glenny D, Lockhart PJ. 2002. Plant dispersal N.E.W.S
		Winter K-U, Becker A, Münster T, Kim JT, Saedler H, Theissen G. 1999. MADS-b
p/cd		Winther JL, Friedman WE. 2008. Arbuscular mycorrhizal associations in Lycopodia
		Wipf D. 1997. Polymorphismes protéique et génomique au sein des Morchellaceae -
p/cd		Wipfli MS, Deal RL, Hennon PE, Gomi T, Orlikowska E, LeSage C, D'Amore DV.
cd		Wirsel SGR, Leibinger W, E pilliroo juurtes kultuur + sekv ITS; juurtes suurim BD l
cd		Wirsel SGR. 2004. Homoge AM mol BD pilliroo juurtes: kas praimereid nii tava-G
		Wisz MS, Pottier J, Kissling WD, Pellissier L, Lenoir J, Damgaard C, Dormann CF,
		Withington JM, Reich PB, Oleksyn J, Eissenstat DM. 2006. Comparisons of structu
p/cd		Wojciechowski MF, Lavin M, Sanderson MJ. 2004. A phylogeny of legumes (Legum
p/cd		Wojciechowski MF. 2003. Reconstructing the phylogeny of legumes.. In: Klitgaard
p/cd		Wolfe BE, Klironomos JN. 2005. Breaking new ground: soil communities and exotic
		Wolfe BE, Kuo M, Pringle A. 2012. *Amanita thiersii* is a saprotrophic fungus expan
		Wolfe BE, Pringle A. 2012. Geographically structured host specificity is caused by t
		Wolfe BE, Richard F, Cross Amanita phalloides invad N-Am: VK enamasti
p/cd		Wolfe BE, Rodgers VL, Stinson KA, Pringle A. 2008. The invasive plant Alliaria pe

		Wolfe BE, Tulloss RE, Pringle A. 2012. The irreversible loss of a decomposition pa
p		Wolfe CB, Bougher NL. 1993. Systematics, mycogeography, and evolutionary histo
p		Wöllecke J. paljude uute k N väetamine: p eri aastaaegadel eri dominandid
p/cd		Wolpert J. 1910. Die Mycorrhizen von *Alnus alnobetula* . Flora 100: 60-68.
		Womack AM, Bohannan BJM, Green JL. 2010. Biodiversity and biogeography of th
	1	Won H, Renner SS. 2006. Dating dispersal and radiation in the gymnosperm *Gnetum*
		Wong KKY Laccaria bicolor:eritüvede erinevused
		Woodcock S, Curtis TP, Head IM, Lunn M, Sloan WT. 2006. Taxa-area relationship
cd		Woodruff DS. 2003. Neogene marine transgressions, palaeogeography and biogeogr
j		Worrall JJ, Anagnost SE, Zabel RA. 1997. Comparision of wood decay among dive
p/cd		Wright JE. 2005. Checklist of the mycobiota of Iguazù Natinal Park (Misio ARG Ig
		Wright MM, Cross R, Cousens RD, May TW, McLean CB. 2010. Taxonomic and f
		Wright S, Keeling J, Gillman L. 2006. The road from Santa Rosalia: A faster tempo
p/cd		Wright SD, Yong CG, Dawson JW, Whittaker DJ, Gardner RC. 2000. Riding the ic
p/cd		Wright SHA, Berch SM, Ber Tsuga; vs väeta enim Cortinarius spp (liigiliselt
p/cd		Wu B, Hogetsu T, Isobe K, Ishii R. 2007. Community structure of arbuscular mycor
		Wu B, Lian C, Hogetsu T. 2002. Development of microsatellite markers in white bir
		Wu B, Maruyama H, Teramoto M, Hogetsu T. 2012. Structural and functional intera
		Wu B, Nara K, Hogetsu T. 1 ECM seente võitlus juurel
		Wu B, Nara K, Hogetsu T. 2001. Can 14C labeled photosynthetic products move be
		Wu B, Nara K, Hogetsu T. 2002. Spatiotemporal transfer of carbon-14-labelled pho
p/cd		Wu B, Nara K, Hogetsu T. 2004. Genetic structure of Cenococcum geophilum popu
		Wu B, Watanabe I, Hayatsu M, Nioh I. 1999. Effect of ectomycorrhizae on the grov
		Wu C-G, Lin S-J. 1997. Endogonales in Taiwan: A new genus with unizygosporic sp
		Wu J, Ma H, Han S, Zhu Y, Jin H, Liang J, Liu L, Xu J. 2010. Rhizoctonia fungi enl
cd		Wu L, Thompson DK, Li G, Hurt RA, Tiedje JM, Zhou J. 2001. Development and e
p		Wu Q, Mueller GM. 1997. Biogeographic relationships between macrofungi of temp
		Wu Q-W, Mueller GM, Lutzoni FM, Huang Y-Q, Quo S-Y. 2000. Phylogenetic and
cd		Wu T, Kabir Z, Koide RT. 2005. A possible role for saprotrophic microfungi in the
cd		Wu T, Sharda JN, Koide RT. 2003. Exploring interactions between saprotrophic mic
		Wu YT, Wubet T, Trogisch mullaseened CHN vanusereas: vanusega seenel
cd		Wu Z, Tsumura Y, Blomquist G, Wang X-R. 2003. 18S rRNA gene variation among
cd		Wubet T, Kottke I, Teketay D, Oberwinkler F. 2003. Mycorrhizal status of indigeno
p/cd		Wubet T, Weiss M, Kottke I, Oberwinkler F. 2006. Two threatened coexisting indig
cd		Wubet T, Weiss M, Kottke I, Teketay D, Oberwinkler F. 2003. Molecular diversity
		Wurzburger x luite-vs segamänı n/a
		Wurzburger N, Bledsoe C. 2 luite-vs segamännik,
cd		Wurzburger N, Hartshorn AS raba vs mets. Me metsas pigem kuusk ja kuusel pms C
p/cd		Wurzburger N, Hendrick RL. 2009. Plant litter chemistry and mycorrhizal roots pro
		Wurzburger N, Higgins BP, Hendrick RL. 2012. Ericoid mycorrhizal root fungi and
cd		Xiang Q-Y, Soltis DE. 2001. Dispersal-vicariance analyses of intercontinental disju
		Xiao G, Berch SM. 1996. Diversity and abundance of ericoid mycorrhizal fungi of G
		Xie J, Yanping Y, Jiang D, Li G, Huang J, Li B, Hsiang T, Peng Y. 2008. Intergener
		Xiong S, Nilsson C. 1999. The effects of plant litter on vegetation: a meta-analysis. .
p/cd		Xu J, Sha T, Li Y-C, Zhao Z-W, Yang ZL. 2008. Recombination and genetic differe
		Xu LH, Ravnskov S, Nicolai juure- vs risosf vs mulla seente BD hernel: juur
		Xu X, Thornton P, Post WM. 2013. A global analysis of soil microbial biomass carb
		Ya T, Ren Z. 1996. Geographical distribution of Tilia L. Acta Phytotaxon. Sin. 34: 2
		Yagame T, Orihara T, Selosse M-A, Yamato M, Iwase K. 2012. Mixotrophy of *Pla*
p/cd		Yagame T, Yamato M, Suzuki A, Iwase K. 2008. Ceratobasidiaceae mycorrhizal fu
		Yagame T, Yamato M. 2013. Mycoheterotrophic growth of Cephalanthera falcata (C
		Yamada A, Tricholoma matsutake
		Yamada A, xxx
		Yamada A, xxx 2*64 subproovi; vs viljakehade asetusmuster xxx, 3a, v
		Yamada A, Kitamura D, Setoguchi M, Matsuda Y, Hashimoto Y, Matushita N, Fuku
		Yamada A, Tricholoma matsutake
		Yamada A, Ogura T, Ohmasa M. 2001. Cultivation of mushrooms of edible ectomyc
		Yamada A, jaapani söögiseened:kirjldused
p/cd		Yamanaka T, Li C-Y, Bormann BT, Okabe H. 2003. Tripartite associations in an ald
		Yamanaka T. 1999. Utilization of inorganic and organic nitrogen in pure cultures by
		Yamasaki SH, Fyles JW, Egger KN, Titus BD. 1998. The effect of Kalmia angustifo
p/cd		Yamashita S, Hattori T, Momose K, Nakagawa M, Aiba M, Nakashizuka T. 2008. I
		Yamato M, Iwase K. 2008. Inroduction of asymbiotically propagated seedlings of *C*
		Yamato M, Iwase K. 2008. Introduction of asymbiotically propagated seedlings of C
p		Yamaya K. 1968. On the influence of alder (Alnus inokumae) on soil properties in n
p		Yang CY, Wilcox HE. 1984. An E-strain ectendomycorrhiza formed by a new speci
		Yang H, Zang Y, Yuan Y, Tang J, Chen X. 2012. Selectivity by host plants affects t

Yang Y, Gao Y, Wang S, Xu D, Yu H, Wu L, Lin Q, Hu Y, Li X, He Z, Deng Y, Zl
Yang Y, Qiu Q, Yang Z, Hu Z, Tam NF-Y, Xin G. 2010. Arbuscular mycorrhizal fu
cd Yang YH, Speed T. 2002. Design issues for cDNA microarray experiments. Nature
Yang ZL, Matheny PB, Ge ZW, Slot JC, Hibbett DS. 2005. New Asian species of tl
p/cd Yang ZL, Trappe JM, Binder M, Sanmee R, Lumyong P, Lumyong S. 2006. The sec
Yang, G, Cl xxx, vulkaanipurskest r-strateegid vulkaanilisel pinnasel: su
Yao F, Vik U, Brysting AK, Bistorta vivipara; järsakul vs nõgu: kooslustes
y Yao H, Song J, Liu C, Luo K, Han J, Li Y, Pang X, Xu H, Zhu Y, Xiao P, Chen S. 2
Yao Y.-J. Pegler DN, Young TWK. 1994. New species in *Endogene* (Endogonales
Yao Y-J, Pegler DN, Young TWK. 1995. Youngiomyces, a new genus in Endogona
(j) Yao Y-J, Spooner BM. 1996. *Oviascoma* , a new genus of Otideaceae. My Oviascor
Yarwood SA, Myrold DD, H mullaseened vs. Girdling: kontrollis EcM seene
p/cd Yen AC, Olmstead R. 2000. Molecular systematics of Cyperaceae tribe Cariceae ba
Yergeau E, Schoondermark-Stolk SA, Brodie EL, Déjean S, DeSantis TZ, Goncalve
Yilmaz P, Kottmann R, Field D, Knight R, Cole JR, Amaral-Zettler L. 2011. Minimu
Yomyart S, Piapukiew J, Wu B, Hogetsu T, Sihanonth P (2007) Community structu
p/cd Yoo K-O, Wen J. 2002. Phylogeny and biogeography of *Carpinus* and subfamily C
p/cd Yorou NS, Agerer R. 2007. *Tomentella furcata* , a new species from Benin (West A
p/cd Yorou NS, Agerer R. 2007.Type studies of three tomentelloid species (Basidiomyco
Yorou NS, Kõljalg U, Sinsin B, Agerer R. 2007. Studies in African thelephoroid fun
Young BW, Massicotte HB, Tackaberry LE, Baldwin QF, Egger KN. 2002. *Monotr*
Young HE. 1937. *Rhizopogon luteolus* , a mycorrhizal fungus of *Pinus* . Forestry 11
Young YPW. 2005. The phylogeny and evolution of nitrogenases. In: Palacios R, N
p Yu T, Nassuth A, Peterson RL. 2001. Characterization of the interaction between th
cd Yu TE, Egg ektendomükoriis ektendomükoriisa: Wilcoxina, Sphaerosporella, Phialop
Yu Y, Breitbart M, McNairnie P, Rohwer F. 2006. FastGroupII: A web-based bioin
Yu Y, Breitbart M, McNairnie P, Rohwer F. 2006. FastGroupII: A web-based bioin
Yuan L, Yankg ZL, Li S-Y, Hu H, Huang J-L. 2010. Mycorrhizal specificity, prefere
Yuan Z-L, Zhang C-L, Lin F-C, Kubicek C. 2010. Identity, diversity and molecular p
Yuan ZY, Chen HYH, Reich PB. 2011. Global-scale latitudinal patterns of plant fin
Yuan ZY, Chen HYH, Reich PB. 2011. Global-scale latitudinal patterns of plant fin
Yue JC, Clayton MK. 2005. A similarity measure based on species proportions. Co
Yue JC, Clayton MK. 2005. A similarity measure based on species proportions. Co
Yukawa T, Ogura-Tsujita Y, Shefferson RP, Yokoyama J. 2009. Mycorrhizal divers
p/cd Yuwa-Amornpitak T, Vichit Tai: 8 proovial Tomentella, Scleroderma-pisol,
cd Zabarovsky ER, Petrenko L, Protopopov A et al. 2003. Restriction site tagged (RST
p/cd Zachow C, Berg C, Müller F risosfääri seenekooslus Tenerifel: enim mõjutal
Zafar U, Houlden A, Robsor polyuretaani lagunemisel eri temperatuuridel. 2
Zak B, Marx DH. 1964. Isolation of mycorrhizal fungi from roots of individual slash
Zak B. 1969. Characterization and classification of mycorrhizae of Douglas-fir. I. *Ps*
j Zak B. 1974 Cortinarius zakii maasikapuul: ektendomükoriisa
Zak B. 1976 leesikas + mfg seened sh kuuseriisikas (Lactarius sanguifluus), Rhizopo
Zak B. 1976 arbutoidse mükoriisa sünt puhaskultuurist: Thel terrestris, Pil
p/cd Zak DR, Holmes WE, White mikroobide PLFA mitmekesisus sõltub taimede biomas
Zak JC, Rabatin SC. 1997. Organization and description of fungal Commu seente di
Zak JC, Whitford WG. 1986. The occurrence of a Hypogeous Ascomycete in the No
Zak JC, Wicklow DT. 1979. Structure and composition of a post-fire ascomycete co
p Zambonelli Tuber albidum ja Tuber aestivum sarapuul
Zambonelli A, Branzanti MB. 1990. Mycorrhizal synthesis between Tuber albidum v
Zambonelli Tuber vs Hebeloma sinapizans, Laccaria, kontaminandid
Zambonelli A, Iotti M. 2001. Effects of fungicides on Tuber borchii and Hebeloma s
cd Zangaro W, Bononi WLR, Trufen SB. 2000. Mycorrhizal dependency, inoculum po
cd Zangaro W, Nisizaki SMA, Domingos JCB, Nakano EM. 2003. Mycorrhizal respon
cd Zanis MJ, Soltis DE, Soltis PS, Mathews S, Donoghue MJ. 2002. The root of the an
Zanne AE, Tank DC, Cornwell WK, Eastman JM, Smith SA, FitzJohn RG et al. 201
Zar JH. 1999. Biostatistical analysis. Upper Saddle River, New Jersey, USA: Prentic
p/cd Zare R, Gams W. 2008. A revision of the *Verticillium fungicola* species complex ar
Zeller B, Bréchet C, Maurice J-C, Le Tacon F. 2007. 13C and 15N isotopic fraction
Zeller B, Bréchet C, Maurice J-C, Le Tacon F. 2008. Saprotrophic versus symbiotic
p Zelmer CD, Corallorhiza trifida juurest isoleeritud kandseen mood EcM männil. Ue
p/cd Zelmer CD, Cuthbertson L, Currah RS. 1996. Fungi associated with terrestrial orchi
Zeng NK, Cai Q, Yang ZL. 2012. Corneroboletus, a new genus to accommodate the
cd Zeppa S, Si 2 trühvli liigi sünteesitud EcM morfomeetria on erinev pärnal. Seene ko
Zerova MY, Rozhenko HL. 1966. *Entoloma erophilum* and *E. sericeum* - mycorrhi
Zerova MY. 1950. *Scleroderma verrucosum* - mikoriznyi grib drevesnych porod v
Zerova MY Inocybe serotina tuvastamine pajul
p/cd Zervakis GI, Moncalvo J-M, Vilgalys R. 2004. Molecular phylogeny, biogeography

	cd		Zervakis GI, Venturella G, Papadopoulou K. 2001. Genetic polymorphism and taxo
	b		Zhan J, McDonald BA. 2005. Analytical and experimental methods for estimating p
	p/cd		Zhan J, Pettway J, McDonald BA. 2003. The global genetic structure of the wheat p
			Zhang B-C, Minter DW. 1989. *Gymnohydnotrya* : a new hypogeous ascomycete ge
	p/cd		Zhang C, Yin L, Dai S. 2009. Diversity of root-associated fungal endophytes in *Rho*
			Zhang D, Hui D, Luo Y, Zhou G. 2008. Rates of litter decomposition in terrestrial e
	(cd)		Zhang D-X, Hewitt GM. 2003. Nuclear DNA analyses in genetic studies of populati
	cd		Zhang D-Y, Lin K, Hanski I. 2004. Coexistence of cryptic species. Ecol. Lett. 7: 16
			Zhang J, Taniguchi T, Taten Quercus CHN: tom-thel, sebacina
	p/cd		Zhang L, Yang J, Yang Z. 2004. Molecular phylogeny of eastern Asian species of A
	j		Zhang N, Blackwell M. 2001. Molecular phylogeny of dogwood anthracnose fungus
	p/cd		Zhang N, Castlebury LA, Miller AN, Huhndorf S, Schoch CL, Seifert KA, Rossman
	p		Zhang Y-H, Zhuang W-Y. 2004. Phylogenetic relationships of some members in the
	p/cd		Zhao Q-F, Wang G, Li Q-X, Ma S-R, Cui Y, Grillo M. 2006. Genetic diversity of fi
	cd		Zhao XR, Lin Q, Brookes PC. 2005. Does soil ergosterol concentration provide a re
	cd		Zheng D, Alm EW, Stahl DA, Raskin L. 1996. Characterization of universal small-s
			Zhou D, Hyde KD. 2001. Host-specificity, host-exclusivity, and host-recurrence in s
	cd		Zhou J, Bruns MA, Tiedje JM. 1996. DNA recovery from soils of diverse compositi
		x	Zhou J, Deng Y, Luo F, He Z, Tu Q, Zhi X. 2010. Functional molecular ecological r
			Zhou J, Deng Y, Luo F, He Z, Yang Y. 2011. Phylogenetic molecular ecological net
	p/cd	x	Zhou J, Kang S, Schadt CW, Garten CT. 2008. Spatial scaling of functional gene di
	cd		Zhou J, Thompson DK. 2002. Challenges in applying microarrays to environmental
	cd		Zhou J, Xia B, Huang H, Pal bakterid mullaprofiilis: 18S RFLP+sekv. Ülakihis liikid
	cd		Zhou J, Xia B, Treves DS, Wu L-Y, Marsh TL, O'Neill RV, Palumbo AV, Tiedje J
	cd		Zhou J. 2003. Microarrays for bacterial detection and microbial community analysis
2012	1		Zhou LW, Tedersoo L. 2012. *Coltricia australica* sp. nov. (Hymenochaetales, Basi
			Zhou M, Sharik TL. 1997. Ectomycorrhizal associations of northern red oak (Quercu
	j		Zhou Z, Hogetsu T. 2002. Su lehise metsas Suillus grevillei viljakehade all: suur vari
		x	Zhou Z, Miwa M, Hogetsu T. 1999. Analysis of genetic structure of a Suil Suillus gr
	p		Zhou Z, Miwa M, Hogetsu T. 2000. Genet distribution of ectomycorrhizal fungus Su
	cd		Zhou Z, Miwa M, Hogetsu T. 2001. Polymorphism of simple sequence repeats revea
		x	Zhou Z, Miwa M, Matsuda Y, Hogetsu T. 2001. Spatial distribution of subterranean
	p/cd		Zhu GS, Yu ZN, Gui Y, Liu ZY. 2008. A novel technique for isolating orchid myco
			Zhu H, Mallik AU. 1994. Interactions between Kalmia and black spruce: isolation a
	cd		Zhu Y-G, Miller RM. 2003. Carbon cycling by arbuscular mycorrhizal fungi in soil–
	p		Ziegler H, Trimborn P. 2000. Typen der Photosynthetischen CO2-Fixierung bei Lan
	p/cd		Zijlstra JD, van't Hof P, Baar J, Verkley GJM. 2005. Diversity of symbiotic root end
	p/cd		Zimmer K, Hynson NA, Gebauer G, Allen EB, Allen MF, Read DJ. 2007. Wide geo
	p/cd		Zimmer K, Meyer C, Gebauer G. 2008. The ectomycorrhizal specialist orchid *Cora*
			Zimmermann K, Mannhalter JW. 1996. Technical aspects of quantitative comparativ
			Zinger L, Amaral-Zettler LA, Fuhrman JA, Horner-Devine MC, Huse SM. 2011. Gl
			Zinger L, Coissac E, Choler seened Alpimullas: ITS vs LSU (viletsam resolu
			Zinger L, Gobet A, Pommier veeorganismide kooslused: ülevaade metoodika
			Zinke PJ. 1962. The pattern of influence of individual forest trees on soil properties.
	p/cd		Zobel M, Öpik M, Moora M, Pärtel M. 2006. Biodiversity and ecosystem functionin
			Zobel M, Otsus M, Liira J, Moora M, Möls T. 2000. Is small-scale species richness
	p		Zobel M, Suurkask M, Rosen E, Pärtel M. 1996. The dynamics of species richness i
	p		Zobel M. 1992. Plant species coexistence -the role of historical, evolutionary and ec

MR tüübid	taime-ja üldökoloogia, ökofüs	biogeo	Kliima	Primer,RFLP,sek	NGS	DNA prob	Array	fülogenee	stat. Analüü	ensüümi

ribosomal DNA Large Subunit (LSU) and Internal Transcribed Spacer 2 (ITS2) in DNA barcoding of Collembola. Eur. J. Soil. Biol. 69: 1-7.	
r choice on characterization of orchid mycorrhizal communities using 454 pyrosequencing. Mol. Ecol. Res. 14: 679-699.	
and F, Abvarenkov K. 2015. Analytical biases in microbial diversity studies. Science (in press).	
rs. 2005. Genome sequencing in open fabricated high density picoliter reactors. Nature 437: 376-380.	1. artikkel 454 pürosekv-st. Teeb vigu enamasti homopolür
er AK, Jumpponen A. 2015. Scraping the bottom of the barrel: are rare high-throughput sequences arti	13-19% NGS on artefactid ja 27-54% potentsiaalselt artefa
from 16S rRNA sequences produced by highly parallel pyrosequencers. Nucl. Ac. Res. 2008: 1-11	16S RDNAs sobivaim jupp 454 jaoks
. The widely used small subunit 18S rDNA molecule greatly underestimates true 18S ei suuda erist	18S ei s 18S ei suuda eristada meiofauna liike nii hästi kui
biotic on the human gut microbiota, as revealed by deep 16S rRNA sequencing. PLoS Biol. 6: e280.	18S rDNA: bakteritel täispikal sekventsil parem resolutsio
essment of estuarine sediments by pyrosequencing eukaryotic ribosomal DNA. Front. Ecol. Environ. 8	18S setete meiofauna 454ga. All18SF ja ALL18SR praime
RNA genes requires copy number correction to accurately reflect the effects of management practices	454 - 18S nematoodidele; soovit korrekteerida rRNA koop
ma preerias ei sõltu stimul kliimamuutustest - mulla soojendamisest. LSU - 454	454 - LSU seentele
454 LSU. Juurtes oli palju Actinobacteria. Baktereid juurtes mõjutas sesoonsus, seeni n	454 - LSU seentele ja 16S bakteritele
girikkam kui alakülg lamatüvedel arv eostega levimise tõttu. EcM seened Amphinema ja	454 ITS2 seened puutüvedest
SC, Schleper C. 2006. Archaea predominate among ammonia-oxidizing prokaryotes in soils. Nature 4	454 metatranskriptoomi esimene töö
lega eukarüootidele, SSU kõigile. Univ-praimer on paljude hälvetega ning ei oma piisav	454: eri Leidsid takson-spetsiifilised thresholdid eri organ
-correction of amplicon pyrosequences using Acacia. Nature Meth. 9: 425-426.	Acacia noise removal: 100x kiirem kui Ampliconoise, ent
cular mycorrhizal fungal biodiversity in soil through a land-use gradient using a pyrosequencing appro	AM seened eri-taimkattetüüpidel mullast
navahel seotud. ANDMETES on varjatud kasvukohatüübi efekt, mis eriti mõjutab seen	Amazonias: seente kooslus ja puude kooslus omavahel seo
	arv. Et singletonid ei ole artefaktid; ITS1 454
d Y, Stenlid J, Brandström-Durling M, Clemmensen KE, Lindahl BD. 2012. Nev gITS7, fITS7 ja fI	A-tag parem 3 x kui T-tag; väga haruldased amplikonid oli
pattern s of bacterial richness and evenness in the NW Mediterranean Sea explored by pyrosequencing	bakterid meres: liigirikkus suureneb s RAREFACTION on
analysis of bacterial diversity in a single soil type as affected by management and land use. Soil Biol. E	bakterid mullas
Camargo FAO, Farmerie WG, Triplett EW. 2007. Pyrosequencing enumerates and contrasts soil micr	bakterid mullas
gin ML. 2007. Microbial population structures in the deep marine biosphere. Science 318: 97-100.	bakterid ookeanisügavikus
erndl GJ. 2006. Microbial diversity in the deep sea and the underexplored "rare biosphere". Proc. Nat	bakterid ookeanisügavikus
contrasted bacterial diversity between oak rhizosphere and surrounding soil. Environ. Microbiol. Rep.	Bakterid risosfääris vs bulk mullas: v erinev
2010. Shifts in microbial community structure along an ecological gradient of hypersaline soils and sec	bakterid setetes: vee konts põhjal arv O2 konts on suurim f
oding of plants and animals. Mol. Ecol. 21: 1834-1847.	bioinformaatilised probleemid ja lahe bioinformaatilised p
seasonal dynamics of taxa within Baltic Sea bacterioplankton communities. ISME J. 4: 171-181.	ca 33% bakterite V6 järjestustest on püro põhjal valesti kla
d H. 2011. CLOTU: an online pipeline for processing and clustering of 454 amplicon reads into OTUs	CLOTU proge CLOTU proge
ding and the cytochrome c oxidase subunit I marker: not a perfect match. Biol. Lett. 10: 20140562.	COI ei sobi metabarcoding jaoks, kuna praimerite mismatc
ding and the cytochrome c oxidase subunit I marker: not a perfect match. Biol. Lett. 10: 20140562.	COI ei sobi metabarcoding jaoks, kuna v tugev primeri bia
ndrial cytochrome c oxidase subunit I for marine invertebrates and application in all-taxa biotic survey	COI super-degenereerunud praimerid annavad paremaid tu
4. Next-generation DNA barcoding to enhance and accelerate DNA barcode caprute from single specir	COI triipkoodi sekveneerimine 454 meetodiga. Müned kor
2012. Darwin Darwin Core standardid terminoloogiale	Darwin Core standardid terminoloogiale
ploiting rank-abundance distributions. Nature Meth. 7: 668-669.	DeNoiser
kov K, Petri, Rosenblad MA, Nilsson RH. 2011. Metaxa: a software tool for automated detection and	domeen domeenide, mitokondrite ja plastiidide automaatne
g exacerbates the potential for biased community diversity comparisons due to variable library sizes.	ei tohi kasutada Chao, ACE jms. Kui siis kasutada võrdsus
coding: a next-generation sequencing approach for biomonitoring applications using river benthos. PL	Environmental barcoding termin; CO1 jõe putukate uurimi
. 2010. Diversity in a hidden world: potential and limitation of next-generation sequencing for surveys	eukarüoodid merevees: 18S rDNP pürp vs traditsiooniline
2010. Multiple marker parallel tag environmental DNA sequencing reveals a highly complex eukaryoti	eukarüoodid merevees: 18S RDNA: V4 ja V9 regioon anna
ter M, Carvalho GM, Blaxter ML, Lambshead PJD, Thomas WK. 2010. Ultrasequencing of the meiof	eukarüoodid mullas ja vees: 18S, sest CO1 ei sobi paljudel
sp, Sclerod citrinum domin; rühmadest Bas 44%, AscoM 17%, Unclassif F 11%, Morti	FRA mets 6 liigiga
, Albertin W, Durrens P, Sherman DJ, Marullo P, Hittinger CT, Goncalves P, Sampaio JP. 2014. A G	fülogenoomika: toidutööstu fülogenoomika: toidutööstuse p
r J, Nekrutenko A, The Galaxy Team. 2009. Windshield splatter analysis with the Galaxy metagenomi	Galaxy pipeline metagenoomidele: suur puudus referents-a
R, Goudet J, Guex N. 2013. Density-based hierarchical clustering of pyrosequences on a large scale -	hierarhilise klasterdamise meetod, mis arvestab tihedusfunk
dfield EE, Shaw EA, Steenbock C, Bradford MA, Wall DH, Fierer N. 2014. Biogeographic patterns in	HiSeq prokarüootidele ja eukarüootilele NY Central park
se in next generation amplicon sequencing. New Phytol. In press.	Illumina andmete töötlemine: soovit kasut ainult 1 ahelat. S
SM, Betley J, Fraser L, Bauer M, Gormley N, Gilbert JA, Smith, G,Knight R. 2012. Ultra-high-throug	Illumina MiSeq ja HiSeq kasutamine
gedasem 0-10 cm kui 10-20 cm	Illumina pipeline seentele
of a dual-index sequencing strategy and curation pipeline for analyzing amplicon sequence data on the	Illumine paired end andmetöötlus mothuris. 99% vigadest
, ten Cate JM, Crielaard W. 2008. Pyrosequencing analysis of he oral microflora of healthy adults. J. I	inimese suuõõnes (saliva, plaque) sadu baktereid
n WE, Metsis invasiivsed palmid assots väga generalistide seentega invas-mullas	invasiivsed palmid assots väga generalistide seentega invas
semiconductor chip based sequencing. Electrophoresis 33: 3397-3417.	Ion Torrent trendid, kvaliteet, kvantiteet
aremini kui sealne peremeestaim	ITS seletab seenekooslust paremini kui LSU; P
: ruumilist mustrit ei ole; Mulla P mõj neg ja pH, taimedeBD ja kõrgus!! mõj pos liigiril	ITS1 454 seentekooslused Sveitsis 700 km2 alal 200 alal: r
ot determined by mineral and chemical differences in serpentine substrates. PLoS ONE 7(9): e44233.	ITS1 ja ITS2 annavad sarnaseid tulemusi
Kooslused on erinevad ja katustel BD madalam. Illuminal ITS1 pyro	ITS1 seentel Illumina masinal
7. 2014. Comparison and validation of some ITS primer pairs useful for fungal m ITS1F-ITS2 kehv	ITS1F-ITS2 kehvem kui ITS3-ITS4 ja ITS86F-ITS4. PCR r
dudes seentekooslusi 1-13 a pärast lisamist. P. gigantea pidas vastu vaid 1 aasta	ITS1F-ITS4B + 454
na liigid asenduvad kiiresti Tyl fibr, Tyl aster ja Athel sp-ga, mis domineerivad lõpuni.	ITS2: SWE kuusikute vanusereas - BD kasvab, EmH biom
creales ja Mortierellales ja Helotiales. Seente elurikkus ei muutu liustikust kaugenedes,	ITSfull
, and washing on the diversity of hand surface bacteria. Proc. Natl. Acad. Sci. USA 105: 17994-17999	käte baktereid mõjutab inimese sugu, pesemiisest mööduni
012. Sample richness and genetic diversity as drivers of chimera formation in nSSU metagenetic analy	kimääride teke on suurem kõrgema Bdga kooslustes ja pig
abbaa D, Highlander SK, Sodergren E, Methe B, DeSantis TZ, Petrosino JF, Knight R, Birren BW. 20	kimääride teke: tüüpiliselt SSUs 15-20%; sarnasematel järj
etween replicate 454 pyrosequencing analyses of ectomycorrhizal plant root samples. Mycorrhiza 22:	kloneerimine vs 454: kloneerides ei tulnud Glomalest , 454
osphere: pyrosequencing errors can lead to artificial inflation of diversity estimates. Environ. Microbio	konkreetse järjestuse pürosekv korrektsete tulemuste saami

iverse fungal communities in temperate *Quercus macrocarpa* phyllosphere. New Phytol. 184: 438-44	lehe-endof
etic markers forhigh-throughput sequencing-based biodiversityassessment in com planktoni määran	loomsele planktonile: COI üldpraimerid ei sobi, kuna selge
L, Urich T. 2012. CREST – classification resources for environmental sequence t määramine refere	määramine referents-aligneeringu vastu. Integreeritud MEC
mady M, Knight R, Bushman FD. 2008. The macaque gut microbiome in health, lentiviral infection, a	makaagi soolestikus - põhierinevused inimese, makaagi ja
V. 2013. Reliable, verifiable and efficient monitoring of biodiversity via metabarcoding. Ecol. Lett. 16	metabarcoding termin metageneetika kohta; edukalt kasuta
communities: towards an integrative approach to the study of global biodiversity. metabarcoding vs	metabarcoding vs barcoding: vaja standardiseeritud lähene
Shi JZ, Yuan MM, Sherry RA, Li D, Schuur EAG, Chain P, Tiedje JM, Zhou J, Konstantinidis KT. 2	metagenoom mikroobidel vs mulla soojendamine 2 kraadi
sets and why it matters. ISME J. 8: 2349-2351.	metagenoomide katvuse määramine: vaja statistiliste testid
ialysis of environmental sequences using MEGAN4. Genome Res. 21: 1552-1560.	Metagenoomika analüüs MEGANIga: kasutab identifitseer
ılysis of environmental sequences using MEGAN4. Genome Res. 21: 1552–1560.	Metagenoomika analüüs MEGANIga: Metagenoomika anal
enomic technologies for complex microbial community analysis: open and closed metagenoomika ja	metagenoomika ja metagenoomika ja amplikoni-põhine di
rative metagenomic and rRNA microbial diversity characterization using archaeal and bacterial synthe	metagenoomika vs amplikoni-põhine: 64-spp bakteri mock
	metagenoomika vs amplikoni-põhine: veeproovid. Metagen
chitzki B, Richter A, Eberl L, Zechmeister-Bolternstern S, Riedel K. 2012. Who is who in litter decon	metaproteoomika lehevarisest: veebr vs mai: taimede osaka
ıd validating sequence identification tags robust to indels. PLoS ONE 7: e42543.	MID/tag vead: delets pms tootmisel ja indel pyros. Indel tu
36-637.	mida haruldasem on OTU, seda suurema tõenäosusega arte
ıa metabarcoding of a soil fungal community. Soil Biol. Biochem. 65: 128-132.	Miseq Illumina: ITSFI2 praimer; ITS1 regioon: 4M sekven
cture in pyrosequencing datasets. PLoS One: 7: e43093	mock cc mock community: suurem sekveneerimissügavus s
Employing 454 amplicon pyrosequencing to reveal intragenomic divergence in the internal transcribed	monospoorse kultuuri sisene ITS varieeruvus tavaliselt min
ons on the assessment of bacterial community structure in soil and human-associated samples. FEMS M	mullaproovide seismise aeg ega temperatuur ei avaldanud r
ısed metagenomic data. PLoS ONE 8:e60458.	müra eemaldamise võtted: trade-off sekventside arvu, kesk
rsity and community structure of anaerobic gut fungi (phylum Neocallimastigomycota) in ruminant anc	Neocallismastigomycota loomade kõhus: suguk tasemel pa
.135-1145.	next-generation DNA sekv strat, sh 454 (pms indelid vigad
ıre Biotechnol. 26: 1117-1124.	next-generation DNA sekv strat, sh 454 , Illumina, AB Soli
chnologies for environmental DNA research. Mol. Ecol. 21: 1794-1805.	NGS meetodite ülevaade
Host identity is a dominant driver of mycorrhizal fungal community composition during ecosystem deve	NS31-AML2 454 vs TRFLP: tulemused kvalit ja kvantit sa
ated in the MinION portable single-molecule nanopore sequencer. GigaScience 3:22.	Oxford Nanopore MinION: mediaanpikkus 5500 b, ent kur
encer. Mol. Ecol. Res. 14: 1097–1102.	Oxford Nanopore MinION: mediaanpikkus 5500 b, ent kur
ing multiplexing and validation of data accuracy for diet assessment: application to omnivorous diet. M	palju praimereid multipleksitud taimedele ja loomadele eri
PH. 2013. Simultaneous amplicon sequencing to explore co-occurrence patterns of bacterial, archaeal	paljude eri geenide produktide kokkusegamine ühiseks NG
m C, Gnirke A. 2011. Analyzing and minimizing PCR amplification bias in Illum PCR bias: AT ja (	PCR bias: AT ja GC rikkad piirkonnad, kus kumbagi üle 9
al inference from next generation DNA sequencing. PLoS ONE 9: e90234.	PCR replikaatide arv ei mõjuta liigirikkust ega BD-indekse
es from complex microbial communities. ISME J. 3: 1314-1317.	PCR-järgne DNA replikats on eriti metagenoomide, vähem
54 pyrosequencing: does read abundance count? Mol. Ecol. In press	PCR-põ PCR-põhised meetodid ei kõlba kvantifitseerimise
Ultra-deep sequencing enables high-fidelity recovery of biodiversity for bulk arthropod samples withou	PCR-vaba rikastatud mtDNA CO1 ja rDNA sekveneerimin
of soil pH as a predictor of soil bacterial community structure at the continental scale. Appl. Environ.	pH määrab bakterite BD (unimod pH6-7) ja koosluse struk
sity. In: Xu J-R, Bluhm BH, eds. Fungal Genomics: Methods and Protocols. ???: Humana Press, pp.??	pipeline kirjeldus: assambleerimine, esmane trimm, kehvad
2007. A pyrosequencing-tailored nucleotide barcode design unveils opportunities for large-scale sampl	praimerite tagide konstrueerimine. Pyro produktide arv või
ın tallgrass prairie soil. Mycologia 102: 1027-1041.	preeriamullas. ITS1 praimer ei kõlba. Esindatud kõik seent
ugenholtz P. 2010. Experimental factors affecting PCR-based estimates of microbial species richness a	produktid kuni 400 bp: lühemaid produkte valitakse 454s,
VT. 2009. Accurate determination of microbial diversity from 454 pyrosequencing data. Nat. Meth. 6:	programm PyroNoise suurendamaks 454 andmete täpsust j
. 2012. The Biological Observation Matrix (BIOM) format or: how I learned to stop worrying and love	proovide-OTUde tabelid ja ühtlustatud pakkimise formaat
ı; linnas Russ, Boletaceae, mõl: Tuberaceae, Cortinariaceae	Quercus spp Kansases linnas vs maal; vs aastaajad; lühikes
ova L, Snajdr J, Ridl J, Vlcek C, Voriskova J. 2012. Active and total microbial communities in forest s	RNA vs DNA, ITS ja SSU
rosequencing: current approaches to data analysis and the introduction of the pipeline SEED. Biol. Fer	SEED pipeline; soovit kasutada konsensusjrk
	seened Bistorta juurtel: 454 pyro
erer N. 2010. Soil bacterial and fungal communities across a pH gradient in an arable soil. ISME J. 4: 1	seened ja bakterid põllumullas pH gradiendil SSU põhjal
Miettinen O, Oinonen P, Auvinen P, Paulin L, Larsson K-H, Mäkipää R. 2010. Id seened puutüvede	seened p 454 Power Soil puidust
eographically patterned and more diverse in temperate zones tha seened siseruumide tolmus: olul	seened siseruumide tolmus: oluline geograafiline regioon/k
vers TO, Tucker AE, Sung W, Thomas K. 2009. Evaluating high-throughput sequencing as a method fo	segu-DNAst ei peegelda kvantitatiivset aspekti kuidagi. V
Heath DD, Critescu ME, McIsaac HJ. 2013. High sensitivity of 454 pyrosequen sensitiivsus kuni 2	sensitiivsus kuni 2.3 x 10-5 1/24 plaadil, mis on u 50000 s
TG. 2008. Increasing ecological infrence from high trouhgput sequencing of fungi in the environment th	sequence tags suuremahuliseks sekveneerimiseks keskkonn
ing reads suffice for accurate microbial community analysis. Nucl. Ac. Res. 35: 1-10.	simuleeritud lühikesed jupid 16S rDNAst on õnnestunud praimerite v
on and sequencing artifacts on 16S rRNA-based studies. PLoS ONE 6: e27310.	SSU Pipeline bakteritele; ehit ka Ampliconnoise. Puhastatu
Experiment - a proposal for standards in functional genomic data reporting. http://www.fged.org/proje	standardid metagenoomika uuringutele
e Rev. Genet. 14: 89-99.	standardidmikroarr standardidmikroarrayde ja metatranskri
esse TC, Voolstra CR. 2014. Assessing Symbiodinium diversity in scleractinian corals via next-genera	Symbiodinium dinoflagellaatidele ITS2 454
ded primers for pyrosequencing hundreds of samples in multiplex. Nature Meth. 5: 235-237.	tagide väljatöötamine, millel 3 bp erinevused - 1 mismatch
rcus macrocarpa phyllosphere differ between urban and nonurban environments. New Phytol., in pres	tamme lehe-endofüüdid: ITS1F-ITS4; sekv ITS4ga ITS2 re
ore accurate pictures of protistan community complexity using pyrosequencing of hypervariable SSU rI	Titanium teeb rohkem homopol vigu kui FLX, ent ei tekita
encing our way towards understanding global eukaryotic biodiversity. Trends Ecol. Evol. 27: 233-243.	trendid ja potentsiaal euk jaoks
Gussarova G, Hassel K, Henden J-A, Killengreen ST, Rämä T, Stenøien, HK, Yoccoz NG, Ims RA.	trnL taimedele ja ITS1 seentele lemmingute maost. Eraldi a
1 759–769.	ülevaade
erud H. 2012. Environmental microbiology through the lens of high-throughput DNA sequencing: curre	ülevaade meetodites ja bioinformaatikast
slimi MM, Batzoglou S, Ronaghi M. 2007. Bacterial flora-typing with targeted, chip-based pyroseque	vagiinaproovides bakterid:
in the rare biosphere through improved OTU clustering. Environ. Microbiol. 12: 1889-1898.	vanades andmetes liigselt OTUsid kuna klasterdamismeeto
lecular surveys. New Phytol. 188: 916-918.	vead sekveneerimisel ülehindavad BDd, eriti Chao-hindaja
l quality of massively parallel DNA pyrosequencing. Genome Biol. 8: R143.	vead: tingitud arv mitme template seondumisest kuulile; ve
nd quality assessment of 454 GS-FLX Titanium pyrosequencing. BMC Genomics 12: 245.	vigade teke: eriti lõpuosas, kokku 10% ilma vigadeta; dom

associations. Fung. Ecol. 7: 70-77.
lant pathogen invasions. In: Ziska SH, Dukes JS (eds). Invasive Species and Global Climate Change. CABI International, Wallingford, UK, pp. 22-44.
il toitainevaestes kasvukohatüüpides. Magistritöö, Tartu Ülikool.
13. Towards a unified paradigm for sequence-based identification of Fungi. Mol. Ecol. 22: 5271–5277.
rhizal impacts on plant nitrogen nutrition: emerging isotopic patterns, latitudinal variation and hidden mechanisms. Ecol. Lett. 18: 96-107.
sequencing reveals host ecological group specificity of arbuscular mycorrhizal fungi in a boreonemoral forest. New Phytol. 184: 424-437.
stress combinations. New Phytol. 203: 32–43.
sson RH, Bork P, Hildebrand F, Abarenkov K. 2015. Shotgun metagenomes and multiple primer pair-barcode combinations of amplicons reveal biases in metabarcoding ar
ger F, Pritsch K, Koricheva J, Abarenkov K. 2015. Tree diversity and species identity effects on soil fungi, protists and animals are context-dependent. ISME J. in press.
Ruiz L, Vasco-Palacios A, Quang Thu P, Suija A, Smith ME, Sharp C, Saluveer E, Saitta A, Ratkowsky D, Pritsch K, Riit T, Põldmaa K, Piepenbring M, Phosri C, Peterso
nia]. Eesti Loodus 62: 8-13.
em E, Chuyong G, Kõljalg U. 2010. 454 Pyrosequencing and Sanger sequencing of tropical mycorrhizal fungi provide similar results but reveal substantial methodological
lowground Components. Princeton University Press, New York.
and K, Kjøller R, Larsson E, Pennanen T, Sen R, Taylor AFS, Tedersoo L, Ursing B, Vrålstad T, Liimatainen K, Peintner U, Kõljalg U. 2010. The UNITE database for mo
: ITS vs SSU annavad mõnevõrra eritulemusi kott vs. Kandseente taksonite osas;
S as an environmental DNA barcode for fungi: an in silico approach reveals pote ITS praimerid seentel: ITS ITS praimerid seentel: ITS4 on hea; ITS1F ja ITS5
P, Sanchez-Garcia M, Ebersberger I, de Sousa F, Amend AS, Jumpponen A, Unterseher M, Kristiansson E, Abarenkov K, Bertrand YJK, Sanli K, HMM-põhine ITS E
C content of template DNA as a predictor of PCR success. Nucl. Ac. Res. 31:e99.
read occurrence of spliceosomal introns in the rDNA genes of Ascomycetes. Mol. Biol. Evol. 17: 1971–1984.
versus ITS2 as DNA metabarcodes for fungi. Mol. Ecol. Res. 13: 218–224.
28.
vironmental samples. Appl. Environ, Microbiol. 66: 4356–4360.
ele ja liigirikkusele pole olulist efekti; kooslustes domineerib Archaeorhizimycetes73% kuivas ja 95% niiskes, ent eri töötlustega aladel eri alarühm
unity ecology and phylogenetic biology. Ecol. Lett. 12: 693-715 liigiteke ja spetsialiseerumine alluvad biogeo vs ajalistele faktoritele sõltuvalt skaalast;
pecies from samples. Version 9. User's Guide and application published at: http://purl.oclc.org/estimates.
ensitivity and speed of chimera detection. Bioinformatics 27: 2194-2200. Uchime
-generation sequencing data. Bioinformatics 23: 3150-3152. CD-Hit
er-friendly OTU processing pipeline. Microbiome 2: 30.
lies based on data from restriction site mapping of nuclear rDNA. Mycologia 86: Praimerid LR0R, LR5, LR7, LR3R jt LR-praimerid Coprinaceae
a R, Stajerova K, Vosatka M, Sykorova Z. 2014. Comparison of commonly usec AM praimerid: parim ja esinduslikum on Krügeri fragment ja soovitus NGS j
osomal RNAs in metatranscriptomic data. Bioinformatics 28: 3211–3217.
ioid homobasidiomycetes. Mycol. Res. 108: 983-1002. LSU homobasidiomütseedid LSU homobasidiomütseedid. 12 pea
n Iowa (United States) aquifer and from previously collected marine and freshwater targeted high-throughput sequencing sets. Environ. Microbiol. 15: 2333–2341.
seq: PAired-eND Assembler for Illumina sequences. BMC Bioinformatics 13: 31.
gion as a target for characterization of fungal communities using emerging sequencing technologies. FEMS Microbiol. Lett. 296: 97–101.
orter TM, Bengtsson-Palme J, Walker DM, de Sousa F, Gamper HA, Larsson E, Larsson K-H, Kõljalg U, Edgar RC, Abarenkov K. 2015. A comprehensive, automatically
l mycorrhizal fungi in meadows and forests as revealed by 454 pyrosequencing. New Phytol. 205: 1608–1618.
works. Ecology 83: 2416–2424. connectance võrgust
ssociated *Frankia* Actinobacteria. New Phytol. 204: 979–988.
unit and internal transcribed spacer rRNA operon regions show similar classification accuracies influenced by c blastN ja Naive Bay klassifikaator ning ITS1, ITS2
O. 2013. The SILVA ribosomal RNA gene database project: improved data processing and web-based tools. Nucl Ac Res 41: D590–D596.
i RA, Oakley BB, Parks DH, Robinson CJ, Sahl JS, Strez B, Thallinger GG, van Horn DJ, Weber CF. 2009. Introducing Mothur: open-source, pl Mothur - sekventsipõ
Bolchacova E, Voigt K, Crous PW, Miller AN, Wingfield MJ, Aime MC, An KD, Bai FY, Barreto RW, Begerow D, Bergeron MJ, Blackwell M, Boekhout T, Bogale M,
:1;
trong host preference of ectomycorrhizal fungi in a Tasmanian wet sclerophyll forest as revealed by DNA barcoding and taxon-specific primers. New Phytol. 180: 479-490
strategies and novel lineages revealed by sequences from belowground. Fung. Biol. Rev. 27: 83-99.
assignment of rRNA sequences into the new bacterial taxonomy. Appl. Environ. Microbiol. 73: 5261-5267. klassifitseerimine automaatselt 16S rDNA põhjal
. 2014. ITS1: a DNA barcode better than ITS2 in eukaryotes? Mol. Ecol. Res. In ITS1 ja ITS2: resolutsioon liigitasemel on paljudes taime- ja loomaperekonda
of fungal ribosomal RNA genes for phylogenetics. In: Innis MA, Gelfand DH, S praimerite ITS1-5, NS-seeria ja mt ML-seeria originaalkirjeldused
ification of fungi by using the ITS2 genetic region and an automated fluorescent c ITS86F praimer seentele: kattub 90% Ihrmarki f/gITS7 praimeriga
relationships among cyanobacteria and plastids by small subunit rRNA sequence SSU515F ja 1391R praimeri originaal
nolecular and morphological evidence. Fung. Div. 49: 125-143.
s in the genus Hebeloma based on ITS1 and 2 sequences, with special emphasis on the Hebeloma crustuliniforme complex. Mycologia Hebeloma: soestumine Salicace
n within a biological species of the ectomycorrhizal fungus *Hebeloma velutipes*. Mycol. Res. 105: 284-290. Hebeloma velutipes: c Hebeloma velutipes: dikaarüon sisal
ive isolation in the ectomycorrhizal Hebeloma crustuliniforme aggregate in Northwestern Europe: a phylogenetic approach. Evolution Hebeloma crustuliniforme kompleks
henetic species concept in the Hebeloma crustuliniforme complex within a phylogenetic framework. Persoonia 18: 285-316. Hebeloma crustuliniforme kompleks
phalanthera longifolia (Neottieae, Orchidaceae) is mixotrophic: a comparative study between green and nonphotosynthetic individuals. Can. J. Bot. 84: 1462-1477.
ous M, Aan A, Ots M, Kurina O, Ostonen I, Jõgeva J, Halapuu S, Põldmaa K, Toots M, Truu J, Larsson K-H, Kõljalg U. 2010. PlutoF – a web based workbench for ecolo
ponents by different fungi: a basis for environmental carbon flux studies. FEMS Microbiol. Ecol. 46: 121-128.
Fine-scale phylogenetic architecture of a complex bacterial community. Nature 4 Bakterite mass-sekv plankton Bakterite mass-sekv planktonist: 516 OTUt (algselt 1067,
: testing the o tunnuste erinevuste ajastuse ja jrk analüüs: Ceanothuse (ja tammede) eri alamperek liigid esinevad koos, aga mitte alamperek sisese tunnuste erinevuste ajas

Roslev P, Wagner M. 2003. The isotope array, a new tool that employs substrate-mediated labeling of rRNA for determinati 18nu oligod 14C rRNA ja nif geenide tuvasta
as a basis for detecting genetically distinct mycelia. Can. J. Bot. 45: 1583 – 1589. Nova Hedw. 53: 267-289.
S Cairnsi läh: Russ/Lact (6), Boletoid (6), Põhja-AUS Cairnsi läh: Russ/Lact (6), Boletoid (6),
Bot. 83: 1-13.
their terrestrial Igapo: Manause ümbruse ökoloogia; Aldina latifolia domineerib kuivema poole peal. Kuivema igapó taimekooslus on kasvukoha-end
n. J,. For. Res. 36: 1805-1817.
classification of eukaryotes. J. Eukaryot. Microbiol. 59: 429–493.

inc-adapted fungus protects pines from zinc stress. New Phytol. 161: 549–555.
; and Plant Co AM vs ErM taimed erineva N, P juures
case study in kõrbes kooslused taastuvad kiiremini kui varem hinnatud, sõltuvalt assotsiatsioonitüübist
äbisch Gmünd, Germany.

ı v lüh tsüstiidid

Ectomyc. 3: 13–18.

omycetes, Basidiomycota), a new species from Australia with spores distinctly blue in water. Aust. Syst. Bot. 14: 599-606. Amaurodoni AUS uus liik. Cunning
RM
Thelephoraceae, Hymenomycetes, Basidiomycota) from Australia. Aust. Syst. Bot. 14: 607-614. Tomentella subamyloidea ja T. Radi
tus of *Ramaria*. Mycol. Progr. 11: 47-59.
ıe and H2O ex eriliigid vs mikro-mullaerinevused
ı EcM seente omavaheline asetus, mikroskaalas, k EcM seente omavaheline asetus, mikroskaalas, konkurents, kooselu
Hydnum sp: 2 RE liigisisene ITS varieeruvus

vs kastmine vs lubi
koos Suilluse ja Rhizopogoniga või ilma. Spets haustorid, arv parasiitlus
ı AK (eds). *Techniques for the Study of Mycorrhiza.* Academic Press, London, UK: Academic Press, 25-73.
ı AK (eds). Techniques for the Study of Mycorrhiza. Pp. 25-73. Academic Press, London.

Suilluse ja Rhizopogoniga või ilma. Spets haustorid, arv parasiitlus

ıhtkcirper und Ektomykorrhizen. *Z*. Mykol. 60: 143-158.
Karst. Descr. Ectomyc. 1: 23–28.

Ectomyc. 1: 107–112.
cr. Ectomyc. 4: 43–47.
tomyc. 4: 109–113.

ınnuste lühiülevaade. Gomphoid klaad on v tugev; Thelephora-Albatrellus ja Gomphidius on v sarnased EcM poolest. Thelephora terrestris ja Tom sublil üsna erinevad ja v
ed, sügavuti liigirikkus väheneb; seened liigivaesed, sügavuti liigirikkus väheneb. bakterid ja seened. DGGE. Bakterid väga mitmeklesised, sügavuti liigirikkus väheneb; se

ctomycorrhizal fine roots of forest trees and shrubs. New Phytol. 132: 259-270.
ectomycorrhizal Pinus sylvestris seedlings in a natural substrate treated with elevated Al concentrations. Tree Physiol. 23: 157-167.
orrhizal plants under constant versus variable soil nutrient concentration. Mycorrhiza 12:257–261.
and interesting species from Guyana. Mycologia 95: 614-619. Guyana torikud, sh. Coltricia verruc
i seedlings wit Larixi idandite EcM kolonis suurim lehise mettsas, vahepealne paljal pinnasel, väikseim Salixi juures. Ilmselt Salix ei fasiliteeri

ıcer of the nuclear ribosomal repeat identify Laccaria proxima strains. Mycologia IGS2 RFLP Laccaria proxima tüvede eristamiseks sobib PCR produkt 4000 bp, tihti mitu
plevis siccigleba (Cribbeaceae), in the Albatrellacae using morphological and molecular data. Mycol. Res. 111: 653-662. Leucogastrales+Polyporoletus ja All
ycol. Res. 111: 1030-1039. puguseente teke tavalistest Russulac
re hepatics. J. Sammalde ja maksasammalde eelistused teatud raba-kasvukohatüüpide suhtes (sh Lophozia, Aneura)
s are induced in eucalyptus roots according to aggressiveness of Australian ectomycorrhizal strains of Pisolithus sp. eukalypti
osts in a transitional tropical plant community. Ecology 88: 559-566. AM ITS-T-RFLP
in relation to mycorrhizal infection. New Phytol. 97: 401-411.
s from Goodyera repens mycorrhizas. Trans. Br. Mycol. Soc. 80: 99-106.
of some Malaysian forest trees. Phil. Trans. R. Soc. Lond. B 335: 379-388.
of some Malaysian forest trees. Phil. Trans. R. Soc. Lond. B. 335: 379-388.
ethacrylate. Br.mycol. Soc. 77: 425-429.
ECM puud troopikas: Dipterocarpaceae, Euphorbiaceae (Uapaca), Caesalpiniaceae, Fabaceae (Pericopsis), Myrtaceae, Nyctaginaceae (Neea)
orest: implicat mükoriisasüsteemid troopilises Aasias ja Aafrikas. Troop metsi limit pms P, N vaid valge-liiva ja erikoidide ökosüs-des. Seentest tihti rohkem kasu kasvule
ECM taimed troopilises Lääne-Aafrikas: ülevaade
Syst. Bot. Mis Amherstieae (GilbertioD, PellegrinioD, Ju Amherstieae (GilbertioD, PellegrinioD, Julbernardia, Brach Amherstieae (GilbertioD, Pelle
Kus ja millal tekkisid EcM seened ja taimed esmalt või tek iseseisvalt eri paigus? Seab kaheldavaks diptero
aring the performance of Bayesian Markov chain Monte Carlo sampling and bootstrapping in assessing phylogenetic confidence. Mol. Baieesia vs Baieesia vs maximum li
rrhizal fungi by other soil-microorganisms. Mycol. Res. 93: 182-186. spooride i
on rates of genetic divergence and speciation. Proc. Natl. Acad. Sci. USA 103: 9130-9135.
ECM vs AM globaalskaalas ECM vs AM globaalskaalas
interactions a ECM ja AM seened: ülevaade; liigirikkusele kindlustushüpotees
ECM vs VAM vulkaanilisele alale. ECM probleem monokaarü ECM vs VAM vulkaanilisele alale. ECM probleem monokaarüonite mitte kokkusaamises

tion find different fungi from the same ericoid mycorrhizal roots. New Phytol. 16 ITS1F-TW13, ErM seentele

setting conservation guidelines. Trends Ecol. Evol. 16: 613-622.
)3 mõju: peaaegu kõigi EcM seente VK toodang vähenes, v.a. Laccari aktiivsete mikroobide tuvastamiseks süstiti mulda 3-bromo-deoksü-uridiini
communities. Proc. Natl. Acad. Sci. USA 105: 11512-11519.
etel seentel kändudes, peentes okstes ja ladvajuppides; T-RFLP vs kultuurid vs viljakehad. Eri puiduosades seened viljusid erinevalt, ent arv peenes lagupuidus on olemas l
Kapimaa taimede MR staatus: Ericaceae-ErM; EcM pole; NM -Cryophyllidae, Brassicaceae, Crassulaceae, Proteaceae, Santalaceae, Zygophyllaceae, Restionaceae, Cype
)be database. Appl. Environ. Microbiol. 62: 3557-3559. oligonukleotiidprobede andmebaas eeskirja oligonukleotiidprobede andmebaas eeskirjade
RNA extracts affects hybridization results. Appl. Environ. Microbiol. 66: 4547–4554. RNA hübrid RNA hübridiseerimist segavad humiinhapped
nsistent metric for nestedness in ecological systems: reconciling concept and measurement. Oikos 117: 1227–1239. nodF nestedness arvu
thinking matri: anti-nestedness: võib tuleneda mitmest asjaolust - keelatud interaktsioonid ja malalaua-asustus. Ka high-turnover, eriti väheste vaatlus
infectious diseases: from evidence to a predictive work. Science 341: 5: kliimamuutused vüivad soodustada või inh haiguste levikut. Erinevad mehanismmid
7. Gapped BLAST and PSI BLAST: a new generation in protein database search programs. Nucl. Ac. Res. 25: 3389 – 3402.
w genus of Inocybaceae from the Mediterranean region. Mycologia 102: 1389–1397.
ıyan GS, Venturella G. 2011. First molecular data on *Delastria rosea* , *Fischerula macrospora* and *Hydnocystis piligera* . Bol. Soc. Micol. Madrid 35: 31-37.
n. *Tuber melosporum* comb. nov. Bol. Soc. Micol. Madrid 36: 23-28.
nd to clay minerals. Mol. Ecol. 7: 775-778. eri koostisega saviosakestega seonduva DNA säilimine, er
a maasiseste viljakehadega seente liigirikkus. ECM peremeestaim on juurde pandud meelevaldselt ilma igasuguse maasisese vaatluseta
ıltimaculatum sp. nov. Mycologia 84: 926-929. Loculotuber gen. Nov. (kasvuk
llings in mineral soil with and without organic layers in a California forest. Can. J. For. Res. 9: 311-315.
spatial distribution of acid phosphatase activity in ectomycorrhizal tissues depends on soil fertility and morphotype, and relates to host plant phosphorus uptake. acid pho
ıe core Malvales: evidence fron the ndhF sequence data. Am. J. Bot. 86: 1474-1486. ndhF: pärn sosarperek Craigiaga ja s

ɔs in microbial ecology. FEMS Microbiol. Rev. 24: 555-565. RNA hübridiseerimise plussid miinused; PCR
e viljakehadega seentel: eriti vanades metsades ja kõdupuidus

eld: linkages i ülevaade: ECM funktsioonid ja roll looduses
ɔr western hemlock (Tsuga heterophylla). Mol. Ecol. Notes 2: 236-238. RAPD, SCAR markerid tsuugale
ion of a prized edible mushroom Tricholoma matsutake. Conserv. Genet. 11: 295-302.
al structure of Matsutake mycorrhizas. Mycol. Res. 113: 541-551. mükoriisadest 1-koopia geenide amplif on suur pro
MC et al. 2013. Macroecological patterns of marine bacteria or bakteritel ookeanides globaalselt
ır the identification of white Tuber species. FEMS Microbiol. Lett. 189: 265-269. multiplex-PCR tuberite eristamiseks, spets praimerid eri tuberi liikidele
ɔf the ectomycorrhizal fungi in the genus Tuber by species-specific ITS primers. spets ITS või 18S praimerid eri tuberi liikidele
ɪm HN

Cortinarius species associated with Quercus and Comarostaphylis in Costa Rica. Can. J. Bot. 85: 794-812. Cortinarius Costa Ricas: liigid, mis s
rse overstorey: puude elurikkus ei mõj muude soontaimede elurikkust
cladistic analysis based on ndhF sequence data. Int. J. Plant Sci. 164: 763-773. Sapotaceae jaguneb 3 rühma, kus tri
fication of the Ericaceae. Nord. J. Bot. 14: 385-401. Enkianthus on basaalne Ericaceae. A
oying morphological, ultrastructural and molecular methods. Mycol. Res. 100: 1117-1126. Rhizoctonia kompleksi rühmad: Hel
seene mütseel mullas: PCR-põhine -ülevaade. Praimerite valik, T-RFLP, praimeri bias
ɔntier. FEMS Microbiol. Rev. 31: 388-406.
ialophora; cf Hymenoscyphus, pms tundmatud 18S-ITS: nested ITS1F-ITS2: DGGE + sekveneerim ITS puusse nii kott ki kandseened
d internal transcribed spacer polymerase chain reaction primers for estimating fur seente mulla BD uurimine: eri seente mulla BD uuri PAUP analüüsi väärkasutamine ilma
s liigisisene: SI vs RAPD; mikrosatelliit
ke by two Australian Pisolithus species. Mycol.Res. 105: 977-982. glutamiini
s liigisisene: RAPD RAPD mikrosatelliit
sation by Pisolithus isolates maintained in axenic culture. Mycorrhiza 11: 53-56.
method of constrained ordination for ecology. Ecology 84: 511-525. CAP: mitteparameetrilir
ınce. Aust. Ecol. 26: 32-46. DISTLM, DISTLM forv
ional multivariate analysis of variance. University of Auckland, New Zealand.
ımine Chao2, jacknife ja bootstrap abil. Proovide arvu suurendades suureneb Chao2 pooltel juhtudest (vahemikus 5-15); 15-20 peal +-stabiilne mardikate ja põrnaikate
. Comparative analysis of human gut microbiota by barcoded pyrosequencing. PLOS One 3: e2836.
Lõuna-Brasiilia Araukaaria ja Atlantilise vihmametsa puud AM Lõuna-Brasiilia Araukaaria ja Atlantilise vihmametsa puud AM, ECM puuduvad, isegi Coccoloba ja Caesa
tive analysis of different methods for evaluating quality of Quercus ilex seedlings inoculated with Tuber melanosporum. Mycorrhiza 24: S29-S37.
mul ja O3 nõrgalt inh EcM seente VK biomassi haavikus. Leccinum spp suurenesid enim, ent mõnedel liikidel ka vähenes (Paxillus). Pigem vähen
ɔersal. In: Wicklow DT, Söderström BE (eds.) The Mycota IV. Springer: Berlin, Germany.
ı plant surfaces bakterid, arhed ja seened taimede pinnal. Funktsi bakterid, arhed ja seened taimede pinnal. Funktsioon, fülogenees, kohastumused, hotspot
Salix rotundifolia . III. Resynthesized mycorrhizal complexes and their surface phosphate activities. Can. J. Bot. 59: 2458–2465.
and belowground responses to global change at community and ecosystem scales. Glob. Change Biol. 15: 914-929. Structural equation r
orrhizal fungi: Leaf fall and litter quality explain changes in fungal communities on the roots of co-occurring Mediterranean oaks. Soil Biol. Biochem. 42: 788-796.
ja varise lan tammeliigid omavad erinevalt varise kvaliteeti ja varise langemiseaega. Varise kvaliteet mõj F-horisondi kvaliteeti ja seeläbi EcM koo
re B. Appl. Environ. Microbiol. 58: 3110-3116. LiP tuvast
ɔyrosekv: Domin Sistotremastrum
dynamic null n bioloogiline mitmekesisus mööda laiuskra bioloogiline mitmekesisus mööda laiuskraade: troopika on tekkekese, aga nullmudel ei toea
edlings. New männid transpordivad juurtesse arv apoplasti kaudu ohku, samas kui kuusel on see minimaalne
n eleven Swedish coniferous forests in relation to site fertility and nitrogen fertilization. Scand. J. For. Res. 11: 1-6.
ı Alnus glutinosa seedlings inoculated with Frankia sp. & Pinus contorta seedlings connected by a common ectomycorrhizal mycelium. New Phytol. 124: 231-242.
mine: mõnevõrra erinev, koosluste sarn madal. Kloneerimisega rohkem kandseeni ja suurem mitmekesisus, vähem Sordariomycetes. K lehe-endofü lehe-endofüüdid: kultuur
s, Dothideomycetes; temp-mets SordM, DothM, boreaalne mets: DothM, SordM. Fülogeneet BD troopikas väiksem kui parasvöõtmes
V, Kauff F, Lutzoni F. 2009. A phylogenetic estimation of trophic transition networks for ascomycetous fungi: are lichens cradles of s samblikega seotud seened on f

hallenges, and frontiers. Fung. Biol. Rev. 21: 51-66.
ogy. In: Carson WP, Schnitzer SA (eds.) Tropical Forest community Ecology. Wiley-Blackwell, Oxford, 254-271.
iäne-Euroopas 1930-1990; ECM vs saprotroofid; K vs R-strateegid, peremeestaime järgi
ıroopas väheneb ECM seentel
l ajas ja ruumis: ülevaade

composition in the rhizosphere of Norway spruce seedlings colonized by Piloderma croceum. J. Plant Nutr. Soil Sci. 479-486.

peroxidase and laccase in degradation and selective ligninolysis of wheat straw. Int. Biodeterior. Biodegr. 50: 115–120. MnP erilii
:. Enzyme Microb. Technol. 28: 602–605. LiP detekt
d seltsist Helotiales
Pisonia grandis-Thelephorales EcM esmakirjeldus: Hartig net v vilets, transfer-rakud
Pisonia grandis-Thelephorales must tüüp ja pruun tüüp: EcM morfoloogia ja anatoomia kirjeldus: Hartig net v vilets, transfer-rakud. Kummagi tüübi esinemine eri saartel
ıycorrhizal fungi. Plant Soil 244: 177-187.
, Thelephora sp, Cenoc; Isol luited: samad dominandid, aga saba palju lühem; inokpot mets: Suillus spp, Rhizopogon spp, Wilcoxina, Trich ustale, Cenoc, Tom sublil; isol
413-433. varis: eucalyptus regnans (mull-huumus, pH 4.0-4.1) lagun 2xkiiremini kui Pomaderris aspera (pH5.3-6.1, sisald palju Ca, N, P, K, madal C/N). Eukalüpti al
Eucalyptus re; Eucalyptus regnans vs Pomaderris aspera: Euc: juurte teke, areng ja juurestiku omapära: areneb süvajuur, mis peatselt kõduneb. Juured ulatuvad väh 1.5 m s
ip siledatel (sh Clitocybe, Agaricus, Mesophellia, Cort radicatus). Mesophellia mood leiva-moodi EcM kus juuretipud läbisegi VK-dega
. Biogeogr. 14: 249-285. Sri Lanka ja India vihmametsa puud on üsna liigivaesed, ent kuuluvad eripärastesse suguko
forest structur Aasia dipterokarbid on jaotunud mullastiku, valg Aasia dipterokarbid on jaotunud mullastiku, valguse ja niiskuse gradiendil. Savanniliigid on mitmeid kordi
corrhization helper bacteria: a case of specificity for altering ectomycorrhiza architecture but not ectomycorrhiza formation. Mycorrhiza 216: 533-541.

ured Archaea. ISME J. 4: 182-190. Arhede kooslust globaalselt ei mõjuta miski peale soolsuse (3%); metaandmete vähesus inh
eflected in nitrogen uptake rates and ecosystem delta 15N. Ecology 92: 883-891.
lants and deco Süsinikku ladestavad N ühiku kohta EcM-domineeritud metsad 1,7x rohkem kui AM-domin metsad.
ıtinental patter C:N 18-20 on piir, kus edasi mikroobid hakkavad allokeerima N-ensüümidele. Seega enamikus kooslustes on mikroobid C-limiteeritu
ngle genet of an isolate of Terfezia boudieri (Ascomycotina), a desert truffle. Ant ITS1-4; Terfezia boudieri ühel eksemplaril 2 ITS tüüpi, mis erinevad pika deletsiooni poo
ald DNA põhjal ei saa kätte kooslust. PCR põhisüüdlane. Kloonimine+sekv annab >90 klooni pu EcM seenekoosluste uurimisel: Vkde segust erald
: spp; resistant prop: samad perek vähemate liikidega. Resistant+N väet Cortinarius väheneb ning Tomentella ja Wilcoxina suureneb.
f terminal restriction fragment length polymorphism (TRFLP) analysis of soil fung T-RFLP puudused EcM seente uurimisel: mitmetel seentel tuvastati samal isendil ITSs pu
Russula aff. A puisniidul väetades muutub kogu taimkate 3 RE, + ITS, LSU seq
ıbellus, Russ mariae; Ind N: Russ amoen, Cenoc, Russ mariae2; Chic kontr: Xeroc rubellus, Russ sp, Lact quietus; Chi N: Lact quietus, Pez, Cort, (
ɔwn Kame Terfezia claveryi. Mycologia 72:494-499.
2. BEAGLE: an application programming interface and high-performance computing library for statistical phylogenetics. Syst. Biol. 6 BEAGLE workbench: kiiremac
at specialize ir taimed EI stimuleeri mullaloomastikku, mis on spetsialiseerunud nend e kõdu lagundamisele
high-elevation kõdulagunemine: männi kõdu laguneb oma tüüpkasvukohas kiiremini kui võõrsil, ent kuuse ja haava oma mitte Home field advantag
pecies traits in puuliigid Hb, Mä ja Ku mõj mulla pH, N, C/N ja nematoodide kooslust
p E, all epidermoidne
ɔlous and silicolous populations of Helianthemum nummularium Helianthemum nummularium: Belgia -suur populatsioonisisene diversiteet vrd samalaadsete taim allosüümi
sis of tropical African trees. Mycorrhiza 22: 1-29.
4 seent. Esimene tumepr arv Tom
Afzelia africana -tsesalpiiniline-ECM süntees õnnestub vaid sama puuliigi alt korjatud seente isolaatidega: Scleroderma spp. , Amanita spp, Pisolithus
lengut: Rhizopogon1, Wilcoxina, Hebeloma, Pyronemataceae1; inokpot kuivtatu 3 RE, sekv vajadusel mitu piirkonda
ɔot developme lepa ECM seened eelistav looduslikke märgi metsi, eutrofiseerumise ja kuivendamise tulemusel ECM kolonisatsioon väheneb
hizal fungi on organic and inorganic nitrogen sources. Mycol. Res. 101: 523-529.
E3 või Cenoc; eemaldades Laccaria, Rhizopogon, Russula, Lactarius
estris L.) seedlings in different soils. Plant Soil 179: 287-292.
s muricata from resistant propagules after a stand-replacing wildfire. New Phytol 143: 409–418.
ts of needle litt vs okka-(mõnd stimuleerib, teist inhibeerib) ja kõrreekstrakt (inhibeerib):
ɔmycetes and soil microfungi under different ammonium regimes in vitro. Mycol. Res. 104: 691-697.
:M seened: Cort ja Lact võivad viljuda püstistel lepatüvedel. Lepa EcM seened kaovad kuivematel aladel, kuna tõrjutakse välja muude puude EcM
5-20 aasta vanuses prim männikus vs sekundaarses. Huumuse koorimine suurendas viljakehade arvu ja BD
:ockum and Zoon, The Hague, The Netherlands.
on of soil fungal mycelium during soil incubation be used to estimate ectomycorrhizal biomass in soil? Soil Biol. Biochem. 36: 2105–2109.
into ergosterol. Soil Biol. Biochem. 33: 2011-2018.
ıtion into ergosterol. Soil Biol. Biochem. 33: 2011-2018.
JA, Johnson I AM network hoiatab teisi seotud taimi lehetäide rünnaku eest, mille järel taimed eritavad keemilisi ühendeid, mis peletavad lehetäisid
ɔrotist diversity assessments: morphology compared with cloning and direct pyrosequencing of 18S rRNA genes and ITS regions using the conspicuous tintinnid ciliates as
Pyronemataceae, Scleroderma, Cort.
ıral dynamics in miombo (Brachystegia-Julbernardia) woodland Tansaanias miombod: kooslused sõltuvad mullatüübist ja tule-reziimist.
ergrazed hillslopes in semi-arid central Tanzania. J. Veg. Sci. ?: Tansaania keskosas metsatüübid: peaaegu kõikides Brachystegia
and Asia. J. V suur osa Aafrika savannidest ja enamus India-Aa suur osa Aafrika savannidest ja enamus India-Aasia ja PNG savanidest on inimtekkesed ja püsivad tänu põ
ɔog GS. 2008. Biodiversity of the genus Cladophialophora. Stud. Mycol. 61: 175-191. Cladophialophora põhiharu=H
d fungus in soil environments by quantitative competitive polymerase chain reacti CQ PCR seentele DNA ekstraktsioon ei soltu pinnasest; parim spooride ja k
d function alor looduslike rohumaade taastamine: aastati muutub üldkatvus ning eri taimerühmade osakaal: kõrreliste hulk, juurte biomass, mikroobide biomass kasvab, roh
, Lewis OT. 2014. Pathogens and insect herbivores drive rainfo Janzen-Connelli fenomen on tugevam taimedel, kelle seemnete tihedus on suurem; fungitsii
ıce control sur Shorea seemikute elumus puu lähedal ja kugel madal, 15 m opt. Teised puuliigid eelistavad Shorea juures kasvada kui nad on fülogen
ı suburban park, Dunedin, New Zealand. N. Z. J. Bot. 42: 939-947.
dre V, Tedersoo L. 2013. The distance-decay of similarity in communities of ectomycorrhizal fungi in different ecosystems and scales. J. Ecol. 101: 1335–1344

ızal fungi of exotic pine plantations in relation to native host trees in Iran: evidence of host range expansion by local symbionts to distantly related host taxa. Mycorrhiza 23
ɪral variability in communities of mycorrhizal fungi. New Phytol. 205: 1454–1463.
us tremula) tree individual may potentially harbour dozens of *Cenococcum geophilum* ITS genotypes and hundreds of species of ectomycorrhizal fungi. FEMS Microbiol
ɜrns of ectomycorrhizal fungal diversity and community structure along an altitudinal gradient in the Hyrcanian forests of northern Iran. New Phytol. 193: 465–473.
acina. Sügavusjaotus mitteoluline, ent Amphinema, Cenoc suht arvukamad ülakihis (F horis); Tomentella, Craterellus, Ramaria, Lactarius suht arvukamad alakihis (A hor)
tion methods on plant and arbuscular mycorrhizal fungal DNA. J. Microbiol. Meth. 82: 124-130. AM seente DNA säilib paremini külmutatud juurte

:, Holloway JD, eds. Biogeography and geological evolution of Kagu-Aasia, Austraalia, Papuaasia: mitmed taimerühmad nagu palmid, Elaeocarpaceae, Gramineae; idapoo
: 269-272.
he ecology of their native rhizobial populations in tropical soils. Appl. Soil Ecol. 22: 211-223.
ycete Pleurotus ostreatus. Folia Microbiol. 47: 385-390. lakaasi toc
FEMS Microbiol. Rev. 32: 501-521. tselluloo
ova I. 2013. Estimation of fungal biomass in forest litter and soil. Fung. Ecol. 6: 1-11.
v. 30: 215-242. lakaasid: r
evidence for their role as facultative soil saprotrophs? Oecologia 161: 657-660. arv. Et E
(ETS) of 18S-26S rDNA: Congruence of ETS and ITS trees of Calycadenia (Cc 18S-IGS praimer
)M, Morgan MJ, King AJ, Wilson JS, Hodda M, Hardy CM. 2013. Impacts of inundation and drought on eukaryote biodiversity in semi-arid floodplain soils. Mol. Ecol. 22
3. Biotite weathering and nutrient uptake by ectomycorrhizal fungus, Suillus tomentosus, in liquid-culture experiments. Geochim. Cosmochim. Acta 72: 2601-2618.
Tansaania: Ka Tansaania: Katavi NP dominCombretum jt mopane puud. Kasutataval maal basaalpind, puude arv ja BD suurem kui kaitsealal -arv et tegu on kahe koosluse
n along a protection gradient in a miombo ecosystem of western Tansaanias Katavi RP-s vähe sademeid ja sealsetes miombodes domin AM-taimed
sed on type studies. Mycologia 90: 118-124.
Plenchette C, Prin Y, Duponnois R, Thiao M, Sylla S, Dreyfus B, Ba AM. 2006. The ectomycorrhizal fungus Scleroderma bermudense alleviates salt stress in seagrape (C
and heterotrophy in New Zealand mistletoes. Oecologia 126:10-20.
re some microbes more ubiquitous than others? Predicting the habitat breadth of soil bacteria. Ecol. Lett. 17: 794-802.
ɔmpetitive PCR for quantitation of a Cytophaga-Flexibacter-Bacteroides phylum kvantit PCR MHB-le
ory metabolism. New Phytol. 181: 243-245.
:ies of temperate upland grasslands. Funct. Ecol. 13: 650-660. PLFA
to linking abo mullaökoloogia ajaline aspekt: päevasisesed muutused johtuvad taimede C liikuimisest, sesoonsed sõltuvad taimede suremisest ja toitainete ringest, aastatep
ɔbial communities along a fertility gradient of temperate grasslands. Soil Biol. Bic PLFA
. Parasitic plai Rhinanthus minor hemiparasiit suurendab taimede maapealset liigirikkust (supresseerides absol dominante), vähendab prod; vähendab mullas seente suht osa
nt of decomposer microbial communities following deglaciation. Soil Biol. Bioch PLFA: mikroobide biomass suurem prim sukts aladel lepa, Equisetumi ja Rhacomitriumi r
cing DNA extracted from single conidia of aquatic hyphomycetes. Fung. Ecol. 3: DNA eraldus ühest koniidist Whatmani paberi vs muude metoodikatega. Saa
viron. Sci. Technol. 28: 78A-87A. peroksida
391-399. liigitekke kiiruse määramine, harude vanuse määramine; näitab et pleistotseenis on liigitekke kiirus peale jääaega jäänu täpseks rekonstr kõikide liikide olem
lant-enemy int peremehe-spetsiifika taimede ja nende parasiitide, patogeenide, herbivooride vahel: generalistliigid või peremehe-spetsiifika taimede ja
a NW-Am vs Maailma ja sh Patagoonia eksoot istandikes: 15 Patagoonias ja 65 Maailmas
ɔma, Amphinema, Wilc, Tom, Pez ostracod, Tuber, Lacc, Rhiz
ia männi istandikes: Eur liigid Hebeloma mesoph, Rhizop roseolus, ka Thel terrestris, Amphinema byssoides, Suillus, Laccaria, Inocybe, Amanita, Scleroderma, Tuber. Ne
ɔtüüpi, kokku 18 tüüpi
ı. J. Bot. 65: 774-778.

ngi in fourwing saltbush, Atriplex canescens. J. Arid Environ. 51:449-459.
mid aastaajati erinevad, koloniseerib ka juhteelemente ilma patoloogiliste sümptomiteta, DSE mood v palju lipiiditilku. Pakutakse mutualistlikku kooselu
ıosphate following absorption by the ascocarps of Tuber melanosporum and T. Aestivum. Mycol. Res. 99: 167-172.
scular plants: towards a world map of phytodiversity. Erdkunde globaalne taimede liigirikkus 10000 km2 kohta: suurim Borneo, PNG, BRA Atl vihmamets
ips among New Caledonian Sapotaceae (Ericales): molecular ev Uus-Kaledoonia Sapotaceae on sinna levinud mitmeid kordi AUSst ja Uus-Kaledoonia Sapotaceae on sinn
ifferences in arbuscular mycorrhizal fungal communities associated with sugar maple seedlings in and outside of invaded garlic mustard forest patches. Biol. Invas. In press
ıeration of multimillion-sequence 16S rRNA gene libraries from complex microbial communities as assembling paied-end Illumina reads. Appl. Environ. Microbiol. 77: 384
-animal mutual network-anal, seemnetelevitajad ja tolmeldajad olif rohkem nested kui toi duahelad. Mida rohkem on koosluses i network-anal, seemn
cilitate biodiversity maintenance. Science 312: 431-433. network analüüs: tug
f biodiversity. Annu. Rev. Ecol. Evol. Syst. 38: 567-593. network analüüs öko
network analüüsi rakendamine ökoloogias; viitab koevolutsioonile; muutuste ennustamine; rakendamine pop-geneetikas
'ogler AP. 2013. Whole-community DNA barcoding reveals a spatiotemporal continuum of biodiversity at species and genetic levels. Nature Commun. 4:1892.
2012. Arthroj Lülijalgsete BD korreleerub taimede Bdga Panamas - nii herbiv kui muud. Troopikas vaid 2-8 korda rohkem artropoodide liike kui ter
ɜade vahel olulised erinevused
n vs 10-20 cm sügavus. Põletamine mõjutas seenekooslusi vaid 10 cm ülakihis, 10-20 cm mitte;
suguk: Russ(17), Thel(12); Lacc(3); Inoc(3+?); Cort(3). Kontroll: Pisol1; Inoc1; Russ3; Unkn; 2y põletamine: Lact1; Thel1; Thel2; Thel3; Thel4; Thel5; 4y põletamine: In
). The architect network-anal: kooslused on tavaliselt niimoodi organiseerunud, et konkurents oleks vähim
tsest DNAst kuulub arhedele, suurem kui C:N madal; r Archaea üle Ameerikate: keskm 2% prokarüootsest DNAst kuulub arhedele, suurem kui C:N
rer N. 2013. Global biogeography of highly diverse protistan co protistide rühmiade levikut määrab eelkõige kliima niiskus kontinentaalses skaalas.
er and sitka alc lepaseemikud peale üleujutamist vähendavad nitrogenaasi aktiivsust ja juurte kasvu ning õhulõhede avatust. Tekivad adventiivsed ja ujutuse-juured. Nooduli
'S, Novak M, Buzek F, Harkness D, Persson T, Schulze E-D. 2000. In: Schulze E-D (ed). Carbon and Nitrogen Cycling in European Forest Ecosystems. Springer-Verlag, I

2001. Portable system for microbial sample preparation and oligonucleotide microarray analysis. Appl. Environ. Microbiol. (väga kiire DNA eraldamine, märgistamine, ka
konkurents ECM seene osakaalu muutus juurel kui on ka teisi seeni
: BD parandab taimede kasvu, kuigi on palju vastuväiteid. Funktsionaalse diversiteedi tuvastamise olulisus
ycorrhizal dive EcM seente suurem diversiteet suurendab org P, aga mitte anorg P kättesaadavust ega mitte N kättesaadavust
em)
WS, Chase MW. 1999. Support for an expanded family concept of Malvaceae w atpB, rbcL Malvales: sugukonnad sees täiesti se

ɟi from roots and leaves of Lepanthes (Orchidaceae). New Phytol. 135: 143-149.
ımycete "fungi". Protoplasma in press. Oomycota: basaalsed rühmad m
iated with Populus-Salix stands in a semiarid riparian ecosystem. New Phytol. 170: 369-380.
11. Impacts of climate change on the world's most exceptional ecoregions. Proc. Natl. Acad. Sci. USA 108: 2306–2311.

ɔhaliformis, Russula sp, Tom2
ɔhaliformis. Lact ja Russ eelistasid madalamat pHd ja kõrgemat N konts; Tom spp pos või neg seotud pHga

fungi isolated from stem tissue of upland cotton (Gossypium hirsutum). Aust. J. Bot. 53: 571-578.
africanum rooted cuttings using a range of mycorrhizal fungi. Int. J. Biol. Chem. Sci. 3: 578–586
s kattus Malaisia dipterokarpidelt saadud liigiga
africanum plantlets from Cameroon. Plant Soil 353: 379-393.
Diversity with a View to Ameliorating Domestication Efforts. PhD Thesis, University of Aberdeen, UK.
na sinnamariense: A tropical mycorrhiza fungus isolated from *Gnetum africanum* ectomycorrhiza root tips. J. Yeast Fung. Res. 2: 132-142.
inoculated with ectomycorrhizal fungi and planted on a clear-cutting and strip mine. Can. J. Bot. 62: 1571-1574.
fertilization on growth and formation of ectomycorrhizae of Quercus alba and Q. rubra seedlings by Pisolithus tinctorius and Scleroderma auranteum. Can. J. Bot. 63: 167
ıslus
508-511
que du Congo.Bulletin de la Societe Royale de Botanique. 78-107.
l von Ektomykorrhizen. PhD Thesis. Ludwig-Maximilians Universität München, Munich. 414 pp.
ives of fungal DNA barcoding and rapid identification procedures. Appl. Microbiol. Biotechnol. 87: 99-108. seente barcoding: CO1 ei sobi, ITS kõige laiemalt
Pisolithus tinctorius hyphae during ectomycorrhizal infection whileexcreted fungal hypaphorine controls root hair development. New Phytol. 136: 525-532.
Amann R. 2003. In situ accessibility of small-subunit rRNA of members of the domains Bacteria, Archaea, and FISH: oligo FISH: oligonu probed cu3-ga 2 bakteril, 1 arh
ulosuse genetit.
ster species of Rhizopogon fungi on mesic and xeric sites in an interior Douglas-fir forest. Mol. Ecol. 21: 6163-6174.
ber melanosporum istutatud (BD madalaim seal); liigirikkus neg korrel Tuber melanosp+aestivumi ohtrusega juurtel; spets praimeritega leiti ka T
revisited. Am. J. Bot. 97: 1296-1303. õistaimede rühmade fülogeneet
005. Larger islands house more bacterial taxa. Science 308: 18 liigirikkus bakteritel veeaugu suurusest sõltub
Arv on segunenud nii vana kui ka uute seente DNA 5.8S_Fungi praimer ITS1 amplifitseerimiseks. CAAGAGATCCGTTGTTGA
rested present põldude metsastamisel jäävad metsataimestikust puudu paljud klonaalselt levivad taimed
AUS Liivakivi pinnase EcM taimed (lõtv kriteerium McGee jr): Platysace (Apiaceae), Amperea (Euphorbiaceae), Dillwyinia, Pultanaea (Fabaceae), Dampiera (Goodeniac
equenti nelle piante tartufigene. Nota 1- Inquinanti in vivaio. Micol. Ital. 1995: 167–178.
of ectomycorrhizal plants. VI. Activities of nutrient mobilizing enzymes in birch litter colonized by Paxillus involutus. New Phytol. 130: 411-417. proteaasid
tivities of ericoid and ectomycorrhizal fungi. Soil Biol. Biochem. 28: 1595-1602. tanniinid
ex by ericoid and ectomycorrhizal fungi. Soil Biol. Biochem. 28: 1603-1612. proteiin-p
rhizal and ericoid mycorrhizal fungi. Mycol. Res. 101: 1348-1354. ligninaasi
er bacteria? New Phytol. 173: 707-710.
in multiple testing with independent statistics. - J. Educ. Behav. Statist. 25: 60-83 Benjamini-Hochberg
rees. J. Biogeogr. 18: 103-115. Euroopas jääaegade refuugiumid: eriti tähtsad ilmselt Apenniinid ja-W-Balkani mäed; väid
Triplett EW (ed) Prokaryotic Nitrogen Fixation: A Model System for Analysis of Biological Process, pp. 207–224. Horizon Scientific Press: Wymondham, UK.
and biogeography. In: Gillings M, Holmes A (eds.) Plant Microl Frankia ja peremeestaimede fülogenees ja biogeograafia. Lahatakse kõiki taimerühmi eraldi. Palju avaldam
ıgi shared by various boreal forest seedlings naturally regenerating after a fire in Interior Alaska and correlation of different fungi with host growth responses. Appl. Enviro
omycorrhizal root tips. J. Microbiol. Meth. 80: 206-208. PCR ilma DNA eraldamata: 100-kordne lahjendus
puude kalibreerimine ja mol kell. Ar
52-58 vendist tänaseni massväljasuremised ja radiatsioonid nii maal kui meres

hing order among Ascomycota: how many nucleotides are enough? Mol. Phyl. Evol. 17: 337-344. vajalik hüp vajalik hüpot.
Can. J. Bot. 71: 1114-1127. seente evol: Chytr: 550Ma, Basidio
time. The Mycota 7B: 229-245. rRNA vs muud geenid: problemaatika fülogeneesis, rRNA vs muud geenid: problemaatik
ve? Fung. Biol. Rev. 24: 1-16.
ete morphology based on 18s rRNA gene sequence data. Mol. Biol. Evol. 13: 462-470. Lokuloaskomütseedid: pole monofyl
and phylogeny of ericoid mycorrhizal fungi. Plant Soil 244: 55-66. ITS ErM seentel, sekv ErM seened: palju erirühmi, märgata
nitte; välja istutatud
ıum, Pinus sylvestris, Allium cepa and *Allium porrum*. Can. J. Bot. 61: 899-905.
Am Prantsuse Guajaanas EcM taimed Coccoloba 3 spp., Neea tristis
iteet, mis antagonistlikud Verticilliumile, maasika vs rapsi risosfääris vs bulk soil Box-PCR + SSU sekv
ation structure across three isolated subpopulations of Russula brevipes in an oak SCAR: Russula brevipes
cowanites sp, Pilod sp, Byssocort sp, ; taksonitest Thel-Tom (ca 14), Russ-Lact (12), Boletacae (6), Tricholoma, Inocybe (mõl 5); endof: Lachnum sp, Phialophora sp., unl
uusikus vs männikus: Russula brevipes-sama-suurus 3-18m RAPD: 3 mikrosat
iodiversity of ericoid mycorrhizal fungi in the absence of the host plant in a Mediterranean ecosystem. Mycorrhiza 13: 69–75.
fungi are common root associates of a Mediterranean ectomycorrhizal plant (*Qu* sekv 2 erikoidMR
matsutake): distribution, abundance and ecology. Scand. J. For. matsutake levikuökoloogia Rootsis
ed taimed, toril haruldased taimed, torikulised ja resupinaatsed: mida suurem ala, seda liigirikkam. Saarte biogeograafia
h C, Newton WE (eds.). Associative and Endophytic Nitrogen-Fixing Bacteria and Cyanobacterial Associations. Springer, Berlin, 257-301.
Geijer J, Herrmann J, Foster GN, Ribera I, Nilsson AN, Barraclough TG, Vogler AP. 2012. The effect of geog barcoding gap: veemardikate liigisisene COI var s
ns the coevolu mutualismi stabiilsuse ja suurima kasu tagab aeglane evolutsioneerumine
MA, USA: EcM puud Alnus, Betula, Fagus, Quercus, Pinus, Tsuga; Prunus, Comptonia peregrina, NM
dikumullal suurem ECM BD. ANCOVA
ergosterol as an indicator of fungal biomass. Mycol. Res. 99: 479-484. ergosterooli mõõtmine j abiom ergosterooli mõõtmine j abiomassi kalkuleerimine pole vee

septad. Ultrastruktuuri põhjal saab kand-ja kottseeni eristada vaid dolipoori vs Woronini kehakese abil, teised mujal mainitud meetodid ei tööta -sõltuvad vanusest, prepara

394: 734. RAPD: Tuber melanosporum -regiooniti väga väike erinevus, erv tegu pudelikaelaga viim
ond M. 2001. Population genetics and dynamics of the black truffle in a man-mac mikrosat (viletsad tulemused) + RAPD: Tuber melanosporum: ühe puu ümber keskm 2 ge
enerate oligonucleotide probes targeting a variable region in bacterial 16S rRNA by PCR with detachable primer 2 PCR tsükl 2 PCR tsükliga, beadsidega sidumine ja järgn
. A new pair of primers designed for amplification of the ITS region in Tuber spe ITS4 analoogid trühvlitele: ITS6 ja ITS7 -mõnikummend bp eemal. Paremad tulemused
epigeous fungi tavaoravate toidus Alpides asinevad pms maasiseste viljakehadega seened: Rhizopogon, Gautieria, Balsamia, Hysterangium; lehikseentest vaid Boletus ja La
Calif kõrbes: EcM taimi pole
ck WD, Tibbe mikroobsed interaktsioonid stabiliseerivad taimekooslusi, ent mõj invasiooni ja troop monodominantsust; ei usu et CMNid jagavad ür
allocation to beneficial symbiont with spatial structure maintains mycorrhizal mutualism. Ecol. Lett. 12: 13-21.

corrhizal fungi reduces plant benefit. Proc. R. Soc. Lond. B. 269: 2595-2601.
eptual framew koikide mullaorganismide koosmoju taimedele. Negatiivne tagasiside domineerib positiivse yle, mis pohjustab muutusi mustrilisuses
R, Harvey JA taimeliigi mõju mullaloomade ja AM-seente kooslustele on enamikus rühmades oluline: PLFA>Nematod>Enchytr>Acari>Macrofauna
poti sümbiondid peale morfotüüpide eristamist
Tulasnella spp Tulasnella spp Cryptothallus mirabilisel, taassüntees mikrokosmos Tulasnella, spets praimerid Tulasnella, spets praimerid
ITS: Tricholoma, Rhizopogon, Gautheria; rbc: mono ITS: Tricho geneetiline
ners in the dark: isotopic and molecular evidence of ectomycorrhizal liaisons between forest orchids and trees. Proc. R. Soc. Lond. B 271: 1799-1806.
s in liverwort-fungal symbioses. Proc. R. Soc. Lond. B 277: 485-492.
carbon sink strenght of ectomycorrhizal fungi? New Phytol. 151: 543-550. JMP, anova
d uneven ectomycorrhizal diversity near *Sarcodes sanguinea* (Ericaceae): a cheater that stimulates its victims? Am. J. Bot. 87: 1783-1788.
2 RE, sekv mtLSU
rühmades mfg AM-seened, ent osades (Treubia, Haplomitrium) Endogonales - mood sarn struktuure AM-seentega (Paris tüüp). Arv. Et kõige esmas
ation and development. Mol. Ecol. 17: 3707-3716.
klaadile. AM diversiteet-epiparasiidid spetsialiseerunud kindlale klaadile.
Mükoheterotr Mükoheterotroofide evol ökol: fülogenees, toitumine jms

ification, and quantification in the environment. In: Dighton J, White JF, Oudema PCR-põhiste ja sekveneerimise PCR-põhiste ja sekveneerimise meetodite artefaktid: hetero
167: 335-352. Pyrolaceae on basaalne teistele arbu
Mycorrhizae. USDA Forest Service: Washington USA. pp. 69-80.
vs töögi-tamme segamets (BD suurem, mass, tihedus väiksem)
mikroseente diversiteed
s from boletoid ancestors. Mycologia 94: 85-98. Boletinellaceae (B. Ja Phlebopu
ylogenetic distribution of resupinate forms across the major clades of mushroom-forming fungi (Homobasidiomycetes). Syst. Biodiv. 3 kandseened ja resupinaatsed vormid
omycetes (mushroom-forming fungi) inferred from four rDNA regions. Mol.Phyl xxx mt vs nuc; SSU vs LSU mol; homobasidiomyc
f Boletales. Mycologia 98: 971-983. Boletales EcM harud tek mitu korda
R, Price SA, Vos RA., Gittleman JL, Purvis A. 2007. The delayed rise of present-day mammals. Nature 446: 507-512. imetajate peamine radiatsioon t
dures, problems, and prospects. Annu. Rev. Ecol. Syst. 33: 265–289 superpuude konstrueerimine, proble
iku all. Sugaval kivimis sambliku-seene hüüfid, Hymenoscyphus ericae aggr., ha 1F-4
J, Schumacher T, Kauserud H. 2010. High diversity of root associated fungi in both alpine and arctic *Dryas octopetala*. BMC Plant Biol. 10: 244.
e. Svensk Bot. Tidskr. 38: 1-13.
chte. Symb. Bot. Ups. 6. 2.
iation in forest trees. Svensk Bot. Tidskr. 43: 223-262.
poole juureseente BD väheneb ja see seletab ka koosluse struktuuri
idase and xylanase by immunocytochemical labeling in wood decayed by basidiomycetes. Appl. Env. Microbiol. 55: 1457-1465. MnP (väh
ls to degradation by white rot basidiomycetes. Can. J. Bot. 66: 1841-1847. ligninaasi
5: 552-556.
ot. 73: S999-S1010.
e indigenous people of North America. In: ???

olemasoleva olemasolevate taimede AM-mükotroofsus määrab ära, millised taimed võivad järgmisena koloniseerida. EcM seente olemasolu võib ta
ycorrhizae of Picea abies in the black forest. Agric. Ecosyst. Environ. 28: 27-30.
y Paxillus involutus and mycorrhizal birch seedlings. FEMS Microbiol. Ecol. 33: 61-67.
B, Chalot M. 2000. Differential responses of ectomycorrhizal fungi to heavy metals in vitro. Mycol. Res. 104: 1366-1371.
Can. J. Biochem. Phys. 37: 911-917.
ty on belowground communities. Ecosphere 1: 1-11.
ative data: behavioral traits are more labile. Evolution 57: 717-745. Blombergi K. K vää
ey TJ, Likens GE. 2002. Mycorrhizal weathering of apatite as an important calcium source in base-poor forest ecosystems. Nature 417: 429-431.
ology: a critiqu Network-anal: ülevaade nisipõhine ja mõjupõhine lähenemine; artefaktid ja juurdunud tõed vs. Proovivõtu kallutatus; soovitused anal
odiv. Conserv. 7: 617-630. nematoodid mullas: liigirikkus kõige kõrgem soojas temperaatses vöötmes ja troopikas
e, Tanzania. III. Effects on the vegetation of local cultivation practices. J. Ecol. XXX
uutuste mõju ülevaade viljakehade tekkele ja arengule: ülevaade
omycetes. FEMS Microbiol. Ecol. 31: 185-194.
idase-encoding genes are present in a phylogenetically wide range of ectomycorrhizal fungi. ISME J. 3: 1387-1395. Peroksid
ic relationships of cyphelloid homobasidiomycetes. Mol. Phyl. Evol. 33: 501–515. torukuj ja pulgakuj cyphelloidsed ka
. 2003. Development and validation of a diagnostic microbial microarray for methanotrophs. Environ. Microbiol metanotroof metanotroofid: 50 bp RNA fragmendid; väga
rns in old-growth forests of southern Chile as integrator for N-cycling. Isot. Environ. Health Stud. 41: 249-259.
W, Schoch CL. 2009. A molecular phylogenetic reappraisal of the Hysteriaceae, Mytilinidiacae and Gloniaceae (Pleosporomycetidae, Dothideomycetes: Pleosporomy
reness of soils long a successional chronosequence. Mycorrhiza 6: 79-90.

eise EcM seenekooslusi: lepp assots mõne kase seenega ja vastupidi, eriti siis kui on prioriteedi efekt. Hüpot, et spetsiifilisus avaldub eoste idanemi
nadal BD, ent Salixil suurem. Domin taksonid sh lepa-liigid olid jagatud mõlema peremehe vahel samades kasvukohtades, ent esines tugev pereme
ctomycorrhizal community and drought affect root hydraulic properties and soil adherence to roots of Pinus pinaster seedlings. Plant Soil 267: 213–223.
etrilised, mitteparameetrilised ja fülogeneetilised lahendused; VIITED mikroobide diversiteedi
Pezizales sp, Thelephora americana
es az ezekkel valo tarsulasuknak mesterseges letrehosaza teren. Erdaszettudomnyi Koezlemynek 1: 93-118.
pecific primers enables quantitative, ultra-high-throughput profiling of fungal communities. Appl. Environ. Micro praimer BITS vahetult enne ITS1 algust
Caporaseo JG. 2013. Quality-filtering vastly improves diversity estimates from Illumina amplicon sequencing. N Illumina järjestustele tavaline kvaliteedikontroll ; p
onifers. In: Tra muld lepa all palju happelisem kui okasmetsas (F hor 3.5 vs 4.3)
of Archaea in defined compartments of pine mycorrhizospheres developed in boreal forest humus microcosms. FEMS Microbiol. Ecol. 43: 163-171.
sotopic, culture-based, and oligonucleotide microchip analyses of thermophilic microbial communities in a continental high-t termofiilsetele bakteritele ja arhedele Siberi n
in a world without fire. New Phytol. 165: 525-538. savannide ökosüsteeme maakeral, er Lõuna-poolkeral palju rohkem kui seletaks vaid kliima. Põlengutel olu
orical biogeography and diversification of truffles in the Tuberaceae and their newly identified Southern Hemisphere sister lineage. PLoS ONE 8: e52765.
), T lyonii ohtrus ei sõltu sellest, kas neid on leitud ja kogutud viljakehadena. Liikide arvult tom-thel; palju Pezizaleseid
of Tuber ITS rDNA sequences: species diversity, host associations and long-distance dispersal. Mol. Ecol. 19: 4 ITS barcode Tuber ITS barcode Tuber: 96%, hiaatu
yron liigid, ka Hymenogaster-Hebeloma. Pezizaleste rohkust seostavad paljandunud mullaga, madala EcM juurte tihedusega, neutraalnse-aluselise r
s in the rhizosphere: interactions between Norway Spruce seedlings Picea abies Karst.), mycorrhiza (Paxillus involutus (Batsch) Fr.) and naked amoebae (protozoa). Appl.
. Diversity of mycorrhizal fungi in terrestrial orchids: compatibility webs, brief encounters, lasting relationships and alien invasions. Mycol. Res. 111: 51-61.
n in a tempera EcM noored taimed kasvavad paremini ja on suurema elumusega, ent eelistatumad herbivooride poolt paikades, kus pole juurkonkurentsi suurte puudega. El
cological variation. Ecology 73: 1045-1055. PCNM vektoritega F
of principal coordinates of neighbour matrices. Ecol. Modell. 153: 51-68. PCNM ruummiliste
seedlings grown in soils collected at different distances from pioneering hardwoods in southwest Oregon clear-cuts. Can. J. For. Res. 20: 712-721.
s and temporal taimede BD mõj taimede biomassi, mis stimul lülijalgsete biomassi ning diversiteeti, mis omakorda soodust stabiilsust. Taimede BD s
explain the 13C-enriched sporocraps of ectomycorrhizal and saprotrophic fungi? New Phytol. 177:1012-1019.
thelephora, cort <0.5 m sees pole ka ruumilist autokorrelatsiooni
sclerophyll forests urgently needed. Biodiv. Conserv. 4: 415-42 Uus-Kaled sklerofüllimetsad on hävimas
ure of two open-pollinated families of Picea abies. Effects of nitrogen source and ectomycorrhizal symbiosis. J. Plant Physiol. 160: 1211-1218.
Rozites species mycorrhizal with Nothofagus and Myrtaceae. Rozites: uued liigid, pms seotud Nothofagusega. Arv Rozites on hiljer Rozites: uued liigid, pms seotud Not
karri (*Eucalyptus diversicolor*) seedlings inoculated with ectomycorrhizal fungi in relation to phosphorus supply. New Phytol. 114: 77-85.
NZL hüpogeilised seened: AUS v liigi-ja perek-rikas, NZL vaesem. Maapealsed sugulased. Sh AUS-sse introduts perek; Pezizales v vä AUS ja NZL hüpogeilised seened: A
Descolea oli arv. algselt seotud Nothofagusega, ent tertsiaaris kliima r Descolea maculata sp nov, mood Ec
mycorrhizas and growth of karri (*Eucalyptus diversicolor*) seedlings inoculated with *Descolea maculata, Pisolithus tinctorius* and *Laccaria laccata* . New Phytol. 114: 87
m Australia. Mycotaxon 42: 255-262. Leccinumi üksik liik AUS QLD euk
M seente BD on u 6500 liiki, arvestades 660 liigi olemasolu ja 10% liikide kirjeldamist
oot-associated fungi from Epacris pulchella (Ericaceae) as determined by culturing and direct DNA extraction from roots. Environ. Microbiol. 7: 819-827.
on lochiae (Ericaceae) in an Australian tropical cloud forest revealed by culturing and culture-independent molecular methods. Environ. Microbiol. 7: 1743-1754.
d other root-associated fungi from Epacris pulchella (Ericaceae). Mycol. Res. 110: 328-334.

equence analysis of endophytes from *Acianthus, Caladenia* and *Pterostylis* (Orchidaceae) in southeastern Queensland. Mycol. Res. 109: 452-460.
underground orchid, Rhizanthella gardneri. New Phytol. 186: 947–956.
ot-associated fungi from Epacris pulchella (Ericaceae) as determined by culturing and direct DNA extraction from roots. Environ. Microbiol. 7: 819-827.
in Hymenosc ericae aggr., muud Helotialesed, Xylariaceae jpt kottseened, vaid paar identifitseerimata kandseent. Kult vs juurest sekv annab eri tulemused, ent mitte siiski
oditega: liikide erinevatel tuvastatavusel ja vaatleja võimekusel oluline roll liigirikkuse hindamisel liigirikkuse modelleerim
Abies, Picea, Fagus, Mycelis muralis ja Sambucus racemosa mood EcM Cenococcumiga; Ei illustr
Fagetum carpaticum de Babia Gora et Celui D'Autres Fageta Precedemment Etudies. Zezsyty Naukowe Wyzszej Szkoly Rolniczej w Szczecinie 3.1.
Cedrus seedri 3 liigil Prantsusmaal EcM: mitmed tüübid. Kahtlustab Geopora sumneriana seost
luorescent proteins for visualizing fungal pathogens. Fun. Gen. Biol. 37: 211 –220.
bacterial communities across land-use types and their relationsh bakterid õhus: kooslused määrab ära allolev ökosüsteem, mitte hetke klimaatilised tingimus
em pools and CO2 fluxes. New Phytol. 178: 24-40.
drought toler kasv veestressi korral ja kasu taimele
level of Rhizoctonia solani AG4 isolates by direct sequence of asymmetric PCR products of the ITS regions. C topeltpiikide interpret Rhizoctonia solani AG4 jaotub 3ks l
3noort vs 3 vana metsa
Cenoc, Suillus brevipes. Erilist raie mõju polnud
composition fauna 3 suurusgrupi eemaldamine. Väikseimate loomakeste eemaldamine suurendas oluliselt rohundite ja liblikoieliste osakaalu vorreldes korrelistega; sama
mmunities to vascular plant abundance along a climate gradient. New Phytol. 205: 1175-1182.
LSU kaas LSU kaasamine ITS-
anti katse eri päritolu muldadega LSU kaas LSU kaasamine ITS-
uber: mosaiikne mantel ja tsüstiidid; Fagirhiza granulosa -Tomentella

by plant-soil f taimeliikide poolt genereeritud mulla heterogeensus suureneb teatud taimeliikide vitaalsust
JD, Jacob A. 2003. PNA microarrays for hybridisation of unlabelled DNA samples. Nucl. Ac. Res. 31: e119. valk-DNA arrayd; sekundaar-mass-spektrome
ke up nutrients by Betula spp. and Picea abies in mixed stands. For. Ecol. Manage. 198: 193–208.

Claridge MF, Dawah HA, Wilson MR (eds.). ??? Chapman & Hall. ??? seente liigikontseptsioonid: peab sob
kuta, seene elab korteksirakkude sees, ei parasiteeri, moodustab nn seedimistsoone nagu orhideedel. Viitavad samasuguse assotsiatsiooni peale kuldkanni vahel; sünteesiti l
hizal fungi for degradation of polycyclic aromatic hydrocarbons. Appl. Microbiol. Biotechnol. 53: 127-132.
icroarray experiment (MIAME): toward standards for microarray data. Nature Genet. 29: 365-371. geeniekspre geeniekspressiooni arrayde standardite pakku
kõdu: Inocybe. Kõdu lisamine vähendab BD, ühtlust (tänu Cenoc-le, mis ei taha varist) Shannoni, Berger-Parke

on in tropical ectomycorrhizal fungi. Res. Microbiol. 156: 184-190.
liigist, valgustatuse tasemest ja P lisamisest
yobalanops lanceolata (Dipterocarpaceae) seedlings grown in ultramafic and non-ultramafic soils. Soil Biol. Biochem. 38: 3407-3410.
ps and the efficacy of ectomycorrhizal inoculation schemes. QQQ
arps and the Efficacy of Ectomycorrhizal Inoculation Schemes . In: Rai M, Varma A, eds. Diversity and Biotechnology of Ectomycorrhizae. PP. 3-17. Springer: Berlin, Ger
:a, in press.
M, Barkhordarian E. 2002. Phylogenetics of asterids based on 3 coding and 3 no chl 3 kodeerivat, 3 mittekodeerivat regiooni chl 3 kodeerivat, 3 mittekodeerivat r
cture of Phialocephala fortinii s. lat. In European tree nurseries, and assessment of the potential of the seedlings as dissemination vehicles. Mycol. Res. 112: 650-662.
hylogenetic relationships within Paxillus s. l. (Basidiomycetes, Boletales): separation of a southern hemisphere g ploidsusastme mõõtm Paxillus, Tapinella (P. atrotomentosu
. 2010. Diversity of fungi associated with *Bistorta vivipara* (L.) Delarbre root systems along a local chronosequence on Svalbard. Agarica 29: 15-26.
54.
e pole. Muuhulgas Serendipita, Helotiales mfg, Cladophialophora, ChytridioM
ogeo, endeeme vähe
81-388. India bio-ja paleogeograafia: Eraldub Aafrikast 160 MAT, Antarktikast 130 MAT, Madagaskarist 88 MAT
. vastuväited maa paisumise hüpoteesidele
of a herbarium. New Phytol. 181: 719–724 70% ITS sarnasus, et defineerida perekonda; vana
ate upland grassland soil. FEMS Microbiol. Ecol. 45: 105-114. T-RFLP on parem kui DGGE keskkonnaproovide võrdlemisel; popgene; polyvinylpyrroli
tes regulate soil fungal community composition and diversity. Appl. Environ. Microbiol. 74: 738-744.
mutualismi ekspluateerimine: eritüübid (konditsionaalne, spets); sanktsioneerimisvõimalus tagab stabiilsuse. Päris ekspluateerijad ei arene mutualistidest, va
of Melaleuca, Callistemon and related genera (Myrtaceae). Aus Melaleuca levinud AUS-st ja Uus-Kaledooniast SE-Aasiani. Teiste läl Melaleuca levinud AUS-st ja Uus-K
ened poolkõrb vs stepp: ilmastiku fluktuatsioonid, mändide vastuvõtlikkus röövliblikatele: mõju sipelgatele, närilistele, ECM seente kolonisatsioonile, resistentsus
the North Crac juurte ulatus aine ülesvõtu järgi puudel 9.6-16.4 (tammel) m
pikkusega 130 b; 333K sekventse jäi järgi pärast kvaliteedikontrolle. Ion Torrent: seened ITS1: 3M sekventsi keskmpikkusega 130 b; 333K sekver
spruce by Laccaria species and Thelephora terrestris and seedling survival and growth after outplanting. Can. J. For. Res. 23: 330-333. Thelephor
g BY, DurkaW, Erfmeier A,Gutknecht J, GuoD, Guo LD, HärdtleW, He JS, Klein A, Kühn P, Liang Y, Liu X, Michalski S, Niklaus P, Pei K, Scherer-Lorenzen M, Scholten
the ectomycorrhizal association between Paxillus involutus and Betula pendula. I. Dynamics of mycorrhiza formation. New Phytol. 129: 487-493.
Austraalia SW osa taimede mükotroofsus: Allocasuarina (Cas), Gompholobium, Mirbelia, Oxylobium (Papil, ;Mirb), Eucalyptus, Agonis, Melaleuca, Pericalymma (Myrt),
. I. Seasonal study of inoculum levels. New Phytol. 127: 539-546.
. II. Spatial variability of inoculum levels. New Phytol. 131: 461-469.
ECM harv prahipaikadel, sagedam normaalsel alal AUS troopikas
corrhizas in forestry and agriculture. ACIAR Monographs 21: 1-374.
etinellus merulioides) and an aphid parasitic on ash tree roots. Symbiosis 3: 315-320.
varakevadisec varakevadised taimed ilma Amta

tol. 154: 275-304. mükoriisa evolutsioon
Rev. 79: 473-495.
Mükoriisa definitsioonid. Paljud EcM raportid on tegelikult 'beaded VAM'
86% taimeliikidest mükoriissed, sh 74% AM, 9% OrM, 2% (6000 liiki) EcM, 1% ErMülevaade taimesugukondade ja elutüüpide kaupa: NM pms
ery inoculation of *Eucalyptus* seedlings in western Australia and Southern China using spores and mycelial inoculum of diverse ectomycorrahizal fungi from different clima
elationships of the Caesalpinioideae (Leguminosae) as inferred f Caesalpinioideae: EcM rühmad 4 harus: I. Afzelia+Intsia; II Macrolot Caesalpinioideae: EcM rühmad 4 ha
der seedlings. Eur. J. For. Path. 20: 430-435.
e roots of trees from the Alps: reliable and fast DNA extraction and PCR-RFLP a taime juured; erinevate DNA ekstraheerimismeetodite võrdlus, trnL intron
gilises lepikus: palju saprotroofe, vähe ECM, üsna erinevad ECM liigid
intraspecific t nulu juured: 56% ül 25 cm; 44% 25-150 cm; taimeindiviidide peer juurte genetite määramine SCAR markeritega
istuliniforme ectomycorrhizas. New Phytol. ???:???
orrhizal structure and growth of Picea abies (L.) Karst.
Alnus crispa in Alaska. Mycologia 81: 667-676. Lepal Alaskal 2 uut Russula liiki, mi
d
versity of ammonia oxidizer 16S rRNA gene sequences in native, tilled, and succ 16S rDNA, NH4 oksidiseerivate praimerid
ungens genetid enne ja peale tulekahju: täielik kontrast-suured vanad genetid aser AFLP
E, FESIN, and frontiers in fungal ecology. New Phytol. 177: 586-588
ölengut viljuvad 2 a pärast Chroogomphus, Suillus, pungens, Coltricia perennis, Hebeloma crustulinif. 5 a pärastlisanduvad Rhizopogon spp, Ampl
engut viljuvad 2 a pärast Chroogomphus, Suillus, pungens, Coltricia perennis, Hebeloma crustulinif. 5 a pärastlisanduvad Rhizopogon spp, Amphinema byssoides
mmunities: what do the exceptions tell us? Integ. Comp. Biol. 42: 352-359.
ock NP. 2008. Inoculum ptential of Rhizopogon spores increases with time over the first 4 yr of a 99-yr spore burial experiment. New Phytol. 181: 463–470.
ophic plants stimulated by fungi isolated from the adult plants. Mycol. Res. 148: 335-342.
nt advances and future directions. Can. J. Bot. 82: 1122–1132. misidentifitseerimine, ITS vs LSU vs valgud; bayes vs pars
skaalas ECM diversiteedi bõhjustaja
tzer A; Garbelotto M, Li Y. 1998. A sequence database for the identification of e MCH sekventside andmebaas Boletales: lahknemine kriidis
atodes, mycor mullaökoloogia: nematoodid vs ECM vs taimed: ülevaade; taimed võivad mõjutada ECM seente kasvu ja nematoodide vältimist
ci. 7: 123-129.
oes on mountainsides: contrasting elevational patterns in bacterial and plant diversity. Proc. Natl. Acad. Sci. USA 105: 11505-11511. Mantel test kooslust
enekoosluse struktuuris. Proove vaid 10
markers in a population of Picea abies. Mol. Ecol. 11: 305-315. RAPD autokorrelatsioon kuusel
ed spacer (ITS) of rDNA genes in fungal communities in a southeastern U.S. salt T-RFLP (liiga sarnased bändid) vs sekv (ITS kottseentel; parim) vs mikroskoopia
emaa torikute nimestik, sh Coltriciella dependens, Coltriciaperennis, cinnamomea, sapincta, strigosa
kortikoidide biogeo AUS ja ümruses: kortikoididel endeemsust keskmiselt, igatahes palju v laia levikuga li
s in ectomycorrhizal fungi: an X-ray microanalytical study. Mycol. Res. 103: 31-39

:arbohydrates in mycorrhizal roots of Populus tremula × Populus alba and the implications for transfer processes in ectomycorrhizal associations. Tree Physiol. 21: 101–10

species richness of pitcher plant food webs. Ecol. Lett. 6: 825-8 putuktoidulistel taimedel Sarracenia purpurea korvides on bakterite ja mikrofauna mitmeke

ll HV, Damschen EI, Grytnes J-A, Hawkins BA, McCain CM, fülogen eripärad põhj muutusi latitud gradiendis; arv 50 MAT kui oli temp-max, tek eriti pa

la spp ja Russ/Lact spp. Vaid Tom ja Lact spp esinesid mulda pandud puusodis. Cellubiohüdrolaas oli A1 ja A2 horisondis rohke, kitinaas puidusodis. Kõik puic NE FRA

e zoo: an overview of plant-associated communities of microorganisms, including phages, bacteria, archaea, and fungi, and some of their structuring factors. Plant Soil. 321

rend: Clavulina, Cenoc, Lactarius; talvel Clavulina, Russula, Lactarius, Tomentella; suvel Clavulina, Cenococcum, Lactarius, Hebeloma Clavulina

ntial metabolic activity of the ectomycorrhizal community in a beech (*Fagus sylvatica*) forest subjected to two thinning regimes. Mycorrhiza 15: 235–245.

; rikastes metsades Euroopas ja Põhja-Ameerikas. Pms lepaga seotud seened, mõned metsatüübid täiesti EcM seente vabad. N-Am ja P-Eur seened 80% sarnased

rion. Curr. Opin. Microbiol. 8: 362-369.

l + kultiveeritavad liigid NZL sissetoodud Tuber: 5 liiki Euroopa puudel + kultiveeritavad liigid

endophytes in a multitrophic interaction. Oikos 102: 491-496.

und-induced resistance and constrains tolerance in a grass. Ecology 85: 679–685.

luctivity and phenology. Front. Ecol. Environ. In press.

cotina using sterile distilled water in cryovials. Mycologia 86: 275-280.

ogeous species of *Geopora* (Pezizales). Mycologia 60: 496-525.

gions of Africa Aafrika taimkate Aafrika taimkate

to increase growth and phosphorus uptake of *Eucalyptus globulus* and *E. diversicolor*. Plant Soil 153: 155-164.

ities associated with the roots of Douglas fir (*Pseudotsuga menziesii*) colonized by different ectomycorrhizal fu bakterite 18S praimerid, mis diskrimineerivad klo

roll: Tomentella sp, Cenoc, Rhizopogon sp.

vironment infl juure-seened póögi-vahtra segametsas: kooslust mõj enim taimkate ja mulla-toitained NMS põhjal

fication in single and pooled root samples: terminal restriction fragment length po morfotüpiseerimine tuvastab palju rohkem EcM seeni kui T-RFLP. Prooviti 3 eri praimeri

T-RFLP kvantitatiivne kasutan T-RFLP kvantitatiivne kasutamine: leiti et 3 dominantliigil

izal fungi: a possible source of Fenton radicals during the degradation of lignocellulose. New Phytol. 139: 637-645. tsellulaasi

d ericoid mycorrhizal fungi. Mycorrhiza 12: 105-116. lakaasid,

ork. Ch 11, 12. seente liigikontseptsioonid ja spetsia

eotropical rainforests. Phil. Trans. R. Soc. Lond. B 359: 1595-1 Lõuna-Am vihmametsad: taimkate kriidist tänapäevani. Kriidis vähe teada, vihmametsade kõrgaeg arv eots

tting in eastern oak forests on Armillaria spp. and a competitor, Megacollybia platyphylla. Can. J. For. Res. 29: 347-355.

H. 2010. Impact of wildfire return interval on the ectomycorrhizal resistant propagules communities of a Mediterranean open forest. Fung. Biol. 114: 628-636.

ei erinenud oluliselt liikide poolest ja põlengutel polnud mõju

ınud jämejuuri nn valkja kattega. Identif septade ultrastr järgi. Mantel paks, Hartigi võrgustik vaid 1-kihiline!!!; väidet ECM. Sek koloniseeris ka kandseene ECM -hartigi v

aaskultuuris Pax > Cyl > Laccaria; Cyl inhibeerib mõlemil, eriti Laccarial ECM teket -mantel on õhem ja hartigi võrgustik on imelik. Cyl tungib läbi Laccaria mantli, ent mi

rhizas of Morchella elata with Picea abies. Mycorrhiza 4: 223-232.

1136 melaniinic

a community-focused living review of multivariate data analyses. FEMS Microbiol. Ecol. 90: 543-550. multivariaat-tehnika

. (Amylocorticiales, Basidiomycota) from New Caledonia. Crypt. Mykol. 33: 453-461.

frican woodland. Kew Bull. 54: 675-681.

ine between *Russula* and *Lactarius*: the dilemma of *Russula* subsect *Ochricompactae*. Fung. Div. 28: 15-40. Multifurca gen. Nov. Sisaldab

h Anisoptera (Dipterocarpaceae) in Papua New Guinea. Aust. Syst. Bot. 12: 727-742. Russula rõngaga uued liigid PNG di

kesk-ja lääneosas. Cortinarius, Hebeloma pole teada, Inocybe va Aafrika kesk-ja lääneosas EcM seentel. Cortinarius, Hebeloma pole teada, Inocybe vaid noortes metsades.

col. Res. 111: 787-798. Lactarius liigid Aafrikas ja madagaskaril enamasti identsed. ITS peaaegu identne. Paljud kasvavad nii vihm

scaril: Eukalüptidega on koos palju seeni, mida pole Austraaliast teada ja mis tunduvad olevat Aafrika päritolu. Malagassid on viimase 60 aastaga

harellus (Basidiomycota, Cantharellaceae) in Tanzania. Nova Hedw. 71: 491-502.

Suilloid2; vanas metsas Suilloid, Tricholomataceae, Cortinarius; kottseeni rohke ITS1-ITS4B kandseente marker, ITS1F-ITS4 kottseente marker (multivar, x2

Gnetum gnemon Sumatral mood eksperim EcM Scleroderma sinnamariensega, mis soodustab taimede kasvu

result in highe Fülogeneetilise diversiteedi mõju vüib olla tugevam kui liigirikkuse mõju taimede produktsioonile kooslustes

influence the strength of competition among vascular plants? Persp. Plant Ecol. 10: 41-50.

tomycorrhizas. II. Carbohydrate allocation in ageing Picea sitchensis/Tylospora fibrillosa ectomycorrhizas. New Phytol. 122: 153-158.

For. Res. 37: 207-215.

an important cocncept for a functional understanding of the ectomycorrhizal symbiosis. New Phytol. 134: 685-695. transporte

vaga. Mycol. Res. 91: 764-767.

udy of the internal structure of mature linear mycelial organs of four basidiomycete species. Can. J. Bot. 67: 2266-2271.

l saprotrophs: implications for decomposition of organic matter in soils and degradation of organic pollutants in the rhizosphere. Can. J. Bot. 80: 803-809. ECM bioc

rsh edaphic conditions. Eur. J. Soil. Sci. 54: 735–740.

hartigi võrgustikuga), kuusel (hartigi võrgustik nõrk, transfer-rakke pole) ja eukalüptil (ei moodusta)

ding functional diversity in ectomycorrhizal fungi. Mycorrhiza 9: 125-135. liigisisene

of carbon dynamics in forest soil. Soil Biol. Biochem. 47: 198-208.

Türgi: palju valeteateid EcM kohta. Väidet Myrtus, Pistacia (Anacardiaceae), Rhamnus, Vitis, Helianthemum, Polygonum equisetiforme, Trachon

by dark-septate, root endophytes. Mycologia 92: 230-232. Cadopho

ental samples using DNA microarrays. J. Microbiol. Meth. 53: 235– 243. liikide identi liikide identifitseerimiseks : PCR amplifitseer

coli O157:H7 using multiplexed PCR and nucleic acid microarrays. Int. J. Food Microbiol. 67: 71–80. E.coli 100nu rDNA, oligonu probed 25-36 nu

E INVADER AM seente tapmine benomüüliga soodustab invasiivse Centaurea sissetungi konkureerides mõne taimega, samas vähendab seda mõne muu taimega konkure

lant invasion. I Centaura vohamine Ameerikas (pärist Euroopast) võib olla seotud AM-seentega, mis pole peremehe-spets ning peremehe-spets patogeenide puudumisega A

d diversification in a biodiversity hotspot: the California floristi California loomade väga kiire divergeerumine tänu mäetekke protsess California loomade väga kiire diverg

osphere on the functional diversity od soil bacterial and fungal communities from a forest stand in relation to nutrient mobilization processes. Microb. Ecol. 54: 567-577.

of heterogeneity in spore progenies and sexuality in the genus Agaricus. Mycol. RAPD: 10 praimerit homo vs heterokaarüon

ɛs by dark-septate, root endophytes. Mycologia 92: 230-232. Phialocep
ing of a new peroxidase found in lignocellulose cultures of Pleurotus eryngii and sequence comparison with other fungal peroxidases. FEMS Microbiol. Lett. 19 VP klone
ion of a versatile peroxidase involved in the natural degradation of lignin that has both manganese peroxidase and lignin peroxidase substrate interaction sites. J. VP, MnP,
Gentianaceae: Bartonia virginica and Obolaria virginica as case studies. Am. J. Bot. 97: 1272-1277.
; the carbon cost of mycorrhizas in the green orchid, *Goodyera repens* . New Phytol. 180: 176-184.
:e from plant-fungus carbon and nitrogen transfers in the green-leaved terrestrial orchid Goodyera repens. New Phytol. 171: 405-416.
hid *Corallorhiza trifida* derives little carbon through photosynthesis. New Phytol. 183: 358-364.
nilial relationships within Orchidaceae. Mol. Phyl. Evol. 31: 1157-1180. Orchidaceae psaB ja rbcL. Basaalsed h
Pyrola picta on parasiit ja P. Aphylla on selle ekstreemne variant
Miombo wood miombo ökosüsteemide majanduslik tähtsus aafrikas kõrge: mesindus, seened. Palju LK ja demogr probleeme, korruptsioon
34: 87–108.
st: a flexible tool for aligning sequences to a template alignment. Bioinformatics 26: 266-267. PyNAST · PyNAST - väga kiire
nitive liverwort Haplomitrium harbour a unique type of endophytic association with aseptate fungi. New Phytol. 160: 185–197.
R. Soc. Lond. B 266: 1221-1225. diversifitseerumine kiirem troopikas kui parasvöötmes
a P, O'Connor taimede elurikkuse mõju ökosüs funktsioonidele ja liigirikkusele: biomass, prod, lagun kasvavad, toitained ammenduvad kiiremini; ve
eau C. 2006. E liigilise mitmekesisuse mõju ökosüsteemile on seletativ sampling effectiga -s.t. Sõltub kõige efektiivsemast liigist koosluses. S.o. Sarnane v erinevates süstee
ı fibrillosa poolt, ent vähendab Lactarius rufuse arvukust juurtel ja viljakehadena
r moss ecosyst hüüfid on võimelised elus-samblast toitaineid välja imema
make a mista(g)ke: is tag switching an overlooked source of error in amplicon pyrosequencing studies? Fung. Ecol. 5: 747-749.
ɔara-Kobresia myosuroides tundra plant community. MSc. Thesis. University of (2 RE, sekv ITS
ata K, Konno H, Muramatsu M, Hayashizaki Y. 2011. Balanced-size and long-si: kloneerimine: eriti pikkadel juppidel pikkuse hälve
and ecosystem ecology. Ecology 77: 677-680.
and ecosystem ecology: reply. Ecology 80: 1085-1088.
2008. Population evidence of cryptic species and geographical structure in the cosmopolitan ectomycorrhizal fungus, Tricholoma scalpturatum. Microb Ecol 56: 513-524.
2008. Population evidence of cryptic species and geographical structure in the cosmopolitan ectomycorrhizal fungus, Tricholoma scalpturatum. Microb. Ecol. 56: 513-524.
324.
S1316-1324.
10. Low pore connectivity increases bacterial diversity in soil. Appl. Environ. Microbiol. 76: 3936-3942.
ı aladel (kultuur + ITS regioon): odrapõllul ja nisupõllul eri seened, nisul sõltusid mikroseened odra ja nisujuurtes erineva maakasutusega aladel (kultuur + ITS regioon): od
arbuscular my network AM vs taimed: kas co-occurrence on interakts? Interakts puhul peab olema tõestus selle kohta otsene;
hizal fungal effects on the bioavailability and mobilization of soil P in the rhizosphere of Pinus pinaster. New Phytol. 163: 177–185.
ıycota), a new sequestrate taxon from Belize. Mycotaxon 100: 289-294. Mayamontana gen nov maa-alu
nance of Douglas-fir nursery stock inoculated with Rhizopogon spores. Can. J. For. Res. 15: 613-617.
ɔtropoideae in Oregon. Mycologia 77: 499-502.
Basidiomycotina, Tricholomataceae) and *Horakiella* gen. nov. (Basidiomycotina, Sclerodermataceae). Aust. Syst. Bot. 5: 639-643.
bliography of type descriptions of Ascomycotina and Zygomycotina. QQQ nimekiri AUS maasisestest Pez
gen. et sp. nov., a new truffle-like fungus from the Sierra Nevada. Mycotaxon 55: 185-188. Amogaster gen nov California
iiki, Cenococcum1, Entoloma1
Iydnobolites, Pachyphloeus, Tuber, Elaphomyces, Melanogaster, Hymenogaster, Rhizopogon jt Mehhiko tamme-männi segametsades
dotsuga menziesii and Tsuga heterophylla seedlings. Grown in Oregon Coast Range Soils. Mycorrhiza 6: 65-67.
rhiza 2: 153-156.
ad. Sci. 106: 12794-12797. taimede barcoding: soovit matK ja rbcL
ːtonia solani AG-3 from potato and tobacco in North Carolina. Mycologia 94: 43 AFLP: Rhizoctonia solani-Thanatephorus AG3 erista AFLP: Rhizoctonia solani-Thanatep
logia 138: 5-12.
Cilia sp-l obs+illustr; Balsamia platyspora obs
ɔsum. Agric. Ecosyst. Environ. 28: 55-58.
xisting microbes from environmental and whole-genome sequence data. Genome Res. 20: 947-959. network-analüüs mik
:o evaluate the causes and consequences of arbuscular mycorrhizal community structure. New Phytol. 194: 307-312.
dophyte Frankia. A review. Symbiosis 51: 201-226.
Genet. 21: S56-S60. inimpopulatsioonide levik, geneetilir
ızal fungi and ectomycorrhizas. FEMS Microbiol. Rev. 22: 21-44.
ton B. 2002. An update on nutrient transport processes in ectomycorrhizas. Plant Soil 244: 165–175.
g amino acid uptake by the ectomycorrhizal fungus Paxillus involutus. Mycol. Res. 99: 1131-1138. aminohap
nical evidence of manganese-dependent peroxidase activity in Tylospora fibrillos MnP Phanerochaete vs Tylospora MnP tõest

Pisonia grandis: 2 liiki Thelephoraceae 7 Austraalia korallsaarel
Pisonia-thelephoroid Pisonia-thelephoroid
the direct detection of 16S rRNA on planar oligonucleotide microarrays. Appl. Environ. Microbiol. 69: 2950–29 16S rRNA 2 16S rRNA 2 bakteriperek kummagi 5 liigi ide
lose allies as inferred by analyses of ITS sequences and AFLP. I Tricholoma mats AFLP: Tricholoma matsutake molekulaarne kell ja kor
ıljakehi tohutult-arv saab kohalikust mullast lisa C-ühendeid
ɔossible means to control Armillaria root disease. Can. J. Bot. 78: 129-134.
ıgi on dilute agar. Mycologia 82: 526-527.
Barcoding geeni valik taimedel ja seentel: mt vs tu
ɛs. I. Role of ecto-and endomycorrhizal fungi and *Frankia* on the growth performance of *Alnus incana* . Plant Soil 118: 145-150.
ing synthetic ecology: a database system to facilitate complex ecological meta-analyses. Bull. Ecol. Soc. Am. 91: 235-243. MycoDB andmebaas
ke genes in ectomycorrhizal basidiomycetes and transcriptional regulation by nit comp RT-PCR lakaas: ec
ıoroid, Dermocybe, Russula; peale põlengut: Eurotiales spp, Dermocybe, Helotia PCR from soil, cloning, sekv
s production by Australian Pisolithus ssp. Isolates. Mycorrhiza Online

lignin peroxidases and manganese peroxidases in ectomycorrhizal fungi. New Ph ligniini peroksidaasi ja mangaani peroksidaasi geenid ligniini ja
ceae) inferred from three chloroplast datasets and its systematic implications. Taxon 59: 29-37. Salix: atpB-rbcL on hea: jagun
lules from Hippophae rhamnoides L. Botany. 86: 240-247.
Li X, Jia X, Lin Y, Leon C. 2010. Validation of the ITS2 region as a novel DNA barcode for identifying medicinal plant species. PLoS One 2010: e8613.
buscular myco VAM vs ECM
r inoculating plantations in South China: effect on Scleroderma on colonization and growth of exotic Eucalyptus globulus, E. Urophylla, Pinus elliottii, and P. Radiata. Myc
rma 3spp, Pisolithus 2spp., Laccaria 2spp domin; + 2 liiki Amanita, 2 liiki Russulat
from sequences of nuclear ribosomal DNA ITS Region. Int. J. P Alnus: subg. Alnobetula on basaalne Alnus: subg. Alnobetula on basaalne
eae as inferred from DNA sequences, morphology and paleobotany. Am. J. Bot. ITS, rbc: betulaceae Betulaceae: pärit hiliskriidist; kask j
king and reading microarrays. Nature Genet. 21: S15-S19. ARRAY metoodika ja töö: ülevaade, pildid
bell B, ed. The Miombo in Transition: Woodlands and Welfare in Africa. Pp. 175-193.
l nutrient statu Zambia miombo: puude mahavõtt suurend rohu biomassi, arv. Et põllustamine on ohtlikum kui raie pinnase org-aine seisukohast
tenure and use miombo: laastades muutub puude tihedus ja tood miombo: laastades muutub puude tihedus ja toodang, loomulikult esinevad tulekahjud
invaded by exotic pines. Oecologia (Berlin) 59: 239-245.
ngi within the ECM vs AM Eukalüptidel
bi kõdukihiga aladel
iübid: Tüüp1 = Cenoc; Tüüp6 = Octavianina
9-234. eukalüpti 2 liigi isendite juured kattuvad kõvasti; kummalgi puul c kromatograafia abil juurte määramine
: 103-111. Eukalüpti EcM seened eukalüpti liikide vahel ei vali, ent mändi ei nakata. Samuti ei lähe eukalüptile Suillus ja Rhizopogon

nal transcribed spacer (ITS) should be incorporated into the core barcode for see taimede (er õistaimede) triipkoodistamiseks I taimede (er õistaimede) triipko
opical evergree liaanide diversiteet indias sõltub metsamaj intens liaanide diversiteet indias sõltub metsamaj intensiivsusest. Eri liaanid eelist eri peremehi, er peenemaid pui
zation by using genome fragments and DNA microarrays. Appl. Environ. Microbiol. 67: 3677-3682. 1-2 kb genoomifragmentide omavah hübridis
ntrols on bacterial community structure: microbial network analysis of bacteria, T4-like viruses and protists. ISME J. 8: 816-829. ter Braaki co-corresp
ols of bacterial community structure: microbial network analysis of bacteria, T4-like viruses and protists. ISME J. 8: 816-829.
omphales). Zeitschrift für mykologie, Band 71/1: 7-42. Ramaria morfotaksonoomia
s" und die Keimung von Pirolaceen. Beih. Bot. Centrabl. 38: 115-158.

l diversity in the Arctic is not fundamentally different from that mullabakterite fülogeneetiline ja liigiline BD on sama arktikas, parasvöötmes ja troopikas
of Douglas fir in New Zealand. N. Z. J. For. Sci. 9: 344-347.
ZL
seudotsuga)
caria laccata, Hebeloma crustuliniforme and Rhizopogon species on growth of radiata pine seedlings. N. Z. J. Bot. 23: 417-424.

oslus muutub ja laguens aktiivsus kasvab; =3 tõusuga kooslus muutub ja ens aktiivsus kahaneb
ns of Chimaphila japonica and Pyrola japonica (Pyrolaceae). Isr. J. Plant Sci. 44: 259-271.
rom Pectelis susannae (L.) Rafin (Orchidaceae), a threatened terrestrial orchid in Thailand. Mycorrhiza, in press.
te viljakehadega seened: Austraalias leiti korraga yle 150 uue liigi; provialade uurimine inimtundides
. Peaaegu kõik maasiseste viljakehadega
olutionary, and mükofaagia levik loomadel. Obligaatsed vaid 3 liiki: 1 N-Am, 2 Austr -neil arenenud eesmagu eoste ferenteerimiseks. Ainult nendel pos energiabilanss vaid
mnopaxillus (Basidiomycota, Austropaxillaceae). Aust. Syst. Bot. 14: 273-281. Gymnopaxillus Lõuna-Ameerik
easuring net pı produktsiooni mõõtmine: maa peal ja maa all on väga palju komponente ja pot artefakte. Ei paku ka lahendust
ucture. Aust. J. Ecol. 18: 117–143.
etamist ja soojendamist, arvukus korrel nitraadi rohkusega. Aeg (juuni vs juuli vs august) mõjutas mõne liigi arvukust oluliselt. Kokku 11 liiki, neist 5 Tom+Thelephora, lisa
saproobid; 5 taimejuurtel ja EcM ning ErM seentel oluline roll C ladenemises kui ei põle
vuti ja eri moodi põlenud ja põlemata aladel
rhizal abundance after long-term fertilization and warming of two arctic tundra ecosystems. New Phytol. 171: 391-404.
ndent N uptak peamine osa mulla N-st liigub taimedesse läbi mikroobide. EcM mütseel võttis üles ka glütsiini ja toimetas seda taimedesse.
hiz vinicolor, PsTom tristis, eemal Rhiz rudus, R. Vinicolor, PsTom tristis, Tuber aff borchii. Huvitav Peziza limnaea LSU 99%
, Pezizales sp. (5st 3 Pezizalesed); kasvuhoone: Wilcoxina, Tomentella ellisii, Thel terrestris, Rhizopogon spp.,; >16m Rhizopogon spp, Tuber sp (endine), PseudoTom tris
10-24 liiki
. 2007. Integration of biological networks and gene expression data using Cytoscape. Nat. Protoc. 2: 2366-2382. network anal: Cytosc
evolution of Entolomataceae. Persoonia 23: 147-176. Entolomataceae: perek Clitopil
bakterite fylogeneesi ja systemaatika
otus ostreatus peroxidases are differentially attacked by Mn2+. Environ. Microbi RT-PCR MnP transkriptide mootmiseks VP, MnP
i juurte püro EcM seente uuringuteks; tuvastasid ka Oomycota ITS6-ITS7 primeritega Phytophthora praimerid ITS6-ITS8 on mittespetsii
B. 2014. Leaf and root-associated fungal assemblages do not fo lehtede ja juurtega assots seente liigirikkus ei muutu kõrgusgradiendil. Juuri mõj ruum 45%
, McGarrell SM, Marsh T, Garrity GM, Tiedje JM. 2009. The Ribosomal Database Project: improved alignments and new tools for rRNA analysis. *Nucl. Ac. Res.* 37: D1
es in filamentous fungi. Fung. Gen. Biol. 24: 86–100.
karyotes? A DNA guide. Mol. Phyl. Evol. 50: 197-203. Barcoding: pakuvad ITS2 kui sobilikku kõigile eukarüootidele, kuna sel on k
sed seened: eri eelistused raie suhtes, üldjuhul raiudes diversiteet ja biomass vähenevad
: *Kjeldsenia aureispora* gen. et sp. nov., a truffle-like fungus in the Cortinariaceae. Mycotaxon 55: 175-178. Kjeldsenia gen nov, arv EcM C
m
, Lact hepatic, Cenoc; mänd: Rhizop, Suill varieg, Lact hepat, Suill bov, Thel terr; vanadel puudel domin Lact hepat, Russ emetic, Cenoc. Lact rufu
otypes and th limiteerivad toitained mõj mükoriisa kasutegurit. AM on pos mõjuga kui N/P üle 14. AM pos efekt kaob kui P-rikast mulda N-väetada
Ecol. Res. In press. barcoding: isendi määramise ja liigituvastamise ni
lutionary adaptation to Zn toxicity in populations of Suilloid fungi. New Phytol. 162: 549–559.
m of ectomycorrhizal fungi and the growth response of Pinus sylvestris L. New Phytol. 120: 127-135.

s of two ectomycorrhizal and a leaf saprotrophic basidiomycete colonizing beach leaf litter. New Phytol. 133: 133-141. vs ECM v
phorus uptake rates in mycorrhizal and non-mycorrhizal roots of intact Pinus sylvestris seedlings. New Phytol. 143: 589 –597
eralization from beech leaf litter colonized by ectomycorrhizal or litter-decomposing basidiomycetes. New Phytol. 134: 123-132.
iigisisene ISSR; normaalne vs metallireostusalal ISSR: 3 praimerit
eography of sp liigirikkus on suurem madalamatel laiustel (Rapo liigirikkus on suurem madalamatel laiustel (Rapoporti seadus) ja madalates mägedes, sest need hõlmavad n
ncidence-based species accumulation curves. Ecology 85: 2717–2727.
pecies from samples. Version 8. Persistent URL <purl.oclc.org/estimates>.
cM liikide arv230 liiki, domin Russula+Lact, Cort, Inocybe, Amanita, Hygrophorus, Hebeloma. 35 liiki on Cistuse-spetsid: sh Cort, Lact, Russ, Inoc, Hebel jt

rhizal fungal diversity: a continuous challenge. In: ... EcM eluviis on taimedel tekkin
rhizal fungal diversity: a continuous challenge. Pp. 165-200 in Pagano, M.C. [editor] Mycorrhiza:Occurrence in Natural and Restored Environments. Nova Science Publish
nefaciens-mediated transformation as a tool for insertional mutagenesis in the symbiotic ectomycorrhizal fungus Hebeloma cylindrosporum. FEMS Microbiol. Lett. 220: 14
arch. New Phytol. 164: 11-14. Vahemeremaad, Kanaari saared jms taimede BD tsentrina: refuugiumid, endeemid, reliktid, välja ja sisserä
or permanent f tree diversity network: metaandmete standardid ja nende tähtsus globaalseteks uuringuteks
Plant diversity and complexity patterns: local, regional and global dimensions. Biol. Skrift. 55: 565-582.
oidne seen eel kolonisatsioon sõltus kõdutüübist; maapinna kulukotte juured ei koloniseerinud. Eri dominandid erineval kõdul: suilloidne seen domineeris männiokastel
ir areas of endemism, and cladistic biogeography. Aust. Syst. B Paljasseemnetaimed: enim endeeme S-Hiinas. Sh Kolumbias perek. Chigua
lasmid-based 16S–23S rDNA intergenic spacer region array for analysis of microbial diversity in industrial wastewater. J. Mi reoveebakterite IGS: palju varieeruvam ja see
, problems and practicalities. Curr. Opin. Biotechnol. 14: 311–318. array keskkonnaproovidest: identifitseerimine
epresents a post-Gondwanan radiation. Proc. R. Soc. B 272: 25 Nothofagus u 84 MYA; Fagales u 90 MYA; Nothofaguse pı Nothofagus u 84 MYA; Fagale
logeny of *Phytophthora* and related oomycetes. Fung. Genet. Biol. 30: 17-32. Phytophthora jt oo Phytophthora jt oomütseetide f
märgala connecticutis: Populus deltoides ja Salix nigra mood nii EcM kui AM
agus in the Southern Hemisphere. MycoKeys 3: 13-22.
EcM seened EcM seened väidet. Kolonis sõnajalgu NZL kui läheduses on Nothofagus v mänd. Kultuuridega nakatumine ebaõnnestus; leptospermu
udying niche conservatism. J. Evol. Biol. 23: 2529-2539. fülogeneet fülogeneetilise signa
sendite geneet kaugus (Mantel) ja puu-siseselt lehtede kaugus
l. Ecology 70: orav Spermophilus sööb palju Elaphomycest: eoseid ei söö, sest need ei seedu; seedib kitiini, seenes palju kättesaamatut N
al comparisons troopilised ökosüs eri mandritel on oma funktsioı troopilised ökosüs eri mandritel on oma funktsionaalsete gruppide poolest erinevad vrd varemarvatuga, san
AM, EcM, I AM, EcM, ErM puittaimed erinevad C-ökonoomika poolest - kasvukiirus, lehtede lagunemine
a wide range of temperate plant species and types. J. Ecol. 84: 573-582.
ot. L'Etat 3: 257-279. Congo DR: 2 liiki Thelephorat
ycol. Soc. 49: 101-113. Ramaria pannaldeta liikide süs
Gomphus, Clavariadelphus, Pa
umber polymorphisms in an arbuscular mycorrhizal fungal population. Appl. Environ. Microbiol. 73: 366-369. 16S rDNA geeni koopiate arv kõigub AM-seentel
us is not a cost to the plant in ectomycorrhizae. Oikos 121: 449-463.
crosporidia-like parasites of amoebae belong to the early fungal lineage Rozellomycota. Parasitol. Res. 113: 1909–1918. Rozellomycota: siia kuuluvad k
(2001) and Hurlbert (1984). Oikos 100: 394-396. pseudoreplikatsiooni võ
ture: interannual variation and effects of atmospheric change on arbuscu AMF: CO_2 mõj kooslust 3,5%, osoon 0%; ent katse-aasta mõjutab 42%. S.t. samal p
secretion of organic matter degrading enzymes by Lactarius quietus ectomycorrhizas before and during bud break. Soil Biol. Biochem. 39: 1655–1663.
l-P, Uroz S, G ECM koosluste tähtsus metsa ökosüsteemides: mobiliseerivad elemente mullaorgaanikast, kuigi ilmselt otseselt ei lagunda polümeere;
EcM see
m lilgris; A -Cenoc, Lact quietus, Russula1, Russ ochrol. Kolmel dominandil suured erinevused O vs A (Tom sublil, Tom lilgris, Tom3 O-s; Cenoc
con F. 2011. Effect of poplar genotypes on mycorrhizal infection and secreted enzyme activities in mycorrhizal and non-mycorrhizal roots. J. Exp. Bot. 62: 249-2 haava lii
ities of the dominant ectomycorrhizal types in a lowland oak forest. Soil Biol. Biochem. 38: 1219-1222. EcM seen
of ectomycorrhiza communities in two forest soils using multiple enzymatic tests. New Phytol. 167: 309-319. eri EcM-s
2011. Carbon AM-süsteemides AM spoorid vs taimejuured vs taimelehed vs mükohet: troop MH taimedel madal N conc; 13C rikastatus sama, mis
mycelium in clonal Sitka spruce during the first growing season after planting. Can. J. For. Res. 20: 861-868.
and of strands ftom Thelephora terrestris mycorrhizas. Can. J. For. Res. 20: 1894-1899.
f Sitka spruce and lodgepole pine. New Phytol. 80: 63-69.
on of Sitka spruce and lodgepole pine to waterlogged soil. New Phytol. 80: 71-77.
s of Sitka spruce and lodgepole pine in waterlogged soil. New Phytol. 90: 467-476.
Mycorrhizas: The Use of Primers to Detect Arbuscular Mycorrhizal Fungi. In: Thangadurai D, Busso CA, Hijri M. Mycorrhizal Biotechnology. Science Publishers, Enfield,
ic dependence of morphological traits using co-inertia prior to investigate character evolution in Loricariinae catfishes. Mol. Phyl. Evo fülogeneet fülogeneetiliste dum
. Laikudes vähem liike; eriti pärast 2 a tormiheidet liikide arv väheneb noortel seemikutel
ception? Trends Ecol. Evol. 20: 487-494. Orhideedel on algne eluviis petmine
4 others. 2009. Global patterns of foliar nitrogen istopes and their relationships with climate, mycorrhizal fungi, foliar nutrient concentrations, and nitrogen availability. Nev
Gnetales triiases, juuras, kriidis laialt levinud, hiljem kasvab koos soontaimedega madalatel laiustel, makro
alpiaasal USA Rocky Mountains: EcM taimed vaid Betula, Salix, Bistorta vivipara, Dryas octop., ÜLEVAADE varasematest uuringutest, millest j
ordiljeerides

ccaria proxima. Muuhulgas Populirhiza nigra (Tom) leidus vaid lagupuidus
pproaches in biogeography. Aust. Syst. Bot. 19: 1-10. biogeo eri valdkonnad. Oluline ühitada ajalooline ja ökol biogeo eriti looduskaitse seisukohalt
on PH, Westob fülogeneetiline konservatiivsus bioomide muutmise osas lõuna-parasvöötme taimedel; hüpped toimuvad pigem sarnaste bioomide vah
le biomes dominated by eucalypts originated at the Cretaceous-I Eucalyptus ja seotud EcM Myrtaceae tek vara-Paleogeenis. Eucalyptus ja seotud EcM Myr
parisons of molecular phylogenies across multiple taxa tell us a Austaalia kaasaegsed kooslused on tek kliimamuutuste tagajärjel. Enne 25 MAT niisked metsad Nothofagu
obium group (Fabaceae: Mirbelieae). Syst. Bot. 28: 705-713. Mirbelieae (Gastrolobium , Chorizema, Podolobium, Mirbelia, Oxylol Mirbelieae (Gastrolobium , Chorizem
tant gymnosperms compared with angiosperms. New Phytol. 192: 997-1009. paljasseemnetaimede kroonirül
ng evolutionar fülogeneetiline nisi konservatism: ülevaade, null-mudelid, seda põhjustavad tegurid fülogeneetiline nisi konservatis

J. Biogeogr. 28: 183-198. Australaia endemism: korrekteeritud endemism parim mõõde. Ei lange kokku liigirikkaimate aladega. Ende
nd fungi: introduction. J. Biogeogr. 28: 153-155. VIITED mol fülogeograafiale
techniques due to rrn operon copy number heterogeneity. Biotechniques 34: 2-9. rDNA, rRNA geenide koopiate erinevatest arvust
ıngal foraging and decomposition. Oecologia 167: 535-545.
aadel kui metsas; koosluste vahe rohumaadel ja metsas on suurim liivasel pinnasel. Mida suurem on MAT, seda väiksemad erinevused on rohumaa
in Tulasnella by correlating morphology and nrDNA ITS-5.8 sequence data of basidiomata from a tropical Andean forest. Tulasnella VK ECU, mis mood
cation method suitable for fresh, herbarium-stored, lichenized, and other fungi. P DNA ekstraheerimise uus meetod CTABi pohjal, kus muudetud on kontsentratsioone ja m
Iolecular phylogenetics of Caryophyllales based on nuclear 18S rDNA and plastid RBCL, ATPB and MATK DNA sequences. Am. J. Caryophyllales. EcM mood klaade 3
ır mycorrhizas from enriched soil patches. I. Roots and hyphae exploiting the same soil volume. New Phytol. 133: 453-460.
ır mycorrhizas from enriched soil patches. II. Hyphae exploiting root-free soil. New Phytol. 133: 461-467.
obial DNA from soil for PCR. Soil Biol. Biochem. 30: 893-993. DNA eraldamine mullast: kõrged temp (70*C) ja sügavkül
functional diversity and resilience of ectomycorrhizal community. Oecologia 161: 661-664. EcM tip
of the ectomycorrhizal fungus Suillus granulatus in a Pinus contorta (lodgepole pine) stand in Yellowstone National Park. Oecologia 158: 77-83. ARV et
Elaphomyces (Eupenicillium); väidet Cenoc ei talu ja Unkn1 eelistab kasvada roogitud okastega plottides. Ent analüüs on vale ja liike üldse saadi kahtlaselt vähe. Kogu ko
ıosa, Piloderma sp, Cortinarius sp. Jääb ebaselgeks, mis määral kooslus ikkagi muutus, sest alasid oli 3 ja esitati vaid kogusumma
of Monotropoideae based on partial 28S ribosomal RNA gene sequencing. Can. J. Bot. 78: 1-2. Monotropa: arv koosneb kahest mor
ıocybe (K 73%), Cenococcum puudus; mujal Rhizopogon, Cantharellaceae sp. ITS1F/4-4B 2RE x2 test liikidele eraldi
:, Hygroph; liigirikkaim Cort, Russu/Lact, Inocybe ITS1F/4B 2RE
base: applications to ecology and evolution. Mol. Ecol. 7: 919-923. 5.8 S nu RDNA andmebaas: taimed, seened, loomad
ceae sp, Wilcc kõdu lisamine: suurendas kolonisatsiooni, vähendas liigirikkust
ɔcaerulescens grupp; Monotropa hypopithys: suilloidid; M. Uniflora: Russulaceae; Sarcodes sanguinea: suilloidid, kantarelloidid
d: Agaric1, Suillus, russula. Liigirikkaim Cortinarius, Russula; kui ühe puuliigi ol ITS1F, ITS1, ITS4, ITs4b kombin, 2RE; sekv mtDNA
ıbase: applications to ecology and evolution. Mol. Ecol. 7: 919-923. 5.8S nu-rDNA ITS vs 5.8S
evoluionay studies. Mol. Ecol. 1: 233-240. taimespets praimer 28KJ; lihtne DNA ealdamisprotseduur: 100yl CTAB+2xkloroform
ıcaceae. Can. j. Bot. 74: 1896-1909. kanarbikulaadsed: ektost erikoidse,
-Coltriciella -enamasti seotud lagupuiduga Coltricia-Coltriciella -enamasti seotu
of an ericoid mycorrhiza-forming fungus occur in roots of Epacris pulchella (Ericaceae) and Leptospermum polygalifolium (Myrtaceae) in an Australian sclerophyll forest.
290 OTU), 91 RFLP tüübist sai pärast sekveneerimist 68, millest 5 ol DGGE (59 OTU), RFLP (DGGE (59 OTU), RFLP (290 OTU), 91 RFLP tüü
ɔoreal species of Platanthera and Coeloglossum (Orchidaceae). Can. J. Bot. 68: 1171-1181.
ı orchids and a new species in the genus Epulorhiza. Rept. Tottori Mycol. Inst. 30: 43-59.
ɔatafora JF, Straus NA. 2003. Ancient tripartite coevolution in the attine ant-micr xxx Pseudoagaricus-sipelgas-parasiit, pa
ı DM, Kerr JT, Oberdorff T, O'Brien E, Turner JRG. 2004. Predictions and tests of climate-based hypotheses of broad-scale variation in taxonomic richness. Ecol. Lett. 7:
jaotusele, indiviidide arvule mullas ja mol taustuuringutele, dominantsusele; arvukus väikeses ja laias skaalas: ookean: 160/ml; muld: 6400-38000/ prokarüootide BD arvut
ınfluence of the infection on the multiplication of viruses in tomato, petunia and strawberry. New Phytol. 72: 975-983.
ooksul: domin. Cortinarius spp., Russulaceae Taxotron, probleemid kott-vs-kandseened, PCR, RFLP Sörenseni I.
ɣ concentration in sporocarps of Suillus variegatus in seven Swedish populations. Mycol. Res. 101: 545-551.
3 RE
s indicated by spatial distribution of fungal clones. New Phytol. 115: 487-493

ariegatus liigisisene
, viited võimalused ülevaade, viited
perties and nutrients in a California oak woodland. Biogeochemistry 39: 45–64.
ühel organismil mitmete alleelide olemasolu, praimerite selektiivsus erinevad PCR-l põhinevad metoodikad -limitatsioonid, ühel organismil mitmete alleelide o
ıdistic analysis of nuclear LSU rDNA sequence data. Mycol. Res. 104: 388-394. Cantharellus, Craterellus, LSU. Can
ırtigi võrgustikuga. Sage rakusisene kolonis; ainult männilistel; Arbutusel puudus
e amino acid metabolism in mycorrhizal roots of Norway spruce (Picea abies). Plant Soil 173: 67-77. N transpo
ıe. New Phytol. 113: 523-527.

x
ıeened mood väikese osa mullakooslusest. Juurtes AM polnud!
th and mycorrhizal development of containerized jack pine seedlings. For. Sci. 30: 828-835.
iljakehi produtseeriv), Amphinema
ɔlophloeus, 3 muud tüüpi
vs kaevanduspinnasele ümber istutatud: inokulandid hääbuvad 3a jooksul ja kohalikud seened votavad yle : algul E-strain; hiljem (3a) Suillus, MRA, Tuber
inevad dominandid, peamiselt siiski thelephora, E, Amphinema, MRA

te viljakehadega kottseened: Geopora ja Elaphomyces Albertas ja nende võimalikud peremeestaimed
ornamentatsiooni ja monilioidsete klamüdospooride järgi, hüüfiseinte ornamentatsioon
mittesteriilses (viletsam) kk-s 2.5 g/l Glc juures. Paks mantel Pinus ponderosa, Larix laricina; rakusisest kolonis polnud. Viitab tugevale tsellulolüütilisele ja fenooloksidaas
v vs põleng
loma, Suillus, Amphinema
ɾoughput taxonomic identification tool for use with next-generation sequencing (FHiTiNGS). J. Basic Microbiol. In press. automatiseeritud mä
ıkaylo E (ed.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 114-121.
ılnud konkreetset mõju; mõj pigem kude ja samblaliik. Kooslust mõj kõik parameetrid
Can. J. Bot. 84: 1509-1519.
from boreal and montane bryophytes. Mycol. Res. 111: 106-116. Cladophialophora spp nov sam
ja aastaajast;
d the hemiparasitic angiosperm *Rhinanthus minor* during co-infection of a host. New Phytol. 139: 555-563.

Kobresia simpliuscula, Carex spp NM
; for biodiversi Mida lähemal ekvaatorile, seda rohkem liike. Lii; Mida lähemal ekvaatorile, seda rohkem liike. Liigirikkus sõltus enim ala suurusest ja õhutemp-st. Ei usu lii;
Gondwanan disjunctions: Evidence from Malpighiaceae. Proc. Malpighiaceae on arv tek Lõuna-Am ja migreerunud läbi Lauraasia ja Põhja-Atlandi maasilla Aafrikasse
Radiation of Malpighiales Supports a Mid-Cretaceous Origin of Malpighiales on tek 120 MAT, radieerunud 110 MAT, Salicaceae tek 105 MAT, Salix+Populus 50 MAT;
e) among liverworts and angiosperms: phylogenetics, distribution, and symbiosis. Am. J. Bot. 90: 1661-1667.
rerwort-associated endophytes. Am. J. Bot. 95: 914-924. maksasammalde risoidide endofüüdid: seenekooslused erinevad suureneva distantsiga, ent l
in plant ecology. Annu. Rev. Ecol. Syst. 33: 507-559.
ical tree family Dipterocarpaceae based on nucleotide sequences Sarcolaena (Monotes(Pakaraimaea(sg Sipterocarpus+Shoreae))); ebasobiv outgroup. Vateriopsis kuulub D
nically profitable post fire restoration with black truffle (Tuber melanosporum) producing plantations. New For. In press.
mpling-based normalization strategies for tagged high-throughput sequencing datasets from gut microbiomes. Appl. Environ. Microbiol. 77: 8795-8 rarefaction mediaani
rersity. Trends mullaökoloogia ruumiline aspekt: bottom-up ja t mullaökoloogia ruumiline aspekt: bottom-up ja top-down suhted eri ökosüsteemides. Eri organismide BD g
Bezemer TM, mullaökoloogia: fauna indutseerib taimede suktsessiooni, inhibeerides algkoosluste dominanttaimeliike
/ 2: 131-133.
of Laccaria bicolor in pure culture and in symbiosis with Pinus banksiana. Can. J. Bot. 73: 1768-1779.
JR. 2001. Cli taimede regenereerumist takistab tuli, vihm ja järgnev erosioon. Vihm tasandab Helianthemumi ja Cistuse seemikute suurusjaotust
as: pms saproobsed kandseened, siin-seal EcM seened: Russ-Lact, Ramaria, Cort, Inoc, Coltricia; muuhulgas Phellodon ja Sarcodon. Kohalikud po
tandustes: Tuber 7 spp, Hymenogaster 5 spp, Genea 2 spp

/. Trends Ecol. Evol. 20: 68-73. arv läbi ookeanide levimine on tähtsam võrreldes vikariantsuse ja mandritriiviga kui seni arvatud. Näited, t

ivelihoods. Proc Nutr. Soc. 65: 190-197.
tomycorrhizas published since 1961. Mycol. Res. 109: 1063-1104.
R. 2012. Land use alters the resistance and resilience of soil food webs to drought. Nat. Clim. Ch. 2: 276-280.
of Grania (Annelida, Clitellata, Enchytraeidae), with discovery of a cryptic speci Enchytraeidae: barcoding ITS parem kui COI (sel esineb liigisis var suur)
what did Baas Becking and Beijerinck really say? Environ. Mi baas Becking
al fungi on bir varajase vs hilise st seened: eri kaugusel tüvest eri seened mood mükoriisat; hilisema st seened mood rohkelt EcM viljakehade all, varase st seened mitte; va

rsen GL. 2011. PCR amplification-independent methods for detection of microbial communities by the high-density microarr DNA ja RNA põhine PCR-vaba phyloc
ngal endophytes of Dipodium hamiltonianum (Orchidaceae). Aust. J. Bot. 54: 487-491.
logy, physiology, evolution and conservation aspects. In: Hock B. (ed.) Fungal associations, The Mycota IX, 2nd ed., in press. Springer-Verlag, Berlin, Germany.
a 17: 475-486.
n California. Mycologia 95: 148-155.
corrhizal fungus Hebeloma cylindrosporum associated with Pinus pinaster. New Phytol. 105: 429-435.

ons of ectomycorrhizal fungi. In: Varma A, Hock B, eds. Mycorrhiza. ???
Pilo3, Pilo4; taksonitest domin: Lactarius/Russula, Piloderma, Amphinema+Tylos ITS1F-NL6C
e of regenerating Betula alleghaniensis and Acer saccharum seedlings in two Quebec mixed deciduous forests. Can. J. For. Res. 32: 1094-1102.
the arbuscular mycorrhizal fungi colonizing Clintonia borealis from a mixed-wood boreal forest. FEMS Microbiol. Ecol. 58: 225-235.
ca. Mycotaxon 103: 329-335.
central African edible mushroom. Cryptog. Mycol. 28: 171-176.
nbezian woodland area A nutritional and ecological approach. Biotechnol. Agron. Soc. Environ. 1: 221-231.
415-433. Collembola: süsteem, morf, 70
nus fertility on varjutamine suurendab männi ja kase tüve pikkust, mitte kuusel; männil ja kuusel oli tugevaimaks konkurendiks kask, mis pärssis kavu enim, seda mõj. Ka h
carpacae vs Fagaceae vs Pinaceae Chiang Mai kandis: Fagaceae all kõige liigirikkam. Väidet 37/57 liiki assots vaid dipterokarpidega
ei mood HN ning tapavad Casuarina equisetifolia. Eukalüpti kasv suurenes 13-32 korda, Allocasuarina max 3x, Casuarina max 2 korda. Casuarina juured tegelesid vasturea
d. Arv. Et viljakehas stimul juurte kasvu ja toitainete eritamist, mis induts VK arengut ja toitaineid
id Hiinas: Pisolithuse püsimine (moned pysivad, teisi pole tuvastatud) ITS: Pisolithus
Vogel TM. 2011. Assessing the soil metagenome for studies of microbial diversity. Appl. Environ. Microbiol. 77 ekstraheerimise, rakkude lüüsi ja fragmentide pikk
ion as a presumptive indicator of nitrogen fixation. Bot. Gaz. 140: S65-S69.
ic patterns in *Leccinum* sect. *Scabra* and the status of arctic-alpine species of *L. rotundifoliae*. Mycol. Res. 111: 663-672. Leccinum sect Scabra: Gapdh annab
host specificity in the ectomycorrhizal genus *Leccinum*. New I Leccinum: ITS2, Gapdh -omavah inkongruentsed, ITS ei suuda hästi e Leccinum: ITS2, Gapdh -omavah inl
vork analyses. BMC Bioinform. 13.113. network analüüs: mõ
10: 363-369.
la seenestik sarnaneb enim AFR omadega, er saproobide osas. E Venezuela seenestik sarnaneb enim AFR omadega, er saproobide osas Venezuela seenestik sarnaneb enim
65.
of zinc toxicity to higher plants. New Phytol. 135: 251-257.
se to zinc among ectomycorrhizal associates. New Phytol. 106: 535-544.
oreau P-A, Nagasawa E, Soytong K, Taylor AFS, Watling R, Moncalvo J-M, McLaughlin DJ. 2010. Molecular phylogenetics of porcini mushrooms (Boletus section Bolet
NA barcode markers for mushrooms and allies. PLoS One 6: e25081. COI vs ITS: COI amplif eri pra
ng the mycelia of stipitate hydnoid fungi in soil. Journal of Microbiological Meth spets praimerid liigsiseselt Bankera, Phellodoni, Hydnellumi ja Sarcodoni lii
evi D, Hu P, Andersen GL. 2006. Greengenes, a Chimera-Checked 16S rRNA gene database and workbench compatible with ARB. Appl. Environ. Microbiol. 72: 5069–5
. Phan, and G. L. Andersen. 2006. NAST: a multiple sequence alignment server for comparative analysis of 16S rRNA genes. Nucleic Acids Res 34:W394-9.
ber, D. Dalevi, P. Hu, and G. L. Andersen. 2006. Greengenes, a Chimera-Checked 16S rRNA Gene Database and Workbench Compatible with ARB. Appl Environ Micro
/ structured environmental variation. Evolution 57: 2647-2652. fülogen distantsimaa
ui ka Endogonales; kumb primaarne ei teata. Järjestused nii E. pisiformiselt kui ka flammicorona rühmast. Jpt rühmadest
f gastroid boletes from Thailand. Fung. Div. 37: 1-8.
boletes from Malaysia. Mycologia 100: 956-961. Durianella: lähedane Intsiaga s

ss väheneb; N-väet: ei muuda eriti. Mõl mõjuvad koosluse struktuurile
nay increase w www: Betula nanast liiguba C ainult Betulasse, mitte Salixisse, erikoididesse ega rohttaimedesse; Ledumist ei liigu C teistesse taimede
sms (DALP) or how to get and characterize new genetic markers in many species DALP metoodika populatsioonigeneetika voi kryptiliste liikide uuringuks. Fragmendid ke
alisation in par nisi konservatism parasitoididel, lehetäidel ja peremeestaimedel: lehetäide fülogeneesil oluline mõju pa nisi konservatism parasitoidide
he I, Rizzo DM. 2007. The fungal dimension of biological inva: invasiivsed seened: ülevaadatud; Phytophthora infestans, P. Alni, Cryphonectria parasitica,
and Armillaria sinapina in the central interior of Brittish Columbia. Can. J. Bot. 7 Armillaria sp2

productivity, and nutrients in boreal grasslands. Can. J. Bot. 82: 104-114.
lpine and bore AM vs ECM (antagonistlik v.a. Hebeloma sp) vs Rhizoctonia (mitteantagonistlik)
eri päritolu isolaatide erinevused viljakeha morfoloogias ja viljakehade ning ECI 3 RE, 9prRAPD
humicola on *Picea abies*. Nova Hedw. 84: 429-440.
survive drying. Mycorrhiza 17: 547-550.
giumi kasvu ja nodulatsiooni; eksperim küll vildakas ja sampling efekti mõju; kõikidel juhtudel mitu liiki parem kui eri monokultuurid
-330. lähte-ja mülgaspopulatsioonid: definitsioon, areng, asukate fitness, kaitse: ÜLEVAADE; VIITED
stimate the proportion of Pisolithus tinctorius and Eucalyptus globulus RNAs in ectomycorrhiza. Appl. Environ. Microbiol. 63: 840-843.
stimate the proportion of Pisolithus tinctorius and Eucalyptus globulus RNAs in ectomycorrhiza. Appl. Environ. Microbiol. 63: 840–843.
aid Cenococcum kattub (sekvents 99.8% identne). Tomentella sp ja juure-endofüüdil sama T-RI proovide kokkusegamisel saab vähem liike kätte k
beech spread. Nothofaguse seemikute EcM kolonis kukub järseult pärast 12 m; Kunzea lähedal sama mis Nothofagusele 12 m lähemal
hizal fungal communities of oak savanna are distinct from forest communities. Mycologia 101: 473-483.
nism (T-RFLP) to identify mycorrhizal fungi: a methods review. Mycorrhiza in pr T-RFLP kasutamine mükoriisa T-RFLP kasutamine mükoriisaseentel: ülevaade, probleem
effects attenuate from species to ecosystem properties? A field test with wood-inhabiting fungi. Ecol. Lett. 15: 133–141.
tamme ECM kolonis on palju tamme läh> Helianthemumi läh > eemal (>20 m)
ede läheduses
Richardson SJ. mükoriisade suktsessioon: väga erinev piirkonniti; suktsessiooni alguses on oluline roll nähtustel dispersal limitation ja pedogenees
zanska E. 2006. Soil modification by different tree species influences the extent of seedling ectomycorrhizal infection. Mycorrhiza 16: 73-79.
s sp. Pezizales: 2sp ITS
iikide arvelt); Laccariat rohkem ja Russulat vähem raiealal
elds and savan tammedel suurem elumus vanade puude risosfääris vrd eemal, mida seletatakse seente abil saadud suurema N konts abil; Väga oluline oli võistlus rohundite
T-RFLP, 2RE Zar, 1999 X2 test iga lii
A, Orwin KH, Kirschbaum MUF, Hunt JE, Burrows LE, Barbour MM, Aislabie J. 2011. Ecosystem service and biodiversity trade-offs in two woody successions. J. Appl.
r (GERM) program. Mycorrhiza 13: 171–172. Exceli-põhine proge RFLP bändide võrdlemiseks Exceli-põhine proge RF
)-233. spetsiifilisus ja eelistus mulla ja peremeestaimede osas; peremees võib ka mulda mõj: nishide n dimensionaalsus.
a G. 2010. Multi-host ectomycorrhizal fungi are predominant in a Guinean tropical rainforest and shared between canopy trees and seedlings. Environ. Microbiol. 12: 221
ITS-RFLP, mtLSU sekveneerimine; ITS1-ITS4 ei ampl Afzelia DNA
. Contrasting responses to ectomycorrhizal inoculation in seedlings of six tropical African tree species. Mycorrhiza 16: 11-17.
oncentrations of glucose and fungal inoculum influence the competitiveness of two early-stage ectomycorrhizal fungi in Afzelia africana seedlings? For. Ecol. Manage. 203:
s in leaf 13C discrimination and implications for studies of past and future climate. Proc. Natl. Acad. Sci. USA 107: 5738-5743.
s liigisisene, vs peremeestaimed ja kasvukohatüübid Pisolithus ssp
truffles (*Terfezia* and *Tirmania*), host specificity and edaphic tolerance. Mycologia 94: 247-259. (Terfezia+Tirmania)Mattirolomyces
r, Labyrinthomyces, Lacc fraterna, Pisol albus, Ruhlandiella berolinensis, Setchelliogaster (kõik AUS seened). Lisaks Sebacina, Thelephora jt teadmata päritoluga seened.
as, a saprotrophic fungus and the decomposition of organic substrates in a microcosm. Biol. Fertil. Soils 4: 145-150.
rimata tüübid vähenevad
A. 2008. 15N enrichment as an integrator of the effects of C and N on microbial metabolism and ecosystem function. Ecol. Lett. 11: 389-397.
rogen stable isotope composition of leaves and roots of plants growing in a forest and a meadow. Isotopes Environ. Health Stud. 39: 29-39.
Domin. Alnicol Lepp fix 40-85 kg N/ha*a. Mullahingamine ja primprod kõrgeim lepikus vrd pöögi metsa ja põlluga. Järeld, et lepp investeerib palju C ülalpidamaks risosfää
kvantitatiivse analüüsi põhjalsuurem aeglaselt lagunevas nisupõhus kui rukkijäär DGGE kvantitatiivne interpret ühel bakteriisolaadil kuni 5 DGGE bandi
liikide ja perekondade vahel tugevad peremehe-eelistused seeneliikidel RDA_MRPP, indika
ngs in geographical ecology. Glob. Ecol. Biogeogr. 12: 53-64. ruumiline autokorr: t
iguez MA, Hawkins BA. 2012. On the selection of phylogenetic eigenvectors for ecological analyses. Ecography 35: 239-249. fülogeneetiliste eige
nating phylogenetic inertia. Evolution 52: 1247-1262. PCNM-tü PCNM-tüüpi analüü
ecific variation in quantitative traits using sequential phylogenetic eigenvector regressions. Evolution 66: 1079-1090. fülogenee fülogeneetiliste eign
heory in geographical ecology. Glob. Ecol. Biogeogr. 17: 479-488. ruumuline autokorr:
eared from fungi in Benin. Afr. Invert. 54: 357-371.
oma, and *Sphaerozone* (order Pezizales). Mycotaxon 12: 287-306.
4-416.
white rot and ectomycorrhizal fungal species and the accumulation of chlorinated benzoic acid in ectomycorrhizal pine seedlings. Chemosphere 49: 297-306. PAH ja kl
ymbioses of ectomycorrhizal fungi. Mycorrhiza 3: 63-68.
ology 24: 7. (abstr.)
American Midland Naturalist 54: 443-451.
mikroobide biogeo: poolt ja vastunäited
analysis: a nev nishianalüüs alternatiivina PCAle ja CCAle: viited: ADE-4 nishianalüüs alternatiivi
d koos seenega
otroph *Arachnitis uniflora* has a unique association with arbuscular mycorrhizal fungi. Botany 87: 1198-1208.
nzalez JA. 2006. The influence of mycorrhization with Tuber melanosporum in the afforestation of a Mediterranean site with Quercus ilex and Quercus faginea. For. Ecol.
Tatra mäed: EcM: Dryas octop, Helianthemum grandiflorum, Bistorta vivip, Pinus, Picea, Salix, Fagus, Rosa (Cenoc) ja Sorbus (A-type). Pedicula
Tatra mäed: EcM: Picea, Salix, Pinus, Sambucus racemosa, Sorbus aucup, Ribes (A-type EcM)
Tatra mäed: Pinus spp, Picea, Betula, Salix 2 spp mood EcM; Polygonum bistorta ja verticillatum mood AM
Tatra mäed: EcM: Picea, Salix, Fagus, AbiesAcer pseudoplatanus, Dryopteris filix-mas, Galium schultesii (A-tüüp ja Cenoc); Sorbus NM

-152.
Ulmus campestris AM
Pyrus communis EcM, vähem AM; Malus sylvestris AM, vähem EcM; Padus avium nii EcM ja AM, illustr!
Pyrus communis kogu Poolas: domin AM, vähem EcM. EcM leidub sõltumata mullatüübist, pHst, muudest EcM puudest, varieteedist ja geogr asu
zwojowa jego metsapuude sügavusjaotus: eripuudel eri sügavusel, kuigi enamus pindmises20 cm
POL: Pinus, Populus tremula, Salix, Betula EcM, Lythrum salicaria mood EcM, millel õhuke seenmantel tumedatest hüüfidest ja HN puudus (Illus
mükoriisastaatus Põhja-Poola pöögimetsades. Palju paska, sest oli vilets EcM kriteerium, pidas DSE Cenococcumiks ja arv. Eksis juurte määramis
e mantli str järgi; Ga, Ib, Id Tomentella; Ia, Ic Tuber; Kb-Cenoc; Kc Mel. Bicolor
. Tomentella ja Cenoc pandud ühte patta (Ga)
ient allocation and mycorrhizas in Scots pine seedlings. Plant Soil 239: 173–185.
nalysis of a hyp Network-anal: seemnelevitajad Animalia: tugevad moodulid, mis sõltuvad pms loomade kehasuurusest ja ka fülogeneet seostest
n of foraging ectomycorrhizal mycelial systems in soil microcosms. Mycorrhiza 14: 37–45.
lial systems of Stropharia caerulea and Phanerochaete velutina to soil nutrient enrichment. New Phytol. 138: 519 – 531.
haria caerulea and other cord-forming, saprotrophic basidiomycetes. New Phytol. 151: 691-704.
nviron. Contam. Toxicol. 54: 507-513.
uurem väetamata heinamaadel. Efekt ka seeneliikidele: vs väetis; muld vs lehekõ PLFA: mikroobide biomass, seente/bakterite osakaal suurem väetamata heinamaadel. Efel
nt geography. Int. J. Plant Sci. 162: S41-S52. biogeograafia: enamus taimi on Hiinast läinud yle Beringi väina NW-Am>NE Am, NW Am välja surnud; v
d the Northern Hemisphere. Phil. Trans. R. Soc. Lond. B 359: 1 taimed põhjapoolkeral perek kaupa: pms jagunemismustrid SE Aasia-NE Am, kusjuures SEA on pms algk
y. Proc. Natl. Acad. Sci. USA 105: 11549-11555.
of species distribution data. Glob. Ecol. Biogeogr. 16: 129-138. ruumiline autokorrel
, Hirzel A, Jetz W, Kissling D, Kühn I, Ohlemüller R, Peres-Neto PR, Reineking B, Schröder B, Schurr FM, Wilson R. 2007. Methods to account Ruumiline autokorre
s of species distribution data. Glob. Ecol. Biogeogr. 16: 129-13 ruumiline autokorr: liigirikkuse lokaalsetel andmetel tekitab kohalikul ruumiline autokorr: l
vol. 2. Polyporales, Boletales, Agaricales, Russulales. pp. 330-333. Nordsvamp, Copenhagen.
of ectomycorrhizas in the response of Douglas fir seedlings in drying soil. New Phytol. 117: 327-334.
ynthesis in Douglas fir seedlings by some ectomycorrhizas. New Phytol. 115: 267-274.
ynthesis in Douglas fir seedlings by some ectomycorrhizas. New Phytol. 115: 269-274
aryons from a basidiome of Laccaria bicolor using random amplified polymorphi RAPD Laccaria bicolor; genetiline sidusus: palju väikeseid kromosoome
tree. John Hop Eukalüptide kasvatamine väljaspool Austraaliat: kõrge produktsioon, vastuolu kohalike elanikega, inh kohalike liikide kasvu. 1828 to
177: 849-858.
biogeography, and characters associated with a radiation of the Nyctaginaceae: Neea, Guapira ja Pisonia sõsartakson on Pisoniella, ja Nyctaginaceae: Neea, Guapira ja Pis
uhtas männikus domin. Cenoc, Basidiom1 (arv Inocybe), Piloderma1K; segamets ITS1-4B (ITS4) + 2 RE; sekv ITS ja mtDNA
coccum geophilum as a model to test how species concepts influence recombination analyses using sequence data from multiple loci. Curr. Genet. 52: 191-201.
night be used to develop microsatellite markers in organisms with limited amoun AFLP põhjal mikrosatelliitmar AFLP põhjal mikrosatelliitmarkerite ning SCAR praimerite
ectomycorrhizal fungus Cenococcum geophilum. New Phytol. 166: 263-271. gpd, ITS, CgSSU intron: , mt SSU: Cenococcumi pu Cenococcum: gpd, ITS, CgSSU intr
mycorrhizal fungi: from current knowledge to emerging directions. Fung. Biol. 115: 569–597.
ycorrhizas. I. Morphological and cellular changes in mycorrhizas formed by Tylospora fibrillosa and Paxillus involutus. New Phytol. 122: 141-152.
e woodland fairy ring fungus Clitocybe nebularis. New Phytol. 111: 699-705.
t Sci. 157: S3-S39. Gnetales vs õistaimed: ülevaade
onary and ecol liigirikkuse-pindala seoseid tugevdab enir liigirikkuse-pindala seoseid tugevdab enim 1) proovide pesitsi paiknemine; 2) mets, 3 ala su
n. Available at http://R-Forge.R-project.org/projects/sedar/.
ework for principal coordinate analysis of neighbour matrixes (PCNM). Ecol. Model. 196: 483-493. PCNM vektorite par
or community and ecosystem ecology: comment. Ecology 80: 1081-1085.
r of ectomycorrhizal abundance and diversity. Plant Cell Environ. 32: 992-1003.
h BEAUti and the BEAST 1.7. Mol. Biol. Evol. 29: 1969-1973.
nizal influence on hydraulic and hormonal factors implicated in the control of stomatal conductance during drought. J. Experim. Bot. 47: 1541-1550.
rRNA gene in Armillaria. Mycol. Res. 94: 266-269. 5S rDNA suund enamusel kandseentel ja Armillarial sama
l fungus Paxillus involutus: contribution of oxalic acid. oksalaat: l
eal population allocation, based on AFLP data. Mol. Ecol. Notes 2: 380-383. AFLPOP -AFLP markerite analyysimisprogramm, vabavara, mahalaadimisviide
oxina
M-seentega. Diferentseerunud koed ja tugev AM-hüüfide mass Treubia -algelisimaid maksasamblai

ns in liverworts share the same mycobiont: isolation of the partners and resynthesis of the associations in vitro. New Phytol. 129: 439-447.

l to the nitrogen-fixing legume tree Acacia crassicarpa A. Cunn. ex Benth. in a field experiment in Madagascar. Eur. J. Soil Sci. IP.
Sarcoleanaceae on ECM taimed, dipterokarpuste sõsarsugukon Sarcoleanaceae on ECM taimed, dipterokarpuste sõsarsugukond endeemne Madagaskaril. Nende ML anal
arellus garnierii sp. nov. , une nouvelle chanterelle des maquis miniers nickélifères de Nouvelle Calédonie. Crypt. Mycol. 25: 115-125 Cantharellus garnierii Uus-Kaledoor
Madagascar: EcM puud Asteropeia 2 spp (Asteropeiaceae), Leptolaena, Schizolaena, Sarcolaena (Sarcolaenaceae), Intsia bijuga. Asteropeiaceae sõ
vaid Acacia sect Phyllodes (syn Racosperma; Austraaliast) moo vaid Acacia sect Phyllodes (syn Racosperma; Austraaliast) mood EcM. Koik akaatsia liigid mood AM. Se
Senegalis looduslikud EcM puud Monotes, Uapaca, Caesalpinaceae. 4 metsatyypi kus EcM sened kasvavad: troop vihmamets, sesoonne mets, savann, istandik.
n of the vegetative mycelium of ectomycorrhizal plants. III. Ultrastructural and autoradiographic analysis of inter-plant carbon distribution through intact mycelial systems.

Suillus grevillei peremehespetsiifika C-puuduses
Suillus grevillei peremehespetsiifika C-külluses (10g/l)
for a flexible a liigirikkuse ja indikaatorliikide mõõtmine: TWINSPAN oma puudustega, uus ja plastilisem IndVal liigirikkuse ja indikaato
Arbutusel ektendoMR, sh tuberkuloidne tüüp
overdominance in the structure of natural communities of arbuscular mycorrhizal fungi: in there a role for stochastic processes? J. Ecol. 98: 419-428.
niche and neut AM-seentel pH gradiendiga mullas: ohtrus kattub kõige paremini zero-sum multinomiaalse jaotusega. Võtsid arvesse ruumilist autoko
nguinea, Scleroderma polyrhizum, Tricholoma albobrunneum, Tuber borchii, Xerocomus badius: sünteesitud männil

rma ja Leccinum viljuvad 3-aastaste istikutega
rial diversity in four Arizona soils. Appl. Environ. Microbiol. 68: 3035–3045. bakterid 16S rDNA bakterid 16S rDNA: BD
nterelle (Cantharellus formosus) genet size using co-dominant microsatellite marl ISSR: Cantharellus formosus pop-d genepop
ındikes W AUS ja üle maailma. Maailmas domin perek Laccaria, Rhizopogon, Suillus, Scleroderma, Tricholoma -kokku 99 liiki, sh Thel terrestris ja Cenococcum
th ectomycorrhiza development in Eucalyptus globulus and Pisolithus macrocarpus. New Phytol. 165: 599–611
ıem, L. bicolor peab mitu aastat vastu)
)08. Soil factors influencing the growth response of Acacia holosericea A. Cunn. Ex G. Don to ectomycorrhizal inoculation. New For. 35: 105-117.
nmunities. In: Dighton J, White JF, Oudemans P, eds. The Fungal Community. Its Organization and Role in the Ecosystem. CRC Press, Boca Rayton, FL, USA, pp. 833-85
:ühimiku suurus

; by ectomycorrhizal fungi in association with Douglas fir. New Phytol. 127: 725-729.
:ological paradigm versus a statistical concept. Oikos 66:152-171. heteroskedastilisus -term
ts. Ecology 74 heterogeenses kk-s: stat analüüs, erivoimalused: blokistamine, nested analüüs, plottide summeerimine kui pole ploti efekti, heteroge heterogeenses kk-s, eriv
ycetes, including the white rot species Coriolus versicolor and Phanerochaete chrysosporium. Appl. Microbiol. Biotechnol. 39: 5-10. oksalaat:
ıd ecology in the soil environment. Can. J. Microbiol. 42: 881-895. oksalaadi
)04. The evolution of non-reciprocal nuclear exchange in mushrooms as a consequence of genomic conflict. Proc. R. Soc. Lond. Ser. B. 271: 1235–1241.
ographical dis taimede, loomade liikuvus, kohanemisvõime on suurem, BD väiksem suuremätel laiuskraadidel, sest Milankovitschi tsükkel mõjutab rohkem
estone grassla loopealsed niidud: peale metsaraiumist taastub aeglaselt
others. 2011. The plant cell wall-decomposing machinery underlies the functional diversity of forest fungi. Science 333: 762-765. pruunmä
zation of ectomycorrhizal fungi under simulated nitrogen deposition. Mycologia 94: 921–932.
8 RE; eristatavus; sekv Lactari sõsarliigid
liigisisene 5 restriktaasi; sekv liigisisene varieeruvus
Russula, Lactarius Russula, Lactarius

rinevus eri inimeste vahel ja mukoosa ning .. Vahel; uued klaadid. Kõikvõimalikud programmid BD võrdlemiseks: rarefaction, ekstrapoleerimine, S rarefaction, ekstrapoleer
haw HD, Heilman PE, Hinckley TM. Eds. Biology of Populus and its Implications for Management and Conservation. NRC Research Populus: vanimad fossiilid troo
sification for Pinus (Pinaceae): phylogenetic tests of fossil-basec Pinus: tek Ida-Aasias ja levinud palju kordi üle Beringi väina Ameerikasse
iction fragment length polymorphism analysis of ribosomal RNA genes to assess T-RFLP seente SSUle 2 RE, p T-RFLP seente SSUle 2 RE, prair CA T-RFLP kvantit mu:
:l. Ac. Res. 26: 2460-2461. Uclust Uclust
ın reads. Nature Meth. 10: 996–998.
:iti Malassezia ja Cryptococcus-sarn pärmid;
ıgal spores along a forestry gradient – responses to habitat loss and isolation? Oikos 104: 35-42.
ing spore dispersal of wood-decaying basidiomycetes. Mycologia 95: 553-556.
T-RFLP mullast: ITS1F-4B+nested ITS1F/4; 3 RE: madal resolutsioon, isegi mõningaid e
ssessed by computer-simulated restriction analysis of a diverse collection of ector T-RFLP vs RFLP Ektomükori T-RFLP vs RFLP Ektomükoriisaseente ITS regiooni erista
spheric N deposition alters fungal community composition and suppresses ligninolytic gene expression in a northern hardwood forest. PLoS ONE 6: e20421.
llakiht ja peremees mõj koguseene-kooslust enim, CO2 ja O3 efekt marginaalne, arv mõj saproobe ja MR-seeni erinevalt
ilability in grassland. New Phytol. 110: 377-381.
izal fungus, Glomus mosseae, within plant roots by competitive polymerase chair comp quant PCR Glomusele. Heterodupleksi probleem ja lahendus
ɔlia Nee. (Fagaceae): patterns of root colonization and effects on seedling growth. Mycorrhiza: accepted
E-strain fungi inferred from ribosomal and mitochondrial DNA polymorphisms. M RFLP Wilcoxina spp: W rehmii on turbapi
rrhizas. Can. J ECM sümbioos kui vastastikune parasitism ja ekspluateerimine: sõltuvus keskkonnast, ekspluatatsiooni def Bronstein2001 jr; stabiliseerivad mehanismid: ge
ıgs and postfire ascomycetes (Pezizales) in monoxenic culture. Can. J. Bot. 64: 2719-2725.
eeds and germinants of lodgepole pine. Can. J. Bot. 64: 2368-2371.
Mycologia 78: 771-780. pürofiilse
. Bot. 73: S1415-S1422. ülevaade eripraimeritest: NL6Bmun jt. Eriti just sekveneerimine annab lubavaid tulemusi
ıd its relationship to *Tricharina* (Pezizales). Can. J. Bot. 74: 773-779. veidrad praimerid, Wilcoxina, Trich
Pezizales: arv esineb tugev kontiinum saproobidega, sest paljudel saproobsed omadused: tsellulaasid, polüfenooolioksidaasid, ligninaasid, kiire kasv.

ses. Ecosystem invasiivsed liigid mõjutavad mullastiku protsesse: ÜLEVAADE. Eriti kasvab biomass, võivad tulla juurde uued funktsioonid. mändidel C ja varise hulk kasv
ıd Fungal communities in identification of cellulose-responsive soils by using stable isotope probing. Appl. Environ. Microbiol. 2012, 78(7):2316-2327. SIP mull
Cassiope tetragona embraces the Arctic. J. Biogeogr. 34: 1559 Cassiope (Ericaceae) on pärit Beringiast, kust on korduvalt levinud välja ja nüüdki N-Am ja
2013. Genetic roadmap of the arctic: plant dispersal highways, t Arktika taimed: Eri liikidel geneetilised piirid läbivad harilikult Kesk-Gröönimaa ja Uuralid
microbial communities: the strong effect of depth on the structure of bacterial and archaeal communities in soil. Soil Biol. Biochem. 50: 58-65.
occurring plan eritaimedel on erinev juurte allokatsioon, juure eripind jms; erinev reaktsioon mulla heterogeensuse dimensioonidele
3. Plant diversi taimede BD mõju mullaloomadele: mõju mikrofaunale positiivne, mesofaunale neutraalne; kasut path analüüsi e structural equation m
NH4+ by Paxillus involutus in association with Betula pendula and Picea abies as affected by substrate pH. New Phytol. 128: 629-637.
ıd Norway spı kuusk ja kask www: 13C netotransport vaid 2%, sellestki pool juurtesse; kui algul andis kuusk 100% C seenele, siis hiljem vaid tühise osa ja sai 15N vastu
ıs involutus in ectomycorrhizal association with Betula pendula. New Phytol. 135: 133-142.
Guyana keskosa taimede nimestik: sh EcM puud Pradosia, Papilionaceae, Gnetum, Nyctaginaceae, Coccol
soils reveals speed of link between tree photosynthesis and root respiration. Oecologia 127: 305-308.
nsfer from *A. incana* to *Pinus sylvestris* influenced by macronutrients and ectomycorrhiza. New Phytol. 131: 453-459.
ation of added C3 -, C4 -and 13 C-labelled sugars to a C3 -forest soil. Oecologia 131:245-249.

ria and fungi in soil profiles from three Danish forest sites. Soil mikroobide levik sügavuti mullas: 1m-ni bakterite hulk väheneb 100..500x; seentel 30..70x, algloomadel 50
mensionality of ecological networks. Ecol. Lett. 16: 577-583. network-analüüs: dir
ı functioning ir mullaökoloogia: ülevaade: teadmatus, funktsionaalsed rühmad, nende interaktsioon, muld takistab organismide liikumist
tive physiological studies. Trans. Br. Mycol. Soc. 51: 353-367.

ition. Trans. Br. Mycol. Soc. 51: 353-367.
GM, Stahl DA. 2003. Direct profiling of environmental microbial populations by thermal dissociation analysis of amplifitseeri amplifitseerimata kogu rRNA 0,5 g proovist;
ITS1-4, 3RE
omycorrhizal Suillus collinitus strain on Pinus halepensis roots suggest successfu ISSR ektomükoriisadele, SCA ISSR ektomükoriisadele, SCAR marker ühele Suillus collin
bishop.hawaii.org/bishop/HBS/ Havail eri organismidest endeemide arvukus
Dryas octopetala Euroopa levila, VIITED esmastele mükoriisakirjeldustele (Hesselman 190
nentella (7). Liikidest domin Cenoc, Lact pseudomucidus, Piloderm asp.
environmental statistika: tavaline vs Bayesia tavaline vs Bayesia
pulation genomics and local adaptation in wild isolates of a model microbial eukaryote. Proc. Natl. Acad. Sci. USA 108: 2831-2836. populatsioonigenoomika tuvast
es. Am. J. Bot. 74: 123-131.
ssimilation and isotopic fractionation of nitrogen by mycorrhizal and nonmycorrhizal subarctic plants. New Phytol. 151: 513-524.
ssimilation and isotopic fractionation of nitrogen by mycorrhizal fungi. New Phytol. 151: 503-511.
nts and a Clavaria sp. New Phytol. 84: 661-667.
y a binucleate Rhizoctonia solani-like fungus. Plant Disease 70: 148-150.
ents. Adv. Eco skaalade ekstrapoleerimine, mikrokosmoste suurus, sellest tingitud vead
ss partitioning lokaalsed kooslused on taksonoomiliselt sarnasemad kui võiks oletada.
nunities. Natur puude biomass ei sõltu laiuskraadist; puude arv ha kohta suurem troopikas ja see otseselt mõj BD-laiuskraadi suhet.
ectomycorrhizal mat soils of a Douglas fir ecosystem. Soil Biol. Biochem. 23: 285-290. Hysterang
v. Conserv. 17: 261-276. Protistide seas palju kirjeldama
ant Ecol. Evol. tolmjate seemnetega taimed - pms parasiidid või mükohet; Rubiaceae jt pole parasitismi tuvastatud; Poolparasiitne eluviis on eeldusek
s 68:371-374. liigifondi hüpotees: testimiseks peab olema täielik liikide nimekiri ja ka liigifond ise; või uurida liikide evol kiirusi eri aladel samades perek-des
ecosystems. (jääkpopulatsioonide tähtsus taimedel
nslocation in ectomycorrhizal and non-mycorrhizal pine seedlings. New Phytol. 119: 235-242.
f three ectomycorrhizal fungi to colonize Pinus sylvestris roots. Mycol. Res. 96: 270-272
ectomycorrhizal basidiomycete Tylospora fibrillosa by RFLP analysis of the PCI Tylospora fibrillosa: IGS, ITS -kultuurist -ei mingit e Tylospora fibrillosa: IGS, ITS -kultu
, Tylopilus 3 RE, Taxotron probleemid topeltbändid …
ngi infecting *Pinus sylvestris* L. II. Growth rates in pure culture at different pH values compared to growth rates in symbiosis with the host plant. New Phytol. 115: 683-6
Pinus sylvestris L. III. Saprophytic growth and host plant infection at different pH values in unsterile humus. New Phytol. 117: 405-411.

1 RE: Tylospora vs teised
minant tree co Brachystegia: seemned ei kuku kaugemale võrast kui 4 m; seemikute arengu kriitiliseks osaks on läbi mullakoore tungimine. Idandamine

tatistilised erinevused
sia herba-alba Helianthemum squamatum idanemine: 5 a jooksul ei vähene õhukindlas purgis; puju on allelopaatiline: eriti külm ekstrakt vrd kuumaga ja suuremates kontse
olishment of H Helianthemum squamatum elumus: sõltub pos kõvast mullakoorikust, samblikukattest, emataimedest jt rohttaimedest; neg sammaldest. Seemned ei levi kaug
jooksul

ruumiline mullaökoloogia: ülevaade
able Isotopes in Ecology and Environmental Science. Blackwell Publishing: Oxford, UK. Pp. 83-98.
e) is clarified by sequence data from duplicated GBSSI genes. Am. J. Bot. 89: 1478–1484. Rosaceae: Photinia lähim sugulane c
rmania spp. New Phytol. 112: 419-422. uurea kog
range expansion: lessons from the infinite-island model. Mol. Ecol. 13: 853-864.
rincipe, S. Tomé, and Annobon). Bull. Brit. Mus. Nat. Hist. Ser. Bot. 4: 327-411.
s en Afrique Tropicale: Etude de Quelques Especes Rouges. Belg. Journ. Bot. 131: 139-149.
s Cantharellus (Basidiomycetes). Aust. Syst. Bot. 14: 587-598. Cantharellus AUSs -tohutult valemä
ncommon mut endofüütide kasulikkus. Toksiinide tootlikkus ja mulla N rikkus

61: 1-10. Faithi fülc Faithi fülodiversiteet
mente JC, Knight R, Heath AC, Leibel RL, Rosenbaum M, Gordon JL. 2013. The long-term stability of the human gut microbiota. Science 350: 44.
opy number on PCR amplification of 16S rRNA genes from a mixture of bacterial PCR 16SrRNA geenide eristar PCR 16SrRNA geenide eristamine kui on erinevad koopia
obs Pinus strobuse seemikute l taimlates. ILLUSTR. Amphinema mütseel väga seotud männi varise ja kõduga ning arvab sellel olevat oluline roll
e viljub itaalias ebatsuuga ja männi 2-3 a istandikes. V sage. Lehise all puudub. Mood mükoriisat, kus vaheseinu ei leitud
eri mullakihtides
Brachystegia, Afzelia, Anthonotha, Paramacrolobium, Monopetalanthus, Gilbertiodendron, Julbernardia (Caesalp) mood EcM Kongos
strobusel
. I. Micorrize e sviluppo dei semenzali nel secondo anno. Allionia 13: 177-186.
Gnetum africanum mood EcM Scleroderma sp-ga
. Microbiol. 1 Network-anal: ülevaadeco-occurrence metoodikast
ay detection of small insertions and deletions in BRCA1 and BRCA2. Nature Genet. 18: 561-564. läbi multiplex PCR SNP detekteerimine p53 t
C, Percy DM, Hajibabei M, Barrett SCH. 2008. Multiple multilocus DNA barco taimede DNA barcoding: trnH-psbA ja rbcL on parimad lookused. Praimerite
ships within the Cantharellaceae inferred from sequence analysis of the nuclear large subunit rDNA. Mycol. Res. 101 : 1423-1430. Cantharellus, Craterellus, LSU. Ame
y and systematics of basidiomycetous yeasts as determined by large-subunit rDNA D1/D2 domain sequence analysis. Int. J. Syst. Evo pärmid esinevad nii nõgiseente, Tren
ers ET, Bücking H. 2012. Carbon availability triggers fungal nitrogen uptake and transport in arbuscular mycorrhizal symbiosis. Proc. Natl. Acad. Sci. USA 109: 2666-267
ate production of laccase and Mn-peroxidase by Panus tigrinus on olive mill wastewater-based media. J. Biotechnol. 100 77-85 MnP: mõ
. Landboh. Aarskr. 1: 332-382.
eks. Esmakordselt mainib seotust mükoriissete struktuuridega Cenococcum graniforme: käsit
etic studies of Terfezia pfeilii and Choiromyces echinulatus (Pezizales) support new genera for southern African truffles: Kalaharitube Terfeziaceae: Choiromyces echinula
nts and succes Costa Rica vanas kakaoistanduses La Selva bioloogiajaamasloodusliku regener osas domin Neea sp.

cumi viljakehad meenutavad sklerootsiume. Ei sekveneeritud
rovirens complex): aspects of its conidiogenesis and ecology. Mycotaxon 54: 287-294.
phytes *Leptodontidium orchidicola* and *Phialocephala fortinii* (Fungi Imperfecti) on the growth of some subalpine plants in culture. Can. J. Bot. 74: 1071–1078.
uction by Ceriporiopsis subvermispora during solid-state fermentation of Eucalyptus grandis. Enz. Microb. Technol. 32: 59–65 MnP: prol
do *Pinus pinaster*. Sol. Pub. Serv. Florestais Aquic. Portugal 8: 65-95.
ic composition Amazonia Igapod: Aldina domin
männiistandikes
n DM, Kerr JT liigirikkus sõltub enim kliimast. Suuremat liigirikkus sõltub enim kliimast. Suurematel uuringualadel seosed tugevamad kui väiksemat
oil bacteria. Ecology 88: 1354-1364.
vards RA, Felts B, Rayhawk S, Knight R, Rohwer F, Jackson RB. 2007. Metagenomic and Small-Subunit rRNA Analyses Reveal the Genetic Diversity of Bacteria, Archa
ecology. Soil mullaökoogia, biokeemia integreerimine: tulemuste võrr fingerprinting meetodite v fingerprinting meetodite võrreldamatus vrd sekv-p
community structure by use of taxon-specific quantitative PCR assays. Appl. Env qPCR eri mikroobirühmadele: seened, arhed, bakterid ja nende eritaksonid
unities. Proc. Natl. Acad. Sci. 103: 616-631. bakteritel: latituudi gradienti ei tuvastatud T-RFLP baasil. Lokaalselt mõjutas kooslust ja lii
t JA, McCulley RL. 2013. Reconstructing the microbial diversity of pre-agricultural tallgrass prairi soils in the United States. Science 342: 621-624.
ekt; kooslused ja metaboolne pot muutuvad tugevasti; fülogeneet, metagenoomi ja kataboolne distants olid omavahel korreleeritud Mantel testi põh
A, Wall DH, Caporaso JG. 2013. Cross-biome metagenomic an metagenoom üle koosluste: kuuma-ja külmakõrbetes BD taksonitel ja metagenoomidel mad
l communities. Am. J. Bot. 98: IN PRESS.
kterid, v palju liike, vähem seeni (SordarioM) ja taimi (Pinus pms) ning loomi (Diptera, lestad). Päevane temporaalne erinevus väga suur ning raske
011. Microbes do not follow the elevational diversity patterns o bakterid kõrgusgradiendil: vahet pole. Arv mõj baktereid muud asjaolud
l controls on the landscape-scale biogeography of stream bacterial communities. Ecology 88: 2162-2173.
ition through two soil depth profiles. Soil Biol. Biochem. 35: 16 mikroobide levik PLFA
erns in belowground communities. Ecol. Lett. 12: 1-12. mullaelukate, sh mikroobide biomass bioomide kaupa: suurim metsa-ökosüs, er troop vihma
and time. In: Zengler K (ed.). Accessing Uncultivated Microor mikroobide biogeograafia ja ökoloogia reeglid
slands. Biodiv. Sao Tome, Principe, Bioko taimkate ja endemism. Sao Tomel 601 liiki, 95 neist endeemid (sh 81 vaid Sao Tomel)
slands. Biodiv. Conserv. 3: 785-793.
nine + ARDRA + sekv. Kuuse risosfääri bakterid ja seened on erinevad haigete i bakterid, seened, 18S (seentele NS1, NS2) + kloneerimine + AR sarnasusindeksid, puule
from soil substrate using real-time PCR. J. Microbiol. Meth. 67-76. Real-time PCR monel juhul mittesteriilne muld inhibeerib vrd steriilse mullaga; väga täpne
ography of Streambed Microbiota. Appl. Environ. Microbiol. 74: 3014-3021.
rkonnast v erinev; küünel hoopis teistsugused seened sh keskk omad; domin Malassezia, vähem Cryptococcus, Candida jt
Kõigis geogr piirkondades on kõik sobivad liigid esindatud tuule heterotroofsete protistide BD on v madal globaalselt. Kõigis geogr piirkondades on kõik sobivad liigid esin
d assimilation of nitrogen from 15N-labelled ammonium by Pinus sylvestris plants infected with four different ectomycorrhizal fungi. New Phytol. 110: 59-66.
tomycorrhizal plants. I. Translocation of 14C-labelled carbon between plants interconnected by a common mycelium. New Phytol. 103: 143-156.
between *Pinu* Suillus spp. Peremehespetsiifika
Agric. Ecosyst. Environ. 28: 127-131.
is on the functional diversity of interactions involving the extraradical mycelium. J. Exp. Bot. 59: 1115-1126.
is on the functional diversity of interactions involving the extraradical mycelium. J. Exp. Bot. 59: 1115-1126.
stina and Xerocomus spp. show contrasting colonization patterns in a mixed fore 2 RAPD praimerit
SL. Deep phylogeny and evolution of slime molds (Mycetozoa). Protist 161: 55-70. Mycetozoa: viljakehadega lima
nity composition in a northern hardwood forest - testing effects of root species, re juurte kvantitat määramine juurte kvantitat määramine trnL kloneerimise+sek
noodulitega ja noodulitega ja mükoriisasümbiooside stabiilsus: Erikoidne ja orhidee MR ning noodulitega küllalt stabiilne -ühes-kahes noodulitega ja mükoriisasümbioosid
231-243.
nd extinction rates from incompletely resolved phylogenies. Syst. Biol. 58: 595-611. liigitekke ja väljasuremise prot
R-quality DNA from environmental soil samples. Appl. Environ. Microbiol. 76: 4571-4573. DNA mitmekordne eraldamine/ puhastamine anna
of the vegetati Seisellide floora: ca 250 põlist õistaimeliiki, mille Seisellide floora: ca 250 põlist õistaimeliiki, millest 84 on endeemsed. Lisaks teada 80 sõnajalga. Eri metsa
ma; mitte isoleeritud Lact pubescens, Hebeloma. Lact vajab vanade puude juurte ühendust
orrhizas on birch seedlings grown around mature trees. New Phytol. 98: 143-153.
e paleozoic origin of enzymatic lignin decomposition reconstructed from 31 fungal gemones. Science 336: 1715-1719. ligniini lagundavad ensüümid p
e identification. Mol. Ecol. 11: 839-850. DNA Barcoding defineerija: Molecular OTU nematoodide 18S rDNA põhjal. Barcoding

diomycotina). Mycologia 77: 732-742. Destuntzia perek gen nov
Dighton J, White JF, Oudemans P, eds. The Fungal Community. Its Organization and Role in the Ecosystem. CRC Press, Boca Rayton, FL, USA, pp. 733-758.
grown in clay-containing medium. J. Chem. Technol. Biotechnol. 78: 23–34.
Veen FJF, Th networking: modulaarsus ja nestedness sõltuvad assots intiimsusest, mitte par v mutualimusest; eri networkide sidumine; multitroofilis
nsect herbivore Spetsialism: herbivooride networkide seas rohkem spetsiliseerumist kui tolmeldajatel arv võidurelvastumise tõttu
ter tener, Hysetrangium, Cenoc, Tuber albidum eri peremeestaimedel

Allionia 24: 91-98.
on 29: 37-44. Stephensia bombycina mood ko
39-46.
ra ja Hebeloma longicaudum VK obs EcM tippudeni myc järgi, kirjeldab ka palju teisi tüüpe, illustr.
Salixi 14 liigil kõigil EcM; üksikud Salix alba, purpurea ja aurita var caprea isendid olid NM; AM v vähe
nd controlled conditions. New Phytol. 99: 441-447.
dland. Acta Hortic. 457: 119-126.
apart molecular-versus fossil-based error estimates when dating Betulaceae parineb mol fül jr 115-130 MAT tagasi; vanimad fossiilid Betulaceae pärineb mol fül jr 115-13
t of the onvasi invasiivsed eukalüptid RSAs: mitmed liigid levivad vaikselt koldest eemale ja transformeerivad maastikku. Kasutatud ornamentaalselt
l'*Helianthemum guttatum* par trois espéces de terfez des genres *Terfezia* et *Tirmania* d'Algerie. Can. J. Bot. 70: 2453-2460.
d their effect on mycorrhizal development. Plant Soil 71: 275-284.
ological changes during ectomycorrhiza formation. Can. J. Bot. 58: 361-365.

s *sylvestris* L. Can. J. Bot. 44: 1087-1092.
R, Bascompte network analüüs: tugevalt connected networkides on rohkem nii nested kui ka modulaarseid kooslusi; nestednessi tuvastamiseks paren
. New Phytol. 88: 705-712.
ributions. Biometrics 66: 186-195.
L. 2002. Mycorrhiza Helper Bacteria stimulate ectomycorrhizal symbiosis of Acacia holosericea with Pisolithus alba. New Phytol. 153: 81–89.
Soil 71: 269-2 varane vs hiline: Leccinum ja Lact pubescens ei levi eostega noortele taimedele; Inocybe, Laccaria ja Hebeloma kolonis eostega noori taimi holpsasti; eosed
Arg keskosa Chaco puissavann: EcM vaid Salix humboldtiana
osure to subfreezing temperatures. Can. J. Bot. 57: 1845-1848.
stera monocytogenes strains involved in invasive and noninvasive listeriosis outb IRS-PCR kasutamine ja selle eelised AFLP ees. Korratav. IRS-PCR>AP-PCR>RAPD
on of plant cor taimed: ruderaalid vs teised: AM tähtsus
with special r taimed: ruderaalid vs teised: AM tähtsus
Quercus, Fagus, Corylus, Picea, Pinus, Castanea, Populus alba mood EcM
Mükoriisatüüpide esmakirjeldused: AM, ErM, OrM, Monotropoid ja EcM; Pyrola leiti NM
Ges. 6: 248-269.
haft vol. 1. W. Engelmann, Leipzig. 669 p.
belowground ektomükoriisa mõiste, EcM esinevus Fagaceae, Salicaceae ja Pinaceae liikidel (Carpinus, Corylus, Fagus, Quercus, Castanea, Salix, Populus, Pinus, Picea,
nt dispersal of fungal spores promotes seedling establishment away from mycorrhizal networks on *Quercus garryana* . Botany 87: 821-829.
rrhizal inoculum in Oregon white oak woodlands. Northwest Sci. 80: 264–273.
seudoplatanus: relationships with seedling growth and soil factors. New Phytol. 101: 133-151.
f a decomposer fungus, Mycena galopus. Can. J. Bot. 73: S1399-S1406.
102: 1-15.
r, and mixed a lepaga segametsades suurem taimede ohtrus ja tihedus, mis arv seostud rohkema valgusega eriti veget-perioodi piirialal (???)
mixed alder-conifer communities. I. Understory vegetation and stand structure. 37-44.
mixed alder-conifer communities.II. Epiphytic, epixylic, and epilithic cryptogams. In: Trappe JM, Franklin JF, Tarrant RF, Hansen GM (eds.) Biology of Alder. Pacific No
ycorrhizal pine seedlings under elevated CO2 vary with fungal species? Plant Soil In Press.
respond differently to increased carbon availability. FEMS Microbiol. Ecol. 61: 246-257.
a sp. Domin. loobuti
e dangers of ignoring an evolutionary model. Am. Nat. 178: E10-E17. fülogenee fülogeneetiline GLS
nd spatial sign tunnuste muutuste uurimine tingimustes, kus liikide fülogeneesi ja areaali on samaaaegselt arvesse võe tunnuste r tunnuste muutuste u
2: 1367-1375. võrdleva analüüsi komistuskivid: madala R2-mudelite usaldamine suure valimi ja log-skaala korral; sa võrdleva a võrdleva analüüsi ko
2004. An expanded plastid DNA phylogeny of Orchidaceae and analysis of Jackknife branch support strategy. Am. J. Bot. 91: 149-1 Orhideed: Apostasioideae, Vanilloid
ricaceae) based on ITS sequences, morphology and development. Syst. Bot. 24: 398-408. Pyroloideae feneetiliste tunnuste põh
ricaceae) based on ITS sequences, morphology, and development. Syst. Bot. 24: 398-408. Pyrolaceae: Chimaphila ja Moneses
et and cytosolic Zn sequestration in the fungal mantle of Picea abies -Hebeloma crustuliniforme ectomycorrhizas. Plant, Cell Environ. 23: 1257-1265.
rtinotti MG, Pierrat J-C, Garbaye J. 2005. Ectomycorrhizal symbiosis affects functional diversity of rhizosphere fluorescent pseudomonads. New Phytol. 165: 317–328
lation of an ectomycorrhizal fungus and mycorrhiza helper bacterium in two forest nurseries. Soil Biol. Biochem. 31: 1555-1562.
New Phytol. 176: 22-36.
ircumscriptions in the ectomycorrhizal genus Laccaria (Agaricales). Mycologia 76: 633-642. Laccaria koosn mitmest eri bioloogil
the ectomycorrhizal fungus Hebeloma mesophaeum (Agaricales). In: ??? (eds). Mycorrhizae: Physiology and Genetics. ???
Kiefer und Fichte. Sv. Bot. Tidskr. 36: 151-156.
es. Trans. Br. Mtcol. Soc. 70: 319-324.
aria laccata (Agaricales). Mycologia 75: 221-227. Laccaria laccata jaguneb vähemasti
fungus Suillus luteus (Boletaceae). New Phytol. 107: 735-739.
fungus Suillus luteus, Boletaceae. New Phytol.107: 735-740.
m the fossil record. Curr. Opin. Pl. Biol. 8: 5–12. õistaimede fülogenees ja varajane biogeograafia: Chloranthaceae, Fag õistaimede fülogenees ja varajane bi
Uruguay Leguminosae: enamasti AM, aga Gleditsia amorphoides, Calliandria parvifolia, tweedii; Prosopis spp mood AM ja EcM; Lonchocarpus n
Romantschuk M. 2000. Effect of Cd-containing wood ash on the microflora of coniferous forest humus. FEMS Microbiol. Ecol. 32: 43-51.
ol. Res. 104: 1202-1212.
ned, väga vähe EcM seeni: Tom, Thel
Termitomyces and related taxa. Mycol. Res. 107: 1277–1286. LSU, mitoch Termitomyces: monofüleetiline seen
oom genus Cortinarius (Basidiomycota, Agaricales): A comparison of RPB1, RPB2, and ITS phylogenies. Mol. Phyl. Evol. 37: 602–6 Cortinarius subgen Phlegmacium: R
in Transition Zambia miombod: Brachystegia BD tsenter. Mio Zambia miombod: Brachystegia BD tsenter. Miombo kliima, muld, juured ulatuvad puust väh 27 m eemale
oil. Soil Biol. Biochem. 43: 1621-1625. PLFA: seente PLFAd 18:2w6,9 ja 18:1w9 on sagedased ka teistel mullamikro
Stary J, Baldri puuliik mõjutab tugevasti varise kvaliteeti, mis omakorda mõjutav mulla A ja O horisondi keemiat ja mikroobe nii otseselt kui k a läb
logy research in China. Soil Biol. Biochem. 1-9.
nden Pilzen. Bibl. Bot. 76: 1-32.
JH. 2008. A latitudinal diversity gradient in planktonic marine b latituudi gradient merebakteritel - just nagu teistel org-del
iigirikkust ja mitmekesisust tundras. Erinevusi liigirikkuses ja koosluse struktuuris mõjutas happeline vs aluseline põhjakivim
ITS-RFLP: SSU

gical species of Armillaria associated with Wynnea and Entoloma abortivum usin IGS-RFLP: Armillaria Jaapanis; eri Armillaria sp parasiteerivad eri Wynnea sp ja Entolon
tion and identification of mycobacterium species isolates by DNA microarray. J. Clin. Microbiol. 41: 2605–2615. gyrP geen Mycobacteria; 15 nu oligod; liigini
e, Northeastern Area, State and Private Forestry. Available at http://www.na.fs.fed.us/pubs/silvics_manual/Volume_2/alnus/glutinosa.htm
.3. URL http://cran.r-project.org/package=fields [accessed 1 February 2011].

A for expression cloning by indirect extraction methods. FEMS Microbiol. Ecol. 44: 153-163. DNA eraldamine erinevatest keskkonnaproovidest -mehaa
metals and radionuclides by fungi, bioweathering and bioremediation. Mycol. Res. 111: 3-49.
ots of Pinus radiata. N. Z. J. For. Sci. 5: 33-41.

e and incompetent Paxillus involutus isolates for ectomycorrhiza formation in vitro with poplar (Populus x canescens) differ in H2O2 production. Plant Biol. 6: 91-99.
mphinema, Cenoc; Ala2: Amphinema (67%), Wilcoxina, Cenoc 99% ITS kriteerium
containerized black spruce seedlings as affected by nitrogen fertilization, inoculum type, and symbiont. Can. J. For. Res. 18: 922-929.
the cap: a field- and modeling-based study. Mycologia 103: 11 eoste levimine: sõltub seeneliigist, pea kõigil 95% kukub 1 m raadiusesse
eplitseerimata. Eri seeneharud
r sequence alignment and molecular phylogeny. Comput. Appl. Biosci. 12: 543-548. Seaview Seaview
ive molecular phylogeny of the subfamily Dipterocarpoideae (Dipterocarpaceae) based on chloroplast DNA sequences. Genes Genet. Dipterocarpoideae jaguneb 4 rühmal
IC, Fröberg M, Stendah J, Philipson CD, Mikusinski G, Andersson E, Westerlund B, Andren H, Moberg F, Moen J, Bengtsson J. 2013. Higher levels of multiple ecosystem
successional plant community. New Phytol. 115: 85-91.
ljumine, eriti s seente viljumine, eriti saproobidel ja EcM lehtpuude seentel on nihkunud nii varasemaks kui ka hilisemaks
onticola . Mycol. Res. 110: 318-327.
rvation of Littoral Ecosystems in Southeastern Madagascar, Tolagnaro (Fort Dauphin). SI/MAB Series #11. Smithsonian Institution, Washington DC, USA.
, Buscot F, Guo L-D. 2013. Host plant genus-level diversity is the best predictor of ectomycorrhizal fungal diversity in a Chinese subtropical forest. Mol. Ecol. 22: 3403–3
neb keskealistest ja vanadest metsadest; noortes ja keskmistes metsades seletas pms keskk-tingimused, ent vanades metsades SEM EcM kooslusel
l (16), Inoc (15), Russ-Lact (8(, Sebacina ja Cort (7)
Malassezia?)
ectomycorrhizal fungus Paxillus involutus with special reference to summer drought. For. Ecol. Manage. 98: 221-228.
cteria associated with the Pseudotsuga menziesii-Laccaria laccata symbiosis. Symbiosis 14: 335-344.
o water stress. Outlook on Agric. 29: 63-69.
terokaryosis Is not required for virulence of Heterobasidion annosum. Mycologia 89: 92-102.
terokaryosis is not required for virulence of Heterobasidion annosum. Mycologia 89: 92-102.
terokaryosis is not required for virulence of Heterobasidion annosum. Mycologia 89: 92-102.
ent and mycorrhizal inoculation as a practice in afforestation of soils with Pinus halepensis Miller: effect on their microbial activity. Soil Biol. Biochem. 32: 1173-1181.
5: 657-663. Bonferroni korrektsioon

EcM morf poolest v sarnased ja kasvavad aluselisel pinnasel koos Quercus ilexiga sünt põhjal
ylvain ZA, Milano de Tomasei C, Wall DH. 2014. Are there links betwe mullamikroobide ja ökosüs funktsioonide sültuvus kliimamuutustest on mõnevõrra s
es – application to the identification of mycorrhizas and rusts. Mol. Ecol. 2: 113- praimer ITS1F ja ITS4B, CTAB-protokoll
BD. VK: Suillus pungens, Amanita franchetii, Cortinarius sp 2 (+2) RE, lisabändid; sekv mtLSU üldosakaalu valem

enous and introduced symbiotic fungi in ectomycorrhizae by amplification of nuc ITS1/4 jt ühed esimesi
n Western Australia by mycorrhizal fungi. For. Ecol. Manage. 24: 27-42.
.
oses in fungi suggested by SSU rDNA phylogeny. Science 268: 1492-1495. samblikud on tekkinud kand-ja kotts
ce
s; fülogeneetiline konserv mitmetes kooslustes, eriti häiritud tüüpides. Mõned Seb A liigid rohttaimede juurtes puudest 20 m eeemal.
us forests in South Chile. Mycologia 34: 136-145. CHI 4 uut Cortinariuse liiki. Se
ic classification in the genus *Cortinarius* (Basidiomycota, Agaricales) derived from morphological and molecular data. Can. J. Bot. 83 Cortinarius
og agarics from nuclear gene sequences and basidiospore ultrastructure. Mycol. Res. 111: 1019-1029. Agaricales: tumedaeoselised paksus
õigi Tshiilisse sissetoodud puuliikide ja Nothofaguse EcM seente nimekiri: Eucalyptus, Betula, Pinaceae, Populus, Quercus, Salix
Kesk-Tshiilis 35,4-37,8*N. EcM puud Nothofagus, Ugni molinae (Myrt); Luma apiculata (Myrt) ja Persea lingue (Kesk-Tsiilis: (Austro)Pax 5, Ar
gen on Walker Branch watershed. Ecology 74: 2098-2113.
graphy and soil phosphorus on the vegetation of Korup forest re Korupi metsa taimestik ja selle seotus mullafosforiga: tsesalp pms madala P kasvukohtades; Uapacal tugev
iversity on roc taimede liigirikkus ega taimede funktsionaalsete rühmade rikkus ei avalda mõju juurte ega mullafauna diversiteedile. Liblikõielised vähendasid juurte hulka j
ökol põhiküsimused on: latituudi grad - B ökol põhiküsimused on: latituudi grad - BD-energia suhted; BD-pindala; BD-BD suhted
ia Warra reservis; vana vs regener mets: peamine viljumisaeg veebr-sept, er juuli keskel. Domin perek Cortinarius s.l. , Russulaceae, Amanita
tion interactions in the ectomycorrhizal fungus Hebeloma cylindrosporum Romagnesi. New Phytol. 123: 335-343.
sity studies and its implications in ecological and biogeographic inferences. Mol. endof liikide eristamiseks jääb teatud rühmades ITSist väheks resol tõttu)Co

the sequestrate *Amogaster viridiglebus* is derived from within the agaricoid genus *Lepiota* (Agaricaceae). Mycol. Progr. 12: 151-155.
mixed stand of spruce, larch and beech trees and of understorey vegetation including fungi. Isotopenpraxis Environ. Health Stud. 29: 35-44.
coheterotrophic orchids provides insight into nitrogen and carbon gain from fungal association. New Phytol. 160: 209-223.
coheterotrophic orchids provides insight into nitrogen and carbon gain from fungal association. New Phytol. 160: 209-223.
nctional groups of fungi in relation to substrate utilisation. New Phytol. 142: 93–101.
a muricatum, Tuber sp, Pezizales sp, Laccaria ameth,
3-4 morfotüüpi (kuni 8) 4 c,3 mullas: heterogeensus suur, ent seda stat ei mõõdetud; Tomentella sp. eelistas orgaanikat
ortance of a community approach. Environ. Entomol. 38: 93-102.
o Australian rain forests: occurrence, colonization, and relationships with plant performance. Mycorrhiza 16: 89-98.
n the formation haabadel AM vs EcM sõltub mullaniiskusest ja niisutamisest. Optimaalse korral EcM, liigniiskes ja liigkuivas rohkem Ami. Eri genetitel ponud rolli AM ja I
a vastavus 2 RE
the mycorrhizal mutualists of plants. Trends Ecol. Evol. 9: 251-255.
stress affect the ectomycorrhizae of pinyon pines. Ecology 76: 2118-2123.
, Schoch C, Tibell L, Untereiner WA, Aptroot A. 2006. Eurotiomycetes: Eurotiomycetidae and Chaetothyriomycetidae. Mycologia 98 (EurotioM + Mycocaliciales) L
ALASKAl: VK andmed ja mulla DNA andmed ei klapi; mullas palju rohkem liike kui viljakeha perek-sisesed kimäärid; singletonide eemaldamine
and cryptic speciation events in the fly agaric (Amanita muscari Amanita muscar B-tub, ITS, LSU Amanita mu NCA jms
s: Alaska: 2 veget-tüüpi (eri tulemused); muld vs VK
oos ME, Taylor DL. 2012. An arctic community of symbiotic fungi assembled by long-distance dispersers: phylogenetic diversity of ectomycorrhizal basidiomycetes in Sva
ong inter-and intracontinental phylogeographic structure in Ama Amanita muscaria koosneb väh 8st iseseisvast evol-harust, mis asuvad eri kontinentidel ja/v

eae, an arbuscular mycorrhizal fungus. Mol. Ecol. 4: 61-68. RAPD praimer Glomus mosseale -RAPD>sisesed spets praimerid; pole hea
acid phos
anic layers by Calluna: the role of ericoid mycorrhizas. J. Exp. Bot. 51: 1117-1125.
yclic aromatic hydrocarbon (PAH) fluorene is retarded in a Scots pine ectomycorrhizosphere. New Phytol. 163: 641–649. Thelephor
iom bicolor; EmH Meliniomyces, Sistotrema, Cortinarius, Cenoc
ncreases with Calluna vs Nardus + mükoriisa
ween Central and South America, Pleistocene climatic fluctuations, or an accident of the Andean orogeny? Annals of the Missouri Botanical Garden 68: 557-593.
ocal communities predicts the size of the regional species pool. J alvaritel mida rikkkam on liigifond, seda suurem on ka keskmine liikidevaheline fülogeneet
ection Cembroides: Implications for Molecular Systematic Studies of Pine Species Complexes. Mol. Phyl. Evol. 21: 449–467. Pinus subsect Cembroides: ITS1 on
n LM. 2001. Phylogenetics of Helotiales and Rhytismateles based on partial small subunit nuclear ribosomal DNA sequences. Mycolo Helotiales: SSU -Helotiales sisaldab
dying the regulation of manganese peroxidase expression. Curr. Genet. 31: 519-524. MnP geen
m, Aureobasidium, v palju reostuseid
amethystina pisikesed genetid 2 RAPD praimerit
face and deep marinebacterial communities. Proc. Natl. Acad. Sci. USA 109: 17633–17638.
tionships of the Gomphales based on nuc-25S-rDNA, mit-12S-rDNA, and mit-atp6-DNA combined sequences. Fung. Biol. 114: 224-2 Gomphales 3 geeni baasil: väga
ja männi istandikes Brasiilias. Palju peremehe spets liike. Domin. Laccaria spp. Ja Scleroderma spp. Eukalüptil ühtl aastaringselt, er sügisel; männil pms talvel ja sügisel,
. 31: 755-773. Trichoder
sus. Ann. Bot. 31: 803-815.
ffects of glucose, nitrogen and phosphorus in relation to successions. Mycol. Res. 94: 166-172.
7-24. mRNA mikroarray geeniekspressiooni uurimi
. Natl. Acad. Sci. USA 104: 4979-4983.
215-220. Hydnocystis, Hydnoplicata, Ste

rv. 12: 1687–1697. Uus-Kaledoonia kuivad troopised metsad on maailma ohustatumaid ökosüsteeme, sisald palju endeemseid
po of molecular evolution in mammals. Proc. R. Soc. B 276: 33 diversifitseerumine kiirem troopikas kui parasvöötmes; ning madalal vs kõrgel: imetajatel.
kus, rakkude arv, epidermoidrakkude pindala
harun EmH
aceae. New Phytol. 92: 533-537.

ompatible and incompatiblr fungi. Can. J. Bot. 68: 1239-1244.
i. Fung. Genet. Biol. 45: 791-802.
i of two Mediterranean plants. New Phytol. 155: 481–498.
of *Pinus halepensis* Mill. Allionia 33: 93-98.
ebauer G, Perotto S. 2011. Photosynthetic Mediterranean meadow orchids feature partial mycoheterotrophy and specific mycorrhizal associations. Am. J. Bot. 98: 1148–11
Segreto R, Loreto F, Cozzolino S, Perotto S. 2006. Inefficient photosynthesis in the Mediterranean orchid Limodorum abortivum is mirrored by specific association to ecto
klasteranalüüs. Polnud olulisi erinevusi aastaajati ega eri pestitsiidide kasutamise bakterid, seened, AM-seened; 18S RT-PCR+DGGE + klasteranalüüs. Polnud olulisi erine
akup, immigration from the boreotropics, and transoceanic dispe kauglevi on olnud taimedel palju olulisem kui arvatud varem. Toetavad siiski Dipterocarpaceae Gondwana
kontrollaladel proovi kohta
elial interconnectedness. Trends Microbiol. 12: 135-141.
evus üle N-Am kontinendi; väiksem BD põhjapool.Resist. Propagule ja mullapõhine-liigirikkus negatiivses seoses (vigane analüüs) - ilmelt polnud
Epulorhiza sp. (sensu Sebacina) isolated from Australian orchids. Aust. Mycologist 20: 12-15. Ceratobasidiales: parentesoom perfo
13C content of primary and secondary plant products in different cell compartments and that of decomposing basidiomycetes. Plant Physiol. 102: 1287-1290.
jarrah metsas: peamine faktor metsa vanus 3-20 a vs vana. Domin Austropax, Laccaria, Ramaria
c variation of ectomycorrhizal fungi associated with Eucalyptus ecosystems as re 4+2 RE, ITS, mt ITS Cortinariust ei saa RFLP põhjal eristada. ITS vähe diverge
iscrimination of primers for PCR-RFLP of larger basidiomycetes and their applic eri RE, praimerite genereerimi praimerisaitide mutats eri DNA piirkondade muutumine eri
Sebacina: LSU, mükoriissed liigid e
Pinus pinaster, Rhizopogon luteolus and their ectomycorrhizal association. New Phytol. 154: 509-516. NO3-tran
) of large community datasets. Nucl. Ac. Res. 38: e155. MultiCoLa automaat
nant process for carbon input into soil organic matter. Plant Soil 281: 15-24. mullaorga

Hebeloma, Cort, Tricholoma, Scleroderma, Pisol, Pax, Laccaria, Amanita, Leccinum, Lact, Thel, Cenoc, , Haaval. Lact pubescens, kase-spets Leccinum spp mood EcM k
color with container-grown white pine seedlings. Mycol. Res. 94: 1051-1058.
ts of competiti Taimede kooseksisteerimine ei sõltu fülogeneetilisest kaugusest. Summaarne fitness oli fülogeneesist sõltuv tunnus
CHILE: vaid Nothofagus spp mood EcM, Ugni candollei jt mood AM
r taxonomy of phytopathogenic fungi: a case study in Peronospora. PLoS One 4: e6319. Geenipanga DNA Geenipanga DNA jrk annoteeri
lata, and their use in phylogenetic inference from sequences with intra-individual variability. BMC Evol. Biol. 8.86. Fülogenee Fülogeneesivõrgustil
oaches to the study of fungal pathogenicity. Annu. Rev. Phytopathol. 39: 337-365.
erv. 6: 359-377. Kapimaa floora on vahemereline, väga liigirikas, mida põhj suht stabiilne pikaajaline keskkond, toitainetev

onserved acros ökoloogilised seosed ja network liikide vahel on evolutsiooniliselt konserveerunud. Viirustel>bakterid>eukarüoodid; sümbiontidel, ek
Garcia LV, Es patogeenide ruumiline levik mullas neighborhood mudeli baasil vüttes arvess puude ja põõsaste lähedust ja basaalpinda; isetehtud tark
us na Baixada Fluminense. Rodriguesia 4: 179-198.
NA systematics of Ceratobasidium and Thanatephorus with Rhizoctonia anamorp ITS v oluline on vältida se 2-tuumalised Ceratobasidium ja mul
osomal DNA and beta-tubulin sequences from fungi in the Rhizoctonia solani species complex. Mol. Phyl. Evol. Indelide kodeerimine Ceratobasidiales: parasiitsed Thanat
al small subunit rRNA V4, V6, and V9 domains reveal highly species-specific va mt SSU praimerid V4U, V4R, V6U, V6R, V9U, V9R Psathyrellale
al Small-Subunit rRNA V4, V6, and V9 domains reveal highly species-specific v V4U, V6U primerid originaalis
tion of Pinus halepensis Mill. and Pinus pinaster Aiton seedlings in two commercial nurseries. Ann. For. Sci. 60: 43–48.
of Concise Descr. Ectomyc.: Including Microscopic and Molecular Characterization. Mycologue publications, Victoria.

observations / types obs

nika: Cenoc, Pilod1, Pilod fallax, Rhizopogon, Lactarius; mineraalis unidentified loobuti
ity of Chicago Press, Chicago. 1709 p.
e nutrient uptake from different soil depths in Quercus robur, Fagus sylvatica and Picea abies. Plant Soil 286: 87-97.
ıs Geopora liigid)5)
ıl Scots pine (Pinus sylvestris) to elevated CO2. New Phytol. 146: 163-168. anova
af photosynth Pyrola rotundifolia: fotosünt aparaat madala võimsusega; aktiivsus suureneb augustis.
mycorrhizas and root-associated fungi of Vaccinium membranaceum across an elevation gradient in the Canadian Rocky Mountains. Fung. Ecol. In press.
f ecological data. J. Stat. Softw. 22: 1-18.
rs. 2009. Patterns and causes of species richness: a general sim globaalne BD: lahkab võimalikke põhjuseid: energia, levimine ja ajalugu
us/pindala = liikide tihedus. Kasutamisvõimalused ja paljud vead. Soovit indiviidide baasil proove koguda. Üld-liigirikkuse ekstrapoleerimine, VII rarefaction: indiviidi ja a
on 7. Acquired Intelligence Inc. & Kesey-Bear. Jericho, VT 05465. http://garyentsminger.com/ecosim.htm. EcoSim: permutatsio
1: 2606-2621. co-occurrence analüü
st record of *Peridiospora tatachia* . Mycotaxon 96: 327-332. Peridiospora tatachia sp nov, se
P. 2008. For. puujuurte ulatus 4-5 m. Sama liigi puude juurestik kattub. Seente viljakehade põhjal sama tulemus
ed by traditional isolation and cultivation-independent DNA-based methods. FEMS Microbiol. Ecol. 58: 404-41 ARDRA-DGGE sama liik ja geneet v sarn tüvi esineb palj
Cylindrocarpon destructans, Colletotrichum coccodes, Plectosporium tabacinum
al user interface for sequence alignment and phylogenetic tree building. *Mol. Biol. Evol.* **27**: 221-224.
production and boreaalsetes metsades prim prod suurem heitlehistes vs okasmetsades, samas juurte prod veidi suurem okasmetsades. Maasisese prod osakaal samas o.36 vs
ıral equation models for ecological systems. Ecol. Monogr. 80: 67-87. structural equation r
bacea
(ed.). Nitrogen-Fixing Leguminous Symbioses, Springer, Berlin, 23-58.
haetales N-Carolinas: Coltriciella dependens levinud kõdutüvedes ja nende all, alati koos EcM juurtega; Coltricia perennis, cinnamomea, foccicola -kõik seotud tugevasti l
Photinia glabra moodusrab ECM Cenococcumiga ja tuberkuloidset tüüpi
evolution and the illusion of precision. Trends Genet. 20: 80-85. teevad maha Hedgesi teevad maha Hedgesi tööd, sest seal
ncultured bacteria. Environ. Microbiol. 3: 481-492.
dies of actinorhizal symbioses of *Alnus* spp. In Slovenia. Phyton 39: 207-211.
Evol. 21: 501-507. mikroobide levik: alla 1 mm mikroobid arv v laialt levinud, suuremad vähem. Ent pole uuritud molekulaars
omy to traits. Science 320: 1039-1043.
aga Australias, koosluste erinevus suureneb kaugusega; ent ko kottseente BD I SSU1758, 58S8 kottseentele: ITS1 kompleksanalüüs sörenseni indeks, mante
dar M, Short JM, Mathur EJ, Detter JC, Bork P, Hugenholtz P, Rubin EM. 2005 metagenoomide DNA analüüs Sangeri baasil. Leidsid, et geenirühmad mullas
arbon and nitrogen transfer between an ericaceous dwarf shrub and fungi isolated from *Piceirhiza bicolorata* ectomycorrhizas. New Phytol. 182: 359-366.
into the mycorrhizal Rhizoscyphus ericae aggregate: spatial structure and co-colonization of ectomycorrhizal and ericoid roots. New Phytol. 188: 210-222.
differences between ericoid mycorrhizal fungi affect nitrogen uptake by *Vaccinium* . New Phytol. 181: 708-718.
rhizae between Eucalyptus pilularis and several strains of Pisolithus tinctorius. Aust. J. Bot. 34: 95-102.
Agaricales perek AUS vs muu maailm: Amanita, Hygrophorus , Hygrocybe, Mycena seas v palju endeemse
83.
cybe spp.) fungi. Bot. J. Scotl. 54: 7-22.
logia 59: 149-154.
traction of DNA and RNA from natural environments for analysis of ribosomal DNA and rRNA-based microbia DNA ja RNA eraldamine mullast: kitipõhine ja 10% CTAB

Gautieria monticola and *Hysterangium setchellii* and their association with Douglas-fir seedlings, a case study. Plant Soil 134: 255-259.
A, Zhao X, Korzeniewski F, Smirnova T, Nordberg H, Dubchak I, Shabalov I. 2014. MycoCosm portal: gearing up for 1000 fungal genomes. Nucl. Ac. Res. 42:D699
portal of the Department of Energy Joint Genome Institute. Nucleic Acids Res 40: D26–D32. seente genoomika andmebaas J
NA elements associated with the MVX disease of Agaricus bisporus. Mycol. Res. 107: 147-154.
a, Suillus1; põlet + tuha eemaldus: Wilc1, Wilc2, Russ2, Rhizopogon; kokku lii 3 RE, sekv ITS, LSU, mtITS xxx
nem Fichtenbestand mit Untersuchungen zur Merkmalsvariabilität in sauer beregneten Flächen. Bibl. Mycol. 125: 1–217.
f Rhizoctonia spp. And Suillus bovinus based on Southern blot and liguid hybridization-fragment lenght polymo Southern blo Southern blot, dot blot Suillus bovinus, Rhizo
patterns of conifer seedlings on a high elevation mine site. Can. J. For. Res. 13: 1145-1158.
orthern Channel Islands create fine-scale genetic structure in tw Rhizopogoni 2 liigi populatsioonide geneetiline distants suureneb kaugusega
hology of *Pinus densiflora* without mycorrhizal formation. Mycologia 84: 528-533.
ortinii s.l. And Acephala applanata in two undisturbed forests in Switzerland and evidence for new cryptic species. Fung. Genet. Biol. Phialocephala fortinii uued krüptilise
FLP markers for population genetic studies of Phialocephala fortinii and closely r RFLP-põhised probed DSE (Phialocephala, RFLP-põhised probed DSE (Phialocephala, tü
for subdivision of the root-endophyte Phialocephala fortinii into cryptic species and recombination within species. Fung. Genet. Biol. ITS vs RFLP vs ISSR Phialocephala
Gen. et Sp. nov.: a dark, septate, conifer-needle endophyte and its relationships to *Phialocephala* and *Acephala* . Mycol. Res. 113: 207-221.
DSE) of the *Phialocephala fortinii s.l. - Acephala applanata* s Phialocephala fortinii-Acephala applanata kompleks: lisaks Phialocephala fortinii-Acephala
phytic fungi (DSE) using inter-simple-sequence-repeat-anchored polymerase cha ISSR DSE kultuuridest üle maailma eristamiseks -tugev meetod, MCA klasteranalüüsi as
g strains of Phialocephala fortinii and phylogenetic analysis of the genus Phialoc Phialocephala: spets ITS praimerid Phialocephala: polüfüleetiline pereko
rk septate endophytes in a confined forest plot. Mycol. Res. 106: 832-840. ISSR DSE kultuuridest kuusejuurtest eristamiseks klasteranalüüs
ad root symbiont Acephala applanata gen. Et sp. Nov., formerly known as dark-s Genoomi RFLP, ISSR; sekven sekveneerimine otse p Acephala applanata
ciation with non-host roots. Mycorrhiza 24: 603-610.
010. Molecular detection of Entoloma spp. associated with roots of rosaceous woody plants. Mycol. Progr. 9: 27-36.
amics of the ectomycorrhizal fungal species Tricholoma populinum and Tricholoma scalpturatum associated with black poplar under differing environmental conditions. En
a: väikesed mobiilsed genetid, suur inbriiding 3 RAPD praimerit
F. 2008. A rock-inhabiting ancestor for mutualistic and pathogen-rich fungal lineages. Stud. Mycol. 61: 111-119. Verrucariales, Chaetothyriales.
corrhizal symbiosis between Lactarius deliciosus and Pinus sylvestris in forest soil samples: symbiotic efficiency and development on roots of a rDNA internal transcribed s
e yle jaapani: IGS1 pohjal, 1 dominantne alleel, 4-5 haruldast matsutake: IGS1 3RE
s on mycorrhizal relationships between Pinus sylvestris and Lactarius deliciosus and unprecedented fruitbody formation of the Saffron milk cap under controlled soilless co
rrhizal fungus Tricholoma matsutake stimulates Pinus densiflora seedling growth in vitro. Mycorrhiza 14: 397–400.

00. Rapid in vitro ectomycorrhizal infection on Pinus denfiflora roots by Tricholoma matsutake. Mycoscience 41: 389-393.
03. Growth stimulation of a shiro-like, mycorrhiza forming, mycelium of Tricholoma matsutake on solid substrates by non-ionic surfactants or vegetable oil. Mycol. Progre
1. The Evolutionary Split of Pinaceae from Other Conifers: Evidence from an Intron Loss and a Multigene Phylogeny. Mol. Phyl. Evol Paljasseemnetaimed: Sycadales(Gin
nd persistence of an ectomycorrhizal fungus. New Phytol. 161: 539-547. kompetitiivne PCR
a cylindrospor Hebeloma sp. Ruderaalsus IGS; 1 RE
vs EMH (ulatub 30 cm eemale) mulla kvantitatiivnePCR spetspraimeritega vs kontrolljärjestus
loculata: eripuudel eriisendid, samal puul enamasti sama isend. 3 geeni sekveneerimine ja alleelid. Paariline enamasti koniid ja väga lähedalt
IGS RFLP meetod geneti määramiseks ECMs
ıse of some different organic nitrogen sources by the ectomycorrhizal fungus Hebeloma cylindrosporum. Mycorrhiza 15: 167-177.
344. Mantel test ja partial
listic networks. Ecol. Lett. 14: 877-885. Koevol tekitab mitte-koevol se
s in specialization in ant-plant mutualistic networks. Proc. R. Soc. B 273: 2041-2047. network analüüs: nes
nis inokuleeritud Suillus granulatuse voi Lactarius deliciosusega 0-7a; Sg: S.bovinus, R. luteolus, C.rutilus, Inocybe sp, L-laccata 2-3a; Ld: Suillus bovinus, Trich pessunda
r fast maximum likelihood-based phylogenetic inference. Nucl. Ac. Res. 33: 557-559. PhyML - PhyML - veebiproge
of fungi and bacteria from submerged decomposing leaf litter. Microb. Ecol. 45: 11-19.
sity of Peradeniya, Peradeniya.
J. Biogeogr. 1 Sri Lanka vihmametsakoosluste kirjeldused: väga vähe säilinud, domin, eri Diperoc rühmad
laceae. Pl. Syst. Evol. 192: 11-29. rbc Juglans ja lähedased sugukonnad
on J. 2013. Pr juurte lagundamine ja N omastamine mikroobide ja noorte taimede poolt on kiirem kui lehtede lagundamine löögi kõdu puhul
exogenous co Juurte eluiga männil sõltub pms juurte järgust ja EcM vs Non-EcM olekust peenimatel juurtel, vähem ka tekkest kas talvel-kevadel vs
ıa chinensis based on morphology and rDNA sequences. New Phytol. 147: 617-630.
ıstern Brazil. Mycotaxon 105: 399-405. Scleroderma sp. Nov Atl vihma
P, Mirzabekov A. 1997. Manual manufacturing of oligonucleotide, DNA, and protein microchips. Anal. Biochem. 250: 203 väike, 100-auguga 4% akrüülamiidgeelil põhi
). 1997. Oligonucleotide microchips as genosensors for determinative and environmental studies in microbiology rRNA, rDN rRNA, rDNA; parim tulemus in vitro transkr
ntrol of pitch in paper pulp manufacturing. Trends in Biotech. 19: 340-348. vaikude, t
. Hüüfid kurrulised, paljude lipiidikehadega. Parasitismi nähte pole
Cistus L. (Cistaceae) based on ITS, trnL-trnF, and matK sequen Cistus -Lääne-Vahemeremaad tsistuse perek radiats-tsenter, ent arv mitte perek ega suguk tekketsenter. Le
roderma bermudense : the status of *Scleroderma echinulatum* and the first record of *Veligaster nitidum* . Mycologia 96: 1370-1379. Scleroderma Ladina-ja Lõuna-Amee
xidase by pellet culture of the lignin-degrading basidiomycete, Pleurotus ostreatus. Appl. Microbiol. Biotechnol. 55: 704 -711. MnP: mõ
77-883. Pyroloideae feneetiliste tunnuste põh
and its parent Pyrola minor x P. Asarifolia: levik, nish, morfolo Pyrola minor x P. Asarifolia: levik, nish, morfoloogia
lissection and microarray analysis of Tuber melanosporum ectomycorrhizas reveal functional heterogeneity between mantle and Hartig net compartments. Environ. Microbi
ub 99: 17-20.
ı *Pinus virginiana* . Mycologia 47: 145-147.
logia 45: 971-975.
ci. 11: 401-404.
22: 577-583.
100: 217-223
ımation of microbial diversity in theory and in practice. ISME J. in press. liigirikkuse ekstrapol on proble
ıst. Biol. Sci. 22: 577-583.
ɔnal climate models MPI Report No. 336, Max Planck Institute kliimakaardid
sh amendment on the growth of the ectomycorrhizal external mycelium. FEMS Microbiol. Ecol. 39: 139-146.

diversiteedikomponendi
ı, Cort amoenolens; metsasrv: Lactarius4, Hebeloma, Wilcoxina, Cortinarius, Ce 3 RE, ITS1/NL6bmun
inema, Tom sp leesikal, Rhizopogon ja Cenococcum, Rhiz2, Wilcoxina ebatsuug 3 RE polyvinylpyrrolidone CTABis
ı Vaikse ookeani vihmametsa Ramariad Colombia Vaikse ookeani vihmametsa Ramariad Colombia Vaikse ookeani vihmamet
ın Ramaricum alboochraceum, einer seltenen Art der Gomphales und seine verwandtschaftliche Beziehung zu Geastrum und Gautieria. Geastrum, Gautieria, Ramaricu
n AM (eds). Nitrogen-fixing Actinorrhizal Symbioses. Springer: Berlin, Germany. Pp 25-47. Frankia: 16S vs 23S ja muud g
e influence of earthworms -a laboratory study. Soil Biol. Biochem. 24: 1525-1528.
ɔdes distinguish species of tropical Lepidoptera. Proc. Natl. Acad. Sci. USA 103: 968-971. Barcoding Lepidoptera: Barco
of species concepts of the small, white, European group of Tuber spp. Based on morphology and rDNA ITS sequences with special r Tuber: ITS põhine: esineb Euroopas
ns. Trends Biotech. 21: 433-438.
getatio 27: 49-69.
Optimal Alnus glutinosa Symbioses. Bot. Gaz. 140: S210-S126.
zae reduce damage to Russian larch by Othiorhyncus larvae. Scand. J. For. Res. 15: 354-358.
ıd *Torrendia* : sequestrate *Amanita* - or a mixed bag? Abstracts of the MSA Annual Meeting, 2004. University of North Carolina Ashenville, NC. p. 56.
sidiomycetes. eostevihm monokarüootidele: eosed levivad väga eostevihm monokarüootidele: eosed levivad väga kaugele, ent elamistingimused ei loba eksootilistel liikide
orth America. Mycologia 99: 310-316. Bothia gen. Nov (Boletaceae) N
Arora D, Hibbett DS, Binder M. 2012. Affinities of the Boletus chromapes group to Royoungia and the description of two new genera, Harrya and Australopilus. Aust. Sy
DS, Binder M. 2012. Sutorius: a new genus for Boletus eximius. Mycologia 104: 951–961.
ogeographic relationships. Mycol. Res. 112: 437-447. Tylopilus ballouii morfoliik on pantroopilise lev Tylopilus ballouii: ITS koosneb paljudest paraloogidest, m
phylogenetic analyses of microbial communities including analysis of pyrosequencing and PhyloChip data. ISME J. 4: 17-27. Fast Unifrac - palju
ated fungi with phylogenetic affinities to *Rhizoscyphus ericae* (≡ *Hymenoscyphus ericae*), Leotiomycetes. Stud. Mycol. 53: 1-27. Meliniomyces on uus parafüleetiline
3: 305-326.
dendraceae. Ann. Mo. Bot. Gard. 78: 89-95. Ticodendron incognitum: levik Mehhikost Panamani, takso Ticodendron incognitum: levik
leotide sequences of chloroplast trnT-trnF region and nuclear rD pappel ja haab on sõsarrühmad, mille lähim perek on paju. pappel ja haab on sõsarrühmad, mill
logical survey Iraani lepakoosluse tüpifitseerimine. Paljudest väga vähe järele jäänud

ssner MO, Jabiol J, Makkonen M, McKie BC, Malmqvist B, Peeters ETHM, Scheu S, Schmid B, van Ruijven J, Vos VCA, Hättenschwiler S. 2014. Consequences of bioc
amidt S, Stewart GR. 1999. The 15N natural abundance (d15N) of ecosystem samples reflects measures of water availability. Aust. J. Plant Physiol. 26: 185-199.
vart RG. 1996. The 15N natural abundance patterns of field-collected fungi from three kinds of ecosystems. Rapid Commun. Mass Spectrosc. 10: 974-978.
cts of the ecto-and VA-mycorrhizal fungi *Hydnangium carneum* and *Glomus clarum* on the delta15N and delta 13C values of *Eucalyptus globulus* and *Ricinus communi*
vegetation: dependence on water availability and disturbance. Funct. Ecol. 8: 306-315.
cCarroll SA. 2015. Large multiallelic copy number variations in humans. Nature Genet. In press.
ion in the ectomycorrhizal fungus Suillus bovinususing hygromycin B as a selecta Suilluse agrobacterium-transformatsioon
microarthropc Oribatida: kõdusegus 3 a jooksul rohkem liike ja rohkem isendeid kui monospec varises. Arv varise kvaliteedi ja arhitektuuri erinevus
tmospheric CO2. Phil. Trans. R. Soc. A 371:20120294 . kliima on sajandi jooksul soojenenud 1.7*, polaaraladel 5*. Tulevikus, kui CO2 2ko
nphasis on *Peziza* . Mycologia 93: 958–990. Pezizaceae: maapealsed maasiseste
eziza inferred from ITS sequences and morphology. Mycol. Res. 106: 879-902. Peziza s.s. ITS regioon. Mõni liik va
ngus genus *Peziza* and Pezizaceae inferred from multiple nuclear genes: RPB2, β 3 geeni Pezizaceae: maapealsed maasiseste
iverse cup-fungus family Pyronemataceae (Pezizomycetes, Ascomycota) clarifies relationships and evolution of selected life history tra Pyronemataceae 3 geeni põhjal
omycetes. Mycologia 98: 1031-1041. Pezizales LSU ja SSU põhjal.
ales, Agaricales, Russulales. 474 pp. Nordsvamp, Copenhagen.
phyllophoroid and Gastromycetoid Basidiomycetes. 444 pp. Nordsvamp, Copenhagen.
al taxa target different carbon sources in forest soil. Ecosystems 11: 1157-1167.
graphic patterns: processes shaping the microbial landscape. Na bakterid: lokaalses skaalas keskkond seletab 25% ja geogr distants 10% bakterite koosluses
of unsupervised Bayesian clustering. Bioinformatics 27: 611-618. CROP, Bayesil põhi
700-706. biogeograafia: tu biogeograafia: tuumamarkerid annavad rohkem ja laialdasemaid voimalusi kui mt-markeri
e in sporophores of wood rotting fungi. Mycologia LXVI, No 3: 469-476 lakaas: sü
il and other fungi. Norrlinia 10: 1–200.
ytol. 105 (Suppl.): 1-102
ge for macroevolutionary simulation and estimating parameters related to diversification from comparative phylogenetic data. [www document] URL http://cRAN.R-projec
ous root endophytes. Mycol. Res. 101: 1397-1404. DSE: ITS + 14RE; avastasid et Phialophora finlandia avastasid et Phialophora finlandia ja
in the Pezizales. I. 18S rRNA sequence data and classification. Mycologia 91: 41-50. Pezizales: 18S rDNA: Orbiliaceae -
etic inference of Sapindaceae sensu lato using plastid matK and rbcL DNA sequences. Syst. Bot. 30: 366-382. Sapindaceae: Allophylus lähedane B
Carex flacca ja C. Piluliferal EcM-moodi struktuur (vähene HN, rakusisene kolonisats, paks mantel) Cort cinnamomeusega. Väidet Cort cinn ei m
Cenococcum, Dryadirhiza fulgens. Domin perek Cortinarius. Kooslus sõltus eelkõige org aine sisaldusest. Org aine rohkus soosis Craterellust ja Cenococcumi
escens, Dryadirhiza fulgens, Cenoc, Boletus. Domin perek. Cortinarius. Ajaline varieeruvus polnud kunagi stat oluline
sekveneerimise vead, nende geenipanka panek, geenipanga vead, nende kontroll, interpret
of local commu lokaalne liigirikkus sõltub lineaarselt ja vä lokaalne liigirikkus sõltub lineaarselt ja väga tugevasti regionaalsest liigirikkusest.
for the study of microbial community similarity from termite mounds and tropica mikroobikoosluste RAPD, praimerite valik, analüüs
tal and isotopic patterns in macrofungal sporocarps and trees in semiarid forests of the south-western USA. Funct. Ecol. 20: 42-51.
forests of the Ituri Forest, Africa. J. Trop. Ecol. 11: 443-459.
ive tolerance to potentially toxic metals in the environment? Plant and Soil 189: 303-319.
sylvestris) seedlings by the ectomycorrhizal fungus Paxillus involutus in the presence of inhibitory levels of Cd and Zn. New Phytol. 142: 141 -149.
: an open-source, high-throughput software tool to identify and extract hypervariable regions of small subunit (1 eraldab SSU eri regioonid HI eraldab SSU eri regi
a, mullahorisondi ja kliimavöötme efektid selet 15-20% igaüks. Mõningate eranditega EcM-seened olid kõik puutumata alade indikaatorid
community structures throughout soil horizons of harvested and naturally disturbed forest stands. Environ. Microbiol. 11: 3045-3062.

nycorrhizae in forest soils of westwern Montana. For. Sci. 27: 442-445.
ated with decayed wood of living northern Idaho conifers. Mycologia 81: 765-771. nitrogena

ja ebatsuugat mõj eri istutusviisid erinevalt; eriviiside ja eripuuliked eri dominant seened
ht
d dehydropolymer of coniferyl alcohol by ericoid and ectomycorrhizal fungi. Arch. Microbiol. 153: 352-354.
2012. Mycoheterotrophic germination of *Pyrola asarifolia* dust seeds reveals convergences with germination in orchids. New Phytol. 195: 620–630.
a 4 MR-tüüpi, millest väh 2 kandseened ja 1 Cenoc Chosenia (Salicaceae) mood EcM ja vähe AM JPN-s
i polnud, ecM kolonisatsioon madalaim

d endophytic Mycelium radicis atrovirens that were dominant in soil from disturbed sites on growth of Betula platyphylla var. japonica seedlings. Ecol. Res. 16: 117-125.
uvad Rhizopogon ja Tricholoma
AM Juniperus inhibeerib EcM teket Pinus edulisel oma pätsides
tatus of boletes on the Northern Yucatan Peninsula, Mexico determined using isotopic methods. Mycorrhiza 26: 465-471.
Biopolymers. Pp. 129-180. Wiley-VCH, Weinheim, Germany. MnP, LiP
inus . J. Arn. Arb.14: 85-99.
strobus L. J. Arn. Arb. 14: 324-334.
obs Pinaceae (6 perek), Quercus, Fagus, Betula, Carya, Corylus. EcM sünt Pinus spp.
in tropical rai kõdulagundamine: 'Starvation/inhibition of decomposers' hypotees - puud minimis varises toitaineid, et saproobid nälgiks ja mükoriisa
in terrestrial e lagunemine vs BD: enamus juhtudel lagundajate seente ja loomade ning taimede BD kiirendab protsessi. Seentel pms fasilitatsioon, m
to utilize fatty acids and a lipid as a carbon source for mycelial growth. Can. J. Bot. 81: 1285-1292.
Graffenrieda emarginata mood AM ja DSE Hymenoscyphus ericae rühmaga, mida peavad ekslikult EcMks. Sealsamas olemas ka Tulasnella, mida

ECM transfer-rakkudega
Taiwan: EcM puud Fagaceae (sh Castanopsis, Pasania, Cyclobalanops), Elaeocarpaceae, Juglandaceae (Engelhardtia), Pinaceae. Pisonia umbellifera mood VAM
2; Hymenosc; Neea2: Tom aff ellisii1; Guapira: Tom aff ellisii2 ITS, LSU

ıonedes regioonides
Fungal community responses to precipitation. Glob. Change Biol. 17: 1637–1645.
ıd 19 others. 2007. A global evaluation of metabolic theory as a latituudi gradient: metabolismi teoori kohta pole tõendeid
›rrings revisited: spatial autocorrelation and parameter estimation in geographical ecology. Ecography 30: 375-384. ruumiline autokorr e
Mittelbach GG, Oberdorff TT, Porter EE, Turner JRG. 2003. Energy, water, and broad-scale geographic patterns of species richness. Ecology 84: 3105-3117.
The case of California butterflies. Am. Nat. 161: 40-49. liblikatel ja taimedel pole diversiteedimustrite regionaalses sarnasuses põhjuslikku seost, ise
ı peremeeste ja kasvukohatüüpide rohkus, kottseeni lisaks ka ressursside rikkus. Arv troopikas on diversiteet suurim
nte ja alamrühmade BD maailmas, Inglismaal ja troopikas. Ekst kõigi seente ja alamrühmade BD maailmas, Inglismaal ja troopikas. Ekstrapoleerimine taim:seen, putuk:see
Kapimaal looduslikud EcM puud puuduvad. Väidetavalt on EcM seeni korjatud Ida-Kapimaa metsadest (Knysna, Tsitsikamma)

›pecificity of *Pisonia grandis* (Nyctaginaceae). Mycorrhiza 22:647-652.
ctions with inc Mida stressirohkem on keskkond, seda suurem on pos interakts proports. Ellujäämuse puhul on fasilitats tugevam; kasvu ja rprodults n
of Pinus arose in the fiery Cretaceous. New Phytol. 194: 751-759. Pinaceae tek 237 MYA (CI 190
›ansfer from ectomycorrhizal pines to adjacent ectomycorrhizal and arbuscular mycorrhizal plants in California oak woodland. New Phytol. 170: 143-151.
ısfer between Pisolithus vahendab N liikumist Casuarina ja Eucalyptuse vahel. Transp on er suur kui Casuarina on Frankia noodulitega ja ECM > ECM > kontroll. Kui on
ıamiana is the N liikumine Eukalüptist kasuariini sõltub suurel määral nii mükoriissest kolonisatsioonist kui kiirikbakterite olemasolust. Voog on kasuariini arv seetõttu, et
›rength of ectomycorrhizal marphotypes of *Quercus douglasii* , *Q. garryana* , and *Q. agarifola* seedlings grown in a northern California oak woodland. Mycorrhiza 18: 33-
-723. merede vs kontinentide biogeo vrd, probleemid. Väärad kalibreeringud eriti tektoonika jr (nt Panama kanal
ıain species massings. J. Biogeogr. 33: 1066-1075. Nothofagus: arv Brassospora Uus-Kaled ja PNG-s kogu aeg olnud, al kriidist. Arv et see on peamine tekke
07-431. FIJI taimestik on arv seal evolutsioneerunud ja hüpanud ühelt saarelt teisele. Vanasti arv oli rohkem saari k
ıronmental heterogeneity for productivity and mortality in a tropical tree plantation. J. Ecol. 96: 903-913. variation partitioning
ːizaceae (Pezizales). An. Jard. Bot. Madrid 66: S25-S32. Calongea gen nov. Maasiseste v
Stafford K, Kumar L, Lee T, Hobart C, Trappe J, Vilgalys R, McLaughlin DJ. 2013. High diversity and widespread occurrence of mitotic spore mats in ectomycorrhizal P
ıalysis of fungal networks. Fung. Biol. Rev. 26: 12-29.
rough DNA barcodes. Proc. R. Soc. Lond. B 270: 313–321. DNA barcoding - triipkoodisamine esmane artikke
ıl kingdom. Biol. Lett. 6: 359–362. barcoding: töötab barcoding: töötab hästi N-Am l
ırough DNA barcodes. PLoS Biol. 2:e312. barcoding gap: esmane kasutamine; eristab hästi li
Molecular Evidence for the Early Colonization of Land by fungi and plants. Science 293: 1129-1133. seente ja taimede eristumine 119 pro
in strains from genetically isolated lineages of the ectomycorrhizal fungus *Paxillus involutus s. lat.* Mycorrhiza IN PRESS Pax invo: peremehe-spets ei sõl
› recognition in the ectomychorrhizal fungus *Paxillus involutus* . Mycol. Res. 112: 965-975. Paxillus involutus koosneb 4 kr
ı in apatite amended and non-amended mesh bags buried in a phosphorus-poor spruce forest. Mycol. Res. 112: 681-688.
ıltural land. Appl. Soil Ecol. 19: 71–78.
ikroobide BD põllumaa rekultveerimine: külvati 4 vs 15 taimeliiki: mikroobide BD idiosünkraatiline, erinev 5 riigis, erinev 3 a jooksul, erinev töötlustes, ent kõikjal +-efek
gement on former agricultural land. Soil Biol. Biochem. 34: 1299–1307.
2558-2562. Pseudoreplikatsiooni tüübid
›sques d' Afrique et de Madagascar. 3-18.
re Francaise). Bull. Jard. Bot. l' Etat 25: 1-91.
›ens -Fontana. Bull. Jard. Bot. l' Etat 28: 385-438.

rest soil CO2 flux: uncovering the contribution and environmental responses of ectomycorrhizas. Glob. Change Biol. 13: 1786–1797.

› Scots pine seedling root and mycorrhizosphere compartments developed on reconstructed podzol humus, E-and B-mineral horizons. Plant Soil 259: 111–121.
ı, Cenococcum; B: Suillus, Hymenoscyphus complex 3 RE ANOVA jt bakteriaal
›t: vahe BD ja koosluses. Aastatega enne raiet istutatud puudel vähenes siledate morfotüüpide arvukus muude arvelt; pärast-lageraiet seosetu; vahe ka kauguses elusmetsas
titioning in ectomycorrhizal Scots pine seedlings. Soil Biol. Biochem. 42: 1614-1623.
ıcalyptus pilularis seedlings. II. The effect of ectomycorrhizas on seedling phosphorus and dry weight acquisition. Aust. J. Bot. 34: 445-454.
ıronment affects birch leaf endophytes. New Phytol. 175: 547-5 endofüütide sagedus kaselehtedel seostud Ahvenenmaa saarte suuruse ja isoleeritusega
wood-wide web? Nature 394: 431.
› wood-wide web? Nature 394: 431. AM1 primer
ıizal fungi colonising Hyacinthoides nonscripta(bluebell) in a seminatural woodland. Mol. Ecol. 8: 659–666.
microbes emer neutraalsed mutatsioonid ja geenidrift ning disp limitation põhj biogeo mustreid ookeani bakterite koosluses. Liigiteke on kiirem kui k
MSc Thesis. puisniidud: BD suurem Ida-Saaremaal ja Muhus, kus puisniite rohkem säilinud (metapop); BD soltub ümbritsevate puisniitude pindalast 10, 15 km raadiuses
› suureneb

›rminants of pl fülogeneet koosluse struktuuri sõltuvus erinevatest faktoritest: eristavad konkurentsi mõju fül sarn-funkts mõjust. Algor fülogeneet l fülogeneet koosluse stru
2013. Mycorrl Fakultatiiselt AM taimedel on laiem levila ja ökoniss kui NM ja oblig AM taimedel;
4, Ylikoski J. 2000. Panfungal PCR and multiplex liquid hybridization for detection of fungi in tissue specimens vedelhübridi vedelhübridisatsioon, ALF express geelil eralo
ıl mycelia production in the field: the soil matrix matters. New Phytol. 171: 179-186.
›ood. Can. J. For. Res. 21: 1299-1304.
s
› unusual basidiomycete from Guyana. Mycol. Res. 110: 1409-1412. Cantharellus pleurotoides Guyanas -
Russula ja La Dicymbe metsas lagupuidus EcM juured

Pseudotulostoma on Elaphomycese s
ı the Pakaraima Mountains of Guyana. Mycol. Progr. 4: 343-350. Clavulina 5 uut liiki Guajaanast
EcM taimed Guajaanas Dicymbe 3 spp, Aldina insignis; teised tsesalpiinilised mitte (Eperua, Macrolobium)
aesalpiniaceae Guajaanas mood Dicymbe Corymbosa monodominantseid metsi, kus võrade tihedus väiksem kui mujal, ent basaalpind suurem kui mujal. Domineeris 25-60
in forest fungi and the roots of the saprotrophic-mycorrhizal divide. Oecologia 128: 480–487.
›y basidiomycete fungi and its implications for natural nitrogen isotope patterns. New Phytol. 162: 771–781.

fractionation by basidiomycete fungi: Delta13C pattern and physiological process. Appl. Environ. Microbiol. 68: 4956-4964.
n of the ribosomal DNA spacers. Mycol. Res. 98: 37-43. ITS ja IGS1 RFLP trühvliliikide eristamiseks. Liike eristavad hästi, tüvesid halvasti. Prain
rtin F. 1994. Monitoring the persistence of Laccaria bicolor as an ectomycorrhiz IGS1-RFLP; eristab hästi Laccaria nii liigisiseselt kui liikidevaheliselt -suur varieeruvus
ectomycorrhizal fungi by amplification of ribosomal RNA genes. New Phytol. 12 kogu rDNA, jupiti, sh IGS1 (suured perekonnasisesed erinevused pikkuses: 500-900bp);
Juured valesti määratud
ioid lagumes: a preliminary analysis based on morphological and molecular data. In: Klitgaard BB, Bruneau A (eds.). Advances in Leg Caesalpinioideae: morf süst: EcM p
ssification and sequence-based identification of host-associated microorganisms. New Phytol. 205: 27-31.
Ecological implications of anti-pathogen effects of tropical fungal endophytes and mycorrhizae. Ecology 88: 550-558.
). Shifting fungal endophyte communnities colonize Bouteloua g juure-endofüütidel BD väheneb põhjast lõunasse (CAN-USA, N-Mex). Ent muld oli põhjas
ungal communities reveals sequences related to root-associated fungal endophytes. Microb. Ecol. 61: 239-244.
crocuttings to study specific effects of mycobionts on plant morphology before, and in the early phase of, ectomycorrhiza formation by Paxillus involutus and Piloderma cro
sel
Arkt: Salix, Polygonum viviparum, Dryas mood EcM; illustr.
Phil. Trans. R. Soc. Lond. B. 359: 183-195. jää-aegade mõju taimede migratsioonile ja geneetilisele divergeerumisele kvaternaaris: enamik laialt levinu

classification of the Fungi. Mycol. Res. 111: 509-547. seente klassifitseerimine hõimkonda
SU, SSU tähelepanu pööratud resupinaatsetele seentele, palju vigu mt, nu LSU, SSU tähelepanu pöörat
ecay mechanisms, mating systems, and substrate ranges in homobasidiomycetes. mt, nu LSU pruunmädanik on toenäoliselt tekkin
nuc SSU/LSU; mch SSU ECM vs saprotr; homobasidiomyc
d their plant hosts estimated using Bayesian relaxed molecular clock analyses. BMC Biol. 7: 13.
molecular and morphological taxon discovery in Fungi and options for formal classification of environmental sequences. Fung. Biol. R seeneliikide kirjeldamiseks kul
4: 279-282.
mushrooms and puffballs inferred from ribosomal DNA sequences. Proc. Natl. mt DNA puguseened on arenenud vähemalt 3
nd? Nature Rev. Microbiol. 11: 129-133. keskkonnast pärit järjestuste ta
ns in the nuclear ribosomal DNA of mushroom-forming fungi. Mol. Biol. Evol. 13: 903-917. Grupp I intron; hibbett arvab, et on t
y of *Lentinula* . J. Biogeogr. 28: 231-241. Lentinula edodes: kosmopoliit v. Euroopas, 7 eriklaadi, Ameerika ja Vana Maailma rühmad on teistest
incompatibility in *Ceratobasidium bicorne* . Mycologia 95: 239-250.
sidium bicorne has an anamorph known as a conifer pathogen. Mycol. Res. 105: ITS4B võtab Ceratobasidiumit Ceratobasidium: ITS v konserveerun
oolest Dothideomycetes, Sordariomycetes, Leotiomycetes, Endomycetes. Paljud 90% ITS kriteerium, ka 95, 97, 99%; lisaks LSU ja S Geoglossum-Trichoglossum on Pezi
usually caused by nonstandard means of dispersal? Ecology 84: taimede juhusl levik pika maa taha ei sõltu tava-levimistüübist. NZL on TAS-st kolonis taimed v palju mik
Vilson SD, Pärtel M. 2012. Plant species richness belowground: higher richness and new patterns revealed by next generation sequencing. Mol. Ecol. 21: 2004–2016.
Zobel M, Wil taimede liigirikkus seletab 8% AM seente liigirikkusest maapealsete osade järgi ja 23% liigirikkusest maa-aluse Sekventside rarefitse
utoideae (Ericaceae): implications for the Madrea-Tethyan hypo Arbutoideae fülogenees ja levik maailmas: levikutsenter Cal Arbutoideae fülogenees ja levik
ll Res. Bull. ???: 233-253. Seisellide väikesaarte floora ja fauna võrdlus ning kaitseväärtus
gaceae): the contribution of the fossil record. Aust. J. Bot. 49: 3 nothofagus: ajalooline biogeograafia
. Lond. B. 359: 1537-1549. Austraalia kliima kriidist tänaseni: tugevad kuivenemised seoses Antarktikast eraldumisega ja hiljem. Fagal
ceptibility of n Asteraceae fülogeneet suhted seletavad 32% herbivooride põhjustatud kahjust. Asteraceae fülogeneet suhted s
163: 192-211 kõikidel makroorganismidel on biodiversi kõikidel makroorganismidel on biodiversiteedil laiuskraadi-gradient, mis on eriti tugev suur
restris on outplanted Scots pine seedlings. Acta Mycol. 41: 313-318.
ges in the rhiz taimed pms hapestavad mulda ATPaasidega, selleks et saada kätte P, Fe. Reaktsioon NH4 ja NO3-le erinev, Al vältimiseks pH tõstmine. Mulda ka orgaanil
and Cortinarius species. Karstenia 39: 39-43.
lembola varies with the ectomycorrhizal symbiont. Mycorrhiza 5: 99-103.
ctus igas mullahorisondis, domin ka viljakehadena ISSR>RAPD>>>IGS Suillusele. 1 ISSR marker
horaceae). II. Svensk Bot. Tidskr. 64: 421 – 428.
horaceae). III. Svensk Bot. Tidskr. 68: 51 – 56.
spond to belowground exploration types. Plant Soil 327: 71-83.
n, availability, and mycorrhizal colonization affect biomass and nitrogen isotope pattrens in *Pinus sylvestris* . Plant Soil 310: 121-136
al fungi correlate with nitrogen isotope patterns in plants. New Phytol. 157: 115–126. EBAKOMPETENTNE
nfluence water N ühendite konts mullas mõjutab taimede veekasutusefektiivsust. Suur transpireerimine on sageli seotud mitte kõrgendatud CO2 vajadusega kui hoopis min
and tundra can estimate nitrogen cycling through mycorrhizal fungi: a review. Ecosystems 11: 815-830.
. 2014. Fungal carbon sources in a pine forest: evidence from a 13C-labeled global change experiment. Fung. Ecol. In press.
nitrogen dynamics. New Phytol. 196: 367-382.
mycorrhizal fungi mobilize nitrogen during litter decomposition. New Phytol. 173: 447-449.
velopment of mycorrhizae and nitrogen supply during primary succession: testing analytical models. Oecologia 146: 258-268.
ics of ectomycorrhizal and saprotrophic fungi from isotopic evidence. Oecologia 118: 353-360.
. Biogeochem. 95: 355-371.
trophic and ectomycorrhizal fungi. Soil Biol. Biochem. 48: 60-68.
ctionation of ectomycorrhizal and saprotrophic fungi in natural abundance and 13C-labelled cultures.Mycol. Res. 108: 725-736.
2014. Fungal functioning in a pine forest: evidence from a 15N-labeled global change experiment. New Phytol. 201: 1431-1439.
ate use and assimilation by litter and soil fungi assessed by carbon isotopes and BIOLOG(R) assays. Soil Biol. Biochem. 35: 303-311.
termine the mycorrhizal status of fungi. New Phytol. 156: 129–136.
gi: the isotopic evidence. New Phytol. 150: 601-610.
ts. In: Buscot F, Varma A (eds.). Micro-organisms in Soils: Roles in Genesis and Functions. Springer: Berlin, pp. 385-404.
ngi. In: Dighton J, White JF, Oudemans P, eds. The Fungal Community. Its Organization and Role in the Ecosystem. CRC Press, Boca Rayton, FL, USA, pp. 3 15N ja 13
ground allocation in culture studies. Ecology 87: 563-569.
. 2009. Mycorrhizal fungi supply nitrogen to host plants in Arctic tundra and boreal forests: 15N is the key signal. Can. J. Microbiol. 55: 84-94.
and carbon flux rates in arctic tundra. Ecology 87: 816-822.
es do not mirr lagunemisprotsessi maa-alustele ja maapealsetele organite.e. Maapealseid kontrollib ligniini konts ja Ca; maa-aluseid määrab juurte jä

Arctic marine food web using d13C and d15N analysis. Mar. Ecol. Progr. Ser. 84: 9-18.
ates decomposition and acquires nitrogen directly from organic material. Nature 413: 297-299.
persion, interspecific competition and mycorrhizal colonization. New Phytol. 157: 303-314.
– the missing heterotroofid on primaarsed asustajad, sest nad satuvad juhuslikult, elavad jäänustes ja kanduvad tuulega
le A, Zabinski mükoriisa mõju on eriti tugev siis kui N/P suhe on kõrge (P limiteerib), sõltuvalt taime funktsionaalsest rühmast, mittesteriilsetes tingi
es. Kooslust mõj mullageogr ja taimepop, aga mitte nende koosmõju
spx, Cenoc ECM seente biodiversiteeti võib ülal hoida juurte "teadlik" selektiivne suretamine juhul kui ECM seened on erineva konkurentsivõime ning kasulikkusega. S
ty in mycorrhizal interactions. Commun. Integr. Biol. 2: 110-112.
narket models: ress jagamisel põhinev mutualismi-protokooperatsiooni mudel kus arvest ress -de kättesaamisef, kättesaamiskomplem, ress vajalikkust. Seen vs bakter (N vs
corrhizal interaction: pines and false truffles. J. Evol. Biol. 20: 1 Rhizopogoni liigid ja männiliigid Californias ei ole spetsiifilised allo-ja sünpatrilisuse seisukohast; Inokul n
187: 286-300. MR seente ja taimede koevo ar
urg PF, Rogers JD, Peever TL, Carris LM. 2004. Fungal endophytes in woody roots of Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). For. P
fungi along natural productivity gradients. Ecosystems 6: 739–746.
eling by fungi kivimiproovid seenehyyfidega. Erivanused. Mida vanemad, seda rohkem hüüfe.
endophyte communnities in cupressaceous trees. Mycol. Res. 112: 331-344. >98% ITSi olid parimad liikide klastrid
etically diverse fungal endophytes. Appl. Environ. Microbiol. 76: 4063-4075.
99. Production of manganese peroxidase and organic acids and mineralization of 14C-labelled lignin (14C-DHP) during solid state fermentation of wheat straw v lakaas (ma
ka A. 1998. Oxidative decomposition of malonic acid as basis for the action of manganese peroxidase in the absence of hydrogen peroxide. FEBS Lett. 434: 262 malonaat
Microb. Technol. 30: 454-466. MnP: ülev
s of the Lyophylleae (Agaricales, Basidiomycota) based on nuclear and mitochondrial rDNA sequences. Mycol. Res. 106: 1043-1059.
fects of nitroge metsakoosluste gradiendil produktsiooni suurenemisega kaasneb pH alanemine, N tõus, C/N vähenemine, mikroobide biomassi tõus 20%, seente osakaalu v
rnton B, Hurry puud investeerivad maa alla augustis 6 x rohkem kui juunis; augustis EcMdmood 39% mikroobsest biomassist mullas; seente viljakeh
adienti läbi veereziimi. N reostus ja puude koorimine vähendab seentesse minevat C, ent ei mõj bakterite arvukust üldse. pH tõus iseenesest suurendab bakterite osakaalu.
s one-third of microbial biomass and produces, together with associated roots, half the dissolved organic carbon in a forest soil. New Phytol. 154: 791-795.
rest: evidence from 15N abundance and foliar analysis. J. Ecol. 83: 217-224.
fractionation during nitrogen uptake by ectomycorrhizal and non-mycorrhizal Pinus sylvestris. New Phytol. 142: 569-576.
15N abundance of surface soils, roots and mycorrhizas in profiles of European forest soils. Oecologia 108: 207-214.
5N abundance of surface soils, roots and mycorrhizas in profiles of European forest soils. Oecologia 108: 207-217.
th and root respiration in boreal pine forest. Oecologia 132: 579–581.
puude koorimisega
Zambia taimk Zambia taimkattetüübid Lawton1978 jr : tulest rä Zambia taimkattetüübid Lawton1978 jr : tulest räsitud Chipyas pole EcM taimi v.a. Pericopsis. Swartsia N
saprotroofid 13C sisaldus
ecology. Tren C-ringe: mükoriisaseened vahendavad taimest tulnud süsinikku maa alla tundide ja päevadega. Juurte elumus 14C põhjal on palju suurem EcM juurtel kui ee
Uapaca , Monotes (Dipterocarpaceae) ja Brachystegia-Julbernardia, Afzelia (Caesalpinoideae) on ECM Tansaanias
(Tanzania). J. Apll. Ecol. 23: 676-688.
ECM taimed ida-aafrika savannis: Caesalpinaceae, ülevaade.
al habit of trees in mixed African woodlands. New Phytol. 115: 483-486.
Aafrika savannides EcM puid vaid miombo-tüüpi savannides, kus need domineerivad. Seal limiteerib N, vihmametsas P; miombos ka P vähe, mis
79-203.
nplications of ITS rDNA sequences. Mycologia 92: 694-710. Cortinarius alamperekonnad, Rozites Cortinarius, Rozites, arutelu, võimal
s that detect quantitatively significant groups of butyrate-producing bacteria in human feces. Appl. Environ. Microbiol. 69: 43 16S rRNA butüraatbakteritele: liigispets ja rü
nes. Nature Rev. Genet. 4: 275-284. klassikalise fülogenees: klassikalise
tremulae: puu kohta keskm. 4 genetit, paiknevad erikorgustel ja nakatavad toenäoliselt elusate okste kaudu, kui need surevad; juurtes puudub täielikult
ity of wood-decomposing fungi. FEMS Microbiol. Ecol. 12: 169-176.
ycetes in artificial systems based on variable inoculum sizes. Oikos 79: 77-84.
ics and possible horizontal transfer of group I introns between closely related plant pathogenic fungi. Mol. Biol. Evol. 16: 114-126. Grupp I intronite horisontaalne ylekä
rea relationshi kõrgematel troofilistel tasemetel liigirikku kõrgematel troofilistel tasemetel liigirikkuse-pindala seos järsem ja tugevam
VK Paxillus erinevad isolaadid inokuleeritud tammedel ja pöökidel: eri-isolaadid IGS1 RFLP (5st 1 kõlbas), VIITED praimeritele; IGS1 Paxillus
zales A, Duffy Ekstinktsioon mõj prim-prod samaväärselt vüi tugevamini kui CO2 tõus ja muud klimaatilised tegurid
Queenslandi N-osa; primaarses vihmametsas, kus domin Acacia, EcM pole. Arv nii on kõikjal N-AUS vihmametsades; sekundaarses EcM domine
Calif rohumaal: EcM taimi pole
prinus and dark-spored allies based on sequence data from the nuclear gene codir LR5, LR7, LR21 jt LR-praimerid LSU: Coprinus pole monofüleetiline
aus Patagonien: *Singeromyces* Moser, *Paxillogaster* Horak und *Gymnopaxillus* Horak. Nova Hedw. 10: 329–338. Singeromyces, Paxillogaster, G
yxacium and subgen. Paramyxacium. Sydowia 42: 88-168. Cortinarius: PNG, Malai, NZL Cortinariused uued liigid. Mitmed seot PNG, Malai, NZL Cortinariused uue
. Bulletin de la Societe Botanique Suisse 77: 362-375. Kesk-Aafrikas uued perek Tubosaet
Zealand. N. Z. J. Bot. 9: 463-493.
Descolea levinud lõunapoolkera Nothofaguse metsades ja siin-seal Ind Descolea levinud lõunapoolkera Not
5-652.
tanica 18: 97-109. Boletused Tshiili Nothofaguse metsades ei sarn NZL Boletustega. Uu Boletused Tshiili Nothofaguse metsa
10: 157-205. Inocybe sect asterosporina PNGs, M
8: 202-208. PNGs uued seeneperek Fissolimbus
es, Boletales Australaasia ja ümbitsevatel mandritel. Arv et muu Agaricales, Boletales Australaasia ja ümbitsevatel mandritel. Arv et m Agaricales, Boletales Australaasia ja
255-309. NZL Hygrophoraceae: arv ainult pe
472.
Zürich, Switzerland. 40-111.
of eucalypt ectomycorrhizas. New Phytol. 109: 451-458.
n? New Phytol. 116: 297-301. terved (mi
zal fungal communities are phylogenetically clustered at small scales. ISME J. 8: 2231-2242.

ion in bacterial evol-ökol bakteritel: kooslused fülogeneet enamasti sarnasemad kui juhuslik; mõnedes kohtades ka erinevamad = üledispersioon (eriti toitainerikkamates pai
on bacterial biodiversity. Proc. R. Soc. Lond. B 271: 113–122.
inev samas 3c taimede ja bakterite liigi-pindala kõver soolasoo taimede ja bakte bakterid: 16S rDNA sekveneerimine, erinevad identsusastmed 95 sörenseni indeks, mante
sity patterns along a gradient of primary productivity. Ecol. Lett bakteritel vs produktiivsus gradient mesokosmostes. Erirühmadel U- ja opt-trendid, MITTE
JA and 7 oth kooseksisteerimine mikroobidel vs makro kooseksisteerimine mikroobidel vs makroobidel: Negatiivne assots oluline pea alati. Fingerp
is heterogeenne keskkond 1mm3 skaalas; tähtis primaarprod -küürukõver; liigisiseselt on biogeogr str, v suur erinevus levimisvõimes; kiire evol-võime nii mutatsioonide, ko
of the edible fungus *Lactarius* deliciosus field competition with *Rhizopogon* spp. Mychorrhiza 18: 69-77.
gus *Lactarius deliciosus* : effects of inoculation strain, initial colonization level, and site characteristics. Mycorrhiza 19: 167-177.
Martin F. 2012. Beech roots are simultaneously colonized by multiple genets in the ectomycorrhizal fungas Laccaria amethystina clustered in two genetic groups. Mol. Eco
med C. 2013. Temperate eucalypt forest decline is linked to altered ectomycorrhizal communities mediated by soil chemistry. For. Ecol. Manage. 302: 329–337.
xxx +taim arcsin, t-test, anova
sp1, Russ amoenolens, Russ xerampelina; vaid Tom sp1, Cort sp1 ja Rhizopogor 3 RE (seen ja taim: 28KJ, TW arutelu Wilcoxon mitteparam.
xxx sekveneerimine: referentsi vähesus
d, Pilod fallax, Rhizop1; 40-a nulu seemikud: Russ xeramp, Pilod fallax, Cenoc; 400-a ebatsuuga: Rhiz2, Thel1, Agaric1; 400-a nulg: Cort1, Russ1, Russ3; kokku 40-a: do
ion in local scale. Plant Soil 244: 29-39. ITS-tüüpide diversiteet: lokaalses skaalas väike, vaid ITS-tüüpide diversiteet: lokaalses sk
e gomphoid-phalloid fungi with an establishment of the new subclass Phallomycetidae and two new orders. Mycologia 98: 949-959. Geastrales(Hysterangiales(Phallales-
hallomycetidae, Basidiomycota). Mycol. Res. 112: 448-462. Hysterangiales: basaalsed on non-EcM; kosmopoliidid; EcM haru dest basaalne on levinud AUS. Üks tipm
l emphasis on the position of Sclerogaster. Bull. Nat. Mus. Nat. Sci., Ser. B 34: 161-173. Geastrales: koosn monofül Sph
s of Boletaceae from tropical Asia: phylogeny, morphology and taxonomy. Fung. Div. 58: 215-226.
ental, spatial, and spatiotemporal components of species distributions. Ecol. Monogr. 81: 329-347. mudeldamine paljud
l analysis. Cladistics 13: 67–79. maa-alade kladistilise v klasteranalüüsi asemel tuleb kasutada vikariantsusel põhin biogeograafias maa-alad
distribution in South America. J. Arn. Arbor. 87-95. Coccoloba: L-Am liigirikkuse kese Venezuelas ja Atlantilise Coccoloba: L-Am liigirikkuse l
): 356-367. Coccoloba
egeneration or Nothofagus idaneb regener pms CWD-l ja üleskistud mullapallidel. Seemned idanevad pms hiliskevadel v varasuvel; Arv tüvedes saavad juured paremini pe
vs rotats-per 3 v 6 a:: samad seened puudel, ent mõj rot-periood

wiloows at former ore mining sites. Eur. J. Soil Biol. 44: 37-44.

istanduses ilma stat vaheta; koosluse str ei hinnatud õigesti; 6 proovis 5-10 liiki; 10 proovis 8-11 liiki
Yong S, Mei-juan W, Yan-juan L, Li-si L, Langenfeld-heyser R, Eberhard F, Polle A. 2008. Effect of NaCl on growth and ion realtions in two salt-tolerant strains of Paxil
. J. Biogeogr. 33: 464-475. Guajaana mägismaa pampade floristika, levik, ajalugu
ic sequences in multiple sequence alignments. Bioinformatics 20: 2317-2319.
nmunity composition in a woodland-forest ecotone. Mycorrhiza 18: 363-374.
trees. Bioinformatics 17: 754-755. MrBayes: b MrBayes: baieesia tüüpi
lassezia, Cryptococcus; antibiootikumid ja haigused põhj tugevaid nihkeid
accumulating in the public databases. Int. J. Syst. Evol. Microbiol. 53: 289–293. kimäärsekventside teke sarnae kimäärsekventside teke sarnaese dNA korral (16S): lahend
l, mitteparam meetodid, head ja vead; VIITED biodiversiteedi arvutami
centage DNA sequence similarity for environmental species' delimitation across basidiomycete fungi. New Phyt ühe viljakeha piiresITS heterogeensus: 50% esines
ribosomal ITS region of a Flammulina (Fungi, Agaricales) hybrid. Mol. Biol. Evol. 81:94-96.
L, Horner-Devine MC, Kane M, Krumins JA, Kuske CR, Morin bakteritel jt mikroobidel: leviku tõenäosus sõltub levimisvõimest ja pop tihedusest; Hüpot. l
ers of bacterial beta-diversity depend on spatial scale. Proc. Natl. Acad. Sci. USA 108: 7850-7854.
99. ei toeta liikide lognorm ja log-seeria jaotust, eelistab dünaamilist mudelit, kus üksikuid domin on v palju ja v palju ka haruldasi; Väidetavalt andmed lognorm
of Pyrola japon Pyrola japonica Koreas: suur populatsioonisisene diversiteet, väike populatsioonidevaheline erinevus vrs teiste sama eluviisiga liikidega allosüümi
ular phylogenetics of Ramaria and related genera: evidence from nuclear large subunit and mitochondrial small s Ramaria LSU mitu er Ramaria on parafüleetiline (LSU, mt
orestry. III. Effects of commercially produced inoculum on container-grown Douglas fir and ponderosa pine seedlings. Can. J. For. Res. 16: 802-806.
ycorrhizal fungi in response to pH in vitro. Mycologia 75: 1983: 234-241.
Pisonia grandise leiud Tansaanias ja mainib Seiselle
P+sekv vs kultuurid (rohumaadel sama, kultuuridel palju väiksem BD, RFLP bän 18 rDNA seeneklooonide (EF4-fung5) kloonide RFLP+sekv vs kultuurid. RFLP bändid sis
ation to shade. Pyrola rotundifolia: varjus vs valguses kasvamine ei mojuta taime kasvu; kasv väga aeglane väljakaevatud ja ümberistutatud taimedel. Looduslikus kohas ko
obal temperature variability despite changing regional patterns. Nature 5 Kliima varieeruvus jääb globaalses mõõtmes samaks, ent põhjapoolkeral on suurene
es from 16S rDNA clone library sequences. J. Microbiol. 42: 9-13. fülogeneetiline statistika
ssp. Rugosa i Lepp saab 85%-100% N Frankiate kaudu, fikseerib u 40 kg N/ha aastas
how would w liigirikkuse ja energia seosed; energia on ressursside kättesaadavus ja produktiivsus ja selle otseseim näitaja on laiuskraad. Energia sc
tomol. 93: 533-535. kriitika ühele pseudorep
. Ecol. Monogr. 54: 187-211. pseudoreplikatsioonitüü
reply to Oksanen. Oikos 104: 591-597. pseudoraplikatsiooni tul
us recovery of RNA and DNA from soils and sediments. Appl. Environ. Microbiol. 67: 4495–4503. DNA ja RNA eraldamine mullast: 1% CTAB/2% SDS mee
y of arbuscular mycorrhizal fungi and patterns of host association over time and space in a tropical forest. Mol. Ecol. 11: 2669–2678.
cosystem funct Naeemi ja Tilmani tööde kriitika: tulemustes varjatud töötlused, vale interpret
tion in vitro by varase staadiumi seened nakatavad perem taimi ilma lisa Glc sootmes, samas kui hilise st saaned tahavad lisa-Glc ja sel juhul voivad nakatada ka mitte-pere
-114.
hizal fungi. Mycologia 81: 587-594.
ulture. II. The enzymatic degradation of selected carbon and nitrogen compounds. Can. J. Bot. 68: 1522-1530. EcM kar
tatus of *Catathelasma imperiale* in North America. Mycologia 84: 472-475. Catathel
ersity of mycorrhizal fungi from single plants of Caladenia formosa (Orchidaceae). Ann. Bot. 104: 757-765.
ngus Tricholoma matsutake: sequence, structure, and phylogenetic analysis. Mol. Cells 8: 251-258. Tricholoma matsutake 18S ja IGS2 ehitus ja pikkus ja sekv
I, Dissanayake AJ, Glockling SL, Goonasekara ID, Gorczak M, Hahn M, Jayawardena RS, van Kan KAL, Laurence MH, Lévesque CA, Li X, Liu J-K, Maharachchikumb
rtrand Y, Oxelman B, Hartmann M, Kauserud H, Ryberg M, Kristiansson E, Nilsson RH. 2013. Incorporating molecular data in fungal systematics: a guide for aspiring res

d ja Tomentellad
sive, but highly selective club. New Phytol. 185: 598-601.
Descomyces!, Amphinema

from fungal n Pyroleae: varjutamine ja juurkontaktide läbilõikamine ei suurenda oluliselt heterotroofsust; Chimaphila käitub nagu autotroof
city is not a bottleneck for the germination of Pyroleae species (Ericaceae) in a Bavarian forest. Mol. Ecol. 22: 1473–1481.
ebs through carbon and nitrogen stable isotope analyses. Ecol. Res. 25: 745-756.
. Does chemic mida tüübirikkamad on mändide monoterpeenid, seda suurem on alustaimestiku (rohundid, kõrred) liigirikkus. Üksikud monoterpeenid ei korrel liigirikkuse
t results on orchid mycorrhizal fungi in Hungary. Acta Biol. Hung. 61: S68-S76.
in the diversity of the mycorrhizal fungi of orchids as a function of the water supply of the habitat. J. Appl. Bot. Food Qual. IN PRESS.
ectomycorrhizal ammonia fungi in warm temperate forest in Japan. Mycoscience 49: 42-55.
ophic Afrothismia gesnerioides (Burmanniaceae). Can. J. Bot. 84: 852-861.
escr Ectomyc 4: 127-133.
na; samas tugev korrelatsioon temperatuuriga
s. London, UK: HMSO.

nev
ds). PCR Protocols: A Guide to Methods and Applications. Academic Press: ??? kõigi PCR komponentide optir kõigi PCR komponentide optimiseerimine, anniling 55*-72
ctomyc. 9-10: 21-25.
characterization of mycelia of some Tuber species in pure culture. New Phytol. 1 Tuber sp

binant manganese peroxidase genes in ligninolytic fungus Pleurotus ostreatus. A RT-PCR MnP transkriptide mootmiseks MnP geen
s a specific association with two Ceratobasidium root-associated fungi across its range in eastern Australia. Mycoscience 48 231-239.
Hymenosc ericae), taksonitest Russ/Lact (35), Sebacina (17), Tomentella/Thel (16), Inocybe (15), Cortinarius (10)
omin sageduselt ja ohtruselt
ctivity of ectomycorrhizal fungal spores in relation to their ecological traits during primary succession. New Phytol. 180: 491–500.
munities of Vaccinium roots in two contrasting boreal forest types. Soil Biol. Biochem. 42: 234-243.
etic production Pyrola incarnata autokoloogia: lehed keskmiselt 1,5a; suremine maapealsetel osadel koguaeg, maasisestel pms augustis; maasiseste osade proportsioon 25 p
e studies: how mikrokosmosed, poollood tingimused, mensur katsed, vaatluskatsed: levik, kestvus, liikide & gener arv jms stat mikrokosmosed, poolloo
t. 168: E1-E14. interaktsioonide võrgustikus m
00 m Dipterocarpaceae, 1700 m Fagaceae+Leptospermum, Tristaniopsis, 2700m, 3100m Myrtaceae. Seente liigirikkus suurim 1700m peal
a, Trich. Aestuans, Lact glyciosmus, Pilod fallax; känd: Suillus variegatus, S. Luteus, Trich. Aestuans; rahnud: Piloderma fallax, Piloderma byssinum, Pilod. Reticulatum. K
ycorrhizal fungus Tricholoma robustum. Can. J. Bot. 70: 1234-1238.
expression of nitrogenase genes (nifH) from ectomycorrhizas of Corsican pine (Pinus nigra). Environ. Microbiol. 8: 2224-2230.
n of endobacterial communities in ectomycorrhizas by DNA-and RNA-based molecular methods. Soil Biol. Biochem. 39: 891-899.
Rhizopogon; sugukonniti Russulaceae, Thelephoraceae, Piloder Ektomükoriisase RFLP eristas tüüpe, mille erine ITS1 kriteerium 4% identsust. Uu kõikal kasutati rarefactio
Cenoc; 75*: Rhiz olivaceotinctus, Rhiz roseolus, Rhiz arctostaphyli. Olul erin Wilc, Cenoc, Rhiz olivaceot. Arv Rhiz eosed on kuumutamisele üsna vastupidavad, arv Rhiz
ike hektari kohta
us, Rhiz2, Cenoc; nulg: W. Rehmii, Cenoc, Pezizales sp, Cadophora finlandica. Domin Rhizopogon spp ja kottseened vrd vana metsa kooslusega.
s of the latitudinal diversity gradient. Science 314: 102-105. troopika on nii liikide tekke allikas kui vanade muuseum. Hüpotees, et troopikast järjest uued liigid asenda
ological patter evolbiol vs paleoökoloogia: ülevaade evolbiol vs paleoökoloogia: ülevaade
tances and DNA from environmental samples. Appl. Environ. Microbiol. 63: 4993–4995. DNA puhastamine humiinainetest on efektiivsem sepharos
tic relationships among *Phialocephala* species and other ascomycetes. Mycologia 95: 637-645. Helotiales SSU, LSU: Phialoce
tion of forest, woodland and savannah biomes. Phil. Trans. R. S Aafrikas kaasaegsete bioomide teke: katteseemnet domin al hiliskriidist: palmi ja pandanimetsad. Paleotsee
ranulatus: RAPD eristab paremini kui SI
pulations of Suillus granulatus as determined by in vitro mycorrl Suillus granulatus: feneetiliste tunnuste ja ECM mood edukuse põhjal mitu väliselt eristamatut liiki: laia pe
nrandom spatial structuring of orchids in a hybrid zone of three Orchis species. New Phytol. In press.
orrhizal associations with tulasnelloid fungi among populations of five Dactylorhiza species. PLoS ONE 7:e42212.
and nested subset structure characterize mycorrhizal associations in five closely related species in the genus Orchis. Mol. Ec OrM-le
2011. Analysis of network architecture reveals phylogenetic constraints on mycorrhizal specificity in the genus Orchis (Orchidaceae). New Phytol. 192: 518-528.
cts on tree seedling emergence and growth. PhD Thesis. Swedish University of Agricultural Sciences, Umea, Sweden.
gi. Ecology 77 mikrokosmoste head ja vead uurimaks nematoodidel parasit seeni
ts of Australian and African ectomycorrhizal fungi in mixed eucalypt plantations. New Phytol. 192: 179–187.
nmunity nutrie arv et AM-süsteemis C-liikumine taimest taime üldiselt ei toimi. Pettus võib olla, et osad taimed panustavad üh süsteemi vähem, anastomoseeruvad hüüfid v

d
la juhusl], ECM kirjeldused. Erin rakuseinte paksuse, mantlil mustade laikude ja risomorfide noodide poolest. Fülogeneetiliselt 2 v 3 klaadi, mis arv alamliigid
ti vähemusmorfotüübid, 4 a piires samas paigas suht püsivad

noisture in gra mulla veesisaldus üldiselt väiksem preerias kui metsas; koikuvam kui vosas ja metsas, tugev aastaajaline fluktuatsioon
NA spacers and its relation to breeding structure of the widespr Schizophyllum commune DNA heterog: IGS2>IGS1>ITS. Kogu maai Schizophyllum commune DNA hete
ode. Bioessays 34: 94-102. Rozellomycota pakuvad Crypto
tion of fungi using a six-gene phylogeny. Nature 443: 818-822. seente algne fülogenees 6 geeni baas

al diversity of ITS rDNA sequences in *Glomus intraradices* assessed by cloning and sequencing, and by SSCP analysis. Mycol. Res. 106: 670–681.
tion by differe AM 1 vs 2 vs 3 AM-seent.Mitme seene puhul mõju biomassile aritm. Keskmine eri liikidemõjule
. Bot. Buitenzorg 14: 53-205.
ies say about the latitudinal diversity gradient? A new look at th enamik taksoneid on tek ja seetõttu ka edaspidi radieerunud troopikas; pärast teise bioomi l

s developed from expressed sequence tags in the ectomycorrhizal fungus Hebelo SCAR praimerite konstrueerimine EST andmebaasi põhjal Hebeloma cylindrosporumile. (
enotüübid RFLP, RAPD
Cenococcum geophilum and Lactarius sp. in relation to soil water potential in five beech forests. Plant Soil 255: 487–494,
. Nat. 104: 50 kitsa peremeesringiga herbivoorid ja parasiitseened mõj taimede dominantsust
nce 311: 1893-1896. Kolumbia-Venetsueela taimede mitmekesisus 60-20 MAT: tugevasti kõikuv, korreleerub jääaja miinimumi
netic species delimitation in ectomycorrhizal fungi and implications for barcoding: the case of the Tricholoma scalpturatum complex (I Tricholoma scalpt komplex: 3 g
s s. str. (Basidiomycetes: Boletales). Plant Biol. 1: 701-706. Paxillus involutus: tüüpliik rabamän
rtinarius ja Russ-lact
ungi in spruce wood by restriction fragment length polymorphism analysis of amplified genes encoding rRNA. A DNA eraldamine puidust: täisprotokoll, täiensused, proble
and historical biogeography of the genus Tuber, the 'true truffl Tuber pärit Euraasiast. JagunebV grupiks (puberulum, melanosp, rufum, excavatum, aestivum). Perek. Tek
t. 109: 107-116.
nowledge: toward a global map of life. Trends Ecol. Evol. 127: 151-158.
of birds in spa lindude radieerumine on ajas erinev, aeglasem Kesk-kriidis ja K-T piiril; erinevates linnurühmades ja lindude radieerumine on ajas er
between Frankia, Glomus and Alnus at different soil phosphorus regimes. New Phytol. 123: 307-311.
mplate for ocean acidification data. Earth Syst. Sci. Data Discuss. 8: 1–21.
an unmanaged Picea abies forest in Sweden. For. Ecol. Manage. 115: 203-211. 3 RE saprotroofidel puidust ja söötmelt eraldatuilt
tinguish fungi of the rice sheath-blight complex, Rhizoctonia solani, R. Oryzae ar praimerid Thantephoruse eri liikidele riisil praimerid Thantephoruse eri liikidele
phere and their significance for sustainable agriculture. FEMS Microbiol. Ecol. 48: 1–13.
ylospora; kask: Cenococcum xxx, PCR sõltub tugevasti proovi hoidmisajast
y alders growi Leppadel suur potentsiaal biokütusena
2007. Soil nutrients influence spatial distributions of tropical tree species. Proc. Natl. Acad. Sci. USA 104: 864-869.
er using pine trees with a distinct stable carbon isotope signature. Funct. Ecol. 19: 81-87.
ds Ecol. Evol. ECM seente levik näriliste, kukruliste jt väikeste ECM seente levik näriliste, kukruliste jt väikeste imetajatega: efektiivne, kauge, mahamatmine; evolutsioon
diversity does taime genotüüpide liigirikkus vähendab seene T-RFLP peakide arvu; arv et mõni genotüüp soosib seeni, aga need ei pääse domineerin
õrgem Carex fl paljas mullas madalam pH, [N], [Ckogu] kui taimede mono ning s bakterite liigirikkus RT-PCR-DGGE bändide põhjal kõrgem Carex flacca monokultuuris j
egulate the function, community structure, and diversity of mycorrhizal fungi? J. Exp. Bot. 56: 1751-1760.
nal studies of grassland mycorrhizal mycelial networks. New Phytol. 152: 555-562.
hizal mycelium of an upland grassland: short-term respiratory losses and accumulation of 14C. Soil Biol. Biochem. 34: 1521–1524.
uals: intraspecific diversity of mycorrhizal plants and fungi in ecosystems. New Phytol. In press.
g JPW, Read DJ. 2004. Plant communities affect arbuscular mycorrhizal fungal c AM liigirikkus: T-RFLP + branch ja bound algoritm puu jaoks + AM liigirikkus: T-RFLP
ependence anc mullapatogeenide negat tagasiside üle USA; mida liigirikkam on kooslus, seda suht tugevam efekt. Põhineb Dickie et al kommentaari
col. Evol. 19: 101-108. mudelite valik ning a
levaade: opt allokatsioon, adaptiivsus, N ja CO2, invas liigid, maakasutuse muutus
along the mutualism-parasitism continuum. New Phytol. 135: 575-585.
mitation is a driver of local adaptation in mycorrhizal symbioses. Proc. Natl. Acad. Sci. USA 107: 2093-2098.
genetic signal in biological traits. Bioinformatics 26: 1907-1909. adephylo - picante a
of polycyclic aromatic hydrocarbons (PAHs) both within and beyond the rhizosphere. Environ. Poll. 142: 34-38.
plants: a new aspect of rhizosphere interactions. Agronomie 23: 495-502.
d local assembly of denitrifier communities. ISME J. 4: 633-641 nirK ja nirS geenide globaalne fülogeo: reageerivad keskkonnale erinevalt. nirK geene mõj
oils – misconceptions and knowledge gaps. Plant Soil 248: 31–41. oksalladi j

niesmikumullal: sama, suur liikide kattuvus eriti segakultuuris; 3a jooksul suurenes oluliselt
symbionts in willow ectomycorrhizas and their changes with time. New Phytol. 119: 99-106.
rrhizal Eucalyptus coccifera: growth response, phosphorus uptake efficiency and external hyphal production. New Phytol. 140: 125-134.
ferences in 15N uptake amongst spruce seedlings colonized by three pioneer ectomycorrhizal fungi in the field. Fung. Ecol. 2: 110-120. ruumiline autokorr: l

EcM fungal communities to long-term fertilization of lodgepole pine (Pinus contorta var latifolia) stands in central British Columbia. Appl. Soil. Ecol. 60: 29-40. ensümaa
ycorrhizas alw ECM ja AM sümbioos kui parasitismi-mutualismi kontiinum: sõltuvus genotüüpidest, keskkonnast, konkurentsist, ajafaktorist, ; arv MR moodustudes taims
act (11), Pseudotom (4), Inocybe (4). Cenoc arvukus suurenes langis sees ja Cort vähenes.
põletatud vs terves metsas EcM see
. Discovery of novel intermediate forms redefines the fungal tree of life. Nature 474: 200-203. Cryptomycota nimi Rozellidale
19-226. miksotroofsus: protistidel fagotroofsus on algne staadium, miksotroofsuse teke lihtne. Miksotroofidel oluline roll C ja P ringes planktonikooslustes
ng phylogenetic methods: accounting for uncertainty of phylogenetic inference ar fülogeneetiline koosluse struktuur: meetodika eristamiseks kasuta fülogeneetiline koosluse
orm vs lämmastik- suured erinevused; domin Cantharellus tubaeformis 3RE, RFLP 4 megamorfotüübist (random)
mycorrhizal community in an oligotrophic Swedish *Picea abies* forest subjected to experimental nitrogen addition: above- and below-ground views. For. Ecol. Manage. 13
ussulaceae (Lactarius rufus), Cortinarius spp. 153-157
s 4 vana metsa (peale põlengut) vs ECM 3 RE liigisisene ja liikide vaheline varie PCA
rchid mycorrhizal fungus from tropical Africa. New Phytol. 83: 121-128.
urise tüüp mõj koosluse struktuuri. Cenoc proportsioon kasvas orgaanika ja tanniinide konts kasvades
efektiga; vahe eripinnasel eripuudel
sula, Lact.) xxx , Taxotron t-test
procal speciali vastastikune spetsialiseerunime on väga harv nähtus interaktsioonide ökoloogias, juhuslik
fe. Bioinformatics 24: 1641-1642. PhyloWidget fülopuude visuali
l: connectance, dependence asymmetries, and coevolution. Am. Nat. 129: 657-676. network anaöyys esi
on of glycogen, starch, and other insoluble polysaccharides during ontogeny of Paxillus involutus-Betula pendula ectomycorrhizas. New Phytol. 140: 331-341.
fungus-growing termites as weathering agents. Eur. J. Soil Sci. 53: 521-527. termiidid
larity opposing Pseudomonas bakterite tüvede rikkus ja geneet erinevused suurendavad koosluse funktsionaalset erinevust ja teise bakteriliigi kasvu ir
and relatedne Pseudomonas bakterite tüvede rikkus ja geneet erinevused suurendavad koosluse vastupidavust . Lihtsal toidul liigirikkus inhibeeris v

ıga, mida pidas koniidideks

helised vs albi albiinode vahene fitness esialgu takistab MH taimede laia levikut ITS

ıxotrophy in orchids: insights from a comparative study of green individuals and ı ITS

vironments: a c seente suktsessioon: ülevaade. Primaarne ja sekundaarne suktsessioon. Arv põhj suktsessiooni eri mustreid seentel mitmesug filtrid: liigifond, keskkonna sob

ıtial difference eri taimed omastavad NH4 erisügavusest eri efektiivsusega. Seda võib muuta omavaheline konkurents, võib mitte muuta

ıt rohkem kandseeni (mulle tundub, et saproobid). Väidet eri kooslused mullas ja juurtel, kuigi suurem osa klaadidest kattusid (ei testitud). N eff pole

ıad sademed: efekti kooslusele ega liigirikkusele polnud ei liigi ega klassi tasemel

ı the rhizoid environment of the liverwort Cephaloziella varians in Antarctica are SSU kimäärid; blasti otsing kimäärid; blasti otsingud muude tule

ıophytic fungus, Phialocephala fortinii, at a primary successional site on a glacier RAPD DSE kultuuridele

Dark septate Dark septate

D: liustiku taandudes domin. Eosepanga seened, hiljem ECM seened ja kott-ning 18S, chimera check, kimääride suur probleem; üsna imelikud seened eriti eospanga-koosl

ıary successional glacier forefront: rDNA sequence results can be affected by pri mullaseente sekv mullast prim mullaseente sekv mullast primerid EF3/4 ja nuSSU 0817/1

bacteria exhibit a bipolar distribution. Proc. Natl. Acad. Sci. US bakteritel globaalselt: mida poolusepoole on levila keskosa, seda suurem on levila (Rapopor

Monogr. Biol. Varzea taimestik ja ökoloogia: EcM liike pole peale Salix humboldtiana

ıidue removal, and nonsymbiotic nitrogen fixation in forest soils of the inland Pacific Northwest. Can. J. For. Res. 22: 1172-1178.

Jain TB. 1997. Impacts of timber harvesting on soil organic matter, nitrogen, productivity, and health of inland northwest forests. For. Sci. 43: 234-251.

ı of the horizontal spatial structure of soil fungal communities in seente ruumiline autokorr tugevam O horisondis kui A horisondis

ıas Tuber melanosporum on ka säilinud. Segane vs mikroskoopia: suur vahe, loll teadlane

ıfication of a host plant for the desert truffleTerfezia pfeilii by molecular methods. Terfezia ja 3 rohttaime: Terfezia pfeilii viljakeha ja a Terfezia ja 3 rohttaime: Terfezia pfe

M, Murphy DV. 2015. Exploring the transfer of recent plant photosynthates to soil microbes: mycorrhizal pathway vs direct root exudation. New Phytol. 205: 15 eksudeer

, Zechmeister-Boltenstern S, Sessitsch A, Richter A. 2010. Belowground carbon allocation by trees drives seasonal patterns of extracellular enzyme activities by N ja girc

ıareous grassla seemnepank: oluline roll taimede levimisel peale häiringut, ent olulisem liigirikkuse ja tousmete rohkuse kohalt seemnepank + seemnevihm. Vaid 1 liik levis

ITS1-4, 5 RE

ıccaria; Phialocephala väga sage endofüüt eriti Laccaria mantlil 5 RE

PCR). J. Biosci. Bioeng. 96: 317-323. PCR bias: ülevaade ja lahendused: primer bias sõl

ıicrosatellite markers of a Pisolithus sp. from a Eucalyptus plantation. Mol. Ecol. RAPD markerite loomine (SC RAPD markerite loomine (SCAR, ISSR) Pisolithus -eukal

: Pisolithus 2 spp (AUSst arv), Inoc, Tomentella (arv AUSst), aff. Choiromyces 85% (arv AUSst)

phylogeny of ectomycorrhizal Pisolithus fungi associated with pine, dipterocarp, and eucalyptus trees in Thailand. Mycoscience 44: 28 Taimaal sissetoodud eukalüptic

soil mimcroart kõdude segu laguneb kiiremini kui on ennustatav üksikkomponentide järgi. Segudes oli üpalju rohkem Oribatida

Martin FN, Levesque CA, Blair JE. 2010. The promise and pitfalls of sequence-based identification of plant-path Phytophthora määramine ITS põhjal: probleemid

ıaponica and P Pyrola ja Chimaphila: kõrge homosügootsus, sarn rametid u 10 m sees samast genetist ensüümkr

ıa terrestris. FEMS Microbiol. Lett. 161: 151-156. eksolakaa

ıe with special reference to Wakefieldia macrospora (Hymenogastraceae, Agaricales) and Geopora clausa (Pyronemataceae, Pezizales Wakefieldia kuulub Hymenoga

feedback contı pioneertaimed vohavad uudsete mikroobidega mullal, ent kiiresti järgnev neg tagasiside; Hilisemad ei saa algul käima, ent hiljem kogı

gisisene ja liikidevaheline 3 RE, liikidesisesed ja -vahelis RFLP usaldatavus xxx

ıous tree pathogen Heterobasidion annosum during early infection of scots pine. Fı Heterobasidion annosum cDNA rmtk

ıaal liigirikkam ja kooslused erinevad

Chaliotis C. 2009. Effect of continuous olive mill wastewater applications, in the presence and absence of nitrogen fertilization, on the structure of rhizosphere-soil fungal cı

ıific variation in growth responses of lodgepole pine. Plant Ecol.

ıinuum in ectomycorrhizas: a quantitative assessmet using meta-analysis. Ecology 89: 1032-1042.

geneous mycorrhizal symbiosis in a rare epiphyte is unrelated to broad biogeographic or environmental features. Mol. Ecol. 22: 5949-5961.

In: Kasesalu H (ed). Year-book of The Estonian Naturalists´ Society vol. 74. pp. 101 – 121. Valgus, Tallinn (in Estonian; abstract in English).

ıluating the pho P sisaldus kontrollib kõdu lagunemist ja varisekihi paksust troopikas (L-Am)

ı seedlings. Mycorrhiza 6: 451-454.

ı-Tyl sp1,2

Akd. Nauk. US RUS Eur-põhjaosas: EcM Polygnum viviparum, Dryas octopetala, Salix spp, Betula spp, Picea obovata, Arctostaphylos alpina, Pyrola

ıtics of Phyllanthaceae inferred from Wve genes (plastid atpB, matK, 3 ndhF, rbcL, and nuclear PHYC). Mol. Phyl. Evol. 36: 112–134 Uapaca: lähiliike sugukonnas Phylla

ısing MAFFT and LAST. Bioinformatics, in press. aligneerimine; lisatakse uued jı

ıracy of multiple sequence alignment. Nucl. Ac. Res. 33: 511-518.

ın 7: improvements in performance and usability. Mol. Biol. Evol. 30: 772-780. Lühikeste Lühikeste sekventsic

ıment program. Brief. Bioinform. 9: 286-298. Mafft Mafft

ıtem for multigene phylogenies. Syst. Biol. 56: 523-531. WASABI: multigeneetilise infc

t ka vahtra

ıushroom's spore size and timing of fruiting are strongly related: is moisture important? Biol. Lett. In press.

ıving parts of boreal forest bryophytes. Botany 86: 1326-1333.

ıay fungus Phellinus nigrolimitatus (Basidiomycota). Can. J. Bot. 80: 597-606. ITS, IGS1, EF homokaarüonidel polı ITS var P nigrolimitatusel 20/730 ja

ıis rosea: lokaalselt ja populatsiooniti sarnased, siiski korge heterosügootsus ITS, IGS, mtLSU, mtSSU, ISSR

ıneer wood-decay fungus Trichaptum abietinum. Mycologia 95: 416-425.

ıheritance in the basidiomycete Trichaptum abietinum: implications for reticulate ı Trichaptum: mitu ITS ja IGS v Trichaptum: mitu ITS Trichaptum: mitu ITS ja IGS variant

ıryptic species of the cellar fungus Coniophora puteana (Basidio Coniophora puteana levikukese N-Am Coniophora puteana levikukese N-A

ıyptic species of the cellar fungus Coniophora puteana (Basidiomycota). Mol. Ecol. 16: 389-399.

ınsiflora saplings by inoculation with Lyophyllum shimeji. Mycologia 89: 228-232.

ensiflora saplings by inoculation with *Lyophyllum shimeji* . Mycologia 89: 228-232.

ıjr: v hea max ühtlases kk-s, vilets norm-tingimustel (taimed). Konservatiivne kui n<B, optimistlik kui n>B; R2 ei saa kasutada ekstrapol headuse h liigirikkuse modelleerim

ectomycorrhizal fungi of Pinus cembra in pure culture. Mycol. Res. 100: 989-998.

ıts of the tribe Pomaderreae (Rhamnaceae) using internal transcı Pomaderreae on levinud üle AUS ja NZLs paiguti, endeemsed. NZL-sse levinud iseseisval Pomaderris mitı

ıtic and chitinolytic enzymes in forest soil. PLoS ONE 5:e10971. praimerid tsellulolüütilistele seente ensüümidele. Rohkem geene leit praimeri

ıberg SP, Webb CO. 2010. Picante: R tools for integrating phylogenies and ecology. Bioinformatics 26: 1463-1464. Picante pakett Ris fü

ee community. fülogeneet str taimekoosluses Barro Coloradol: sekund taimkattega ja per kuivadel aladel esines klasterdumine, soistel aladel ja nõlvad
elationships between phyllosphere bacterial communities and plant functional traits in a neotropical forest. Proc. Natl. Acad. Sci. USA 111: 13715-13720.
bly: assessing the performance of community phylogenetic structure tests. Ecol. Lett. 12: 949-960. nullmudelid fülogeneetilise stru
tulemused Chao1, Sace jt; VIITED bakterid: erinevate BD a
achusetts, USA
J. Bot. 39: 1079-1085. Phialocephala gen nov
coheterotrophic *Hexalectris* Raf. (Orchidaceae: Epidendroideae). Mol. Ecol. 20: 1303–1316.
seened ja bakterid T-RFLP ja ARISA ordinatsioon Monte Car
actions, comm konkurents EcM kooslustes ja katsetes: kas määrab taim v seen? Metoodika
hizal competition between two Rhizopogon species colonizing Pinus muricata seedlings. New Phytol. 166: 631-638.
izal fungi in Mexican Alnus forests support the host co-migration hypothesis and continental-scale patterns in phylogeography. Mycorrhiza 21: 1–10.
v Tom sublilacina s.l. Puudel on eksitud - Tom lateritia ja Tom galzinii, Lact spinosulus UNITEst poleilmselt lepaga seotud. Kahelt alalt leitud ka
mong three ectomycorrhizal fungi and their relation to host plant performance. J.Ecol. 95: 1338-1345.
ga: Russula1, Ascomycota1, Sebacina; Lithocarpus: Agaricales1, Ascomycota1, 2 RE, taimel trnL + Alu; sekv 1 praimeriga; ITS1F/ITS4 sarnasuskoef, t-test
Scaling up: examining the macroecology of ectomycorrhizal fungi. Mol. Ecol. 21: 4151-4154.
zal fungi: are priority effects a rule or an exception? Ecology 90: 2098-2107.
e of the ectomycorrhizal symbiosis between Rhizopogon species and Pinus muricata. Plant Soil 291: 155-165.
elurikkus, pea kõik sagedasemad seeneliigid mõlemal peremehel
rsity as a barri põllul mida suurem taimede diversiteet, seda suurem resistentsus invasioonidele
lasiocarpa and *Picea engelmannii* . Can. J. Bot. 75: 1843–1850.
entella, Amphinema, Pseudotomentella; vs ECM: väga erinev, domin Cortinarius
judel seentel esineb peremeespuu-eelistus, ent spetsiifilisust mitte. Kask erineb okaspuudest suht rohkem
: Thelephora sp, Hymenosc., Phialophora; Ala2: Thelephora, Phialophora, Hyme 2 RE; NL6C fpraimer; kogu ju panevad kotikute ja kandade ITSid samasse algneeringusse
multiregressioon, CA
öötmes 4 RE; subalpi vöötmes
520. arv taimed ja seened induts biol. Mitmekesisust vastastikku

terial diversity associated with subalpine fir (Abies lasiocarpa) ectomycorrhizae MHB:ARDRA 16S phi-indeks
). A general suite of fungal endophytes dominate the roots of two dominant grasses in a semiarid grassland. J. Arid. Environ. 74: 35-32.
ction in two different types of soil. Plant Soil 50: 719-722.

Global patterns of plant diversity and floristic knowledge. J. Bio taimede liigirikkuse globaalne analüüs inimmõjusid arvestamata: Suurim Borneol. Inimmõju ja liigirikkus k
n CR, Kowalchuk GA, Hart MM, Bago A, Palmer TM, West SA, Vandenkoornhuyse P, Jansa J, Bücking H. 2011. Reciprocal rewards stabilize cooperation in the mycorr
rsity in phane korallriffidel korallide mitmekesisusest sõltub ökokatastroofiga kaasnev muutus liigilise koosseisus, mitte aga vastupidi. Toetab kindlustushüpoteesi
n of basidiospores of the ectomycorrhizal fungus Suillus bovinus. Mycorrhiza 17: 563-570. Flavonoid
troughput method to extract high yields of good quality DNA from fungi. Mol. Ec DNA eraldus seenekultuuridest uus ja kiire meetod, mis arv ei sobi juurtele n
re of a tropical semideciduopus forest in the Chiquitania region Neea hermaphrodita on rohkuselt teine puu Boliivia kuivas heitlehises metsas
tribes Scutellineae and Sowerbyellae (Pyronemataceae, Pezizales, Ascomycetes). Mycologia 78: 735-743. Acervus ja Caloscypha on sarn Aleu
Aleuriae in the Pyronemataceae (Pezizales, Ascomycetes). Mycologia 78: 407-417. septade ultrastr järgi saab ära tunda
worth DL (ed.). Ascomycete systematics: Problems and Perspectives of the Nineties. Pp. 127-141. septade ultrastr järgi saab ära tunda
ol. Ecol. 7: 1151-1161. Alnus glutinosa: L-Eur ja Aasias populatsioonid mitmekesised, Alpidest ja Karpaatidest põh
ngerprinting closely related Xanthomonas pathovars with random nonamer oligonucleotide microarrays. Appl. Environ. Micr Xanthomonas eritüve Tüvede eristamine PCA
Tuber spp.) inferred from sequences of four nuclear loci. Mycologia 103: 779-794 .
thin Entoloma inferred from molecular phylogenetic analyses. Fung. Biol. 116: 1250-1262. Entoloma: Rosaceae-seotud hai
dini: BD väheneb 25-50%. Taluvate seas on rohkesti Pyronemataceae esindajaid ja Rhizopogon
tel BD madalam kui varasematel; koosluse str erines põlenud vs mitte aladel, ent põlengu vanusel polnud mingit efekti
uillus granulatuse SAMPLING EFF arvelt, eriti niiskes (vrd kuivas). 8 ensüümi rohkus ei seleta taimede biomassi kasvu
516-517.
gninases by Phanerochaete chrysosporium: effect of selected growth conditions and use of a mutant strain. Enzyme Microb. Technol. 8: 27-32. ligninaasi
elin J, Prin Y, eukalüpti invasioon arv tänu mürgisele varisele ja allelokemikaalidele. Eukalüpt mõjutab risosf bakterite kooslust DGGE ja funktsionaalset mitmekesisust ne
Towards novel approaches to modelling biotic interactions in multispecies assemblages at large spatial extents. J. Biogeogr. 39: 2163-2178. kooseksisteerimise a
l continuum of tropical rain forests differing in N availability on Mount Kinabalu, Borneo. Plant Soil 229: 203-212.
versity: impac taimede BDl suurem efekt juure mikroobikooslustele kui indiv taimede efekt või kohaliku vs eksoot päritolu ef. Kohalikel taimedel rol
California pine forests. Mycologia 95: 603-613. Rhizopogon ECM-kultuurist 2RE
ic Atheliaceae sp; mä kontr: Russ decol, R paludosa, vinosa; Kuusk lubi: Tyl aster, T fibrill, Helot sp1; ; Cenoc; Ku kontr: Tyl aster, Pilod1, Cenoc
: Tylospora fibr tundlik N suhtes. Ühtlasi väheneb ka mükoriisade arv ja mütseeli ohtrus
ubarctic mire cummunity share fungal root endophytes. Fung. Ecol. 3: 205-214.
in roots by nested PCR and SSCP (Single Stranded Conformation Polymorphism SSCP AM-seentele
ella1, Tomentella2; EcM: Russula nigricans, Lact subdulcis, Inoc peltiginosa, Cort anomalus; taksonitest Russul Kloonidest 20.7% olid NM-seened ja liikidest proovi kohta
j-maal suurem seente BD kui metsas ja põllumaj-maal T-RFLP (ARDRA): ITS1F-ITS4 -mahajäetud põllumaj-maal suurem seente BD kui metsa
tiivselt seeni CO2-rohkuses enam t-RFLP, 2 RE ??? ITS praimerid, nendega manipuleerimine täpsuse saavutam
, ; v palju Sordariales, Hypocreales, Helotiales
verall diversity and dominance of microdiverse relationships in salt marsh sulpha kimääridest hoidumine: 15 tsül kimääridest hoidumin kimääridest kimääridest hoidumine:
och AM, Facelli JM, Facelli E, Dickie IA, Bever JD. 2010. Forc AM olemasolu seletab 18%-57% taimede BDst v liigirikkusest
): 651-652. Laccaria bicolor tapab collembolaid ja transpordib 15N taimesse
veness in communities. Nature 417: 67-70.
arius obs, vilets illustr
J, Myrold DD. 2010. Ectomycorrhizal mats alter soil biogeochemistry. Soil Biol. Biochem. 42: 1607-1613. EcM ma

)8. Host generalists dominate fungal communities associated with seeds of four neotropical pioneer species. J. Trop. Ecol. 24: 351-354.
ıan FC, Knight R, Kellwy ST. 2011. Bayesian community-wide culture-independent microbial source tracking. Nat. Meth. 8: 761-765. proovi koosluse strul
-2635. fülogeograafia populatsioonidel: ülevaade ja Templetoni NCA mahate fülogeograa fülogeograafia populatsi
3-612. meetodid fülogeograafias
n North Europ uibulehelised: vähene putuktolmlemine, taimed võimelised iseviljastuma, kuid mitte apomiktiliselt. Seemned v väikesed (viited edasi)
fungus Trichaptum abietinum. Mol. Phyl. Evol. 23: 112-122. mch, ITS1, ITS2, spets ITS1 praimerid Trichaptum abietinum: 3 ortoloogset
fid kollapseeruvad

diation of TNT-contaminated soil. Acta Biotechnol. 22: 67-80.
EcM taimedel lehtedes P konts kõrgem, ent kui arvestada fülogen seoseid, siis mitte. Muud lehtede omadused sarn EcM ja muudel taimedel. Arv. I
Wolf M, Schultz J. 2010. The ITS2 Database III - sequences and structures for phylogeny. Nucl. Ac. Res. 38: D275-D279. ITS2 sekundaarstruktuuri andm
Ellesmere CAN: EcM taimedKobresia, Salix arctica, Dryas integrif., ebaharilikest ka Pedicularis capitata (2/8), Saxifraga oppositifolia (3/4), Cassi
ıoodi struktuuri kirjeldus [tundub, et siiski pole ektoga tegemist, sest mantel väga laigutine ja HN väga nõrgalt aren Neocudoniella radicella kuusej
)-308. seente liigitekke mehhanismid: üleva
ik M. 2011. Ericaceous dwarf shrubs affect ectomycorrhizal fungal community of the invasive *Pinus strobus* and native *Pinus sylvestris* in a pot experiment. Mycorrhiza 2
mics of 13C natural abundance in wood decomposing fungi and their ecophysiological implications. Soil Biol. Biochem. 37: 1598–1607.
3C diskriminatsioon eristab ECM seeni ja saprotroofe
Soil 244: 307–317.
ing fungal DNA from ectomycorrhizal roots. Biotechniques 32: 52-56. DNA ekstaheerimine: alternatiivne meetod
Pinus resinosa EcM juured lagunevad mõnedel seeneliikidel kiiremini kui teistel liikidel ja kui NM juured
ɪetween Pisolithus tinctorius and other forest-floor microbes. New Phytol. 150: 179-188.
biotrophy-saprotrophy continuum. New Phytol. 178: 230-233. lagundar
rv EcM-del ajalist erinevust ei esine, kuna juuretipud elavad suht vanaks. Uurida võiks eri juurekohortide tasemel. Arvutiproge abil leidsid 3 kontrastset mustrid EcM seene
d pine plantations in Pennsylvania, USA. Plant Soil 219: 57-69.
ıs of Pinus resinosa and ectomycorrhizal fungi. New Phytol. 140: 539-547.
inosa plantation. New Phytol. in press
la; ECM: Cenc ECM seentel pms vältivad interakts omavahel, pms dominantidel; DNA eriline ekstraheerimine mullast + TRFLP ITS1F-ITS4 ann 49*C 2 RE mõl otstest; s
10; ECM Cenococcum, Lactarius, Tylopilus, Clavulina ;; 1 juuretippu anal -Ceno T-RFLP mullast
y herbs in dec potis kasvatatud Pyrola japonica: lehed kuni 3-a, varjulehe tüüpi FS. Mõningane FS ka sügisel ja talvel
ui M, Urushigawa Y, Stahl DA. 2002. Parallel characterization of anaerobic toluene-and ethylbenzene-degradin 16S rDNA j 16S rDNA ja in vitro transkribeeritud rRNA (
nus sylvestris . Mycol. Res. 96: 215 – 220.
ɾasia. 213 pp. Fungiflora, Oslo.
x
Tomentella sp
and S, Høiland K, Kjøller R, Larsson E, Pennanen T, Sen R, Taylor AFS, Tedersoo L, Vrålstad T, Ursing BM. 2 andmebaas ITSle andmebaas ITSle
ıpinate Hymenomyces. Karstenia 40: 71 – 77.
x
ɛal-time PCR a AM seente liigirikkus sõltub taimede liigirikkusest, mull DNA eraldus mulda läbi pestes EDTA-Triton lahusega; FastDNA Spin Kit Fo
ɾee species in a cross-inoculation experiment. J. Ecol. 99: 1394–1401.
Angianthus, Waitzia (Asteraceae), Poranthera (Euphorbiaceae), Stylidium (Stylidiaceae), Gompholobium Pultanaea (Fabaceae),on ECM sünteesides nii Labyrinthomyces,
vores: a meta-analysis. Ecology 90: 2088-2097.
ɪned (Wilcoxina, Cenoc jt.), Atheliaceae; kiiretel Atheliaceae ja Thelephora terr jt.
ɔderma reticulatum, Amph byss, Mel bicolor, Amph1. Sh 4 Tylosporat, 2 Wilcoxinat, 3 Amphinemat, 4 Pilodermat, 4 Thelephorales. Arv et metsas puuindiv arv läbi genee
edle litter from slow- and fast-growing Norway spruce (*Picea abies*) clones; Microb. Ecol. 56: 76-89.
suurlinna läheduses, korreleerub okkakahjustustega
Havail EcM infekt vaid sissetoodud Coccolobal; Pisonia umbellifiera jt AM v NM
d dunes. Can. J. Bot. 53: 87-93.
)
ri metsatüüpides. Kõikjal v.a. Männiistandikes EcM seeni polnu Keenia: sademed märts-mai; Oct-Dec
, *Byssocorticium caeruleum sp. nova* , and new combinations in *Dendrothele* and *Pseudomerulius* (Basidiomycota). Ann. Bot. Fenn. 48: 37-48.
ıoculation with feces of tassel-eared squirrels. Mycologia 76: 758-760.
sümbiondid maksasammaldel: Jungermanniales: Sebacinaceae + mõnedel tundmatud kottseened; Aneura pinguis: Tulasnellales. Jungermannoidne mükoriisa
ɪstablishing mycorrhizae in coniferous tree seedlings. Trees 1: 191-194.
ɛkventsitüübid kattuvad minimaalselt, ent täpsed järjestused mitte grupisiseselt liikidel kattuvcad!; orhideedel ja kanarbikulistel Sebacinales liigid ei kattu!, ent grupi-sees ku
lar bodies of Cenococcum geophilum Fr. mycorrhizas as detected by electron energy loss spectroscopy. New Phytol. 129: 411-416.
dua and Picea abies by Suillus grevillei. Trees 2: 115-128.
tes in the hyphal sheath of ectomycorrhizas -the soil-root interface. In: ??? (eds). EUROSILVA -Contribuion to Forest Tree Physiology. Les Colloques, Dourdan, France.
ɛogumises
lomycetes belonging to the 'rust' lineage (Pucciniomycotina) form mycorrhizae with terrestrial and epiphytic neotropical orchids. Proc. R. Soc. Lond. B. 277: 1289-1298.
h status of trees in diverse forest stands in West Germany. In: Hüttl RF, Mueller-Dombois D (eds.). Forest Decline in the Atlantic and Pacific Region. Pp. 189-201. Spring
of exotic and native plant species on the structure and function of soil microbial communities. Soil Biol. Biochem. 35: 895-905.
esert truffles: new species and a highly variable species complex with intrasporocarpic nrDNA ITS heterogeneity. Mycologia 103: 841 Terfezia claveryi, leptoderma s
juure mood sklerootsiume -just nagu Morchella. Peremeestaimi palju
stavaid tüüpe Ungaris
ffle genus to accommodate *Terfezia gigantea* . Mycologia 100: 930-939. Imaia, gen nov (sõsar Leucangi
ia disappears from the American truffle mycota as two new genera and *Mattirolomyces* species emerge. Mycologia 103: 831-840. Stouffera, temperantia /marcell
zia ja Robinia vahel pole samuti mingi EcM. Helianthemumi ja Robinia korteksirakud lagundati, eriti kõrgete P konts juures, hüüfid tungisid steeli ja endodermisesse, põhj

of fungal infections of Ammophila arenaria (Marram grass) roots by Denaturing C DGGE: Ammophila arenaria ju DGGE
komposti inokul vs kontr DNA ei hävine peale autoklaavimist
rs. 2012. Disentangling the drivers of beta diversity along latitud beta-BD globaalselt: kui võtta arvesse Gamma-BD, siis efekt puudub: Lin ef asemel unimod
y assembly, and the phylogenetic structure of ecological communities. Am. Nat. 170: 271-283. Fülogeneetilise struk
ommunity asse topograafia määrab Yasunis puude nishid
y of dry grassl ölandi suure alvari geobotaanilised kooslused. kokku 4. Üks olulisemaid Helianthemum oelandicum-Galium oelandicum kooslus -väga ohukesel ja kuival kü
u
comus badius, Piceir paralella; mittesaast: Amphinema, Hydnum rufescens, Piceir oleiferans, Cenococcum
d. Sci. Prague 6: 9-15.

ANOVA
n foliar nitrogen concentration and d15N along productivity gradients of a boreal forest. Ecosystems 13: 108-117.
rikkusele ja kooslusele ümberistutuskatsete põhjal: ökotüüp NS, Kooslust mõj prooviala ja eriti selle produktiivsus. Ökotüübi looduslikul distantsil
; lageraie: Thelephora domin tugevasti; vana mets: Paxillus, ITE6=Tylospora??? plottide klasterdamine
ccinum, Lactarius; Lageraie puudeta: Thelephora, ITE2=Elaphomyces???, Cenoc
il (madalam liigirikkus, domin Amphinema, Thelephora, Laccaria) kasvanud istikutel vs ümberistutamine lagedale (muudab kooslusi sarnasemaks. Domineerima hakkavad
, Cenoc, Russula decolorans; tsuugal Russ occidentalis, Lact pseudomucidus, Cenoc, Amphinema; juurekontakti osas sama
Phylogenetic interaktsioonide networkid on fülogeneet determineeritud mooduliteks. Parasiitide peremehed on pigem interaktsioonide networkid on f
skaya NP, Pou parasiitide - lestade ja kirpude fauna-kooslus sõltub näriliste taksonoomilisest ja fül kaugusest; distants parasiitide distantsimaatriksite p
in ecological tr peremehe-spetsiifika kirpudel: regionaalselt fülogen signaal puudub, ent kontinentaalskaalas on see olu peremehe-spetsiifika kirpudel:
ground growth of white spruce seedlings with roots divided into different substrates with or without controlled release fertilizer. Plant Soil 217: 131-143.
snelloid fungi (Basidiomycota) - a model for early steps in fungal symbiosis. Fung Tulasnella praimerid LR2Tulrev,
Proc. Natl. Acad. Sci. USA 104: 5925-5930. taimede globaalne liigirikkus 110x110 km ruutudel: pos tegurid energia, sademed, mägisus
mainib esmakordselt Coccoloba EcM ilma kirjelduseta
Rhizopogon: viited html
n the Boletales. Mol. Phyl. Evol. 13: 483–492. mt atp6 , cox3 praimerid Boletales. mt atp6 ja mtLSU pohjal.
eal the below ground distribution of genets in two species of Rhizopogon forming Rhizopogon 2 spp genetid ECM Rhizopogon 2 spp genetid ECM järgi: SCAR praimerid GC
from 38 recognized species of Suillus sensu lato: Phylogenetic and taxonomic im ITS: Suillus spp. . Suillus spp: sisaldab Boletinus, Fusc
gon vinicolor species complex based on analysis of ITS sequences and microsate ITS Rhizopogon s villosuli liikide ühend
identification of mycorrhizal fungi in Neuwiedia veratrifolia (Orchidaceae). Mol mt LSU rDNA ML3LIN-ML6
orhoidne MR, ühest pelotonist, mch-DNA
kveneerimise jr, eriti streptokokke (arv PCR artefakt, mistõttu lõigati streptokoki-restriktaasiga DNA katki IRW). Paljud bakterid ei kasvanud kultuuris
Luteyn JL. 2002. Phylogenic classification of Ericaceae: molecular and morphological evidence. Bot. Rev. 68: 335-423. Ericales matK, rbcL, morph
nplex microbial community fingerprints using pairwise similarity measures. J. Mic geelitatud mikroobiprofiilide statistiline võrdlemine: igale jooksul geelitatud mikroobiprofi
sequestate genus in the Agaricaceae with evidence for adaptive radiation in western North America. Mycologia 104: 164-174. Cryptolepiota = end. Am. Giga
archipelago with biogeographical evidence for a paleotropical origin. Fung. Biol. 114: 790-796. Inoc tauensis Samoalt - korjatu
w sequestrate genus in the Agaricaceae with evidence for adaptive radiation in western North America. Mycologia 104: 164-174.
l performance on monokaryons and reconstituted dikaryons of Laccaria bicolor. Can. J. Bot. 66: 289-294.
er of the Basic arv Cercocarpus on ECM -seotud Gigasperma americanaga Gigasperma americanum sp nov -arv
ogia 74: 479-488.
VDl
itavatest ka Cenococcum, Rhizopogon spp, Suillus spp
munities associated with *Populus tremula* growing on a heavy metal contaminated site. Mycol. Res. 112: 1069-1079.
n and purificationof total community DNA from soil. J. Microbiol. Meth. 39: 1–16. DNA eraldamine: fenool-kloroformi etapp v oluline; lüsosü
ciation between Quercus robur and Piloderma croceum. New Phytol. 163: 149–157. Piloderma
rence data for systematics and phylotaxonomy of aruscular mycorrhizal fungi from phylum to species level. New Phytol. 196: 970-984 AM seentele SSU, ITS, LSU re
tection of Glomeromycota: one PCR primer set for all arbuscular mycorrhizal fungi. New Phytol. 183: 212-223.
volatile compounds. Can. J. Bot. 49: 1425-1431. Suillus va
oxalate in lignin biodegradation. Proc. Natl. Acad. Sci. 90: 1242-1246. oksalaat s
l community resemblance methods differ in their ability to detect biologically relevant patterns. Nature Meth. 7: 769-775. Ordinatsioonides eri
-ground competition shapes tree regeneration in invasive Cinnamomum verum forests. J. Ecol. 95: 273-282.
on of ectomycorrhizal eucalypts for plantations. Mycol. Res. 96: 273-277.
Leotia lubrica arbutoidne mükoriisa Comarostaphylosel
r filtering in trait analysis. Glob. Ecol. Biogeogr. 18: 745-758. ruumilise ja fülogene
rth U, Finlay RD, Tuomi J. 2003. Severe defoliation of Scots pine reduces reproc samal uurimisalal tuberkuloidne ECM: Suillus bovinus, S luteus, Rhizopogon sp
on in the ontogeny of orchids of the temperate zone. Russ. J. Ecol. 32: 408–412.
eg. Sci. 2: 711 Laelatu puisniit: suurem valgus, vähesem sigade tuhnimine, niitmine suurendavad taimede BD
nds of rare vasc Eesti taimkatte elemendid: haruldaste taimede levik (pms Lä-Saaremaa, Hiiumaa), levilapiirid jm haruldust põhjustavad faktorid
roportsionaalset osakaalu ja juurte koguarvu nulul. Cenoc talub hästi varju ja vajab ilmselt vähem C kui Lactarius
rDNA ITS regions within and between anastomosis groups in Rhizoctonia solan ITS Thanatephorus cucumeris=Rhizocto
ctonia solani to anastomosis group 2-1 (AG2-1) on account of rDNA-ITS sequence similarity. J. Pl. Pathol. 82: 61-64.
SAR, Chatelain C, Sosef M, Barthlott W. 2004. Africa's hotspo Aafrika floristika hotspotid: 2004 uuendus BIOTA-AFRICA põhine. Suuresti kattub Myersi omaga ja kattu
izosphere, plant stress, and herbivory affect the abundance of microbial decomposers in soils. Microb. Ecol. 45: 340–352.
racting species of saprotrophic fungi. Mycol. Res. 99: 1128-1130.
l. 177: 297-300.
ds using multiple stable isotopes. Oecologia 110: 262-277.
odendron vaid elusjuurtes (ka kasel ja männil); Geomyces, Gymnoascus,Pseudogymnoascus ja pigem seigseened kõdujuurtes

own or closely arv et ECM seente dikarüootsed genetid inkorpor endisse haploidseid eoseid et säilitada potentsiaali
ecies Lophozia Lophozia-peamiselt asex levik -idanemine aprillis, vähenedes järsult sügiseks.
Fenn. 16: 208-212.
ization of differentially expressed genes in the mycelium and fruitbody of Tuber borchii. Appl. Environ. Microbiol. 68: 4574- geenieks pressioon trühvli viljakehas vs mütse
AF, Green JL, Pollard KS. 2013. Global marine bacterial biodiversity peaks at high latitudes in winter. ISME J. in press.
biogeography of Australian Rhamnaceae, tribe Pomaderreae. J. E Rhamnaceae -Pomaderreae (ecm) Austraalias: pms ida ja lääne vaheli Rhamnaceae -Pomaderreae (ecm) A
nd the phylogeny of large genera in the plant family Myrtaceae. Myrtaceae: Eucalyptus (Australia), Eucalyptopsis (Uus-Guinea), Arill Myrtaceae: Eucalyptus (Australia), E
s. Aust. Syst. Bot. 18: 1-3.
. Res. 111: 1075-1099. Pezizales maaaluste viljakehad

evelopment in forest nurseries. Acta For. Fenn. 77.2.
9.3.
or. Fenn. 106: 1-72.
in plant diver taimede elurikkus SW AUS lokaalses skaalas seletab pH, mis tuleneb kohaliku liigifondi kohastumisest.
in forest management. Int. J. For. Res. 2012:263953. SEM metsandustööd
nsformed white spruce on soil fungal communities under greenhouse conditions. FEMS Microbiol. Ecol. 76: 199-208.
isosf: liigirikkus ja koosluse str sama; mõjutas mullahorisont ja aeg
aceae. Syst. Bot. 28: 326-332. Polygonaceae: Coccoloba sõsarrühm
soils. I. Effects of density and time of application of inoculum and phosphorus amendment on mycorrhizal infection. Soil Biol. Biochem. 6: 167-171.
soils. II. Effects of density and time of application of inoculum and phosphorus amendment on seedling yield. Soil Biol. Biochem. 6: 173-177.
omycorrhizal f vastupidavus temperatuurile: eosed=oiidid>klamüdosp (arv Helotiales spp)>>hüüfid
gies change with soil age. Trends Ecol. Evol. 23: 95-103.
ter stress of Pinus pinaster inoculated with ten dikaryotic strains of Pisolithus sp. Tree Physiol. 10: 153-167.
r potential at the soil-root interface of Pinus pinaster seedlings inoculated with different dikaryons of Pisolithus sp. Tree Physiol. 10: 231-244.
corrhiza formation by Pisolithus arhizus on Pinus pinaster and Pinus banksiana. New Phytol. 115: 689-697.
matricial phase of Pisolithus sp.
liome development on current photosynthesis of Pinus strobus seedlings. Can. J. For. Res. 24: 1797-1804.
W-AUS lubjakivi koopas >10 m sügaval Eucalyptus gomphocephala EcM juured tumepr morfotüübiga
al agents for e mükofagne kukkurrott sööb pms Mesophellia, Zelleromycese ja Labyrinthomycese eoseid. Eosed idanevad ja mood EcM vaid siis kui rott on need ära söönu
noc 7 cort5
plants to rocks: ectomycorrhizal fungi mobilize nutrients from minerals. Trends Ecol. Evol. 16: 248-254. oksalaat: r
orans; E1: R. decolorans, C. collinitus; E2: C. sp; B: Piloderma sp1, P. sp2 ITS1F-4B, annealing 50O möga
ne, vale interpretatsioon
ification of ectomycorrhizal mycelium in soil by real-time PCR compared to conventional quantification techniques. FEMS Microbiol. Ecol. 45: 283-292.
reen and everg Pyrola: suurem assimileerimine kevadel ja sügisel, igihaljas; vrd igih taimedega väiksem FS varieeruvus
Atlantilises BI Atlantilises BRA vihmametsas domin AM mürdilised; ainsaks uuritud EcM taimeks Coccoloba rosea. Coccoloba on BRA sh Atl vihmametsades laialt levinu
the Pezizales (Ascomycota): phylogenetic analyses of SSU rDNA sequences. Nordic Journal of Botany 17: 403-418. Pezizales: SSU: jagunevad 3 klaadik
Goodfellow (ed.), Nucleic acid techniques in bacterial systematics. John Wiley & Nu-SSU-515f ja Nu-SSU-1391r praimerid
d molecular characterization. In: Stocchi V et al (eds) Biotechnology of Ectomyc trühvlid: IGS vs ITS vs RAPD eri liikidele. IGS varieeruvam kui ITS
three ectomycorrhizal truffles. FEMS Microbiol. Lett. 134: 109-114. chs, kitiini süntetaasi geen trühvlitel: sarn eriliikidel väh 91.5%, aminohapetel palju vähem
irikkusest, sest Fraxinus rikub ära. Basaalpinna ja juurte biomassi järgi puude diversiteet v sarn
amus liike laia peremeheringiga
ogy 84: 2302- ECM peenjuured lagunevad aeglasemalt kui mitteECM peeneimad juured; Seeneosas rohkem N, P, ent kuni 60% kitiini ja seetõttu lagun aegl. ; arv sõltub su
007. Paxillus involutus mycorrhiza attenuate NaCl-stress responses in the salt-sensitive hybrid poplar Populusxcanescens. Mycorrhiza 17: 121-131.
ystem function bakterite BD vs funktsionaalsus: mida roh bakterite BD vs funktsionaalsus: mida rohkem liike, seda kõrgem metaboolne akt ja väiksem
n influences in vitro ectomycorrhizal synthesis on the European aspen *Populus tremula* L. Mycorrhiza 18: 297-307.
root decomposition: the post-mortem fungal legacy. Ecol. Lett. 9: 955-959.

of polymorphic simple sequence repeat loci in Armillaria ostoyae. Mol. Ecol. N RAPD, SCAR markerid Armillaria ostoyale
fungus Paxillus involutus. New Phytol. 106: 139-146. oksalaat:
Paxillus involutus. Plant Soil 110: 3-8. oksalaat:
fungal inoculum. New Phytol. 100: 585-593.
calcifuge, of the mycorrhizal fungus Paxillus involutus. New Phytol. 100: 93-104.
sociated with e eukalüptid: pH, ECM vs AM
ung. Div. 49: 93-100. Oomycota: basaalsed rühmad n
ned ja Ciliates
zella form the deepest branching clade of fungi. Protist 161: 116–121.
s and pyrolaceous plants in northern California. Can. J. Bot. 58: 2274-2279.
analysis of phylogenetic trees. Mol. Biol. Evol. 16: 750–759. Monte Carl Monte Carlo Bayesi pro
a fallax = bicolor = croceum ja eristamine P. Byssinumist värvi, tsüstidioolide, eoste, basiidide jr
Thesis. Göteborg, Sweden: University of Göteborg
tes with emphasis on aphyllophoralean taxa. Mycologia 95: 1037-1065. ITS, LSU, viited eripraimeritel . russuloidse klaadi liigid. Albatrellus
d. ITS1F/4B Gloeocystidiellum
pine forest in northern Fennoscandia. Mycoscience 52: 289-295. Lyophyllum: palju lähedasi liik
Hymenochaetales: a molecular phylogeny of the hymenochaetoid clade. Mycologia 98: 926-936.
11: 1040-1063.
taime vananedes liigirikkus ja BD kasvavad. 2 a: Laccaria; 3: Thelephora; 4: Hebeloma, Inocybe, Lactarius pubescens; 6: Cortinarius, Leccinum, Peziza, Ramaria
lora and its mycorrhizal fungus Epulorhiza sp. Biol. Plant. 54: 97-104.

ecies diversity. In: Ricklefs RE, Schluter D (eds). Species Diver: Puude BD temp Aasia>E-Am>Eur. Seepärast et Aasias külgnev subtroop regioon, ei liigenda E-W mäestik
ation structure across loci. New Phytol. 161: 51–58. alleelide divergeerumine ja geenitriiv
õlenud mullal madal BD; sh paar kottseent, Tomentella sp.
Plant Soil 170: 23-33. Vihmausside arvukus soojas temperaatses ja troopilises vöötmes ühtmoodi kõrge. Arv vihm
Leguminosae implicates a rapid diversification of lineages during Leguminosae tek vara-Paleotseenis ja radieerus kiireti peale teket; Ecl Leguminosae tek vara-Paleotseenis j
nes CE, Matos AB, Wojciechowski MF. 2004. Metacommunity process rather than continental tectonic history better explains geograp Fabaceae s.l. Kontinentidevahelised
forests explains patterns of plant phylogeny and endemism. In: ? arv. L-Am kuivad kooslused on olnud püsivad u 10 MA, mitte efemeersed, sest Coursetia liigid on jõudnud
genetic diversity of lichen-associated homobasidiomycetes. Mol. Phyl. Evol. 44: 778-789. kandsamblikud on tekkinud korduva
berales. Acta Mycol. 26: 7-75. Pezizales maasiseste Vkdega liikide levik Euroopas
te viljakehadega seente mitmekesisust enamuses Eur maades v vähe uuritud, mistõttu on ka puudulik kaitsekorraldus. Lihtsalt pole teada harulduse põhjused, kas nt leiuef.
he related chipya vegetation types of northeastern Rhodesia. J. I Zambia Marqusia mets v piiratud aladel ja väga tundlik raiele. Areneb võsamets chipyaks ja v raskelt taast
66: 175-198. rohumaa taimkate võimaldab areneda Uapacal, n rohumaa taimkate võimaldab areneda Uapacal, mis omakorda soodustab Brachystega, Julbenardia ja Marq
a, Cryptococcus, kottseened. Kult vs otse PCr+klon andsid eritulemused
son T, Tunlid A. 2004. Divergence in gene expression related to variation in host specificity of an ectomycorrhizal fungus. Mol. Ecol. 13: 3809–3819.
me of the ectomycorrhizal fungus Paxillus involutus. Fung. Gen. Biol. 36: 234-241.
power and influence: the role of mycorrhizal mycelium in controlling plant communities and agroecosystem functioning. Can. J. Bot. 82: 1016–1045.
s). Ecological saprotroofid vs ECMseened: roll looduses, ensüümid, konkurents, katsed, ülevaade
ies of carbon flux to ectomycorrhizal mycelium following 14C pulse labeling of Pinus sylvestris seedlings: effects of litter patches and interactions with a wood-decomposer
2008. Biological weathering in soil: the role of symbiotic root-associated fungi biosensing minerals and directing photosynthate energy into grain-scale mineral weathering.
and development of the myco-heterotroph Monotropa hypopitys in nature and its requirement for locally distributed Tricholoma spp. New Phytol. 163: 405–423.
Res. 94: 993-995.
ytol. 127: 171- mükoheterotroofid: ülevaade kõigist aspektidest
zal and arbuscular mycorrhizal fungi. Curr. Opin. Plant Biol. 7: 422–428.
and New Zealand species related to Russula. Mycologia 94: 327-354. Russula hüpog taksonoomia
les) in Australia. Aust. Syst. Bot. 22: 39-55.
Orihara gen. nov. (Boletaceae) from Australasia and Japan: new species and new combinations. Fung. Div. 52: 49–71.
cies of *Russula* (Russulaceae, Basidiomycota). Aust. Syst. Bot. 20: 355–381.
long-sistance suill-rhizop
e copy number: absolute and relative quantification assays with *Escherichia coli* rDNA geeni koopiate arvu rDNA geeni koopiate arvu määramine RT-PCR ab
ication of arbuscular mycorrhizal fungi. FEMS Microbiol. Ecol. 65: 339-349.
mongolica Koreas: domin Boletaceae, Amanita, Russula/Lact. Coltricia cinnamomea peetakse saproobiks
rusted granite: textural controls on organic–mineral interactions and deposition of silica-rich layers. Chem. Geol. 161: 385–397.
In: Innis MA, Gelfand DH. (eds). PCR Protocols: A Guide to Methods and Applications. Academic Press: ??? p DNA eraldamine SDS+Tris+merkaptoet-kloroformfenool-
eprosula Russula, jt
2. Population Intsia: seemned langevad võra alla, putuktolmlemine, suured viljad. Nagu enamus troopika puid, populatsioonid väheerinevad, pop sees suur varieeruvus
nutrient additions and ectomycorrhizal infection. Plant Soil 163: 299-306.
la sp, Scleroderma sp; tugev suktsessiooniline muster 1-7 kuu; liigirikkus suurem, kus vanu peremeestaimi tihedamalt
oculation of two dipterocarp species with locally isolated fungus in Peninsular Malaysia. J. Trop. For. Sci. 20: 237-247.
alaysian dipterocarp seedlings. J. Trop. For. Sci. 22: 355-363.
aadiumi seened malaisias: Russula alboareolata, R. Virescens, Boletus aureomycelinus, Scleroderma sinnamariense -kasvavad raielankidel
Pasoh dipterokarbid: domin Russula+Lactarius, Boletaceae, Amanita. Russ ja Amanita viljuvad üksteist välistavalt. Pms viljumisper märts ning aug-sept. Lisaks 10 liiki m
ew of Dipterocarps: Taxonimy, Ecology and Silviculture. Pp. 100-114.
aches for detecting complex multivariate relationships in the spatial analysis of genetic data. Mol. Ecol. Res. 10: 831-844. Mantel test on kehve
ation of species data. Oecologia 129: 271-280. Eukl distantsi puhul
ity in a subtropical broad-leaved forest of China. Ecology 90: 663-674.
ple regression and canonical analysis. J. Plant Ecol. 1: 3-8. CCA; RDA, variatio
a spp; vs risomorfide diversiteet
rrhizal fungi. Scand. J. For. Res. 7: 177-182.
arating the roles of environmental filters and historical biogeography. Ecol. Lett. 13: 1290-1299. Fourth corner analüü
estrictions and dispersal in the composition of arbuscular mycorrhizal fungal communities. J. Ecol. 95: 95-105. variance partitioning mu
n SJ, Rosendahl S. 2012. 454-sequencing reveals stochastic local reassembly and high disturbance tolerance within arbuscular mycorrhizal fungal communities. J. Ecol. 100
ficient solution for the problem of large phylogeny estimation. Proc. Natl. Acad. Sci. 99: 10516–10521. MetaPiGA MetaPiGA proge; palju
er- and intraspecific variability in the main species of Boletus edulis by ITS analysis. FEMS Microbiol. Lett. 243: 411-416. Boletus edulise kompleks jagun
from the middle Eocene. Am. J. Bot. 84: 410-412. ECM eotseenist 50 mya. Viitavad: E
based on fossil and extant representatives. Acta Hortic. 615: 29- Männiliste levik nüüd ja vanasti. Pseudolarix teada Mongooliast hilis-Juuras 156 MAT. See lükkab Wang e

a split-root system of arbuscular mycorrhizal plants is fungal and plant species dependent. New Phytol. 157: 589–595.
elie der van D. 2008. Elevated atmospheric CO2 affects soil microbial diversity associated with trembling aspen. Environmental Microbiology 10: 926-941.
ane, koosluse struktuur veidi erinev
derma, Paxillus
villei; ülejäänud 5 kõi Pezizales
ery: Wilcoxina
size, mismatch position and number on hybridization in DNA oligonucleotide microarrays. J. Microbiol. Meth. 57: 269– 278 Bac thuringensis Cry1Aa1 geen: eripikkusega
and cons of synthetic stands and across-site comparisons in established forests. Basic Appl. Ecol. 10: 1-9.
nd genomic exploration. Fung. Div. 50: 35-46.
liigitekke mehhanismid: saartel suurem ökoloogiline võimalus, sama ka suure häiringu korral mujal. Polüpl
291.
orrhizal inoculation. QQQ 42-47

Pauls P, Swanton CJ, Trevors JT, Dunfield KE. 2007. Cycling of extracellular DNA in the soil environment. Soi DNA mullas: bakterite poolne lagundamine, transf
populations of the Pleurotus eryngii complex in Israel. Mycol. Res. 105: 941-951 RAPD: 1 praimer, praimerite valik populatsioo Popgene, sas, statistica
16: 30-37. erinevate fülogeneesi moodulite võrd
strategy for some hemiparasitic species of *Pedicularis* (Orobanchaceae). Mycorrhiza 18: 429-436.
Hiinas Pedicularis liigid 90% AM
Douglas-fir tuberculate ectomycorrhizae. Plant Soil 140: 35-40.
Alba and their infiltration into a residence. Mycol. Res. 109: 123 Amanita muscaria eoste levik: aja jooksul eoste suurus vähenes; eoste eraldumine max pära
ark septate endophytes in a grassland site in southwest China. FEMS Microbiol. Ecol. 54: 367–373.
lationships in Fagales based on DNA sequences from three genomes. Int. J. Plant Sci. 165: 311-324. Fagales: Nothofag ((((Fagaceae
nolecular and morphological evidence. Fung. Div. 49: 125–143.
siflora (Japanese red pine) by microsatellite polymorphism. Heredity 88: 88-98. RAPD männile tolmeldajate leidmiseks.
ment of microsatellite markers in polyploid *Salix reinii* . Mol. Ecol. Notes 1: 160 RAPD, SCAR markerid pajule
Tomentella sp, Cort sp; ringis Tr matsutake ja 3 liiki <1%; ringist väljas: Russ sp, Rhiz sp, Cort sp, Sistotrema sp; Huvitavatest Coltricia sp. Klaadidest domin Thel (8), Co
arkers using amplified fragments of inter-simple sequence repeat (ISSR). J. Plant. RAPD, ISSR genereerimine
d kontsentreerunud 2-3 m kaugusel viljakehadest
nalysis tool. Plant Ecol. 188: 117-131. MRM - partial Mant
2010. C and N stable isotope signatures reveal constraints to nutritional modes in orchids from the Mediterranean and Macaronesia. Am. J. Bot. 97: 903-912.
gain through ectomycorrhizas in the ghost orchid Epipogium aphyllum Swartz. Plant Biol. In press.
l zone. Env. Exp. Biol. 10: 35-40.
From extensive clone libraries to comprehensive DNA arrays for the efficient and OrM: parim ITSOF-ITS4, ent soovit I OrM seentele Tulasnellaceae rühmast
parenhüümi gametofüüdil, sarnased struktuurid orhidoidse mükoriisaga
kadakal arbuskulaarne MR ja DSE, kahest kohast leiti Cenococcum, mille ristlõik v sarn okaspuudele

nsis. 6.3.
nt communitie mida rohkem investeeritakse juurtesse, seda suurem on liigirikkus (vastupidi ???); juurte ja taimede üldbiomassis valitseb rametite arvuga küürselg-kõver
E jr mikrolülijalgsete BD mõjutab taime kasvu vähesel määral, suurem DGGE (Pennanen 2001 meetod), PLFA
ted Scots pine and Norway spruce seedlings. For. Path. 30: 109-115.
ols of water-loss rates of epigeous ectomycorrhizal fungal sporocarps during summer drought. New Phytol. 182: 483-494.
st stand-level spatial structure in ectomycorrhizal fungal commu ECM seente ruumiline autokorrel: olematu alates 8 m. Eri liikidele erinev. Biomas Mantel test: ECM seent
fungi of contrasting life history strategies are mediated by addition of organic nutrient patches. New Phytol. 159: 141-151.
us, Tomentella Tom sublilacina: eosed levivad paljute mullaselgrootute seedetraktis ja kitiinkestal. Võimalik levimiskaugus. Eosed vitaalsed peale esimest seedekulgla läbi
N-gradient: kõrge N> ECM BD väiksem. VK korrel tugevasti EcM andmetega, N 3 RE; sekv ITS (ITS1F/4), mchITS (ML5/6)-osadele morfotüüpidele
N saastudes. Eriti tundlikudCortinarius, Lactarius, Russula, Hebeloma, Tricholoma. N taluvad Lact theiogalus, Laccaria, Pax, Hygroph olivaceo-albus. Koosluse koosseis r
response to ni ECM seente 13C korreleerub seente N-ühendite kasutusega. Mida mineraal-N rikkamal pinnasel kasvab seen, seda jõuetum on ta kasutama valke ja aminoh
: exploring the linkages between functional and taxonomic responses to anthropogenic N deposition. Fung. Ecol. 4: 174-183. proteaasi
rrhizal fungal community-environment relationships? New Phytol. 174: 250-256. EcM seente koosluste u
fungi of contrasting life history strategies are mediated by addition of organic nutrient patches. New Phytol. 159: 141-151.
nd abundance of microsatellites in 14 fungal genomes. Fung. Genet. Biol. 41: 1025–1036.
õhjal: Thuja ja Tsuga lisandumine kooslusse muudab struktuuri
P and 33P between wood blocks connected by mycelial cords of Hypholoma fasciculare. New Phytol. 150: 189-194.
rrhizal fungal communities. In: Dighton J, White JF, Oudemans P, eds. The Fungal Community. Its Organization and Role in the Ecosystem. CRC Press, Boca R EcM seen
econdary colonization of wood by basidiomycetous fungi. New Phytol. 169: 389-397. saproobse
Marasmius, Cantharellales, samblakõdust ja allpool Capronia, Thelephorales, Helotiales, Umbelopsis (endof Zygomycota), Archaeorhizomycetes
eractions and 32P between saprotrophic and an ectomycorrhizal fungus in soil microcosms. FEMS Microbiol. Ecol. 1287: 1-10.
cting mycelia of a wood-decomposing fungus and ectomycorrhizal fungi in microcosm systems. New Phytol. 144: 183-193
cycling in boreal forests -towards a less phytocentric perspective. Plant Soil 242: 123-135.
posers, yet not ECM seened lagundavad teatud määral orgaanilist ainet, ent N ja P kättesaamise eesmärgil. Neid ei saa saproobideks pidada. ECM see
36 – 387
senduvad Helotialestega, samas bakterite hõimk tasemel rühmad samad
J, Pennanen T, Rosendahl S, Stenlid J, Kauserud H. 2013. Fungal community analysis by high-throughput sequencing of amplified markers – a user's guide. New Phytol. 19
enes in ectomycorrhizal basidiomycetes. New Phytol. 164: 193-199. kitinaasi
. Soc. Lond. B 359: 1623-1632. Kapimaa floora on eristunud <5 MAT kui kliima muutus kuivemaks. V Restionaceae Kapimaal al 40 MAT
ogeogr. 28: 169-182. Aafrikas: suurima taimede liigirikkusega alad Kamerun-Gabon, Dar-Es-Salaam-kuni Keenia; Põhja-Sambia
The Complete External Transcribed Spacer of 18S-26S rDNA:Amplification and ETS1F praimer
f fungal ITS sequences from *Picea glauca* roots. Mycologia 101: 157–165.
ures phylogenetic relationships and inflates estimates of operational taxonomic units in genus Laetiporus. Mycolo Laetiporus kultuurisisene ITS varieeruvus enamast
dl R, Delzon S, Corona P, Kolström M, Lexer MJ, Marchetti M. 2010. Climate change impacts, adaptive capacity, and vulnerability of European forest ecosystems. For. E
chung. Bot. Not. 315-355.
phic and yeast-like fungal pathogens using specific DNA probes. J. Clin. Microbiol. 39: 3505–3511. pärmseenpatogeenide hindamiseks ITS rDNA
l macroalgae. J. Biogeogr. 28: 243-251. makrovetikate levik Põhja-jäämerest Vaiksesse ja Atlandi ookeani ning vastupidi. Väinade ühendused, hoo
ligonucleotide arrays. Nature Genet. 21: 20-24. ARRAY metoodika, analüüs: ülevaade, pildid
of amino acid nitrogen to the alpine sedge Kobresia myosuroides. New Phytol. 142: 163-167.
ndel ja suvel. Ajaline mitterepl. Kogu-DNA hübridisatsiooni põhjal ning funktsionaalsete assayde põhjal: talvel suht rohkem seeni, parem tselluloosi ja vanilli lagund. Suvel
Alnus viridis are strongly influenced by host species identity. Int. J. Plant Sci. 172: 403-410.
beyond Mantel: bringing procrustes association metric to the plant and soil ecologist's toolbox. PLoS ONE 9: e101238. Procrustes ja Partial
s (Pinaceae) based on nuclear ribosomal DNA Internal Transcribed Spacer region sequences. Mol. Phyl. Evol. 11: 95–109. Pinus -mänd: ITS 3000 bp: 2 erialan
nish BA, West MA, Black MND, Tester PA. 2007. Recognizing dinoflagellate sp dinoflagellaatidele sobib p dinoflagellaatidele sobib paremini triipkoodistami
nd terrestrial e Invasiivsed mittepatogeensed mmikroobic Invasiivsed mittepatogeensed mmikroobid: ülevaade (seente osa v vilets)

ınd terrestrial ecosystems. Ecol. Lett. 13: 1560-1572.
. Population genomics of domestic and wild yeasts. Nature 458: 337-341. SaccharoM cerevisiae - inimmú
ıb. Change Biol. 13: 2089-2109.
ıl endophytes isolated from Woollsia pungens. New Phytol. 140: 145-153. Woollsia pungens erikoidse mükoriisa seened RAPD
ır role in orchid conservation in China - a review. Bot. Rev. 76: 241-262.
A polymerase II phylogeny. Proc. Natl. Acad. Sci. 101: 4507-4512. kottseened: RPB2: Helotiales sõsarr
ırge-scale coestimation of sequence alignments and phylogenetic trees. Science 324: 1561-1564. SATe´ - proge mis võimaldab iteratiivselt paranda
ıxonomic classification of fungal large-subunit rRNA genes. Appl. Environ. Microbiol. 78: 1523-1533.
ıochip for microbial identification studies: a non-equilibrium dissociation approach. Environ. Microbiol. 3: 619-6 in vitro trans in vitro transkribeeritud 16S rRNA; 30 20-nu
ınce for a phylı mullapatogeenide kahjud on suuremad kui taim istutada suhteliselt fülogeneet sarnasema taime mulda. Castanopsisel isegi lähedaste r
ıg BF. 2009. Phylogenomic analyses support the monophyly of Taphrinomycotina, including Schizosaccharomyces fission yeasts. Mol fülogenoomika ESTde põhjal: S
ıvidence from an RNA polymerse II subunit. Mol. Biol. Evol. 16: 1799–1808. RNA pol II, kottseened, aminohapped RNA pol II, kottseened, aminohappe
ılennost, Moscow. 217 p.
ıorrhizal Fungi: Key Genera in Profile. pp. 187 – 309. Springer, Berlin.
ıcorrhizal symbiont *Cenococcum geophilum* Fr. and other mycorrhizal fungi amo 18S Kottseened, sh kõik suuremad ECM
ıcorrhizal fungus Cenococcum geophilum Fr. Mycologia 94: 772-780. PCR-SSCP 9 lookusele; spets Cenococcumi praimerid geneetiline
ılomycorrhizal seedlings of Pinus resinosa on iron tailings. Can. J. Bot. 66: 55-60.
ıishing: Oxford, UK.
AM vs ECM
paju ja Populus deltoides: Looduses EcM domin mõõduka niiskuse juures, AM domin kuivemates ja niiskemates, ent väldib ka äärmusi. Eksperim
Puerto Rico EcM taimed on Pisonia subcordata, Coccoloba swartzii, C. Pyrifolia, mis mood kõik transfer-rakkudega HN; lisaks teada C. Uvifera ja arv. Neea buxifolia
ER site. http://luq.lternet.edu/data/lterdb86/metadata/lterdb86.htm
ıiates, Inc. Sunderland, Massachusetts, USA.
Dipterocarpaceae from the Neotropics. I. Introduction, taxonom Pseudomonotes tropenbosii levinud Colombias mõnes kasvukohas 200-300 müm terra firmal, 3000mm sad
ınktsioonidega Haruldaste liikide rühmit liigirikkuse ekstrapoleer
ımasoonias: eri metsatüüpides; Pseudomonotese metsas Russ, Lact, Bol,
J, Johnson KB, Rodriguez RJ, Dickman MB, Ciuffetti LM. 2001. Green fluorescent protein is lighting up fungal biology. Appl. Environ. Microbiol. 67: 1987–19 gfp kasuta
ıersity using terminal restriction fragment (TRF) pattern analysis: comparison of 1 t-RFLP metoodika, arvutibioloogia uute praimerite disainimisel ja restriktaaside määramis
ıty experiments biodiversiteedikatsete analüüs: var jagamine sampling efektiks ja komplementaarsuse efektiks. Sobib vaid katsetele, kus on ka monok
ıty experiments taimede liigirikkus suurendab koosluse biomassi võtters arvesse iga liigi panust polükultuuris vs monokultuuris taimede liigirikkus s
ıent knowledge taimede mitmekesisus vs funktsioon: ylevaade. Üksikud dominandid voivad anda vale ettekujutuse koosluse liigirikkusest
ı prob = samp liigirikkus-ökosüs prod, stab suhe: nishi efekt, selection prob = sampling eff -tihti tugev kattuvad; taastumine häiringust. teoreetiline tagapõhi. Originaalideed
ıp.) with ectomycorrhizal fungi on mined boreal peatland. Plant Soil 116: 229-238.
ı4-1354. ökomorfoloogiline fülogenees ökomorfoloogiline fülogenees: probl
ıonshipp betwe fülogneet nishi konservatismile vastuargumendid niitude põhjal
ıgematel juureotstel, õhukese mantli ja tugeva rakusisese kolonis-ga, HN hästi arenenud
Singapur rand: mida suurem oli taimede katvus ja vanem ranna ala, seda rohkem oli AM taimi. Scaveola (Goodeniaceae) , Casuarina equisetifolia
plocystis wrightii in the Sclerodermatineae (Boletales) based on nuclear ribosomal large subunit DNA sequences. Mycoscience 48: 66-69.
and ecosyster AM diversiteet suurem seal kus suurem taimede primaarprod, ent kooslus v erinev. AM koosluse ühtlus suurendas P summaarset ülesvõttu . AM kooslused
ıaltitudinal gra Tansaania Udzungwa mägedes puude BD suurim Tansaania Udzungwa mägedes puude BD suurim u 1500 m peal. Arv mägede ülemise vöötme puudumise t
ıy in the Eastern Arc mauntains of Tanzania. J. Trop. Ecol. 12: 629-650.
SSCP, sekv dominandid 18S (1900 bp) TU indeks BD jaoks
:.
2002. Oligonucleotide microarray for 16S rRNA gene-based detection of all recognized lineages of sulfate-redu 16S rDNA: 16S rDNA: 132 probe 18nu, erinevatele bakte
sequence alignment and evolutionary analysis. Science 320: 1632-1635.
ıicrobial communities. Appl. Environ. Microbiol. 71: 8228-8235. mikroobide fülogeneetilise koosluse
ıective distance metric for microbial community comparison. ISME J. 5: 169–172. Unifrac sõltub sekve
ıght R. 2008. The convergence of carbohydrate active gene repertoires in human gut microbes. Proc. Natl. Acad. Sci. 105: 15076-1508 mittealigneeritavate geenide võ
β diveristy measures lead to different insights into factors that structure microbial communities. Environ. Microbiol. 73: 1576-1585. UNIFRAC-kaalutud sta
ınicrobial community diversity in a phylogenetic context. BMC Bioinformatics 7: 1-14. UNIFRAC -online analü
ıd. Sci. USA 104: 11436-11440 Vaja rohkem metaandmeid UNIFRAC analüüsideks
ıal diversity. FEMS Microbiol. Rev. 32: 557-578. fülogeneetiline statis
ıps of endophytic *Colletotrichum* isolates from the Iwokrama Forest Reserve, Guyana. Mycol. Res. 108: 53-63.
us globulus istandikes W AUS ja üle maakera: Auss domin Cortinariaceae ja Russulaceae. Laccaria ja Sclerodermataceae ka v noortes istandikes. Maailmas pms perek Am
lobulus seedlings inoculated with spores of various ectomycorrhizal fungi. Mycorrhiza 8: 81-86.
I.W. Chase MW, Wilson PG. 2005 . Phylogenetic patterns in the fleshy-fruited Myrtaceae – preliminary molecular evidence. Plant Sys Myrtaceae: Leptospermum ja Eucaly
ı activity following simulated atmospheric N deposition. Soil Biol. Biochem. 40: 1662-1669.
Pyrola perek seemnete idanevus eri tingimustes
ıial response of ectomycorrhizal and saprotrophic fungal mycelium from coniferous forest soils to selected monoterpenes. Soil Biol. Biochem. 40: 669-678.
ıtic ecosystems. Soil Biol. Biochem. 40: 11-29.
ıılaceae, ülal seejärel saproMycena spp, Boletaceae spp
ıntides: suurim O-horis: seal pms saproobide oma, min-mullas pms ECM seente sl kandseente lakaasi geenide diversiteet mulla eri horis taks: Ruhlandiella, Sphae lakaasi ge
ıcolonization of root systems of three Populus species grown under elevated CO2 (POPFACE). Glob. Change Biol. 9: 838-848.
ıgeography of fungi. Mycol. Res. 112: 423-424. mikro- ja makroseentel on väga konkreetsed biogeo mustrid
ınal phylogenetic relationships of Lecanoromycetes based on a Bayesian analysis nuLSU, mtSSU Lecanoromycetes on monofüleet, se
ıomycota -2007. Myconet 13: 1-58. kottseente taksonoomia klassid
Pseudotsuga menziesii seedling roots and monokaryotic and dikaryotic isolates of Laccaria bicolor. Mycorrhiza 5: 237-244.
ı J, Engelbrektsson A, Kunin V, del Rio TG, Edgar RC, Eickhorst T, Ley RE, Hugenholtz P, Tringe SG, Dangl JL. 2012. Defining the Rarefitseerimine vs mitte annal

novations for high-throughput amplicon sequencing. Nature Meth. 10: 999–1002.
nd nutrient uptake in oak seedlings inoculated with selected ectomycorrhizal fungi. Restor. Ecol. 11: 125–130.
ste vk seentel NW-Am ebatsuuga metsas: kokku 0.59 ha 4 aasta jooksul: 47 liiki; biomass 1.3 kg ha-1. 5 metsatüüpi uuriti (n=2). Eri liikidel tugev eelistus mingite kasvukc
d puude all liigirikkus per proov ja akumul olul suurem kui võra alt väljas
Chondrogaster angustisporus k
ysorr, Russ vesca, Tricholoma albobrunn obs tammedel + ILLUSTR; Arcangeliella asterosperma obs tammel (EcM ei klapi Russulaceae-ga)
ascomycete from the Olympic peninsula. Mycotaxon 30: 417-431. Pseudaleuria gen nov: saproobı
ldas LS, Ziegl puuvoorikutel sama intens fotosynt kui peremeestaimedel. Puuvoorikutel kauem ohulohede avatud, madalam lehetemp ja korgem rakusis CO2 rohk
progress, classification, and evolution of subcellular traits. Am. J. Bot. 91: 1446-1480. Seentel. 4 geeni. Kottseentel Taphrii
mbiotic ancestors. Nature 411: 937-940.
mutualism. Proc. Natl. Acad. Sci. 94: 11422-11427. evolutsioon kiireneb lihhenis vs mitt
328-341. multi-regressioon: ta
ceae; Pneumatospora (Canth); cf Volvariella; Ceratobasidiaceae; Copı SSU-ITS-LSU kandseente-spets praimerid -andsid ca 4.6% muid seeni
d with early decaying leaves of Spartina spp. from central California estuaries. Oecologia 162: 435-442.
ion resistance. mida suurem BD, seda raskem invasiivsel raiheinal (Lolium multiflorum) kanda kinnitada, samas kui biomass ei avalda mingit vastunõju
acid irrigation on enzyme activities of the single partners of ectomycorrhizas from a limed stand of Norway spruce (Picea abies [L.] Karst.). Plant Soil 199: 71-8 Glc6P DH
Dufresne M, Freitag M, Grabherr M, Henrissat B et al. 2010. Comparative genomics reveals mobile pathogenicity chromosomes in *Fusarium*. Nature 464: 367-373.
hiza isolates from tropical orchids. Mycol. Res. 107: 1041–1049. orhideedel Sebacina-Epulorhiza ITS1-ITS4 kultuuris orhideedel Sebacina-Epulorhiza ITS
ic black truffle (Tuber indicum) in commercialized products: fruiting bodies and PCR produkt liikide eristamiseks; sekv Tuber sp ITS
rRNA for stable isotopic characterization. Environ. Microbiol. 4: 451-464. 13C eriliikic 13C eriliikide 16S rRNA valikuline puhastam
LV. 2008. Fungal root endophytes from natural vegetation in Mediterranean environments with special reference to *Fusarium* spp. FEMS Microbiol. Ecol. 64: 90-105.
analysis. Evolution 62: 1103-1118.
erid, Flexibakter-grupp, aktinobakterid 18S rDNA
y of bacterial and archaeal communities in the anoxic zone of the Cariaco Basin. 16S rDNA
täpne ja põhjalik ülevaade JPN taimede mükoriissusest. EcM: Abies, Cedrus, Larix, Picea, Pseudotsuga, Tsuga, PinusAlnus, Betula, Carpinus, Coı
012. Plant spec liigirikkus taimedel kuivadel aladel suurendab otseselt ökosüs multifunktsionaalsust (eri mullaühendite rohkust)
M, Kitamoto Y, Aimi T. 2008. Rapid Species Identification of Cooked Poisonou keeduetud jm töödeldud seentest DNA eraldamine ja PCR liigispets-praimeri
Pakaraimea dipterocarpacea: Guyana ja Venezuela savannides Pakaraimea dipterocarpacea: Guyana ja Venezuela savannides üksikutel aladel. Kindlasti on vikariantne, r
Press, Princeton, N.J.
species abunc haruldaste liikide suure osakaalu põhjused -log jaotus; dominantidel log-norm jaotus. Nende kattudes tekib negatiivne skew
scr. Ectomyc. 4: 61-65.
eloma; Lageraie + looduslik uuendus: Thelephora, Amphinema, Wilcoxina; Lag 3 RE, põhjalik protokolli kirjel RFLP lahutus vs morfotüpiseerimi PHI jt indeksid, Bonferr
2012. PHYMYCO-DB: A curated database for analyses of fungal fiversity and e PHYMYCO-DB:andmebaas SSU ja fülogeneesis kasutatud geenidele
ar mycorrhizal fungal communities. PLoS One 7: e36695.
embly and ecosystem functioning. Science 316: 1746-1748.
eiogalus 3 RE x
od ash on microbial activity,plant growth and nutrient uptake by ectomycorrhizal spruce seedlings. FEMS Microbiol. Ecol. 43: 121-131.
fibrillosa; 3 t tuhka/ha: Unkn1, Tylospora fibrillosa, Piloderma1, Piloderma falla 3 RE +tarkvara, andmebaas
fungi in wood ash amended substrates. FEMS Microbiol. Lett. 221: 81-87.
kottseened kui ECM moodustajad: Pezizales ja Elaphomyces kui EcM moodustajad: kõigi autori töödest ülevaade, v palju kontrollimatut jama
in an organism with endosymbionts: microsatellites in the scleractinian coral Seri RAPD, SCAR markerid sümbi RAPD, SCAR markerid sümbiontsele korallile. vaja sümbi
ytic and proteolytic activity in ectomycorrhizal fungi and Heterobasidion annosum.New Phytol. 117: 643-648. proteaasic
, Kew Bull. 1: 1-19.
g on forest str Kongo Ituri: prim metsas rohkem >10cm dbh puuliike nii ala kui indiv kohta vrd sekund-metsaga. Sek-metsas eriti vähe Gilbertiodendroni ja Julbernardiat, r
nce of six African timber species. Biotropica 37: 227-237.
III. Superficial ectomycorrhizas initiated by *Hysterangium* and *Cortinarius* species. New Phytol. 105: 421-428.
tlets of *Eucalyptus camaldulensis* with ectomycorrhizal fungi, and comparison with seedling inoculation using inoculum contained in a peat/vermiculite carrier. Aust. For.
ajast. MR tüübid levinud eri horisontides.
mycorrhizal and uninfected seedlings of Eucalyptus calophylla. Aust. J. Bot. 23: 231-238.

. II. The ultrastructure of compatible and incompatible mycorrhizal fungi and associated roots. New Phytol. 96: 43-53.
Tüüp4 meenutab väga Meliniomyces bicolorit
Orthilia secunda: ErM ja Arbut MR; Rosa, Rubus NM; Alnus, Cetula, Populus balsamifera EcM ja AM; Corylus ja Picea vaid EcM. Obs Cenococ
Cistaceae in North America. Can. J. Bot. 63: 872-875.
EcM evolutsioon: arv, et EcM
cance of myco mükoriissed taimed kogu maailmas: ülevaade mükoriissed taimed kogu maailmas: ülevaade

(parem kuivemas)
urtel Scleroderma; cenococcum
ark septate endophytic fungi. Stud. Mycol. 53: 173-189.
ing, a novel means of linking microbial community function to phylogeny. Appl. RT-PCR bakteritele, mille fenoolne substraat oli rikastatud 13C-ga; gradienttsentrifuugim
ria, and Fungi During Leaf Decomposition in a Stream. Microb Ecol 56: 467-473.
r JD. 2010. N troopikapuudel negatiivne mullamikroobide tagasiside, mis arv suurendab BD.
interrelationships among common European Suillus species based on ribosomal I ITS Suillus ITS -suur liigisisene varieeru
id derivatives: kuuse eriliigi hybriidid on väiksema fotosünteesivoimega kui molemad vanemliigid
ecies Profiles for Pacific Island Agroforestry. Permanent Agriculture Resources (PAR), Hōlualoa, Hawaii. Available at: http://www.traditionaltree.org
molecular differentiation in Quercus subgenus Quercus (Fagaceae). Mol. Phyl. Evol. 12: 333-349. tamm: Quercus alamperek Quercus:
he tertiary history of temperate and subtropical forests of the Nc Fagaceae: tertsiaaris või varem olid kõik perek olemas nii Eur, N-Am kui Aasias. Fagus tek arv Kaug-Idas

tification of a laccase gene family in the new lignin-degrading Basidiomycete CE SB, NB, lakaasi geenidele ja transkriptidele: väh 5 geeni (Trametes) Trametes
e gene family from Basidiomycete I-62 (CECT 20197). Appl. Environ. Microbiol. 64: 771–774. Trametes
R-based estimates of soil microbial richness and community structure. Appl. Environ. Microbiol. 76: 2086-2090 proovide poolimine vähendab üldise liigirikkuse tı
s to water stre põuataluvus mullaorganismidel: seentel on eeliseid kuivades tingimustes; mineraalmullas tundlikum madalate veepot suhtes, kuna lah
onvergent evolution of arboreal life in oribatid mites indicates the primacy of ecology. Proc. R. Soc. B 276: 3219-3227. Oribatida: puudel elavad vormi
atid mites. Ecography 30: 209-216. Oribatid mites lestade globaalne liigirikkus: tipp temperaaltsed metsad ja troopika: troopika
fusipes genetid SI vs IGS1, IGS2 pikkus; hästi ei klappinud; täpne amplifitseerimisprotokoll
DGGE 18S rRNA 1650 bp. Algul risosf domin pleosporales, mitterisosf Eurotial DGGE 18S rRNA 1650 bp NS1-FR1. DGGE bändi taga võib olla 5 eri seeneliiki (sekv)
cotton root rot pathogen, Phymatotrichopsis omnivora. Persoonia 22: 63-74. Phymatotrichopsis omnivora o
NW-ITA: EcM taimed Alnus glutinosa, Cistus spp, Arbutus (arbutoidne), Quercus spp, Pinus spp, Populus alba, Crataegus monogyna (ei illustr.)
Strait. Nature 397: 149-151. fossiilide põhjal beringi väin avanes kainosoikumis I korda 7.5-4.8 MAT
tican Nothofagus forests. In: In: Veblen TT, Hill RS, Read J (ec Nothofagus: tek Antarktika ps-S-Patagoonias väh 83 MAT. Siis oli kooslustes koos Podocarpaceae, Protea
itrogen fixation in an actinorhizal plant at the edge of its range. Botany 86: 398-407.
86: 501-510.
creases carbon limitation in ectomycorrhizal symbiosis of *Betula pubescens* . Oecologia 140: 234–240.
vs Ni; vs samblike eemaldamine; P. fallax ei talu samblike eemaldamist, suilloid-tüüp eelista kerget niklisaastet
ngal biomass in Scots pine stands on an urban pollution gradient. New Phytol. 131: 139-147.
03. Application of an rRNA probe matrix for rapid identification of bacteria and fungi from routine blood cultures. J. Clin. M rRNA eribakteritele, v kiire, kemoluminestser
pecies richness niidu niitmine suurendab pms rohundite liigirikkust
IX No1: 244 – 276 xxx, isotsi
phic? Oecolog puuvoorik saab kadakast 61 protsenti oma sysinikust
. Recent introduction of a chytrid fungus endangers western palearctic salamanders. Science 346: 630-631.
ty of microbial communities. Appl. Environ. Microbiol. 68: 3673–3682. P ja Fst test fülogeneetiline P ja Fst t
bosomal DNA in Pisolithus isolates associated with pine, eucalyptus and Afzelia Pisolithus IGS ja ITS võrdselt variabiilsed Pisolithus IGS ja ITS võrdselt variab
l *Pisolithus* species as inferred from nuclear ribosomal DNA IT Pisolithus spp. C Pisolithus spp: ITS Pisolithus spp: ITS
opmental cross talking in the ectomycorrhizal symbiosis: signals and communication genes. New Phytol. 151: 145-154.
gord black truffle genome uncovers evolutionary origins and mechanisms of symbiosis. Nature 464: 1033-1038.
nts. Curr. Opin. Plant Biol. 12: 508-515. Laccaria
he ectomycorrhizal basidiomycete Laccaria bicolor: structural analysis and allelic polymorphism. Microbiology Laccaria bicolor/ samal indiviidil 2 IGS2 alleeli, mis erinev
s of the ITS region of environmental DNA extracts. BMC Microbiol. 5: 28. praimerid seenespets mullast amplif-ks ümber ITS regiooni ja 5.8S: sh 58SF
between *Stephanospora caroticolor* and *Lindtneria trachyspora* . Mycotaxon 90: 133-140. Stephanospora ja Lindtneria on
phylla and Setchelliogaster tenuipes based on morphological and molecular data. Mycotaxon 71: 141-148. Setchelligaster (puguseen) on tulene
Robertson GP, Santos OC, Treseder K. 1999. Nitrogen stable isotope composition of leaves and soil: tropical versus temperate forests. Biogeochem. 46: 45-65.
G. 2001. DNA extraction from soils: old bias for new microbial diversity analysis methods. Appl. Environ. Mi DNA eraldamise meetodite võrdlemine mullast. Küsitavate
l fungi from heavy metal polluted soils: their identification and growth in the presence of zinc ions. Mycol. Res. 104: 338-344.
kahandavad kõvasti metsade saagikust, er EcM seente viljumist. Cistuse plotid annavad mitmekesisemalt seente viljakehi kui männi plotid ja paljud liigid kattuvad. Männi
losse M-A. 2009. Independent recruitment of saprobic fungi as mycorrhizal partners by tropical achlorophyllous orchids. New Phytol. 184: 668–681
f epiphytism in architecture and evolutionary constraint within mycorrhizal networks of tropical orchids. Mol. Ecol. 21: 5098–5109.
tions of Thelephora terrestris and other ectomycorrhizal fungi of shortleaf pine seedlings grown in fumigated soil. Can. J. Bot. 48: 207-211.
ent and susceptibility of loblolly pine roots to ectomycorrhizal infection by *Pisolithus tinctorius* . Can. J. Bot. 55: 1569-1574.
tomycorrhizae on pine seedlings using basidiospore-encapsulated seeds. For. Sci. 30: 897-907.
Inoculum. In: ???
basidiospores of Thelephora terrestris. Can. J. Bot. 48: 197-198.
basidiospores of Thelephora terrestris. Can. J. Bot. 48: 197-198.
ic ectomycorrhizae on loblolly pine seedlings. For. Sci. 27: 167-176.
ctions. In: Hacskaylo E (ed.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 81-95.
ECM: bak
pment and growth of inoculated Eucalyptus globulus seedlings in wet and dry conditions in the glasshouse. For. Ecol. Manage. 128: 269-277.
gen and phosphorus on mycorrhizal development and shoot growth of Eucalyptus globulus seedlings inoculated with two different ectomycorrhizal fungi. For. Ecol. Manag
d phosphorus concentration on mycorrhizal development and growth of Eucalyptus globulus seedlings inoculated with 10 different fungi. For. Ecol. Manage. 128: 249-258
s sookask (väiksem kasvukiirus, vähem seeneliike); põhjapoolt toodud kase kloonid aegl kasvuga, vähemate viljakehadega
read of sheathi varajase vs hilise staadiumi seened: Hebeloma eelistab tugevasti mineraalmulda turbale; inokuleeritud varase st seened voivad samuti asenduda peale istutan
mise faasist (kohe-õhem), mõnel juhul taime rakukest tegi sissesopistisi.

of ectomycorrhiza formation in Alnus glutinosa and Pinus resinosa with Paxillus involutus. Mycorrhiza 8: 229-240.
usad, PILDID
l P-asarifolial; ülejäänutel üksikutel juuretippudel ja Amphinemat meenutaval morfotüübil
peremehespetsiifika, selle liigisisene, sektsioonisisene ja perekonnasisene varieeruvus, variatsioonimustrid, mõju taimedele
eri peremeeste eelistused, juhuperemehed

aponica: domin Cortinarius sp ja cf. Paxillus sp. Alnus firmal lisaks ka Cenococcum, mis võib olla valeteade vale puu juurte põhjal
ccosus männil, "Hydnum" männil, Bankera männil, Scleroderma Castaneal VK viidi EcMga kokku

Lodge DJ, Soytong K, Trappe JM, Hibbett DS. 2009. Out of the palaeotropics? Historical biogeography and diversification in the cosmopolitan ectomycorrhizal mushroom
forests of Guyana. Mycol. Res. 107: 495-505. Inocybe Dicymbe all: mitmed liigid

a (Inocybaceae, Agaricales): molecular systematics, taxonomy a Auritella (Inocybe s.l.) Aafrikas ja Austraalias -kalibr Ida-ja Lääne Au Auritella (Inocybe s.l.) Aafrikas ja A
ies: a multilocus phylogenetic overview. Mycologia 98: 984-997. Euagarics klaad = Agaricales. Palju
; the phylogenetic position of the Wallemiomycetes: an enigmatic major lineage of Basidiomycota. Can. J. Bot. 84: 1794-1985. Wallemiomycetes on takson, mis eri
ve phylogenetic inference among mushrooms (Inocybe, Agaricales). Am. J. Bot. RPBII (RNA Pol II) + LSU Inocybe: RPBII (RNA Pol II) + LSU
1 to the phylogeny of mushrooms and allies (Basidiomycota, Fungi). Mol. Phyl. Evol. 43: 430-451. kandseente süst: rpb2 hea, tef1 kesk
l RPB2 nucleotide sequences (Inocybe; Agaricales). Mol. Phyl. Evol. 35: 1–20. Inocybe: uus sugukond Inocybaceca
07. Effects of abiotic factors on the phylogenetic diversity of bacterial communities in acid thermal springs. Appl. Environ. Microbiol. 73: 2612-262 Paarikaupa Fii(st) vä
usus ectomycorrhizas on Momi fir by RFLP analysis of the PCR-amplified ITS region of the rDNA. J. For. Res. 4: 145–150.
a sp1; seemikutel seejärel Cenoc, vanadel puudel teised mitteidentif tüübid ITS-RFLP 2 RE
sessioon
cture and function. Biol. Chem. 387: 1535-1544. Leucine
and mixtures c Melampyrum mojutab peremeestaimede vah konkurentsi. Peremehe segude moju parasiidile idiosynkraat. Voib soodustada korgemat lokaalset taimede dive
Malpighia 1: 359.
use and biodiversity. Trends Ecol. Evol. 20: 610-616.
pterocarpaceae. In: Appanah S, Turnbull J, eds. A Review of D Dipterocarpaceae kogu maailmas. Fossiilid Ida-Aafrikas, kahtlased fo Dipterocarpaceae kogu maailmas. F
. 110: 499-500.
In: Eucalypt Ecology: Individuals to Ecosystems. Williams J, W Austraalia seened: taksonoomia probleemid Eur nimedega, Paljud see Austraalia seened: taksonoomia prol
beyond. Aust. Syst. Bot. 14: 329-356.
rofungi? Aust. Syst. Bot. 15: 501-511. AUstraalia seente biogeo: W-AUS mitmeid endeeme perek-des Amanit, Torrendia, er maasis kandseened.
a for the year 2000. J. Biogeogr. 31: 861–877. Aafrika maakasutuse kaart: SLAIDID;LINGID; statistika
monodominant tropical forests of Guyana? New Phytol. 169: 579-588. arv, et Ec
fungi using stable isotopes. Ecol. Lett. 12: 171-183.
otope patterns in Alaskan black spruce reflect organic nitrogen sources and the activity of ectomycorrhizal fungi. Ecosystems 15: 819-831.
rrhizal mycobionts under field conditions. Can. J. For. Res. 17: 859-864.
ts under field conditions. Can. J. Bot. 64: 848-852.
comment on ditstance-based redundancy analysis. Ecology 82: 290-297. DISTLM, DISTLM for
naal: majandamata alal suurem BD, suurem liigirikkus, kollektorkõver järsem. Sa bakterid 16S rDNA majandatud vs majandamata rohumaal: majandamata alal suurem BD
community structure under different land management regimens by using 16S rit B: DGGE: loodusik vs pollloodusik vs kultuurrohumaa: vahet p PCA -DGGE bändidele
012. Limitations on orchid recruitment: not a simple picture. Mol. Ecol. 21: 1511-1523.
; Tipularia bicolor: Tulasnella spp; Liparis: Tulasnella 1sp; Goodyera pubescens: Tulasnellad saadi kätte ITS5/ITS4 või ITS1F/ITS4 p fülogeneesianal tot jura
Bruns TD, Taylor DL. 2009. Abundance and distribution of *Corallorhiza odontorhiza* reflect variations in climate and ectomycorrhizae. Ecol. Monogr. 79: 619-635.
fungus fidelity: a marriage meant to last? Ecology 87: 903-911.
MjM Software, Gleneden Beach, Oregon, USA.
Version 5.04. MjM Software, Gleneden Beach, Oregon, U.S.A. PC-Ord 5.04

Rocky Mountains Pseudotsuga, Pinus murrayana, Abies, Picea, Populus tremuloides mood EcM; Juniperus, Cercocarpus 3 spp ja Pinus monophyl
Illinois: Populus deltoides, Carya cordiformis, Carpinus sp, Quercus spp, Tilia am mood ECM, Juglans, Crataegus, Prunus, Carya laciniosa mood
Michigan: Tilia, Carya, Quercus, Larix mood EcM, illustreeritud!
North Carolina: Castanea dentata, Betula lutea, Magnolia spp, Quercus velutina, Carya glabra, Abies balsamea, Picea, Tsuga, Pinus mood EcM. Ill
ics. Trends Ecol. Evol. 21: 157-164. L-Am suurimetajate paleontoloogia ja biogeograafia uusaegkonnas, ulatuslikud kliimamuutused ja levik
mi pine (Wollemia nobilis) and related Araucariaceae. Aust. J. I Araukaarialistel VAM
Ceratopetalum apetalum: VAM ja 1-rakukihise mantliga ilma HN-ta EcM. EcM-ga rakud elasid palju kauem kui ilma. Ceratopetalumi seened ei mood EcM muudel puude
Further Australian sporocarpic Glomaceae. Aust. Syst. Bot. 15: 115-124. Glomus spp, mis mood viljakehi ja A
Austraalia poolkõrbe EcM taimed: Thysanotus (Asphodelaceae), Helichrysum, Podolepis, Toxanthes (Asteraceae: Inuleae), Astroloma (Epacrid), Poranthera (Euphorb.)G
Thysanotus (monokott) väidetavalt ECM, kuigi ECM struktuure pole peale rakkudevah kolonis, juurte vohamise ja kogu kasvu stimnul. [Arv auksiinid]
Thysanotus mood v naljakaid struktuure AM ja EcM (Peziza whitei) seentega, mis mood vaid rakusiseseid struktuure. Eriti Peziza parandas taimel
ora tubaeformis mood 1-2 rakukihise mantli Melaleuca uncinatal. Võib mood viljakehi potikultuuris Densospora (Endogonaceae) -EcM s
unctional diversity in resource use by fungi. Ecology 91: 2324-2332.
de liigirikkusest kõdus; kõdus ja mullas olid erinevad seenekooslused fülogeneetilised või
L-Am Guyana L-Am Guyana puud on enamasti AM, v.a. Aldina mood EcM ja Dicymbe mood nii eCM kui Amv EcM+AM soodustab Dicymbe levikut ja paremat minera
mposition is b monodomin metsas kõdulagunemine aeglasem kui AM-metsas GUY: lehtede päritolul polnud tähtsust; AM-metsas suurem mikroobne
nce in a tropic Dicymbe monodominantsus: seemikute elumus suurem puude läheduses, kus on olemas EcM võrgustikud. EcM ja/või juurte kontakt parandab kasvu. Ka ee
ymbe corymbo Dicymbe idanemine ei olene seemnete tihedusest. Dicymbe jpt AM puud idanesid paremini Dicymbe-rohketes metsades. Dicymbe elumus palju suurem 1 a
a-sarn seeni. Vahet pole kas AM-taimed saeti maha v mitte
t of myco-heterotrophic plants in nature: transfer of carbon from ectomycorrhizal Salix repens and Betula pendula to the orchid Corallorhiza trifida through shared hyphal c
development of the myco-heterotrophic orchid plants in nature: ontogeny of Corallorhiza trifda and characterization of its mycorrhizal fungi. New Phytol. 145: 523-537.

emaa seente nimestik, sh. Coltriciella dependens, Thelephorales
Mycologia 66:197-202.
zoic floristic provincialism. Aust. J. Bot. 49: 271-300. Gondwana lagunemine ja floristilised tsoonid
ja vähese Nothofagusega metsas; vs eri vanuses peale põlengut. EcM seentest Laccariasp ja Cort1 mõni a peale põlengut ja ka vanades metsades, vaid vanades Clavulina,
1.

547.
Lepa juured lä Lepa juured lähevad nii horisontaali kui ka sügavale, mis varustab veega ka kuivaperioodil. Frankiad pms tüvede lähedal ja ei ulatu veepiiri alla
. Alnus glutinosa kannatab palju paremini üleujutamist kui kask; ei kasva happelisel turvasel, kus ei mood ka aktinoriisa
Mediterranean Basin. J. Biogeogr. 36: 1333-1345. refuugiumid:Vahemere-äärsed mägised piirkonnad on täis. Poolesd neist korrel taimede BD
ta. Bull. Soc. Mycol. Fr. 121: 91-98. Sowerbyella liikide morf ja kas

rus sõltub VK suurusest vaid mones perekonnas, teises poordvördeline
iations and toxic metal cations. Mycol. Res. 107: 1253–1265. orgaanilis
ity, and below- kõdulagunemine: kõdu segu efekt sõltub kõdu keemilisest diversiteedist (S-W index), mitte taimeliikide diversiteedist. Keemiline BD
le
num conditions for pure culture of major ectomycorrhizal fungi obtained from *Pinus sylvestris var: mongolica* plantations in southeastern Keerqin sandy lands, China. J. F
arisk vähendab EcM ja AM seente kolonisatsioonni BD ja mõj EcMF koosluse struktuuri; neg efekt EcM seentele tugevam kasvuhoone-katses
unities indicates limited taxon sharing between studies and the presence of biogeographic patterns. New Phytol. 201: 623-635.
r significance in respect to Phosphorus uptake. New Phytol. 68: 141-149.

vuseti (kus olid erinevad morfotüübid), ent sama aastaajati. Cenococcumi tüüp eriti 10-30 süg mullas. Teistel puuliikidel erinevused ka aastaajati.

Euroopas, k.a. Cenoc
abies by two *Boletus* species on the accumulation of phosphorus. New Phytol. 74: 455-459.
mükoriisast mükoriisastaatus Tsehhi turvastunud metsades-rabades. Puud norm EcM.
us Virginiana through mycorrhizal mycelium. Bot. Gaz. ???: 243-246.
(L.) karst. Svensk Bot. Tidskr. 15: 192-203.
hiza in reinkultur. Svensk Bot. Tidskr. 16: 161-196.
zen und Ihre Pilzsymbionten. Svensk Bot. Tidskr. 17: 479-519.
der Mykorrhizen von *Pinus silvestris* L. und *Picea Abies* (L.) Karst. Mykol. Untersuch. Ber. 2: 73-331.
nz der Wurzelpilze von Kiefer und Fichte. Bot. Not. 1924: 38-48.
ot. 4: 69-92.

s der pilzsymbionten. Svensk Bot. Tidskr. 19: 98-103.
. Handb. D. Biol. Arbeitsmeth. 11. 4.
zen, mit besonderer berücksichtigung der wurzelpilze von bäumne. Symb. Bot. Ups. 8.3: 3-117.
nsk Bot. Tidskr. 48: 86-94.
inatum and its relatedness to other black truffles. Environ. Microbiol. 4: 584–594. Tuber uncinatum ja Tuber aestivum
ldanud
he detection of white truffles in ectomycorrhizal roots. New Phytol. 141: 511-51(multiplex PCR: spets praimerid Tuber borchii, T. Magnatum
al roots by PCR amplification of the ribosomal DNA spacers. Mycorrhiza 6: 417 Tuber: ITS-RFLP eriliikide ja Sphaerosporella eristamiseks
ii versus Tuber maculatum: neotype studies and DNA analyses. Mycologia 92: 326-331. Tuber borchii erineb T maculatumist
lihtsate matemaatiliste funktsioonidega: 11 eri funktsiooni paljudele eri biol andmetele. Üldiselt parim LS meetod, järgn neg binoom, jackknife1, l liigirikkuse ekstrapoleer
ycorrhizae synthesized between dry as Integrifolia and Hebeloma cylindrosporum. Bot. Gaz. 148: 332-341.
tor visitation Network-anal: võõrliigid nii mesilastel kui ka taimedel on integr hästi kohalikku networki; võõrliikidel on on tavaliselt 1.2 korda vähe
y. Trends Pl. Sci. ?: 1-5.
elustüvedes: erinevad, ent paiguti kattuvad Phialocephala liigid DSE -ITS -juuretippudes, lagujuurtes, kändudes, elusjuurtes, elustüvedes: erinevad, ent pa
damine parandab puude kasvu, ent inh EcM kolonis
nov. and a sequence-based classification of related soil fungal species. Fung. Ecol. 118: 943-945. Archaeorhizomyces borealis. S
muudest Neonectria, Phialoceph fortinii, Neonectria2
, Suillus lut; kuusk Amphinema, Hymenosc, Thel; plastikpottides Thel, Laccaria eripuudel. Liikidest männil 52% ITS liigisisene var <2 %; perekonnasisene var 90-97%
; Mä -Suillus luteus, Rhizopogon spp, Thel terr
ities in mycorrhizal roots of conifer seedlings in forest nurseries under different cultivation systems, assessed by morphotyping, direct sequencing and mycelial isolation. M
val on growth and mycorrhization of Picea abies seedlings outplanted on a forest clear-cut; Mycorrhiza (2010) In press
ARG mägiaasadel vaid AM
ivum, mesentericum, macrosporum -cys pole
ular mycorrhizal mutualism. Proc. R. Soc. Lond. Ser. B 275: 1029-1035.
plants. Ann. Bot. 104: 1255-1261. mükohet taimed võivad olla ev
Mycoheterotrophic interactions are not limited to a narrow phylogenetic range of arbuscular mycorrhizal fungi. Mol. Ecol. In press.
nduced water stress. Can.J.Bot. 51: 1579-1588
guez A, Stevens R, Wilke A, Wilkening A, Edwards RA. 2008. The metagenomics RAST server – a public resource for the automatic phylogenetic and functional analysis
Manause läl Manause kandis erin mujal amasooniast happeline N-vaene liiv; sademed okt-mai, üleuj jaan-juuni. Varzea muld K, P-rikas, Igapos N
odkinson BP, Kukwa M, Lücking R, Hestmark G, Otalora M.G, Rauhut A, Büdel B, Scheidegger C, Timdal E, Stenrros S, Brodo I, Pe Lecanoromycetes
preiliminary phylogeny of the tribe Miconieae (Melastomataceae) based on nr I taimedele 24LR praimer 240 bp LSUs
haltsbestimmung von Chimaphilin in Chimaphila umbellata Urtinktur mittels differentieller Pulspolarographie. Pharmazie 52: 451-453. chimaphil
xicology, and ethnomycology.Mycol. Res. 107: 131-146. toksiinid,
ce in heath and forest tundra ecosystems is closely correlated with presence and type of mycorrhizal fungi in roots. Oecologia 115: 406-418.

phyte genotypes in a Woollsia pungens (Ericaceae) root system. Aust. J. Bot. 50: 559-565.
kus (1 m eemal) juurest saadud kultuuride põhjal. Palju selliseid isolaate, mis hilje mikrosatellitpraimerid genetite tuvastamiseks, ITS-RFLP (3) liikide grupeerimiseks ErM s
proobid
ability on rhizomorph generation by Armillaria tabescens in comparison with A. gallica and A. mellea. Mycol. Res. 106: 897-704.
ng. Mycol. Res. 111: 339-346.
anistic backgrounds and experimental approach with a decomposer food web. Oikos 83: 180-194.
ilcoxina
Research Institute, Helsinki. 101 p. Cenococ
eun. `Vanamo` 9: S197-S201.

eneb

eeritud puude istandikes. Enamasti levitas Kew Bot Aed. Puud ameerikast, seened euroopast. Enamus seeni levinud koos puu kasvumullaga. Männiga eriti laialt levinud Su

ektendoMR seened: varajane kolonisatsioon, väike konkurentsivõime, kasu

e acceleration Kõdulagundamisel koduväljaeelis-5.4%, 6.6% ja 19.5% vastavalt kõdu kvaliteedi langusele;

phology is a better predictor of phylogenetic relationships than ascospore morphology in the Sordariales (Ascomycota, Fungi). Mol. Ph Sordariales: LSU+RPB2+B-tub pere

of DNA extraction and purification procedures for soil and sediment samples. Appl. Environ. Microbiol. 65: 47 DNA eraldamine: fenooli või kloroformi etapp v oluline; lü

y substances from soils and sediments. J. Microbiol. Meth. 44: 49–58. DNA eraldamine huumushapetest ja muust sodist -palju m

stem collapse in Pleistocene Australia and a human role in mega arv et hiidlinnud ja teised suurloomad surid Austraalias valja 45000 a eest tanu inimese pohj kliimamuutuse

d Aculeiferum.. Austr. Syst. Bot. 16: 27-33. Acacia: subgen Acacia, Aculeiferum

7-705. Acacia: osad harud Austraalias, osad Aafrikas-L-Am Acacia. EcM haru subgen Phyllodin

alysis of the Acacieae and Ingeae (Mimosoideae, Fabaceae) based on trnK, matK, psbA-trnH, anf trnL-trnF sequence data. Syst. Bot. Acacia + Ingeae (Mimosaceae) -aka

le new volvate genus in the Elaphomycetaceae from Guyana. Mycol. Res. 105: 1268-1272. Pseudotulostoma gen nov. 2 lii

Kariibi mere saartel EcM taimed Coccoloba, Andira inermis (Papilionaceae), arv ka Hymenea courbaril (Caesalpinaceae). Uued liigid Kariibi mere saartel EcM taimed Co

-228.

ot. 61: 909-916.

a 95: 176-183.

verished soils. mitteMR juured domineerivad väga toitainevaestes tingimustes Carex ja Proteaceae rühmades. Norm toitainete korral teevad normaaljuuri.

Paxillus, mitte Cenococcum

the new Russulales. Mycologia 98: 960-970. Russulales LSU: 2 EcM haru: 1)Rus

of ectomycorr maasiseste viljakehadega seente eosed püsivad mullas kevadeni palju rohklem vrd maapealsete viljakehadega seentega; Maasisestel seentel eoseid rohkem k

ds: mycelial and cultural characteristics of field and pot culture isolates. Can. J. Bot. 65: 598-606.

l 7 others. Bio invasiivsed liigid: kasu ja kahju levikul mutualistidest, konkurentidest, vaenlastest, abioot kk sobivusest ja nende interaktsioonidest. L

): 62-74. keskkonnast seente sekveneeri keskkonnast seente sekveneerimine: praimerid, regioonid,

ison SP, Hurlbert AH, Knowlton N, Lessios HA, McCain CM, l latituudi gradient: ülevaade hüpoteesidest, kõigil tähtsamatel organismirühmadel nüüd ja aja

peremeestaimel.

ispinnasel

i. 2012. Biogeography revisited with network theory: retracing t network-anal kasutamine biogeograafias hydrothermal vent koosluste n network-anal kasutan

nyceten als mykorrhizabildner bei kiefer und fichte. Svensk Bot. Tidskr. 33: 91-93.

Bot. Ups. 5.1: 3-147.

usega alal ARDRA bakteritele + juhusl kloonide sekv power-analüüs optimaal

ality DNA from plants. Mol. Ecol. Notes 3: 666–668. DNA eraldamine taimematerjalist 96-täite kaupa SDS + rä

han S, Lang A, Machmuller M, Taylor M, Witt CA. 2014. Mycorrhizal põua, temp, CO2 ja O3 mõju AM ja EcM ohtrusele ja aktiivsusele

lbicaulis (5-okka-mänd): madal BD Domin Cort, Suillus-Rhizop, Hygrophorus

the characterisation of fungal communities: methods for DNA extraction, PCR an seentele LSU P1, P2 (40 ja 85 DNA eraldamine vanadest metallmaalidest: vaja lisaks Che

ymbiosis: community-ecological consequences and practical implications. In: Allen M (ed) Mycorrhizal functioning. An integrative plant-fungal process. New York, USA:

ure Manipulation of Ectomycorrhizal Fungi. In: ???

Conservation and management of forest fungi in the Pacific Northwestern United States: an integrated ecosystem approach. In: ???

genus Rhizopogon. III. Influence of co-cultured conifer species on mycorrhizal specificity with the arbutoid hosts Arctostaphylos uva-ursi and Arbutus menziesii. New Phy

dence and the modelleerimine: negatiivne ruumiline soltuvus: nork neg soltuvus -liigid kobaras, juhuslikult; 2. tugev ja levimisvoimalus suur voi väike: kobaras rastriline

es: positive fre Üldine diversiteediteooria positiivse tagasisideme kohta, kus vaja asustamiskolbmatuid alasid. arusaamatu

naivosolo R, Eggleton P, Barraclough TG, Vogler AP. 2009. Accelerated species inventory on madagascar using coalescent-based models of species delineation. Syst. Biol

dealing with incongruent gene trees and phylogenetic reconstruction methods. Mycologia 98: 937-948. Cantharelloid clade: Basaalsed harud

ades of euagarics. Mol. Phyl. Evol. 23: 357-400. LSU kandseened LSU homobasidiomycota

ma inferred from the internal transcribed spacers and 25S ribosomal DNA sequen ITS; LR0R, LR21; LR3; LR5; LR7; ITS liigisisene e Ganoderma : ITS

itred. Protist 161: 7-34. Barcoding: Diatoomid ITS on parem kui COI praimerite sobivuse ja eristatav

fungi. Can. J. Bot. 77: 1580-1594. ErM kultuurist RFLP, 5 RE, IT. ErM seened: ITS2 sekveneerimine F

er relations of the mycorrhizal association Helianthemum almariense-Terflezia claveryi. Mycorrhiza 10: 115-119.

resadola, Trento, Italy, 714 p.

etwork structu network-anal: taimeliigid valiti n vastavalt ohtrusele; MEX taimedel taimede nestedness 2x suurem kui seentel; Öpiku koosluses ka ol

fungal biomass from soil ergosterol analyses. Soil Biol. Biochem. 32: 1207-1217.

nces from picoplankton reveal unsuspected eukaryotic diversity. Nature 409: 607-610.

(FAST DNA Spin Kit): 1800 bp tuleb ilusti kätte v paljudest rühmadest.

nse to different root-associated microbial communities and to alterations in nutrient availability. Ann. Bot. Fenn. 41: 263-271.

ference to the jelly fungi. Mycologia 70: 1007-1024. heterokandseentel (Exidia, Tulasnell

etry and spectral mapping technique for the study of the production of manganese-dependent and manganese-independent peroxidases by Pleurotus ostreatus.J. E MnP: mõõ

udies. Oikos 100: 403-405. ettepanek Bonferronist l

diversification in the age of angiosperms. Science 312: 101-104. sipelgate radieerumine langeb kokku

). Fungal Diversity 20: 121-155. Alnicola: liigikirjeldused, süno

jeldust kahtlaseks Alnicola cholea on basaalne teistele

oom genus *Alnicola* (Basidiomycota, Cortinariaceae) based on Alnicola: polüfüleetiline väh 3 haruga. Hymenogaster ka polüfüleet ka Alnicola: polüfüleetiline väh 3 harug

ardes M. 2012. Agarics of alders 1 – The Alnicola badia complex. Mycotaxon 121: 1-22.
my of Alnus-associated hypogeous species of Alpova and Melanogaster (Basidiomycota, Paxillaceae) in Europe. Cryptog. Mycol. 32: Alpova
‹andera sp. BOS55. 1. Regulation of enzymatic production. Bioproc. Engin. 23: 657-661. MnP tood
‹kandera sp. BOS55. 2. Operation in stirred tank reactors. Bioproc. Engin. 23: 663-667. MnP tood
ıtification of genes differentially expressed in extraradical mycelium and ectomycorrhizal roots during Paxillus involutus-Betu EMH-s ekspresseeruvad mitmed geenid teisiti
ndalucía (España). Bol. Soc. Micol. Madrid 25: 215–241.
3D väheneb, kuivas sama. Niiskes domin Cort Tom, RuLa, Inc EcM seened: nniiskes tundras BD väheneb, kuivas sama. Niiskes domin Cort Tom, I
lignin degrading heme peroxidases in the Agaricomycetes. J. Mol. Evol. 66: 243-257. Agaricomycetes: Ligniiniperok
reen JL. 2008. A general framework for the distance decay of similarity in ecological communities. Ecol. Lett. 11: 904-917. ruumiline autokorr: (

›f Social Anthropology, Goldsmiths' College, University of London, New Cross. Kirkia 13: 323-364.
ybe 4; Sebacina 3 Tricholoma 3; domin Cort sp1; Lactarius aff. Alnicola
ies on ectomycorrhizal communities associated with two co-occurring oaks *(Quercus* spp.) in a tropical cloud forest. FEMS Microbiol. Ecol. 69: 274-287.
ybe (20), Russ-Lact (12) Sebacina (10), Genea (9). Huvitavatest Scabropezia, Marcelleina, Hydnobolites, Hydnoplicata (Peziza aff badia).
ırks are structured independently of latitude and host guild. Ecol. Lett. 17: 340-349.
ionally active methanotroph population in a peat soil microcosm by stable-isotop 13C metaanil kasvavad bakter 13C DNA eraldamine mullast, CsCl gradient, 265000g tse
›plications in parasitology. DNA Cell Biol. 22: 357–394. eksperimendi disain j mikroarrayde eksperime
water relations in mycorrhizal and non-mycorrhizal Pinus halepensis in response to drought. Biol. Plant. 44: 263-267.
ıropagated *Helianthemum almariense* plantlets with *Terfezia claveryi* (desert truffle). Agric. Sci. Finl. 3: 309-314.
staceae). Agronomie 12: 807-809.
ibosomal RNA intergenic regions of Verticillium alboatrum and V. Dahliae. My‹ Verticillium: IGS ca 1570 bp, Verticillium: IGS ca 1570 bp, 5S RNA pole selles paigas;
ectomycorrhizal types of Quercus robur L. In relation to tree decline and thinning. Soil Biol. Biochem. 39: 2897-2904. 8 ens akti
ntella sp,Genea sp; sh ka Gilkeya ja Otidea. Linidzitest domin Sebacina, Tom ja genea-humaria

a 39: 138-147. Cortinarius spp Papuaasias, Australa
47-101. Cortinarius, mis seotud lepaga:
l. 77: 32-40.
Alpid vs Rocky Mountains: väga palju samu ja sõsarliike. Tihti r Altai vs Alpid vs Rocky Mountains: seeneliigid: väga palju samu ja sõsarliike. Tihti regionaalselt aluseline
phy evolved from mixotrophic ancestors: evidence in Cymbidium (Orchidaceae). Ann. Bot. IN PRESS
ay spruce (Picea abies) seedlings in relation to boron supply. Trees 15: 319-326.
Geremia RA. 2011. Differences in fungal communities associated to Festuca paniculata roots in subalpine grasslands. Fung. Div. 47: 55-63.
Ecophylogenetics: advances and perspectives. Biol. Rev. In press. fülogeneesi kaasami
ıan arbuscular mycorrhizas in tropical heath forests? New Phytol. 150: 591–599.
Zealand indicates multiple long-distance dispersal from Australia Pisolithuse krüptilised liigid on iseseisvalt Austraaliast kohale tulnud I Pisolithuse krüptilised liigid on isese
ECM vs AM: ECM vs AM: Uapaca on pigem ECM kuival pinnal ja AM niiskel pinnal, topeltkolonis harvem kui võiks eeldada; Leptospermum on ECM kui lähedal teisec
Lõuna-Venezı Lõuna-Venezuela Caatinga EcM taimed on Neea, Guapira, Aldina, Coccoloba, paiguti ka Gnetum. Keskm EcM kolonis 7-100%Kõigil lisaks ka AM. Papili
Pakaraimea ja kogu Dipterocarpaceae EcM seened on arv tek e Pakaraimea ja kogu Dipterocarpaceae EcM seened on arv tek enne Gondwana lagunemist 135 MAT
-lact
oships between mushrooms and false truffles. McIlvainea 11: 61-74.
RE, Hjortstam K, Iturriaga T, Larsson K-H, Lodge DJ, May TW, Mintner D, Rajchenberg M, Redhead SA, Ryvarden L, Trappe JM, Watling R, Wu Q. 2007. Global dive
Ne, NW Ameerika Suillus, Xerula, . ITS Suillus, Xerula, Armil Suillus, Xer Simpsoni indeks
ıvah sugulased, jmuidu oli ka muid, sh Cenoc, Geopora cooperi, Rhiz rubescens, Tom pilosa. Arv kottseened on arvukamad parasiteeritud puudel, sest need on stressi all (l
agriculture in insects. Annu. Rev. Ecol. Evol. Syst. 36: 563-595.
ophilum. Rühmadest domin Tomentella (8), Inocybe (3), Cort (2), Sebacina (2)

, sh Tarzetta
es water conductance and limits shoot sodium uptake in white spruce (Picea glauca) seedlings. Plant Soil 238: 217-225.
and root hydaulic conductivity in Ulmus americana seedlings. New Phytol. 153: 153-158.
sment of the effects of environmental heavy metal pollution on the genetic structu AFLP: Suillus luteus
cterization of microsatellite loci from the ectomycorrhizal basidiomycete Suillus SCAR markerid Suillus luteus mikrosatelliitregioonidele
T. 2000. The taxonomic position of Asterodon, Asterostroma and Coltricia inferred from the septal pore cap ultrastructure. Mycol. Re Hymenochaetales: enamus liikidel o
ion and analysis for sustainable forest management in ACP countries -linking national and international efforts. FAO, Rome.
ılysis or arbuscular mycorrhizal fungal communities via terminal restriction fragm AM Seentele LSU praimerid: FLR4 ja FLR4 pole AM-spets või ei kata kõiki rühmi
n madalas korrelatsioonis, ent kumbki sõletub erinevatest kk-tingimustest: taimekooslused sõltusid N-st, ent seened mitte. 0.3 m skaalas autokorr p
. 2012. How to measure and test phylogenetic signal. Meth. Ecol. Evol. 3: 743-756. fülogeneei fülogeneetilise signa
distance dispersal vehicle in the Southern Hemisphere. Science Lõunapoolkera subantarktilistel ja parasvöötme saartel mängib tuul olulist rolli (mitte geogr. Lähedus) saml
F. 2009. The ectomycorrhizal morphotype *Pinirhiza sclerotia* is formed by *Acephala macrosclerotiorum* sp. nov., a close relative of *Phialocephala fortinii*. Mycorrhiza 1
rulum; mineraalmullas Wilcoxina, Pinirhiza dimorpha, Inocybe1; org-s Amphinema, Pinir discolor; aluselisel Tuber, Inocybe1; happel Pinir dimorpha
natomische charakterisierung der Mykorrhiza Lactarius deterrimus-Picea abies in vitro. Z. Mykol. 52:407-415.
ties in mycorrhizal and non-mycorrhizal fine roots of Norway spruce (Picea abies) and larch (Larix decidua). Can. J. Bot. 75: 932-938. peroksida
Morphology, anatomy, and molecular studies of the ectomycorrhiza formed axenically by the fungus Sistotrema sp. (Basidiomycota). Mycol. Progr. 11: 817-826.
in Japan. II. Comparative studies on all species, including shru Alnus Jaapanis: levikumustrid, taksonoomia Alnus Jaapanis: levikumustrid,
2004. Polymorphism at the ribosomal DNA ITS and its relatior Tuber melanosp‹ Tuber melanosporum: ITS sarı Tuber melanosporum: Tuber mela ARLEQUIN; NCA, jt
M, Le Tacon F, Robin C, Halkett F, Martin F, Paolocci F. 2013. Fine-scale spatial structure of the black truffle (Tuber melanosporum) investigated with neutral microsatell
erit, 2 Helvellat-morf sarnased ja väidet omavah assotsieerunud), Sebacinaceae
atened by an invasive species? We dreaded it and it has happen Arv. Et Tuber indicum koloniseerib Euroopat pms läbi saastatud istikute
e perspectives. Mycorrhiza 25: 77-81.

ı the massive persisting rhizosphere colony "shiro" of the ectomycorrhizal basidi IRAP: retrotransposoonidel põhinev geneetiline fingerprint Tricholoma matsutakele
inarius
a subgenus Phyllodineae (Mimosoideae: Leguminosae) based on DNA sequences of the internal transcribed spacer region. Aust. Syst. Acacia: Phyllodineae: kamm
ctomycorrhizal fungi in paired culture and in association with seedlings of lodgepole pine and Sitka-spruce. For. Path. 31: 331-344.
rhizal morphology and dark septate fungal associations in medicinal and aromatic plants of Western Ghats, Southern India. Mycorrhiza 17: 11-24.
Lõuna-Hiina: Shorea-Castanopsis-Lihocarpuse metsas EcM pole
view. Mycorrhiza 14: 65-77.
ulations by denaturing gradient gel electrophoresis analysis of polymerase chain r prokarüootide praimerid 341f ja 806r originaalis
sity hotspots for conservation purposes. Nature 403: 853-858. taimede ja selgroogsete loomade BD tulipunktid. Endeemsete liikide arv, suhe pindalasse, ohukategooriad;
al abundances and N use by tundra plants. Oecologia 107: 386-394.
ınces in forest soil organic matter. Soil Sci. Soc. Am. J. 52: 1633-1640.
stem function and service? Curr. Opin. Environ. Sustain. 2: 75-79.
/ and plant pro taimede biodiversiteeti suurendades kasvab ka bioproduktsioon; produktiivsus on soltuv muutuja
509. mikroorganismidefunktsionaalsete rühmade arvukus ja suurem liigiline koosseis suurendavad biomassi, vähendab juhuslikku varieeruvust
nic studies of closely related species in the oriental fruit fly (Bactrocera dorsalis) complex. Mol. Ecol. Notes 3: 662–665. 50 b probed Bactrocera-kärbse aktiini geeni ii
ri praimerid annavad v erineva pildi; domin Saccharomycetales. Sügavuseti pole erinevust
thideoM, SordM, ExobasM, TremelloM, MicrobotrM, Asco DSF1, Cryptomycota, Fungi BCGI
ıe unseen fungal diversity hidden? A study of *Mortierella* reveals a large contribution of reference collections to the identification of fı Mortierella: tüüpkultuuride sek
rends Ecol. Ev puuliikide koeksist teooriad parasvöötmes: tuul vs putuktolmlemine, seemne suurus vs levimine vs varud vs varjutaluvus. Paljudele liikidele on olulised kaits
tüüpides: suurim sõltuvus puuliikidest

the alderwooc Lepikud Iraanis jaot 3 rühma, neist üks A. Lepikud Iraanis jaot 3 rühma, neist üks A. subcordata jõgedes, muud A. glutinosa madalma
bovista, Laccaria amethystina) vs suur terve põõsas (Inocybe lacera, Laccaria murina) vs suur haige põõsas (Laccaria laccata, Laccaria murina). Noore Salixi ECM kooslus
domin Laccaria, Inocybe, Cscleroderma (peremees salix reinii)
Laccaria laccata, L. Amethystina, Inocybe lacera; keskm. Scleroderma bovista, L. T-RFLP: ITS1F-HinFI; ITS3-ITS4, duubelbändid Pearsoni exact test + Mı
imary succession. New Phytol. 169: 169–178.
a1, Hebel mes Salixi prim kolonis ja EcM nakatumine võimaldab hiljem ka kasel ja lehisel kolonis kui nad EcM seentega nakatuvad.
ı and dormancy. New Phytol. 181: 245-248.
ptate root endophyte allied to the Herpotrichiellaceae (Chaetothyriales) obtained from some forest soil samples in Canada using bait pl Chaetothyriales : Chatospira (C
n wilt in eggplant by some fungal root endophytes. Eur. J. Plant Pathol. 108: 103-109.
nder S, Högbe ektomükoriisaseened arv soodustavad suuremat N-limitats boreaalsetes okasmetsades; arv. See tagasiside tagab neile ja madalt N toler
arison of SSU, ITS and COI genes as tools for molecular identification of naked amööbidel triipkoodistamine: CO1 palju parem kui ITS (parem resolutsioon,
terr, Lacc, Rhizop; 7a Lacc, Rhiz, Suillus; 12a: Amanita, Rhizop, ; 17a Scleroderma, Amanita, Rhizop, Suillus;
ned Indias dipterokarpuste metsas: domin Russulaceae, Inocybe, Amanita. Nimekirjas väga vähe! Peremeespuid Vateria, Hopea, Dipterocarpus
taimede kauglevimine -juhuslik protsess, mis toimub ennustamatute sündmustena. V raske analüüsida harul
ır phylogeny of Alnus (Betulaceae), inferred from nuclear ribosc Alnus: 2 alamperek ja 3 sektsiooni, mida toetab ITS fülogen, on Jaapa Alnus: 2 alamperek ja 3 sektsiooni, ı
floras associated with mycorrhizae of red alder and Douglas-fir. In: Trappe JM, Franklin JF, Tarrant RF, Hansen GM (eds.) Biology of Alder. Pacific Northwest and Range
karune mantel)
ıl communities across compost recipes, preparation methods, and Composting times. PLoS ONE 8: e79512.
ctomycorrhizas: gene expression, monosaccharide transport and metabolic control. New Phytol. 150: 533–541.
l. Sci. 70: 3321-3323.
ll number of individuals. Genetics 89: 583-590.
tection of 16S ribosomal RNA hybridization on reusable DNA arrays using surface plasmon resonance imaging. Environ. Mi pinnarefrektsioon-peegeldus array. Põhineb ko
rk School revisited. Aust J. Bot. 49: 389-409. biogeograafia: ajalugu, näited, paraloogia
N, Townsend A, Cleveland CC, Stanish L, Knight R. 2010. Glol bakteritel globaalselt: arv et laialt levinud bakteriOTUd on laborireostus; ohtrus ja sagedus c
JE, Starcy JL mikroobide biogeo ja koosluste str mõjuta mikroobide biogeo ja koosluste str mõjutajad: rev
ı JK. 2008. The significance of ectomycorrhizas in chemical quality of silver birc praimerid AM-seentele SSUsse (spetsiifilised)
Tatra mäed: EcM Salix 2spp; Bistorta vivipara ja Polygonum bistorta mood AM
ptibility to atta kooslustes patogeenide kahjustused suurenevad kui lähikonnas on fülogeneet lähedasem liik kooslustes uued fülogeneetilise
vs lehtedes: BD sama. Enamus liike kattub maapealsetes ja maa-alustes osades, ent paaril stat olulised erinevused juurtes vs mujal või üleujutatud v
imate over global land areas. Clim. Res. 21: 1-25.
frican rain for Kamerun:EcM puude rohkus mõjutab juurte hulka pealispinnases ja suurendab P hulka mullas. Arv EcM seened hoiavad üleval tsesalpiinide monodominants
Korupi taimestik: domin EcM tsesalp. EcM tõestati 10 perek: A Korupi taimestik: domin EcM tsesalp. EcM tõestati 10 perek: Anthonotha, Aphanocalyx, Berlinia, Dideloti
d dipterocarp forest at Danum Valley, Sabah, Malaysia: structu Dipterokarbid on basaalpinna jr domin Sabah vihmametsas Malaisias. Esineb ka Fagaceae
ain forest trees Dipterocarpaceae massviljumine toimub keskm üle ühe aasta peale kuiva kuivaperioodi, millele eelnes niiske kuivaperiood. Arv ecM seened regul mass-vilju
age and soil phosphorus on the vegetation of Douala-Edea fores Kameruni Douala-Edea LKA taimestiku kirjeldus: vähe EcM puid, millest sagedaseimad Anthonothamacro
bolan under sitka spruce: distribution, abundance and selective grazing. Soil Biol. Biochem. 16: 227-233.
taimesugukondade kaupa EcM, VAM: kontrollimata andmed
s: viljakehade liigirikkus sõltub peremeestaime hulgast kogu maal. Cortinarius, Naucoria, Russula, Suillus, Leccinum, Hygrophorus liigid teada vaid üksikute peremeestaim
ıg oak and birch. I. Nutrient uptake and the development of mycorrhizal infection during seedling establishment. New Phytol. 117: 37-44.
ıg oak and birch. II. The effect of fertilizers on growth, nutrient uptake and ectomycorrhizal infection. New Phytol. 117: 45-52.
s kasele või tammele. Scleroderma eelistas selgelt tamme ja Paxillus eelistas kaske. Cenoc arenes eriti potis
corrhiza 2: 75 varajased-hilised

ies of Leohumicola from South Africa and the United States. Persoonia 21: 57-69. Leohumicola: ITS vs Cox1 barc
tes in mycorrhizas of Norway spruce and changes induced by exposure to frost and desiccation. Eur. J. For. Path. 22: 291-299.
. J. Ecol. 95: 1 Network-anal: absol nestedness ei sõltu proovide arvust, suht nestedness: 50% proovidest on ok, connectance puhul 25% on ok
. Colonisation and molecular diversity of arbuscular mycorrhizal fungi in the aqu AM seentele LSU nested amplif: 1-universaalne, 2. eri klaadidele eri degener praimerid

on of ectomycorrhizal fungi in rooting of Scots pine fascicular shoots. Can. J. For. Res. 30: 1221-1230.
ogenous auxins influence root and mycorrhiza formation of Scots pine hypocotyl cuttings in vitro. Tree Phys. 22: 1231-1239. IBA stimu
ng summer in Mikroobne ens aktiivsus palju suurem leppade kui mändide all Mikroobn
ıora terrestris, tomentellopsis sp
kandseente, kottseente, AM-seente (vilets), viburseente ja munasseente jaoks eraldi praim
ater fungi on decaying leaves: comparison of traditional and molecular approache DGGE, T-RFLP vs koniidide lugemine: erinevused; T-RFLP ei suuda eristada 18S lõikusi
ıycorrhizae of Norway spruce. Plant Soil 198: 179–184.
rhizal mycelia ErM+ECM biomass suureneb lokaalsel toitainete gradiendil kui toiyu on vähem (mõõtmistehnika kahtlane, saproobide lahutamine peale proovide pikka seis
al fungi in a norway spruce forest was reduced in response to nitrogen fertilization. New Phytol. in press.
mpetrum hermaphrodithum on development and nitrogen uptake by roots and mycorrhizae of Pinus sylvestris. Can. J. Bot. 71: 620 – 628.
tion and diversity on the boreal forest plant-soil system. Oikos 86: 16-26.
JF, Ryberg M, Kristiansson E. 2010. An open source chimera checker for the fungal ITS region. Mol. Ecol. Res. 10: 1076–1081.
ɪeline for processing and identification of fungal ITS sequences. Source Code in Biology and Medicine 4: 1.
lves A, Anderson CL, Antonelli A, Arnold AE, Bahnmann B, Bahram M, Bengtsson-Palme J, Berlin A, Branco S, Chomnunti P, Dissanayake A, Drenkhan R, Friberg H, F
cific ITS variability in the kingdom Fungi as expressed in the international sequence databases and its implicatio barcoding seentel: barcoding barcoding seentel: pe
omic affiliation of unidentified sequences in public databases - an example from the mycorrhizal fungi. BMC Bic automaatne blast otsingute kordan automaatne blast otsingu
ular identification of root tip mantle mycelia provides strong indications of ectomycorrhizal associations in two species of *Sistotrema* . Sistotrema: vaid üks klaad koos Hyd
reliability of DNA sequences in public sequence databases: a fungal perspective. PloS ONE 1: e59. andmebaasides palju v kaugeid sarnasuseta sekventse ja v
choch CL, Nylander JAA, Bergsten J, Porter TM, Jumpponen A, Vaishampayan P, Ovaskainen O, Hallenberg N, Bengtsson-Palme J, Eriksson KM, Larsson K-H, Larsson
Pennanen T, Stenlid J, Bruns T, Larsson K-H, Kõljalg U, Kauserud H. 2011. Towards standardization of the description and publication of next-generation sequencing data
sson E, Ryberg M, Jumpponen A, Abarenkov K 2010. An open source software package for automated extraction of ITS1 and ITS2 from fungal ITS sequences for use in h
ie A, Bertrand Y, Alfredsson JF, Larsson K-H, Kõljalg U, Abarenkov K. 2011. A note on the incidence of reverse complementary fungal ITS sequences in the public seque
343: 493-494. metaani kogus atmosfääris on alates 2007 tkiiresti tõusnud, kuigi vahepeal langes. T

ja póögil, Tricholoma terreum, Hygrophorus russula männil ja póögil, Geastrum fornicatus, fimbriatus -männil ja nulul; mütseeli jälgimine mükori
gi, construction characteristics and environmental conditions on the quality of wooden check-dams. J. For. Prod. 58: 72-79.
of astigmatid mites using the second internal transcribed spacer (ITS2) region and its application for phylogenetic study. Exp. Appl. A Acari: liigisisene var ITS < 2%
ccompanyng fertilizer N transformations in soil and trees of a Scots pine ecosystem. Plant Soil 158: 169-182.
ɔctonia-like fungi from roots of three orchid genera, Pachiopedilum, Dendrobium, and Cymbidium, collected in Chiang Rai and Chiang Mai provinces of Thailand. Mycor
ıdudele, mida on eelnevalt lagundanud Fomitopsis pinicola
s drive diversity-dependent mortality in established seedlings of two dominant African rain-forest trees? J. Trop. Ecol. 26: 1-9.
seedlings using image analysis. Scand. J. For. Res. 10: 347-352
fysiologi. Svensk Bot. Tidskr. 38: 121-122.
skr. 43: 485-490.
pecial reference to mycorrhiza formation. Symb. Bot. Ups. 11.1.
ces of two Alnus species. Can. J. Microbiol. 28: 1133-1142.
lineages. Biol. J. Linn. Soc. 79: 69-84. aseksuaalsete org vs seks org DNA:
lpine flora of I kõrgmägede floora eripärad, tüübid ja vöö kõrgmägede floora eripärad, tüübid ja vööndid Iraanis. EcM taimedest siin-seal arvukad Ko
ıal P. pleuracystidiata sp. nov. and P. carmanahensis reconsidered. Mycologia 92: 984-991.
ities associated to *Nothofagus* species in Northern Patagonia. Mycorrhiza 23: 487-496.
Phlebopus bruchii ei mood EcM Fragara cocoga. Eluviisi lähemalt ei kirjeldata

carp production from Nothofagus dombeyi and N. pumilio forests in southern Argentina. Mycologia 104: 45-52.
iew of the Boletineae. Fung. Biol. 117: 479–511.
tualistic netwo antinested mustrid ilmuvad kui koevolutsioon suurendab vastastikust spetsialiseerumist; koevolutsiooniltähtis roll networki kuju mõju
mberloff D. 2013. Exotic mammals disoerse exotic fungi that promote invasion of exotic trees. PLoS One 8:e66832.
iz 3 spp. Wi EcM seened fasilit Mä invasiooni ARGs
trient acquisition patterns by mycorrhizal fungi of rare and common orchids explains diversification in a global biodiversity hotspot. Ann. Bot. 111: 1233-1241.
patterns of intact Pinus sylvestris mycorrhizospheres in dry pine forest soil: an electron microscopy study. Can. J. Microbiol. 43: 1017-1035.
in *Lactarius* section *Deliciosi* in Europe. Mycol. Res. 111: 1285-1297. Lactarius sect. Deliciosi Euroopas: l
Natural Areas Journal 6: 6–36.
racellular protease activity in different species and genera of ectomycorrhizal fungi. Mycorrhiza 17: 241-248. proteaas
nary Biology Centre, Uppsala University.
Hebeloma cylindrosporum mycorrhizal with Pinus pinaster and P. sylvestris L. in hydroponic culture. Mycorrhiza 4: 247-250. IAA-supe
orrhizal colonization of Sitka spruce (Picea sitchensis) and ash (Fraxinus excelsior) in Irish nursery soil. For. Path. 30: 165-174.
ıiv vs. niiske DCA
arpellales and Kickxellales. Mycologia 90: 624-639. Kickxellales (Zygomycetes) ja Harp
among ascomycetous truffles and false morels inferred from 18S and 28S riboson SSU, LSU kottseentel: ei ühti eriti Pezizales: [(Morchellaceae, Discina
in a monophyletic lineage of the fungus Fusarium are nonorthologous. Mol. Phyl Fusarium, ja selle teleomorf Gibberella: mtSSU, nuL Fusariumil ja selle teleomorfil Gibbe
lani species complex. Mycologia 92: 919-938. Nectria-Fusarium solani kompleks: I
ng mucoralean fungi (Zygomycota): evidence for family polyphyly on a large sca EF1a, LSU, SSU Mucorales: kõik morfopere-ja suguk
hizopogon sp
JPN Vulkaani primaarsukts: Quercus, Betula, Populus maximowiczii, Salix sachalinensis, hultenii mood EcM
omycorrhizal fungi in potted *Populus maximowiczii* seedlings. Mycoscience 50: 143-145.
013. Enigmatic Sebacinales. Mycol. Progr. 12: 1-27.
Sebacinales, a case study. Mycol. Progr. 13: 445-470. Sebacinales: Sebacinaceae s.str
luation of the Ceratobasidium-Rhizoctonia complex and Rhizoctonia butinii, a new species attacking spruce. Mycol. Progr. 12: 763-77 Ceratobasidiaceae: perek Rhizo
his (sh Hygrocybe A-horis) Arv 97 protsenti ITS regiooni identsust on konservqtiivne l

composition on ectomycorrhizal colonization and seedling growth. Plant Soil, IN PRESS.
Trends Microbiol. 11: 272-279.
host utilization taimtuiduliste putukate kooslust mõjutab taimede fülogen lähedus; efekt eksponentsiaalselt kahanev
ny and historical biogeography of true morels (Morchella) revea Morchella: paljude geenide põhjal väh 40 liiki - M. Elata ja Morchella: paljude geenide põh
. In: Veblen T Nothofagus NZL: ülevaade
or novel and specialized mycorrhizal parasitism: the orchid *Gastrodia confusa* gains carbon from saprotrophic *Mycena*. Proc. R. Soc. Lond. Ser. B. 276: 761-767.
ungi during the evolution of autotrophy to mycoheterotrophy in Cymbidium (Orchidaceae). Am. J. Bot. 99: 1158 ITS1OF ja ITS4OF ei tööta Tulasn puhul eriti
preference towards ectomycorrhizal fungi with contrasting geographic disrtibutions in Japan. Mycorrhiza 18: 331-338.
ation of wood-decaying fungi by hybridization of immobilized sequence-specific oligonucleotide probes with PCR-Amplified ARRAy seente identifitseerimiseks puidust: li
ama, ent kooslused erinevad
tamine: üldiselt kahaneb, uurea soodustab
larch seedlings assessed by ergosterol assay. Mycologia 92: 394-398.
enus Boletus in pure culture. Mycoscience 44: 295-300.
eji, in pure culture. Mycoscience 35: 147-151.
eloma in pure culture. Mycoscience 39: 15-19.
cificity in Lecanorchis. Mycorrhiza 22: 545-553.
L, Solymos P, Stevens HH, Wagner H. 2012. vegan: Community Ecology Package. Available from http://vegan.r-forge.rproject.org/.
ue?. Oikos 94: 27-38. pseudoraplikatsioon on
605. pseudoraplikatsioon on
s var. magnus (Diapensiaceae) is regarded as ericoid mycorrhiza from its structure and fungal identities. Mycoscience 52: 425–430.
European species of Clavulina (Cantharellales, Basidiomycota) inferred from phylogenetic analyses of ITS region and morphological Clavulina: suur liigisisene morf
production and nitrogen fixation of black locust (Robinia pseudoacacia) seedlings grown under elevated atmospheric carbon dioxide. New Phytol. 142: 133-140.
. Insight into trade-off between wood decay and parasitism from the genome of a fungal forest pathogen. New Phytol. 194: 1 Heterobasidion annosum genoomika
11: 438.
. Infect. 4: 1353-1359.
ood EC, Damico JA, Itoua I, Strand HE, Morrison JC, Loucks C maakera jagamine 8 realmiks ja 14 bioomiks
cautionary examples from the human genome. Mol. Biol. Evol. 19: 93–100. mitokondriaalsete pse mitokondriaalsete pseudogeenide tu
4. Response of ericoid mycorrhizal colonization and functioning to global change factors. New Phytol. 162: 459–469.
egies of Myco ECM vs AM: EMH ehitus, RM, transport, sink, source, EMH kasv: ülevaade ECM, AM
Gomphidius sõltuvus Suillus spp. Suillus + Gomphidius sega-DNA, erikontsentratsioonid ja vahekorrad
bacterial community in soils amended with various primary minerals. FEMS Microbiol. Ecol. 27: 195-205.
bacterial community in soils amended with various primary minerals. FEMS Microbiol. Ecol. 27: 195-205.
bacterial community in soils amended with various primary minerals. FEMS Mic PLFA
edling survival troopilised ECM-puud: seemikud sõltuval kaugusest emapuust (oluline) ja ECM kolonisatsioonist (pole oluline)
Kameruni lõunaosa EcM puud: Uapaca spp, Gnetum 3 spp, Caesalpinoideae: Anthonotha, Berlinia, Brachystegia, Didelotia, Gilbertiodendron, Julbenardia, Monopetalanth
i Tropenbosi a Kamerunis inokpot: muld Gnetumi alt vs Afzelia alt vs Amhersteae alt nii raiutud kui ürgses metsas Tetraberlinia ja Afzelia seentele -oluline saidi ja häiringu
tion of Glomeromycota: the virtual taxonomy of environmental sequences. Botany 92: 135–147.
nokulumi potentsiaal AM seened + DGGE
mycorrhizal fungal communities colonize roots of Pulsatilla spp. in boreal Scots pine forest and grassland soils. New Phytol. 160: 581-593.
lar mycorrhizal fungal communities in different ecosystems arou AM biogeo taksonitel (klaadidel) erinev: lokaalsed, regionaalsed ja globaalse levikuga liigid. AM BD suur
diversity of arbuscular mycorrhizal fungi in a boreal herb-rich coniferous forest. New Phytol. 179: 867-876.
M. 2010. The online database MaarjAM reveals global and ecosystemic distribution patterns in arbuscular mycor Fülotüüpide nimetamine, esindussekventside loom
M, Koorem K, Leal ME, Liira J, Metsis M, Neshataeva V, Paal J, Phosri C, Põlme S, Reier Ü, Saks Ü, Schimann H, Thiery O, Vasar M, Moora M. 2013. Global sampling
ersity and DNA mullauuringute metoodika standardiseerimise vajadus ning ühtse andmebaasi loomine
ase K. 2010. Taxonomic reconsideration of a sequestrate fungus, Octaviania columellifera, with the proposal of a new genus, Heliogaster, and its phylogenetic relationship
stematics of the sequestrate genus *Octaviania* in Japan: two new subgenera and eleven new species. Persoonia 28: 85-112.
ente perek nim Uus-Meremaa EcM taimed: Leptospermum, Kun Uus-Meremaa EcM taimed: Leptospermum, Kunzea, Nothofagus. Seente perek nimekirjad nii kohalike pu
omposer fungal communities and decomposition processes of leaf litter. Can. J. Microbiol. 52: 701-716.
omposer fungal communities and decomposition processes of leaf litter. Can. J. Microbiol. 52: 701-716.
nino acids in grassland and arable soils. Soil Biol. Biochem. 31: 1751-1755.
oos A-J, Nöjd P, Uri V, Merilä P, Asi E, Lõhmus K. 2011. Fine root foraging strategies in Norway spruce forests across a European climate gradient. Glob. Change Biol. 1
ub seeneliigist. Mantel 16.5 -29 (max 70) ym, korteks 84 -104 ym, steel 123 -166 ym. Rikkalikemal mullatüüpidel oli suurem korteksi, steeli, kogujuure diam
ycorrhizal root traits in *Alnus* species? Can. J. For. Res. 39: 1787-1796.
tic Rhizoctonia-like fungi from tropical orchids. Am. J. Bot. 89: 1852-1858.
etween two tropical orchids. Mol. Ecol. 13: 2393-2404.
stems in the ectomycorrhiza-building basidiomycete Paxillus involutus (Bartsch) Fr.and its reaction to cadmium. FEMS Microbiol. Ecol. 42: 359-366. antioksüd
chordata
e puudest: kaugus mõjutab %kol ja liigirikkust
isteerimine tüvedel kasutades Bayese meetodeid; Stat oluline co-occ võib tuleneda paljudest asjaoludest ja see püstitatab vaid kooseksisteerimine t
. 16S T-RFLP ja sekveneerimine sarn tulemustega, mitmed DGGE bändid on kim bakterite ja arhede BD hüpersaliinses (kuni 32%) vees. 16S T-RFLP ja sekveneerimine sa
id: hea ülevaade mikroobide BD mõõtmise põhjused ja mõõtmismeetodid: hea ülevaade (nt RISA, ARISA,
eneity and mycorrhiza as determinants of plant species diversity. Acta Bot. Neerl. 46: 237-254.
nn. (in Estonian)
a Mycol. 16: 97-103. Coltricia p
nycorrhizae in nurseries. Acta Mycol. 27: 49-61.
us silvestris L.). Warsaw, Forest Research Institute. 130 p.

om Zimbabwe. Mycotaxon 75: 225-228. Mackintoshia gen nov Boletale
ia eukalüptimetsas (koos Nothofagus cunninghamiiga): pms mõj seenekooslusi metsa vanus ja geoloogiline aluspõhi
ı to evolutionary divergence at the molecular level. Science 314: 119-121. liigiteke on pms punktuatsiooniline,
377-884. molekulaarsete kellade kalibreerimi
ınberra, Australia.
r. 29: 1517-1530. Castanea dentata vs Endothia
rylus, Quercus, Pinus; T. Rufumil ka P. Sylvestris, Abies alba, Tilia, Fagus jt. T rufum ja melanosp -cys pole
ıisatsioon, EMH jämedad, paksu kestaga, tihedate septadega
Mantel nurgeline kuni subepidermoidne. EmH jämedad, esinevad rakusisesed hüüfid. Tõestatud RFLP analüüsiga vs VK
:, Helotiales sp; linidzitest domin Tom-Thel
axillus, Boletus, Russula, Gautieria, Cenococcum

ion and cpDN kase fylogeograafia, programmid; cpDNA kask. 3 levikutsentrit peale jääaega: Uural, Alpid ja Louna-Skandinaavia

Sebacina (4), huvitavatest Chromelosporium, Pulveroboletus pulverulentus, Byssocorticium, Hydnobolites. Liikidest domin Scleroderma areolatum
t, Tuber, Sebacina; liikidest Scleroderma areolatum, Russula pectinatoides, Russula sp taimeperemehe määramine ITS järgi
375-397. arvutisimulatsioon
AFLP; 2praimerit; RFLP: 2RE ITS liigisisene polümorfism fenogramm RFLP, AFL
etic orchid is non-specific in its mycorrhizal associations. Mol. Ecol. 22: 2341-2354.
cola in culture. Can. J. Bot. 40: 1313-1319.
ıber uncinatum: two morphotypes or 3 two species? FEMS Microbiology Letters in press. Tuber aestivum ja T. Uncinatum on
ımperate to boreal forests. Glob. Ecol. Biogeogr. 20: 170-180.
Pezizales 3 spp, thelephoroid 2 spp, Cortinarius ja Hebeloma
ion in R language. Bioinformatics 20: 289–290.
tomycorrhizal fungi mediated by Agrobacterium tumefaciens. Mycol. Res. 106 : 132-137.
cosystems at regional and global scales. In: West JB, ed. Isoscapes: Understanding Movement, Pattern and Process on Earth Through Isotope Mapping. Springer: New Yor
ing foliar and root d15N. Biogeochem. 80: 143-171.
12. Glacial survival of boreal trees in Northern Scandinavia. Sci Andoya saar N Norras oli jääaja refuugium
orphological discrimination of stipitate hydnoids in the genera Hydnellum and Phellodon. Mycol. Res. 111: 761-777. Phellodon ja Hydnellum liigikomple
erson DJ, Katz LA. 2010. Broadly sampled multigene analyses yield a well-resolved eukaryotic tree of life. Syst. Biol. 59: 518-533. Eukarüoodid: plastiide on oma
For ammonium-saturated 2:1 phyllosilicates by ectomycorrhizal fungi in vitro. Soil Biol. Biochem. 27: 1237-1244.
l K, Geiser DM, Kang S. 2011. Cyber infrastructure for Fusarium: three integrated platforms supporting strain identification, phylogenetics, comparative genomics and kno
er Entomobryomorpha (Collembola: Hexapoda). Entomol. Res. 39: 334-340. Collembola: ITS
ımycorrhiza and vesicular-arbuscular mycorrhiza formation in disturbed and undisturbed forest soils of Southwest Oregon. Can. J. For. Res. 13: 657-665.
velopment and growth of Douglas-fir and western red cedar seedlings. Can. J. For. Res. 13: 666-671.
thern Spain to colonize Douglas-fir and other introduced conifers. Mycorrhiza 6 :51–55.
em diameter growth response of Pinus pinea seedlings mycorrhizal with Rhizopogon roseolus and submitted to two water regimes. Mycorrhiza 11: 129-136.
species for the production of Pinus pinaster and P. sylvestris mycorrhizal seedlings under greenhouse conditions. Mycorrhiza 14: 171–176.
an igapó flood Rio Negro igapo: domin Aldina latifolia üleujutatava ala ülemises osas
rs. 2004. Cent Igapo, Varzea taimede ökofüs omadused, sh Salix, Aldina
us, Russ2, Russ3* Lact*; CO2 rohkem: Russ1, Russ2*, Lact1, Russ2; klaadidest ITS4NA praimer, 97% ITS kriteerium, mass-sekveneerimine Chao koosluse sarnasus
attern to process in fungal symbioses: linking functional traits, community ecology and phylogenetics. New Phytol. 185: 882–886.
nandid ja koosluse str muutuvad. EmH: Tylospora D, Thel; EcM: Russula G. Kokku domin Thelephoroid 63; Sebacina 11; Russula 9
era to epacrid mycorrhizae and to Hymenoscyphus ericae display specificity. Can. J. of Bot. 78: 841-850. taime rets
ne grassland c alvarite taastamine. Alvarilt võetud mullapahmakas olevad taimed kadusid metsa istutades ära, värskelt raadatud rohumaale viies jäid aga püsima. Mingit efe
ion in species Eesti alvarite jaotus kuueks klaadiks (liigilise koosseisu baasil)
onships across taimedel liigirikkuse-produktsiooni seos l taimedel liigirikkuse-produktsiooni seos lineaarne troopikas, ent unimodaalne parasvöötme
en calcareous 16 alvaril ei esine geograafilist liigirikkuse agregeerumist, tuumik-liikidest sõltub liigirikkus, satelliitliikidest mustrilisus Mantel test + Monte Ca
l alvar commu karussellimudel töötab nii suures kui väikeses skaalas metsas, raiesmikul, niidul
s determined b taimeliikide arvu ja liigifondi vahel tugev korrelatsioon nii alabaasil kui varte arvu baasil Eesti alvaritel läänesaartel
al scale. Ecolo taimed vs pH: kõrge pH tugevas korrelatsioonis l taimed vs pH: kõrge pH tugevas korrelatsioonis liigirikkusega. Suurem osa liigitekketsentreid kõrge pHga
ecological papers. Acta Oecol. 30: 97-99. online supplementide ja toorandmete kättesaadavuse vajalikkus meta-uuringuteks
. Increased air humidity and understory composition shape short root traits and the colonizing ectomycorrhizal fungal community in silver birch stands. For. Ecol. Manage.
imed: vahet pole, ent Inoc, Hebeloma ja Laccaria (Agaricales!!!) vähem transgeensetel taimedel ja Phialocephala palju rohkem Arv siiski, et taimek
ly: a unified approach. Biol. Rev. 86: 792-812. fülogeneetilise divers
geny, traits, abiotic variables and space: a novel approach to linking environmental filtering and plant community assembly. J. Ecol. 99: 165–175. Fourth corner analüü
communities: a double principal coordinate analysis. Journal of Theoretical Biology 228: 523–537. PCoA
arbuscular mycorrhizal fungi. Nature 427: 733-737.
yotic richness beyond the animal, plant, and fungal kingdoms. PLoS Biol. 10:e1(protistide barcoding: SSU protistide barcodin protistide barcoding: SSU eel-b
M. 2015. Quantitative evaluation of bias in PCR amplification and next-generation sequencing derived from metabarcoding samples. Anal. Bioanal. Chem. 407: 1841–1848
ies of Armillaria. Can. J. Bot. 65: 69-71.
new insighs into gene flow in the Australian bush rat, Rattus fuscipes. Evolution 57: 1182-1195. Mantel test on nõrge

om Phanerochaete chrysosporium. J. Bacteriol. 174: 3532-3540. MnP: Pha
ra. J. Biogeogr. 34: 132-146. Antarktika samblad ja samblikud. Arv mitmed samblikud iidse vikariantse levikuga, samblad hiljutised kol
-oliv, Humicola-endof; kontr: Wilc, Laccaria, Rhiz-occid ADONIS-R-põhine
g to the biogeography of fungal–plant interactions across roots, shoots and ecosystems. New Phytol. 185: 878–882.
scale is driven by stochastic and deterministic processes and ge EcM kandseente levimine eostega on maastiku skaalas piiratud. Erinevused nii ajas kui ruu

iz occidentalis, Thel terrestris, Tom sublil sagedaimad eri alade EcM seente liigirikkus kasvab kooslustes seoses pindalaga 2-100000 m2. Puurühmade kaugusest liigirikku

icroorganisms: isolation reduces species richness on mycorrhiza EcM seentel - isolatsioon vähendab BD: üksikpuudel 1000 m peale liigirikkus kukub 50%

t with a molecular master. Bioscience 58: 799-810.

(13), Cort(12), muuh ElaphoM, Helot???,Piloderma, Sord Ruumiline autokorr:

fungal dispersal : macroecological patterns driven by microscop EcM seened: eoste efektiivne levik, kus taimed mükoriissed 100-1000 m; Eri liikidel erinev

er, and mixed lepaga segametsades krüptogaamide BD suurem

cts plant competition for phosphorus between Pinus elliottii and Panicium chamaelonche. Mycorrhiza 9: 199-204.

ing and Conservation. Royal Botanical Gardens, UK.

esser Antilles. Kew Bull. 33: 601-627.

v vähe EcM seeni (ilmselt korjatud valedes kohtades); s.h. Phle seened Keenias: v vähe EcM seeni (ilmselt korjatud valedes kohtades) seened Keenias: v vähe EcM seeni (

Zambia. Kew Bull. 37: 255-271.

Väikeste antillide seenestik: sarnaneb mandri-L-Am omaga eni Väikeste antillide seenestik: sarnaneb mandri-L-Am omaga enim. EcM Väikeste antillide seenestik: sarnane

ckley &Curtis. 1987. Kew Bull. 42: 501-585.

e &Murrill. 1987. Kew Bull. 42: 855-888.

nd species. Kew Bull. 43: 53-75.

l: EcM seentest 2 liiki Inocybe, uued liigid Kapimaal: EcM seentest 2 liiki Inocybe, uued liigid Kapimaal: EcM seentest 2 liiki Inoc

Vilgalys R. 2001. Multiple origins of sequestrate fungi related to *Cortinarius* (Cortinariaceae). Am. J. Bot. 88: 2168–2179. Cortinariaceae (sõsar arv Gymnopilu

be and *Rapacea* inferred from ITS and LSU rDNA sequences. Mycologia 94: 620-629. Cortinarius sisaldab Rozites, C

t chrysorrheus, Lact sp, Boletus aereus, Piloderma sp; EmH: Russula emetica, Lact vellereus, Tylosp asterophora, Byssocorticium, Tomentella sp, Cenoc, Mortierella, Seba

infrageneric relationships in *Cortinarius* (Agaricales, Basidiomycota). Mycologia 96: 1042-1058. Cortinarius: sisaldab endas Roz

rrhizal Cortinarius species from tropical India and their phyloge Cortinariused Indias: pole omavah seotud, paikn nii subgen Cortinariu Cortinariused Indias: pole omavah se

st boundary. J mullaorganismidega neutraalne tagasiside

in Biotechnol. 19: 500-506.

ennius, Hyster. Cenoc proportsioon kasvas

üüpi N-ühendeid eri aegadel ja eri kaugusel märgistatud allikast, mis vastab eksploratsioonitüübile

ucture of the microbial communities in coniferous forest soils in relation to site fe mikroorganismid: PLFA eri-okasmetsatüüpides: seened vs bakter PCA

ct analysis of fungal communities in the complex environmental samples. Soil Bic PCR otse mullast 18S rDNAle bändide rohkus

pp, Setchelliogaster, Descomyces ja mõned kohalikud seened

ani

netic relationships of basal papilionoid legumes based on sequences of the chloroplast trnL intron. Syst. Bot. 26: 537-556. Papilionoideae: Aldina sõsarperek C

and ecology in the tropics: perspectives from seasonally dry trop kuivad troopilised metsad S-Am: mitmekesised; kuna esinevad saarekestena, siis on kõrge e

d speciation in neotropical seasonally dry forest plants. In: ??? I Caesalpiniaceae: õietolm hiliskriidist, makrofossiilid paleotseenist. L-Am kuivade caatingade leguminoosid

ion of species-rich biomes from dated plant phylogenies, neutral taimekoosluste struktuur ja selle põhjused üle maailma, eriti troopikas. L-Am-sse on paljud liigid üle mere

1598-1599.

ay-based detection of bacteria with 16S rRNA-targeting oligonucleotide probes. Appl. Environ. Microbiol. 69: 1 16S rDNA: 16S rDNA: 15-20 nu oligod; sama probe liitul

93-200.

truffles (Pezizales: Tuberaceae, Terfeziaceae) derived from nuclear rDNA sequen Pezizales, Tuberaceae 18S rDNA 2D struktu SSU: Pezizales, Tuberaceae. Choiro

olecular characterization of mycorrhizal fungi isolated from neotropical orchids in Brazil. Can. J. Bot. 83: 54-65.

dvantages of a Procrustean superimposition approach over the Mantel test. Oecologia 129: 169–178. Protest ja Procrustes

ole of site suitability, morphology and phylogeny versus species interactions. Oecologia 140: 352-360. co-occurrence anal. I

es data matrices: estimation and comparison of fractions. Ecology 87: 2614-2625.

sts and savannas in southern Mexico. J. Biogeogr. 33: 438-447. Mehhikos savannid ja kuivad metsad on taksonoomiliselt üsna erineva koosseisuga vrd Aafrika süsteemide

tems with special reference to nutrient recycling in boreal forests. Proc. R. Soc. Lond. B. 268: 1329-1335

direct pathway provided by the mycorrhizal mycelial network. Plant, Cell Environ. 24: 1219–1226.

o tree seedlings via the vegetative mycelium of ectomycorrhizal plants. New Phytol. 145: 301-309.

dentification by searching sequence databases using mass spectrometry data. Electrophoresis 20: 3551-3567.

i from ericoid mycorrhizal roots. Mol. Ecol. 5: 123-131. RFLP, RAPD: erikoidse mükoriisa jaoks

ectives on old acquaintances. Plant Soil 244: 41-53. ErM seentel introni probleem

Uus-Kaledoonia EcM taimed: Nothofagus ja Tristanopsis. Teisel alal Araukaaria mägimetsas >860 müm Tristanopsis vaid AM. Kõigil taimedel sh Nothof VAM

nd substrates. Plant Soil 71: 345-351.

4: 277-278. eritaimeteaduste webi-lingid

nemataceae. Mycol. Res. 111: 549-571. Pyronemataceae: maasisesed VK tel

ronemataceae (Ascomycota, Pezizales) from California. Fung. Div. 28: 65-72. Chaetothiersia gen nov kevadel

apping in ecosystems. Bioscience 39: 230-237.

s and other tales of positive feedback, redundancy and stability. In: ??? (eds). The ecology of mixed-species stands of trees. ???

d ecosystem stability during climate change: the belowground connection. Conserv. Biol. 4: 266-274.

mediation of competition between coniferous tree species. New Phytol. 112: 501-511.

reforestation: arv et mükoriisade mitmekesisus muudab seemikud tolerantsemaks eri keskkonnatingimustele

244. kompleksökoloogia eritasanditel: iseregulatsioon, tagasisidemed

communities. mükoriisasümbioosi tähtsus läbi aegade, teke, petmine

e J, Cheung F, Parvizi B, Tsai J, Quackenbush J. 2003. TIGR Gene Indices clustering tools (TGICL): a software system for fast clustering of large EST datasets. Bioinfor

iversity perfor taimede funktsionaalse BD mõõtmise üritus. Mõõdeti tohutu hulk tunnuseid, tehti neist 2-kaupa kombinatsioonid ning bootstrapi ab taimede funktsionaalse I

us spp

morfot vs ECM random RFLP: väga erinev, minimaalne kattuvus. Liigirikkaimad proovist 1 juuretipp random + rarefaction

vs N väetis 3 RE, varieeruvus ITS polümorfism
Arcangeliella ja Zelleromyces on La
lessis S, Chalot M, Podila G, Martin F. 2003. Analysis of expressed sequence taş ESTde võrdlus: Laccaria vs Pisolithus
systems: desig mesokosmose uuringute usaldusväärsus
: enamus eelistab aluselist pinnast ja vähest org sisaldust. V.a Pez badia happelisel pinnasel
stimul viljumist tuleasemeseentel Ascobolus pusillus, Fayodia maura, Trich hemisphaerioides, Lamprospora, Octospora, Pex endocarpoides, Pez praetervisa, Pez granulosa
sidel: 4 suktsessioonitaset: I Anthracobia spp -vaid lõkkeasemetel, arv kasut kiiresti vabanenud toitaineid ja lagund juuri; II Ascobolus carbonarius, Geopyxis carbonaria (a
metsades Taanis: 4-5 suktsessioonitaset/gruppi: I Antaracobia spp 3-5 k peale põlemist; II Geopyxis, Peziza praetervisa, echinosp, trachycarpa, Rhizina , Pholiota; III Trich
aa tuleasemetel ja põlendikel: domin Tricharina gilva, Peziza praetervisa, Pez echinospora. Samad seened mis Taanis. Geopyxis carbonaria esines tuleasemel koos Salix sp
: osad kevadel (Tarzetta ochracea, Helv acetabulum, Pez sp), teised sügisel
ecules. McIlvainea 18: 22-28. seeneliigid Põhja-poolkeral: eri
49: 440-452. Kandseentel Sümpatrilisi mikroliike üllatavalt palju. Allopatrilistel liik liigikontseptsioonid ja nende sobivus
dendropsis. Mycotaxon. 45-65.
ican Collections. Mycologia 80: 571-576. Clavulina ja Scytinopogon Ven
Heroni korallsaarel mood taimed peale Pisonia jt Nyctaginaceae AM. Pisonia metsas enamus taimi NM.
unktsioon tundmatu
kus korteksi rakud on sobivalt moondunud; mantlit pole, rakusis kolonis mõõdukas

oots, but not melting pots of genetic diversity. Science 300: 156: puudel geneetiline mitmekesisus suurem vahemere refuugiumides, eriti Sarapuu, valgepöök
et. Roma 3: 43-50.

. Le Stazioni Esperimentali Agrarie Italiae 53: 24-31.
, virescens, chloroides, populnea, Lact volemus, piperatus, laricinus, Inocybe praetervisa, Boletus radicans, calopus, Cantharellus edulis, Lecc scab
ITA: Pinus, Abies, Larix, Fagus, Quercus, Betula, Populus, Tilia
ITA: Fagus, Corylus, Betula, Larix mood EcM
+ Betula: kirjeldused; Tuber melanosporum + Quercus obs.
Salix, Helianthemum, Bistorta vivipara, Arctostaphylos ja Vaccinium oliginosum mood EcM
Alpid. Salix, Helianthemum, Polygonum viviparum, Asrctostaphylos, Vaccinium uliginosum (vaid ühes kohas 1 tipp Cortinariusega) mood EcM
EG, Lemke PA (eds.). The Mycota VIIA. Systematics and Evolution. Pp. 257-281. Springer-Verlag, Berlin. Pezizales-Helotiales-Rhytismatales j
les (Ascomycota) with four genera. Mycol. Res. 112: 513-527.
sarnane ja sarnane ka nende mükoriisale Genea, Humaria, Jafneadelphuse vil
ics of voles and shrews for use in biodiversity monitoring studies, and evaluation of mitochondrial cytochrome o närilised ja p närilised ja putuktoidulised: morf eristamatud
hing mycorrhiza between the tropical bolete Phlebopus spongiosus and Citrus maxima. Mycoscience in press.
transport in woody roots of Sitka spruce and lodgepole pine. New Phytol. 85: 489-494.
s. Oecologia 127: 171-179.
mixing models. Oecologia 130: 114-125.
a critique. Oecologia 127: 166-170.
magnitude of EcM taimed vs AM taimed: EcM taimede risodfääris palju suuremad erin vs bulk soiliga kui AM taimede risosf: eriti N miner pot, fosfataaside aktiivsus. Ec
ots and fungi a mulla süsiniku akumul vähenev suurenenud CO2 keskkonnas, kuna risodeposiidid avhelduvad kiiremini ja EcM seened vabastavad ni
eny and re-assessment of some Scleroderma spp. (Gasteromycetes). Ann. Jard. Bot. Madrid 66: S83-S91. Scleroderma ITS: 3 suurt klaad
sity and community composition of ectomycorrhizal fungi in a dry deciduous dipterocarp forest in Thailand. Biodiv. Conserv. 21: 2287–2298.
atkendlik HN, ulatuslik rakusisene kolonis; hüüfid tugevasti vakuol.

ycorrhizas: analytical strategies. In: Azcon-Aguilar C (ed.) Mycorrhizas - Functional Processes and Ecological Impact, pp. 155-164.
e paiknemine - enamik liikidel ruumiline autokorr o.5 - 1.2 m piirides
vironmental factors in an ectomycorrhizal symbiosis, and the p EcM-Rhizopogoni efekt männile sõltub genotüübist ja on päritav, sõltu LRR - Log Response
cephala fortinii across a broad latitudinal transect in Canada. M Phialocephala fo ITS2
gal taxa from ericalean roots and their association with the roots of *Rhododendron groenlandicum* and *Picea mariana* in culture. Mycorrhiza 12: 175–180.
he northern lir harilik pärn: pohjasuunas levimine takistatud, sest kevadel tolmutorud ei joua valmida ja sügiseks viljad ei küpse.
ata; tüüpiline kottseene ultrastr
ry soils. New Phytol. 92: 513-517.

a sumave? Ceska Mykol. 19: 180-181. Buchwaldoboletus (Phlebopus)
Buchwaldoboletus gen nov. Mi
AcFarlane E, Baker B, Molina R, Smith JE. 2007. Ecology and management of morels harvested from the forests of western North America. Gen. Tech. Rep. PNW-GTR-7
y of morel mushrooms in healthy, burned, and insect-damaged forests of northea Morchella spp. Morchella spp. Sisaldavad krüptilisi
odels. Available from http://cran.rproject.org/web/packages/nlme/.
ion, isolation and identification of Tuber melanosporum from old and new oak hosts in Israel. Mycol. Res. 104: 472-477.
f mycorrhizae during development of riparian forests along an unregulated river. Ecography 31: 245-253.

iism. BioSystems 6 : 153-164. arv AM eellased ja kaasaegsete taimede eellased koloniseeri arv AM eellased ja kaasaegsete
ustralaasias ja ümb regioonides: parasiidid ja sümbiondid er. N seened Australaasias ja ümb regioonides: parasiidid ja sümbiondid er. Nothofagusel aitavad mõista biogeo
oiaryExplorer: visualizing large phylogenetic trees with environmental metadata. Bioinformatics 27:3067-3069. TopiaryE TopiaryExplorer: IT
n rainforest. Phil. Trans. R. Soc. Lond. B 359: 1573-1583. Ida-Aafrika vihmametsade areng. Aafrikas väiksem B ja G-BD kui S-Am ja SE Aasias. Hiliskriidist paleog
iber melanosp Tuber melanosporum parasiteerib mitte-peremeestaimedel: Antho immuunoblot, ELISA trühvlile taimejuures
l fungal genomes. Trends Genet. 27:14-22.
5: 21-31. SSCP markerite leidmine mändidel
work of ecolo ökoloogilised võrgustikud üle mitmete troofiliste tasemete, ent taimedele tsentreeritud: struktuurne keerukus ei taga stabiilsust. Kriitili

a kirjeldus: viljakehad kasvavad välja otse ECMst; juure struktuur hävib. Eriti cenococcumil
s MJ. 2002. Fungal gene expression in early symbiotic interactions between Laccaria bicolor and red pine. Plant Soil 244: 11 Laccaria bicolor geeniekspressioon ECM tekl
l. Biotechnol. 57: 20-33. ligninaasi
pecies interaction networks. Ecol. Lett. 15: 1353-1361. Network analüüsi be
tification of differentially expressed cDNA clones in Tilia platyphyllos-Tuber bo cDNA raamatukogu tegemine vähene mRNA sisaldus
forest in Con Nothofagus mägede kõrgemates paikades ei vaja regen-ks suuri häiringuid, arv sest puuduvad Lauraceae varjutajad
nen M, Wang P-H, Matsuda Y, Naadel T, Kennedy PG, Kõljalg U, Tedersoo L. 2013. Biogeography of ectomycorrhizal fungi associated with alders *(Alnus* spp.) in relatio
lid A, Hagström Å. 2007. Global patterns of diversity and community structure in marine bacterioplankton. Mol. Ecol. 16: 867-880.
2 others. 2007. Global patterns of diversity and community stru latituudi gradient merebakteritel - just nagu teistel org-del
food web of s 13C ja 15N toiduahelas mullas: d13C sama, d15N kasvab ahelas ylespoole; koik soltub vaga palju kohapealsest varise 15N vaartustest; 15N prop kasvab sy
sylvestris-Lactarius rufus ectomycorrhizas and their effect on mycorrhiza format bakterite 16SrDNA ANOVA B. ensüüm
al isolates belonging to AG-6 and AG-12 of the Rhizoctonia solani species complex. Mycologia 93: 712-719. Rhizoctonia AG-6 ja AG-12 sisald r

all DH. 2003. taimede BD vs mullaloomade BD looduslikel rohumaadel. Taimede BD ei mõj nematoodide, algloomade BD ega bakterite PLFA-sid.
ty and effects on seed germination and plant growth. Mycologia 99: 510-525. praimerid ITS Ceratobas ja Tulasnellale
008. Novel Root Fungal Consortium Associated with a Dominant Desert Grass. Appl. Environ. Microbiol. 74: 2805-2813.
propriate for classifying internal transcribed spacer (ITS) metagenomic amplicons? New Phytol. In press. BLAST-põhised mee
l Saccharomycotina ja Taphrinomycotina vahepeal mullaseened: kõikjal mullas sage ko
Ontario Tsuga, EmH: 185 liiki kandseeni mullast; domin Agaricales; 57-65% liikidest mood EcM; väidet. Annavad EmH vs viljakehade uuringud e
s: Advantages of Akaike information criterion and Bayesian approaches over likelihood ratio tests. Syst. Biol. 53: 793–808. Akaike informatsiooni kriteerium on
distic analysis of the geographical distribution of genetic haplotypes. Mol. Ecol. 9: 487-488. fülogeograafia -Geodis.
n. Bioinformatics 14: 817-818. MODELTEST
vorks. Trends Ecol. Evol. 16: 37-45. ülevaade eri fülogeneesikäsitlustest
253-1256. jModel Test: mude jModel Test: mudelite valik. Si
s and assumptions. Ecology 83: 703-718.
ular mycorrhizal, fine endophytic and dark septate fungi across a pH gradient in acid beech forests. Soil Biol. Biochem. 39: 400-408.
-89. Rosaceae: Photinia lähim sugulane c
rtson KR, Arsenault M, Dickinson TA, Campbell CS. 2007. Phylogeny and classification of Rosaceae. Plant Syst. Evol. 266: 5-43.
and biogeogra võrdlev analüüsja biogeo parasiitidel: fülogneet signaal mitmel tasemel, uuritava või seletava tunnusena; kirpude nish ja levila kasvab
hic space. Tre peremehespetsiifika parasiitidel: erinevad indeksid ja terminid geogr ja fülogeneet asjaolude jaoks;
s. Parasitolog fülogeneetiline sarnasus peremeeskaladel suguk siseselt mõjutab parasiitusside esinemist (Monogenea ja Trematoda, ent mitte Cestoda
rm operational approaches in producing ecologically relevant fungal species inventories. Mol. Ecol. 20: 655-666.
ylogenetic trait conservatism and the evolution of functional trade-offs in arbuscular mycorrhizal fungi. Proc. R. Soc. B 276: 4237-4245.
182-184. keystone-liikide uuem kontsept ja diskussioonid
ublilacina
ased clustering: using ecology to refine the Operational Taxonomic Unit. Appl. Environ. Microbiol. 79: 6593-6603. klasterdamine järk-jä
e-tuning of carbon gain by two partially myco-heterotrophic orchids. Proc. R. Soc. Lond. B 277: 1333-1336.
litter and soil puuliikide varis mõj seenekooslusi, eriti F-horisondis. Home vs. Away - viimases madalam lagunemiskiirus
lew Phytol. 16 parasiitsete taimede mõju peremeestaimedele, kooslustele jm organismidele. PEAB arvestama parasiitidega, tehes toitainete analüüse. PAR vähe, ent liigub l
e carbon flux Hemiparasiit Striga spp saavad 28-35 protsenti C oma peremehelt
n nutrient poor hemiparasiidid: kõrgem toitainete konts tänu suuremale resp-le, mõj taimede maapealset konkurentsi ja suurendavad BD tänu koguprod inh-le. Arv toitaine-r
s a range of host responses in the rhizoids of leafy liverworts: an experimental and cytological analysis. Fieldiana 47: 59-72.
functional diversity using sole-carbon-source utilisation profiles -a critique. FEMS Microbiol. Ecol. 42: 1-14.
Munch J-C. 2(põua mõju Saksamaa töögi-kuuse segametsades
n trees with profiles instead of a distance matrix. Mol. Biol. Evol. 26: 1641-1650. FastTree - FastTree - kiire NJ
lar evidence. Int. J. Plant. Sci. 157: S40-S49. Gnetum: iseseisvad alamperekonnad põhja-ja lõunapoolkeral Gnetales sõsarrühm katteseemnetain
nita phalloides was introduced and is expanding its range on the Amanita Phall IGSil palju koopiaid
rrhizal symbi invasiivsus: mükoriisa roll taimede invasiivsuses - invasiivsed taimed pms NM või väikese kasvuefektiga. Paljud suruvad kohalikku n
?: 1-9.
biogeography and invasion biology of the death cap mushroom Amanita phalloides: looduslik biogeo ja introduts. Am, AUS, Probleem liigikontsepts, leiuandmete usaldus
, Schaminee J Fül klastedunud taimekooslustes on suurem f-naalne mitmekesisus kui mitteklasterdunud kooslustes h Fül klastedunud taimekoosluste
n and identification of *Alnus acuminata* ectomycorrhizae from Argentinean alder stands using anatomical characterization and ITS-sequence analysis. Mycologia 102: 126
pikus: väike 5 RE, mustri sarnasuse järgi perekondade eristamine
n M, Egli S, Ernst J, Fraissinet-Tachet L, Kuhar F, Legname E, Marmeisse R, Müller A, Nikolova P, Peter M, Plassard C, Richard F, Schloter M, Selosse M-A, standard
neral nutrients from soil organic matter. Ann. For. Sci. 68: 25–32.

Alnirhiza cystidiobrunnea: v sarnane Th terrestrisele ja T sublilacinale
2004. A rapid and highly sensitive method for measuring enzyme activities in single mycorrhizal tips using 4-methylumbelliferone-labelled fluorogenic substrates in a micr
Schwarzerle (*Alnus glutinosa* (L.) Gaertn.). PhD Thesis. University of Tübingen. Lepa-Ec
latüübil, Chytridiomycota teisel mullatüübil. Mõjur arv N
2007. A phylogenetic evaluation of whether endophytes become saprotrophs at host senescence. Microb. Ecol. 53: 579-590.
L, Green LE, ökoloogia teooria kehtib väga paljuski ka bakteritel. Arvestada tuleb, et bakterid asex organismid.
oil 244: 9-17. viited,lühiülevaade kõigist mol ja FA meetoditest, probleemid
T-RFLP tippe ja DGGE b T-RFLP tippe ja DGGE bänd replikatsioon ja korr
uality checked and aligned ribosomal RNA sequence data compatible with ARB. Nucl. Ac. Res. 35: 7188–7196.
i, muudest domin Tom ellisii, v palju teisi tomentella-thelephora, Tuberi ja Scleroderma liike
Puccinia sorghi. Can. J. Bot. 65: 1380-2383.
occum, Laccaria amethystina. Tomentella ja Cortinarius küllalt liigirikkad

Gap Discovery for primary species delimitation. Mol. Ecol. 21: 1864–1877. Barcoding gap leidmine paariviisilise distantsi põhjal ar Barcoding gap leidm
ius spp, Tomentella, Laccaria
ffles, and microhabitat structure in Sierra Nevada old-growth habitat. Can. J. For. Res. 32: 1016-1024.
gradients revisited. Glob. Ecol. Biogeogr. 22: 659–670.
globally consistent relationship that precludes region effects. A regionaalne efekt on taimekoosluste taksonirikkuse määramisel tugevam kui laiuskraad. Ena
ersity of temperate plants. Nature 407: 180-182. Aasias suurem sama perek taimede BD kui N-Ameerikas, sest heterogeenne kk, palju refuugiume, väiksem
nts and terrest taimedel ja maismaalooma rühmadel esin taimedel ja maismaalooma rühmadel esineb terav diversiteedigradient laiuskraadi järgi. See
togeographical patterns in East Asia in relation to latitudinal and Ida-aasias on alla 30* laiused palju taimeperekonna-rikkamad kui yleval pool
versity along latitudinal and elevational gradients. Science 335: beta-BD on globaalselt ja N-Am puude andmetel tugevasti negatiivselt seotud laiusega
rth America. Glob. Ecol. Biogeogr. 18: 327–332.
ntagonistic microfungal populations and their potential interactions in the mycorrhizoplane of Norway spruce (Picea abies (L.) Karst.) and beech (Fagus sylvatica L.) on aci

tic basidiomycete with an exceptionally large plant host range. Mol. Plant Pathol. In press.
enet. 32: S496-S501. cDNA arrayde transf cDNA arrayde transforr
yptic speciation in *Hymenoscyphus albidus*. For. Path. 41: 133–142.
l temporal dynamics of a community of the tree-root endophyte Phialocephala fortinii s.l. New Phytol. 168: 651–660.
ographical pattern for a root-associated fungal species complex. Phialocephala: kõik dominantsed liigid levinud kogu Põhja-Poolkeral; Sveits liigirikkaim al
fer from oaks poud: tamme süvajuured votavad vaid öösiti vett üles ja translokeerivad seda vaid AM ja ECM seente, mitte parasiitide hüüfidesse. Translokatsioon palju ef
zosphere hyph rohumaadel tammedeta mulla ülakihid kuivavad palju kiiremini läbi ja hüüfid surevad vrd tammesavanniga. Arv hüdrauliline veevarustus selle taga.
tammel Cali tammel Californias: kuiv vs niiske a; nõgu vs kuiv küngas: AM domin kuival aastal kuivas kasvukohas; EcM seentel ja AM-seentel (p

ey on root colonization, growth, and nutrient uptake of aspen and balsam poplar. Biomass Bioen. 32: 381-391.
d species 5 years after nursery inoculation in the Canadian Prairee Provinces. New For. 35: 235-253.
and ectomycorrhizal development of black spruce seedlings. ???
velopment of container-grown Picea mariana seedlings in response to exponential nutrient loading. Can. J. For. Res. 30: 191-201. vektoranalüüs
omputing. R Foundation for Statistical Computing, Vienna, Austria. Available from http://www.R-project.org/.
tool in microbial ecology. Nature 403: 646-649. substraadi rikastamine 13C-ga substraadi rikastamine 13C-ga, 13C inkorporatsioon DNA
cids: a window to the function of uncultured microorganisms. Curr. Opin. Biotechnol. 14: 296-302. 13C kasutamine mikroobide funktsionaalsetes uuringutes
ecologically important microbes by rep-PCR genomic fingerprinting. In: Akkermans ADL, van Elsas JD, de Bruijn FJ (ed.). Molecular microbial ecology manual, v3.4.3.
d ecology thro ookeanides Ameerika ümber funktsionaa ookeanides Ameerika ümber funktsionaalne metagenoomi-põhine BD on tipuga 20*N ja ko
ness. Proc. Natl. Acad. Sci. 98: 4534-4539. Lõuna-Am linnudel: 1* ruutude kaupa: BD kasvab koos topogr heterogeensusega, sademete

Costa Rica pilvemetsade epifüütidel, esines sageli ka seenmantel -eriti maapinnal kasvavatel ning epifüütsetel veidi kuivemates tingimustes, DSE kuivemates, AM kõikjal
uccession of active fungi during the decay of Norway spruce logs. Fung. Ecol. 4: RNA ITSst ja 18S-st võimaldab identifitseerida aktiivset kooslust
lgul domin va-mä Phellinus spp; EcM seened (Lact tabidus, Russ, Piloderma, Tylospora) mood 10% järjestustest II st. kuni 60% V st. VK arvukus
ycotaxon 54: 427-453. ARG Nothofagus torikud: Post
kari Uapaca 3 metsa, sh Isoala. Domin Boletus s.l., Russula-Lact, Amanita, Cantharellus
ce and environmental heterogeneity in a patchy ecosystem. Proc bakteri Burkholderia ambifaria isolaatide genoomide sarnasuse ruumiline autokorr ulatub k
l. 62: 142-160. ordinatsioonid ja Mante
origin of Orchidaceae from a fossil orchid with its pollinator. Nature 448: 1042-1045. Orhideede minim. Tekkeaeg 76-84 M
cea (Pinaceae): implications for phylogeographical studies using Picea: tek Põhja-Ameerikas ja väh viis mandritevah levikut. Aasia kaudu levis ka Euroopasse
onal tool for spatial analysis in macroecology and biogeography. Glob. Ecol. Biogeogr. 15: 321-327. Ruumilise varieeruvuse
bakterite (IGS) ja seente (ITS) ARISA=ARDRA. Sekveneerimise polyakryylamiidgeel. K
species and their nutrient uptake in gypsum mine spoil in India. Appl. Soil Ecol. 17: 279–284.
ulture of Cortinarius orellanus. Trans. Br. Mycol. Soc. 89: 41-44.
some ectomycorrhizal fungi. Mycol. Res. 96: 971-976. ECM seen
agous life style. Oikos 118: 334-345.
y technique and its application in terrestrial orchids. Am. J. Bot. 80: 1374-1378.
on of Tipularia discolor (Orchidaceae). Am. J. Bot. 85: 829-834.
studies of terrestrial orchid populations. Bot. J. Linn. Soc. 126: 49-64.
ia eri metsades saproobid ja lehik-EcM seened 7 a jooksul: domin Cortinarius s.l. , Russ+Lact; Amanita
he Barcode Index Number (BIN) system. PLoS One 8:e66213. Liikidele ja OTUdele geneetilis
ogy. Wiley: Chichester, UK.
and epigenetic instability in mycelial systems. Can. J.Bot. 73: 1241 – 1248.

n processes in ekto-ja erikoidse MR seentel oluline roll tundra-ja boreaalse vöötme C ja N ringes. Omastavad eelistatult aminohappeid mineraalse N üh asemel ja suudavad
mation of the ectotrophic mycorrhizal sheath in conifer seedlings. New Phtyol. 71: 49-53.
ciations in 'lower' land plants. Phil.Trans. R. Soc. Lond. B 355: 815-831.

a journey towards relevance. New Phytol. 157: 475–492.
emasolu sõltub Ericales: erikoidne, arbutoidne, monotropoidne MR. Pyrolatel mantli olemasolu sõltub mullast; Kõik Pyrolaceae liigid on seotud EcM taimedega; Ei ole õnn
oy. Soc. Edinb luidete arenemine. N-limit faktor. Vajadus mükoriisa järgi suureneb. Eri kk-des eri tüübid. Pyrola rotundif ssp maritima, Monotropa: esinevad luidete vahel n
Hill RS, Read Nothofagus Austraalias: ülevaade
. Ecol. 76: 558 Tasmaania vihmametsad: Nothofagus regener pidevalt, ent okaspuud vajavad suuri gäppe
pecies of Noth Nothofaguse strateegiad: varjukartlikud, samas ruderaalsed, ent ka troopikametsade dominandid, ECM polearvestatud

s of some mon Nothofaguse monodominantsed ja segametsadel Nothofaguse monodominantsed ja segametsadel pole olulist vahet puude koosluses. Kus on palju Nothofag
a contortipes, the Rosetta Stone of a mycoparasitic agaric genus. Can. J. Bot. 72: 1812-1824. Kamerunist kortikoidid, sh Tom radi
igiline koosseis sarnasem lähemal asuvates. Järvest vaid 1 proov bakterite BD suurem suuremates Hisp mägijärvedes; liigiline koosseis sarnasem lähemal asuvates. Järvest v
o host species Casuarinaceae: EcM ja noodulite teke sõltub v palju Casuarina ja Allocasuarina liigist ning mullaomadustest. Allocasuarinal esineb EcM sagemini kui Casua
JS eukalüpti hõredates metsades: Boletoidid (19)Russ/Lact (15) Põhja-AUS: eukalüpti hõredad metsad: basaalpinnalt domin EcM puud, juurtel 24-55% EcM kolonis ja 6-2
Queensland apogeotroofsete juurte funktsioon on arv hingamine, stemflow ära kasutamine, läbi mükoriisade kõrgvee ajal toitainete omastamine
rginata) in litte: varise tüüp mõjutab EcM mood: Banksia lehekõdul ei mood, ent eukalüpti ja akaatsia kõdul moodustab. Cenoc ja Hysterangium levinud mineraalmullas, val
EcM taimed AUS kaevanduspinnasel: Allosyncarpia, Asteromyrtus (Myrt), Erythrophloeum (Caesalp., mantel 1-2 kihti, HN pole; Aafrikas VAM), Jacksonia (Legumin, M
izal fungi. Soil Biol. Biochem. 23: 767-774.
Casuarina cunninghmina Queenslandis vaid AM. Üleujutatud aladel mood klasterjuuri
Pinus patula se Laccaria ja Thelephora koinokuleerimine oli 12 kuud hiljem parem kui kumbki seen eraldi voi kontroll. Parem igal juhul steriliseeritud agropinnasel. Thelepl
cience 289: 1920-1921. Glomales fossiil 460-455 MAT (enn
izal fungi (Glomales). Mol. Phyl. Evol. 14: 276-284. AM-spec praimerid, AM-seen AM-spec praimerid, k AM-seened; morfoloogia ja SSU sel
sporocarp-forming species of glomeromycotan fungi in the Diversisporales lineage. Mycol. Progr. 6: 35-44. Glomeromycota: uue haru kirjeldus
al fungi): recent developments and new gene markers. Mycologia 98: 885-895. AM seentel mt LSU homogeenne ja paljulubav süste Glomeromycota: Geosiphon on arv.
An evidence-based consensus for the classification of arbuscular mycorrhizal fungi (Glomeromycota). Mycorrhiza 23: 515-531. Glomeromycota taksonoomia
nthogalactus, Russula cremicolor and Amanita francheti in late-stage ectomycorr AFLP + elektroferogrammid sarnasusindeksite jaotus
l fungi. Plant Soil 244: 64-73. SSU . AM-seened; ülevaade SSU fülogene
phyllosphere: geographic and phylogenetic variability in the distr baktritest endofüütidel: tähtsam peremeestaime hõimkond kui geogr kaugus fülogen BDle.
Afzelia ja Brachystegia mood EcM Nigeerias
Canada and its biological status. Can. J. Bot. 64: 1249-1254.
n. J. Bot. 67: 3003-3062.
ciated with a superficial fairy ring. Can. J. Bot. 59: 410-414.
ia ; 3, on *Neolecta* . Mycologia 71: 1248-1253.

o parasitism: who controls the outcome, host or invader? New Phytol. 151: 705-716.
rance generated by plant/fungal symbiosis. Science 298: 1581.
studies of the euascomycetes (Pezizomycotina, Fungi) with special emphasis on LSU, SSU, RPB2 kottseened, er lihheniseerunud ja po
729-735.
ns of the Indian Ocean and reconnecting continental shear zones Gondwana lagunemise kronoloogia. India uuendused
d EF1-a sequences: evidence for cryptic diversification and links to *Cordyceps* teleomorphs. Mycologia 97: 84-98.
gonucleotide microarray to characterize ectomycorrhizal fungal communities. BMC Microbiol. 9: 241. EcM seentele: chipil mitteolevaid liike
over J, Chadwick OA, Hale CM, Tjoelker MG. 2005. Linking litter calcium, earthworms and soil properties: a common garden test with 14 tree species. Ecol. Lett. 8: 811-
12. Impacts of Liigirikkuse mõju funktsionaalsusele ja bipomassile tüuseb aastatega ja näiline esialgne redundantsus org vahel väheneb
association of l valgus: varjukartlikud liigid kasvavad kiiremini ka varjus kui varjutaluvad muid aeglased liigid; ruderaalsetel väikeseseemnelistel puudel algne kasv aeglaser
al pole ühtki natiivset EcM-seent. Sünonüümiprobleem
Africa. Contributions from the Bolus Herbarium.No.7.
ligniinilag
phora terrestris. In: Hacskaylo E (ed.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 222-227.
pathogens and invasiivse Prunus liigi invasiivne asurkond Eur-s seotud vähem patogeensete Pythium tüvedega kui Am-s
hizae: integrating evolutionary history and plant traits. Ecol. Lett. 15: 689-695.
kadakal tuberkuloidne ECM (???)
, Dreyfus B, D Acacia Austraaliast introdutseeritud ja eriti kui veel nakatatud Pisolithus albusega, mõjutab mikroobikooslusi ja -aktiivsust, mulla toit
tes as potential vectors for soil microfungi: study of mite-associated fungal species. Microb. Ecol. 50: 518-528.
Atherospermataceae (Laurales): evidence from coding and nonc Atherospermataceae Lõuna-poolkeral. On Nothofaguse matsade alustaimestikus pea kõikjal. Sugukond tek
ts. Int. J. Plant Sci. 165: S23-S33.
nts. Trends Plant Sci. 10: 550-558. Gnetales biogeo illustr.; molekulaarsete relakseeritud kellade kasutamine ajaloolises biogeos
ander ES, Mitzenmacher M, Sabeti PC. 2011. Detecting novel associations in large data sets. Science 334: 1518-1524. MIC: Maximal Infor
est tom-thel, inoc, amph-tyl
and plant con niidutaimed koloniseerivad neile omasemaid substraadilaike. Eritaimede elupaigas erinev mikroobne aktiivsus, N sisaldus
and phylogeny on the nested structure of mutualistic networks. Oikos 116: 1919 1929.
n coextinctions Network-anal: väljasuremised on mittejuhuslikud; fülog ja ökol distants on tugevasti korreleeritud networkis tolmeldajate vahel; looma
yxotrichoid hyphomycete, Oidiodendron maius. Mycol. Res. 106: 1463-1467. Oidiodendron maius: toodab turbapa
ialocephala dimorphospora). Can. J. Bot. 51: 2247-2248. MRA vanad kultuurid (Melini
ns; Tomentella sp; maasikapuu: Cenoc, Tomentella, Inocybe tigrina; suguk kaupa ITS1F-4; RFLP liigisisene varieeruvus olematu v a seal kus ennegi kahtlustatud krüptilisi
Quercus ilex-Arbutus: 4 a jooksul Domin Laccaria laccata, Lact chrysorrheus, Inocybe tigrina. Liigirikkaimad perek Russulaceae, Cortinarius s.l., Amanita, Inocybe. Väga
nii aastaaeg kui ka põua indukts; aastaaeg eriti põuastel plottidel. Aastati võisid kevad vs talv mõjud olla v erinevad - ilma sesoonse mustrita
sions - the rol taimede invasiivsus ja invasiooni seosed mutualistidega: Ficus-liblikas parimini uuritud; introduts. Liikidel võib spetsiifilisus muutuda
Naturalization invas sõnastiku definits: invasiivne - kui levib ise >100 m eemale v >6m 3 a jooksul; naturalization, aliens, transformers, weeds
d predictive fr invasiivsed paljasseemnetaimed - pea eranditult Pinaceae ja Araucariaceae-Podocarpaceae; teistest paistavad andmete põhjal olulisel k
well do we und invasiivsed liigid RSAs: Pinus spp, Acacia spp, Populus spp jpt
sissetoodud metsanduseliikide omadused: parem puit, kiirem kasv, lihtsam majandamine, seemnete/seemikute saadavus, suurem resist
c analysis of Rhamnaceae using rbcL and trnL-F plastid DNA s Rhamnaceae: EcM Austraalia Rhamnaceae-Pomaderreae (sh Pomader Rhamnaceae: EcM Austraalia Rham
richness values. Insect Conserv. Div. 1: 135-141.
ings inoculated with mycelial slurries of ectomycorrhizal fungi. New Forest. 3: 247-258.
kirjeldused Langermannia gigantea, Lygoperdon ja Tapinella atrotomentosa ei mood EcM
osa) mycorrhizoplane-associated actinomycetes on in vitro growth of ectomycorrhizal fungi. Plant Soil 115: 109-116.
obal Ecol. Biogeogr. 11: 353-361. saarte biogeograafia edasiarendus väikeste antillide ja lindude näitel: levimine>kolon>nishid>ekstinktsioon

Evolution 48: taimesuguk vanuse ja liikide arvu vahel pos seos; suguk vanuse mõõtmine esmaleidude põhjal fossiilidena on ebakorrektne. Liigirikku
es. In: Rickleft lokaalne BD sõltub regionaalsest BD-st (ränne). lokaalne BD sõltub regionaalsest BD-st (ränne). Liikide vahetus lokaalsete paikade vahel on asümm, sõltub
Ecol. Lett. 7: 1- globaalsetes liigirikkusmustrites on lokaal globaalsetes liigirikkusmustrites on lokaalsed ja regionaalsed tasemed väga tihedasti seotud
onment relationship. Ecology 87: S3-S13.
Frankia IGS primer F16S gtgggaccggcgattgggac
pecies, from New Zealand (Fungi, Agaricales, Amanitaceae). Aust. Syst. Bot. 6: 155-159. Limacella spp. NZL: Podocarpuse-s
ional scale and possible speciation in *Sebacina epigaea* and *S. incrustans*. BMC Evol. Biol. 13:102.
st refuges in Gabon: Preliminary results. Bull. Mus. natl. Hist. na Gaboni ja Kameruni lääneosa metsad, eti Montsde Cristal on tähtsad vihmametsa refuugium
f artificially inoculated Ponderosa and Scots pine in a greenhouse and plantation. For. Sci. 28: 646-660.
d.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 97-113.
Cystoderm
rrhizal infection on the rhizosphere pH around roots of maritime pine (Pinus pinaster). New Phytol. 130: 141-147.
ensive sampling of basidiomycete genomes demonstrates inadequacy of the white rot/brown rot paradigm for wood decay fungi. Proc. Natl. Acad. Sci. USA 111: 9923-992
th, glomalin, and soil aggregate stability in semiarid Mediterranean steppes. Soil Biol. Biochem. 35: 1257–1260.
1-53. glomaliin:
n: van der Heij taimed, mükoriisaseened vs globaalsed muutused: ülevaade
arating the wheat from the chaff. Fung. Div. 33: 1-45.
dlings with seven ectomycorrhizal fungi. Mycorrhiza Online
sis Mill. with selected ectomycorrhizal fungi improves seedling establishment 2 years after planting in a degraded gypsum soil. Mycorrhiza 18: 23-32.
Mõne liigi ohtrus muutus (Lact delic vähenes)
to measure iron mobilization and oxalate secretion by ectomycorrhizal tree roots. Soil Biol. Biochem. IN PRESS oksalaat: l
as a case study of functional diversity and functional redundancy. Ann. For. Sci. 68: 69–80.
mycorrhizal communities through specialized fungal symbionts? Mycorrhiza 19: 493-500.
A. 2013. Carbon availability triggers the decomposition of plant litter and assimilation of nitrogen by an ectomycorrhizal fungus. ISME J. 7: 2010-2022.
Guineas EcM taimed: Afzelia spp, Anthonotha spp, Cryptosepalum, Gilbertiodendron, Paramacrolobium, Pellegriodendron, Uapaca spp
Guinea EcM puud Afzelia, Cryptosepalum, Pellegriniodendron, Paramacrolobium, Anthonotha, Gilbertiodendron, Uapaca 5 spp
sidiomycete Russula subsect Foetentinae populations in a primary dipterocarp forest. Mycorrhiza 16: 143-148.
al communitie eksootiliste patogeensete seente introduktsioon: näidisliigid, nende päritolu, kahju jms. Nii munasseened, kottseened kui roosteseened. Tingimused epideem
peraceae) based on ITS and trnT-L-F region sequences. Syst. Bot. 26: 318-341. Kobresia on pisike rühm perek Care
interpreted as an orchid associate. Mycol. Res. 102: 1074-1076. Ceratobasidium obscurum on tegelt
54: 517-539. klavarioidsed seened Korupist
55: 803-842.
vation Area at Kew. Kew Bull. 56: 761-762. Amphinema angustispora sp nc
Bull. 56: 163-187. Tulasnella, Thanatephorus jt he

cology 68: 744 geostatistika autokorrelatsiooni korral geostatistika autokorrela
development of mycorrhizal roots and its significance for experimental studies. QQQ 253-283.
irikkus sama, koosluse koosseis erinev
il rotifer communities are extremely diverse globally but spatially autocorrelated locally. Proc. Natl. Acad. Sci. USA 108: 4406-4410. keriloomade ruumili
1:341-353.
plants linked by a common mycorrhizal network. J. Experim. Bot. 50: 9-13.
ol. 16: 153-162.
e seened AUS -samad v sarn EUR omadega
suktsessioonis 5a jooksul pärast põlengut
rius (19), Inocybe (12), Clavulina (6), Russ-Lact)6) Amanita (5), Ramaria (4), Boletaceae (4); va palju Pezizaleseid
st specialization in three mushroom-forming genera of Alnus-ass lepaseentel Lactarius, Alpova ja Alnicola - paljud liigid spet lepaseentel Lactarius, Alpova ja
Ley P. 2010. Marine nematode taxonomy in the age of DNA: the present and future molecular tools to assess th nematoodidel ITS peetakse ebasobivaks kuna indi
ty and functional roles. New Phytol. 182: 314-330.
nelt-down in a plant-bacteria mutualism? J. Biogeogr. 37: 1611-1622.
nycorrhizal fungi drives plant growth and intraspecific fungal coexistence. ISME J. 7: 2137-2146.
rjälä K, Haahtela K. 2000. Means to improve the effect of in situ bioremediation of contaminated soil: an overview of novel approaches. Environ. Poll. 107: 179-185.
ot. Tidskr. 15: 204-213.
-530.
ems of mycotrophy. Svensk Bot. Tidskr. 32: 90-99.

der mixed models. Bioinformatics 19: 1572–1574. MrBayes 3: MrBayes 3: baieesia tüü
, Liu L, Suchard MA, Huelsenbeck JP. 2012. MrBayes 3.2: efficient Bayesian phylogenetic inference and model choice across a large model space. Syst. Biol. 61: 539-54
Birth and death of a concerted evolution paradigm. Proc. Natl. Acad. Sci. 102: 5084-5089. 5S rDNA paikneb seentel jt organismidel paljude koopiate
BD, näiline suur erinevus, ebapiisav proovivõtt Praimerid: Viaud2000 kottseened troopikas termiidikuhilates vs mullas: kõrge BD, näiline
ascomycete fungi have drag-minimizing shapes. Proc. Natl. Acad. Sci. USA 105: 20583–20588.
Host plant variability and heritability of ectomycorrhizal and root traits. New Phytol. 126: 105-110.
Fungal variability and heritability of ectomycorrhizal traits. New Phytol. 126: 111-117.
on the growth and colonization of mycorrhizal fungi. J. Chem. Ecol. 9: 1153-1162.
USA, ENG, JPN: Alnus, Myrica, Shepherdia (Elaeagnaceae) mood EcM ja AM; Dryas ja Comptonia mood vaid EcM. Protokoll mõeldud AM tuva
nizal fungi. New Phytol. 178: 253-266.
ffect on fine-root and leaf morphology in a silver birch forest chronosequence. Eur. J. For. Res. 132: 219-230.
ess.
n function posterior probabilities. Bioinformatics ???: 1-6. Probalign: efektiivne an

ïames TY. 2011. Archaeorhizomycetes: unearthing an ancient class of ubiquitous soil fungi. Science 333: 876-879 Archaeorhizomycetes = SCGI;
; Piloderma spp. Nii O kui C
s and mycelium colonising different mineral substrates. New Phytol. 162: 795–802.
te acidification of ectomycorrhizal fungi in response to different minerals. FEMS Microbiol. Ecol. 1583: 1-7. eriseened
phae in Terfezia. Antonie van Leeuwenhoek 85: 165–168.
)99. Phylogenetic relationships between European and Chinese truffles based on Tuberaceae: ITS1F-4 Tuber aestivum-pikk Tuberaceae: 3 põhiklaadi
: PATCH DY liikide kooseksist hüpotees: keskmise häirimise teooria: liigid pysivad koos tänu häiringutele teat aja tagant. See võimaldab ruderaalidel levida ja C-strateegi
lence from population genetics that the ectomycorrhizal basidiomycete *Laccaria amethystina* is an actual multihost symbiont. Mol. Ecol. 17: 2825-2838.
erotrophic orchids from Thailand tropical forests associate with a broad diversity of ectomycorrhizal fungi. BMC Biol. 7: 51.
I-A. 2009. Ectomycorrhizal *Inocybe* species associate with the mycoheterotrophic orchid *Epipogium aphyllum* but not its asexual propagules. Ann. Bot. 104: 595-610.
)r the revegetation and remediation of contaminated ecosystems. Can. J. Bot. 85: 237-251.
rization of polymorphic microsatellite loci in white truffle (Tuber magnatum). Mc SCAR praimerite konstrueerimine AFLP ja minisatellit-probede ning sekveneerimise põhj
F. 2011. The AD-type ectomycorrhizas, one of the most common morphotypes present in truffle fields, result from fungi belonging to the *Trichophaea woolhopeia* species
iosporum: mating type distribution in a natural plantation and dynamics of strains of different mating types on the roots of nursery-inoculated host plants. New Phytol. 189:
ti 1 ja 2 a seas, 3 a vähem
nvolutus strains in relation to their IAA-synthesizing activity. New Phytol. 137: 509-517.
ecific labeled 16S rRNA gene oligonucleotide probes for genetic profiling of cyanobacterial abundance and diversity by array 22-28 bp oligod -vastavate PCR praimerite kc
on stable isotope fractionation and trophic transfer of fatty acids in fungal based soil food chains. Soil Biol. Biochem. 37: 945–953.
aiknemist sama 137Cs/134Cs erinevus mullas näitab seente mütseeli paiknemist samas mullas VK sisalduse baasil; saprotroofid, Hydnum, Xerocomus, Lactarius F ja O hor
gr. 32: 921–927. Guajaana mägismaa on biodiv hotspot, kuna on võimaldanud jääaegadel taimedel pidevalt üles-alla liikuda
ı, Cenococcum, Xerocomus badius, Wilcoxina; pöök eripaigus -Russ ochroleuca, Xerocomus chrysenteron, Genea, Cenococcum, Lact subdulcis
/e basidiomycete teleomorphs and phylogenetic placement of the coelomycete genera: Chaetospermum, Giulia and Mycotribus based c Chaetospermum camelliae ja C

DS ja AM arktika rohttaimedel sessoonselt
ke kui teistel, ent peremehe spetsiifikat ei esine. Alade kaupa m eri männiliikidel Rhizopogon: mõnel idaneb rohkem liike kui teistel, ent peremehe spetsiifikat ei esine. Ala
generation by taimed ja seemikud on mittejuhuslikult jaotunud heterogeensel maastikul, samblad ja samblikud soodustavad seemikute idanemist, ent kuldkannil mitte
aceae harbour arbuscular mycorrhizal fungi. New Phytol. 156: 283–295. AM seente spets praimerid uued: Glomus cf intraradices ja Archaeospora sp kolonisatsioo
In: Werner D, Newton WE (eds.). Nitrogen Fixation in Forestry, Agriculture, Ecology, and the Environment, springer, Amsterdam, 143-171.
PC, Stebner F, Thomas JC, Solorzano Kraemer M, Williams C India Kesk-Lääne osas olid 50 MAT suured Dipterokarbimetsad
& Sons Inc.
izal communities associated with *Salix herbacea* and *Salix polaris* in alpine tundra. Mycorrhiza 21: 289-296.
ı, Russ-Lact, Cort, Suill-Rhizop. Piloderma, Sebacina; kõik ITS kokku: Cort, Russ-Lact, Tuber, seente ITS kasvab eksponentsiaalselt, eriti mittetäi
gical and ecological characters in the mushroom family Inocybaceae. Mol. Phyl. Evol. 55: 431-442. Inocybe: kiudloor tekkis hiljem
u); Inoc
ication of a large clade of mushroom-forming fungi. Evolution 65: 1862-1878. Hebelomatae: EcM rühm 60+-
Agaricales. Proc. R. Soc. B doi:10.1098/rspb.2011.2428 EcM harud Agaricales tek eri a
Agaricales. Proc. R. Soc. B. 279: 2003-2011.
ining metadata from unidentified ITS sequences in GenBank: A case study in *Inocybe* (Basidiomycota). BMC Evol. Biol. 8: 50. Inocybe g Inocybe geenipanga
phedra: Createaceous fossils and extant molecules. Proc. Natl. Acad. Sci. 101: 165 taimede ITS praimerid ITS18-SF, ITS26S-R
temporal occurrence of ectomycorrhizae on ponderosa pine (Pinus ponderosa Laws.) seedlings grown under varied atmospheric CO2 and nitrogen levels. Plant Soil 189: 2
stone grasslan gap-dünaamika ja seemikute elumus rohumaadel: gappidel erilist efekti pole, pigem karm kk jm faktorid
-Coltriciella -enamasti seotud lagupuiduga või põlenud puiduga Coltricia-Coltriciella -enamasti seotu
n. Muuhulgas männijuured lähevad väh 18m puust eemale
rk persistence network-anal: organismid, mis oluliselt panustavad networki, on suurimas väljasuremisohus; sama ka firmade kohta
oma radicosum (Agaricales): shrew, *Sorex* sp. (Mammalia, Insectivora). Mycoscience 49: 207-210.
a radicans jms korjustel
ikkad tüübid siledamate tüüpidega, seente biomass ja penjuurte mass vähenes, kolonisatsioon 100%
ymbioses. Trends Pl. Sci. 9: 275-280.
teria from phylogenetic lineages previously only detected in cultivation-independent surveys. Environ. Microbiol. 4: 654–666.
ıud Rhizopogone vs morfotüpiseerimine: kattusid enamasti kergelt tuntavate liikide puhul, ent ei eristanud F
ıoslustes 2 aastal + biomass, vs sademed
root hemiparas Melampyrum oli palju parema kasvuga ja reprod mykoriissetel mandidel kui mitte-MR. EcM seened ei takist parasiidiga nakatumist; ilma taimeta Melamp s
on host plant-parasitic interactions. Mycorrhiza 11: 95-100.
t DNA in the grasses. Mol. Ecol. Notes 1: 76-78. praimerid taime kloroplastile: trnL jt
ıinus uuritud faktor) määrab seenekooslused

132-141. Uapaca paikneb suguk Phyllanthace
e evolution of Eriogonoideae. Syst. Bot. 33: 87-96. Coccoloba sõsarrühmaks Eriog
e on in vitro cultures of ectomycorrhizal fungi from Mediterranean forests. Cryptog. Mycol. 22: 243-258.
phytic mycobiota of leaves and roots of the grass *Holcus lanatus*. Fung. Div. 41: 115-123.
genetics of the fungal partner. Annu. Rev. Genet. 44: 271-292.
ıste morf jr metoodika, sest sporulatsioon esineb vähestel ja morf on konservatiivne. Kas eelistada liigisisest BD rühmasisesele Bdle? AM liigikontseptsioon; erinevate v eri
ing the age of angiosperms from rbcL and 18S rDNA data. Am. J. Bot. 88: 1499–1516. õistaimede õistaimede radiatsioonia
trees. Trends Pl. Sci. 8: 374-379. superpuud: meetodid, vead; bootstra
Annu. Rev. Ecol. Syst. 2002. 33: 49–72. metoodika probleemid: outgroup, ge
ce times: a penalized likelihood approach. Mol. Biol. Evol. 19: 101-109. ultrameetriliste puude konstr: n
ɔsis of fungal infections. J. Clin. Microbiol. 33: 2913–2919. 14 nu radioa 14 nu radioakt märgistatud oligod; iga seene 2
olution and biogeography of Paeonia (Paeoniaceae). Am. J. Bot. 84: 1120–1136. psbH praimer

ogen sources using a new floating culture technique. Mycol. Res. 106: 74-85. ECM seen
nd diversification in the Holarctic. Biol. J. Linn. Soc. 73: 345-39 Põhjapoolkeral loomade biogeo: tektoonika ülevaade. Enim vikariantsusi Eur --> Aasia vahel ning NW-Am
phylogeny-based island biogeography,with special reference to t Kanaari saarte kesksaared on liigirikkaimad suure kõrgus-ja kliimavööndite rohkuse tõttu. Bayesi meetodig
t-based models: plant versus animal patterns. Syst. Biol. 53: 21(Lõuna-poolkeral taimed vs loomad. Mustrid väga erinevad. Loomade rühmad tihti märksa vanemad kui tain
molecular analyses in *Scleroderma* species associated with some Caesalpinioid legumes, Dipterocarpaceae and Phyllanthaceae trees Scleroderma Burkina Fasos - p
Burkina Faso: Afzelia, Isoberlinia, Brachystegia, Uapaca, Monotes: viljakehadena Boletaceae, Russulaceae, Sclerodermataceae, Amanita; paljudel peremehe-spets. Sünt. I
046–1056. sümbioos vs mutualism: terminoloogia, teaduse areng, ajaloolised ja kaasaegsed käsitlused
47: 155-198.
TOL plasmid containing mycorrhizosphere bacterium on development of Scots pine seedlings, their mycorrhizosphere and the microbial flora in m-toluate-amended soil. FE
M, Sen R. 1998. Microbial biofilms and catabolic plasmid harbouring degradative fluorescent pseudomonads in Scots pine mycorrhizospheres developed on petroleum con
allel temporal responses in a host tree and its fungal symbionts. Oecologia 156: 117-123.

ots. Mycologia 97: 45-49.
idel ja EcM seentel eri aegadel JPN. EcMF sültub fotosünt aktiivsusest, saproobidel kliimast.
omycorrhizal genus *Strobilomyces*: Population-level CAPS marker-based genetic analysis. Mol. Phyl. Evol. 48: 326-334.
stribution of fungal species: new insights into microbial cosmopo seentel: EcM kitsam liikide areaal kui saproobidel. EcM sõltub rohkem sama peremeestaime
ctomycorrhizal genus strobilomyces (Strobilomycetaceae). Am. J. Bot. 94: 1630-1641. Strobilomyces: JPN palju krüpt
in the genus Salix. PhD Thesis. University of Minnesota, USA.
in development of a mycosilviculture. Appl. Microbiol. Biotechnol. 89: 971-979.
ysis of plastid atpB and rbcL gene sequences. Syst. Biol. 49: 306-362. rbcL vs atpB vs rDNA: väikesed erinevused paljas-ja katteseemnetaimede pohirü
ysis based on rbcL sequences. Kew Bull. 55: 257-309. rbcL eu-kaheidulehelised
1995. The use of herbarium specimens in DNA phylogenetics: evaluation and improvement. Plant Syst. Evol. 197: 87 – 98.
milies related to Celastrales based on rbcL 5′ flanking sequences. Mol. Phyl. Evo atpF ja rbcL introni praimerid
us sp. Liigisisene 3 RE, mikroliigid
ria liigisisene: Amanita introduktsioon RAPD: mikrosatelliit
of the desert truffles *Picoa juniperi* and *Picoa lefebvrei*. Antonie van Leeuwenhoek 98: 429-436. Picoa: P. Lefebvrei ja P juniper
sünteesitud: palju lima, mantlil tüüpiline limane saagjas str, juurekarvad alusel olemas; kuusel õhuke mantel 1 või enam kihiga, HN norm, rakusis kolonis pole;kasel ka 1. j
kesisus inimese soolestikus pasa põhjal: kultiv-ja mittekultiv annavad v erin tulemusi: Candida vs Blastocystis spp. Ka Psathyrella candolleana ja C
l korrel chlA sisaldusega lehtedes, mis mõl korrel seente koosluse struktuuriga
erinevad
oosluse struktuuri
nanita muscaria; OH: Cenoc, ElaphoM, Russ acrif; A: Russ acrif, Cenoc, Elaphom; B: Russ acrif, Cort obtusus, Cenoc
orway spruce stands and correlations with the main pedoclimatic factors. PhD Thesis. Universita Degli Studi di Padova, Italy.
les, Verticillium, Dothideales 18S + DGGE; sekv 18S: eri praimerid -kottseened aknaklaasi värvilt
vused talve-kevade ning suve vahel. Molekulaarne diversiteed. Ka ACE ja Chao1 ITS9 -LSU1221 (uus) : uued kottseente harud tundramullas. Märgatavad erinevused talve
n of a dark-septate fungus associated with the alpine plant Ranunculus adoneus. New Phytol. 150: 747-755.
least one widespread group. Science, in press.
linking molecules and fossils in oribatid mites (Acari, Oribatida). Mol. Phyl. Evol. 57: 113-121. Oribatida: evol 570 MAT, radia
. A novel test kõrreliste ja lehe-endofüütide koevoluts on küllalt jäik, ent esinevad mõned peremehe-vahetused. Arv koevolutsi koevolutsiooni test
and oomycetes: a review. Mol. Ecol. 12: 2861–2873.
y common descent of fungal symbionts (Epichloë spp.) and grass hosts. Mol. Biol. Evol. 14: 133-143.
osse M-A. 2010. A case study of modified interactions with symbionts in a hybrid Mediterranean orchid. Am. J. Bot. 97: 1278-1288.
acteria and ectomycorrhizal fungi in vitro. Mycorrhiza 6: 481-485.
titudinal gradient in the importance of biotic interactions? Annu. Rev. Ecol. Evol. Syst. 40: 245-269.
ers. 2010. Bo taimede BS mõj muude maismaaorg indiviidide arvu ja BDd. Mõju tugevaim herbivooridel , vähim omnivooridel; Maa peal on peam
lds G, Schulze E-D. 2006. The design of experimental tree plantations for functional biodiversity research. Ecol. Stud. 176: 348-375.
15N sisaldus kasvab mulla toiduahelas ylespoole (3-5 lyli). Sama liigi d15N muster oli sama eri mullahoris -arv et liiguvad eluea jooksul ringi. Vihmaussid e
nce and comm vihmaussid: 3 erifunktsionaalset tüüpi, tüübisiseselt enam-vähem redundantsed; suurem funktsionaalne ja ka liigiline mitmekesisus suurendavad potentsiaals
la as affected t hooghännalised toituvad eri saproobide peal eri eelistusega. Melaniin ei mõjuta. Kahel hooghännalise liigil sarnased eelistused. Paljunemise edukus üldiselt
s, legumes, and root nodules herbor different arbuscular mycorrhizal fungal communities. Appl. Environ. Microbiol. 70: 6240-6246.
lifferent tree species in forests of the Taunus Mountains in Central Germany. Open J. Ecol. 3: 66-81.
Trends Ecol. evolutsioonilised ja ökoloogilised loksud, mis on pohjustatud inimtegevuse poolt. Loomaökoloogia näited
Saavedra F, S networks: Seemnelevitajate ja taimede vü Seemnelevitajate ja taimede võrgustike modulaarsuskasvab pooluste suunas. Parimates muc
ining operational taxonomic units and estimating species richness. Appl. Environ. Microbiol. 71: 1501-1506. DOTUR: genereerib OT
tatistics: a test to compare gene libraries. Appl. Environ. Microbiol. 70: 5485-5492. S-Libshuff -võrdleb erin
unities have the same structure. ISME J. 2: 265-275. fülostatistika paketti
diversity. In: I sarnased kooslused isol arenevad samades suund sarnased kooslused isol arenevad samades suundades, samad evol-harud on sarn s koosluste konvergentsiu
). liigitekke mehanismid: ülevaade
diazotrophic alpha-and beta-proteobacteria. In: Elmerich C, Newton WE (eds.). Associative nad Endophytic Nitrogen-Fixing Bacteria and Cyanobacterial Associations. Sp
. Holzforschung 52: 229-233. RAPD majaseentele: Serpula lacrymans-väike gen.var.; S. himanthoides & C.puteana -su
Heron Island, a guaanosaarel taimed omast efektiivselt kusihapet ja ammooniumi. Taimedel üsna erinev 15N ülesvõtt, Pisonial sh suht madal -arv. To
orrhizal association on growth and δ15N of two subtropical Eucalyptus species from contrasting ecosystems. Funct. Plant Biol. 33: 367-379.
y abd utilization in a subtropical wet heathland. Plant, Cell Environ. 20: 1231-1241.
y and utilizatio AUS niiskes põõsastikus (wallum) mükoriissetel taimedel ja NM-taimedel erinev 15N signatuur, mis tuleneb arvatavasti N transpordis
species reflect root specialisations and soil nitrogen status. Oecologia 134: 569-577.
Heron Island, a subtropical coral cay of the Great Barrier Reef, Australia. Functioanl Blant Biology 31: 517-528.
rRNA-Based OperationalTaxonomic Units at a Global Scale. PLoS Comput. Bi klasterdamine algoritmid single, average, complete linkage, UCLUST, CD-H
- hinnang: proovipõhine hinnang alahindab alati, v.a. Chao3. See jällegi erinevalt teistest ei anna komponentide hinnangu summat sama mis komponentide summa hinnang

pinna-vs puidusaprotroofid 2 alal 2 aastal koguliigirikkust ennusta
›n ectomycorrhizal fungi. Mycorrhiza 16: 67–72.
l 48 others. 2009. A class-wide phylogenetic assessment of Dothideomycetes. Stud. Mycol. 64: 1-15. Dothideomycetes: Dothideomy
›o L, Federnse S. 2014. Finding needles in haystacks: linking scientific names, reference specimens and molecular data for Fungi. Data tüüpeksemplaride ja liiginimed
Fungal Barcoding Consortium. 2012. Nuclear ribosomal internal transcribed spacer (ITS) region as a universal DNA barcode marker for Fungi. Proc. Natl. Acad. Sci. USA
)06. A multigene phylogeny of the Dothideomycetes using four nuclear loci. Mycologia 98: 1043-1054. Dothideomycetes:
e: a phylum-wide phylogeny clarifies the origin and evolution of fundamental reproductive and ecological traits. Syst. Biol. 58: 224-23 Ascomycota 6 geeni baasil: par
., Geoglossales ord. Nov. And taxa above class rank in the Ascomycota Tree of Life. Persoonia 22: 129-138. Geoglossomycetes, kottseente l
ends in savanna structure and composition along aridity gradient Edela-Zambiast LAVni: Brachystegia savann kui sademeid üle 700 mm
ig in Pennsylvania. Trans. Am. Phil. Soc. 56: 1-194.
sae: insights from recent phylogenies. Biologiske Skrifter 55: 37 Caesalpinioideae: mõned EcM perek-grupid levinud nii Aafrikas kui S-Ameerikas (nt Intsia -Afzelia-Brodr
itative detection of agar-cultivated and rhizotron-grown Piloderma croceum Eriks quantPCR Piloderma fallax vs hüüfide otsene loendamine. Väga tähtis on inhibiitoritevaba
source of novel biologically active secondary metabolites. Mycol. Res. 106: 996-1004. lehe-end

ogically active secondary metabolites of endophytic *Pezicula* species. Mycol. Res. 8: 1007-1015. endofüüt
lin.
ratios of mistle puuvoorikutes 47-67 protsenti Cst tuleb peremeestaimest; v tugev korrel puuvooriku ja peremehe 15N vaartustel. Puuvooriku 13C 2 promilli vaiksem kui C4
mis and arbuscular mycorrhizal fungi. Plant Soil 244: 75-83. Geosiphon ja AM-seened
and genera. Schüßler A, Walker C, Gloucester, Published in libraries at Royal Botanic Garden Edinburgh, Kew, Botanische Staatssammlung Munich, and Oregon State Un
Oregon: Colrylus avellana on EcM, Juglans regia AM
K, Pringle A. 2 EcM ja AM seente introduts: ülevaade ja ohud: seend ei pruugi soodust peremehe kasvu, võivad stimul invas taimede invasiivsust, er männid a eukal. Sama
arkets as a mc ress jagamisel põhinev mutualismi-protokooperatsiooni mudel kus on vaja, et organismid spetsialiseeruksid mingi konkreetse ressursi kättesaamisele. Hiljem
ı Trees. 185 pp. Springer-Verlag, Berlin Heidelberg.
t SC. 2008. Plant-soil-microorganism interactions: heritable relationship between plant genotype and associated soil microorganisms.
ing cottonwoo kõdulagunemine: kloonidevah erinevused sama suured kui liikidevah (Populus). Kõdusegul pole aditiivset efekti
›. in human fecal samples with species-specific 16S rRNA-targeted oligonucleotide probes. Appl. Environ. Microbiol. 66: 37 18-20 nu oligonu probed eraldi; nii PCR-ampl
ifferent evolutionarily conserved regions of the small-subunit rRNA gene in PCR 16S: eri praimerid + SSCP 18S: eri praimerid + SSCP: kultuurist samal bakteril kuni 4
usions on the use of genetic profiles based on PCR-amplified partial small subuni 16S: + SSCP bakterite BD ma SSCP ühes bändis sisaldub mitukümmend liiki, arv suurem
n 52: 101-104 taimede liigirikkuse globaalne hinnang 223300. Arv sõltub enim sünonüümide% hinnangutest. Muud estimeidid 260000-422000
as revealed by mapped PCR-based markers. Acta Hortic. 457: 363-369. RAPD, SCAR
-281. Aleuria, Aleurina, Sowerbyella
127-136. Nothofagus ja tema parasiidid on kongruentselt levinud austaalises; siiski siin-seal seletama
› nutrient additions and ectomycorrhizal infection. Plant Soil 163: 299-306.
e exclusion, b liikidevaheline konkurents mõjutab taimede liigirikkust ja beta-div positiivselt v negatiivselt
rDNA sequences. BMC Bioinformatics 2: 9. FastGroup: sekventside
iizal depender invasiivsel Hypericumil P-Ams sissetoodud populatsioonidel väiksem sõltuvus sümbiontidest kui euroopa populatsioonidel. Katse va
, McLaughlin ???, Lemke ??? (eds.). The Mycota VIIA. Systematics and Evolution. Pp. 307-347. anamorfsed seened -pms kottseened
f biotrophy in Hygrophoraceae inferred from combined stable isotope and phylogenetic analyses. Mycologia 103: 280-290.
l cuttings of Picea sitchensis -the influence of plant growth regulators. New Phytol. 120: 453-457. kuuse mik
nmunity-level soil microbial function in conifer forests of the Pacific Northwest, USA. Soil Biol. Biochem. 37: 1860–1868. lepa lisan
ITS1F-4: Sebacinaceae
ion and recombination of the intergenic spacer of the ribosomal DNA in the ecto IGS1 IGS1 heteroduplekside moodustumine tandemjärjestuste tc
vith plant roots as endophytes? Mycol. Res. 113: 1062-1069.
ıla sp, Hysterangium spp, Sebacina sp, Tomentella spp, Elaphomyces spp (?) Epipactis ITS1F-ITS4,TW13; ITS1-ITS4Tul
bicolor: introdutseeritud vs kohalikud tüved
rends Ecol. Evol. 13: 15 – 20. taime ja seene vaheline sümbioos, se
S Laccaria intraspec. sekv LSU M3/M6
sp perek-sisene, genetid RAPD
dangereuses? Trends Ecol. Evol. 11: 621-628.
ut mixotrophy miksotroofsed taimed: arv. C-toitumine on tek N ja P toitumise käigus pooljuhuslikult
vertical transmission? An evolutionary perspective. New Phytol. 173: 452-458.
es are common mycorrhizal associates of Ericaceae. New Phytol. 174: 864-878.
omycetes plant endophytes? New Phytol. 178: 3-7.
sebacinoid basidiomycetes associated with the achlorophyllous orchid Neottia nic ITS1F-4: Sebacinaceae
ı duriusculum: noores metsas suur genet, vanemates palju väiksemaid: rajaja efekt -1m kasvukiirus a-1
l9. maksasammaldes endofüütsed seened mood palju erinevaid struktuure. Tõenäoliselt pole need igivanad, vaid suht uued. Ka paljud seenerühmad on noorema
g-term experimental warming alters community composition of ascomyc tundras saprotroofsed kottseened: BD ei muutu, ent soojenemise mõju on kooslustel
izal roots. Presilia 33: 341-350.
d spacer RFLP groupings in binucleate Rhizoctonia isolates representing root en 3 RE: Rhizoctonia
sylvestris L.) forests based on somatic incompatibility and isozyme analyses. New Phytol. 114: 607 – 616. esteraas, l

ıngi affect Scots pine seedling performance in nursery soil. New Phytol. 152: 543-553. ANOVA jt oxalaat
site reclamations: fungal selection criteria. Lett. Appl. Microbiol. 16: 142-146.
nass suurem)vs vanas (BD suurem)alpikuusikus
e forming Penicillium nodositatum inferred from RFLP analysis of the ribosomal Penicillium nodositatum: ITS-RFLP 2234T (ITS1) ja 3126T (ITS4 analoog); RAPD 10me
microbial abun mullamikroobide biomassi glob skaalas se mullamikroobide biomassi glob skaalas seletavad paremini MAP, evapotransp, MAP/Eto x
ljong B, Bodrossy L. 2006. Diagnostic microbial microarrays in soil ecology. New Phytol. 171: 719-736. mikroarray tüüpide ülevaade. Seente ja bakter
soil communi mulla mikroja mesofauna redundantsus: funktsionaalsne redundantsus olemas, ent liikidel ilmselt erinevad ökol tolerantsid, mistõttu te

ure in the presence and absence of ectomycorrhiza. Oecologia 125: 109-118.
ı strategy to estimate species richness in Sebacinales in the tropical Andes based Sebacinales DNA barcoding: ITS 3% vastab LSU 1% (20% vähem liike!)
mõlemad rühmad assots nii kottseentega kui Sebacinalestega, ent vaid Cavendishioidid mood rakkudevahelisi hüüfe ja õhukese seenmantli

ıycorrhizas. New Phytol. 72: 381-385.
fungal diversity in Quercus ilex Mediterranean woodlands: variation among sites and over soil depth profiles in hyphal exploration types, species richness and community
gs inoculated with Tuber aestivum in the boreal region of Finland. Mycol. Progr. 13: 373-380.
ıxonomic replacement of Rhizoctonia-like endophytes from orchid roots. Mycologia 94: 230-239.
owski B, Ideker T. 2003. Cytoscape: a software environment for integrated models of biomolecular interaction networks. Genome Res. 13: 2498-2 Cytoscape,
enestik, originaalandmed Madhya Pradesh)Kesk-IND): W Ghat-Dipteroc, W-Himal-Pinaceae,Fagaceae, MP-Shorea domin russ-lact, amanita, bole
ıizoctonia spp. using rDNA-ITS sequence analysis supports the genetic basis of the classical anastomis grouping. Mycoscience 49: 93- Ceratobasidiaceae, Tulasnellac
ınd classification of *Rhizoctonia* spp. using molecular and biotechnological methods compared with the classica multi-tuumsed Rhizoc multi-tuumsed Rhizoctoniad (Thanat
ull. 54: 739-746.
ıt isolated from Pisonia grandis (Nyctaginaceae) mycorrhiza. Mycorrhiza 7: 255-260. Tomentel
ycobiont isolated from mycorrhizas of Pisonia grandis. Mycol. Res. 101: 315-318.
root-associated fungal endophytes from Calluna vulgaris at contrasting field sites. New Phytol. 148: 153-162.
ːum in a Quercus ilex plantation in southern France. Mycol. Res 100: 1176 -1178.
saprotrophic fungi on agar and in association with seedlings of lodgepole pine (Pinus contorta). Mycol. Res. 99: 159-165
ıoto T. 2010. Evolution of host breadth in broad interactions: mycorrhizal specificity in East Asian and North American rattlesnake plantains (Goodyera spp.) and their fung
Estonian mine site tailings hills. Am. J. Bot. 95: 156-164.
ı vaid 2 klaadi Tulasnellaga ilma geogr mustrita; palju Phialophora-endofüüte, mi ITS, LSU, mtLSU osa praimereid sekv taime, teised ei amplif üldse
Mikrobiologija 25: 57-60.

ı to atmospheric convective mixing. Nature 505: 37-42. globaalse soojenemisega toimub maismaapinna ja ookeanipinna kuivenemine, kuna
22. sajandiks on kõik kooslused maismaal muutunud kuivemaks peale alade Indias j
cis, Xerocomus chrysenteron, Byssocorticium atrovirens xxx ITS praimerid ???
ıfricanum Welw., a leafy vegetable from West Africa. J. Hortic. Sci. 71: 149-155. Gnetum: v
al roles of oxalic acid as low molecular weight compound involved in brown-rot and white-rot wood decays. J. Biotechnol. 53: 103-113. oksalaat: v
cterization of mycorrhizal fungi isolated from the threatened *Cypripedium macranthos* in a northern island of Japan: two phylogenetically distinct fungi associated with the
Cenococcum sp rDNA intron ja ITSd
struktuur ITS: 13 RE; Cenococcum sp ü Cenococcum: ITS koı Cenococcum sp
d populations, in particular of the dark septate endophyte *Phialocephala fortinii s.l.* In: Schulz BJE, Boyle CJC, Sieber TN (eds.). Microbial root endophytes. Springer, Be
Rev. 21: 75-89.
. Nucl. Ac. Res. 23: 1087-1088. DNA walking meetodi parandus, arusaamatu
ecies from roots of ericaceous hosts in western North America. Stud. Mycol. 53: 53-62. Cryptosporiopsis brunnea ja C.
unes of Baja California. Mycorrhiza 6: 151-157.
ı to obtain endophytic microorganisms frrom field-collected roots. Soil Biol. Biochem. 40: 1259-1263.
the hierarchical organization of plant diversity. Ecology 87: S39-S49.
ınt communitie vastuargument evolutsioonilisele ökoloogiale hemiboreaalsel rohumaal
ies-rich grassla Reseda ja Anthyllis idanesid horeda taimkattega mikropaikades alvaril
ırrhizal networ EcM võrgustikud: C transport: ülevaade; sesoonselt võib suund olla erinev; kevadel PsTsuga -> Betula, suvel vastupidi ja sügisel PsTs
tween Betula papyrifera nad Pseudotsuga menziesii seedlings using 13C pulse labeling method. Plant Soil 191: 41-55.
rocal transfer of carbon isotopes between ectomycorrhizal Betula papyrifera and Pseudotsuga menziesii. New Phytol. 137: 529 – 542.
Between Myco ülevaade ECM seente mineraal-ja C-toitumisest, WWW, C, N, P ülekanne taimest taime
l flora as agents of complex adaptive systems. In: Messier C, Puettman KJ, Coates KD (eds.) Managing Forests as Complex Adaptive Systems. Oxon, UK: Routledge. Pp.
transfer of carbon between ectomycorrhizal tree species in the field. Nature 388: 579-582.
enched): MRA (Phialocephala), Rhizopogon, E-strain (Wilcoxina), Amphinema -mitmed RM tüübid; kontroll: MRA, E-strain jt siledad tüübid. Oluline erinevus vaid Rhizo
tion and facilit Lepp faciliteerib noorte mändide kasvu läbi mõõduka varjutuse ja N produtseerimise
iron. Microbiol. 77: 1153-1161.
lence with vascular land plants. Nature 363: 67-69.
al genes from vesicular–arbuscular endomycorrhizal fungi colonising roots. Appl NS31 primer
Recent assembly of the Cerrado, a neotropical plant diversity h Cerrado taimestik on evolutsioneerunud iseseisvalt 10 MAT v vähem
ıer than previously thought. Mol. Biol. Evol. 25: 2251-2254. ühel haploidsel seeneindiviidil mitukümmend SSU
idel: domin Boletus; Suillus koos sissetoodud ja origin-mändidega; Paxillus rubicundulus lepal; Scleroderma, Ramaria (Dipteroc); Thelephora (1);
isolithus and Scleroderma identified by combined phenotypic and genomic marke 3RE, Pisolithus, Scleroderma isosüümid
Manause läh üleujutatud aladel (tumeda, toitainevaese settega, happeline pind) EcM taimed domin: Aldina ja Swartzia (, Macrolobium?). Seened üleujutuste vahepeal vihm
Lõuna-Ameerika põhjaosas: Aldina, Glycoxylon (Pradosia), Allophylus edulis (Gyrodon rompelii, mille lähedased Lõuna-Ameerika põhjaosas: Ca
Ameerika lõunaosas: Tucuman + Tierra del Fuego: Nothofagus, Alnus, Salix, sissetoodud lehtpuud Populus, Tilia. L Lõuna-Ameerika lõunaosas: Tu
ties. Ecology 41: 549-551.
CHL: Ecm seente viljakehi väljaspool Nothofaguse metsi pole; domin Cortinarius ja Inocybe
Boletochaete, Xanthoconium (s
Neopaxillus gen nov Brasiilia l

Lõuna-Ameerikas Eur EcM puude all Amanita muscaria, Am pl Lõuna-Ameerikas Eur EcM puude all Amanita muscaria, Am phalloides, Leccinum nigrescens, Trich flavo
f the east slope of the Andes and Brazil. V. Gasteromycetes with agaricoid affinities (secotiaceous Hymenogastrineae and related forms). Bol. Soc. Arg. Bot. 10: 52-67.
meerikas Boletaceae: v mitmekesine Paxillaceae: nii EcM kui sapro vormid kogu kontinendil. Linderomyces, Gyrodon, Gyrodon romp Lõuna-Ameerikas Boletaceae: v mitı
tel Uruguai Atlandi rannikul: sagedasemad Peziza ammophila ja Peziza ammophila, ka Hygrocybe, Leucoagaricus, Coprinus, Conocybe, Agrocybe, Psilocybe. EcM liike p
Tsiilist uute saproobsete lehikseente

corrhiza Sociology and Fungus Succesion in the Nothofagus dombeyi-Austrocedrus chilensis Woods of Patagonia. In: Hacskaylo E (ed.). Mycorrhizae. USDA Forest Serv
gus dombeyi -Austrocedrus segamets: põlismetsas domin Cortinarius, Inocybe, muid palju vähem liike; põlendikel Peziza echinospora, Pez nothofageti, P. Petersii, Sowerby
Phyllobolites gen nov (Paxillac
Manause läh üleujutatud aladel (valge liivaga, toitaineterikka settega) puuduvad EcM taimekooslused, kuigi v üksikud Amanita nauseosa, Gyrodon ja Pulveroboletuse vilja
Manause juures Campinaranas (valgel liival) esineb palju EcM puid -Aldina, Pradosia schomburgkiana (syn Glycoxylon inophyllum), Swartzia, G
40: 435-447. Lactarius sect panuoidei: kasvavad c
c Books, Germany.
Millard P. 2008. Relationship between assemblages of mycorrhizal fungi and bacteria on grass roots. Environ. Microbiol. 10: 534-541. koosluste korrelatsio
nd seed yield, and seed quality. Eur. J. For. Path. 20: 397-404.
eri praimerid annavad v erineva pildi; domin Wallemiomycetes ja Malassezia.
isons of 16S rRNA gene sequence libraries from environmental samples. Appl. Environ. Microbiol. 67: 4374–4376. evolutsioon evolutsiooniline distants
d 15 others. 2008. Stoichiometry of soil enzyme activity at global scale. Ecol. Lett. 11: 1252-1264 mullaens
river and its ba Amasoonia igapo vs varzea. Sademete jaotus. Salix humboldtiana varzea alumise piiri puu
cleroderma) ja Russuloid klaadid Peremeestaime identif trnL-trnF järgi
sete rakkude läbimõõdu ja mantli paksusega
1998. In vitro mycorrhizal synthesis of micropropagated Tilia platyphyllos plantlets with Tuber borchii mycelium in pure culture. Acta Hortic 457: 379-387.
ic matter, biota and aggregation in temperate and tropical soils - effects of no-tillage. Agronomie 22: 755-775.
nary history of Serpulaceae: molecular phylogeny, historical biogeography and evidence for a single transition of nutritional mode. BMC Evol. Biol. 11: 230.
, Carbohydrates, and Auxines. In: Hacskaylo E (ed.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 151-182.
f 16S rRNA in soil. Appl. Environ. Microbiol. 67: 4708–4716. vt<; detektsi 15-20 nu detektor-chaperon probed, eraldi pü
titution rates through time in Bayesian phylogeny reconstruction of Sapotoideae (Sapotaceae). Mol. Phyl. Evol. 39: 706-721. Sapotaceae: Sapotoideae -
diversity in the wheat rhizosphere by sequencing of cloned PCR-amplified genes encoding 18S rRNA and temperature gradient gel electrophoresis. Appl. Environ. Microbi
ECM: väga erinev DGGE; ITS1, ITS4B; DGGE; anniiling 48*C
times. J. Afr. Earth Sci. 28: 71-97. Gondwana kambriumist triiaseni: peri-Gondwana tükid, lagunemine tõenäoliselt pluumide toimel; pooluste
Cribbea gen nov. Maapealsete s
al forest and vicinity -I. The genus Phaeocollybia (Agaricales) and notes and descriptions of other species in the Agaricales. Mycologia 64:1138-1153.
tal forest and vicinity I. The genus *Phaeocollybia* (Agaricales) and notes and descriptions of other species in the Agaricales. Mycologia 64: 1138-1153.
Psiloboletinus on arv Suillus
.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 1-8.
llings of Pinaceae and Betulaceae after spore inoculation with Glomus intraradices. Mycorrhiza 7: 279-285.
lc sp
Cortinarius42; sagedus: Tricholoma sp, Rhizopogon sp, Piloderma sp; perekondadest eriti Inocybe, Tomentella ja Cortinarius; Liigiti aastatevah erinevus palju suurem kui a
regressioon (SAS)

ushrooms. In: Zambonelli A, Bonito GM (eds). Edible Ectomycorrhizal Mushrooms. Spriner: Berlin, Germany. Pp. 17-38.
e exception or the rule? Dominant ectomycorrhizal fungi on *Pinus sabiniana* differ from those on co-occurring *Quercus* species. New Phytol. 182: 295-299.
lla (16); Russ/Lact (15); Geneoid (8); Inocybe (8) Amanita (5); sh Amanita ja Tricholoma (4) ei leitud EcM-na. Väidavad, et vilets viljakehade korjamine on tublisti kalluta
ariation of ectomycorrhizal fungi as assessed by rDNA sequencing of sporocarps and pooled ectomycoprrhizal ro EcM seente liigisisene varieeruvus väh 40% liikidest lokaa
Phylogenetic analysis of the genus Modicell areveals an independent evolutionary origin of sporocarp-forming fungi in the Mortierella Modicella on viljakehi produtse
and. Mycol. Res. 113: 858–866. Otideal 2 haru. Mõl mood EcM
fungal diversity and community structure on three co-occurring leguminous canopy tree species in a Neotropical rainforest. New Phytol. 192: 699-712.
he ectomycorrhizal fungal community in a neotropical forest dominated by the endemic dipterocarp Pakaraimaea dipterocarpacea. PLoS One 8 (1): e55160.
raction between *Boletus robropunctus* (Boletaceae) and *Quercus* species (Fagaceae) in the United States and Mexico. Am. J. Bot. 96: 1665-1675.
truffle *Fevansia aurantiaca* is an ectomycorrhizal member of the Albatrellus lineage. Mycorrhiza 23: 663-668. Fevansia aurantiaca kuulub /alb
w of F. von Höhnel's truffles from Java. Mycol Progr. 10: 249–260.
ov. (sequestrate Russulaceae), an ectomycorrhizal associate of *Quercus* in California. Mycol. Res. 110: 575-582.
ascomata and ectomycorrhiza formation in a *Quercus* woodland. Mycologia 98: Genea, Genabea ja Gilkeya on sarn perekonnad. Ger Genea, Genabea ja Gilkeya on sarn
rapping fungi (Orbiliales). Microb. Ecol. IN PRESS Orbiliales: LSU fülogenees ja s
ry in flowering plants. Science 322: 86-89. Puud evolutsioneeruvad aeglase
s, London.
s, London, UK.
al (AM) symbioses: the contribution of the mycorrhizal P uptake pathway is not correlated with mycorrhizal responses in growth or total P uptake. New Phytol. 162: 511–5
nix experiments result from differences in resource quality between litters? Oikos 102: 235-242.
ssima (Orchidaceae) and persistence in a re-introduced population. Aust. J. Bot. 58: 97-106.
ctor in forest re Dipterokarbid: poolvarjus kasvavad seemikud kõige paremini. Fagaceae ja Pinaceae juurte lisamine ei nakatanud seemikuid EcMga. Arv selektiivraiega aeg
ransformations puuliigid mõjutavad mulda ja mikroobide aktiivsust eriti >40 a metsades
en K, Baldrian P. 2011. Transformation of *Quercus petraea* litter: successive changes in litter chemistry are reflected in differential enzyme activity and changes in the mic
8) Spatial variability of enzyme activities and microbial biomass in the upper layers of *Quercus petraea* forest soil. Soil Biol Biochem 40: 2068-2075.
inktsioonidega: Michealis-Menten-fn parim liigirikkuse ekstrapoleer
in Pleurotus sajor-caju. Microbiol. 147: 1755–1763. lakaasi geenide rt-PCR 4 lakaasi i
a podzolized pine forest soil in Central Sweden. Soil Biol. Biochem. 11: 149-154.
pending disaster. Trends Ecol. Evol. 19: 654-660. Kagu-Aasia biodiversiteet eri geoloogilistel mikrokontinentidel, hetkeseis, kaitse ja tume tulevik
by organism size. Ecology 94: 660–670.
ological communities. Ecography 30: 3-12. ruumilise autokorrela
osystems. Ecology, in press.
eneity among lineages of tracheophytes: integration of fossil data and evidence for molecular living fossils. Proc. erinevad soontaimede erinevad soontaimede rühmad DNA
Limited carbon and nutrient gain from mycorrhizal fungi by adult Australian orchids. Am. J. Bot. 99: 1133-1145.
LD. 1996. Isolation of expressed sequence tags of Agaricus bisporus and their assignment to chromosomes. Ap rDNA koopiate arv on erinev ja pikkus isolaadisiseselt var

sekv ITS praimeriga parsimoonia või distantsanalüüs liik

älja istutatud: Pezizales domin

the mounds of termiidipesades on paiguti v palju ECM seente eoseid

. Lutzoni F, Hofstetter V, Fraker E, Gueidan C, Miadlikowska J, Reeb V, Lumbsch T, Lücking R, Schmitt I, Aptroot A, Roux C, Mille eukottseened: OrbilioM(Pezizo

;enetic placement of the ectomycorrhizal Cenococcum in Gloniaceae. Mycologia 104: 758-765. Cenococcum on suguk Gloniac

pective on the occurrence of nodulation. New Phytol. 174: 11-2! Leguminosae noodulite evol, teke ja kaotamine: arv mitmekordselt. Pc Leguminosae noodulite evol, teke ja

fit in? Plant Physiol. 144: 575-581.

S vs ITS)pole viburseeni) andis v erin tulemused;

ite conditions i erinevate okaspuude seemnete idanemine eri soo mikropaikades: erisamblad on oluliselt erinevad eriokaspuude idanemiseks ja kasvuks, moni neist sammald

:5-229. Pisonia grandis on levinud AUS Jõulusaarest Taivanini ja Pitcairnini

›, Venezuela. Acta Cient. Venezolana 34: 233-237.

Manause ümbruse amasoonias mood EcM Gnetum ja Neea 2 spp. EcM ja AM puude juured pms ül 10 cm kihis; NM puude juured (sh Swartzia 2 spp) pms >30 cm kihis;

Statistical approaches for estimating actinobacterial diversity inmarine sediments. Appl. Environ. Microbiol. 69: 6189–6200. aktinobakterid 16S rDN

›f hyphae of mycorrhizal fungi determined by AMS microanalysis of 14C. Science 300: 1138-1140.

. Bicolor; kõrvalalal: Cenoc, Mel. Bicolor, Amanita muscaria, Lact decipiens

Pyrus communis, Malus domestica, Sorbus aucuparia, Crataegus, Prunus mood EcM

V. 2009. The Fungi. Curr. Biol. 19: R840-R845.

AxML web-servers. Syst. Biol. 75: 758-771.

ılyses with thousands of taxa and mixed models. Bioinformatics 22: 2688-2690. RaXML uus versioon

Juglandaceae) based on matK and ITS sequence data. Am. J. B Juglans levinud P-Am, Andides Kaukaasias, Ida-Aasias. Arv levinud l Carya(Platycarya(Cyclocarya(Juglar

ı89. taimed toodavad niitudel juuri eri aegadel, nematoodide, termiitide tähtsus

›nization of half-high blueberry cultivars influenced by cultural practices. Acta Hortic. 715: 449-454.

rchid *Gymnadenia conopsea* . Mycol. Res. 113: 952-959

l.) Mycorrhizae. USDA Forest Service: Washington, USA.228-229.

ceae tribe Cariceae I: generic relationships and evolutionary scenarios. Syst. Bot. 29: 528-544. Kobresia on polüfüleet rühm Carexi

.statsoft.com.

ylogeny of Casuarinaceae. Mol. Phyl. Evol. 28: 47-59. Casuarinaceae: Allocasuarina, Casuarina, Ceuthostoma ja Gymnoston Casuarinaceae: Allocasuarina, Casua

dicine 9: 140-145. ülevaade, pildid

ıdeva R, Jones network-anal:Bakterite ja protistide SSU-põhine kooseksist network meres

uce (Picea glauca) from southern Quebec. Can. J. Bot. 84: 777-790.

›n target and non-target fungi. Environ. Res. 18: 441-475.

ımpared to phenotypic data reveals multiple cryptic species in Australian dermocyboid Cortinarius (Agaricales). Mol. Phyl. Evol. 71: 2 Cortinarius AUS: parim ITS ba

ı 8-year-old transgenic poplar plantation on the ectomycorrhizal fungal community. Appl. Environ. Microbiol. 75: 7527–7536.

hizal fungi. Can. J. Bot. 68: 468-470.

ıypocotyl cuttings of Larix laricina. Can. J. Bot. 68: 492-498.

›f radionuclides in forest ecosystems. J. Environ. Radioactivity 58: 217-241.

1, Russ2; poletatud: Martellia, Tom2, Tomentella sublilacina, Hygroph. Liigirikk 3 RE

spread? Ecol. Bull. 49: 85-91.

›us controls of developmental pathways: variation and its significance in the forest pathogen, Heterobasidion annosum. New Phytol. 113: 245 – 258. lakkasi, P

airings between sibling homokaryons of Heterobasidion annosum. Mycol. Res. 95: 1275-1283

›matic incompatibility, sexual incompatibility, and isoenzyme patterns. Can. J. Bot. 63: 2268 – 2273. isotsüüma

611. ei usu et ECM seente dikarüootsed genetid inkorpor endisse haploidseid eoseid et säilitada potentsiaali, sest on tugev konkurents, vähe toitaineid ja vähe val

inus sylvestris Hebeloma, Laccaria, Thelephora mood ECM ka vee all olevatel juurtel, Suillus spp mitte. Samas olemasoleva ECM üleujutamine ei tapa mükoriisasid. Suill

zieae-Aldininae) from the Venezuelan Guayana highlands. Harv Aldina levinud NW-BRA, COL, VEN, GUY

aluating the ribosomal Internal Transcribed Spacer (ITS) as a candidate dinoflage Barcoding: Dinoflagellate ITS on parem kui COI, sobiv 98% threshold; vahe

odiversity effe stress: mida suurem stress, seda tugevam negatiivsem mõju on madala BD-ga kooslustele. Vetikate põhjal

cies coexist in Rapoporti seadus Rapoporti seadus

NZL Hygrophoraceae taksonoc

-growth beech (Nothofagus) forests, New Zealand. JJ. Veg. Sci. 2: 679-690.

5: 2001-2009. ANOVA, multiple comp

M. 2010. The neglected hypogeous fungus Hydnotrya bailii Soehner (1959) is a widespread sister taxon of Hydnotrya tulasnei. Mycol. Hydnotrya: ITS põhjal 13 liiki,

P, Göker M. 2013. *Hoffmannoscypha*, a novel genus of brightly coloured, cupulate Pyronemataceae closely related to *Tricharina* and *Geopora*. Mycol. Progr. 12: 675-68

t SG, Prati D, Klironomos J. 2006. Invasive plant suppresses the growth of native tree seedlings by disrupting belowground mutualisms. PLOS Biol. 4: 727-731.

idence for the symbiosis between Tuber aestivum and Picea abies. Mycorrhiza 23: 669-673.

Y, Bex V, Midgley PM. Climate Change 2013: The Physical Science B ülevaade toimunud ja eeldatavatest kliimamuutustest

izal fungi. New Phytol. 187: 461-474.

largest subunit of RNA polymerase II as a new marker gene to study assemblages of arbuscular mycorrhizal fungi in the field. PLoS ONE 9: e107783.

model fungus in arbuscular mycorrhiza research, is not Glomus intraradices. New Phytol. 183: 1176–1187.

›erimental pla taimed: tihedusest ja agregeeritusest soltuvad kasvuerinevused: 4 taime väga erineva kasvukiirusega. Vaid koige kiiremini kasvaval taimel oli liigisisene kon

. 46: 59-102. metsas puujuurte ulatus reeglina 10-20 m, üksikutel puudel kuni 30m; troopikas kuni 50m; sügavus sõltub pinnaveest; kuni 60m troop

xxx, transform

ıycorrhizal mushroom Cantharellus cibarius obtained by germination of spores and culture of fruit body tissue. Trans. Br. Mycol. Soc. 85: 689-697.

proovid soo metanotroofid: ca 18 b probed (soovit teha üh

ıotyping Cryptosporidium parvum with an hsp70 single-nucleotide polymorphism microarray. Appl. Environ. M 15 nu probe 15 nu probed SNP av ANOVA

ions and native Australian forests. Aust. Ecol. 26: 447-457.

ın the eye of th metsataime Rhododendroni varis laguneb kiiremini metsa-aladel; rohu varis laguneb kiiremini rohumaadel

ificance of mic varis laguneb kiiremini omaenda kasvukohast korjatud mullainokulumi juures, mis on eriti oluline rasklaguneva varise puhul. Mikrok

ıt and conditions of mycorrhizal synthesis in vitro. New Phytol. 102: 95-101.
e on ethylene production by mycorrhizal fungi on pine. Mycorrhiza 4: 193-196. etüleeni tc
rdii species complex (Russulales). Fung. Biol. 114: 271-283. Lactarius gerardii koosneb troo
sion of two divergent fungal individuals led to the recent emergence of a unique widespread pathogen species. Proc. Natl. Acad. Sci. USA 109: 10954–10959.
-dominant genetic markers from single spores of arbuscular mycorrhizal fungi by AM seente intronitele ja LSUle multiplex PCR. K mitte-degener praimereid, mis arv on pe
the forest dies: the response of forest soil fungi to a bark beetle-induced tree dieback. ISME J. 8: 1920–1931.
oss-taxon con; koosluste võrdlemisel kasutada sarnasusindeksit, mis põhineb BD-l mitte vaid liigirikkusel. Bray-Curtise indeks, mantel-test koosluste võrdlemisel ka
es subgroup B from mycorrhizae with epiphytic orchids in a neotropical mountain rain forest. Mycol. Progr. 7: 75-85.
rsity: a microc erinevad mullaloomad armastavad eri-lehekõdu; BD suurem kui kõdud on laikudena vs segatud; lagunemiskiirus ei muutu; CWDs kõige vähem loomi
microfungi on formation of mycorrhiza by *Laccaria bicolor* in vitro. New Phytol. 105: 437-448.
f black spruce. Can. j. Bot. 66: 553-557.
cent microhabitats within the rhizosphere of black spruce. Can. J. Bot. 67: 1085-1095.
pathogenic species in the genus Fusarium. In: Gillings M, Holmes A (eds.). Plant Microbiology. Pp. 207-223.
angiosperm, Archaefructus, from Northeast China. Science 282: Archaefructus: ülem-triiases Hiinast, iseloomulikud tunnused
nycorrhizal and saprotrophic fungi. Mycorrhiza 1: 63-69.
n-reabsorption in a mycorrhizal fungus, the dynamic interface for interaction with soil and soil microorganisms. Mycorrhiza 9: 137-144.
lysis of a symbiosis-regulated and Ras-interacting vesicular assembly protein gene from the ectomycorrhizal fungus Laccaria bicolor. New Phytol. 161: 529–538.
f the Mbé National Park, Monts de Cristal, Gabon. CARPE report, Libreville, Gabon

Mycol. 60: 29–62.
ı. Mykol. 60: 29-62. Xerocomellus, Hemileccinum g
a pirolata, in Pyrola asarifolia and cones of Picea glauca, and morphology of the spore stages. Can. J. Bot. 62: 2441-2447.
zal symbionts of *Pisonia grandis* and *P. sechellarum* in Seychelles: identification of mycorrhizal fungi and description of new *Tomentella* species. Mycologia 102: 522-53
ıtram N-depos aladel, lkust puudusid Tricholoma, Piloderma, Cortinarius; Boletus vähemarvukas;
oil. FEMS Microbiol. Lett. 254: 251-257. Tuber melanosporum-spets ITS praimerid, kv Tuber melanosporum-spets ITS
nsive and non-redundant UniProt reference clusters. Bioinformatics 23: 1282-128 Uniref, Uniprot
ın hierarchical clustering. Bioinformatics 22: 1540–1542.
ıycorrhizal symbiosis leads to rarity in an endangered orchid. Mol. Ecol. 19: 3226-3242.
oral variation in temperature and rainfall differentially affects ectomycorrhizal colonization at two contrasting sites. New Phytol. 139: 733-739.
eet ja ECM kolonis kui põua poolt mittekahj ALADE puudel. ECM kooslus erin ITS1F-ITS4 + 2 RE multidimens skaleerimir
ım in a single stump of Picea abies. Mycol. Res. 105: 183 – 189.
ria species using DNA sequence from Laccaria proxima. Mycol. Res. 100: 1515- 6 RE, southern blot southern blot + RFLP põhjal
n and promise evolutsiooniline ökoloogia taimedel: olulised agr evolutsiooniline ökoloogia taimedel: olulised agreg-mustrid alates regionaalsest ja riiklikust skaalast ning v
evisited with specieal emphasis on the enigmatic distribution of Nothofagus Uus-Kaledoonias arv levinud Uue-Meremaalt kunagise maismaaühenduse kaudu 70 MAT neid
Aethods). Version 4. Sinauer Associates, Sunderland, MA.
Bot. 20: 333- Uus-Meremaale naturaliseerunud taimed: sh Dip Uus-Meremaale naturaliseerunud taimed: sh Dipterokarpused L-Am-st; tammed, pajud, paplid, haab; Nycta
Pisonia brunoniana (soe lõunapoolkera parasvöö Pisonia brunoniana (soe lõunapoolkera parasvööde, rannikul NZL AUS; OCE) lindude abil levik, P. Umbe
ications for Biological Control of Root Pathogens.
ım oxysporum and on Douglas-fir seedlings. Phytopathology 73: 384-389.
erence and model averaging in bahavioural ecology using Akaike's information criterion. Behav. Ecol. Sociobiol. 65: 13-21. mudelite valik, võrdl
G. 2004. Clades, clocks and continents: historical and biogeogr Myrtales: pms kladid tek 110-100 MAT eiteakus, ent Lõuna-Ameerikas enim basaalseid rühmi; Myrtacea
ationship: newperspectives on the null-hypothesis. Oikos 121: 321-326. log-ratio transformat
ı the ability to form ectomycorrhizas in the F1 progeny of an interspecific poplar (Populus spp.) cross. Mycorrhiza 10: 237-240.
ungi as regulators of soil C dynamics in ecosystems under global change. Funct. Ecol. 22: 955-963.
Kooslused on määratud eelkõige ruumilise kauguse poolest (ligi 50%), ent horisondil pole mõju! Mulla pot ensümaatilist aktiivsust mõj eelkõige lo
(*A. glutinosa*) in Fennoscandia. New Phytol. 73: 529-546. Lepp levis Eesti ja Skand aladele ulatuslikult 7000-6000 a BC; mägilepast pole P-Eur ming
st trees in the Usambara mountains of Tanzania: correlations wit Tansaania Udzungwa mägedes puude fülogeneetiline BD liigi ja perek tasemel väheneb, ent suguk ja seltsi
2 RE, õnnestumisstat PCR-RFLP
spp; Robinia plaju: Tomentella stuposa ja T. ellisii Sekv 97.0% ITS kriteerium
hort-root-specific peroxidases during development. Eur. J. Biochem. 268: 86-92. peroksida
nicroarray for the study of functional gene diversity in the nitrogen cycle in the environment Appl. Environ. Mic nir**: 70 nu nir**: 70 nu probed cy5, cy3; n=(3)*2; kõva r
eroderma
f the polyploid species Syst. Bot. 28: 723–737. trnH praimer
xonomy. Trends Ecol. Evol. 18: 70-74. süstemaatika: DNAl põhineva eeldus

ld. Mycologist 19: 102-112. EcM taimede biogeograafia: männilised, dipterokarbid, tsesalp, põõgilised. Cortinarius: pms parasvöötmes
oliv-alb, Russ ochroleuca, Pilod sp; Dolomiidi lisamine: Amphinema, Tomentella loobuti
ies level patterns in C and N abundance of ectomycorrhizal and saprotrophic fungal sporocarps. New Phytol. 159: 757-774. isotoopidel kui fn ryhmi
e-labelled (15N and 13C) glycine by mycorrhizal pine seedlings. New Phytol. 164: 383-388.
ındance in fruit bodies of ectomycorrhizal fungi from boreal forests. New Phytol. 136: 713-720.
ıt, 4 põögikut Euroopas; Laccaria amethystina liigisisene: väga väikesed genetid loobuti; RAPD 2 praimerit: Laccaria amethystina orgaanilis
arutelu loobuti
s. New Phytol. 177: 845-847.
51: 197–212.

ıarud ITS1F/cNL2F (seenespets, k1100bp)
mutualism by two nonphotosynthetic orchids. Proc. Natl. Acad. Sci. 94: 4510-45 3 RE, täpsus RFLP

vipes, Lactarius rufus, Amanita franchetii, 0/17st Pezizales; inokpot: Rhizopogon 2 RE; sekv RFLP-tüüpidel mch ja ITS
ogenetic bias in fungal environmental clone library construction. Environ. Microbiol. 9: 1329-1334. eri kloneerimismeetodid annavad mõnede liikide arvukuse
es for improved characterization of basidomycetous orchid mycorrhizas. New Ph primerid kandseentele, Tomentellale, Tulasnellale tuvastamiseks mullast. ITSOF, ITS4-O
Phytol. 163: 217-221.
view of the past 8 years of DNA barcoding. Mol. Ecol. Res. 12: 377-388. barcoding: ajalugu, kriitika
ction, speciation and classification. Annu. Rev. Phytopathol. 37: 197-246.
2000. Phylogenetic species recognition and species concepts in fungi. Fungal Genetics and Biology 31: 21–32.
crobes, species recognition and the geographic limits of species: Liigikriteeriumid seentel ja kuidas liikide arv kasvab morf<l Liigikriteeriumid seentel ja kui
crobes, species recognition and the geographic limits of species: seenetaksonitel v konkreetsed biogeo mustrid ja allopatriline liigiteke mol andmete põhjal. I
ring the gamet Rhynie Cherti taimede elukäik: sporofüüdi ja gar Rhynie Cherti taimede elukäik: sporofüüdi ja gametofüüdi faas. Algselt AM-seened koloniseerisid kogu tal
tions for biodiversity conservation in Cameroon. Tropenbos Ca Kameruni lõunaosas on tsesalpiiniliste üks BD koldeid. Eriti madalates mägedes ja jõeäärtes palju endemis
Bonito GM, Veldre V, Jairus T, Ryberg M, Larsson K-H, Kõljalg U. 2011. Tidying up International Nucleotide Sequence Databases: ecological, geographical and sequence
H, Hillebrand F, Abarenkov K. 2015a. Performance of nine primer pair and genetic marker combinations in high-throughput sequencing of fungi. MycoKeys (pending revie
nd F, Abarenkov K. 2015a. Performance of nine primer pair and genetic marker combinations in high-throughput sequencing of fungi. Science (pending review)
phic interactions in Pezizomycetes (Ascomycota, Fungi). Mol. Ecol. 22: 1488–1493.
of ectomycorrhizal fungi? Re-evaluation of Gao et al. (2013) data sets reveals sampling effects. Mol. Ecol. 23: 992-995.
rianjohany E, Razafimandimbison S, Sadam A, Naadel T, Kõljalg U. 2011. Spatial structure and the effects of host and soil environments on communities of ectomycorrhiz
fungi. Science 234: 1078.
al biogeography of the ectomycorrhizal /sebacina lineage (Fungi, Sebacinales) as revealed from comparative phylogenetics analyses. Mol. Ecol. 23: 4168–4183.
I, Nara K, Nouhra E, Peay KG, Põlme S, Ryberg M, Smith ME, Kõljalg U. 2012. Towards global patterns in the diversity and community structure of ectomycorrhizal fung
us T. 2009. Establishment of ectomycorrhizal fungal community on isolated *Nothofagus cunninghamii* seedlings regenerating on dead wood in Australian wet temperate fo
versity of pezizalean ectomycorrhiza. New Phytol. 170: 581-596.
e analysis, field observations and synthesis experiments suggest that *Odontia* is a non-mycorrhizal sister genus of *Tomentella* and *Thelephora*. Fung. Ecol. 11: 80-90.
ectomycorrhizal fungi and roots across substrate layers including coarse woody debris in a mixed forest. New Phytol. 159: 153-165.
iversity, distribution, and evolution of phylogenetic lineages. Mycorrhiza 20: 217-263.
g host plants explain differences in fungal species richness and community composition in ectomycorrhizal symbiosis. New Phytol. 199: 822–831.
aa K. 2012. Enzymatic activities and stable isotope patterns of ectomycorrhizal fungi in relation to phylogeny and exploration types in an afrotropical rain forest. New Phyt
ectomycorrhizal fungi. New Phytol. 185: 351-354.
associated with ectomycorrhizas: molecular diversity and ecology with particular reference to the Helotiales. Environ. Microbiol. 11: 3166–3178.
mycoheterotrophy in understorey Ericaceae and Orchidaceae: ecological evidence for mixotrophy in Pyroleae. Oecologia 151: 206-217.
tomycorrhizal symbionts associate with Gnetum gnemon (Gnetophyta) in Papua New Guinea. Mycorrhiza 22: 663-668.
nd high host preference of ectomycorrhizal fungi in Western Amazonia, a neotropical biodiversity hotspot. ISME J. 4: 465-471.
elles: diversity patterns and host shifts from the native *Vateriopsis seychellarum* (Dipterocarpaceae) and *Intsia bijuga* (Caesalpiniaceae) to the introduced *Eucalyptus rob*
riciella (Hymenochaetales, Basidiomycota) on Caesalpiniaceae, Dipterocarpaceae and Myrtaceae in Seychelles. Mycol. Progr. 6: 101-107.
ty composition of ectomycorrhizal fungi on seedlings of *Picea abies* and *Betula pendula*. Environ. Microbiol. 10: 1189–1201.
fungi of *Alnus*: differential host specificity, diversity and determinants of the fungal community. New Phytol. 182: 727-735.
of ectomycorrhizal fungi in a wooded meadow. Mycol. Res. 110: 734-748.
nia, Seychelles and Australia. PhD Thesis. University of Tartu, Estonia. 22.627417
, Bergeron Y (eds.). Handbook of Forest Ecology. Routledge Publishing, Milton Park, UK. (in press)
out in a silvopastoral system. Biol. Fertil. Soils 43: 843-848.
morphospecies. Science 312: 1015 diatoomide metapopulatsioonidel on kindel regionaalne biogeogr struktuur. Arv metakoosluse protsessid on
undance δ 15N: indicators of relative rates of nitrogen cycling in temperate forest ecosystems. Oecologia 153: 399-406.
heses about gene flow and population history. Mol. Ecol. 7: 381 fülogeograafia populatsioonidel: ülevaade ja statistik fülogeograa fülogeograafia populatsi
, Ashton PMS. 2005. Ectomycorrhizal colonization and seedlin Allocasuarina all palju seeni, mis samad eukalüptide ja akaatsiatega; Casuarinade all v vähe liike ja harva
method to relate two community compositions. Ecology 85: 834-846 (abstract). CoCA kahe eri org koos
Vindows user's guide: software for canonical community ordination (version 4.5). Ithaca: Microcomputer Power.
ntinental-scale patterns of canopy tree composition and function Amazonia taimekooslused on eri L-Am osades veidi erinevad pms leguminooside ohtruse poolest. EcM pu
a highland area: a brief overview. In: ??? Plant diversity in Gua Guyanas veget sõltub tugevasti kõrgusest. Dicymbe Kesk-ja Lääne Guyanas madalates j akõrgemates mets
tegy in Guyana. Biodiv. Conserv. 7: 1457-1483. Guyanas metsatüübid. EcM metsad levinud valge liivaga toitainetevaestel muldadel Kesk-Guyanas ja Lõun
n a National Protected area strategy in Guyana? Biodiv. Conser Guyanas eir veget-tüübid. Eriti keskosas ja Lõunaosas EcM-domin metsad, er Swartzia lokaalne rikkus ja
ocal and regional scales. J. Trop. Ecol. 14: 645-664.
wo Amazonian treelets. J. Trop. Ecol. 15: 751-763. Neea on väikeste gäppide pioneerliik, mis peale idanemist talub hästi varju
nte viljakehade koguproduktsioon noores vs vanas metsas, ülevaade
seedlings of Pinus sylvestris. Eur. J. For. Pathol. ???: 404-413.
ente viljakehade arv liigiti: noor vs vana mets
g phylogeny, environment and space to explore variation inmacroecological traits of Viperidae and Elapidae (Squamata: Serpentes). J. ruumiliste ruumiliste ja fülogen
sterangium; au peale kobraste poolt põhj üleujutisi säilib sadakond aastat metsa asemel kõrgerohu-niit, kuhu okaspuud tagasi ei leviarv seetõttu, et niidul pole ECM-seente
la J. 2013. Ploidy-specific symbiotic interactions: divergence of mycorrhizal fungi between cytotypes of the *Gymnadenia conopsea* group (Orchidaceae). New Phytol. 199
-A. 2015. Two widespread green Neottia species (Orchidaceae) show mycorrhizal preference for Sebacinales in various habitats and ontogenetic stages. Mol. Ecol. 24: 112
ination capability of four *Epipactis* species (Orchidaceae) is broader than expected from adult ecology. Am. J. Bot. 99: 1020-1032.
ter patterns of mükoriisa võrgustikud: seemikute kasv parim kui www olemas ja kaugus puust nii et ei varjuta, aga mükorisosfäärid kattuvad
etween Pseud www: transport väga vähene, sporaadiline, ei sõltu taime suurusest ega fotosünteesitava C kogusest, ent oleneb seeneliigist (Rhizopog
xina rehmii, www olemasolu suurendab seemikute elumust 26% . Seemikutesse jõudis 0.0004% teiste puude süsinikust ehk 0,0063% seemikute sü
Can. J. Bot. 65: 419-431.
re of mutualis network-anal:
ociations of Pinus radiata. Aust. J. Bot. 17: 59-67.
ations of Pinus radiata. Aust. J. Bot. 19: 13-20.
mycorrhizal fungi. Soil Biol. Biochem. 5: 765-771.

Casuarina (sh equisetifolia), Allocasuarina kui Eucalyptus liikidel. Casuarina liikidel EcM kolonis väiksem ja tihti nõrgalt arenenud HN. Suilloidid ei nakata ühtki. Optima
ons in elation to soil organic matter cycling. Biol. Fertil. Soils 46: 215-225. lakaas: e
a. Sydowia 8: 381-390.
ja viisid kuidas sekotioidsed ja maasiseste viljakehadega vormid on arenenud maapealsetest nii kott kui kandseened. Arv põhjuseks p põhjused ja viisid kuidas sekotioidse
).
n arbuscular m EcM seente mütseelimatid ja nendega seotud noored puud võimaldavad mändidel rohumaid invadeerida. Samas tammedel ja rohumaadel väga madal inokpo
as erinev; veidi erinev ka peale Ps. Fluorescens inokul ja fungitsiid imazalili kasutamist. PsF ise vähenes aja jooksul tunduvalt
; Uapaca guineensise ja Afzelia africana puistutes: domin Russula/Lactarius, Boletaceae, Amanita. Vähesed liigid kattuvad eri peremeestel. Arv et liigirikkus võrreldav para
Senegali EcM taimed: Uapaca spp, Afzelia, Anthonotha (Caesalp), + inroduts liikidel (sh Cinnamomum sp, Lauraceae).
lanicus (Gyrodontaceae) in Senegal. Agric. Ecosyst. Environ. 28: 519-523.
hiziques des plantations d' exotiques du Haut-Shaba (Republique du Zaire). Bull. Rech. Agron. Gembloux 9: 215-227.
ical Africa. In: Isaac S, Frankland JC, Watling R, Whalley AJS Aafrika EcM puud perekondade ja liikide kaupa, võib-olla ka Salix ja Allophyllus. Enim EcM puid on Gui
8.
EcM süntees ja kirjeldused Picea istandikus; Type5 = MelinioM. bicolor
hizal genus Cortinariaceae from India and its phylogenetic position based on ITS and LSU seqences. Mycol. Res. 106: 245-251. Anamika gen nov Indiast Hope
erisation of fungal endophytic morphospecies associated with the indigenous forest tree, *Theobroma gileri* , in Ecuador. Mycol. Res. 112:852-860
BRA cerrado mükoriisne staatus: kõik AM, v.a. Campomanesia BRA cerrado mükoriisne staatus: kõik AM, v.a. Campomanesia coerulea (Myrtaceae) ja Bauhinia holophy
koevolutsioon igapäevaselt ja c
sis platyphylla in a woodland site. New Phytol. 92: 103-114.
nenemine 3, 6, 12 kuu jooksul
: the effect of s peremees-parasiidi interaktsioonide modelleerimine metapopulatsioonide tasandil: pole superpatogeene; patogeensusgeene rohkem kui peremeestel resistent
pulation. Scien parasiidi-peremehe koevolutsioon; tasakaal: resistentseid populatsioone ründavad agressiivsemad vormid ja norku vorme avirulentsemad
tualists and parasites in a community context. Trends Ecol. Evol. 22: 120-126.
r mycorrhizae and Rhizobium on the growth and nitrogen fixation by black locust, Robinia pseudoacacia. New For. 25: 125–131.
ganic nitrogen by ectomycorrhizal fungi (Hebeloma spp.) of arctic and temperate origin. Mycol. Res. 102: 1525-1532. aminohap
rough improved access to discrete organic nutrient patches of high resource quality. Ann. Bot. 89: 783-789.
nce in evaluating plant phylogeographical hypotheses in the No Põhja-poolkera tertsiaaris: taimekooslused, nende liikumine, ookeanide sulgumine, temperatuur, niiskus.
much as resou Liigirikkuse mõju funktsionaalsusele ja biomassile tüüseb aastatega samas kui N-lisamisel ja häiringutel vähenev või ei muutu. Eskal
ecade-long gra taimede bioloogiline mitmekesisus põhjustab pikemaajalist koosluse prod stabiilsust
gy 75: 2-16. niidutaimed: eri koloniseerimine, suremus, konkurents võimaldab koeksistentsi
50-363. rohumaadel suurem liigirikkus tagab stabiilsema keskkonna ja biomassi nii põuatingimustes kui sellest taastudes (kiirem taastumine). Samas liigisisene biom
or general prin diversiteet vs stabiilsus: ülevaade taimede kohta. Arv mitmekesisemad ökosüsteemid on resistentsemad invasioonidele. Teoreetiliselt mitmekesisus suurenda
Biodiversity No Zambezi jõgikonna taimkattetüübid: levik ja kait Zambezi jõgikonna taimkattetüübid: levik ja kaitse, iseloomustus
vusi kiikide arvus pole laiuskraadi mööda ega taimeliikide koosluste vahel
OL. 2012. Distribution and drivers of ectomycorrhizal fungal communities across the North American Arctic. Ecosphere 3(11):111.
eente BD väheneb põhjapoole, lihheniseerunud seentel mullaseened Kanadas NAAT transektil: EcM seente BD väheneb põhjapoole, lihheniserun
333-334. vereimejate spetsialiseerumine teat linnuliikidele: mis on põhjus? Kas aerodün, füsiol või mitte-kokkujuhtumine?

tact Scots pine – *Suillus bovinus* and – *Paxillus involutus* mycorrhizospheres developed in natural forest humus. New Phytol. 138: 355 – 366. PPO, laka
l diversity in Scots pine ectomycorrhiza from natural humus microcosms using is x esteraas, i
Suillus spp. and different *Pinus sylvestris* genotype combinations: identity and 315-319 320-321 esteraas, i
plant commun Pyrolal suur indikaatorväärtus -näitab kuusemetsa; metsasuktsessioon Kanada joeäärsetes metsades
010. Global patterns and predictors of marine biodiversity across taxa. Nature 466: 1098-1103.
drive diversit suurem seente arv mikrokosmis induts kiiremat substr lagunemist, kuna ühed seened induts teisi. BD efekt suurem tselluloosil vrd kee
fragments for phylogenetic studies within the family Photoseiidae. In: Sabelis M oribatida: triipkoodistamis oribatida: triipkoodistamiseks sobivad nii ITS, kui
parating the eff liigirikkuse-pindala seose kuju mõjutab ag liigirikkuse-pindala seose kuju mõjutab agregatsioon ja eelkõige ebaühtlane ja liikide katvu

nt–fungus networks. Nature Commun. 5: 5273. Network taimejuurte
palju EcM se networks: antagonistlike võrgustike struktuur ei sõltu laiuskraadist ega taksonoomiast. Enamik ntw meetrikutest sõltub maatriksi suuru
DNA-based identification of ascomycetes and basidiomycetes in environmental ITS praimerid degener saitidega (liiga palju neid): ITS1F, ITS3 ja ITS4 pos-d
s üsna erinevad. Üleval vaesemas ja kuivemas domin Russ decolorans, Pilod fallax, Pilod reticulatum, Tylospora fibrillosa; allpool Tyl asterophora, Tomentella sp, Amphin
ling in temperate Australian woodlands. In: Hobbs RJ, Yates CJ, eds. Temperate eucalypt woodlands in Australia: biology, conservation, management and restoration. Surr
propagated clones of Eucalyptus marginata inoculated with isolates of Pisolithus tinctorius. New Phytol. 111: 209-214.
omposing fungi. FEMS Microbiol. Ecol. 40: 13-20. OH*
and P transfer EMH kasv on jõudsam vähesema mulla P korral; väga tugev seos EMH koguse ja taime P vahel
s with basidiospores of Pisolithus arhizus, Rhizopogon roseolus and Suillus collinitus. Ann. For. Sci. 51: 521-528.
in tropical low monodominantsus troopikapuudel. Levinud laiguti kõikjal, pms EcM taimedel, ent er L-Am ka AM taimed. Gilbertiodendron Kongos: mets v varjukas (ka g
omycorrhizal Hypothesis. Biotropica 31: 220-228.
Rhodesia. J. I Zambia Copperbelt miombo ; vs varane põletamine vs hiline põletamine. Domin Brachyst, Julbern, Uapaca spp, Marquesia paiguti. Põletamine vara vähese
ersity, Ecology, and Conservation of Truffle Fungi in Forests of the Pacific Northwest. USDA general technical report PNW-GTR-772.
sperms from an evolutionary standpoint. In: Safir RF (ed). Ecophysiology of VA Plants. 224 pp. CRC Press, Boca Raton, FL.
mmivena potorooi gen. et sp. nov. (Basidiomycota, Mesophelliaceae), with a key to the 'gummy' genera and species in the Mesophelliaceae. Australas. Mycol. 21: 9-11.
6: *Stephensia bynumii* sp. nov. (Ascomycota), with a key to the species of *Stephensia* . Mycotaxon 55: 185-188. Stephensia bynumii, sp nov
alajczuk N. 2013. Australasian sequestrate fungi. 18: Solioccasus polychromus gen. & sp. nov., a richly colored, tropical to subtropical, hypogeous fungus. Mycologia 105

a covered by the northwest forest plan. Mycotaxon 75: 153-179. Fevansia gen. Nov -lähedane R
Kalahari: ecology, ethnomycology, and taxonomy. Econ. Bot. 62: 521-529. Kalaharituber ökoloogia ja kasu
alian outback: ecology, ethnomycology and taxonomy. Econ. Bot. 62: 497-506. Elderia arenivaga, Ulurua nonp

is viljakehadeg arv maasis viljakehadega seened tek kohastumusena per põuale, aga ka külmale. EcM seente tekkeaeg arv langeb kokk arv maasis viljakehadega seened tek
ffles of the Australian Outback and African Kalahari. Mycol. Progr. In press.
ffles of the Australian Outback and African Kalahari. Mycol. Progr., in press.
606.
loydia 27: 100-106.
Hebeloma, Suillus and *Astraeus*. For. Sci. 13: 121-130.
. Trans. Br. Mycol. Soc. 57: 85-92. Carbomyces (Carbomycetaceae); Te
rhizae. USDA Forest Service: Washington USA. pp. 19-37.
ologic theory. A.B. Franki panus ektomükoriisatöödesse. Juba 1840ndatel kirjeldati EcM struktuure, ent seeni peeti parasiitideks. Frank oli esimene, kes tuli välja vastastik
its relationship to the other sequestrate genera in Morchellaceae. Mycologia 102: 1058-1065. Kalapuya, monofüleet Imaia-Le
f fungal rhizomorphs under nitrogen fertilization in a pinyon-juniper woodland. Plant Soil 270: 249–255.
Ecosystems 9: 305-316.
id by ectomycorrhizal fungi in a boreal forest. Soil Biol. Biochem. 40: 1964-1966.
lutionary histories of soil fungi are reflected in their largescale biogeography. Ecol. Lett. 9: 1086–1093.
volutionary histories of soil fungi are reflected in their large-scal Seenehõimkonnad erinesid keskmise distantsi poolest ekvaatorist Ameerika latituudi gradie
nents of ectom väidavad, et ECM-seened saavad viljakehade C taimedelt kohe, e x
to test use of litter carbon by ectomycorrhizal fungi. Soil Biol. Biochem. 38: 1077-1082.
lization in boreal ecosystems: potential consequences for soil carbon storage. Glob. Ghange Biol. 13: 78-88.
rus, and atmos mükoriisa väheneb N ja P (tugevamini) väetades, kasvab CO2 mõjul: metaanalüüs
metsades domin Cortinarius, Russ/Lact; Boletus, Inocybe. Muul PNG metsade EcM taimed: rannaäär -Casuarina, Leptospermum; Kuiv igihaljas mets -Myrtaceae, Acacia;
In: Misra JK, Tewari JP, Deshmukh SK. Systematics and Evolution of Fungi. Science Publishers: Jersey, UK, pp. 15-28.
In: Misra JK, Tewari JP, Deshmukh SK. Systematics and Evolution of Fungi. Science Publishers: Jersey, UK, pp. 15-28.
vahel sarnasemad kui tammeliigid omavahel. Sissetoodud puuliikidel sama plaju EcM BD kui kohalikel puuliikidel. Plotte reostavad naaberplottide
identity determ EcM seeneliigid mõjutavad erinevalt EcM juurte hingamist. Peamine mõjutaja oli siiski juuretippude N sisaldus, mis erines tugevasti
ophaeum, H.helodes, Tomentella lilacinogrisea
dophora finlandica, Tuber sp. Ka Pulvinula constellatio ja Tricharina ochroleuca
P, Mabilat C. 1999. Mycobacterium species identification and rifampin resistance testing with high-density DNA probe array Mycobacterium: 4 eri geeni rDNA, sh 16S rR
pacity to degrade and solubilize 14C-labelled lignin. Microbios 50: 91-97. ligninaasid
hiza epidermoides, Cortinarius sp; noorendusega: Tylospora (49%), P. Epidermoides, Cenoc, Piceirh cornuta
Laccaria sp, Tomentella spp, Peziza spp, incl P. Alaskana (pigem tüvest eemal)
abundances support the myco-heterotrophic nature and host-specificity of certain achlorophyllous plants. New Phytol. 160: 391-401.
ole isotope rati Arv et korge 15N liigid on S strateegid suure EMHga ja mad 15N liigid R-strat limit EMHga
Wroclaw: Salix mood EcM; Alnus ja Polygonaceae NM
Wroclaw: Alnus glutinosa, Betula EcM ja AM; Carpinus, Corylus, Picea, Tilia ECM; Frangula alnus, Ribes subaeratus, Sorbus aucuparia mood Ec
ity of microbia Lepp on mikroobide poolest mitmekesiseim ja aktiivseim kooslus. Eri koosluste vahel mõj mikroobe enim %Orgaanika, %N, pH Lepp on n
ogés suivi de laur monographie, et accompagne de planches. C. R. Hebd. Seanc. Acad. Sci. Paris 21: 1432-1436.
ées, observés dans les environs de Paris et les départements de la Vienne et d' Indre-et-Loire. Ann. De la Soc. Nat. 19.1.
. Mycorrhizal association between the desert truffle Terfezia boudieri and Helianthemum sessiflorum alters plant physiology and fitness to arid conditions. Mycorrhiza 21: (
noculation with the ectomycorrhizal fungi Pisolithus arhizus and Scleroderma sp. improves early growth of Shorea pinanga nursery seedlings. New For. 30: 67-73.
tke I. 2001. Carbon dioxide concentration and carbon input affect the C and N storage pools in Amanita muscaria-Picea abies mycorrhizae. Tree Phys. 21: 93-99.
on in Suillus luteus mycorrhizas-as revealed by micro-PIXE analysis. Nucl. Instr. And Meth. In Phys. Res. B 181: 649-658.
d the West Pacific. J. Biogeogr. 28: 217-230. taimede ja putukate biogeogr S, SE-Aasias, Austraalias ja Okeaanias PAUP analüüs biogeograafias
relationships among cyanobacteria and plastids by small subunit rRNA sequence nu-ssu-517f primer
9.
rius (19), Russulaceae (17), Inocybe (13). Liikidest Rhiz vinicolor, Cenoc
pöök vs valgep tamm vs pöök vs valgepöök: ektomükoriisaseened on veidi spetsiifilisemad kui saprotroofid, täielikke spetse väga vähe
ure of tropical host-parasitoid food-webs. Nature 445: 202-205. mesilaste ja parasitoidide toiduahela võrgustiku muutused seoses maakasutusega: muutused
s in soil. Can. J. Bot. 61: 1345-1348.
ons. Mycologia 59: 819-832. Stephensia=Densocarpa shanor
e common ectomycorrhizal symbionts in Northern Hemisphere forests. Mycorrhiza 22: 577-581. Membranomyces on Clavulina
tekkel ning lagundamisel
d, säilib vaid Hartigi võrgustik. Vee all tekkivad uued mükoriisad omavad vaid Hartigi võrku.
a of Glacier Bay, Alaska. In: Trappe JM, Franklin JF, Tarrant RF, Hansen GM (eds.) Biology of Alder. Pacific Northwest and Range Experiment Station Forest Service, U.
lacier Bay, Alaska. 115-139.
rmocybe crocea on *Pinus sylvestris* and *Dermocybe palustris* on *Pinus mugo*. Nova Hedw. 45: 509–527.
ct of arbuscular mycorrhizal fungal communities from ecosystems along management gradient on the growth of forest understorey plant species. Soil Biol Biochem. 41: 21
rsch. Freunde Berl. 253-289
alysis. Oikos 1 Nestedness: pea kõik kooslused on nested ja see on loodusl normaalne, käib kaasa koevolutsiooniga. Andmete ko Nestedness: pea kõik
ecies co-occurrence. Oikos 116: 2053-2063. nestedness ja co-occ
conservatism, phylogenetic assortment and habitat filtering. Meth. Ecol. Evol. 3: 930-939. Niche proge. Null m
acelerated by monokaryons and dikaryons of Lenzites betulinus and Trametes hirsuta. Mycoscience 40: 367-371.

ome ectomycorrhizal fungi. Mycorrhiza 1: 13-20.
ora verrucosa complex: new insights from analyses of beta-tubulin, large subunit nucleat rDNA and ITS sequences. Botany 86: 742-7 Chaetothyriales: Phialophora, E
tler M. 2011, Species abundance distributions and richness estimations in fungal metagenomics - lessons learned from community ecology. Mol. Ecol. 20: 275-285.
id mycorrhizal fungus Rhizoscyphus ericae and a leafy liverwort in the maritime and sub-Antarctic. New Phytol. 176: 460-471.
tahl DA. 2003. Optimization of single-base-pair mismatch discrimination in oligonucleotide microarrays. Appl. I 2le organism 2le organismile tihed Neural Network (mitteli
discrimination of terminal mismatches by using oligonucleotide microarrays and neural network analyses. Appl. 2le organism 2le organismile tihed ANOVA-SNK; Neural N

studies on terriculous microfungi reveal novel anamorphs of two Tuber species. Mycol. Res. 108: 749-758. Tuber anamorfid: iseloomustus, sarn
enoc, Lact deliciosus; muidu Russ-Lact (5), Tom-Thel (4); EcM-kaas eraldi praimerid Capronia, Hymenoscyphus, Porteri AscoM, Phialocephala fo
cina on assots arv Sebacina on assots mitmete kottseentega, sest neid on alatihti Sebacina ITS,LSU ECM liigid 2 klaadis
E. 2009. Diversity and evolutionary origins of fungi associated with seeds of a neotropical pioneer tree: a case s DOTUR ja Sequer seemnete endofüüdid on eri per
ographic structure of endophytic and endolichenic fungi at a continental scale. Am. J. Bot. 99: 898-914.
als close affinities between endophytic and endolichenic fungi in mosses and lichens. Microb. Ecol. 60: 340-353.
short-rotation Lepp: peenjuuri 550+-105 kg/ha; u 50% -10 cm ja 75% -20 cm süg. Juurte biomass 18% kogumassist. Aastas viib mulda 30-60 kg N/ha. Valge lepp paljulul
Thelephora, Tuber
gev must pigment) Wilcoxina, punaneAsco, Hebeloma, Thelephora, Tuber istandikus vs puhaskult (v a Hebeloma)
d from hair roots of Rhododendron obtusum var. kaempferi in a Japanese red pine forest. Mycoscience 44: 97-102.
by the root endophytic fungus *Heteroconium chaetospira* within roots of *Rhododendron obtusum var. kaempferi* . Mychorriza 15: 61-64.
rib oma shiro-aladel; shiro-alal vrd ümbrusega kõrgem b-glükosidaasi akt shiro-ala
weeks are required to differentiate ectomycorrhizal Hartig net structures in roots of Pinus densiflora seedlings cultivated on artificial substrate. J. For. Res. 5: 293-297.
ic potential of Tricholoma matsutake: growth over pine bark treated with surfactants. Mycorrhiza ???
hization of Tricholoma matsutake and two major conifers in Finland - an assessment of in vitro mycorrhiza formation. Mycorrhiza 20: 511-518.

ng gel electrophoresis of amplified ribosomal DNA. Mycol. Res. 104: 927-936. PCR otse mullast 18S rDNAle PCR otse mullast 18S rDNAle, geelelektroforeesil lahutam
ndary. Science 303: 1489. krridi-tertsiaari piiril peale asteroidi mõned (?) aastad valitsesid palünoloogilistes andmetes vaid seeneeose
agard E, Bass M, Losos EC, Balslev H. 2004. Yasuni Forest Dynamics Plot, Ecuador. In: Losos EC, Leigh J, Giles E, eds. Tropical forest diversity and dynamism: Finding
K, Losos E, M Yasuni ploti kirjeldus
sp?; tundmata liigid, palju Pezizaleseid (väidetavalt mitu Tuberit, Peziza infossa j ITS1F-4; 3RE
Ecol. Evol. 24: 110-117. triipkoodistamise geenide valik
thofaguse metsades: invasiivsed liigid Pinus radiata istandikest: Amanita muscaria, A. Rubescens, Pax involutus, Xerocomus rubellus; kohalikest liikidest domin Cort, Tricl
ARRAy seente identi UPGMA
arative analysi Fül koosluse str: klasterdumine on domineeriv pooltes maailma kooslustes, ent tugevam kõrgemal taks Fül koosluse str: klasterdumine
Mycorrhizal weathering: A true case of mineral plant nutrition? Biogeochem. 49: 53–67.
e MW. 2005. An overview of the phylogenetic relationships within Epidendroideae inferred from multiple DNA regions and recircums Orhideed Epidendroideae: ITS pikku
uenced by both stochastic and deterministic ecological factors. Environ. Microbiol. 10: 1411-1418.
icrobiol. 64: 167-182. prokarüootidel liigirikkus-pindala seos madalam, ent võib olla sarnane taimede ja loomadeg
ECM BD vs k ECM: Salix: eri kk-tingimused PCA
orrhizal plant influence effectiveness of the mycorrhizal symbiosis? Plant Soil 230: 161-174. repeated ANOVA
ngi of *Salix re* Eri strateegiad: osad stimul kasvu (root stimul), teised asendavad juuri (suur kolonis, madal kasvustimul; root replacement). eri ECM seened annavad taimed
d; vs N, P sisa ECM vs VAM: Salix repens; vs kk-tingimused, aastaajad
mycorrhizal in ECM vs AM: kevadel vs sügisel, ajas
soil microbes hüpot: mikroobide BD on suurem tähtsus vaestes ökosüsteemides kui rikastes
ar mycorrhizal AM eriseened eritaimedel MANOVA, AM-sõltuvu
orrhizal fungal mükoriisa võrgustikud: seemikud võivad saada kasu v kahju
ust, vähendab AM diversiteet tõstab taimede BDd, biomassi, P sisaldust, vähendab mulla P sisaldust
ien K, Boller T AM seened soodust P ülesvõttu, mullastruktuuri (peatasid erosiooni), mitmete taimeliikide ellujäämust süsteemis ning taimeliikide ühtlust. Eri seened mõjuta
nizal fungi alte 2 taime omavahelist konkurentsi mojutavad eri-AM-seened, mis individuaalselt mojuvad ka erinevalt. 3 AM-seene koosmoju keskmine
gical invasions. invasiivsus mikroobidel, mis seotud taimedega v mitte. Augustis taimed investeerisid
RM, Kamp A invasiivne kõrs Cenchrus Botswanas on seotud vaid 1-2 AM seeneliigiga; positiivne-neutr tagasiside oma mullaga. Samas kohalikud liigid seonduvad rohken
abundance res kliimamuutuste mõju mikroobidele ja mikroob-taim suhetele. Ennustamine keskkonna ja omavaeliste suhete läbi
belowground n v oluline on uurida interaktsioone laiemalt, mitte vaid 2 osapoole vahel, vaid kaasata ka muud seonduvad. Taim-patogeen + mükoriisa,antagonist,patogeen2.
TM, Bradford mullaorganismid võivad mõj suktsessiooni; taimed mõj läbi assots mikroobide teineteist;
09. Septal pore complex morphology in the Agaricomycotina (Basidiomycota) with emphasis on the Cantharellales and Hymenochaeta Kandseeltel septumi parentesoo
New Phytol. 157: 525-537.
airs targeting the nuclear rRNA operon for characterization of arbuscular mycorrh AMF seentele 8 SSU ja LSU praimeri paari katsetused. NS31-AM1 amplifits
izas on the concentration and biodegradation of simple organic acids in a forest soil. Eur. J. Soil Sci. 54: 697–706. Paxillus k
late and ferricrocin exudation by the extramatrical mycelium of an ectomycorrhizal fungus in symbiosis with Pinus sylvestris. New Phytol. 169: 367-378. Hebeloma
corrhizal fungi and Pinus sylvestris in response to nutrient deficiencies. New Phytol. 170: 153-163. EcM seen
minerals muscovite and hornblende. New Phytol. 171: 805-814.
terization of rc AM-seente kooseksistents rDNA LSU
y Diverged Species: Relative Performance of Matching Methods. PLoS ONE 7: e30490. barcoding: keeruli barcoding: keerulisem kui liigi
ive fungal colonization in plant roots. Science 295: 2051. uued seenespets praimerid 18S-le, Korrelise juurtest tohutu mitmekesisus seeni, millest pa
raheerimine ja seente ning bakterite sekveneerimine: DNA, rikastatud RNA ja rikastamata RNA 13C rikastatud süsinikuga taimedest RNA ekstrah
sting grass species have distinctive arbuscular mycorrhizal communities. Mol. Ec NS31-AM1; mõlemad märgist T-RFLP erijooksud erinevate tulen parsimoonia analüüs 10
hment: a meta 15N ökosysteemide toiduahelates, metaanal: 15N prop soltub enim eritatava N jaagi ainest, taimtoit=loomtoit>kodutoit, taksonoom kuuluvus, elupaik magev
eek sand dune. Pedobiologia 36: 373-382.
1993. Element concentrations in certain ectomycorrhizal fungi in Finnish Lapland. Aquilo Ser. Bot. 31: 137-142.
Teravmägedel AM taimi pole, leiti vaid 1 AM eos. EcM taimed Dryas, Salix spp, Betula; ErM Cassiope, Empetrum. Sagedad DSE. 1 EcM tipp leiti Pedicularis dasynthalt
izal and non-mycorrhizal Pinus sylvestris seedlings. Aquilo Ser. Bot. 26: 19-24

egatus as revealed by energy dispersive spectrometry. ???
idase and aryl-alcohol oxidase genes in 30 fungal species. J. Biotechnol. 83: 245 – 251. LiP, arüül
k alder (*Alnus* Lepp Sirgalas: lehed ja varred v N ja P rikkad. Must lepp v paljulubav karjääride rekultiveerimisel
ied in biological and chemicalstump treatments in the fight against Heterobasidion annosum. Mycologia 95: 379-387.

Aacromicetes de la región del medio Caqueta, departmentos de Caqueta y Amazonas (Colombia). Biota Colombiana 6: 127-140.
roots of conifer seedlings. New Phytol. 174: 441-446.
VE FEATURI taimede-tolmeldajate spetsialiseerumine on asümm. Põhjused (mitteorig): vaatlushälbed, proovialade hälbed, regionaalne kohastumine; väljasuremise risk, sp
pollinator inte network analüüs: taimede ja tolmeldajad: nullmudelite kasutamine, erinevad statistikud ja artefaktid. NullM2 on parim, ent nullM1 tul
structure of plant-animal mutualistic networks. Ecology 90: 2039-2046. fülogeneesi, ruumilis
Species abund network-anal.: liikide erinev ohtrus põhj peamiselt asümmeetriat ökol suhete võrgustikus. Sagedasemad liigid mõj oma partnereid tug
ofide kooslus muutub kui lisada lupja, eriti okaspuudelkasvavad vähenevad; mõned lisanduvad, mõned kaovad; ECM seentest Amphinema ja Sistotrema octospora eelistasi
position and di puude elurikkus ei mõj lülijalgsete liigirikkust, ent eri aladel ja eritaksonitel esines puuliigi efekt. Vaja uurida mitmeid kooslusi
Tedersoo L. 2013. Evolution of nutritional modes of Ceratobasidiaceae (Cantharellales, Basidiomycota) as revealed from publicly available ITS sequences. Fung. Ecol. 6: 2
its correlation with anastomosis grouping and ecology. Thesis. University of Tartu, Tartu.
facilitation. C väljend 'diversity begets diversity'. Konkurents ja fasilitats avaldavad samaaegset mõju liigirikkusele sõltuvalt sümmeetriast, ajast ja u
: 183-206. Koosluseökoloogia põhikontseptsioonid on liigiteke, geenitriiv, looduslik valik, levimine; n
ota (Agaricaceae). Mycologia 95: 442-456. ITS, LSU Macrolepiota, Endoptychum, Chlorc
ations. New Phytol. 181: 960-973. introduts EcM seened: pms perek Suillus. Kokku 200 teada introduts liiki -ainult VK põhjal
ons of ectomycorrhizal diversity and root structuring in seedlings of Norway spruce (Picea abies) with fast- and slow-growing genotypes. New Phytol. 201: 610–622.
tree effects on the ectomycorrhizal community and root characteristics of Norway spruce. Mycorrhiza 23: 21-33.
PNG EcM puud Pimelodendron amboinicum (Euphorbiaceae), Haplobolus floribundus (Burseraceae); dipterokarbid on ü hõredalt; Int Lactarius PNGs: madalates metsade
PNG: Pimelodendron (laikudena monodominant) mood EcM ja assotsieerub Pterygellusega (Cantharellales)
tion of the world's biodiversity hotspots: the biota of African 'Ca Cape: taimed levinud hiljuti üle mandrite, mitte Gondwana jäänukid; radiatsioon eri rühmad
ate control: increasing your power. Oikos 108: 643-647. Bonferroni analoogid, m
omy of root-inhabiting *Cryptosporiopsis species* , and *C. rhizophila* sp. nov., a fungus inhabiting roots of several Ericaceae. Mycol. R Cryptosporiopsis spp nov Pezic
, Franken P. 1998. Piriformospora indica, gen. Et sp. Nov., a new root-colonizing fungus. Mycologia 90: 896-903. Piriformospora indica -sarn 18S rDN
Panama maakitsuse formeerumine 3 MAT korreleerus Atlandi ookeanis suure väljasuremiste lainega 2,4 M
, Va-mäd ja P EcM morfotüüpide suht arvukus ei erine metsapinnasel, Va-mäd ja Pruunmäd lagupuidul, ent seenmantli paksus va-mäd puidul samade morfotüüpide kaupa
obovata in the Altitudinal Gradient (the Denezhkin Kamen` Mountain Ridge, Central Urals). Sib. Ekol. Zh. 15: 497-505.
3: 337-344. puittaimed mõjutavad savannide mullastiku toitaineid. Rohttaimede ja puude vaheline fasilitatsioon
nomes and its consequences for bacterial community analyses. PLoS One 8:e57923. Bakterite rDNA: 1-15 koopiat, pms 1-7; koopiate
P of ITS. Mycol. Res. 104: 1027-1032. total DNA mullast
rlequin ladybird carries biological weapons against native competitors. Science 340: 862-863.
zoctonia. Annu. Rev. Phytopathol. 32: 135-155. Rhizoctonia: Ceratobasidiaceae
Thanatephorus praticola. Curr. Genet. 18:277-280.
ally amplified ribosomal DNA from several Cryptococcus species. J. Bacteriol. 1 LR1, LR3, LR5, LR6, LR7, LR7R, LR12, 5.8S, 5.8S-R praimerite süntees
he oyster mushroom Pleurotus revealed by phylogenetic analysis Pleurotus ostreatus komleks: ristumise baasil morfoloogilised liigid on samad bioloogilised liigid, bioloogil
sp, Cenoc, Lactarius sp
from the *Hymenoscyphus ericae* aggregate and roots of *Pinus* and *Vaccinium* . New Phytol. 164: 183-192.
ns between ectomycorrhizal fungi and ericaceaous plants. Symbiosis, in press.
segamets-okasmets-nõmmemets; ECM (eriti segametsas ja okasmetsas)vs saprotroofid (eriti AM-lehtmetsas)
icolor peab mitu aastat vastu)
M-A. 2012. Extensive gene flow over Europe and possible speciation over Eurasia in the ectomycorrhizal basidiomycete *Laccaria amethystina* complex. Mol. Ecol. 21: 28
gal associates of *Pyrola rotundifolia* , a mixotrophic Ericaceae, from two Estonian boreal forests. Mycorrhiza *19: 15-25.*
owland vegetation during the Late Quaternary: pollen evidence f ZAMbia-Tanz piiriala taimkate on viimase 45000 a jooksul pidevalt muutunud sõltuvalt vihmaper pikkuses
oyers BT, Renaut S, Rennison DJ, Veen T, Yeaman S. 2013. Mandated data archiving greatly improves access to research data. FASEB J. 27: 1304-1308.
Tomentella
llus, Coltricia, Inocybe; keskiga: Russula, Bankera, Lactarius, Cortinarius; vana: Russula, Suillus, Cortinarius, Hydnellum none
5: 1861-1876. inimasustus on viimastel ajal muutnud oluliselt nii N, C, S tsükleid, levivad tehnogeensed ühendid ja raskemetrallid. Globaalne soojenemine toimub pms fos
through long-t kõdulagunemine: iga puu varis laguneb tema alal kiiremini kui teise puu all - arv mikroobikoosluste adaptatsiooni tõttu; Lehtede segu
) from the Dominican Republic and the status of *Neopaxillus* within the Agaricales. Mycologia 102: 138–147. Neopaxillus on Crepidotuse sõs
ness determine the diversity and productivity of a tallgrass prairie system. New Phytl. 172: 554-562.
with a ligninolytic basidiomycete, but not root symbiotic ascomycetes, positively affects growth of highbush blueberry (Ericaceae) grown in a pine litter substrate. Plant So
ated genes in Eucalyptus globulus-Pisolithus tinctorius mycorrhiza by differentia ECM geenid array põhjal
ogenetic positioning of fungi: impact in applied microbiology and environmental biotechnology. Appl. Microbiol. Biotechnol. 90: 41-5 seentel ülevaade. Mikrosporiidi
ification of thermophilic Campylobacter jejuni, C. coli, C. lari, and C. upsaliensis1. J. Clin. Microbiol. 41: 4071-4080.* Campylobacter spp identifitseerimiseks: 2 gee
a species by microarray-based assay. J. Clin. Microbiol. 40: 4720-4728. Listera spp identifitseerimiseks: 1 geen, iga lii
a tool for improved taxon identification and detection of species diversity. Biodiv barcoding taimedele (rbcL, matK, trnH-psbA ja seentele ITS
Eri klassidel selged substraadi/elukeskkonna eelistused. Ringpuu
diversity in environmental samples: pitfalls of PCR-based rRNA analysis. FEMS Microbiol. Rev. 21: 213-229. erinev molekulaarse analüüsi tulemus vrd reaalse olukorrag
systems and time durations. J. Biogeogr. 27: 1151-1157. Pleistotseeni veetaseme kõikumised kuni -120m: Juba -40 m Sumatra, Jaava, Kra, Kalimantan omavahel üh
ad graduaalselt lagundajatega, >12 mo domin kandseened (pärmid) ja liigirikkus kasvab; ajapikku kasvab ka CBH geenide BD; 24 mo kõdus domi
nade kaupa, ECM max suvel, min kevadel ent mitteoluliselt. Paljudel EcM liikidel olulised erinevused
ia, Cenoc, Xerocomus, Phylloporus EcM süntees ilma kirjeldusteta!Ei mood Strobilomyces ja Lycoperdon
Maryland: Fagus, Quercus EcM, Ilex, Liriodendron, Acer rub, Ulmus am AM; kõik illustr
Populus delto Populus deltoides on AM Mississ deltas, vähemviljakal mood AM ja EcM; P. Heterophylla oli NM; P. Fremontii, P. Grandidentata, P. Tremuloides mood va
Mycorrhizae. USDA Forest Service: Washington USA. pp. 187-195.
Piceirhiza vs Hymenoscyphus perekonnaspetsiifilise Piceirhiza vs Hymenoscyphus
xis carbonaria (Ascomycota) is a biotrophic root associate with Norway spruce (*Picea abies*) in nature. Mol. Ecol. 7: 609–616.
finities of symbiotic root-associated ascomycetes of the Helotiales in burnt and metal polluted habitats. New Phytol. 155: 131-148. enamus juure isolaate ja Piceirhiza b

ew Phytol. 164: 7-10.
mycetes. PhD Thesis. University of Oslo.
cure for use in forest ecosystems. Environ. Exp. Bot. 21: 267-268.
nation management system for DNA barcoding workflows. Integr. Biol. In press. süsteem DNA eraldu
ersity, dominance and community structure in the rhizosphere of clonal *Picea mariana* plants throughout nursery production chronosequences. Microb. Ecol. 54: 672-684.
atellite markers from an ectomycorrhizal fungus, Laccaria amethystina, by a dual SCAR mikrosatelliid id Laccaria amethystinale. AFLP põhjal + kloneerides, 3 praimeriga
soil communit mullaorganismide suuruse järgi kaotamine tugevalt vähendas ökosüsteemide multifunktsionaalsust. Osaliselt toimus mõju läbi taimed
y effects of pla AM-seente realiseerunud mitmekesisus suurendab prod. Statistiliselt eemaldati erinevate liikide efekt eraldi. AM-seente realiseeru
ycorrhizal, arbuscular mycorrhizal, and dark septate fungi in seedlings of four members of the Pinaceae. Mycorrhiza 18: 103-110.
Variogram analysis of the spatial genetic structure of continuous populations using multilocus microsatellite data. Genetics 169: 1739-1752. variogrammide kasu
ldwide taxa Phellinus s.l. And Inonotus s.l., and phylogenetic relationships of allied genera. Mycologia 94: 998-1016. Hymenochaetales: Phellinaceae ja In
Tom-Thel 2 spp, PsTom 2 spp, Lact rufus, Lacc prox, jpt
mõjutas fenoolide lisamine, tugev mõju männiokaste lisamisel. Fenoolide lisamine 13C PLFA puisniidul
Agaricales sp, Mortierella sp, Metharhizum sp, Fusarium sp. Teiste hulgas ka Ecl ITS1-ITS4 mullast
pponen A. 2011. Diverse Helotiales associated with the roots of three species of Arctic Ericaceae provide no evidence for host specificity. New Phytol. 191: 515–527.
ungus assemblages on oak seedlings in the southeastern Appalachian Mountains. Mycorrhiza 18: 123-132.
caria laccata, Cantharellaceae1; sugukonniti Russulaceae, Thelephoraceae, Cortir ITS ITS1+5.8S+ITS2 identsuskriteerium 97%
of ectomycorr ECM seeni inhibeerivad erikoidid, v.a Cenococcum
tatus of *Tremellodendron* (Sebacinaceae). In: Cripps CL (ed.). Fungi in Forest E ITS4NA praimer kandseente jaoks
t need ühel peremehel singletonid; ensüümide aktiivsus Acid phosphatase kõrgem lepa seentel kui PsTsuga seentel. Haruldastel liikidel samasugun
n in subalpine clearcuts affects ectomycorrhizal root tip community structure within fifteen years of harvest. Appl. Soil Ecol. 60: 5-15.
and soil N fertility effects on growth, mycorrhizal colonization, and xylem water potential of juvenile ponderosa pine in a field soil. Plant Soil 195: 25-36.
ycorrhizal fungi in intensively fertilized Norway spruce forests. For. Ecol. Manage. 262: 999-1007.
natural abunda EMH kuusikus vs kuuse-tamme segametsas. Kuusikus sügavusjaotus ühtlasem kui tammikus, üldse kuni 70 cm süg olulisel määral. 13C mütseelis sügavuti s
composition of ectomycorrhizal rhizomorphs grown in contact with different minerals in forest soil. FEMS Microbiol. Ecol. 39: 147-156.
mposition of ectomycorrhizal mycelia identi ¢ed by PCR ^RFLP analysis and grown in contact with apatite or wood ash in forest soil. FEMS Microbiol. Ecol. 44: 57-65.

nd seasonal growth of external mycelium of ectomycorrhizal fungi in the field. N PLFA: ergosterool, rasvhapped, sõelkotist väljas-sõelkotis, 13C eristamaks saprotroofides
nd mineral concentration in host tissue on ectomycorrhizal development on Pinus sylvestris L. in relation to nutrient supply. New Phytol. 127: 521-528.
ration and mycorrhizal development of Pinus sylvestris L. seedlings. New Phytol. 119: 405-411.
l by different ectomycorrhizal fungi. Plant Soil 218: 249-256.
nering of biotite induced by pine seedlings colonised by ectomycorrhizal fungi from two different soils. Plant Soil 222: 215-229.
cetes, Sordariomycetes domin. Kandseentest domin Agaricales, Aphyllophorales, Boletales. Sesoonsed muutused esinesid klassi-ja madalamatel takson-tasemetel. Mullast
g the in situ activity of soil extracellular enzymes. Soil Biol. Biochem. 40: 2098-2106. mõõtmis
est by trampling: Effects on mycorrhizal roots of seedlings and mature trees of Fagus sylvatica. Plant Soil 243: 143-154.
. J. Bot. 51: 331-353.
and plants. My maismaataimede MR staatus: palju valeandmeid, andmed puudu. EcM ja NM taimed ning mükoheterotr tek palju kordi maismaataimede MR staatus: palju v
ycorrhizal genes in the common ancestor of land plants suggests a key role of mycorrhizas in the colonization of land by plants. New P mükoriisa tekkeks vajalikud ge
orrhizal fungi: *Phialophora finlandia, Chloridium paucisporum* and *Phialocephala fortinii*. Mycologia 77: 951–958. Phialophora finlandia (Cadoph
of PCR co-amplification of 16S rrNA genes from different bacterial species. Mic keskkonnaproovide sekveneer keskkonnaproovide sekveneerimine 16S rDNA ja kimääric

n ferruginea
lianotungensis of different ages in a northern China temperate forest. Mycorrhiza. In press.
f oligonucleotide-microarray method for the detection of human intestinal bacteria in fecal samples. FEMS Micro 16S rDNA p 16S rDNA probed 40 Ei mingit normaliseerim
from the roots of aspen in central Alberta: indentification, morphology, and interactions with the host, in vitro. Can. J. Bot. 85: 1241-1226.
evidence from three genomes. Mol. Biol. Evol. 17: 773-781. männiliste teke juura-ajastu lõpus. Fülogenees: basaalne Cedrus (((Pin männiliste teke juura-ajastu lõpus. F
ees. Scand. J. For. Res. 16: 199-220. RFLP, SCCE, AFLP jt: ülevaade puude kohta; sekv eritaimedel ja eriDNA pii allosüüma
ements. Can. J. Bot. 82: 1063–1073.
olution of helotialean fungi (Leotiomycetes, Pezizomycotina): a nuclear rDNA phylogeny. Mol. Phyl. Evol. 41: 295-312. Helotiales: LSU + SSU +5.8rDNA.
ylogenetic classification of the Leotiomycetes based on rDNA data. Mycologia 98: 1066-1076. Leotiomycetes fülogenees
rphology in leaf endophytes. PLoS One 4: e4246. Helotiales: VKd on redutseerur
nsend JP. 2011. Tasting soil fungal diversity with earth tongues: phylogenetic test of SATé alignments for environmental ITS data. PL Geoglossales INSDst ITS. SAT
Austraalia Ast Austraalia Asteraceae subF Inuleae on u pooled ECM, sh kõik on 1-a rohttaimed; puud ja puhmad on AM, teised subF on AM. Sünteesitud mullal mingi tun
ds. New Phytol. 66: 631-641.
amorfi iseloomustus, kasvavad eukalüptidega, peale põlengut mood viljakehi. Mantel õhuke, HN fragmentaalne. Sarn Ruhlandiella. Pu Muciturbo: hüpogeiliste viljakehade
. New Phytol. 70: 41-46.
ECM puud austraalias: Myrtaceae, Casuarinaceae, Rhamnaceae, mimosaceae, Fabaceae, Euphorbiaceae, Sterculiaceae, Thymeliaceae, Apiaceae, Rubiaceae, Goodeniacea
87: 371-381.
9: 267-272.
and close association with *Melaleuca uncinata* (Myrtaceae) in western Australia. New Phytol. 99: 273-280.
Lobelioideae moned 1a Austraalia liigid mood EcM (Lobelia heterophylla), teised mood endoMR EcM seentega, kolmandad AM. EcM on monedele liikidele hadavajalik,
Phytol. 110: 227-231.
eukalüptimetsas 1-3 a peale põlengut: pürofiilsetel kottseentel oma suktsessioon. 1a: Anthracobia melaloma, A. Maurilabra (mitteMR), Peziza tenacella (mitteMR), Pulvin
ole, HN norm
Inuleae (AUS Inuleae (AUS Asteraceae) mood kas EcM ja VAM või VAM, sõltuvalt fülogen. Positsioonist Inuleae (AUS Asteraceae) mood ka
andiella, Muciturbo -Viljakehade mood põhjal taassünteesil puhaskultuurist, nähti ka identifitseerimata anamorfe), kandseentest Laccaria
Thanatephorus gardneri mood ECM Melaleucal ja eukalüptidel
ol. 72: 387-392.

ıtaar, bakterite molekulaarne liigidefinitsioon (97% SSU = 70% DNA-DNA reass kineetika); 16S rDNA põhjal bakterite diversiteet: lühiülevaade, Curtis2002 kommentaa
decomposers, erinevate troofiliste rühmade sõltuvus taimede funktsionaalsest mitmekesisusest: väike; tugev vaid taimkatte puudumise korral
2004. Ecologi maapealsed ja maaalused seosed: ülevaade
ntal evidence which does not support the view that enhanced species richness improves ecosystem function. Oikos 79: 247-258.
46: 1052-1053.
diversity on d kõdulagunemine: kõdu segu efekt on aditiivne. Mullaloomadele mõjub mitte BD, vaid taimeliikide identiteet!
trophic level s taimede liigirikkus per se ja funktsionaalsed grupid ei mõjuta niivõrd mikroobide BD kui seda teevad individuaalsed taimeliigid; mõ blocked 1-way ANOVA
ı on ecosystem properties. Science 277: 1296-1299. saare suurusest sõltuvad taimekooslused: kovariatsioon: suured saared põlevad sagedamini, sest on suurem
liversity-ecosy ülddiversiteediuuringud: probleemid, ämbrid, korrektne katse püstitus ülddiversiteediuuringud:
. 9: 870-886. taimede liigirikkuse ja muude tunnuste/funktsioonide stimuleerivad mõjud mullaelustiku BD-le otseselt ja kaudselt
ıidase from the basidiomycete Phanerochaete chrysosporium. J. Biol. Chem. 267:23688-23695. MnP: meh
ology alter soil seente-bakterite suhe sõltub enim mulla C:N suhtest
water from Pi hydrauliline lift: maha saetud puukändudele joodetud vesi ja deuteerium jõuavad 3 nädalaga läbi mükoriisaseente ka noortele puudele
water from Pinus ponderosa trees to seedlings: evidence for an ectomycorrhizal pathway. New Phytol. 178: 382-394.
rraclough TG, Pauw A. 2011. The effects of above- and belowground mutualisms on orchid speciation and coexistence. Am. Nat. 177: E54-E68.
llination and mycorrhizal biology of orchids. J. Exp. Bot. 59: 1085-1096.
a: eri dipterok perek-del dominadid kattuvad: Huvitavatest Sarcodon thwaitsei, Laccaria vinaceoavellanea
a: eri dipterok perek-del dominadid kattuvad: Huvitavatest Leccinum sp
Bot. 14: 407-416. Boletales poroidsed perek Austraalias ja seosed Aasia ning Lõuna-pooleraga: Boletus, Boletellus, Tylopilu
south-east Asia. Mycol. Res. 105: 1440-1448. Boletales: er perek Boletus SE aasias v liigirikas. Käib läbi kõigi troo Boletales: er perek Boletus SE aasia
pecies and fungi: interactions with fungal, plant, and animal communities. In: Dighton J, White JF, Oudemans P, eds. The Fungal Community. Its Organization and Role in
Sclerodermatales: Astraeus hygrometricus on arv kompleksliik nagu P Sclerodermatales: Astraeus hygrome
ible solution. Appl. Environ. Microbiol. 62: 4299–4301. prokarüootide BD indek
Community Phylogenetic Structure and Trait Evolution, Version 4.0.1. Available from URL: http://www.phylodiversity.net/phylocom/.
unity ecology. süstemaatika abil liikide grupeerimine, tegemaks analüüse: ülevaade
d the phylogenetic structure of tropical forest tree communities. troopika puukoosluste fülogeneetilise võrdlemise idee
tality, size str evol ökol: Borneol seemikute ellujäämus sõltub nii sama liiki seemikute kui sõsarliikide tihedusest. Mida suurem on sõsarliikide fülogen mitmekesisus seemi
n example for evolutsiooniline ökoloogia: sarnasemad liigid sar evolutsiooniline ökoloogia: sarnasemad liigid sarnasemates kasvukohtades vrd juhuslikuga. Evol superpuu
orrhiza-dominated forests: testing the role of inoculum potential of arbuscular mycorrhizal fungi. Oecologia 143:148-156.
ıce Data: A Case Study of Foraminifera? PLoS One 8:e56739. mock community: Foraminifera - saab anda kvantitatiivse hinnangu enamiku
mycorrhizas of an American Laccaria bicolor strain inoculated in European Dou SCAR markerid Laccaria bicolor N238le. RAPD unikaalsete bändide põhjal. N238 sageli
ve and experimental approaches. Trends Ecol. Evol. In press.
ous fungus Tuber aestivum syn. T. Uncinatum on the island of G Tuber aestivum RAPD Tuber aestivum
he synonyms Tuber aestivum and Tuber uncinatum. Environ. M Tuber aestivum Rootsis: täpset sisserändepäritolu ei suudetud näidata, Tuber aestivum = Tuber uncinatum
skr. 95: 205-211.
Quercus robur and Corylus avellana field trials on the island of Gotland. Scand. J. For. Res. 24: 37-53.
or the same fu Stictis ja Conotrema: lihhenis ja mittelihhenis saproobne kottseen on jaotunud samade seeneliikide vahel Stictis ja Conotrema: lihhenis ja mitt
iza 21: 105–115.
charina sp
rsion of host u herbivoorsete putukakooslused on sarnasemad fülogeneet lähedasematel peremeestaimedel. Spetsialiseeritus erines suuresti putukarühmiti
ved hjelp av taxon-selektive nrDNA baserte *Helvella* -primere. Cand. Sci. Thesis Helvella-spets praimerid
ree seedlings. Phytopathology 11: 141-144.
on rates of bird Liigiteke ja väljasuremine on suurem tem Liigiteke ja väljasuremine on suurem temp-boreaalsetel aladel ,kus kliimamuutused on tuge
l related groups-hypothesis derived from nuclear ribosomal DNA sequences. My heterobasidiomycota: ITS, LSU Heterobasidiomycota: Tremellales,
hitherto overlooked cosm of heterobasidiomycetes with a broad mycorrhizal potential. Mycol. Res. 108: 1003-1010. Sebacinales: taksonoomia, süstemaa
ıer R, Redecker D. 2011. Sebacinales everywhere: previosuly overlooked ubiquitous fungal endophytes. PLoS One 6: e16793. Sebacinales: palju juure-endofü
by the corf-forming basidiomycete Phanerochaete velutina: the significance of local nutrient supply. New Phytol. 138: 607-617.
ily Sebacinaceae. Mycologia 74: 324-331. Tremelloscypha gen noc. 2 liik
Mycologia 67: 147-156. Efibulobasidium: VK sültjad n
odules of geographically isolated Arizona alder trees in Central Arizona (United States). Appl. Environ. Microbiol. 75: 6913-6918.
si liike vaid 1 Rhizopogon
ıs between Tuber melanosporum mycelia and transformed roots of Cistus incanus. Plant Cell Reports 20: 369-373.
. J. Bot. 60: 103-110.
pe ratio analysis. Rapid Communications in Mass Spectrometry 15: 501-519.
ope transition: stepis vs metsas vs kkt (eri mullaniiskus, mullatemp, PAR, kõdu, pH, orgaanika sisaldus, häiring; mulla N, P); DCA DCA
ogy and evolution. Ecology 87: S163-S165.
mbiosis with Casuarinal N lisamine ja taimekasvukiirus määrasid d15N
ll T. 2002. Interactions between decomposing wood, mycorrhiza, and terrestrial orchid seeds and protocorms. In: Kindlmann P, Willems JH, Whigham DF, eds. Trends an
hogens. Can. J. Bot. 82: 1198-1227.
opulations of hyperthermophilic archaea. Science 301: 976-978.
01. 13C incorporation into DNA as a means of identifying the active components 13C rDNA bakterid, rikastatud 13CO2
nment and clustering of phylogenetic markers - implications for microbial diversity studies. BMC Bioinform. 11: 152. iteratiivne klasterdar
logeny of the Zygomycota based on nuclear ribosomal sequence data. Mycologia 98: 872-874. Zygomycota: 3 evol-haru. Endo
ray: Amanita, Austropax, Boletus, Cantharellus, Clavulina, Coltricia, Cortinarius (domin), Descolea, Entoloma, Hebeloma, Inocybe, Laccaria, Tom
iving. Am. Nat. 175: 145-146. andmete kättesaadav
Ecol. Evol. 2 andmete säilitamine arhiivides on eelistatum kui artikli kodulehtedel, kodulehel või andmete säilitamine arhiivides on eelistatum kui a
k
is of the speci meta-analüüsi vaja kaasata ka uuritud skaala, proovide suurus. Kriitika Pärtel 2007 ja Laanisto 2008 aadressil

:47-54.

ecies structure troopikametsades üldiselt pole üksikliike, kel väga suur mõju koosluse struktuuri üle. Panamas pigem repellendid ja Sri Lankal mõned
N. 2012. Testi kooseksisteerimine: suurema liigirikkuse korral puudel üksteise vältimise muster väheneb (proportsionaalselt, mitte abs!) ja assotsiatsi
blue butterflies (Lepidoptera: Lycaenidae). Front. Zool. 4:8. barcoding gap: artefakt väheste proovide tõttu
wood-wide web. Curr. Opin. Plant Biol. 5: 1-7.
ı HV et al. 201 nisi konservatism: ülevaade testimisest, LK-st, toiduahelast, invasiivsetest, kliimamuutusest; prioritted nisi konservatism: ülevaade tes
ss. Trends Ec evolutsioonilise ökoloogia arendus, fülogeneetili evolutsioonilise ökoloogia arendus, fülogeneetilise nissi säilitamine. Taksoni levikut mõj algne ökoniss, alg
d conservation nishi konserveerumine: sõltub skaalast ja nishi konserveerumine: sõltub skaalast ja tuvastamisprobleemid; olemus
ui väetada: Cortinarius kaob, niisutades tuleb Cortinarius just juurde
ating the family tree. Proc. R. Soc. Lond. B. 268: 2211-2220. taimedel: erinevate geenisekventside
t affects communities of culturable root-endophytic fungi in temperate grasslands. Soil Biol. Biochem. 35: 1143–1154. DCA; TWINSPAN, Bri
idega; Phialophora finlandia sarnane ektendoMR klamüdospooridega (??? Chloridium paucisporum???)

eajuurtesse, väga ohuke mantel, DS hüüfid, harv kaheksharunemine
, P fortinii, Phialophora finlandia (ECM või ektendoMR), Chloridium paucisporum??? (ECM või ektendoMR), Cenoc. Mitmed peremeestaimed: mänd, kuusk, kask
aylo E (ed.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 54-68.
aylo E (ed.). Mycorrhizae. USDA Forest Service: Washington USA. pp. 183-185.
yphal necroma EcM seente liigirikkus vs hüüfide lagunemine ja CO2 eritamine: BD pos efekt
versity regulat Paxillus obscurosporus isolaatidel v erinev mõju taime kasvule ja mullahingamisele. Suurem genotüüpide arv stimul kasvu
ol. Biogeogr. Lett. 7: 137-140. arv. Et mükoriisad mõj taimede migratsiooni pärast jääaega. Puude levikukiirused 200-200(
407-410. ektomükoriisa püsimine probleemid: vastastikuse altruismi hüpotees -lükati ümber, positiivse tagasisidemega koosolemine (Perry et al 92 hüpot); grupivalik,
anisms. A comment on Fitter et al. 1998. Funct. Ecol. 13: 435-436.
ology? Oikos sümbioosi sh mükoriisa evol püsimiseks kõlbavad lisaks vertikaalsele ülekandele ka horis ülekande erijuhud: kui peremees saab valida paljude sümbiontide
AM ja ECM teke. ECM tekkinud iseseisvalt mitı AM ja ECM teke. ECM tekkinud iseseisvalt mitmetes rühmades ja tagasi pöördumine saprotroofideks, mit
ee-living microorganisms? J. Biogeogr. 28: 285-291. amööbidel suurusega alla 100 ym on enamasti kosmopoliitne levik
f Poa pratensis. Can. J. Bot. 65: 150-153.
ja kuusel bakterid, hiljem hakkavad bakterid enam domin. Mikroobide biomass suureneb ajas.
ot replace morphology for identification and classification. Cladistics 20: 47-55. DNA barcoding ei saa DNA barcoding ei saa asendada mo
ifty thousand years of arctic vegetation and megafaunal diet. Nature 506: 47-51.
ular investigation of sterile root-associated fungi from Epacris microphylla R. Br. (Ericaceae) and other epacrids at alpine, subalpine and coastal heathland sites. Australas.
of Coriolus versicolor. New Phytol. 89: 307-319.
ntarctica. Mycol. Res. 98: 34-36.
North New Mexico, S Wyoming: Purshia tridentata, Cercocarpus montanus mood EcM, AM ja Frankiaga nooduleid
Annu. Rev. Ecol. Evol. Syst. 34: 273-309. latituudi gradient: ülevaade taksonitest ja hüpoteesidest. Geometric constraint on tähtis
cience 311: 5 troopikas puude diversiteeti hoiab üleval lokaalselt haruldaste väiksem suremus
ar´s microendemic biota. Science 312: 1063-1065. Madagaskari jaot biogeo mikroregioonideks. Imetajatel on see sõltuv veelehkmealadest. Kuivadel ja jaheda
ic pairings of Echinodontium tinctorium. Can. J. Bot. 69: 2716 – 2723.
al host associations in the Sclerodermatineae (Boletales, Basidi Sclerodermatineae - arv /scler-pisol linidz tek 66 (50-90 err) MAT Aasias. Arv Aasias tek k
ology on diversification rates in three independent clades of Fungi estimated during binary state speciation and extinction analysis. Evo gasteroidsete ja mitteG evolkiir
s pundis, mood EcM Calostoma cinnabarinum on pi
Phialocephala fortinii, P. Sphaeroides, vähem Leptodontidium orchidicola Phialocephala sphaeroides liigikirjel
i TA, Andersen GL. 2002. High-density microarray of small-subunit ribosomal DNA probes. Appl. Environ. Microbiol. 68: 16S rDNA: >30000 probe, väga tihedasti, 20
ential microbial colonisation of ferromagnesian minerals affect mineral weathering in soil? Naturwissenschaften 95: 851-858.
essment of infrafamilial groups. Am. J. Bot. 88: 2013-2025. Myrtaceae: EcM perek väh 4 eri har
). juurkonkurents preerias karmim kui metsas haavale, ent mitte Boutelouale. Haab ECM-puu
ific identification of 18 pathogenic microorganisms using microarray technology. Mol. Cell. Probes 16: 119–127. 18 eri patogeeni (viirused, bakterid jt) spetsiif
2010. Photosynthetic carbon isotope discrimination and its relationships to the carbon isotope signals of stem, soil and ecosystem respiration. New Phytol. 188: 576-589.
otic forest fungi, especially in the tropics and the Southern Hemisphere. Bioscience 51: 134-140.
Picea abies) roots affects the pathway of anaplerotic CO2 fixation. Physiol. Plant. 96: 699-705. PEP karbo
NA sequences. PhD Thesis. University of Umea, Sweden. kottseente üldfülogenees 18S: vilets,
S from New Zealand. Trends Ecol. Evol. 17: 514-520. Uus-Meremaa biogeo: paljud NZL taimeliigid on hiljuti sinna levinud, radieerunud ja edasi levinud. Arv ei
ox genes reveal that gnetophytes are more closely related to conifers than to flowering plants. Proc. Natl. Acad. Sci. 96: 7342-7347. Gnetales vs õistaimed: MADS home
ceae. New Ph Lycopodiaceae sporofüüdid ja gametofüüdid mood AM. Gametofüüdid on mükoheterotroofid ja seonduvad vaid nende Glomuste rühmadega, mis ka eelneva
- Mise au point d'un outil moléculaire adapté à l'étude de l'écologie du genre *Morchella* en milieu forestier. PhD thesis, Laboratoire de Biologie Forestière, Nancy, France
2003. Compa Alnus rubra on tähtis komponent Alaska ökosüsteemis nii tootlikkuse kui bioloogilise mitmekesisuse koha pealt
kuival pinnal (Cylindrocarpon, Trichoderma), nii kival kui märjal juurtes (Bjerka ITS1F-ITS4 + spets praimerid pilliroole ning Trichodermale
lomustele kui ka spetspraimerid eristunud rühmadele. Leiti 35 liiki, sügiseti rohke AM mol BD pilliroo juurtes: kas praimereid nii tava-Glomustele kui ka spetspraimerid eri
Svenning J-C liikide kooseksisteerimise, sh konkurentsi ja fasilitatsiooni mõõtmise viisid ja interpreteerimine; ülevaade liikide kooseksisteer
re and life spa taime lehtede ja juurte ökomorf: okaspuudel juured jämedamad pms seenmantli võrra! Välja toodud seenmantli paksused liikide kaupa
minosae).. liblikõielised: väh 2 EcM klaadi: aka
BB, Bruneau A. (eds.) Advances in legume systematics. liblikõielised: radiatsioon kesk-eotse
plant invasio mullamikroobid hõlbust invas taimede invasiooni mullamikroobid hõlbust invas taimede invasiooni. Paljud invas taimed muudavad mullamikroobide kooslus
nding its range in the United States. Mycologia 104: 22-33.
he range expansions and host shifts of a symbiotic fungus. ISME J. 6 :745-755.
leitud teede ääres, ent mõnes kohas ka sügaval metsas Amanita phalloides invad N-Am: VK enamasti leitud teede ääres, ent mõnes kohas ka sügav
tiolata (garlic invasiivsed taimed Alliaria petiolata reduts. Männi EcM kolonis ja ecM biomassi allelopaatia teel.

thway marks the single origin of an ectomycorrhizal symbiosis. PLoS ONE 7: e39597. Amanita: saproobsed (EcM am
ry of Tylopilus subg. Roseoscabra in Australia, elucidated by comparison with Asian and American species. Aust. Syst. Bot. 6: 187-2 Tylopilus subgen Roseoscabra: uued
l morfot põhjal. Aastate lõikes muster ei kordu.
Alnus alnobetula idandid: obs vaid AM ja juurenooduleid
ne atmosphere. Phil. Trans. R. Soc. B 365: 3645-3653. atmosfääri mikroobid: dormantsed aga v paljud ka aktiivsed; arvukus väheneb vertikaalselt;
n (Gnetales) -clock calibration when outgroup relationships are Gnetum -v vana rühm, mis säilis L-Am ja viimase 47-13 MA jooksul l Gnetum -v vana rühm, mis säilis L-A

ps for microbes: the unsampled and the unseen. Ecol. Lett. 9: 80 mikroobide liigirikkus-ala suurus väikesed z-väärtused tulenevad eelkõige tuvastamata haru
aphic transitions on the Thai–Malay Peninsula. J. Biogeogr. 30: Malaka poolsaar, Kra maakitsus; merede regressioonid ja transgressioonid ning selle mõju elusloodusele
rse lignicolous fungi. Mycologia 89: 199-219.
uazu NP: EcM puid ei mainita. Leitud vaid Thelephora 1sp, Coltricia 1-2 spp; saproobidest sh Phlebopus tropicus, Geastrum 3 spp, Spherobolus
unctional characterization of fungi from the *Sebacina vermifera* complex from common and rare orchids in the genus *Caladenia* . Mycorrhiza, in press.
of evolution in tropical climates. Proc. Natl. Acad. Sci. 20: 771 taimede molekulaarne evolutsioon on troopikas keskm 2x ki taimede molekulaarne evolutsio
e age El Nino? Pacific biogeography and evolution of Metroside Metrosideros tek arv Uus-Meremaal, kust levis suht hiljuti alles välja arv kliimamuutuste ja sellest lähtuval
ja ka ca 33% kloonidest)
rhizal fungi in a primary successional volcanic desert on the southeast slope of M AM nuLSU t-RFLP,sekv
ch (Betula platyphylla var. japonica). Mol. Ecol. Notes 2: 413-415. RAPD, SCAR markerid kasele
ctions between extraradical mycelia of ectomycorrhizal Pisolithus isolates. New Phytol. 194: 1070-1078.

tween Pinus densiflora seedlings linked by ectomycorrhizal mycelia? New Phytol. 149: 137-146.
tosynthate from ectomycorrhizal Pinus densiflora seedlings to extramatricial mycelia. Mycorrhiza online.
lations in primary successional volcanic deserts on Mount Fuji a Cenococcum: levib primaarse suktsessiooni aladele vegetatiivselt. Lähedastel aladel mõned identsed genot
vth and uptake and transport of 15N-labeled compounds by Pinus tabulaeformis seedlings under water-stressed conditions. Biol. Fertil. Soils 28: 136-138.
porocraps and a hyphal mantle. Mycotaxon. 179-188. Peridiospora gen nov. Zygomy
hance the growth of the endangered orchid Cymbidium goeringii. Botany 88: 20-29.
evaluation of functional gene arrays for detection of selected genes in the environment. Appl. Environ. Microbiol kogu geeni a kogu geeni array: amoA, pmoA, nirS, nirK, 1
erate eastern Asia and eastern North America. Can. J. Bot. 75: sarnaseimad piirkonnad 'Simpsoni indeksi jr: Amanita -Aasia-Eur; NE Am-NW Am; Lactarius -Eur-Aasia;
l biogeographic relationships of eastern Asian and eastern North Suillus biogeograafia: Aasias vs Ameerikas -populatsioonid on selgelt eristunud moningatel liikidel
N nutrition of ectomycorrhizal Pinus resinosa. Soil Biol. Biochem. 37: 965–975.
crobes and ectomycorrhizal fungi using a protein–tannin complex as an N source by red pine (Pinus resinosa). New Phytol. 159: 131-139.
kooslus muutub, korrel taimekooslusega va EcMF
g common airborne fungi, and development of specific oligonucleotide probes for the detection of fungal isolates. Appl. Envi slot blotid >30 eostega levivale seenele, 18-2
puudel Etioopias AM
genous conifer species in the dry Afromontane forests of Ethiopia are associated with distinct arbuscular mycorrhizal fungal communities. Can. J. Bot. 84: 1617-1627.
of arbuscular mycorrhizal fungi in Prunus africana, an endangered medicinal tree species in dry Afromontane fo praimerite mittesobivus AM seent X2 test 2 koosluse erista
2RE + sekv

enococcum; rabas mänd ja männil Suillus tomentosus; 3. Russula sp. Tuvastasid Suilluse ka tsuuga ja kuuse juurel
note a nitroge Rododendroni varis lagun aeglasemalt kui lehtpuudel ja sisald rohkem tanniine. ErM juured said rododendroni pinnaselt paremini kätt
their multicopper oxidases from a temperate forest shrub. Ecol. Evol. 2: 65-79.
cts: Historical biogeographical implications for angiosperms in 10 taimeperek boreotroopilises vöötmes: enamuse levikutsenter SE-A Proge DIVA kasutamine traimede bi
Gaultheria shallon on forest clearcuts. Can. J. Bot. 74: 337-346.
ric transfer of ribosomal genes between two fungi. BMC Evol. Biol. 8: 87.
J. Ecol. 87: 98 varise efekt taimekooslustele: üldjuhul negatiivne seal kus paks kõdukiht; pikemas perspektiivis varustab toitainetega; positiivne rohu
ntation among natural populations of the ectomycorrhizal mushroom Tricholoma matsutake from southwestern China. Mol. Ecol. 17: 1238-1247.
tis vähim, mullas rohkem; kooslused muutuvad haigetel taimedel
on, nitrogen and phosphorus in terrestrial ecosystems. Glob. Ec Mulla ja mikroobne C, N, P suurenevad pooluste poole; maailma keskmine mulla C/N=17 j
254-264. pärn levinud vaid põhjapoolkeral kuni Kesk-Mehhikoni, tsentriga Ida-Aasias. Tek hiliskriidis Kagu-Aasias
tanthera minor , an orchid associated with ectomycorrhiza-forming Ceratobasidiaceae fungi. New Phytol. 193: 178–187.
ngi isolated from nonphotosynthetic orchid *Chamaegastrodia sikokiana* . Mycorrhiza 18: 97-101.
Orchidaceae) in tripartite symbioses with Thelephoraceae fungi and Quercus serrata (Fagaceae) in pot culture consition. J. Plant Res. In press.

vrd ECM BD Kolmogorov
uda M. 2008. *Monotropastrum humile var. humile* is associated with diverse ectomycorrhizal Russulaceae fungi in Japanese forest. Ecol. Res. 23: 983-993.

corrhizal fungi associated with *Pinus densiflora* by in vitro mycorrhizal synthesis. I. Primordium and basidiocarp formation in open-pot culture. Mycorrhiza 11: 59-66.
3 RE, tõestamine
der: effects of Frankia and Alpova diplophloeus on the growth, nitrogen fixation and mineral acquisition of Alnus tenuifolia. Plant Soil 254: 179-186.
saprotrophic and ectomycorrhizal fungi producing sporophores on urea-untreated forest floor. Mycol. Res. 103: 811-816.
olia on the growth, nutrition and ectomycorrhizal symbiont community of black spruce. For. Ecol. Manage. 105: 197-207.
Effects of Forest Use on Aphyllophoraceous Fungal Community Structure in Sarawak, Malaysia. Biotropica 40: 354-362.
ephalanthera falcata (Orchidaceae) into natural habitat and investigation of colonized mycorrhizal fungi. Ecol. Res. 23: 329-337.
Cephalanthera falcata (Orchidaceae) into natural habitat and investigation of colonized mycorrhizal fungi. Ecol. Res. 23: 329-337.
orthern Japan. lepa muld on happeline, ent okaspuudega võrreldes toitaineterikas; lepa varis laguneb kiiresti vrd teiste puudega, on toitaineterikas (er
es, Tricharina mikolae. Mycologia 76: 675-684. Tricharina mikolae (nüüd Wilcoxina
he distribution of arbuscular mycorrhizal fungi: evidence from ITS rDNA sequence metadata. BMC Evol. Biol. 12: 50.

hou J. 2014. The microbial gene diversity along an elevational gradient of the Tibetan grassland. ISME J. 8: 430-440. geenide
ngi in two mangroves in South China. Plant Soil 331: 181-191.
Rev. Genet. 3: 579-588. cDNA microarray dis cDNA microarray disain
ne genus Anamika (eugarics, hebelomatoid clade) based on morphology and ribosomal DNA seqences. Mycol. Res. 109: 1259-1267. Anamika uued liigid JPN ,S-Hi
questrate genus *Rhodactina* (Basidiomycota, Boletales) in northern Thailand. Mycotaxon 96: 133-140. Rhodactina gen nov. Hypog Bo
ıktsessioon
suured erinevused, ent BD sama. EcM BD nõgudes kõrgem. Seentekooslusel ja taimede kooslusel v tugev Procrustes korrelatsioon
2010. Use of ITS2 region as the universal DNA barcode for plants and animals. F ITS2 eristab keskmiselt 92% loomaliikidest ja 75% taimeliikidest. 0.3% taim
). Kew Bull. 50: 359-365
les (Zygomycotina) Kew Bull. 50: 349-357.
na kirjeldus
ed Cortinarius, Atheliales, girdling: Helotiales, Serendipitaceae, Ganodermataceae. Bakteritel muutused väiksemad: vähenesid alphaproteoB ja Acio
sed on two chloroplast DNA regions: ndhF and trnL Intron-intergenic spacer. Syst. Bot. 25: 479-494. Kobresia on pisike rühm perek Care
s O, Piceno YM, Andersen GL, Kowalchuk GA. 2009. Environmental microarray analyses of Antarctic soil microbial comm Phylochip vs Geochip: fülog BD ja fun
m information MIMARKS standardid ökoloogilistele uuringutele ja proovidele
e of ectomycorrhizal fungi in a dipterocarp forest in Thailand. International Symposium on Microbial Ecology. Asia 2007, 15-17 September 2007. Ehime Univ., Matsuyam
oryloideae (Betulaceae). Int. J. Plant Sci. 163: 641-650. Corylus(Ostryopsis(Ostrya+Carpinus segi)). Aasia on refuugium Corylus(Ostryopsis(Ostrya+Carpinu
frica) with basidia forming internal hyphae. Mycol. Progr. 6: 239-247. Tomentella furcata sp nov
ta, Thelephorales): *Tomentella radiosa*, *Tomentella cinereoumbrina* and *Tomentella punicea*. Nova Hedw. 85: 521-539. Tomentella tüübikirjeldused: T. Pun
gi: 1. *Tomentella capitata* and *Tomentella brunneocystidia*, two new species from Benin (West Africa) with capitate cystidia. Mycol. Progr. 6: 7-18.
opa uniflora: morphological and molecular assessment of mycorrhizae retrieved from sites in the sub-boreal spruce biogeoclimatic zone in central British Columbia.
: 30-31.
ewton WE (eds.). Genomes and Genomics of Nitrogen-Fixing Organisms, Springer, Amsterdam, 221-241. nitrogenaasi eri geenid bakterit
e dark septate fungus Phialocephala fortinii and Asparagus officinalis roots. Can. J. Microbiol. 47: 741-753.
phora
formatics platform for analyses of large 16S rDNA libraries. BMC Bioinform 7: 57
formatics platform for analyses of large 16S rDNA libraries. BMC Bioinform 7: 57
ence, and plasticity of six slipper orchids from South Western China. Mycorrhiza 20: 559-568.
phylogeny of the endophytic mycobiota in the roots of rare wild rice (Oryza granulata) from a nature reserve in Yunnan, China. Appl. Environ. Microbiol. 76: 1642-1652.
e-root nitrogen Juurte N:P suhe on suurem troopikas, eks Juurte N:P suhe on suurem troopikas, eksponentsiaalne seos; lehtede N:P suhe troopikas lin
e-root nitrogen and phosphorus. Nature Commun. 2: 1-6. lehtede ja juurte N/C suhe on troopikas palju suurem kuna P on limiteerivam;
mmun. Stat. 34: 2123-2131. Nonparametric Maxi
mmun. Stat. Theor. Meth. 34: 2123–2131.
sity in Apostasia (Orchidaceae) indicates the origin and evolution of orchid mycorrhiza. Am. J. Bot. 96: 1997-2009.
Russ-lact
) microarrays: a novel technique to study the species composition of complex microbial systems. Nucl. Ac. Res. 31: e95. NotI kõikuvatel regioonidel põhinev restriktsi
ɔ sademed, mitte EcM vs AM; Domin kandseened! Eriti Cryptococcus; männi-tsistuse kooslusest identif Inocybe x 2 , Hebeloma x 2
5* domin Fusarium; 45 ja 50* domin Candida ethanolica
pines. For. Sci. 10: 214-222.
seudotusga menziesii + *Poria terrestris* (blue- and orange-staining strains). Can. J. Bot. 47: 1833-1840.

gon vinicolor, Poria terrestris; Cenoc ja Piloderma fallax ei moodustanud ECM
oderma bicolor, Cenoc, Pisol -lühikirjeldused
ssist, mis omak mikroobide PLFA mitmekesisus sõltub taimede biomassist, mis omakorda on seotud taimede liigirikkusega Tilmani plottides; samas muutused mikroobikoos
versiteet: kontseptsioon, põhimõtted, meetodid, ülevaade diversiteediindekseid ei
orthern Chihuahuan desert. Mycologia 78: 840-841.
mmunity: role of abiotic and biotic factors. Can. J. Bot. 58: 1915-1922.

with Castanea sativa, Quercus suber and Alnus cordata. Agric. Ecosyst. Environ. 28: 563-567.
3 RE
sinapizans ectomycorrhizas. Mycol. Res. 105: 611-614
tential and habitat preference of native woody species in South Brazil. J. Trop. Ecol. 16: 603-622.
se and successional status in 80 woody species from south Brazil. J. Trop. Ecol. 19: 315–324.
giosperms revisited. Proc. Natl. Acad. Sci. 99: 6848–6853. õistaimede basaalne perek. On Amb
14. Three keys külmas kliimasse tulekuks oli vaja taimedel juba peenikeste juhtsoonte olemasolu. Samas lehtede langetamine tekkis pärast kolimist ja
ce Hall.
nd its affinity with the genus *Lecanicillium*. Mycol. Res. 112: 811-824.
ation in trees, soils and fungi in a natural forest stand and Norway spruce plantation. Ann. For. Sci. 64: 419-429.
strategy during truffle ascocarp development under holm oak. A response based on 13C and 15N natural abundance. Ann. For. Sci. 65: 607-617.
emate uuringute andmete põhjal on tegu Tomentella liigiga
d mycorrhizas, seeds and protocorms. Mycoscience 37: 439-448. Ceratobas
southeastern Asian Boletus indecorus. Mycologia 104: 1420-1432.
e osakaal 79 vs 37%; seene RNA osakaal 64 vs 35%; ergosterooli konts 1,62 yg/mg vs 0.72 yg/mg
izal symbionts of oak. Ukr. Bot. Zh. 23: 62-66.
suhije stepi. Ukr. Bot. Zh. 10: 67-71.

and speciation of the mushroom species Pleurotus cystidiosus a Pleurotus spp: enamik liike esineb konkreetsetes makroregioonides, v üksikutel sõsargrupp kaugel -arv. Ku

nomic infrastructure of the Pleurotus eryngii species-complex as determined by RAPD analysis, isozyme profiles and ecomorphologica Pleurotus eryngii: populatsioonide sp
opulation genetic structure of fungi. In: Dighton J, White JF, Oudemans P, eds. The Fungal Community. Its Organization and Role in the Ecosystem. CRC Press, Boca Ray
athogen Mycosphaerella graminicola is characterised by high nuclear diversity, low mitochondrial diversity, regular recombination, and gene flow. Fung. Genet. Biol. 38: 2
ıus from Australia. Mycol. Res. 92: 192-198.
dodendron fortunei in subtropical forests of China. Mycorrhiza 19: 417-423.
ecosystems: global patterns and controlling factors. J. Plant Ecol. 1: 85-93.
ons: practice, problems and prospects. Mol. Ecol. 12: 563-584. populatsiooniuuringuteks ja SNPde tuvastamiseks soovit SCAR praimerid; DHPLC kirjel
5–169. kimalaste krüptilised liigid on tihti spetsialiseerunud eri taimeliikidele. Samale liigile spetsialiseerunute koeksistentsi soodustab suguline allokatsioon

manita (Agaricales, Basidiomycota): taxonomic and biogeographic implications. Fung. Div. 17: 219-238. Amanita perek-sisene ITS, LSU
(Discula destructiva) and the Diaporthales. Mycologia 93: 355 -365. RNApol II SU; SSU; LSU Diaporthales on monofüleetiline rühm
AY, Rogers JD, Kohlmeyer J, Volkmann-Kohlmeyer B, Sung G-H. 2006. An overview of the systematics of the Sordariomycetes base Sordariomycetes: Lulworthiales+Xy
genus Hymenoscyphus (Ascomycetes, Helotiales). Nova Hedw. 78: 475-484. ITS Hymenoscyphus on v lai perekond,
ve Kobresia sp Kobresia: levikukese Hiina-Tiibeti alpiaasad. Täl Kobresia: levikukese Hiina-Tiibeti alpiaasad. Tähtis keystone rühm. Aseks paljunemine risoomidega
liable estimate of soil fungal biomass? Soil Biol. Biochem. 37: 311–317
ubunit rRNA hybridization probes for quantitative molecular microbial ecology studies. Appl. Environ. Microbi dot blotid ül dot blotid üksikute oligoprobede (15-18 nu) is
aprobic fungi. Mycol. Res. 105: 1449-1457.
on. Appl. Environ. Microbiol. 62: 316–322. DNA eraldamine mullast: 1% CTAB parem kui PVPP (40
etworks. mBio 1:e00169-10. network analüüs met
work of soil microbial communities in response to elevated CO2. mBio 2:e00122-11.
versity across various microbial taxa. Proc. Natl. Acad. Sci. USA 105: 7768-7773. Geochip: mullaensüümide profiilide mu
studies. Curr. Opin. Biotechnol. 13: 204–207. mikroarrayd kasutamine mikroobide tuvastamiseks, ka kes
le ja fülogen diversiteet ning liigirikkus palju suurem, domin pole; all tugev domi bakterid mullaprofiilis: 18S RFLP+sekv. Ülakihis liikide ja fülogen diversiteet ning liigiril
M. 2002. Spatial and resource factors influencing high microbia bakterite diversiteeti mullas mõjutab C-rikkus, C-heterogeensus, konkurents, isola 1/D, lognorm alfa: bakte
. Curr. Opin. Microbiol. 6 :288–294. mikroarrayd kasutamine mikroobide tuvastamiseks, ka kes
diomycota) from Australia. Mycotaxon 122: 123-128.
us rubra) seedl taimestiku katvus vs ECM koloniseeritus (opt 30…40%) jpt näitajad
atsioon kõrvuti proovides T-RFLP: palju suurem lahutusvõime
ev. Liigisisene ISSR (RAPD): 3 mikrosatelliitpraimerit, praimerite valik, bändid RAPD markerite põhjal
uillus grevillei populations in two Larix kaemferi stand over two years. J. Plant R ISSR Suillus grevillei
als gene flow within and between ectomycorrhizal Suillus grevillei populations. N ISSR e SCAR mikrosatelliitmarkerid (3) Suillus grevillei jaoks -3 markerit ei võimalda kõ
mycelia and ectomycorrhizae of Suillus grevillei genets.J. Plant Res. 114: 179-1 SSR analüüs ECM juuretippudele liigispetsiifiliste markeritega
rhizal fungi. Fung. Div. 33: 123-137.
nd identification of allelopathic compounds. J. Chem. Ecol. 20: 407-421.
plant systems. Trends Pl. Sci. 8: 407-409.
dpflanzen in Mitteleuropa. Hoppea 61: 43-55.
lophytes of the Helotiales in ericaceous plants and the grass, Deschampsia flexuosa. Stud. Mycol. 53: 147-162.
graphical and ecological distribution of nitrogen and carbon gains from fungi in pyroloids and monotropoids (Ericaceae) and in orchids. New Phytol. In press.
llorhiza trifida is a partial myco-heterotroph. New Phytol. 178: 395-400.
e PCR. Biotechniques 21: 268-279. kvantit kompetit PCR
obal Patterns of Bacterial Beta-Diversity in Seafloor and Seawa bakterid meres: pms erinevus bentose ja pelaagiliste koosluste vahel; bentose omadl tugevan
uts); erinevad klasterdamisalgoritmid; soovit MCL
ast; nt singletonide ja <50sekv-OTUde väljaviskamine ei muuda tulemusi kvalitatiivselt, ent väh veeorganismide kooslused: ülevaade metoodikast;
Ecology 43: 1 puuindiviidi mõju mullaomadustele: pH madalam ja N konc kõrgem puu lähedal
g: it is time fo levikueksperimentide kaasamine on vajalik BS v levikueksperimentide kaasamine on vajalik BS vs ökosüs fn eksperimentidesse, mis aitab planeerida ka kai
limited by see taimeliikide arv kasvas kui lisati seemneid, eriti kontrollalal, häiringu tagajärjel
n an experime puisniitu taastades metsa maha võttes on oluline niita raiesmikku, et suurendada taimede liigirikkust. Ka juurte läbilõikamine suurendab liigirikkust ja võsud
ological factor taimede koeksist eri teooriad: tutvustus -arv kõigil teooriatel oma osa eri kooslustes sõltuvalt proportsioonist. Puisniitudel on tähtis liigifond ja regulaarne nii

kõdulagunemine: varise BD mõjutab pos seda lagundavate mikroobide Funktsionaalset BDd (PLFA)

Tomentelloid	trühvlid	ECM-seened	Orhideed, monotrop, MH	patogeenid, herbiv	saprotroofid

meerides ja sekventsi viimases kolmandikus
ktid. LSU puhul on neid rohkem. Soovit eemaldada singletonid ja Illumina puhul OTUd, mida alla 10.

COI. Peaks kasutama 99.5% thresholdi.
on; enamik singletonidest on tõenäoliselt vigased järjestused
rid, mis on perfect match 80% ja 89% vastavalt eri eukarüootidele
ianumbrit

ismidele ja markeritele 454: eri praimerid IT
sarn täpsus, toob sisse vähem vigu

tud. ANDMETES on varjatud kasvukohatüübi efekt, mis eriti mõjutab seente liigirikkust. 454 ITS1

d üle-esindatud sekventside seas; üks primeri mismatch langetab suht arvukust u 5-10 x.
line proge

aktor
robleemid ja lahendused NGS analüüsiks. Surnud organismide DNA on lagunenud kuni 150 bp fragmentideks.
ssifitseeritud kui võrrelda RDP andmebaasiga

h ja tugev bias.
s
lemusi kui tava-Folmeri praimerid, ent osad taksonid siiski puudu. Kõiki variante pole võimalik arvestada, kuna spetsiifilisus kaob
taminandid, heteroplasmiat, üldjuhul kõik indiviidisisesed variandid y 98% sarn

eristus SSU põhjal
tatud sekv arvu proovi kohta
seks
single-cell PCR - üldiselt sarnane, ent erinevused rühmades, kus on teada suured rDNA koopiate erinevused (alveolaadid); 454 pul
avad 2,5x erinevaid BD tulemusi ja 7x erinevaid homopol tulemusi; hõimkonnad on võrdeliselt esindatud, ent dinoflagellaatide sug
e mikroobidele sh nematoodidele; Universaalsete euk praimerite mismatchid seentel, molluskitel jpt-l

pärmiliikide fülogeograafia genoomide baasil. Sacch uvarum pärineb S-Am Nothofaguse ja Cyttaria juurest, ent korra levinud Põhj
ndmetest, mmillest tuleneb väga suur seltsi-tasemel ebatäpsus (palju inimsekventse)
ktsiooni. Tulemus sarnaneb ESPRIT-tree meetodile. ITS jörjestuste väljalõikamine alternatiivsel moel PFTOOLS paketiga
prokarüootidele ja eu
Soovit. Mock-communityt. Helvella spp ei saa kahepoolseid ega reverse sekventse

on suva asendused, qual v21,

-mullas

ruumilist mustrit ei ole; Mulla P mõj neg ja pH, taimedeBD ja kõrgus!! mõj pos liigirikkust; seente fülogen be seentekooslused Sve

replikaadid annavad eri tulemusi

ass max 10-30 a metsades enne hõrendamist
Lyman liustiku alt va
ud aeg, käelisus
em erinevamate sekventsidega kooslustes; kimääritekkekoht on tavaliselt konserveerunud paigas, ei sõltu GC ega AT rikkusest.
estustel rohkem kimääre; samu kimääre võib olla rohkem kui 1 koopia, sest break-point on sama ja korduvalt tek uued; metagenoo
ei saanud Cenoc. 454 eelistas kõrge G+C; kloeneetimine A+T järjestusi. PCR replikaadid väga sarn omavahel
seks peab similarity olema 97% ja per-base error probability </=0.2. Muidu v palju artefakte homopol tõttu. Said 0.03 kontaminan

bias. 18S võttis kõige laiemalt
GANisse
hiirte vahel, ent ka haigestumise ja sugude vahel (UniFrac). Eeldavad et pürosekv vead akumul sekventside vahel juhuslikult
sid putukate DNA segude peal mitmest proovialast. Valideerimiseks määratud isendid tohutus koguses
mist. Markereid peaks olema mitu, üks neist ametlik triipkood; markerid peaks olema kindlasti liigi-tasemel resolutsiooniga, sest n
võrra: denitrifikatsioon kasvab, geenide suht G+C content kasvab, CO dehüdrogenaas, respiratoorsed geenid kasvavad, bakterite ja
e ja olulisuse jaoks. Üle 2x erineva katvusega proovide võrdlemist peaks vältima. Piisav katvus on 50%, mis mulla puhul tähendab
imiseks NCBI taksonoomiat
lüüs MEGANIga: kasutab identifitseerimiseks NCBI taksonoomiat
versiteedianalüüs, metatranskriptoomika vs. Array-põhised tehnoloogiad (Geochip, Phylochip). Avatud meetodite puhul uute hõim
-comm, kus kõigil genoomid sekveneeritud!. 454 puhul selge GC hälve, ent Illuminal mitte. Metagenoom andis ka vasteid muudel
oom saab kätte palju rohkemate hüimkondade ja perek 16S regiooni vrd amplikonidega. Bakteritel 0.1% kõigist geenidest on rDN
al väheneb ja seente oma suureneb; domin kottseened; Glomeromycota polnud; . Tsellulassi tootsid veebr pms Leotiomycetes, ma
leb arvestada ka tagide disainil, selleks Levenshtein e edit distance. Ed=3 lubab 1 bp parandada
fakt; vead tekitavad unikaalseid OTUsid
tsi, millest jäi 2.6M pärast proovideks jagamist; ühest mullaproovist 1550-3000 OTUt; anniiling temperatuur mõjutas tugevasti OT
suurendab täpsust, replikaatide sarnasst ja beta-diversiteeti. GC-content mängib rolli proovide konkureerimisel NGS analüüsis. Soo
imaalne; eranditeks Laetiporus, Aspergillus sp, kus >1% sekventse tunduvalt erinevad.
nõju bakterikooslusele
mise pikkuse ja kvaliteedi vahel: AmpliconNoise vs QIIME; mothur vs acacia. Tulemuste parandamine muutes üksikuid parameet
ljude loomade sümbiondite kooslused sarn. Ka sisalikel olemas. 1000x erin sekventside arvus
eks), Illumina, AB SoliD, HelisCope. Väga oluline arendada tarkvara ja hinnata sekv vigu; arhiveerimine
iD, HelisCope.

rnased, ent pyro oli tundlikum ja andis märksa rohkem OTUsid.
i 30000 b; kavaliteet 1-way 70%, 2-way 85% õigeid
i 30000 b; pms vead on mitmesed insertsioonid ja N
geenipiirkondadele, sh plastiid, ITS2 ja mtDNA
S analüüsiks. Lühemad jupid tulevad rohkem esile. Altern praimerite vahel on teatud eripärad koosluse str tuvastamises. Ruumeni
0% on v raske amplifitseerida Phu polümeraasiga. Aitab segu-polõmeraasi ja keemia kasutamine. PCR-vabadel tehnoloogiatel häl
id; Illumina toodab 2x rohkem liike kui 454, ent 3 altern põhjust: 30x rohkem sekventse, ITS1 vs kogu-ITS, platvormi-spets.
rDNA geenide 454 anal artefakt
ks. 20-kordsed erinevused eri seentel; osa seeni on viletsama kvalit-skooriga, esineb palju autapomorfseid vigu, mis ei tule välja k
e Illumina HiSeq 2000 platformil.
tuuri
e eemaldamine, kehvade nukleotiidide maskimine, Tagide tundmine, reverse-complementary, ITS ja LSU eraldamine,
tagiti erineda 10x
e hõimk: kottseentest (41%) domin Onygenales, Pertusariales, Pleosporales, Hypocreales (Helotiales ja Pezizales 2%); kandseente
>400 bp pole enam vahet. >1000 bp sekv edukus 10%. Arv kehva primerite sobivus vähendab BD, seetõttu tuleb lisada degener p
a analüüsi kiirust; eraldab ka kimääre

ed jupid annavad piisavalt head taksonoomilist infot

pH gradient ei mõj li

liima, mitte ehitisetüüp. LROR-F ja LR5-F
suured erinevused LSU ja SSU vahel; kui mingit liiki võtta kordades rohkem, ei peegeldu see pürode arvus; 0.6% sekventsidest ki
ekv. Praimerid 18S planktonis
ast. Eri tagid ei tekita stat olulist erinevust
aliku korral võimelised tuvastama muutusi mikroobide koosluse struktuuris; vaja andmebaasi pikkade järjestustega
d sekventsidele pakuvad 1% vea-kriteeriumi

ptoomide uuringutes: kriteeriumid, vajalikkus, metaandmete puudulikkus, falsifitseeritavus jms.

võimaldab töötluse taastada
giooni! erinevused linna- ja maapuude vahel ning eelkõige sesoonne muster - BD kasvab sesoonselt
juhuslikke insertsioone. SSU V4 vs V9 erinevad suurel määral sekv-vigade poolest, interakteerudes masinaga. Titaniumil singleto

nalüüside tõttu ei saa seente ja taimede osakaalu dieedis hinnata

did soosisid seda. Soovit single-linkage eelklasterdamist ja average-linkage klasterdamist ,Pikka saba see siiski ei vähenda. Paljud
te kasutamine. Soovit kasutada vähe sekventse, et vähendada artef teket; arvustisimul
ad ebaproports seega jaotunud. Eriti probleemsed homopolümeersed regioonid; kasvõi üht N sisaldavad järjestused, normaalsest p
in inserts ja delets suva kohtades. U 300-400 bp pealt kvaliteet halveneb järsult; Vigade hulk sõltub ka pos Ptplaadil. Lüj jrk on lü

ıalyses of fungi. MycoKeys 10: 1-43.

ɔn M, Parts K, Pärtel K, Otsing E, Nouhra E, Njouonkou AL, Nilsson RH, Morgado LN, Mayor J, May TW, Kohout P, Hosaka K, Hiiesalu I, Henkel T

biases. New Phytol. 188: 291-301.

ɔlecular identification of fungi – recent updates and future perspectives. New Phytol. 186: 281-285.

mõõdukad. ITS1F ei amplifitseeri mitmeid seenerühmi. ITS4B vilets - spets kandseentele, ent jätab välja paljud rühmad
xtractor ITSx

ad. Koosluse struktuuri mõjutab nii seentel kui bakteritel induts põud, ent CO2 ja temp polnud olulised seened vs CO2, temp

jaoks on ITS7o-ITS4: ITS2 regioon

kladi: euagaric; boletoid (athelioid); hymenochaetoid (corticioid); phlebioid; russuloid; polyporoid (trechisporoid); thelephoroid; gomphoid; cantharello

updated fungal ITS sequence dataset for reference-based chimera control in environmental sequencing efforts. Microbes and Environments (in press).

iku analüüsis põhjustab erisusi. Mõju Arvestatakse maha regressioonanalüüsi käigus

2 ja LSU annavad sama täpseid määranguid duguk tasemel. Täpsus sama ITS2 puhul. Ka perk-tasemel. Koos bootstrapi 50% arvut

õhiste analüüside statistika
Boonyuen N, Burgaz AR, Buyck B, Cai L, Cai Q, Cardinali G, Chaverri P, Coppins BJ, Crespo A, Cubas P, Cummings C, Damm U, de Beer ZW, de H

.

ıdes parem kui triipkoodistamise geenidel; ITS1 eristab pisut paremmini kui ITS2, ent ITS1 pikkus varieerub rohkem kui ITS2. Vr

eae-ga tek väh 3x, var liikide vahel väike, näitab kiiret radieerumist hiljuti cruliniforme rühmas. Bioloogiliste liikide vahel tihti erin
dab kaht monokaarüonit (lahknevad 50 Hebeloma sp.
: bioloogilised liigid pooleldi sobimatud; mõni tundub olevat kahe teise hübriid tuuma ja mt DNA põhjal (IGS vs CTB); liigiteket on mõjutanud geogr. A
: 22 bioloogilist liiki, mis on paiguti parafüleetilised ning morf eristamatud. Kompromissina 4 feneetilist liiki
Cephalanthera longifolia albiinod vs FS taimed -kolonis Tomentella-Thelephora lii
gical and taxonomic research with an online implementation for fungal ITS sequences. Evol. Bioinform. 6: 189-196.

millest enamus olid kimäärid). Barcoding kriteerium 99%, prooviti ka 98% ja 97%,ent erilist vahet polnd
tuse ja jrk analüüs: Ceanothuse (ja tammede) eri alamperek liigid esinevad koos, aga mitte alamperek siseselt

miseks bakteritel, mängimine formamiidiga, oligotel kompetiitorite kasutamine, 14C-rRNA eraldamine gradienttsentrifuugiga
Fomes

eemne ja liigirikkam kui varzea. Siin-seal, eriti saartel kasvab ka Coccolobat; Glatsiaaltsüklid on igapode leviala v tugevasti mõjuta
protistide ökoloogia

Suillus bovinus

Piceirhiza

Amaurodoni AUS uus liik. Cunninghami A.viridist peab Tomentellaks. Risomorfid tsentraalsete hüüfidega, v sarn Boletalestele. Märkas, et väga agaralt

osa AUSs

Ramaria: subgen Le

Entoloma saepium: ECM vs parasiit? Pigem parasiit

Entoloma saepium: ECM vs parasiit? Pigem parasiit
viljakehade produktsioon

T. albom., Bankeraceae, Thelephoraceae

Xerocomus ja Gomphidius

väidet ei saa olla sõsarliigid. Tuberil 2 mantlitüüpi; Geastrum ei mood HN; Eri RM tüüpide, cys ja mantlitüüpide funkts tähtsus.

ened liigivaesed, sügavuti liigirikkus väheneb. Seentel 18S rDNA, Kowalchuk 1999 praimerid ja metoodika

bakterid ja seened. DG

Boletus aereus, edulis, reticulatus Cistus sp-l; Boletus pinophilus ei mood EcM Cistusega

Laccaria, Hebeloma

ata sp nov, Coltriciella navispora sp nov -mõl assots tugevasti lagunenud puidu ja EcM Dicymbe metsadega

; praimerid, protokolli optimiseerimine

Laccaria proxima

patrellaceae on sõsartaksonid. Am v sagedased maasiseste vk vormid

eae ja Gomphales näitel

kitinaasid ja peroksidaasid olid eriti aktiivsed agressiivsete Pisolithuse vahel

OrM: Goodyera repens vs Ceratobas cornigerum: MR taime 32P ylesvott palju ef-

Ceratobasidium cornigerum: kõik isolaadid stimul seemnete idanemist, ent kasvu s

kui toitainete lisamisest. MR roll ka arv Al detoksifits. EcM seente BD troopikas arv >= parasvöötmes

grinioD, Julbernardia, Brachystegia, TetraBerlinia, Microberlinia, Isoberlinia, Berlinia, Paramacrolobium, Anthonotha, Monopetal

karpide vikariantsuse hüpoteesi ja 135 MY vanuse

kelihood vs most parsimony. Baieesia meetodid suudavad pakkuda kõrgemat usaldust, eriti lühikeste sõlmede puhul ja tunnuste vähesuse korral. Samas

danemist stimuleerivad

spooride idanemine bakterite mõjul

ka seened, mis viljuvad ainult jämedel puidul; kult ja viljakehad andsid eritulemuse. T-RFLP tuvastas vaid 5 liiki, seega v vilets
raceae
ga nimetamise ja omaduste kohta; http://www.cme.msu.edu/OPD.
(seonduvad membraanile), DNA suuremates kogustes(interakts RNAga), polyA suuremates kogustes. Ei soovitata kasutada Dnaase, sest need lagund I
utamiseks. Võimaldab hinnata mõlema osapoole jaoks eraldi. Kui maatriksis on alla 10% kaetud, teeb vähem vigu kui varasemad r
tega põhjustab sellist str.
l; modelleerimine

aldamine ning PCR

oht koos Cistaceae ja Quercusega)

sphatase - aktiivsus mükoriisas sõltuvalt seeneliigist kas HN-s või seenmantlis. Väetades HN-s olev ens-akt suurenes - arv suurem
sosartriibuse Dombeyoideaga seltsis Malvales. Malvales s.l. holmab ka Cistaceae ja Dipterocarpaceae.

järel kloonide suhtelise arvu lugemine on jama; ARB tarkvara kasutamine

Rhizopogon

obleem

Tuber spp: maculatum, T. borchii, Sphaerosporella
Tuber spp: maculatum, T. borchii, Sphaerosporella
Pulvinula

seotud tamme ja arbutoididega

ibuses Chrysophylleae on Pradosia. Klaad ise täielik kamm. Sõsarperek Chrysophyllum, Synsepalum, Pouteria, Omphalocarpum, Micropholis, Leptosty
Arv kõik teised Ericaceae liikmete eellsed olid sarn Enkianthuse moodi puuga
icobasidion, Tulasnella, Sebacina, Thar Rhizoctonia kompleksi rühmad: Helicobasidion, Tulasnell Rhizoctonia kompleksi rühm Rhizoctonia kompleksi r

Penicillium sp, Verticill
outgruppideta ning ITS algn üle kogu seeneriigi

omastamine Pisolithus
Pisolithus

ne ordin faktoritega tunnustele, telgede arvu autom tuvastamine
ward distantsi-põhised redundancy ordin RDA

BD Honduurases ekstrapoleerimine Chao2, jacknife ja bootstrap abil. Proovide arvu suurendades suureneb Chao2 pooltel juhtudest (vahemikus 5-15); 1

lpinoideae: noored taimed!
ülevaade kvaliteedikontrollist nakatamise efektiivsuse uurimisel
es varase st seentel ja kasvas hilistel seentel

bakterid, arhed ja seene

nodelling AM seente kooslustes. AM-seeend mõj muid ökosüs komponente ja seeläbi kk-protsesse kliimamuutustes

slusi ja positiivset tagasisidet seemikkute elumusele. Peremeestaim otse EcM seenekooslust ei mõjuta.
amine -uus meetod azure A, B, C abil

ta väiksemat väljasuremist, pigem on väljasuremine seal ka kiirem

ripõhine vs otse PCR+kloneerimine: mõnevõrra erinev, koosluste sarn madal. Kloneerimisega rohkem kandseeni ja suurem mitmekesisus, vähem Sordar

ülogeneet allikas taimede endofüütidele. Endofüütide ja parasiitide vahel palju üleminekuid; saproobsuse paljukordne teke eriti pa vs ECM: langus arvukus

vähenemine EL maades

muutused ajas

Piloderma croceum

Piloderma croceum

Piloderma fallax

kidel väga erinevad aktiivsuseajad; MnP, LiP, Lakaaside mootmine; arv. koik 3 ens samaväärse tähtsusega

teerimine: azure B meetod on palju parem kui tradits VA meetod

luited: Wilcoxina, Suillus spp, värske hirvesitt: Suillus spp, Rhizopogon spp, Tom sublil; kuivand hirvesitt: Rhizopogon spp, Suillusi v vähe. Arv et Suil

ll palju kooretükke ja oksi.

üg. Juurte horis ulatus väh 19m; Pomaderrisel v pinnalähedane juurestik (0-15 cm) levikuga 1,8-3,6 m tüvest eemale. Ankurjuured ulatuvad 65 cm süg-r

Eucalyptus regnansil: Cort purpurascens (ka Pomaderrisel). Ektendo-tüüp siledatel (sh (Eucalyptus regnansil: C

ndadesse isolatsiooni tõttu: Dipterocarpaceae ja Dilleniaceae; paljud iseloomulikud rühmad puudu

tek vihmametsa liikidest 2 MA jooksul. Liigirikkaim Borneo, endeeme vähe, v.a. Sri Lankal. Võrreldav bioloogia pöögilistega, kes on arv suurimad kon

analüüsi; hydrothermal vendid on suurima arhede linidzirikkusega- arv arhed seal tek.;

d. Mikroobide ensümaatiline toodang erineb taimede omast; C:N 18-20 on piir, k

lest. Kuna s.o. Väga püsiv, arv on tegu heterokarüootsusega

DNA põhjal ei saa kätte kooslust. PCR põhisüüdlane. Kloonimine+sekv annab >90 klooni puhul 90% liikidest 20 liigi segu puhul,

nktmutatsioonid ja pikkuse polümorfism, mis annab lisabände. Lisabände annab sageli mittetäielik restriktsioon; T-RFLP bände ei tohi kasutada koguliig

Cenoc

l fülog anal parall.

ge stat

analüüs

Pisolithus, Amanita, Scleroderma sünt Afzelia africanaga. Uapaca all olevad seened ei mood Ecl

Paxillus, Laccaria, Coltricia, Lactarius hepaticus

Laccaria, Suillus, Rhizopogon

vs saprotroofid: Laccaraia, Cenococcum, Rhizopogon mikro-ja makroseened v

seente poolt. VIITED.

, ent meelitavad parasitoide

a case study. ISME J. 7: 244-255.

letamisele. Metsad on toitainete-rikkamad kui savannid

erpotrichiellaceae on mullas elavad mustad pärmid, millest paljud ka patogeenid ja elunevad ekstreemsetes paikades. ErM seened s

oniidide lohkumiseks on munapeks, detektsioon 10…100 korda parem kui kultuurplaatidele viimine Trichoderma viride

undite osakkal, mulla tihedus langeb. Muutused eriti pindmises 10 cm mullas. 12 a jooksul taimkate nagu loodusl, muld sügavamal siiski mitte

dide kasutamine suurendab taimede dominantsust ja vähendab elurikkust Janzen-Connelli fenomen on tugevam taimede

eet kauged; lähedased mitte.

: 11-29.

. Ecol. 75: 313–320.

es kui kuivatatud või lahustesse topitud juurtes.

ılseim dipterokarp on Irian Jaya lääneosas Hopea sp

ıdang -suur ajaline varieeruvus, eriti alguses Pleurotus ostreatus

si lagund ens: CBH, beta-glukanase, beta-glucosidase ens kandseentel: ülevaade

ıii taimedel kui v paljudel eri kand ja kottseentel. Opt pH = 4; pms toodetakse varise ja puidulagundamisel, komposti tekkes, samuti antagonistlike reakt

:cM seened ei käitu fakult saproobidena; pakub altern lahendusi mitmetele töödele ja hindab kriitiliselt meetodite puudujääke ning

2: 1746-1758.

seguga

occoloba uvifera L.) seedlings. Mycorr Scleroderma

Tuber borchii

eri kõrrelised mõjutavad

ikkused johtuvad suktsessiooniomapäradest; suktsessiooni käigus järk-järgult lisandub taimede tagasiside mulla patogeenidega, SLAIDID

mikroobide arvukus suu

akaalu ning kiirendab N ringet Rhinanthus minor hemiparasiit suurendab taimede ma

risosfäärides vrd teiste taimede ja palja mullaga

k ikka niru

asid vs kemikaalid valge-mädanik-seentel. ülevaade, JOONISED, kineetika, pseudokineetika

nasolu analüüsis vjalik; liigitekke kiiruse määramine, harude vanuse määramine; näitab et pleistotseenis on liigitekke kiirus peale jääaega jäänud samaks;

a nende parasiitide, patogeenide, herbivooride vahel: generalistliigid võivad koosneda tugevalt spetsialis genotüüpidest; evolutsioon

ed ei lange kokku kohalike liikidega

Pleurotus ostreatus: söö

, Andid; KAARDID

a levinud mitmeid kordi AUSst ja arv korra PNGst, kus edasi on toimunud kiire ja põhjalik divergeerumine. L-Ams ja AAFRs levinud klaadid on basaal

s.

46-3852.

etelevitajad ja tolmeldajad olif rohkem nested kui toi duahelad. Mida rohkem on koosluses interaktsioone (seos liigirikkusega pos

gevad seosed vastastikuselt välistavad üksteist; see on seletatav koevol komplementaarsuse v konvergentsiga. Liikide jõud sõltub p

ıloogias: ülevaade ja kontsepts

np vöötmes

mullaseened; RNA vs D

oc1; Cort1; Cort2; Lact2; 2y ajutiselt mittepõlenud: Russ1; Thel6; Russ2; Thel5. Thelephoraceae eelistas 2 y põletamist; Cortinariaceae ja Pisolithus ee

N madal; madal liigirikkus, kaks dominanti üle kogu mandri.

ite teke polnud häiritud. Lepaliikidel erinevad vastused

Berlin, Germany.

ınne arrayle; DNA fragmenteerimine 95*C + radikaalide juuresolekul; GuSCN kemikaal seondumiseks

palju: Piloderma, Pisolithus, Laccaria, Cenococcum…

egamini. Tilia üksikult (Craigiat pole analüüsitud). Dipterokarpuselised ja tsistuselised samas seltsis s.l.

juured vs lehed Lepanthes orhideel. Mõlemis domineerivad Rhizoctonia-Ceratobas
nerevees ja parasiidid; saproobid tek hiljem; ülevaade kõigi rühmade ökoloogiast

puuvillataimede juured kult + sekv: Fusarium spp, Ne

Scleroderma Gnetumil: parandab P ja N kättesaadavust, seda ka nõrga P-väetamise korral

7-168. Pisolithus, Scleroderma

Stereum

kasutusel; 3% kriteerium ei tööta paljudel kas liiga madal v kõrge; iga kirjeldatud liik peaks kaasama ka ITS sekventsi
Pisolithus
el, pärmil. 16(18S) rDNA. Probede fluorestsents sõltus tugevasti probede asetusest DNA konformatsioonis: v raske hinnata. Prokarüootidel olid oluliseo

nel DNAd sealt kus komplekskoosluses teda ei tabatud
iline vanus:

AAGTT

eae), Acacia spp; Angophora, Baeckea, Eucalyptus, Kunzea, Leptospermum (Myrt)

l, PPO, peroksüdaasid… Paxillus
. Paxillus, Pisolithus, Suillus bovinus
. xxx
Piloderma (piiratud ligninaasne aktiivsı paljud

; FDR Bonferroni analoogina
et. Jääaegadel puude pop-d surid P-Eur välja (vb mänd, Salix, Betula mitte), ent pop-d ei levinud pärast jää pealetungi tagasi, sõltu

ata andmeid.
n. Microbiol. 77: 3351-3359.
on sama efektiivne või rohkemgi kui DNA eraldusega
v mol kell annab liiga vanu ennustusi, sest viga on Poissoni jaot ja liiga palju on valesid ja puuduvaid andmeid, mis võimenduvad kauges minevikus veel

390 MA, roosted 330MA, Tremellales 230MA,
a fülogeneesis, praimerid, duplikatsioon jms; puude kalibreerimine: 1 seened-loomad 965 Ma 2 maismaataimed 600 Ma 3 Glomales 390 Ma, 4 septade

eetiline; Pleosporles monofüleetiline
valt suurem diversiteet kui varem arvatud
Rhizopogon
Endogone pisiformis: saprotroof nii turbasambla kui laukude surevatel lehtedel, männig Endogone pisiformis: sa

mullaseente kultuuripõh

kn sp; taksonitest Helotiales, SordM, CApronia s.l., Umbelopsis

matsutake
torikulised ja resupinaat

uureneb geogr distantsiga; kasvab ka mitte-monofüleet liikide osakaal (arv incomplete lineage sorting tõttu). Liigikriteerum mittek

seentel usaldatav ergosterooli mõõtmine j adi eriüärast

asest jääajast, arv põhj viljakehade hiline valmimine
netit, geneetiline varieeruvus kasvab pu Tuber melanosporum
ev puhastamine probede sünteesiks; PCR-sünteesitud probedel u 5*C kõrgem Tm kui ostetud probedel

accaria. Eoste põhjkal sitast.

nber C-ühendeid

koikide mullaorganismide koosmoju taimedele. Nega
a. BIOLOG plaadid ja AMF eosed ja Collembola andsid mitteolulise tulemuse. Funktsionaalsus ei muutunud. Ühelgi juhul ei mõj t

Tulasnella spp Cryptothallus Tulasnella spp Cryptothallus mirabilisel

OrM: rohelistel orhideedel lai peremeesring: Cephalanthera damasonium: Cortinari
maksasamblad: mükohet tek ühel korral EcM Tulasnelladega. Sarn per
Suillus, Paxillus

sed taimed võisid olla seotud Zygomycotaga ja seejärel GlomeroM.

Mükoheterotroofide evol ökol: fülogenees, toitumine jms

odupleksid, kimäärid: ülevaade ja kuidas vältida
toididele ja monotropoididele; eri monc Monotropoidne. eri monotropoidide liigid kitsalt seoutud eri suguk. Seentega: Russulaceae, Hydnellu, Tricholon

i võrdlemine rarefactioni abil mikroseente diversiteedi võr mikroseente diversiteed
us) on Sclerodermatineae basaalsed harud
: pidev divergeerumine edasitagasi koigis klaadides, sh ka Cantharelloidide juures (k.A. Tulasnella, Ceratobasidium, Sebacina. Selles osas lahkarvamus
kladistika
pruunmäd-seentest: 1) Austropaxillus, Gymnopaxillus; 2)Rhizopogon+Gomphidius+Suillus) + (Paxillus, Melanogaster) + Gyrodon + (Scleroderma, Pis
toimus 50 MAT, mitte kohe K/T piiril
emid, tõlgendus, lahendused
mikroseente diversiteet kõva mikroseente diversiteet

. Phanerochaete, Phellinu
. trahheede seinad valgen
pocket-rot, traskumädar
puidulagunemise eritüüb
Phellinus igniarius: tuba

akistada AM-taimede tulekut

Paxillus involutus
Paxillus, Pisolithus, Suillus spp.

rtus ei sõltu N-st, ent oluliseks saamine tahab reeglina üle 20 liigi.Töötab vaid univariate juhtudel. Eri tunnuste K väärtusi saab om

iüsiks ja proovivõtuks; eri alade kasutamine võib tuua artefaktid

ülevaade interaktsioonic
laasid Class II on rohked Russula, Lactarius ja Cortinarius liikidel, ka Hygrophorus ja Gomphusel. Cortinariusel mitu isovormi
ndseened kuuluvad fülogen. Pms euagaike ja polüporoidide hulka. Tõen. Kõik saproobid. Mitmed mood omaette klaade.
täpne ülevaade probede disainist ja diskussioon selle üle; protokolli optimeerimine ja diskussioon. Pesemine DMSO mitte SDSga

ycetidae (sh Cenoc, Ord inc.sedis - sõsarrühm Glonium; mõl Gloniaceae). Seltside ja suguk kirjeldused ja määrajad

ıse faasis
he-eelistus.

mõõtmise alternatiivid: parameetrilised, mitteparameetrilised ja fülogeneetilised lahendused; VIITED

Amanita pantherina,rubescens,vaginata; Boletus edulis, luridus, Lecc scabrum, Xeroc subtoment

pikkus väh 75% originaalist, Phred =3, N´=0; r=3 (maks lubatud madalakvaliteedilisi järjest)

Suillus, Paxillus

aftamaardlate õli-vee segus: 16S rRNA: uued liigid, substraadi utilisatsioon

ıline roll koosluste kujundajana ja puude represseerijana. Põlengutest sõltuvad ökosüs tek enne inimese teket. Põlengualade floora kogu Maailmas väga

us 3-4% erinevust

nullaga, füüsilise häiringuga mullapinnale

Soil Ecol. 18: 193-204. Paxillus

idanemine seente poolt: Pterostylis -Ceratobas; Caladenia -Sebacina EcM vorm; Pı

lumus vahepealne kui puudub nii juurte kui vanempuude EcM seente mytseeliga kontakt ja korgeim kui on ainult mytseelivorgustikuga kontakt. AM vah

RDAs eraldatakse ruumiline var, faktorite var ja nende ühisosa. Vektorid saab k kanoon koefitsientidena

vektorite analüüs

ıoodust taimede stabiilsust. Arv. Jäeti olulised muutujad "abundance" ja "average size" mudelitest välja

hofagusega. Arv Rozites on hiljem üle läinud ka teistele peremeestaimedele kusiganes need kattuvad (eukalüptid, pöögilised). Ei usu, et Rozites on läinı

Descolea maculata, Pisolithus tinctorius and Laccaria laccata

AUS v liigi-ja perek-rikas, NZL vaesem. Maapealsed sugulased. Sh AUS-sse introduts perek; Pezizales v vähe. Phallales maap VK liigid on tek hüpog li

M Eucalyptus 2 spp-l, ent mitte männiga. Arv, et Descolea oli algselt seotud Nothofagusega, ent tertsiaaris kliima muutudes ja Nothof välja surres nakat

'-91. Descolea maculata, Pisolithus tinctorius and Laccaria laccata

alüptus grandise all

AUS EcM seente BD on u 6500 liiki, arvestades 660 liigi olemasolu ja 10% liikide kirjeldamist

Pterostylis - Ceratobas; Acianthus - Tulasnella; Caladenia - Sebacina vı

Rhizanthella gardneri saab kuni 6% puu C-st endale (v.a. respir); Gly sa

väga. Juure DGGE annab vähem liike kui kultuuride sekv

ıine eri jackknife meetoditega: liikide erinevatel tuvastamisvõimalustel olulinet roll liigirikkuse hindamisel

Magnaporthe, Fusarium

ed

Paxillus, Hebeloma, Laccaria, Pisolithus

ıästi piiritletud rühmaks ITS sekventside alusel. Eristusid virulentsed ja vähevirulentsed tüved ning peremeestaime järgi.

s taimede biomassi ei mojutanud see kuidagi, makrofauna kohalolek vähendas tugevasti AM kolonisatsiooni

-põhise distantsimaatriksi koostamiseks

-põhise distantsimaatriksi koostamiseks

ıetriaga mõõtmine

pivaimaks ja universaalseimaks fülogeneetilist. Pooldav liberaalset mikroliikide liikideks tegemist, sest enamasti on neil oma nishid: parasiitidel pms oma

ka in vitro Terfezia terfezoides

palju

mine

ri ühtluse indeks

many.

egiooni. Asterids: euasterids ja Ericales sõsarrühmad, Ericales: v palju sugukondi. Cornales Ericales+euasterids sõsarrühm

is-väga erinev), Austropaxillus, Gyrodon (sarnane)

, Seisellidest 65 MAT, kollisioon Aasiaga 65-55 MAT, lõplikult 42-55 MAT. pidev ühendus Aafrikaga; ei tekkinud erilisi taimi ega loomi seetottu. Indi

dest eksemplaridest ei saa DNAd õi sekventsi kätte, suurem kontamin; 69% herbaareksemplaridest ei õnnestunud liigini määrata 9
done

id on evol jooksul iseseisvalt tekkinud, mimitseerides mutualiste; pms pole ekspluateerimine v kallis ega mõj oluliselt fitnessi; paljud mutualistid võimalu
aledooniast SE-Aasiani. Teiste lähiperek -Regelia, Phymatocarpus, Lamarchea, Calothamnus, Eremaea, Callistemon, Beaufortia, Conothamnus levik on
se hind

ntse jäi järgi pärast kvaliteedikontrolle. Palju vigu sekventsi alguses.
a reostus Laccaria proxima, L. laccata
n T, Schuldt A, Seidler G, von Oheimb G,Welk E,Wirth C,Wubet T, Yang XF, Yu MJ, Zhang SR, Zhou HZ, Fischer M, Ma KP, Schmid B. 2014. Design
Paxillus
Cryptandra, Trymalium (Rhamn) mood EcM ja AM vähem. Osad Myrtaceae, kõik Acacia, enamus Papilionaceae mood vaid AM, Stylidiaceae ja Good

Boletinellus merulioides Boletinellus merulio

evolutsiooniline mükoriisa teke

Mükoriisa definitsioonid. Paljud EcM raportid on tegelikult 'beaded VAM'
parasiitidel, karnivooridel, klasterjuursetel, hüdrofüütidel. Definitsioon ja diagnoos EcM ja AM taimedele, ülevaade kahtlastest tea
tic regions. For. Ecol. Manage. 209: 19 Eucalyptus sünt AUS ja Hiinas; eostest ja kultuurist: Amanita, Descolea, Laccaria, Boletus, Piso
rus: I. Afzelia+Intsia; II Macrolobieae: Berlinia, Gilbertiodendron, Brachystegia, Anthonotha, Julbenardia, Oddoniodendron, Bikinia, Icuria, Aphanocal

vs ECM lepikutes. Sapr

Hebeloma
Hebeloma crustuliniforme kõrge N korral
s seostuvad eri peremeestega. Vrd R. Pumila vs alnetorum. Läh liigid R. Atropurpurea, R. Norvegica. Alaska liigid on arv seotud vaid Alnus crispaga. C
Hebeloma spp

inema byssoides

Sarcodes ja Pterospora: vaid Rhizopogon spp stimul idanemist ja laboris idanevad vaid mittetalvitunud seemned.
simoonia, ML, NJ; ECM seente ja taimede koevolutsioon, ECM teke mitmeid kordi; Hibbett 2000 andmete ülevaatamine, arv ECM tekib sagemini kui k
CWD: ECM diversiteedi põhjustaja ECM diversiteedi põhjustaja

Amanita, Heimioporus betula (Bol.), Xeroc chrysent, Lacc lacc, Leucopaxillus albissimus (Clito
e vs keskkonnaparam võrdluseks

soolakutaimede lagunda

ike. Raske midagi väita puuduliku uurimuse tõttu
Paxillus, Suillus bovinus

7. Laccaria
sisus korvi kohta väiksem lõuna poole, ent eri rühmades veidi erinev. Kumulatiivne prooviala kohta sama. Skaala Kesk-Kanadast S
ilju harusid soojas kliimas;
NE FRA tammikus: domin Tomentella NE FRA tammikus: domin Tomentella spp ja Russ/Lact spp. Vaid Tom ja Lact spp esinesid mulda pandud puus
.: 189-212.
jt talveseened metaboolselt aktiivsed talvel, Cenoc jt suveseened aktiivsed rohkem suvel; fosfataasi aj dehüdrogenaasi akt

Pisolithus tinctorius palju isolaate
roplasti ja mitokonrit

paari ITS regioonile, sh 58A2, NSI1, NLB4. T-RFLP tekitas kaheldava õigsusega mustreid, mida ei tuvastatud hiljem sekveneerimisega. Re3konstrueer
on tugev korrelatsioon piigi pindala ja juuretippude arvu vahel (R2=0.28; 0.54; 0.56; y=0.77x; 0.77X; 0.44x), ent ülejäänud sagedastel tüüpidel seost ei
d ECM pole Suillus, Pisolitjus, Cortinarius Phanerochaete
.
liseerumine. Autor eelistab morf konts. V sageli morf ja fülogeneet konts ei lähe kokku, eriti allopatrilistel juhtudel. Somaatiline tõrjuvus palju tugevam
eenis, tek arv kriidi lõpus. Siis domin paljassseemne taimed
Armillaria spp. Vs Megacoll Armillaria spp. Vs Mega

õrgustiku rakkude vahel. Sellinsed stru Morchella rotunda kuusel: koloniseerib nii juuretippe kui ka suberiseerunud jämejuuri n Morchella rotunda kuus
tte läbi Paxilluse seenmantli. Mitte-MR Paxillus involutus, Laccaria laccata Cylindrocarpon destructans vs Paxillus involutus, La

l: keemiline koostis, definitsioon; mitmeid eritüüpe tekke järgi. Bakteritel, kandseentel ja kottseentel erinev melaniin. Bakteril n melaniinid: keemiline ko
d online portaalis GUSTA ME. Interaktiivsed soovitused ja juhised

Russula üht klaadi, mis v haruldane ja eri 4 liiki assots oksapuude, pöögiliste või dipterokarpidega
pterokarpide metsast
Tricholoma, Laccaria, Pezizales pole teada; Zairis 20 liiki Cantharellales, palju Russulales, Amanita, 50 liiki Boletales; Suurim liigirikkus Zairis ja Kam
ametsades kui miombodes
muutunud seenetarbijateks

Scleroderma sinnamariensega inokul soodustab Gnetum gnemon taimede kasvu

Tylospora

rid, lagundajad xxx: füsioloogia füsioloogia
Xenasmatella vagal
xxx risomorfi str
legradatsioon ja lignolyys:ylevaade

varieeruvus metaboolsetes ja füsiol pr liigisisene varieeruvus metaboolsetes ja füsiol protsessides EcM seentel tuvastatud pea igas uuringus

itum venetum (Apocynaceae), Echinops (Asteraceae), Rubia tenuifolia, Paronychia (Illecebraceae)
ora finlandica ja Phialocephala lagund tselluloosi jm polüsahhariide
itud target parem, kuigi PCR inhibiitorid. Ka hübridisatsioonil oma inhibiitorid, erinev temp; isendite identifitseerimine
; alamlimiitide tuvastamine, 32X parem kui geelelektroforees
erides. Eri taimede risosfääris eri pH ning DCA põhjal eri mikroobide kooslused
meerikas Centaura vohamine Am
geerumine tänu mäetekke protsessidele ja populatsioonide isoleeritusele; taimedel ei esine
mükorisosfääri seened ja
Agaricus

hala fortinii ja Phialophora finlandia suudavad lagund polüsahh tselluloosi, tärklist, ksülaani, rasvhapete estreid, valke, mitte aga Phialophora finlandia
erimine, täissekvents ja vordlus teiste geenidega ning AC viited
LiP molekulaarstruktuuride vordlus, pildid. VP kui uus liik peroksidaase voi hybriid

Orhidee annab seenele rohkem C kui ise vastu saab
Goodyera repens: seene (Ceratobasidium cornigerum) ja taime vastastikune 13C 15
Corallorhiza fotosünt efektiivsus on võrreldav Neottiaga
arud Apostasioideae, (Cypripedioideae + Vanilloideae)

viirus: seened taimeviiruste vektoritena. Olpidium, Oo
algoritm, millega liidetaksi uusi sekventse olemasolevasse aligneeringusse

ekooslustes on BD efekt suht suurem; maismaa kooslustes nii BD kui liigi efekt; BD ja funktsionaalsuse suhe on parimini kirjelda
emides

hüüfid on võimelised elus-samblast toitaineid välja imema hüüfid on võimelised elus-samblast toitaineid välja im

.

lrapõllul ja nisupõllul eri seened, nisul sõltusid sellest kui kaua oli eelnevalt seal nisu või oder olnu mikroseened odra ja nisujuur mikroseened odra ja nis

Hebeloma cylindrosporum, Rhizopogon roseolus
iste VK, kasvab Coccoloba belizensis ja Neea sp all; ITS ja LSU lähedane Stephanosporaceae-le
Rhizopogon spp.

izalestest ja sünonüümika
Poplus spp all arv EcM

horus AG3 eristab tubaka-ja kartuli spets tüved omaette rühmadesse. AG sees on somaatilise mitte Rhizoctonia solani-Thanatephorus AG3 eristab tubak

kroobidele SSU ja metagenoomi põhjal. Koosolevatel genoomidel sarn suurus, GC, fülogen sarnasus 85-90%

ne muutlikkus

ete transferaasid: pH, vanus (väheneb) Paxillus
tamine Tylospora: MnP

ECM & orchid
ntifitseerimiseks. Fikseerivad chaperonprobed ja biotiin-märgistatud probe. V palju sõltus, kui kaugel asus teine probe ->14nu , et oleks perek-spets hüb
rel geogr distantsiga

Armillaria vs Hypholoma Armillaria vs Hypholom
xxx
umageen e. Hübridis vs lihtsus.

seente metaanalüüsideks
lakaase ei transkribeerita Pilodema byssinum jt
osakaal EMH ITSs suur
Pisolithus ssp.

peroksidaase ei leitud; LiP eriti Tylosp palju: ligninaaside olemasolu
eb subgen Salix ja subgen Chamaetia+Vetrix+Chosenia+Toisusu+Triandrae

orrhiza 16: 251-259. Scleroderma spp: männi ja eukalüpti kolonis eri liikidel ja sama liigi isolaatidel erinev. Tehti suurt vahet ka männ

a lepp sõsarrühmad, sarapuu ja valgepöök lähedalt seotud

Eukalüpti EcM seened eukalüpti liikide vahel ei vali, ent mändi ei nakata. Samuti ei lähe eukalüptile Suillus ja R
Eukalüpidel ülevaade
odistamiseks ITSil (er ITS2) kõige suurem diskr-võime
d. Domin Hiptage, Elaeagnus, Gnetum ula
bakteritel; üldjoontes vastavus 16S rRNA puule; eraldi replikaatide erinevus 2.5-6% (u sama, tüvesiseselt; liigisisene u 6-10%)
ondence analüüs

Moneses uniflora, Pyrola minor, P rotundifolia, Orthilia secunda arbutoidse mükoriisaga, sh P. Minoril sageli tug
CWD: ECM 6 liiki; lagunemisklassid

Endogone flammicorona

Laccaria laccata, Hebeloma crustulinif, Rhizopogon rubescens parandavad taime kasvu, er Rhiz Kõigi kolme see
Tuber sp. Endogone flammicorona, Rhizopogon sp: süntees. Rhizopogon kiirendab männi kasvu palju efektiivse

Pectelis susannae THAI assots Tulasnelladega. Kultuur + ITS

seentest toitumisel. Söövad kõiki esinemissag jr väikeste eranditega.
ast ja AUSst

aks Cenoc, Cort, Clavulina, Heb, Inoc, Russ. 9/10 parimast sekventsi vastest tuli UNITEst.

tis; <6m: Rhizopogon spp., Russ. Nigricans, Pstom tristis; vanad puud: Cenoc, PsTom, Russ chloroides; Kokku metsas domin. Athelioid, Thelephoroid,

ape proge, juhised
us (sisald Rhodocybe) ja Entoloma monofüleetilised; maasisesed VK tek 2 korda; EcM rühmadega maasisesed ei kattu; EcM rühm
a probleemid, eriteooriad, kohastumused, liigiteke,
Pleurotus ostreatus -Mn2+ mojul mone 4st isosüümist transkriptide arv kasvab, monel langeb; eri MnP ja VP genide praimerid Pleurotus ostreatus
filised
, pH 9%, temp 9%; lehtedel ruum 52%, temp 15%, pH 5%. Juurte ja leheseente BD väga sarnane
41-D145

onserv sek str

alif

ıs
a. P-vaese mulla N-väetamine suurendab mükoriisa mõju, sest taimed allokeerivad rohkem maa alla.
ng uute liikide leidmise eesmärkide segiajamine; puudulik liikideks jagamine a priori!; NJ puude kasutamine liikide eristamiseks p
Suillus luteus, S bovinus, Rhizopogon, Paxillus
Suillus spp, Thelephora, Laccaria, Scleroderma, Paxillus

's saprotroof: proteaasid, PPO, peroksü	Thelephora, Sullus bovinus		Lepista nuda
	xxx		
	Suillus, Thelephora		Lepista nuda
	Suillus luteus: välitingimustes metallitolerantsusvarieeruvus		
nfg laia amplituudiga liike			
ıud 25-26 korda			
ers, Hauppauge, NY.			
1-148.	Hebeloma		
nde strateegiad			
			kõdu lagunemine ja hüü
ga täpsem; sihtmärk rDNA ca 700 nu; probe: plasmiid+originaalorg DNA tükk ? Pikkusega. Plasmiid sisaldab normaliseerijana ka kanamütsiini geeni. 5			
, cDNA analüüs, võrdlev genoomika. Spotitud vs sünteesitud ja klaas vs nailon-arrayd. Ülevaade			
s u 90 MYA; Nothofaguse praegune levik pole ilmselt mandrite triivi tulemus vaid väljasuremiste, hiliste liigitekete ja LDD tulemu			
ülogeneesiks ja liikide eristamiseks ITS sobib, ent paljud lähedased liigid ja hübriidid pole eristatavad. Praimerid ITS6, ITS7, ITS8			
ım mood EcM siis kui on Männi või Nothofaguse lähedal, muidu mood AM.			
ali tuvastamine erinevatel juhtudel ja eri evol küsimuste jaoks. Nullmudelid			
	Elaphomyces		
nas esineb v palju ka konvergentsi. Eriti just saartel olevates metsades on puudus mõningatest funkts rühmadest, mida invasiivsed liigid võivad eriti kerg			
ja hulk klavarioidseid liike			
temaatika üle maailma			
xillus, Gloeocantharellus: võrdlus ja hüpt fülogen seosed			
2-4 korda Glomus intraradicesel			
ka amööbide parasiidid. Mõnedel leidub ITS2. Aphelidea on varaseim seente rühm või seente sõsarrühm			
ib kasutada juhul kui see on arusaadav ja vältimatu. Keskpos lähenemine			
põllul eri aastatel võib AMF kooslus suurel määral muutuda. Vb hoopis eraldusmeetodi efekt?			
ammutavad ka lähtekivimitest mineraalseid toitaineid org-hapete eritamisega; MHB abistavad murendamisel; www-d aitavad seeı			
nte kooslus ja seeneliikide ensüümitoodang on väga erinevad A1 vs A2 horisondis ning Aprillis vs Jaanuaris. Seeneliigii eri ensüüı			
: A-s)			
gisisene var mõju on Laccaria bicolori kolonisatsioonile ja ens aktiivsusele suur, ent kumbki tunnus pole päritavad; mitte-EcM juu			
tel lakaasi aktiivsuse tipp kevadel -arvseotud N omastamisega; fosfataasi tipp talvel -arv P omastamine kõdust, et kevadel kasvu jätkata; Cort anomalus			
eentel eri ensüümide aktiivsus. S. O siis sh			
AM juurtel ja AM eostel; 15N ka sarnane. 13C phul on erinev understorey leaves vs MH leaves, mida tuleks omavahel võrrelda			
Thelephora	Thelephora		
Thelephora	Thelephora		
, NH, USA.			
myde konstrueerimine node'de kaupa			
nektari puudumise labi, millest on korduvalt tek nektariga vormid. Petvatel gruppidel geneetiline diversiteet palju vaiksem (inbreeding?)			
v Phytol. 183: 980–992.			
fossiile väga vähe			
äreldab, et Pedicularisel on arktikas EcM (Stutz, Väre, Kohn&Stasovski) ja Alpi vöötmes AM. EcM leitud vel Vaccinium uliginosı			
	Amanita pantherina, Inocybe lacera jt		
Muuhulgas Populirhiza nigra (Tom) leidus vaid lagupuidus			
el, nt kuiv vs sklerofüll			
taceae tek vara-Paleogeenis. EcM gruppe ilmselt 3. Eukalüptidel võimaldas savanni kolida tänu võrsumise võime teke, mida pole v			
ıse, Banksia, Gymnostoma, Podocarpaceae, Myrtaceaega; 25-10 MAT sklerofüllitaimestik Myrtaceae, Casuarinaceae, Ericaceae; 5-2 MAT kõrbestumiı			
na, Podolobium, Mirbelia, Oxylobium, Otion, Callistachys) kuuluvad AUS endeemsesse Mirbelieae triibusesse			
ımad on väga noored (v.a. Pinaceae) vrd Angiosp-ga. Pinaceae kroonirühmad harunesid 100 MYA			
m: ülevaade, null-mudelid, seda põhjustavad tegurid			

emismi keskused: SW Aus, Cairns, Brisbane-Sydney, Adelaide, Tasmaania. Cape Yorki floora palju sarnasem PNG teatud aladele kui muule Austraalial

organismidel tulenevad kõrvalekalded molekulaarsetes identifitseerimismeetodites. Suure koopiaarvuga ruderaalid amplifitseeritak

eri meso- ja makrofauna eri meso- ja makrofa

ja metsa vahel Seente ja bakterite S

OrM, kuuluvad ühte liiki

merkaptoetanooli asendab polyvinylpyrrolidone. Korvaldab paremini igasugu polysahh ja fenoolod

: Nyctaginaceae, Coccoloba, Bistorta. Viimased on eriklaadides Polygonaceae suguk. (lähiperek Brunnichia, Eriogonum, Ruprechtia, Triplaris, Persicar

m-matsereerimine soodustavad humiinhapete kaasa tulemist (vrd kuulikestega lõhkumine); PVPP-columni etapp kasulik puhastamisel humiinhapetest; is

pudel avalduvad ensüümid rohkem kui lisada varist; NM juurte aktiivsus ei muutu; EcM juurtel 300-400x kõrgem fosfataasi aktiiv

Suillus granulatus suudab täielikult puitu lagundada, eriti siis kui peremeespuu on 50% okastest vabastatud. Kõigi ensüümide aktii

oslus ei muutunud

f identsest ent fyl kaugest krypt liigist voi on sekveneeritud vale materjali

seenlillelistel: Pterospora andromedea: Rhizopogon subcaerulescens grupp; Monotropa hypopithys: suilloidid; M

arbutoidse ja monotropoidse hypoteetiline teke

d lagupuiduga

FEMS Microbiol. Ecol. 67: 411-420.

bist sai pärast sekveneerimist 68, millest 5 olid arv kimeerid.

OrM: Platanthera ja Coeloglossumi endofüüdid ja kultuurikirjeldused: Leptodontid

orhideedel: Armillaria, Ceratobasidium, Ceratorhiza, Epulorhiza, Marasmius, Mela

rasiidiparasiidi koevolutsioon; väga sarnane Pseudoagaricus-sipelgas

1121–1134.

amine toetudes lognormaalsele jaotusele, indiviidide arvule mullas ja mol taustuuringutele, dominantsusele; arvukus väikeses ja laias skaalas: ookean: 1(

viirus: AM taimedel virionide produktsioon märksa k

Cenoc, Pilod, Tylosp.

Suillus 491-492

Suillus variegatus somatic incompatibility genetite määramiseks

domin

lemasolu, praimerite selektiivsus

tharellus: vaid C. Cibarius, C. Formosus, C. Subalbidus

Morchella spp: puhaskultuuris ektendoMR õhukese mantl Morchella spp: puhaskultuur Morchella spp: puhasku

rterid, konverterid vs lupjamine 4 liigi juuretipud

Cantharellus sp

Cantharellus cibarius

Sphaerosporella, Wilcoxina, Laccaria Pisolithus

domin

Tomentella 4 spp EcM süntees pu Coltricia, Tomentella 4 spp., Amphinema, Phlebiella (Trechispora) vaga???: süntees kultuuri või

esmakordselt sümbiotroof

Wilcoxina-ektendoMR mänd kultuuritunnused: jaotas klamüdospooride ornamentatsiooni ja monilioidsete klamü

si aktiivsusele Sphaerosporella brunnea Sphaerosporella brunnea

EcM sünt: Coltricia, Ba

mõned üksikud vähesel hulgal varajaste koloniseerijate hulgas

äramine indexfungorum taksonoomia ja mitme blast vaste põhjal. UNIX-põhine

samblad vs EcM seened: pms veget kasv ja surnud aineses samblad vs seened: eri intera samblad vs seened: eri i

maldest

sammaldel seened: s

girikkuse ja mol kella kiiruse vah otsest seost, mis võib olla kk energi efekt

Salix eraldunud Populusest 35 MAT (sõsarperek Idesia ja Poliothyrsis). Malphigiales sisald Elaeocarpust ja Medusagyne. Arv et Malphigialese radiatsi

atit gradienti pole. Peremehe-spetsiifikat pole

ipterocarpeae hulka. Arv suguk pärineb Aafrikast. Sarcoleanaceae L-Aafr väljasurnud

Tuber melanosporum

ni on parem kui miinimumini

;radient eri ökosüsteemides; ressursside heterogeensus

Laccaria bicolor

t peremehed Salix humboldtiana, Allophylus edulis?,Neea-Pisonia-Guapira, Coccoloba; veget-tüüpide kaupa. Koos eukalüptide, pa

erminite definitsioonid

Quercirhiza cumulosa = Tomentella sp

Quercirhiza stellata = Tomentella sp

rase st seened v arvukad viljakehade alt voetud proovidesse istutatud noortel puudel

:hip: erinevad tulemused, haruldased liigid tuvastamata, vale-pos.

Dipodium hamiltonianum: seotud Gymnomyces ja Russula spp-ga AUSs. Teised li

VIITED, ÜLEVAADE liikidest ja nendega seotud rühmadest. Rhizanthella gardne

Hebeloma

)0 liiki teada;

ıuumuse fertiilsus; EcM kolonis sõltus fertiilsusest ja konkurentsist, aga mitte varjutamisest. Kuuse EcM moodustamist stimuleeris ja männil inhibeeris k

ktsiooniga ning epidermise rakud kolla Pisolithus ja Scleroderma sobivad Allocasuarina ja Eucaly Pisolithus ja Scleroderma sobivad Allocasuarina ja Eu

Mesophellia, Castorium: mükoriisad viljakehades ja mullas samasugused. Arv. Et viljakehas stimul juurte kasvu

:use eri kasutamisega saadakse erinev pilt bakterikooslustest mullas. Ükski pole täiuslik, kõik täiendavad teineteist

parema resolutsiooni kui ITS2. mõningal inkongruents ja arv. Hiljutine hübridis. ITS1s mikrosatelliidid. Lecc scabrumil suur liigisis ITS var. Arv. Ka L

kongruentsed, ITS ei suuda hästi eristada liike. Vanad deletsioonid, mikrosatelliidid. ML, MP, Bayesi meetodid, statistikud lisaks. Leccinum v kitsa pere

isted, meetrikud, proge

Venezuelast 3 liiki Tomentelloide

Paurocotylis pila: ass

Paxillus involutus

us). Mol. Phyl. Evol. 57: 1276-1292.

imerite kombin-dega vaid 30% Agaricomycetes; palju pikki introneid. Pole nii eraldusvõimega kui ITS

kide määramiseks mullast.

072.

biol 72:5069-72.

triksite analüüs on analoogne ruumilisele distantsile läbi PCNM vektorite; mudelisse jätta vaid olulised vektorid!

eotud seenele Boletus klaadis

esse. Mulla läbi liikus 10% doonoris fikseeritud C, millest 5.2% liikus otse läbi juurte, 4.1 läbi www ja 1.4% läbi mullalahuse. Soo
rgesti eraldatavad ja sekveneeritavad
l, lehetäidel ja peremeestaimedel: lehetäide fülogeneesil oluline mõju parasitoide edukusele; lehetäide peremeestaimedel polnud pa
Batrachochytrium, jpt invasiivsed seened: ülevaadatud; Phytophthor
Armillaria 2 sp; vs patogeens Armillaria 2 sp; vs patog

Laccaria bicolor S238

ui muidu

id: praimerite ja restriktaaside valik, ükski 2 restriktaasi kombin pole täiuslik; erinevate sekv-masinate kasutamine, kiidavad oma R-keelel põhin TRAM
esmasest koloniseeri

ga
gi jaoks
Ecol. 48:926-934.
LP bändide võrdlemiseks

)-2232.

Tomentella sp inokul püsib ja suurenet		Tomentella sp
Thelephora sp		Thel, Sceroderma, Pisolithus
Tomentella sp kolonis Afzeliat kiiremi		Tomentella, Scleroderma

)Tuber); ITS regioonile; Peziza perek liigid polnud aligneeritavad (erin teistest uuringutest SSU ja LSU); liigisisene ITS varieeruvaus <1%, v.a. Terf lep
Lacc fraterna nakatab ka Cistaceae spp. Paljud kõdusaproobid on samuti kaasa tulnud. Tõestatud N-poolkera seeni eukalüptide istandustest ei leitud. . l
Suillus luteus Mycena galopus-suuren

iri keemiat, bioloogiat

atorliikide analüüs
üübid, definits ja seletus; lisaks võib mõjutada multikollineaarsus; VIITED kliimavariaablite saamiseks; mudelid, mis arvet autoko
ivectorite valik ja interpret
s fülogeneesivektoritele peakoord-analüüsi põhjal; eigenvektorite arvu valik broken-stick mudeli põhjal ja seletusvõime põhjal; vel
evectorite põhjal fülo-signaali määramine; eri arvu eigenv abil optimaalse määramine
ka mudelite valik AIC põhjal sõltub autokorrist;

orineeritud yhendite biodegr vamä (ena x x
Laccaria, Thelephora, Cenococcum, Pisolithus, Suillus
Boletus spp, Suillus spp, Cantharellus cibarius, Amanita muscaria, Russula lepida, Scleroderma
Suillus, Boletus, Cenoc EcM süntees

ia PCAle ja CCAle: viited: ADE-4

Manage. 231: 226-233. Tuber melanosporum
ris mood AM

ıkohast. Illustr

ıtr.); ka Andromedea polifolia, Sorbus aucuparia, Juniperus communis mood EcM
ıel.

Suillus bovinus, Paxillus

Stroph., Phanerochaete
xxx

xxx
kt ka seeneliikidele: vs väetis; muld vs lehekõdu. BD mullas ei muutu, ent kõdus väetamisega väheneb; liigirikkus väheneb mõlemal juhul
ähesed Euroopa kaudu yle Atlandi ookeani
ohaks. SEA algkohaks ka Eur suhtes. Vrd loomadega, (sanmartin,2001), millel pms disjunkts SEAasia-Eur ja NE Am-NW Am. Seega arv et taimed levi

: arvestamine parandab R2. SACi põhjustab ka olulise muutuja mittearvestamine, uurija suva. SAC eiramine põhj valesid param n
latsioon: kriteerium Morani I; eri metoodikate võrdlus; Bayes vs tavaline; proged, soovit standardis ridade kaupa; Ruumilise autok
liigirikkuse lokaalsetel andmetel tekitab kohalikul tasandil toimuvate protsesside eiramine; ka uurijad võivad tugevasti autokorr tek

Rhizopogon, Hebeloma
Rhizopogon, Hebeloma
Rhizopogon vinicolor, Laccaria laccata, Hebeloma crustulinif. Rhiz stimul taime fotosünteesi. Heb ja Rhiz suure

odi Kapimaale Mauritiuselt, kuhu viidi Austraaliast 1800. Zimbabwesse 1890ks aastateks. Maailmas katsid istandused 1990ndatel

ıonia sõsartakson on Pisoniella, ja kõige nende sõsarrühm on Bougainvillea+Belemia+Phaeoptilum. Pisoniee tekketsenter on L-Am, kust on levinud troo

e tegemine. Efektiivne, kiire, ökonoomne, vajab vähe, ent puhast DNAd. AFLP>hübridismikrosat-probedega>duplekside erald>kloneerimine>sekv
on: , mt SSU: kongruentsed tulemused. Intron tekkinud ühel korral. Arv Cenoc => 3 tugevalt toetatud liiki, millel arv eri fpüsiol omadused; eri liigid sam

Tylospora, Paxillus

Clitocybe nebularis nõia

ıurus; 4 väiksem ala ulatus; 5 keha mass; 6 väiksemad laiuskraadid. Liigirikkus suureneb pindala kasvades eriti troopikas. Tugeva

andatud arvutamine R's (SpaceMaker)

mis ülejäänud, originaaloligote jrk | Armillaria | Armillaria
kvantitatiivne mõõtmine; Paxillus tooda Paxillus involutus | Fusarium

d on v keerulises assotsiatsioonis AM-seentega. Diferentseerunud koed ja tugev AM-hüüfide mass

Pisolithus sp (ei paranda Acacia kasvu Madagaskaril 19 kuu jooksul)
üüsi järgi Pakaraimea on lähedasem hoopis Cistaceae-le, Monotes ja Am Pseudomonotes mood ühise klaadi
ıia kaevanduspinnasel koos eri peremeestaimedega(Acacia, Casuarina, Nothofagus)
ısarsuguk on Physenaceae, samuti Madagaskari endeem
ıegali istandustes domin AM; tihti EcM ja AM valistavad teineteist

New Phytol. ??? Suillus bovinus
Monotropa MR ultrastr, termin 'Monotropoid MR'
Suillus grevillei
Suillus grevillei | taimsete fenoolide teke, lignifikatsioon, taime-ja seen
rliikide mõõtmine: TWINSPAN oma puudustega, uus ja plastilisem IndVal
Arbutusel ektendoMR, sh tuberkuloidne tüüp

ır ja selle põhjal pH mõj AM-seenekooslusi palju enam kui taimeliik. Levimine piirab seeni väga vähe
Boletus pinophilus, Gautieria othii, Hebeloma longicaudum, Russula sanguinea, Scleroderma polyrhizum, Tricho

Leccinum, Pisolithus, Scleroderma
), BD näitajate modelleerimine, proovisuurus, kogu liigirikkus, võrdlus, usaldusspiirid,VIITED
Cantharellus formosus

Laccaria bicolor

55. metsamajanduse mõju: p

Hebeloma, Laccaria
Cenococcum, Laccaria, Suillus, Rhizopogon
nin ainult variaablitele, sellest ülesaamise transformatsioonid; heterogeensuse mõõtmisviisid, eksperimendi disain mis võtab arvesse heterogeensust
voimalused: blokistamine, nested analüüs, plottide summeerimine kui pole ploti efekti, heterogeensuse enda analüüs
.
. oksalaadi roll: metallide inak oksalaadi roll: metallide

idaniku seened ja EcM seened on genoomika põhjal kaotanud suure osa lignotselluloosi lagundavatest ensüümidest ja oksidoreduk
xxx
Lactarius
Tylospora

:imine, S-Libshuff, DPCoA, DOTUR. Sekv 13355 bakteri sekventsi
p P-Am sect Abaso 58 MAT; sect Tacamahaca ja Populus on palju hilisemad, 15-20 MA vanad

strile T-RFLP seente SSUle 2

ookeanisetted: eukar
Fomitopsis rosea ja Phle
leviku uurimine välja pa
rinevaid seeni ei suudeta eristada. Samas mitmel pool ka arvestatav liigisisene varieeruvus. Määrangud kahtlased.
miseks. Vaja mitmeid ensüüme ja ka siis raske eristada gruppe, missarnasemad kui 90 -95%. RFLP sama täpsuse juure pole oluliselt parem. Liigisisene

Agaricus: noiaringid vt s

vs AM
nnasel pigem kuusega ja ei mood klamüdosp, W mikolae pigem männiga ja mood klamüdospoore ja häiringutel-põlengutel, arv nende vaheline hübriid V
eneetiline uniformsus???, vertikaalne ülekanne, parasiitide rohkus, suured genetid???, filtreerimine ECM sümbioos kui vastastikune parasitism ja eksplua
Sphaerosporella tuleaseme-kottseente bio
Pezizales vs seemnete idanev Pezizales vs seemnete id
d kottseened: amüloosi, amülopektiini, pektiini, ksülaani lagundamine. Peroksidaasid kõigil; türosinaasid, lakkasid varieeruvad l pürofiilsed kottseened: a
identifitseerimisel
arina

Pezizales: arv esineb tugev kontiinum saproobidega, sest paljudel saproobsed omadused: tsellulaasid, polüfenool

vab, N ja pH väheneb, mikroelementide leostumine suurem
as rikastatud tselluloosi lagundajatele. 12C domin kandseened; 13C domin pioneersed kottseened. Arv. Mullaproovi eraldamisega
a Gröönimaa kaudu Skandinaaviasse. Siberis refuugium
l. Geneetiline diversiteet suurim Beringias er. RUS poolel, Kaukaasias ja pisut ka Alpides; Geneetiliselt eripäraseimad olid Alpid ja

odelling: Ainult bottom-up efektid, aga mitte vastupidi toiduahelas; Taimede BD mõju oli tugevam kui N või CO2 tõusu mõju. Te
Paxillus involutus
ka vaid tühise osa. Mehhanism ebaselg Scleroderma
Paxillus
oba, Tiliaceae?

Paxillus involutus

Piloderma
00..1000 korda
nensionaalsus ehk kui paljude tunnstega saab võrgustikku küllastunult kirjeldada

pürofiilsed kottseened: l

Pyronema domesticum:

probed 16S piirkonnale (erinevalt mittemärklauast väh 2 bp valepaardumine 3´otsas): universaalsed, rühmaspets, redundantsed, replikatsioonid array pii

nitus indiviidile

)) jt

:ab Neurosporal temperatuuriadaptatsiooni võtme

2tuumaline Ceratobasidium põhjustab mändide surma

;iumi mattides laguneb okkakõdu kiiren Hysterangium (matid)

ıta rühmi, kust vaid molekulaarsed 18S andmed, eriti ookeanides; eriti fülotüübirikkad on arktilised veed ja kuumaveevendid

:s tolmjate seemnete tekkele, sest need ei toida end ise ära;

pink

Piloderma, pink | Piloderma, pink, Paxillus

ıurist -ei mingit erinevust liigisiseselt; E Tylospora fibrillosa

domin

Piloderma, Tomentellopsis | Piloderma, Tomentellopsis

Tomentellopsis, Piloderma ja Paxillus on võimelised kasvama läbi mittesteriilse metsahuumuse ja nakatama män

iseloomustus | tomentelloidid | tomentelloidid

ıntratsioonides; puju muld koos varisega takistas palju

;ele

ın Pseudocydonia jt õunviljalised

ıunemine Terfezia viljakehadesse (ornitiini aktiivsus), nitraadi reduktaasi suurem aktiivsus hüüfides

äranguid Clelandilt. Õigeid Cantharellusesse kuuluvaid liike vaid 2-3

roll

di index: näitab summarset BD; ei arvesta proovide hulka

d, eriorganismid; erigeelid; klooni-rmtk-d ei saa kasut kvantitat hinnanguks

l min-toitumises

Endogone viljub itaalias ebatsuuga ja männi 2-3 a istandikes. V sage. Lehise all puudub. Mood mükoriisat, kus v

Tuber maculatum esmane süntees Pinus strobusega. Eriti vermikuliidilisaga pinnasel parem taim

Gnetum africanum mood EcM Scleroderma sp-ga

uumorpiirkonnas

ɛ järjestused

ɛerika liigid pms

nellide kui ka roosteseente hulgas. Ülevaade

1.

õtmine, max aktiivsus 7-9päeval; lakaasil alates 5 päevast lõpuni (-14) | Panus tigrinus

Cenococcum esmakirjeldused

lus läbi ajaloo. Peetud fossiilideks. Esmakordselt mainib seotust mükoriissete struktuuridega

tus=>Eremiomyces ech. (peremees teadmata) ja Terfezia pfeilii =Kalaharituber pfeilii (peremees Acacia ja Citrullus vulgaris???). ITS ja LSU järgi. Mu ɔleemid mõõtmisega, segavad faktorid -vaba Mn, aromaatsed ühendid

vs parasiidid, ECM seened: l vs parasiidid, ECM seen

ːel aladel. Väiksemad mõjurid keskkonna heterogeensus ja ajaloolised faktorid

ea, Fungi, and Viruses in Soil. Appl. Environ. Microbiol. 73: 7059-7066.

ɔõhised

girikkust enim pH (unimodaalne Ph7 juures)

ıjal.Ka väike sekventside arv on metagenoomi puhul määrav

alam kui metsades ja rohumaadel

ːsti ennustatav

mikroobide levik sügavu

amets ja temp okasmets; mikroobide osakaal suurim kõrbealadel; seente/bakterite suhe suurim temp leht- ja okasmetsades, madala

Monte Carlo test (Singelton,2001) bakterid, seened, 18S (s

ɘ vrd algse DNA kogusega

ıdatud tuule ja veega leviku tõttu ning aeglaste liigitekkeprots tõttu. Glob leviku piiriks on org suurus 1 mm

Paxillus, Suillus bovinus, Pisolithus, Rhizopogon

Suillus, Pisolithus

Suillus spp. lehis vs mänd: Suillus spp. 32P ja 14C ülekanne. Mär

Suillus spp.

Laccaria amethystina, Xerocomus chrysenteron, X. pruinatus

kud hilistekkesed, monofüleet

v baasil: erinevused eraldamises, koopia arvus, vitaalsuses. Jämedamaid juuri diskrimineeriti

e stabiilsus: Erikoidne ja orhidee MR ning noodulitega küllalt stabiilne -ühes-kahes taimerühmas; ECM labiilne. Arv süsiniku hinna tõttu N2 fikseerivad

sesside hindamine tipu-kamm-fülogeneesi põhjal. Bayesi proge BISSE

b paremaid tulemusi inhibiitorite eemaldamisel, samas DNA kogus väheneb

ıtüübid. Pakutakse välja ka minevikus dominantpuid. Merede kerkest ja taandumisest ülevaade

ɔärin kandseente eellaselt; roostetel ja nõgiseentel kadunud; VP, MnP, LiP geenide areng ja taandareng eri rühmades; permis ja kar

ɔn v paljulubav ja soovit. Selle baasil luua mikrokiibid liikide määramiseks

Cladosporidium ja Aure

sed netw;

Elaphomyces muricatus, Genea klotzschii, Rhiz rubescens, Hymenogaster tener, Hysterangium, Cenoc, Tuber al

Tuber brumale sünt Pinus nigral -cys olemas

Stephensia bombycina EI MOOD EcM tammega ega polnud ka biotroofne Stephensia bombyci

ɔniide

30 MAT tagasi; vanimad fossiilid pärit u 90 MAT; mitmed väljasurnud perek Coryluse, Carpinuse ja Alnuse sugulased. Perek. Lepp -Alnus tek 100-112

ː, varjuna, kütteks ja ehituspuiduks. Kuivatavad maapinda ja stimul põlenguid

Terfezia arenaria, claveryi, Tirmania pinoyi sünt Helianthemumil. Taimekasv ja EcM vs rakusis

Amanita rubescens sünt männi hüpokotüüli juurtega puhaskult
n modifitseeritud fixed model, probabilistlik mudel tõstab I vea tõenäosust;

Pisolithus alba
idanesid ka sama hasti mullas, mida oli hoitud 6 kuud 18 kraadi juures

Mükoriisatüüpide esmakirjeldused: AM, ErM, OrM, Monotropoid ja E

Abies); miskipärast ei leitud lehisel, kas ektomükoriisa mõiste, EcM esinevus Fagaceae, Salicaceae ja Pinaceae liikidel (miskipärast ei leitud lehisel, kase

Mycena galopus vs Mar
suktsessioon varisel ja li

rthwest and Range Experiment Station Forest Service, U.S. Department of Agriculture, Portland, Ore, pp. 85-98.

töötab paremini (täpsem, madalam type I error) kui phyl eigenvector PVR
urimine tingimustes, kus liikide fülogeneesi ja areaali on samaaaegselt arvesse võetud
mistuskivid: madala R2-mudelite usaldamine suure valimi ja log-skaala korral; samaaegne raporteerimine fülogeneesi arvesse võtv
leae ja Cypripedoideae on basaalsed harud
ajal perek eristamine: Pyrola, Orthilia, Monotes, Chimaphila: ITS: Monotes Chimaphila sees
omaette grupis; Orthilia on sõsarrühm Pyrolale. Lehtedeta vormid on väga lähedased P. Chloranthale; Chimaphilat peetakse primitiivseks
Hebeloma crustuliniforme

Laccaria bicolor

lisest liigist. Sh. Lacc laccata koosn 2 krüpt liigist.
Hebeloma mesophaeum
Suillus luteus, S. Granulatus, Scleroderma aurantium, Tricholoma pessundatum
mitmed
Rootsis 4 bioloogiliseks krüpt liigiks monokaarüonide intersteriilsuse põhjal

ogeograafia: Chloranthaceae, Fagales. Eellaste otsingud, divergeerumine, välja suremine
iitidus mood vaid EcM. Ei illustr.

erühm Lyophyllumi kõrval: termiidiseened tekkinud 1 korra ja tagasievol pole; eri klaadid paiknesid tavaliselt eraldi kas Aasias v Aafr
PB1>RPB2>ITS. RPB2 oma pikkuse kohta parim. Praimerid
Julbernardial. Arv EcM-l v oluline roll. Põletamise intervall määrab koosluse tüübi
obidel. Metsamullas on mõlemad head indikaatorid. AM jaoks töötab 16:1w5 hästi juurtes, ent kehvasti mullas. Mulla jaoks parem
i vihmausside

esimene üritus EcM sünteesida, ent ebaõnnestus (Lact deliciosus, Sarcodon Collybia macrourus

a abortivum il IGS-RFLP: Armillaria Jaapanis; eri Armillaria sp para
identifitseerimiseks oligote kombinatsioonid, u 3 tk. V täpne. Protokoll antud; Ka chaperon-probe

nilised meetodid andsid 3x paremaid tulemusi kui CTAB-pohinevad lüüsimeetodid; huumusainete probleem

lehekõdu lagundamine ja

Paxillus involutus: terve rida isolaate ei mood haavaga EcM, tekitades paksenenud rakuseinad

Hebeloma, Laccaria

Kõdus Pinus, Populu

ks: Shoreae (Diptrocarpus (Vateriopsis (Stemonoporus-Vatica-Vateria)
services are found in forests with more tree species. Nature Commun. 4: 1340.

414.
e Mantel maatriksi põhjal

Paxillus
Laccaria bicolor

Heterobasidion annosum on suuteline nakatama ja ka

Pisolithus
: kasutamisjuhud. Selle parandused, püüded hinnata stat oluliste seast tõelisi nullhüpoteese, alternatiivsed viisid alfa korrektsiooniks: false discovery rate

Tuber melanosporum, Tuber indicum ja pseudoexcavatum on EcM morf poolest v sarnased ja ka
sarnane

x

troopilised veeseene
seentel evol jooksul mitmeid kordi

al neid kokku >250

einalised on tek heledaeoselistest õhukeseseinalistest mitmeid kordi. Tricholomataceae ja Entolomataceae on läh seorud; Cortinariuse sõsarperek on Pha

nanita 4; Descolea 1; Cort 41, He (Austro)paxillus statuus, Pax inv, Cenoc mood EcM Nothofagustel; P. statuum ei mood EcM Eu

optimum. Hüpot et EcM võivad põhj tsesalp monodomin madala P aladel
a talitlesid omamoodi.

Hebeloma sylindosporum
lletotrichum, Trichoderma harzianum complex). ITS jaoks peaks kasutama 99-100% barcoding threshold

orhideed saavad seente kaudu kuni 85% C ja 80% N; eristuvad selgesti autotroofse

x x

AM-seente mõju patogeenidele võib olla pos,

EcM eelistuses.

BD sõltuvus pinnasest

ecanoroM. Pseudotulostoma lähim Trichocoma; kõik kuuluvad Eurotiales seltsi

lbard based on soil and sporocarp DNA. J. Biogeogr. 34: 74-88.
või kliimavöötmetes. Neist 3 eranditult Santa Cruzi saartelt. Peab 8ks iseseisvaks füloliigiks. Suurimad linidzid polnud b-tubuliini j

phatase aktiivsus sesoonselt Lactarius blennius, L. subdulcis

ra, Laccaria omavad vedelkultuuris väga Thelephora, Laccaria, Lactarius, Paxillus, Cenococcum, Suillus, Rhizopogon

kaugus; log-suhe
väga pikk, sisald mitmeid kordusi. Eri ITS koopiad võivad olla üsna erinevad, olemas tervel subsektsioonil. Ka teistel Pinaceae liikidel pikad ITS1d.
endas Thelebolaceae ja Rhytismatales (selle sõsargrupp on Cudonia+Spathularia)
iide transkriptsiooni mõõtmine Northern blotiga: MnP, H2O2, kuumashokk indutseerivad; N inhibeerib Phanerochaethe

a erineva morfoloogiaga seened. EcM teke korreleerub mullapealse eluviisile üleminekuga (basaalne puidul)
vähem kevadel
ma: antibiootikumid Heterobasidion vs Trichoderma-oluline roll antibiooti
Heterobasidion
late stage vs early stage
seks -kasutus parasitismi ja sümbioosi uurimiseks
peremeestering enamasti perek (66%) ja sugul
ephensia taksonoomia
Tricholoma matsutake
haruldusi. EcM taimedest Pisonia aculeata, Acacia spirorbis
Vaatluse alla võeti puu harupikkused lähi-liigipaaridel

Tuber macrosporum sünt Corylus ja Quercus spp. Cys asemel imelikult harun EmH
Tuber spp.
Tuber albidum, brumale, aestivum, rufum parandasid Cistus incanuse kasvu. Tuber melanosporum eri Cistaceae

63. niiduorhideed Ophrys fuciflora , Anacamptis laxiflora , Orchis purpurea
mycorrhizal Russulaceae. Mol. Ecol. 15: 491-504. OrM: Limodorum abortivum ja Limodorum spp. Assotseerunud Russula spp-ga, er
evusi aastaajati ega eri pestitsiidide kasutamisega bakterid, seened, AM-se
-päritolu; põhjalik diskuss Araukaaria, Agathise ja Wollemia biogeo üle

seost
oreeritud, Sebacina vermifera: mitteperfor parenthesoom

erunud, ent mtLSU annab hoopis paremaid tulemusi. Paljudel seentel suure liigisisene varieeruvus
kiirusega eriliikidel
ri-lähigruppides
sferaas: seenel alati aktiivne Rhizopogon luteolus
tne eri thresholdidega multivar analüüs kooslustele: dominandid ja haruldased liigid käituvad eraldi, ent üldiselt thresholdi mõju ko
anika ei koosne mitte niivõrd ligniinijääkidest, kui mükoriissete seente hüüfijääkidest, mis ei lagune.

oos rakusisese kolonisatsiooniga. Alpov Hebeloma, Cort, Tricholoma, Scleroderma, Pisol, Pax, Laccaria, Amanita, Leccinum, Lact, Thel, Cenoc, süntees
Laccaria bicolor

mine ja klasterdamine liikideks. Eri klasterdusmeetodid; puupõhine ei sobi; Peronospora puhul oluline ökoloogiline + geneetiline i
kud - neighbor-net - kui mitu alleeli v klooni; delta väärtused ja treelikeness põhjal; Optsil
fütopatogeenide kaasaegseimad uurimismeetodid: üle
aesed mullad, suur topograafiline ja klimaatiline varieeruvus. Fossiilidena sh Casuarinaceae ja Sarcoleanaceae

spluateerijatel > muudel; spetsialistide seas oli see rohkem evol konserveerunud.
vara; eri patogeenirühmad reageerisid keskkonnale erinevalt; Ei võtnud arvesse ruu patogeenide ruumiline levik mullas neighborh
Phlebopus tropicus mood Cistus spp juurte ümber Phlebopus tropicus mood Phlebopus tropicus r
tituumsed Thanatephurus Rhizoctonia anamorfidega . Thanatephoruse sees paikneb mitu rühma ku 2-tuumalised Ceratobasidium ja multituumsed Thanat
hephorus paljutuumalised vormid on tek 2-tuumalise saproobse Ceratobasidiumi sees palju kordi iseseisvalt. Indelide kodeerimine annab v head tulemus

Lactarius deliciosus, L. Sanguifluus, Pisolithus, Rhizopogon, Suillus spp.

erved mudel (kumulatiivne tüüpide arv)
CWD: Piloderma CWD: ECM palju liike; madal pH ja N, kõrge C…

Suillus, Laccaria

ala baasil, teisendused; liigirikkus/pindala = liikide tihedus. Kasutamisvõimalused ja paljud vead. Soovit indiviidide baasil proove koguda. Üld-liigirikku
ponidel põhinevate statistikute leidmine: ANOVA, Chi Square, Macroecology, Niche Breadth, Co-occurrence, Guild structure jms.
is: sobivaim C-score ja nullmudelitest sellised, mille ridade (liikide) sageduse summa konstantne
eotud AM Passiflora alata risosfääriga; erinevusest Glomeralestest

udes eripikkusega DGGE bandides

0.19 V. Suur kõikumine . Tuleb arvestada ka häiringutega. Kõik uuritud alad külmemad kui Eestis
models, path anal; ülevaade, mõisted, latentsed var
Entoloma alpicola

agunenud puiduga ja samas mändide m Hymenochaetales N-Carolinas: Coltriciella dependens levinud kõdutüvedes ja nende all, alati koos EcM juurtega

pole arvestatud dispersiooni. Lahknemiste arvutamisel alati kasutada mfg kalibreerimispunkte koos dispersiooniga, mida ka edaspidi arvestada

elt, st välditakse krüpt liikide teemat; Mitmetel mikroobidel keskmises skaalas oluline distants, mitte niivord keskk heterogeensus (mulla tüüp vms). Tul

li test kottseente BD ITS1 pik
, Sargasso meres ja vaalaraibetes on erinevad

eid liike

Hygrocybe, Clavulina, C Hygrocybe, Clavulin
saproobide (Polyporus, Pleu saproobide (Polyporus,
Bi kasutav meetod
Gaultiera, Hysterangium matid

–D704
GI-l: Mycocosm
viirus: Agaricus bisporus M\ Agaricus bisporus
subdom: T. sublilacina

ctonia spp. Biotiiniga seotud oligonukleotiidid head PCR amplifitseeritud DNAle, kogu DNAle mitte; ca 120 nu oligod töötasid üsna hästi genoomsel D
Suillus granulatus, Pisolithus, Cenoc

Boletinellus merulioides ei mood EcM männiga, ent muudab viimase juure Boletinellus merulio
ed liigid;
üp1) populatsioonigeneetika uurimiseks. Phialocephalal kõrge polümorfism (Nei indeks), tüüp1-l madalam. Samad RFLP-probed ei andnud tulemusi tei
puhul. ITS ei andnud head tulemust

applanata kompleks: Stoyke 1992 ja Zijlstra 2005 isolaadid ei kuulu sinna rühma; ekslikult peetakse EcM taksoniteks; kritiseeriv
emel
ond

Tuber Aestivum CZ assots v paljude AM-taimede juurtega, eriti Fraxinusel, vähem Ulmusel ja Taraxacumil; Arv
Entoloma clypeatum - suudab kasutada väga
viron. Microbiol. 8: 773-786.
Hebeloma cylindrosporum
ChatothyrioM basaalsed harud on kivis elavad. Lihheniseerumine on selkundaarne ja polüfüleet arv.
spacer-selectedisolate of L. deliciosus. Lactarius deliciosus
Matsutake
ndi Lactarius deliciosus
Tricholoma matsutake stimul Pinus densifolia kasvu

Tricholoma matsutake
ss 2: 37-44. Matsutake
gko((Araucaria+Taxus)Gnetales(Pinaceae))))). Gnetum pole Gnetales hulgas basaalne
Hebeloma cylindrosporum

Hebeloma

Hebeloma cylindrosporum
test: kõrgendatud tüüp I viga ja madal võimsus
oseid läbi moodulite liitmise; super-generalistid stabilis mutualismi ja soodust BD ja komplementaarsust ning konvergentsi;
stedness ja asümmeetria sõltuvad pms võrgustiku suurusest m x n; mutualistidel ja antagonistidel sarnased mustrid kui netw suurus
tum. Liikidel eri-levikustrateegiad: moned tyve lähedal, teised eemal
ML ja bootstrap kiireks analüüsiks
Hypocreales domineeriv

suvel-sügisel (madalam). EcM mediaaneluiga ca 200 päeva, max 1000 p

ametsast seot VÄIDET Gomidesia spectabilisega
nev mikroarray; 8-20 bp immobilis oligod: 20 bp kõrgeim signaal, veidi madalam valepaardumiste tuvastaja -parim neist)
rRNAga; oligoprobed; 2 märgitud sihtmärk-ahelat (teine kontrolliks); arvavad, et teoreetiliselt pole vaja nu-happeid amplifitseerida; soovitavad kogu arra
. Saprotroofide biotehnol
Terfezia, Picoa
vik Kanaaridele üks kord. Fossiilid miotseenist 23 MAT
rikas. S. Bermudense ja S. Stellatum assots Coccolobaga laiadela aladel, Veligaster nitidum kasvab koos Pisonia subcordataga Neitsisaartel
õtmine, max aktiivsus 7-9päeval; eriti peale Glc ära tarbimist ja aeroobsetes tingimustes Pleurotus ostreatus
njal perek eristamine: Pyrola, Orthilia, Monotes, Chimaphila: erinev kromosoomide arv, jms

ol. 15: 1853-1869.
Hebeloma 26 spp männil. Sh H. Radicosum. Paljud pajude-liigid ei mood männiga EcM -ARV s
Amanita spp, Boletus bicolor, Suillus, Rhizopogon sünt männil
Chlorophyllum rhacodes, Suillus variegatus, Rhizopogon roseolus -süntees vermikuliidil (terra-li

maatiline ja väga ebatäpne, ei sõltu modeleeritud haruldaste liikide tegelikust arvust

d eraldi Piloderma võimalikud saprotroofsed omadused Piloderma võimalikud sa

sa Ramariad
um jt Phallaleste morfotaksonoomia cys ja RM baasil.
eenid

lingut tuleb rakendada koos muu ökol analüüsiga. Hea krüpt liikide tuvastamiseks
paar kryptilist liiki
Tuber, Boletus edulis, Tricholoma matsutake: kultiveerimine, VIITED

Lepa EcM seened: ülevaade
ECM vs Otiorhyncus (Coleoptera)

l kanda kinnitada eostevihm monokarüoot
NE USA segametsadest
yst. Bot. 25: 418-431.

illel eri järjestus
võimsam
perekond, mis hõlmab Vralstadi liike. Sisald.Rhizosc. Ericae = erikoid MR; M. Vraolstadii = EcM; Cadophora finlandia = EcM, M. Bicolorata = Picein
Suillus grevillei sünt lehisel nii eostest kui puhaskultuurist. Teisi puid ei nakata; stimul lehise ka
Mehhikost Panamani 500-2400m a s l, taksonoomia
e lähim perek on paju.

liversity loss for litter decomposition across biomes. Nature 509: 218-221. seened transpordivad

s . Plant Cell Environ. 16: 375-382.

Suillus bovinus

ed põhj suuremat BD, mitte aga lehe liigirikkus per se

rdistub, tüuseb temp keskm 4*. Ookeanitase võib tõusta 5-10 m arv Pleistotseeni max; 10-15 m arv. Eutseeni max.

viljakehadega läbisegi. LSU Evolutsioon kiirem maasiseste VK rühmades. Rühmade iseloomustus, ökoloogia

rieeruv, teine mitte. Var liikidel üld ei esine geogr või substraadimustrit. Peziza varial siiski kerge on. 13 liiki kokku

viljakehadega läbisegi. 3 geeni. Enam-vähem konkordantne

kooslused erinevad e

t

nev klasterdamine

d

ringaldasiin oksüdaas

t.org/.

Chloridium paucisporum (Wilcoxi isolaat) on sama RE-mustriga ja arv et tegu on ikkagi ühe liigiga

outgroup; A) Pezizaceae-basaalne; B)Morchellaceae (Tuberaceae-Helvellaceae); C)Sarcosomataceae(Pyronemataceae-Sarcoscyphaceae)

ridgesia

ood EcM ainsa EcM taime Dryasega; VK seevastu arvukalt (???)

teerimine, soovit vigaseid asju mitte geenipanka panna, mõlemat ahelat pidi sekveneerida, kontrollida DNA sekundaarstruktuuri jr

Paxillus

oonid HMM põhjal. Prokarüootidel (V1-V2; V6) ja seentel (V4, V7) on variabiilsed regioonid erinevad

mulla bakterid, arhe

CWD: ECM juuretippude suur arvukus eriti juulis; suur veesisaldus

CWD: orgaanika on oluline ECM jaoks kuival aastaajal, niiskel mitte

asi aktiivsus mädanevates eluspuudes: eriseened eri puudel erinevalt; mõjutab pos niiskus, temp nitrogenaasi aktiivsus m

CWD: ECM suurem levik istandikes vrd mineraal-ja orgaanilise mullaga

. MnP, LiP, Lakaasid, tei

kriitika varasemate tööde aadressil, kes üritavad mütseeli viljakehadest EcMini vedada või misir

Lactarius deliciosus, chrysorheus, Amanita muscaria, Gyroporus castaneus, Suillus bovinus, lute

Mycelium radicis nigrostrigosum = Cenococcum geophilum: obs Pinaceae (6 perek), Quercus, F

aseened saaks kätte toitaineid suht paremini

itte nishihõive. Seeni võivad neg mõj teatud kõdu tanniinid; arv N liikumine kergesti lagunevast raskestilagunevasse pole tähtis; M

xxx

tuvastati SEM järgi

Neeal ja Guapiral

i mõjuta faktoreid ja nende tähtsust uurides kontinentaalseid liigirikkusmustreid

ɛgi kui vaadata vaid peremeestaimi. Mõlemaid mõj samad keskk faktorid - eelkõige max AET ja kõrguste vahe

ɛn, peremehe-spetsiifika, uued liigid ekspeditsioonidelt jms. Arv 5.1 miljonit, siiski jäävad 1.5 miljoni juurde

ɲõõtes konkurents stressiga väheneb
)-290 node age); Pinus tek 126 MYA, kroon 89 MYA; arvatavasti radieerus ja oli edukas tänu põlengutele, millele kohastus

nii Frankia kui ECM, siis transp toimub pms Casuarinasse hoolimata sellest kumba taime on N väetatud. NO3 ja NH4 efekt sama
tal on suurem N vajadus Pisolithus
41.
); saarte biogeo on paljuski sõltub varem olnud vulk saartest, millelt on saadud asukad. Arv et organismid on liigirikkad aladel kus nad on tekkinud. Pan
tsenter Brassosporale kuna seal on preagu enim liike
:oos. Mägede taimed on arv radieerunud ja spetsialiseerunud tänu maapinna kiirele tõusule. Taimestiku nimekiri: pot EcM ja indig Gnetum, Goodyera, C
g, et määrata diversiteedi jm efektid produktiivsusele ja suremusele
viljakehadega, phyl /peziza depressa kõrval, ent puudub bootstrap support
ezizales. Mol. Ecol. 22: 1717–1732.

el; liblikate liigisisene COI var väga väike
iblikatel; seal kus ei tööta, on osaliselt süüdi krüptilised liigid
innuliike N-AM. Leiti 4 uut liiki; ei sõltu geogr kaugusest
ɔt sekventsi järgi 1.55 GAT; kandseened vs kottseened 1.2 GAT, sisemise kalbiratsiooni järgi väh 0.75-1.1 GAT
ltu krüpt liigist ega kultiveerimise ajast. Tõen käituvad isolaadid looduses teisiti
rüptilisest liigist, mis eristuvad 6 geeni põhjal. Mõnedel on erinev ökoloogia (nt pargi lehtpuud), teiste kohta raske öelda. Vastavad

ktid. Arv. Tulenes täpsest maakasutusest enne. Umbrohte eelnevalt ei hävitatud, vaid külvati taimed peale

Laccaria bicolor

Th terr domin lai kooselu skaala
t.

konkurentsi tõttu väljasuremine: mudelitepõhine
; BD: lähtekooslus>neelukooslus>jäänukkooslus; liigifond suurim vaid lähtekooslustes

ıktuuri sõltuvus erinevatest faktoritest: eristavad konkurentsi mõju fül sarn-funkts mõjust. Algoritmid

damine: Aspergillus, Candida. Spets probed 20 nu rDNA ITS. Täpne protokoll; diskussioon kontsentratsioonide spetsiifiliseks muutvate reagentide üle.

lagupuidul ja tüvedel, ent arv EcM sest vaid Dicymbe metsas. Arv efektiivsem eostega levik puidult, sest VK ei pea tungima läbi kõdu

õsarperek, levinud Jaapanis ja Guyanas, mood EcM

% >10cm dbh tüvedest. Mullaandmed ei seletanud Dicymbe vs liigirikka metsa olemasolu. Dicymbe mets väga püsiv, sest kõik vanusejärgud domin.

nerid.

Laccaria spp.

kuni 2500 bp loigud LSU Laccaria

erek mitmes lähedases Amhersteae klaadis. Sõsarperek veel Aphanocalyx, Bikinia, Icuuria, Didelotia, Pellegriniodendron, Englerodendron, Polystemona

org-rikkam ja kleepus rohkem juurtele külge; juured peenemad

Piloderma Paxillus

d liikidel mitmeid refuugiume Eur, Aasias, Ameerikas. Pms geneetilised piirid mitmetel liikidel jooksevad 1) läbi Skandinaavia ps., 2) Uural-Obi j; 3) Le

de, klasside ja seltside tasemel. Kandseente seltsifd vastavad klaadidele

ud resupinaatsetele seentele, palju vigu

ud 3 korda evol. jooksul. Hibet väidab, et pea koik pr-mä seened on dipolaarsed ???. Väidab, et on väga oluline seos okaspuu r pruunmädanik on toenäo

x evolutsioon

ub 1000-4000 a INSDs 16969 seeneklastrit + 9432 singletoni 93% ITS sarn põhjal. Pakub võimaluse keskkonnaproovidest liikide

korda muudest viljakeha tüüpidest. Nad on kaotanud eoste laengu ning esinevad teised levikumehanismid. Teistpidi arenguid pole

ksonoomia N

oimunud horisontaalne ylekanne

eraldi monofüleetilised. Tekke kohta erihüpoteesid LSU ja mt DNA põhjal Lentinula edodes: kosm

Ceratobasidium bicorne -1-tuumaline Rhizoctonia: tõ

ud, ITS1 v varieeruv 1tuumaline Ceratobasidium bicorne on okaspuuseemi

zomycetesist järgmine haru

osk seemnetega, ent mujal pole olulisi seoseid

erimine annab nõrgemaid tulemusi

maailmas: levikutsenter California; Arbutus parafüleet; levinud Euroopasse arv NE-Amst.

les fossiile leitud 96-92 MAT, mis olid ühed esimestest domin lehtpuudest. Muidu Podoc, Arauc jpt; Weddellia prov on arv tekkekohaks Nothofagaceae

eletavad 32% herbivooride põhjustatud kahjust.

ema massi juures, kõrgemal troofilisel tasemel, meres ja maismaal vs magevees, Ameerika kontinendil. Erinevatel kontinentidel ja

ised happed (pms 2-lisaelektroniga), mis puhverdavad pHd rakus ja tekivad raku liigses aluselistudes. H(2)PO4 puhverdab pHd nii mullas kui rakus. Eri

Pisolithus, Suillus Collembola eelistab mõnda ECM seent teisele, eriti m

all, süs, morf(TOE 426) I x gen Tom-opsis

all, süs, morf, määraja (TOE 52)

REGRESSIOON; anova Thelephora terrestris, Suillus luteus

eraalainete kattesaamisega mullalahuses Suillus, Thelephora

vs ECM seened 13C ja

arvavad, et Otidea on ECM, Ramaria, Clavulina saprotroofid 14C põhjal. Sowerbyella p arvavad, et Otidea on E

13C, 15N tuvastamine

C diskrimineerimine eri metabol9ismiprotsessides: ülevaade

medus ja hemitselluloosi konts. Pole vahet EcM ja AM puudel. Maapealsete ja maa-aluste organitele suht lagunemiskiirus erinev l mustes ja kompleksse inokulumi korral. MR tüüp, seeneperek mõju väike

ee aitab vältida ka arengut parasitismiks. Mudel.

C) näide
nändide kasv kiirem ja EcM kolonis väiksem lõunapoolsetel liikidel ja pop-del.
v. Jätkub hoolimata paljude partnerite olemasolust; taimedel ilmselt lõhestav valik, sest samad geenid mängus MR seente ja patoge
ath. 34:255–271.

ax aktiivsus 10 päeva pärast), MnP (aktiivne 10-16 päeval), LiP (vähe); orgaanilised happed: fumaraat, malaat, oksalaat (HPLC Nematoloma frowardii
võib asendada H2O2 MnP reaktsioonis. Tekib oksalaat
aade
Lyophylleae: Lyophyllumi koosneb mitmest polüfüleet osast. Lyophyllum semitale ja L decastes
ähenemine 15%lt 1%ni. Arv. Kõrge N korral ECM seened saavad vähe C ja seetõttu rohkem saprotroofe
adesse jõuab C 3-4 p pärast 13C rikastamist, mis tähendab et primordiumid saavad uue C-süsti arenguks, mitte ei kasva vanast ras
Seened eelistavad happelist pinda hõrge C/N suhtega. Seega, nii pH kui ka C/N suhe otseselt mõj mikroobide osakaalu

M; Miombos ja Mateshis palju EcM taimi. Leiti et ka Faurea (Proteaceae) mood EcM -pole tüüpilisi proteoidseid juuri. Kalaharis (sad u 700 mm/a) pol
13C sisaldus vs sapro vs ECM: 13C sisaldus v
lnevalt arvatud

tõttu seal vähe ka N2-fikseerijaid

used, probleemid
hmaspets probed. Kvantit määrang, protokolli pole antud
d (MP; NJ; ML) + Bootstrap vs Bayesia meetodid

inokulumi suurus on täh
suktsessiooniline rida: h
anne kottseentel toen viiruste kaasabil

eris

, sisaldab Psathyrellat, Lacrymariat jt. LSU varieeruvad ja konserv domeenid, LR5, LR7, LR21 jt LR-praimerid
ymnopaxillus spp nov ARG,CHL
d liigid. Mitmed seotud nii Fagaceae kui Nothofagaceae-ga. PNGs pms märtsist maini, vähem oktoobirist märtsini. Mõned liigid levinud L-Ams ja NZL
a (Boletochaete-st), Verrucospora (Cystoderma sarn)

hofaguse metsades ja siin-seal Indias, Jaapanis. Arv levinud põhjapoolkerale läbi Indo-Malai. Lähedane Rozitesele

ades ei sarn NZL Boletustega. Uued liigid Tsiilist
lalai saarestikus. PNGs pms märtsist maini, vähem oktoobirist märtsini.
(sarn Inocybe, ent mitte-EcM metsades), Morobia (sarn Lepiotula pisike dsapro), Termiticola -vaid termiidikuhilates Castanopsis-Lithocarpuse metsade
ümbitsevatel mandritel. Arv et muud AUS EcM taimed on oma seened saanud Nothofaguselt. Nii saproobidel kui EcM seentel palju liike või liigikomp
ek Hygrophorus (5 liigiga) on EcM; tei NZL Hygrophoraceae: arv ainult perek Hygrophorus (5 liigiga) on EcM; teised -Camarophyllus, Hygrocybe, Gli

Pisolithus
itte aga lõigatud) juuretipud eritavad ke Pisolithus spp, Lactarius deliciosus, Paxillus, Suillus

ıkades). Habitat filtering tähtsam kui konkurents koosluse str seisukohalt. Arv sõltub elupaiga heterogeensusest

li test
_OLULINE!
ɔrinting ülehindab ja puudulik proovivõtt ning taksonoomia alahindavad mustrit
ɔnjug kui lod valiku teel; väike väljasuremus arv, OTU ja liigidefin

l. 21: 2116-2129.

x

min Russuloidid; 400-a domin Russuloidid. Liiga väike proov, liiga vähe proove, 400a metsas puud jaotusid ebaühtlaselt
ɛaalas väike, vaid monel liigil suur (Lac xxx
+Gomphales). EcM harud 1)Hysterangiaceae+Maseophelliaceae+Gallaceaeceae; 2) Gautieraceae, Ramaria pp., Gomphus, Gloeocantharellus?; 3) mõne
ıine klaad hõlmab ainult põhja-poolkera liike, teine nii põhja-kui lõunapoolkera liike. Tek pigem eukalüptidel ja neilt levinud ka Nothofagusele
aerobolaceae; Pyrenogaster, Sclerogster, Myriostoma; Geastrum+Radiigera p. Parte

ele tunnustele gruppide kaupa, ü flexible
le kladistilise v klasteranalüüsi asemel tuleb kasutada vikariantsusel põhinevat analüüsi ja eelnevalt need sündmused ükshaaval välja selgitada
ɛese Venezuelas ja Atlantilises vihmametsas RdJ osariigis. Kokku L-Am 77 liiki Taksonoomia

ɪetr ja vett varuda. Lyrebird kisub metsas enamus taimi mullalt üles. Arv P sisaldus on limiteeriv faktor Nothofaguse kasvuks ja regener.

lus involutus. For. Stud. China 10: 95-100.

i fülogeneesikäsitluse lühiülevaade. LINK
mikrobioom inimese: normaalselt Candida, M
lus: Chimera_Check
ıne: rarefaction, parameetrilised, mitteparam meetodid, head ja vead; VIITED
ITS polümorfism; ülejäänutel polüm kuni 3.27%. >3& 1 juht 200st; >2% -3 juhtu 200st; >1% -8 juhtu 200st. Perekonnas Amanit

Et mikroobiel kehasuurus ei piira levimistõenäosust ega määra pop-tihedust ega areaali. Teadvustavad, et 16S pole liigi, vaid perek

n proovide summimise tõttu
analüüs
SSU); selles paiknevad Gautieria, Clavariadelphus, Gomphus, võib-olla ka Phallales LSU järgi. Eellane saprotroof ja ramarioidse viljakehaga (Bruns 2
Laccaria laccata
palju

sald mitmeid seeneliike. 1650 bp suurune fragment ei kõlba RFLPks. Palju kandseeni, üksainus AM-seen!!!??? seente diversiteet 2 rohu
ɪikjl ymber paju. Lepa juures ei kasva. Leiavad, et Pyrolate hea kasv pea täielikus varjus ei seletu millegagi, ent pakuvad 1. C kandmist mööda risoome;
nud varieeruvus suvel ja kevadel, mison arv põhj arktika jää erinevates tasemetes
eri koosluste võrdlemiseks rDNA eri cutoff väärtustega. Paariviisiline align > UPGMA klasterdus >cutoff väärtus > PCR või klasteranalüüs eri aladele.

ɔodustab indiviidide rohkust, mis omakorda soodust liikide rohkust. Erandid on noored linidzid, mis tek parasvöötmes, ja väikesed
l tööle. Lisaks: blokk-disaini võib lahendada ka tavaliste ANOVA meetoditega, aga vähemvõimas
bid, sagedus, ANOVA ja X2 võimalused ja möödapanekud, prooviühik; proovivõtumetoodika
eb igati vältida. Oksaneni peksmine. Replitseerimata andmeid saab analüüsida regressiooni abil ja mitmeF ANOVA korral interaktsiooni jr. Vähevõimas
etod, purustamine külmas 3* kloroformi ekstraheerimist, isoprop, etanooli pole. Edasi DNA ja RNA eristamine Quiageni kommertskitiga. Väga tõhus

meestaimi. Cenoc isolaat nakatas okaspuid, aga mitte yhtki lehtpuud. Kui lisada liiga palju Glc, on taime kasv inhib arv seente eritatud pigmentide tottu
Limacella illinata -N
kultuuris EcM kandseened ei tooda koniide; Limacella NM toodab
ndseentel ja cenococcumil puudub võime lagundada tselluloosi, pektiini ja ligniini. Paljud väidet EcM seened on valemäärangud (X
asma imperiale: ei lagunda tsellul Catathelasma imperiale: mood vähearenenud EcM männil 2-kihilise Hniga
Caladenia formosa: Serendipitaliigid. Experim sama liigi tüvedel üsna
ındaarstr
ɔura SSN, Manamgoda DS, Martin FN, McKenzie EHC, McTaggart AR, Mortimer PE, Nair PVR, Pawlowska J, Rintoul TL, Shivas RG, Spies CFJ, Su
earchers. Curr. Res. Environ. Appl. Mycol. 3: 1-32.

nimekiri MHP-ga seotud seentest

Pyrola aphylla (mükohet), Pyrola picta: palju EcM ja endof seeni. Indiv
Pyroleae: varjutamine ja juurkontaktide läbilõikamine ei suurenda oluli

ga

Orchis jpt orhideed Ungasris: eri niiskusega kasvukohtades seonduvad
märgalade orhideed kultuuripõhine: Tulasnella 2 suurt haru, Serendipit
ammooniumiseened: Alnicola lactariolens ja Hebeloma vinosophyllum mood EcM eriti uureaga
mükohet Afrothismia (Burmanniaceae) juurtes on 2 seent: AM-seen ja endofüüt, m

Tuber albidum ja Tuber aestivum sarapuul
Riessia -Shoreal ilma hartigi võrgustikuta
?*, Tm-st 5* madalam, ekstensioon 35-100 bp sec-1, tsüklite arv; praimerite ehitus ja disain ning Tm arvutamine, platoo efekt

Tuber spp

ii transformatsioon Pleurotusesse ja selle transkriptsioon Pleurotus ostreatus

otsenti kogumassist; Netoprod suurim aprillist juunini, suvel domin resp konsumptsioon. Erin teistest analoogsetest taimedest ei soltu P incarnata suurel
od tingimused, mensur katsed, vaatluskatsed: levik, kestvus, liikide & gener arv jms stat
itme osapoole fülogeneesi kasutamine; taime fül määrab lehelõikajate ja neil olevate parasitoidide interakts; parasitoidide fül-stpee

Kooslused selgelt erinevad. Arv põhj. Kas konkurents või erinevused levimisviisides
Tricholoma robustum jt spp

oni proovide ühtlustamiseks biomassi järgi
olivaceotinctus on er kohastunud ruderaalse eluviisiga. Võib-olla mõjutab suurem hüdrofoobsuse teke eri seente konkurentsi hoopiski

vad bor vöötme liike. Eriti hästi näha karpidel

e 4B kui teiste sepharose ja sephadex-ga. Isetehtud kolonnid
phala kuulub Helotialeste sekka
enis olid olemas algmed pea kõigist tähtsamatest suguk-dest, sh Caesalpiniaceae. Põhja-Aafr sarn floristiliselt Eur-ga. Hiliskriidist Ida-Aafr Dipterokarpi

remeesringiga (N-Am, E-aasia) ja kitsa Suillus granulatus: feneetiliste tunnuste ja ECM mood edukuse põhjal mitu väliselt eristamatut liiki: laia peremee
Orchis spp: hübriidid on agregeerunud emapoolse vanema juurde, mille
Dactylosrhiza 5 spp Belgias kõik assots Tulanselladega, eri liikidel sarn
Orchise liigid assots 4-9 Tulasnella liigiga v.a. Orchis mascula, mis sec
Orchis üle euroopa: Tulasnellaceae, vähem Sebacinaceae, + mõned EcM

õimaldavad efektiivsemalt toitaineid transada ja stimul signalisatsiooni

Tomentella stuposa 2 alatüüpi, mis morf poolest veidi erinevad [voib-olla juhusl], ECM kirjeldused. Erin rakuseinte paksuse, mantlil mustade laikude ja
Ungari tasandiku metsades analüüsitud vaid Tomentella ektomükoriisad: enamasti vähemusmorfotüübid, 4 a piires samas paigas suht püsivad, arv. Mela

rog: IGS2>IGS1>ITS. Kogu maailma populatsioonides geograafiline ja pikem ökoloogiline koondumine klaadidesse. Praimerid Schizophyllum commun
omycota hõimkonna nimeks. Rozellal on genoomis kitiini süntaasid olemas, aga kitiinkesta ei moodusta; arv tek meres, kuigi enam
sil: parasiitsed Rozella allomycis + Microsporidia on basaalsed seened. Viburseened ja ikkesseened on parafüleet, sest vibur on kadunud mitmeid kordi

evimist mol evol kiirus kahaneb, mitte ei kasva!

5 markerit suudavad eristada 10/12 mor Hebeloma cylindrosporum

Cenococcum, Lactarius cf subdulcis

dega ja arv ka troopiliste ökosüsteemide pindalaga piirkonnas. Troopilise kliimaga vs muudega oli mitmekesisus suurim. Leidus ka Nothofaguse eellane
geeni: liikide vahed väikesed, 98.5% ITS1 v ITS2 (kokku 97.5%) sobib barcode'ks. Väidet T. inocybeoides on T argyr ja T scalp re
ikutes, P. vernalis parkides-aedades, P. filamentosus lepikutes

emid. Hoolimata kõigest tuleb kasutada PCR-l BSA stabilisaatorit, Taq Start antikeha v hot starti. Puidust DNA eraldamiseks kasutada 1% CTAB! Mida
270-140 MAT. Ameerika liigid eraldusid u 42, 40, 18 MAT, levides narv üle P-Atlandi silla. Puberulumi, Melanosp, ja rufumi rühmad levisid arv üle B

rinev, aeglasem Kesk-kriidis ja K-T piiril; erinevates linnurühmades ja maailmajagudes samuti erinev diversif kiirus. Troop ja mitt

DNA eraldamine puidus
e riisil praimerid Thantephorus

ı palju kordi. Ülevaade
ıa palju-genotüübilistes kooslustes
ja paljal mullal kui Festuca rubra ja 12 taime segakultuuri puhul.

' + branch ja bound algoritm puu jaoks + bootstrap
põhjal valel nullmudelil ja tegelikku neg tagasisidet pole
arvukate mudelite kontrueerimine teatudd küsimuste lahendamiseks. Akaike kriteeriumi kasutamine selekteerimiseks

parasiidid vs sümbiondid paasitism vs mutualism Armillaria: sümbiont vs

naloog

eriti mulla niiskus. Sarnased ökosüsteemid üldjuhul klasterdusid.
jt orgaaniliste hapete roll mullas: liiga madal kontsentratsioon lagundamiseks, pooleluiga kõdus 1-5h, min-mullas 5-12h; mõõtmisprobleemid; mikroobid

Laccaria, Thelephora
looduslikult koloniseeritud istikutel puudub 0.5 m peal

tiline akt juuretippudel suureneb pärast N väetamist. Mõistlik väetamine ei vähenda EcM seente aktiivsust toitainete kättesaamisel
ed toitainete omastamise protsessid ase Wilcoxina, Amphinema, DSE ECM ja AM sümbioos kui parasitismi-mutualismi ko

ntel erinev liigiti ja eri kasvukohtades; ühe taime piires seeneliikidel erinev, samas koosluse tasemel üsnagi kattuvad profiilid hool
. Sagedased veeseened

struktuur: metoodika eristamiseks kasutades Bayesi puid ja SIMMAP proget

2: 143–156.

Favolaschia Zambiast orhideedelt Polystachya sp ja Microcoelia sp moodustab ass

8 eraldi vs koos

seerimiseks. Output pdf.
mene: sõltuvus 11st on asymm; enamikus tolmeldajate ja seemnelevitajate rühmades v madal

valivad ränimineraale oma kodade ehituseks ning suurendavad mineraalide paisuvust
ıhibitsiooni ning kasvu komplekssel toiduallikal. Lihtsal toidul liigirikkus inhibeeris v polnud oluline. Arv et antagonistlikud intera
polnud oluline. Arv et antagonistlikud interakts Serratia bakteri invasiivsusele. Siiski, kõige liigirikkam kooslus polnud kõige vast

OrM: Cephalanthera damasonium rohelised vs albiinod: seened samad, tomentelloi
Cephalanthera damasonium rohelised vs albiinod: seened samad, tomentelloidid ja
›ivus, peremehega sobivus, konkurentsis ellujäämine. Nende hulgasherbivooria ja bakteritepoolne fungistaas eoste idanemisele ja kasvule.

mustega kui NJ analüüs

ustes
536 andsid erinevaid tulemusi. Väga palju oli kimäärseid molekule (eri praimeritel 31-40%). Arv et nn. Schadti ja vandenkoorn mullaseente sekv mullas
t!); paljud bakterite OTUd kattuvad lõuna- ja põhjaparasvöötmes

Tuber melanosporum
ilii viljakeha ja arbuusijuure ITS-RFLP kattuvad. Juures endomükoriisa"" septadega ja struktuuritu
:ivad nii juured kui AMF hüüfid. Osakaalu raske hinnata
lling vs mulla mikroobid ja nende ensüm akt aastaajati: Girdl vähendas juurte kolonis alles 14 kuud hiljem u 60% võrra, peenjuurte
ainult vegetatiivselt

tuvalt mismätchidest ja degener pos vs annealing temp vs tsüklite arv; heteroduplexid, kimäärid ja nende tekkeviisid. Soovit mitme
yptiga seotud seentele disainitud markerid ei sobi muudele tyvedele

l seonduvad Pisolithusega, mis ei koloniseeri teadaolevalt dipterokarpe ega mändi, kuigi männi omad mujalt leitud eukalüpte kolon

omatogramm gen str uurimiseks
Thelephora
sterisse
uvad mutualiste ja vohavad
x palju, valitud DNA analüüsiks
Heterobasidion annosum cDNA rmtk: geenidel vähe s

ommunities. FEMS Microbiol. Ecol. 70: 388-401.

Epidendrum firmum epifüüt: assots laialt Serendipitaceae ja Tulasnella

Amanita porphyria, pantherina, spreta, rubescens, Cenoc, LEPISTA GRAVEOLENS, LEPISTA

grandoflora (ektendoMR). ILLUSTR; muud taimed AM, Pedicularis NM; VIITED, ülevaade
nthaceae pole, sõsarad Spondianthus ja Bischofia
k olemasolevasse aligneeringusse

le - nn profiilide aligneerimine suurde MSAsse

pipeline: andmebaas, deponeerinmine, bulk blast, align, puude tegemine

IGS1: 14/490
Phellinus nigrolimitatus:
Fomitopsis rosea
Trichaptum abietinum: t
i. Dik org-s kummaski tuumas erinev ITS v IGS versioon. 85% juhtudest ITS1 ja IGS2 samad; 95% juhtudest ITS1 ja ITS2 versioonid samad -mingil ta
m. 3 krüptilist liiki, millesharvad hübridisatsioonid EF1alfa, Beta-tubuliin ja ITS-s. ITS ü homogeenne, teistes tulevad tugevad erinevused. Allopatr mik

Lyophyllum shimeji
Lyophyllum shimeji=L. Fumosum EcM mood juurutatud vartel. Mood puhaskultuuris ka viljake
ine Michaelis-Menteni kõvera jr: v hea max ühtlases kk-s, vilets norm-tingimustel (taimed). Konservatiivne kui n<B, optimistlik kui n>B; R2 ei saa kasu

ı korda
d tselluloluütilistele seente ensüümidele. Rohkem geene leiti N-vaesest vrd N-rikastatud mullast (v.a.Ox dekarboxylase, kitinaas)
ılogeneetiliste distantside jaoks

ıel fülogeneet üledispers

ıktuuri tuvastamises: soovit Brownian motion
ırvutavate progede võrdlus: eri tulemused Chao1, Sace jt; VIITED

loga, v põhjalik seletus ja lahtimõtestamine mullaseened erinevad ol

Rhizopogon 2 spp

PsT tristis ja Xerocomus sp (1 ala)

Tomentella, Amphinema, Pseudotomentella esmakordselt viljakehade uuringus

ɛ

Pyrola rotundifolia arbutoidse mykoriisa kirjeldus: kandseen, paks mantel, tugev rakusis kolonis, haustorite seed

x MHB

Cenococcum

orreleeritud
hizal symbiosis. Science 333: 880-882.

id Moriin ja Hesperidiin induts Suillus bovinus eoste idanemist
ıuu sodi pärast

ıriae triibusele septade ultrastr jr; Cheilymenia ja Scutellinia on erinevad, ent omav sarn
Pezizales seltsi tasemel, raskemini suguk tasemel. Perek tasemel peaaegu identne ultrastr Aleuria-Leucoscypha on omavah seotud, Octospora-Anthracol
Pezizales seltsi tasemel, ja enamasti suguk tasemel. Perek tasemel peaaegu identne ultrastr . Tuberales toodi ultrastr põhjal Pezizalesse ja Thelebolus era
ıjas vaid üks alleel
ja x2 testi abil üht tüüpi märgistusega genoomse DNA abil.

ɾu ja EcM haru on sõsarrühmad ITS+RPB2+LSU baasil. Maasis vk-dega harud on tek mitmetes saprotroofsetes rühmades; EcM rü

.
ɛg. AM seened potikatses vähendavad eukalüpti efekti teistele taimedele
nalüüs:ülevaade meetoditest;

ıhkem arbuskuleid kui eksootilistel; -> Invas taimed mõj seenekooslusi läbi taimede BD vähendamise
Rhizopogon spp
:, Lact rufus

ı 42.6% olid NM. EmH järgi leiti proovist 4 liiki vs 3.1 EmH-na, kokku 31 EcM-na ja 24 EmH-na. 3% kimäärseid sekventse
ıs ja põllumaj-maal
ıiseks

15 tsüklit + puhastus + 5 tsüklit. Kimääride tuvastamisproge link ja barcoding tasemete proge link. Väidavad, et ka 99% barcoding krit 16S rDNAle on

Laccaria, Cenococcum xxx
mullapatogeenid määravad taimede edukuse, harulduse

tid suurendavad mikroobide biomassi ja mitme ensüümi aktiivsust mattides, ent erinevusi pole kui kaaluda mikroobse biomassiga.

ktuuri ja olemasolevate andmete põhjal tehaks kindlask, kust proov võiks pärineda ja kas tegu võib olla reostusega
:oonidel: ülevaade ja Templetoni NCA mahategemine

: ITS1 regiooni (pseudogeenid, hübridisatsioon, heteromeersetes kromosoomides: jamps), ent muu sama; mch, ITS1, ITS2

taimed + ECM + saprotroofid TNT bioremediatsioonis efektiivsed taimed + ECM + saprot
Madala toitainete sisaldusega muldadel EcM parandas konkurentsivõimet, vb ka muud hüved
ıebaas ja veebipõhine analüüs
ıope tetragona (4/9); Pyrola grandiflora (7/8). Kokkuvõte varasematest arktoalp. Töödest. Selgub, et Cassiope on EcM N-Am; Saxi
uurtel. Liigikirjeldus ja EcM-moo Neocudoniella radicella kuusejuurtel. Liigikirjeldus ja EcM-moodi struktuuri kirjeldus [tundub,
ıade: allo vs sümpatriline, polüploidiseerumine, genoomi introgressioon, hübridiseerumine. Kodust seente liigitekke mehhanismid: ülevaade: allo vs sümp
:1: 403-412.
13C: saproobidel fraktsi

ınine EcM seentel arv fakultatiivn lagundamine EcM seentel arv fakultatiivne. Ei tohiks ranget vahet teha EcM lagundamine EcM se
eliikide esinemises, ent 3 rühma olid ette antud!!!
edafon ei mõjutanud sap
Suillus, Cenococcum, Amanita jt

tandard: 3 4st peab kattuma. T-RFLP kapillaar-geelelektroforeesil ABI 3100 masinal ECM mütseeli uuringus

stabiilsuse tagamiseks hübridisatsioonil); oligonukleotiidprobed 16-24 bp; dissotsiatsioonitemp, pesemistemp optimiseerimine; 1 bp valepaardumise kor

1986 1990-1994+ süsteem 1986, 1990 tomentelloid
3 liiki

Hydnellum; 76
Tomentellopsis sp
or Soil, Real-time PCR AM seeneliikide ITS regioonile, mis teeb määramise 6x odavamaks ja kiiremaks süsteemis, kus 13-14 liiki
Colletotrichumi peremehe-spts tüved põhjusta
Peziza whitei kui Laccaria sp-ga. Mantel v õhuke v fragm ja epidermise rakud ei pikene (v.a. Fabaceae). Kõik seened stimul kasvu 1.5 -90kordselt

t rikkuse soodust EcM liigirikkust
kuuseokka kõdus: B

maksasammaldel: Jungermar maksasammaldel: Jungermanniales: Sebacinaceae + mõnedel tundmatud kottseened

üll; puudel AM-seened ühised paljudel liikidel; Ecuadoris: Maksasamblad ja orhideed: Tulasnellales sekventsitüübid kattuvad mini
Cenococcum
Suillus grevillei

T. submollis sisaldab palju rohkem Mn xxx
Attractiellales on Tulasnellade järel sagesudelt teine mükobiontide rühm
er-Verlag, Berlin, Germany.

isald mitmeid krüpt liike, millel pole peremehe-eelistusi. T. leptoderma indiviidides on 2-7 erinevad ITS alleeli, mille sarn on 98.0%

ıum carthusianumile)
eina-pez gerardii klaadis
tugevat taime vastureakts; mõju taimek Terfezia ja Helianthemumi suhe pole EcM, kuigi seda väic Terfezia ja Helianthemumi suhe pole EcM, kuigi seda

DGGE: Ammophila are
DGGE bändid: bakterid
l; lat asemel oleks pidanud k temp vms
tuuri analüüsis määravtunnuste rohkus kui tegu 'limiting similarity', Power suurem kui valim on u 50% liigifondist

lmakerke-ornal pinnasel; helianthemum karjatamist vähetaluv

Pyrola rotundifolia arbutoidse mykoriisa kirjeldus: kandseen, õhuke mantel, taimeraku tuuma muutused. Tugev r

. kuni 450 km polnud tähtsust

Thelephora, Amphinema, Laccaria)

fülogeneet determineeritud mooduliteks. Parasiitide peremehed on pigem samades moodulites, aga parasiidid ise on moodulites juh
põhjal keskkonna, kliima, fülogeneesi mõjude hindamine parasiitide kooslustele
regionaalselt fülogen signaal puudub, ent kontinentaalskaalas on see oluline; sarnased kirbuliigid ei jaganud sarnast ohtrust ega pe

Atp6 parandab sugukondade lahutusvoimet oluliselt, ent perekonna-ja liigitasemel on vilets
CG ja CAC kordustele; pikemaid alleel Rhizopogon 2 spp
oboletinus, Gastrosuillus; lehis esialgne peremeestaim
amine
OrM: Neuwiedia -Ceratobasidiales, Tulasnellales

iilide statistiline võrdlemine: igale jooksule arvut Pearsoni korrel-koef ning vrd grupisiseseid korrel gruppidevah korrel-ga kasutades Monte Carlo simula
sperma (NZL= Cortinarius); tek Lepiotast, sageli kasvab koos Rosacae-ga
d väidet Pisonia grandise alt, ent ei välistata teisi peremehi.

Laccaria bicolor
seotud Cercocarpusega (Rosaceae)
Hygrophorus purpurascens EcM süntees jpt
CWD: ECM viljakehad

üm ha kõigi rakuseinte eemaldamiseks ja ka fenoolide vastu
fallax: corticrocin -sünteesib siis kui on süsivesikuid, nt side peremeestaime juurtega
ferentsid

riegatus ja mänd erinvad oma substraat Suillus vriegatus
timuleerib MnP (aktiivsus fenoolpunasega mõõdetud)
distantsimõõdud ja meetodid: ChiSq ja Pearson Corr efektiivsed gradientide puhul; Gower ja Canberra diskreetsetel juhtudel; 100

xxx
Leotia lubrica arbutoidne mükoriisa Comarostaphylosel
eet autokorr samaaegne arvestamine: parim moodus on ruumilise analüüsi jääkidesse fülogeneetiliste vektorite sobitamine

orhideede mykoriisa isolaadid: moned stimuleerivad, teised mitte orhideede idanem

nia solani -Agde ITS varieeruvus: ITS1 varieeruvam kui ITS2; AG-sisene var 0-3%; AG1 jaguneb Thanatephorus cucumeris=Rhizoctonia solani -Agde

ıvad BD tsentritega: 1) Katanga 2) L-Aafr 3) Keenia mägimetad ja Eastern Arc; 4)S-Kamerun --Gabon
Pinus edulis: isolaatide a
Clitocybe, Lepista: nitri

risosfääri seened tamme

elis: viljakehas avalduvad antioksüdantide geenid jms

ustraalias: pms ida ja lääne vaheline levikujoon. Ida liigid levinud arv korduvalt ka NZL-i. Arv ida-lääne piir tek paleotseenis

Eucalyptopsis (Uus-Guinea), Arillastrum (Uus-Kaledoonia) jt. EcM eukalüptid tek hiliskriidis Austraalias. Mõned Eukalüpti liigid levinud ka Mindanao,

ega: ökoloogia ja fülogeneet kuuluvus (Mattirolomyces -NM Peziza proteana), (Kalaharituber -Iodowynnea; Eremiomyces echinul

Wilcoxina-ülevaade peremeestaimedest; katseliselt EktendoMR männi ja lehisega, ekto teistega+ kask + haab v

Paxillus involutus: tüüpiline ruderaal. Kolonis. Kaevatud maad, põlenud alasid, metsataimlaid, väetamine stimul.

les. Statistikud ja presenteerimine

kuuse geneetiline mu

mullaseened vs endo

Eriogonum, Antiogonon

Pisolithus sp

Pisolithus sp

Pisolithus

Pisolithus

Laccaria bicolor

ud. Arv. Et rott on v efektiivne eoste levitaja, läbides päeval 1 km

nineraalide lagundamine:ülevaade

Suillus bovinus, Paxillus

ud. VIITED.

s: A) Pezizaceae, Ascobolus; B) Gyromitra, Morchella, Caloscypha, Tuber, Helvella; c) Sarcoscypha, Sarcosoma, Pyronemataceae

uktsessiooniga, sest ECM taimed on võimelised min-aineid seente vahendusel paremini kätte saama kui AM taimed; hüpotees: l ECM peenjuured lagune

n SD; erinevused suurenevad ajaga; mitme liigi segu kogutoodang on suurem kui vastavate liikide monokultuuri keskmine. C-ühe

Paxillus

Paxillus

Paxillus, Pisolithus

Paxillus

nerevees ja parasiidid; taimekudede nakatamisvõime tek 2x - Pythium ja Phytophthora; loomseid rakke nakatavad kõik rühmad v.s

ge BAMBE

Piloderma fallax = bicolor = croceum ja eristamine P. Byssinumist värvi, tsüstidioolide, eoste, basiidide jr

e sõsarrühm Hericium, Heterobasidion

e, sõsarliigid/vormid eristuvad lehtpuu vs okaspuu peremehe järgi. JPN shimeji on kuivades SWE männikutes

Serapias-orhidee saab org-vaesel mullal ise fotosünteesides C; orgaanil

:ud. Euroopas ei elanud üle jääaegu. Puudel raske ehitada kompleks külmakaitsemehh. Erandina Am-s rohkem Carya, Crataegus, Quercus kui Aasias. C
/. Erinevused survega geenidest. Metsapuude näited

ausside metabolism troopikas palju efektiivsem ja seetõttu liikide nishid on laiemad.
a radieerus kiireti peale teket; EcM harud tek peale 30 MAT (Amhersteae ja Acacia).
disjunktid 2-3 x vanemad kui kontinentide sisesed disjunktid; Levik mängib palju olulisemat rolli kui tektooniline ajalugu, eriti sarn kooslusetüüpide vah
l radieeruda
lt kandseente hulgas, eriti palju Corticiales ja Cantharellales seltsides. Lihhenikoolsed seened tek korduvalt v erinevatest muudest toitumisvormidest. Lil

Tuleb kaitsta ka inimhäiringutega kooslusi, sest mitmed liigid tahavad just seda
ub. Juured ulatuvad väh 3 m sügavusele, arv 9 meetriniMetsatüüpide alustaimestik. Muld metsas palju niiskem ki hilisemas võsas. Miombo ja Marquesia
uesia kasvamahakkamist Zambias. Vegetatsioonitüübid 1000-1600 m kõrgusel. Peaaegu kõikjal dominandid EcM puud

Paxillus
Paxillus involutus G 21.5Mb

vs ECMseened: roll loo
r fungus. Tree Physiol. 21: 71-82. Suillus, Paxillus Phanerochaete
Miner. Mag. 72: 85-89.

mükoheterotroofid: ülevaade mükoheterotroofid: ülevaade mükoheterotroofid: ülevaade mükoheterotroofid: ülev

il

Coltricia cinnamomea peetakse saproobiks Coltricia cinnamomea p

NaOAc-isoprop-etanool meetodil

Thelephoraceae sp - efekt positiivne v neutraalne
Riessiella sp mood EcM nii Acacia mangiumi kui Shoreaga

aasis VK seeni. Suur enamus seeni kirjeldamata liigid
Dipterokarpidel: ülevaade ja viited kohalikele töödele
em kui kanoonilised (RDA) meetodid, eriti 2-d andmete puhul ja müra puhul
tuleb andmeid transformeerida: chi square omistab nullidele v suure kaalu; head on Hellingeri transform ja Chord. Bray, Sorensen

n partitioning PCNM vektorite abil. Ülevaade statistikutest

Paxillus, Laccaria, Thelephora, Hebeloma
isi edasiarendus. Osaline regressioon maatriksitele. PCNM vektorite ja koosluse str põhjal)01) tehakse sõlmede maatriks. Mõelduc
ıltiv, DCA korral
): 151-160.
kiirem kui ML, MP, võrreldav teiste baieesia progedega. Skoor = P
ıeb krüpt liikideks, millel oma kindel peremees. Liigisisene ITS var 0.1-0,33%
3erbee & Taylor, 1993: ECM teke varakriidis 130 mya
et al kalibreeringut ajas tagasi. EcM teada eotseenist. EcM taimed arv radieerusid ja levisid hilis-miotseenis ja pliotseenis nii N-Am kui Aasias kui toimu

probed: 30 -3000 b. Mida pikem seda intens signaal; Vahet pole praimerite keemilisel ja PCR-sünteesil; 50 bp probedel valepaardumised madald signa

Oomycota review
oidide omadused ei pruugi olla aditiivsed. Mõjutab sümbiontide -tolmeldajate divergeerumine

Lecc scabrum ei mood männiga EcM, ent stimul selle kasvu . Suillus bovinus mood EcM, ent pc formeerimine vs seondumine mullaosakestega, mis eriti aktiivne saviosakestega (er montmorilloniit) ja sõltub pHst; GMO taimede

dlus. Soovit Bayesi meetodeid

Rhizopogon

st täisküpsust 3 p jooksul; öösel m Amanita muscaria eoste levik: aja jooksul eoste suurus väheneb; eoste eraldumine max pärast täi

e)(Casuarinaceae(TicoD,Betulaceae))(Myricaceae((Rhoiptelea, Juglandaceae))));;;;; Ticodendron(((Alnus((Betula(Corylus, Carpinu

rt (7), Russ-Lact (4), Trich (4)

el testi analoog, võimaldab kasutada samaaegselt mitmeid dist-maatrikseid

Itaalias ja Makaroneesias. Neottieae miksotroofid ja seot EcM seentega

Epipogium aphyllum - saab mingi osa N ja C seene kaudu; seotud Inoc

Cenococcum: ei mood ECM 2 pajuga, lepaga ja kadakaga

Pyrola rotundifolia, P secunda: isoleeriti juurtest mitmeid seeni, sh MRA1, pannaldega kandseen, MRA2, MRA3

mikrolülijalgsete BD mu

1tuumaline Ceratobasidium on nii kuuse kui männi ist

e ruumiline autokorrel

Tomentella sublilacina vs Rhizopogon sp

Tom sublilacina: eosed levivad paljute mullaselgrootute seedetraktis ja kitiinkestal. Võimalik levimiskaugus. Eosed vitaalsed peale esimest seedekulgla

proovides palju, N-tundlikud | N-tundlikus liigiti

muutub enne rohustu muutumist. Arv, et Euroopas on seente BD vähenemine samuti seotud N-ga

appeid puhaskultuuris (Lact theiogalus) ja vastupidi (Cortinarius spp.)

e toodavad pigem ohtra niidistikuga liigid. N-väetamise all kannatavad eelkõige ohtra myc liigid - on arv liigseks kulutuseks taime

uringuks on vaja sobilikke töö disaine, keskk andmeid, ja nende põhiseid mudeleid; distaalsed vs proksimaalsed muutujad, ; tuleb tekitada globaalseid a

T. Sublilacina | T. Sublilacina, Rhizopogon

Hypholoma

tel: klassikaline vs molekulaarne vs analüütiline tuvastamine. Sama seeneliigi puhul ei tohi kasutada vaid ühtainsat tüve

d kandseened eritavad eriti koloonia keskosas (mitte tipmises) kitinaase, er siis kui varem on seal kasvanud Fomitopsis pinicola

värskes kõdus Helotiale

Suillus variegatus vs Hypholoma fasciculare; inokulumi efekt | Suillus variegatus vs Hy

xxx | Hypholoma

ECM vs sapro toitainete liikumine ja aineringe: ülevaade, diskuss | ECM vs sapro toitainete

ened lagundavad teatud määral orgaanilist ainet, ent N ja P kättesaamise eesmärgil. Neid ei saa saproobideks | ECM seened lagunda

x

mullaseened; vs gird

09: 288–299.

geenide tuvastamine EcM seentest: puudu Lactariustel, Canth, Hydnumil; 1 isovorm Coltricia, Hygrophorus, Cort, Pax, Russula, S

a, Ruanda-Burundi, Sierra Leone-Libeeria. Endeemidelt esireas Kapimaa, Põhja-Sambia, jt. Lokaalne liigirikkus korrel v tugevasti aastase sademetehulga

ti <2%, ent esineb >5% erinevaid kloone, mis on sarnasemad teistele liikidele. Pms transitsioonid, vähem transvers ja indel

col. Manage. 259: 698–709.

. oligoprobed: ITS3B+biotiin -universaalne; ITS2 regioonisisesed probed liikide jaoks + dioksigeniin. Vedelhübridisatsioon PCR produktile. Probe fluor

vused: ülevaade

l

parem aminohapete lagund. Hübridis erinevam aastaajati kui paari m kaupa repl-proovides, ometi sesoons sarn kui paari km kaugustel replikaatidel

procrustes on usaldusväärsed meetrikud koosluste korrelatsiooni võrdlemiseks. PAM vektorite testimine, võimaldab vähe proove k

nperekonda Pinus ja Strobus; mõl vaid põhjapoolkeral; Pinus fossiilide jr vanem, feneetika jr noorem

seks ITS. Barcoding gap 2-4%, soovit 4% liikide eristamiseks õjul popd ristunud, eri tüved kõlbavad kääritamiseks; Sake ja veini jaoks mitteseotud tüved.

CHN-s: ülevaade

ühm Sordariomycetes. Pezizales on kahe iseseisva haruna eukottseentele basaalselt (100% baiesi toetus, madal Bootstrap)

da aligneeringut ML-puude põhjal. Kiire, täpne

oligoprobet, pesitsi ja redundantsed seas. Õige-ja valepaardumiste eristamine mängides sulamiskõveraga. Külmhübridisatsioon. Vähene soolade konts p

ühmade EcM staatus ei vähendanud negatiivset mõju

Saccharomycetales ja Taphrinomycetales on monofüleet. Long Branch attractioni probleem

ed; Leotiales Pyrenomyceteste sosarryhm, Discomycetes parafyleetiline; vähe liike!!!

grupid

Cenococcum

Complexipes, Phialophora, Suillus, Pisolithus

ıentaalselt mõl eelistasid parasniisket. Arv EcM tõrjub AM välja sobivates tingimustes

ıemeid

imine lihtsate matemaatiliste funktsioonidega: binaarsetele sipelgaandmetele (tugevalt lognorm jaotus) lognorm ei anna usaldusv hinnangut. ICE ja Mich

ımine rakuprotsesside visualiseerimisel; VIITED; VIDEO VIITED

ısel

ultuur

uurendab koosluse biomassi võtters arvesse iga liigi panust polükultuuris vs monokultuuris

d

EcM süntees: Salix spp + Entoloma nidorosum, Entoloma sp, Hebeloma pusillum, Pax involutus, Cortinarius pu

eemid, ülevaade

vaid AM. Noortel aladel NM Cyperaceae.

erinevad peremeestaimeti ja koosluseti ning sõltuvad, kas taim on mono või polükultuuris

õttu suurim BD just seal

erirühmade, kõrgematele taksonitele, universaalsed, 2 neg kontrolli, optimiseerimine dissots-temp ja pesemistemp jr; tetrametüülammooniumkloriid A-T

struktuuri võrdlemine nii harupikkuste kui ka fül. Suhete baasil. Eeldab võrdset sekventside arvu jackknifingus. Väljundiks kasutada peakoordinaatide a

ntside arvust proovis, ent muid hälbeid ei olevat. Soovit jacknife'da proove, et oleks võrdse suurusega

rdlemine ühes analüüsis, standardiseerides max harupikkuse jr

tistik on parem, sest tekitab palju tihedamad klastrid, kuna binaarsed ja ohtruse andmed võivad sõltuda eri teguritest

üüs, permutation test, vajab fülogeneesi puud nexus või newick formaadis ja fili, kus kirjas, mis kust; saab teha haru kaupa

tika: ülevaade meetoditest ja nende olemusest. Webbi NTI ja NRI kvalitatiivsed, UniFrac võib olla kvantit

ıanita, Laccaria, Pisolithus, Scleroderma

Amanita, Boletuse, Cortinarius, Descolea, Hydnangium, Hydnum, Laccaria, Lactarius, Mesophellia, Paxillus, Pi

yptus on sõsarperek.

enid kandseentel: saproobidel kuni 8, ECM seentel 1 (3). Pole alati vastavuses ensüümkatsetega. Lakaas võib olemas olla, ent ei tule välja Petri tassil

al asuvad seltsid aga tõen parafüleet. Sõsarrühm Eurotiomycetes

est sugukondadeni nimetades perekonnad

Laccaria bicolor

samad tulemused;

Laccaria,Hebeloma,Cortinarius anomalus
ɔhtade/plottide suhtes; ka aastaajaline varieeruvus: oluline saak ka kevadel; viljusid pms A ja O horis piiril v veidi ülalpool

uulub Phallomycetidae alamklassi

ıe kottseen (mullal ja lagupuidul), viljub kevadel, Wash osariigis

ıomycota basaalne ent polüfüleet., Pezizales päriskottseentest basaalne ja monofüleetiline. Kandseentel põhiklaadid lahendamata. Ikkesseened ja vibursı
samblikud on päriskotts
elihhenis Omphalinadel -nii 28S rDNA ja ITSs eriti AA ja TT saitides, kus võiksid muudustuda T-T dimeerid. Arv põhjus suurenev UV kiirgus seoses n
.va vs jääkide jaotused. Suunad ja olulisus võivad erineda - konservatiivne on pidada oluliseks, kus mõlemad on samasuunalised

Tomentella sp Tuber puberulum, Russula ochroleuca

1-ITS4 kultuurist

ine oligonu-probede ja streptavidiini teradega

ɾylus, Ostya, Cyclobalanopsis, Fagus, Quercus, Shiia=Castanopsis; Populus, Salix; AM leiti Eucalyptus, Callistemon, Tilia, kõik R

.tega. Eraldati mingi vana meetodiga. Keetmisel jupid lühemad, akstreemjuhtudel <500 bp
ıitte kauglevinud. Arv Dipterocarpaceae tek sesoonsestes troop metsades, mitte vihmametsades

ɾoni test

Th. Terr domin
Piloderma sp1, P. fallax
domin
Piloderma spp
kottseened: Pezizales ja Elaphomyces kui EcM moodustajad: kõigi autori töödest ülevaade, v palju kontrollimatı
ıoosivaba tükki.
l: esinesid Heterobasidionil ja Amanital Amanita regalis, Paxillus, Suillus bovinus proteaasid: esinesid Het

ınis domin ürgmetsas

Res. 16: 199-206.
Eucalyptus marginata EcM tüüpide Ohtrus sõltub aastaajast. MR tüübid levinud eri horisontides.

palju
Suillus, Rhizopogon, Amanita, Hydnangium, Hebeloma (3 viimast asustavad normaalselt ka eukalüpte)
eukalüpti 2 liigi vaheline peremehespetsiifilisus v suur
cum Alnusel

on tek saproobidest mitmeid kordi iseseisvalt. Ei ole kodustatud parasiidid. Tselluloosi lagund supresseeriti koevol käigus. Pigem v

Tuber melanosporum
Tuber melanosporum, T. brumale
Tuber melanosporum

ine. 13C DNAs 2x, rRNAs 10x vahe

vus, eriti S. granulatusel

ITS: Cerris (Lobatae (Protobalanus, Quercus)): monofül rühmad Ameerikas ja Euraasias; põhjapoolkeral
v L-Hiinas; Lithocarpus SE-Aasias; Disjunktsed taksonid on eristunud miotseenis ja arv levinud üle Beringi silla. Kolumbia ja SE Aasia Trigonobalanus

lakaasi geenidele ja transkriptidele SB, NB, väh 5 geeni; fruktuus Glc asemel ja veratrüülalkohol stimuleerivad aktiivsust; aktiiv Trametes
lakaasi erinevate geenide transkriptsiooni reguleerivad erinevad faktorid ja ajastatus on erinev Trametes
ıvastamist ja takistab erinevuste väljatoomist treatmentide vahel
useline ühendatus katkeb kiiremini; orgaanikas ensüümid vähem tundlikud kuivuse suhtes
.d on tek >15x. Eelduseks sklerotiseerumine ja seksuaalsus
s vähem indiviide ja rohkem sugulist palj. Põhj arv. Liigirikkuse-pindala suhtes Z=0.17 mandril ja 0.28 saartel
Collybia fusipes
maisi risosfäär Brasiilias: 20 maisi risosfäär Brasiilias
ın Rhizinaceae-sse kuulub patogeen; Phymatrotrichum on saproobne anamorf Pyron Phymatotrichopsis omni Phymatotrichopsis o

ıceae ja Myrtaceaega. Hiljem er koos Podocarpaceaega. Hiliskriidis levinud nii lääne kui idakaldal kuni 25* S. Hiljem vähenes. Jääaegadel er areaali lõu

viljakehade mass vs EcM
ıts-probed, PCR pole, meetodit ei kirjeldata

ıümanalüüs, oksüdaasid oksüdaas

Batrachochytrium salamandrivorans ähvardab
test biodiversiteedi võrdlemiseks, proge arlequin; muud meetodid
ɔiilsed
Pisolithus

l puuduvad geenid suhkrute ülesvõtmiseks mullast iseseisvalt;
ʋad suure indeli poolest. IGS sisald v palju mikrosatelliite, mis on sarn teiste seente IGSle (Collybia ja Trich matsutake)

ı lähedalt seotud ja asuvad Stereales-Russulales rühmas
nud Naucoria rhrheophyllast

ɛ tulemuste interpreteerimisega

plottides oli põlengu efekt palju tugevam kui tsistuse plottides. Nõlva suund ei olnud eriti oluline, kuid Boletus edulis eelistas tsistuse N-plotte ja Lecc c
Reunionil ja Guadeloupel mükohet orhideed on seotud saproobsete seen
OrM Reunionil: Network str Nested; spetsiifilisus madal; pms Tulansel
Thelephora terrestris moodustab s Thelephora terrestris moodustab savipottide välisküljel resupinaatse viljakeha
Pisolithus
Pisolithus

Thelephora
Thelephora Thelephora
Thelephora, Pisolithus

ɛteritsiidid, fungitsiidid patogeenid vs ECM seened agaril ja looduses
Laccaria, Pisolithus
ʒe. 128: 259-268. Laccaria, Hydnangium
ɜ. palju

ıist teiste varase st seentega; varase st seened nakatavad peremeest peale inokul joudsasti ka mittesteril mullas, hilise st seened vajavad sterilis mulda
Alpova, Pisolithus, Laccaria

Rhizopogon vs Truncocolumella sünt ja EcM SEM kirjeldus
Paxillus involutus

Pyrola, Chimaphila, Orthilia, Moneses: mantel hästi arenenud P-asarifo
maasisesed juhuperemehel
eri peremeeste eelistused, juhuperemehed

Cenococcum

Lyophyllum shimeji -EcM?, tek dihhotoomsed juured. Teistega läks aia taha , sest liiga vara inol

ı family Inocybaceae. J. Biogeogr. 36: 577-592.
kasvavad Dicymbe tüvedel

ıustraalias -kalibr Ida-ja Lääne Austraalia eraldumise jr 15 MAT. Leiavad, et AUS ja Aafr klaadid lahknesid 86 MAT. AUS liigid on hiljem korduvalt di
geene. EcM harud 1) Hygrophorus, 2) Amanitaceae; 3)Phaeocollybia??? 4)Hebeloma, Anamika, Alnicola; 5) Inocybe; 6) Cortinarius; 7) Descolea; 8) L
geenide järjestuse järgi on kas Agaricomycotina sõsartakson või kogu kandseente sõsartakson.
J; suht hästi vastavuses feneetikaga, ITS pole aligneeritav; RPBII annab pluliselt juurde
pärane (Bankeraceae liikidel polümorfism või pseudogeenid, ent muidu head pikad harud). Mõlematel teatud vastuolud rDNAga. Praimerid.
e, sõsarsugukond Crepidotaceae, sh Crepidotus. Cortinariaceae on kaugel asuv; Inocybaceae iseseisvalt tek EcM takson. Sileda ja nurgeliste eostega lii
iärtuste ordineerimine ja korreleerimine keskk parameetritega

aminopeptidase: ülevaade. 2 konvergentset ensüümirühma; mittespetsiifilised valkude lagundajad, v palju muid anabolismi ja sign
rsiteeti

ossiilid Ida-Aafrikas, kahtlased fossiilid Eur ja N-Am. Perek kaupa liikide arv

ɔleemid Eur nimedega, Paljud seened eri biogeo mustriga: Kosmop, Gondwana, Pantroop, AuS-MAL, Patsif, AUS-Holarktika. Australia seened: takso

Kitsaid endemismikoldeid pole teada. Mitmed sõsarliikidepaarid eristunud Ida-ja Lääne Austraalias, ent väga paljud liigid on levinud nii idas kui läänes.

M seened aitavad kaasa lagunemisele Dicymbe metsades, sest olulist lagun aeglustumist EcM plottides (vrd sapro ja lõigatud plottidega) ei esinenud. Sa

Pisolithus, Laccaria
Suillus, Pisolithus, Laccaria
vard distantsi-põhised redundancy ordin RDA
, suurem liigirikkus, kollektorkõver järsem. Sarnasusindeksid proovidele. Proovide DNAde kokkupeksmine, et saada üle PCR nihkest (Walther,1994). N

potentsiaalsete peremeesseente arvukus mõj 3 orhideeliigi idanemise, e
OrM: Cephalanthera austineae (MHP): Tomentella spp; Tipularia bicolor: Tulasnel
Corallorhiza odontorhiza - assots vaid Tomentella spp, eriti üks liik, mi
Goodyera pubescens: assots vaid teatud lähedaste Tulasnella liikidega.

la vaid AM
AM

lustr Castanea

l ega EcM seened ei mood EcM Ceratopetalumil
AM AUSs
ɔodenia, Dampiera (Goodeniaceae), Baeckea, Calytrix, Eucalyptus, Melaleuca, Leptosp (Myrtaceae), Comesperma (Polygalaceae), Pomaderris (Rhamn

kasvu
seened seigseente hulgas. Densospora t Densospora (Endogonaceae) -EcM seened seigseente hulgas. Densospora tubaeformis mood 1-2 rakukihise man
lehekõdus haab vs k
nalused ökoloogias
ıltoitumist
biomass, Bakterite osakaal, seente fülogen BD; seega arv. Mikroobid on kiirem lagunemise taga
mal mood EcM, ent puudusid EcM võrgustikud. Pakuvad,. Et töötlustes, kus hüüfid ja juured said ligi olid erinevad kooslused kus isoleeritud
pärast monodomin metsas; teistel puudel madal elumus, ent AM metsas kõigil ühtlaselt madal; seemned 'kadusid' segametsas kõigil taimedel rohkem kui

onnections. New Phytol. 145: 539-548. vs orhidee orhideede MR Corallorhiza
Corallorhiza trifida -1 liik Tomentellasid varajases staadiumis
Neottia: sebacina

Hydnum, Cortinarius2, Lactarius sp. Ka saproobidel kindelsuktsessioon, paarkümmend liiki esinevad kõigis staadiumites. Vahetult peale põlengut viljuv

tulipunktidega. Ilmselt pikemaajalised stabiilse kliimaga paigad
vukoha võrdlus. Kõik kasvavad metsades koos Fagaceae ja Pinaceaega.

ed happed metallide kelaatimiseks hüüfiseintele või mitte eritamine vältimaks liikuvaks muutumist
ise ei kasvanud koos taimede Bdga

'or. Res. 19:113-118.

Tilia tomentosa oli ühes kaevanduses täiesti AM; paljudel teistel oli ka AM lisaks. Lepal 12 tüüpi. Mantli paksus peenenes 10-12 v

Suillus 2 spp parand männi ja kuuse kasvu ja P omastamist

Rhizopogon roseolusele süstiti 22N ja transporditi 2 ööpäeva jooksul taime
juurtelt eraldatud seentega sünt EcM Mycelium ra Mycelium Radicis Atrovirensi eraldus, kirjelc
Suillus grevillei ja Mycelium radicis silvestris alfa ja beeta mood lehisel EcM.
Lecc scabrum, aurantiacum s.l., Tricholoma flavobrunneum, Amanita muscaria. Myc Rad silv gi
Suillus, Xeroc badius, Mycelium radicis sylvestris alfa, beeta,gamma,delta süntees männil.

Suillus granulatus, luteus, variegatus, Russ fragilis, Lact deliciosus, Cort mucosus, Tricholoma v

Piloderma fallax obs ja süntees

on eri liigid ITS ja mikrosatelliit DNA põhjal

:, et ei oma Emh ega tsüstiide periidiumis
:imine proovipõhistel andmetel lihtsate matemaatiliste funktsioonidega: 11 eri funktsiooni paljudele eri biol andmetele. Üldiselt parim LS meetod, järgn r

m sidemeid ; kõik võõrtolmeldajad olid generalisttid v isegi supergeneralistid

Uromyces, Colletotrichum infektsioon: ülevaade

aiguti kattuvad Phialocephala liigid. ITS erinevus liigi sees <2 (3)%; liikide vahel märksa rohkem

elle klassi sekventside jagamine liikidesse 98% sarnasuse põhjal ja nendele iseloomulikud geenijärjestused ITS1s ja ITS2s. 98% kr

Cenoc, Mel bicolor, Hebeloma. Eri seened mõj erinevalt männi ja kuuse kasvu. Puud inokuleerit

Iycorrhiza 16: 33-41.

mükohet Afrothismia liigid on kitsalt spetsialiseerunud ühele Glomus l

ol väga vanad, ent neil on tihti kiirenenud evol plastiidi ger mükohet taimed võivad olla evol väga vanad, ent neil on tihti kiirenenu

of metagenomes. BMC Bioinform. 9:386.
, P, K-vaene. Aldina mood paiguti kuni 47% rinnaspinnast

in ja selle mootmine Chimaphilast
kasutamine, levik Amanita muscaria

seentel

Armillaria spp Armillaria spp

:cum: ei kasva tselluloosil, eelistal Cenoc

Wilcoxina-ektendoMR kuusk vs mänd; N-väetades rakusis kolonis väheneb. Domin vanades istandikes er 1-2 a illus spp.

ek-d polüfüleet, parafüleet; eoste kuju seltsis v labiilne, viljakeha serv parem takson tunnus
isosüüm kahjulik; puhastamiseks parim Sephalose kommertsmeetod (v aeglane), peaaegu samaväärne ränimaatriks
eetodeid ja voimalusi
ele: poletamise intensiivsusele ja taimkatte muutustele, kus havisid paljud spetsialist herbivoorid ja seetottu ka kiskjad
ı (sisald ECM liike)
eae Austraalias. Selle sõsarharu perek Faidherbia=Acacia subgen Aculeiferum sect Filicineae/Ingeae (perek Harvardia, Albizia jt.). Vaja teha mitu perek
atsiad väh 3 eri harus. Phyllodineae AUS, eraldi.
giga Guyanast ja Jaapanist
ccoloba, Andira inermis (Papilionaceae), arv ka Hymenea courbaril (Caesalpinaceae). Uued liigid perek Boletus, Russula, Lactarius, Amanita, Phyllopo

sekotioidsete seente eri tunnused mükoriisamoodustajatel (closed pore hilu sekotioidsete seente

xxx

s+Lact; 2) Albatrellus, Byssoporia, Plyporoletus; Mycolevis?, Leucogaster;
ka sügavamal, 3-6 cm mullakihis, samas kui maapealsetel enamasti varisel. Cenococcumi ja morchella sklerootsiume palju tuha sees (tek enne põlengut);
Sebacina vermifera-laadseid seeni on leitud rohttaimede juurtest
ähedastelt liikidelt võib vaenlasi varsti juurde yulla
probleemid. Fingerprinting meetodid
alooliselt; tähtis osa suuremal liigitekke kiirusel ja soojemas kiiruses, ka väljasuremised võivad erineda

mine biogeograafias hydrothermal vent koosluste rajoneerimises
Amanita mappa, A. muscaria, A. pantherina, A. rubescens, Suillus flavidus, Xeroc subtoment, E

se proovide arvu ning sekveneeritud kloonide arvu saamiseks keskkonnaproovist. Soovit kas n=4, sekv 47 või n=3 + 2 (sekv vähem + rarefaction)
nimaatriksi >jahvatamine, tsentrifuug 96-sele ning isoprop

elex, GeneClean, BSA
Chapman and Hall, 357–423.

tol. 137: 519-528. Rhizopogon spp.

palju
valimiskriteeriumid istandikesse
palju
palju

l. 58: 298–311.
d Ceratobasidium, Botryobasidium, Tulasnella. Membranomyces delectabile ja Clavulina mood haru; Cantharellus, Craterellus, Hydnum ja Sistotrema c
võib kahtlustada: Leucopaxillus, Porpoloma (Trich), Catathelasma, Rhodocybe, Entoloma (Ent), Melanoleuca (F

use poolest, soovit kasutada suguk-spets thresholde. Indiviidisisene var kuni 6% ja liigisisene kuni 19%. Mõnes perekonnas sõsarl
RFLP tüüpidest-3 eriseltsi kottseeni
Terflezia: (ekt)endomükoriisa

uline nestedness taimedel
xxx

a, Auricularia, Dacrymyces) mitteperforeeritud parentosoomid; Tremellaceae, Ustilaginales -vesikulaarsed parentesoomid; Uredinales; Septobasidium -
ötmine: spektrofotomeetria + ordinatsioonitehnikad; aktiivsus väga varieeruv, sõltus tugevasti täpsest substraatagarist Pleurotus ostreatus
oobuda ökol uuringutes, sest s o ebaõiglane ja mida suurem uurimus seda rängem on Bonf. Bonf ei arvesta kui mitu tulemust on läinud stat oluliseks
ı katteseemnetaimede radieerumise ja domineerimisega 60-100 MAT. Sipelgad tek palju varem -140 -170 MAT
nüümid, peremeesring
Alnicolatele. Peavad Becerra A. Escharioidese kirjeldust kahtlaseks. Seostub pms Salix spp-ga
a. Hymenogaster ka polüfüleet kahe haruga. Alnicola bohemica ja arv lähedane Hymenogaster sp monokarüootidena. . Alnicolal tek seos leppadega ises

angu piik soltub N hulgast vedelsöötmes. Mida rohkem , seda kiiremini tuleb piik, seda suuremad on mütseelipallid ja seda rohl Bjerkandera
angu piik 8 päeval Bjerkandera
i kui EcM-s. EcM-s ja EMH-s erinev N-ühendite konts. (EMH-s tunduvalt väikemad konts.). Uurea osatähtsus EMH-s v suur

RuLa, Inoc, ent soojenedes Tom, Inoc ja Russ BD väheneb. Kuivas tundras domin Tom, Cort, RuLa, Inoc, soojenedes Tom, Seb, In
sidaaside levik ja fülogenees. Lagundajatel seentel; mõnedel arv muu funktsioon nagu H2O2 inakt. MnP ja VP (versatile peroxidas
distance-decay kõver on vilets näitaja beeta ja gamma-BD-le. Tõus sültub dominantliikide agregeerumiseset. Ka väike fraktsioon k

ntrifuug; 13C interpretatsioon: ilmselt metabolismiproduktide kaudu saavad oma osa ka teised bakterid
endi disain ja andmeanalüüs: replikatsioon, parameetriline ja mitteparameetriline dispersioonanalüüs, probleemid
Suillus
Terfezia

madal varieeruvus nii liikide sees kui vahel, mõni hüpervarieeruv kordusjrk, vahel homokaarüonil Verticillium Verticillium
Tom sublil 8 ens aktiivsus sõltuvalt jaan vs mai; vs harvendusraie; vs declining puud. 3 seeneliiki. Kõik toimisid erinevalt, k

asias: uued liigid,
3 eri alamperekonnas ja sisaldavad mitmeid lähedasi liike. Mõni võib olla vale, sest peemes pole kindel

ja happeline pinnas isegi erinevamad. Liigirikkus Ameerikas suurem kui Alpides ja ligi 50% liikidest samad. Altais olemas mitmed Ameerika elemendid
Cymbidium: mükohet arenes välja miksotroof eellastest

ne ökol analüüsidesse ja LK-sse. Koosluse str, network anal., vürdlev meetod

isvalt Austraaliast kohale tulnud Lepto: Pisolithus
l ECM puud; AM kui pole ECM puid; AM "ultramafic" pinnasel. Mõl liigil mõl MR tüübi kolonis v var
onaceae liigid Eperua ja Macrolobium ja Swartzia mood vaid AM. EcM taimi enim vaeses perioodiliselt kuivas/per üleujutatud liivapinnasega aladel (A

rsity and distribution of macrofungi. Biodiv. Conserv. 16: 37-48.

ka muud stressorid Arizonas -herbiv, konkurents, hemiparasiit parasiidiga EcM kol ol suurem, liigirikk
termiidiseened, sipel

Hebeloma crustuliniforme

n mitteperf parentesoomid. Coltricia perennise kultiv. V raske, eri kollekts saadud tüved olid reostused
Cantharellus ja Amnita on Zambias tähtsal kohal

uudus. Seeni stimul eelkõige naabruses olevate EcM taimede ohtrus
ali mõõtmine: Moran's I ja Blomb K viletsad, Abouh Cmean ja Pageli lambda on head. Lambda annab ka MEAN EFFECT SIZE, e
blike, sammalde, maksasammalde ja sõnajalgtaimede levikus. Sõnajalgtaimedel erinevalt teistest on leviku kauguse suhtes piirangud, sest varakult on va
.9: 481-492.

as, lakaas ECM vs non-ECM juurtel (P Laccaria laccata, L. ametysthea

taksonoomia

ites and functional mating type genes. New Phytol. in press.

nakatamise ajalugu ja istikute toodang. Kvaliteedikriteeriumid

Laccaria, Hebeloma, Paxillus vs Tricholomopsis agaril; Hebeloma vs T. sümbioosis Laccaria, Hebeloma, Pa

sh Madag ja Uus-Kaledoonia

ıtronile. Teeb vahet eri liikidel. Ühe liigi jaoks mitu probet, sest heterosügootsus

ookeanisetete seened

veneerimine ja keskkonnaproovide tuvastamine: paljud kk-st saadud järjestused on identifitseeritud liikideks

stud paigad, häiringute põhj keskkonna heterogeensus

al. Koordinaadid

sõltus sellest, kas ta oli pandud kasvama terve (L amethystina, I lacera) või haige poosa (I lacera, S bovista) alla. Vanadest põõsastest eemal ECM ei te

onte Carlo

Hebeloma spp, Russula spp, Inocybe lacera, Scleroderma, Laccaria spp, Cenoc. Salix reinii idanditel, mis moodu

Cladophialophora, Exophiala ja Capronia sugulased) isol taimejuurtest

eerivatele männilistele konkurentsieelise

väiksem liigisisene var); teistele protistidele CO1 ei pruugi sobida

lduse tõttu ja puuduvad stat meetodid

mida toetab ITS fülogen, on Jaapanis kõik levinud. Arv NE-Aasia on levikutsenter. N-Am lepa fossiilid miotseenist

Experiment Station Forest Service, U.S. Department of Agriculture, Portland, Ore, pp. 57-71. mikroobide aktiivsus

kompostis seente ja l

eemilistel reaktsioonidel ja sellest tuleneval pinna muutustel. RNA (nii kogu kui ka in vitro transkr) tuvastamine (eelnevalt vaja keeta või lõhkuda sek-str

on väga tihedalt seotud;

distantsi meetrikud: 1/NND ja 1/MPD

vs mitte-üuj mullas. Domin Cladosporium sp; seltsidest Sordariales; klassidest SordM ja DothideoM. Lisaks v palju EcM-seeni nii

si, saades toitaineid efektiivsemalt kõdust kätte ja vähendades leostumist

ia, Gilbertiodendron, Julbernardia, Microberlinia, Monopetalanthus, Tetraberlinia, Afzelia. EcM puude arv ei sõltu mulla P-st (erin Gartlan 1986). Puude

umist

phylla, Berlinia bracteosa. Enim mõj taimestikku saviosakeste osakaal. Anthonotaha, Cryptosepalum, Afzelia 2 spp reageerivad olul P muutustele mulla

Mycena, Marasmius

nede alt; evol lähedased peremeestaimed kippusid omama sarnasemaid kooslusi

Tricholoma tridentnum: inokuleerimine

coding: sama. Liigid on endofüüsed ja erikoidset mükoriisat moodustavad, eriti sagedased põlengutel

Pisolithus, Paxillus
ıleerib männi juurdumist ja ECM teket : Pisolithus, Paxillus
e ens aktiivsus palju suurem leppade kui mändide all

ıerid, mis välistavad üksteise rühmi. Kandseentel pole arvest heterobasidiomütseete, nõgiseeni ega roosteid. ITS4 derivaadid; koos ITS5 v ITS3-ga
id liikide ja ka perek vahel veeseened lehtedel: algu

mist!!!); EMH produktsioon suurim keskel, kus lühikesed rohundid domin, sealh korrel see juurte biomassiga; AM prod suurim kõrgete rohundite juurre

røslev TG, Halwachs B, Hartmann M, Henricot B, Jayawardena R, Jumpponen A, Kauserud H, Koskela S, Kulik T, Liimatainen K, Lindahl BD, Lindne
ole ühtlast kriteeriumi võimalik rakendada. Varieeruvus suurem liigisees vibur-ja AM-seentel. Ei sõltu seente elustiilist. Väidet liig
ıte kordamine emerencia abil, et tuvastada keskkonna proovidest EcM seeni
lnumiga teadaolevalt EcM, teises klaad Sistotrema alboluteum, S. Muscicola on EcM
palju valesti määratuid v määranguta sekventse
E, Kõljalg U. 2012. Five simple guidelines for establishing basic authenticity and reliability of newly generated fungal ITS sequences. MycoKeys 4: 37–
asets of fungal communities. New Phytol. 191: 314-318.
igh-throughput community assays and molecular ecology. Fung. Ecol. 3: 284-287.
ence databases and a software means for their detection and reorientation. Mycoscience, in press. DOI: 10.1007/s10267-010-0086-z.
äpsetlt ei osata seletada, ent suurt rolli mängivad troopilised märgalad ja igikeltsa sulamine

ıisadeni. Peab Tuberi mükoriisat Geastrumi omaks

, ent on mitmeid erandeid - kuni 7% (krüpt liigid?) ITS2 pikkkus pms 300-530 bp

chiza 20: 459-471. Tai rohelistelt orhideeldelt pms Tulasnella isolaadid kultiveerimise teel
kuusekändudele, mida o

Tricholoma saponaceum, equestre, sejunctum, flavobrunneum mood EcM kasel; sapon ja equest
Tricholomataceae: Lyophyllum fu Tricholomataceae: Lyophyllum fumosum (arv fakult ja ka ektendo) ja Trich Tricholomataceae: L

mutatsioonid, genoomi ülesehitus. Aseks org püsimajäämise eeldused ja vastavus seks vajalikkuse hüpoteesidele: Mülleri ratchet, Kondrashov hatchet,
bresia liigid. Alborzi mägedes metsapiiri moodustab Quercus macranthera või Juniperus communis+Carpinus orientalis

Phlebopus bruchii ei

ıtajana, eriti konnektiivsust mõj.; seega kauem kooaevol kooslused on robustsemad häiringute suhtes
ARG sissetoodud metssead ja hirved levitavad mändidega sissetoodud seeni ja soodust seega inv

ıea tulemuse annab gpd. Lact fennoscandicus ja L. Deliciosus ei eristu ITS ja gpd põhjal, ent AFLP eristab hästi.

ide aktiivsus puhaskultuuris piimasöötmel: märgatavad liigisisesed erinevused; enamik liike ja isolaate tootsid proteaase.

rmutant ECM-seened -efekti pole Hebeloma

excl
ellales (Trichomycetes) on sõsarrühmad
ceae),(Helvellaceae, Tuberaceae + Terfleziaceae)], Pezizaceae. Hüpogeilised vormid on tekkinud mitmeid kordi
rellal on mitteortoloogsed ITS sekventsid
TS, LSU, EfTu. ITS ja EF head ja suht kongruentsed
onnad täiesti läbisegi; hetero/homotallism ja 1/mitmespoorne sporangium väga labiilsed tunnused

Lacc ameth, Hebeloma mesoph, Thel terr, Tomentella sp sünt Populus maximowiczii ga

. (sh Paulisebacina allantoidea, Globulisebacina rolleyi, Helvellosebacina gen. Nov.
ctonia re-juvenatsioon (Thanatephorus on nüüd Rhizoctonia). Perek Ceratobasidium hõlmab ainult C. Calosporum. Rhizoctonia a
liigipiir

ıjal väh 40 liiki - M. Elata ja esculenta rühmad on monofüleet. Suurim BS NE-Am ja Türgis. Enamik liike regionaalse levikuga, ka

Gastrodia confusa: seotud saproobse 4 Mycena liigiga
Cymbidium spp: autotroofid on seoud Tulasnelladega, mixotr nii tulasn
Epipactis helleborine JPN: rannikupopulatsioonis vaid Wilcoxina 2 spp

igispets probed ARRAy seente identifits

Suillus grevillei, Inocybe kobayasii, Lact porninsis, Gomphidius maculatous EcM süntees. Seene
Boletus sp
Lyophyllum shimeji Lyophyllum shimeji võin
Hebeloma spp Hebeloma spp võime pr
Lecanorchis (MH Vanilloideae) - assots Lactarius spp, Russula spp, At

paha väljend. Soovit siiski kasutada andmetöötlust ka mittereplitseerituse korral, sest see meeldib inimestele lugeda. Võimaluse korral siiski replitseerida
lubatav, et ka subopt didsaini korral näitata eri töötluste varieeruvust, er kus on tegu proov-alamproov probleemiga. Ei tunnista näivat psr. Peab Hurlbeti

f varieeruvus; kõik on kompleksliigid; DNA põhjal oleks võinud liike veel lahutada

Heterobasidion annosum Heterobasidion anno
Heterobasidion: hübriidi virulentsust männi suhtes ko
hübriidide teke, ohtlikkus, eeldused

ıma genoomis avastamine sekundaarstruktuuri ja energia järgi

M, sapro
Suillus+Gomphidius

Suillus variegatus, Paxillus
Paxillus, Suillus

ıus, Paraberlinia, Tetraberlinia, Touabouate; ent Detarium ja Allophylus (Sapindaceae) mood AM
ı efektid. Tetraberlinia omastab EcM pa Kamerunis inokpot: muld Gnetumi alt vs Afzelia alt vs Amhersteae alt nii raiutud kui ürgses metsas Tetraberlinia

im troopikas

ıine,
g of plant roots expands the described molecular diversity of arbuscular mycorrhizal fungi. Mycorrhiza 23: 411-430.

s in the Boletales. Mycologia 102: 108–121.

ıde kui sissetoodute all. Amanita muscaria kolonis ka natiivseid puid

7: 3620-3632.

Orhideede mykoriisa isolaadid: fülogeneetiliselt vaid perekonnas Ceratobasidium: r
OrM: Ionopsis urticularioides (Ceratobasidium 1 klaad) on palju spetsiifilisem kui T
ıandid Cd vastu -glutatioon ja Cd kiire v Paxillus

üvedel kasutades Bayese meetodeid; Stat oluline co-occ võib tuleneda paljudest asjaoludest ja see püstitatab vaid edasisis ökol hüp
ırn tulemustega, mitmed DGGE bändid on kimäärsed artefaktid; v madal liigirikkus. Reassotsiatsioonikineetika võrdlus, diskussioon
, ARDRA; DGGE, PLFA jpt)

ɔerennise süntees; ei sisald ühtki testitu Coltricia perennise süntees; ei sisald ühtki testitud laguensüümi (lakaasi, peroksidaasi, türosinaasi ega reageeri ta

ektendo-Wilcoxina: 1-2 aastastel mändidel 50-100% Poola istandikes, osakaal suureneb uurea ja kivifosfaadi lisa s Zimbabwest Brachystegia ja Burkea all

mitte graduaalne, avaldudes järskudes DNA muutustes hüüpeliselt /eriti seentel ja taimedel, vähem loomadel)
ıe, radiatsioonide tuvastamine mol kella jr; arv mol kell on ühtlane; parsimoonia vs ML, vs baieesia; arv loomad olid divergeerunud ammu enne Kambriu

Tuber brumale, T. Melanosporum, T. Rufum -süntees ja kirjeldused Corylus, Quercus, Pinus; T. Rufumil ka P. S

Suillus spp sünt ja kirjeld 2 männiliigil

, Russ pectinatoides (nii abund kui freq)

P põhjal

Cenococcum

Piperia yadonii USAs on haruldane, ent kasvab eri ökosüs, kus seostud

ükssama liik ITS, EF-Tu ja beeta-Tub geenide põhjal

k, NY, USA. pp 221-249.

ksid sisald mitmeid krüptilisi liike, mis pole eristunud peremeestaime järgi. Nendel toimib hästi 97% ITS1 identsuspiir
ndatud korduvalt ;16 suuremat rühma
Paxillus, rhizopogon jt

Paxillus, rhizopogon jt

wledge sharing. Nucl. Ac. Res. 39: D640–D646.

süntees ebatsuugal jt okaspuudel, sh Lyophyllum, Suillus, Rhizopogon, Amanita, Lactarius deliciosus moodustav
Rhizopogon roseolus

veestressi olukord: Rhizopogon

Lactarius deliciosus, L sanguifluus: Pinus pinaster, P sylvestris

e indeksid

eptorid
ekti kõrvalolevale taimestikule ei olnud. Muidu peale raadamist kontrollalal liigirikkus märgatavalt tõusis esimese 4 a jooksul

; ajaloolistel liigifondiga seotud põhjustel
rlo

310: 720-728.
kloonide vahe suurem kui transgeenne efekt
siteedi mõõtmine; PD indeks laialt aktsept. Soovit kasutada uuringutes nii füloBD, traitBD kui tax BD. Nende suhestumine võimal
isi edasiarendus tunnuste uurimiseks läbi fülogeneesi ja ruumilise str. Ei anna R2 väärtusi. Lagundavad nii ruumi kui ka fül vaid pı

ıarcode, COI ja ITS ja LSU jt rühmaspetsiifiliselt

Armillaria: diploidne mütseel Armillaria: diploidne mü
m kui analoogsed pop-gen testid, k. one-tail testi; bootstrap on nõrgem kui permutatsioon

nerochaete 4 isosüümi kodeeritud erigeenide poolt; aktiivsus ei lange C-nälja puhul, ent langeb N limit puhul, kui lisada ribosoo Phanerochaete
ɔnistid. Arv on esinenud refuugiume läbi pleistotseeni jäätumiste. Üldiselt liigirikkus sisemaa poole väheneb, sest väheneb substraadi hulk
ANOSIM analoog võimaldab kaasata mitmeid faktoreid ja interakts

mis, enim sõltub sademetest ja tuule kiirusest s ei olenenud. Seejuures väiksemate alade liigiline koostis moodustas osa suuremate koostisest -nimelt kõige sagedasematest liikidest, mis on ka efektiiv

3.75m, ent puudub 7.5 m
kriitiline eoste arv. Kõik EcM seened levivad eostega, ent Russula, Amanita ja Cort ei koloniseeri seemikuid; Amanita, Russ ja Bo

Pisolithus

ilmselt korjatud valedes kohtades); s.h. Phlebopus sudanicus=Phaeogyroporus portentosus, introduts Laccaria lateritia, Tricholoma pratense sp nov. Sap

b mandri-L-Am omaga enim

ybe, Saproobid: uued liigid
ıs) jaguneb kolmeks kindlaks klaadiks: 1. Cortinarius+Thaxterogaster+Hymenogaster pp + Protoglossum; 2. Hebeloma+Naucoria+Hymenogaster pp; 3.
uphocybe, Rapacea
ıcina sp, Mycena, Hymenoscyphus. Boletus edulis v sage EcMna, ent EmHna sisuliselt puudus. Boletus edulist ei seostatud ühegi muu EcM seenega
zites, Rapacea, Cuphocybe, Dermocybe. Defineerib klaadid. Klassikalised alamperek ei lange eriti kokku molekulaarsüs-ga
eotud, paikn nii subgen Cortinarius kui Telmonia

ordyla madagascariensis, Mildbraediodendron excelsum (mõl. Aafr), Amburana cearensis (S-AM)
ndeemsus. Limiteeritud leviku poolt, vrd vihmametsaga esineb nishikonserveeritud er põuataluvuse suhtes
tek varem, ca 5-15 MAT, enne kui hakkasid kuivad kooslused domineerima. See seletab ka mitmete liikide laia disjunktst levikut
rännanud. Fülogenees aitab hinnata bioomide vanust. Vihmametsades on nii iidseid kui ka modernseid radiatsioone, nooremates savannikooslustes S-An

b eri komplem sihtmärkidele v erinevalt, palju vale-negatiivseid (pms sekundaarstr tõttu; mida lühem sihtmärk, seda labiilsem 2nd str!!!); alati ühe valepa
Amanita aspera, muscaria, pantherina, spissa, rubescens, Cenoc, RHODOCOLLYBIA maculata,
myces on Tuberi keskel; Terfeziaceae on üsna kauge haru
OrM: Brasiilia epifüütsetel ja maapealsetel orhideedel pms Ceratorhiza ja Epulorhi
ja Partial procrustes: suurem võimsus kui Mantel testil
Kasutades eri nullmudeleied, et välistada keskkonna ja ruumilist mõju; C-score ja T-score; kasutas liike, mis >5% proovides; koos

ga. Mets märksa rikkalikuma koosseisuga
Paxillus
Paxillus
Paxillus

Hebelomaga nakatatud pinnases on Pythiumi nakatumisvõ EcM Hebelomaga nakatatud pinnases on Pythiumi na

väh 5 korral, arv. Humaria olek Genea sees on artefakt; EcM harusid 5-6
ciljub, kasvab puidul

Laccaria, Hebeloma, 2 Rhizopogon sp
arv et mükoriisade mitmekesisus muudab seemikud tolerantsemaks eri keskkonnatingimustele

natics 19: 651–652.
BD mõõtmise üritus. Mõõdeti tohutu hulk tunnuseid, tehti neist 2-kaupa kombinatsioonid ning bootstrapi abil mõõdeti stat olulisust. Veidi paremad kui l

viljakehad vs ECM-seen

ctarius sect Russula derivaadid, Gymnomyces ja Martellia on Russula foetens sõsarharud,

, Iodophanus carneus) ja K2CO3 (stimul vilj Ascobolus denudatus, Lyophyllum gibberosum, L tyliicolor, Pez palustris -kõik niiskust armastavad seened
rv juurte parasiit), Peziza anthracina (seot lehtpuudega enne lõket), Pez echinospora, Pez praetervisa, Pez trachycarpa, Pholiota carbonaria, Rhizina -mf
hemisph, Pez endocarpoides; IV maksasammaldega assots seened; V Tricharina gilva, Pez violacea, Pyronema omphalodes, Inermisia carbonicola. An
ja Empetrumiga. Anthracobia spp sagedased põlenud metsas

mandrite morfoliike ei tohi käsitleda samana, sest hoolimata sageli esinevast bioloogilisest sobivusest on eri ökol ja geneet omadu
kandseentele. Palju morf identseid liike, mis ei ristu, ent ka vastupidi. Sümpatrilisi mikroliike üllatavalt palju. Allopatrilistel liikidel pole olnud arv vaja

ezuelast

, Alnus glutinosa

obs Suillus cavipes, S. grevillei Larixil; Leccinum aurantiacum Populusel

rum, Gyroporus cyanescens obs EcM eri puudega ajades myc jälgi

Hydnotrya tulasnei + Larix, Suillus caviper + Larix; Russula + Betula: kirjeldused; Tuber melan

t apoteetsiumidega seltsid: ülevaade, morf tunnused, veidi ökoloogiast -väidavad, et ökoloogiast on vähe teada, sest seda pole spets uuritud ja toetutakse

jakeha periidiumi rakkude morf on sarnane ja sarnane ka nende mükoriisale

liigid: igale liigile cyt oksidaas I ja cyt b geenile 2 probet (21-27 nu). Keskpärane tulemus; probleemid pseudogeenidega, valepositiivsetega (intens küll

Phlebopus spongiosus - mood 'EcM' pomeloga nii istanduses kui sünteesides - paks mantel ja pa

M puudel üldiselt madalam pH kui AM puudel risosf vrd bulk soil, ent see võib olla okaspuude" efekt. Risosf pH korrel tugevasti vihmausside arvukuse

i orgC kui ka orgN. Tänu kõrgemale kvaliteedile laguneb juurtekõdu mullas kiiremini. Fenoolide rohkus väheneb CO2 suurema hu

i; mitmed morfoliigid on liigikompleksid

Ratio - hea tunnus suhtelise mõju uurimiseks

Cenococcum

Cenococcum

lignicola iseloomustus. Illustreeritud viljumass tugevasti segamädanikuga lagundatud kuusekännus

itseel okaspuu lagupuidul või paksus huumuskihis

10. Portland, Oregon: US Dept. Agriculture, Forest Service, Pacific Northwest Research Satation. 161 p.

Morchella: kasvukoh

liike. Osa liike viljub 1 a peale põlengut, teised looduslikes metsades ja need on Dahlströmi järgi ka MR.

Tuber melanosporum

taimede eellased koloniseerisid maismaad koos. Nimet. 'oomycetes'

proc. Hüpot, et PNGs Nothofagus ja Fagaceae taastavad EcM kontakte (lk 144); Pliotseenis on Fagaceae, Betulaceae ja Salicaceae liikunud ECU, Arg,

OL-analoog, puude visualiseerimine

eenini Aafrika oli 15* lõunas vrd praegusega. Siis soe ja niiske, miotseenis külm ja kuiv -vihmametsad üksikutes refuugiumites, mis kahandas BDd. Plio

Tuber melanosporum

sed taimsed lülid ühe rühma jaoks ei ole kriitilised teisele tarbijate rühmale.

Moserella kirjeldus: viljakehad kasvavad välja otse E
ke ajal: 33% geenidest Laccarial 2x ülesreguleeritud
d
valgemädanikutekitajad
eta-diversiteet. Töötab kui 40% linkidest on teada
Tuber borchii

on to biotic and abiotic variables at the global scale. New Phytol. 198: 1239–1249.

gavuti, d13C sama mullaprofiilis; vt vajaliku mat hulk!
nid
Lactarius rufus
nii patogeene, Orm sümbionte kui saproobe. Kõikide AG-gruppide fü Rhizoctonia AG-6 ja AG-12 Rhizoctonia AG-6 ja AG-12 sisald nii patogeene, Orm

Sampling effect vaid taimtoidulistele nematoodidele.
Vanilla 2 liiki on seotud nii Ceratobasidiumi kui Tulasnellaga. Erinevu

etodid annavad rohkem tulemusi kui fülogeneesi-põhised; MEGAN teeb vähim vigu; fülogeneesi-põhised on parimad kui fragment
ttseen on evol-puul Saccharomycotina ja Taphrinomycotina vahepeal
ri tulemusi. EI korjatud resupinaate!
. parim valimaks fülogeneesianal modelit
Omadused: x2 test, Monte Carlo permutatsioonid, hierarhiline kladistika

ning programmidest. Retikulaarne fülogenees
senf fasta ja output phylip vms

n Cotoneaster jt õunviljalised

põhjapoole; peremehe fülogen ja biogeo mõjud parasiitidele

a ja Nematoda - neil rühmadel arv biol erinevused, mis ei võimalda mõnel peremehi vahetada). Ei uuritud parasiiteide fül BD

õrgult võttes arvesse kk-faktoreid; paneb haruldased ja vigased OTUd kokku samast keskkonnast pärit sarnaste proovidega, ent mi
Cephalanthera spp heterotroofsus suurem kui valgust vähem NB!!! Võr

läbi palju toitaineid -keystone liigid
parasiitsete taimede mõju peremeestaimedele, kooslu

rikka kõdu olemasolu kiirendab toitainete tsirkul mullas
hemiparasiidid: kõrgem toitainete konts tänu suurema

BIOLOG plaat seente ja

nedele

nükoriisat maha, võimaldades jätkuvat invas.
fitness
väärsus. Am seente ITS identne Eur omadega. L-Aafr-s tamme ja haava istandustes. On teateid A phalloidese seotusest Myrtaceae liikidega NZL-s
es on suurem f-naalne mitmekesisus kui mitteklasterdunud kooslustes hoolimata sellest, et f-naalsed variaablid on fül konserveerun
53-1273.

id EcM ensüümimõõtmistele: vaid vitaalseid tippe võib kasutada; parim säilitusviis +4*C mullakamakates

Alnirhiza cystidiobrunnea:
oplate system. J. Microbiol. Meth. 58: 233– 241.
Tomentella stuposa lepal on hästi kultiveeritav

endofüüdid perekondad

alik katsedisain on eeldus kõigile mikrobiol uuringutele ja järeldustele. Halba teadust ei tohikski avaldada

viirus: Puccinia sorghi ja dsr Puccinia sorghi ja dsrN ıine paariviisilise distantsi põhjal arvutuslikult

ıamik taimi on tek troopikas ja seetõttu nendes rühmades troopika suurem mitmekesisus, teistel mujal
ı jäätumine: väiksem väljasuremine; suurem võimalus diversifitseeruda. Ka meri madalam ja veepinna kõikumine ulatuslikum
korrel eri rühmadel tugevasti. Peaminselt korreleerus keskm temp ja PET, sademed ja actual evapotransp. Ilmselt kujundab seda e

idified and limed plots. Plant Soil 199: mikroseened ECM satelliitsed: T. viride happelisel pinnas mikroseened ECM satelliitse mikroseened ECM sate

ıeerimine (log2) ja normaliseerimine (lowess, erinevad plottimised)

ı. Kooslus ega BD ei korrel geogr, peremehe ega klimaatiliste muutujatega
ektiivsem ja kaugeleulatuvam risomorf Cortinarius collinitus, Cenococcum

ıerek tase) erinevused aastati ja kasvukohati ning EcM vs EmH

Laccaria bicolor, Hebeloma
Hebeloma, Laccaria

sse, raskusgradientfuugimine, spetsliikide määramine bakteritel, hilisem funktsionnalgeenide otsing

Kluwer Academic Publishers, Dordrecht, The Netherlands. p. 1-27.
ırreleerub primaarproduktsiooniga. Termin "functional biogeography"
ıga

väheneb hilistes st. kuna toitained ammenduvad;
ia, Aurantioporus jms

ıni 50 m-ni
l testi mikroobiökoloogias: ülevaade, kasutussoovitused
MAT fossiilide kalibreeringu järgi matK ja rbcL põhjal.

arvestamine ökoloogias. Proge SAM
õrge taust, piikide pikkuse kvantit arvestamine, kerge varieeruvus replikaatide seas, geeli mõõtmist ei replitseeritud, regiooni pi bakterite (IGS) ja seente

ıed toodavad happeid mitte AB: puhver paljud vs ECM seened puhasku
OrM parasitismi valguses ülevaade
OrM: seemnepaki meetod: nailonitükk+seemned filmiklapi vahel
OrM: Tipularia discolor: seemned idanevad pea eranditult lagupuidus: vaatlus-ja m
OrM: Tipularia discolor: 1a taimelt lagupuidus eraldati monilioidsete rakkudeg (cf

ıed BIN koodid

mitmed

l mõnevõrra omastada N kitiinist ja mu CWD: püstitavad olulised küsimused CWD funktsiooni kohta

maksasammaldel: Southbya, maksasammaldel: Southbya, Cryptothallus jmt

estunud näidata radioakt C liikumist Salixist Pyrola rotundifoliasse. Arv et Pyrolatel pole MR olemasolu obligaatne
ıõgudes alati Salixi läheduses -arv konl Pyrola rotundif ssp maritima, Monotropa: esinevad luidete vahel nõgudes alati Salixi läheduses -arv konkreetne

ust, seal on tihti ka muid potentsiaalselt EcM puid: Arillastrum, Gymnostoma, Leptospermum
osa ja Tom sublil mükoparasiitsed makroseened: Squamanita, Clitocyb
vaid 1 proov ja DGGE
rinal, noodulitega on lood vastupidi. Noodulite teke sõltub paljuski mulla P sisaldusest
2% AM kolonis. süntees paljude liikidega, sh. Elaphomyces, Tylopilus, Gautieria, Gummiglobus, Mesophellia, Nothocastoreum,

ged ja pruunid tüübid orgaanika vahel.
lirbeliae), Calogyne (Goodeniaceae)

ora ise kasvas paremini nii eraldi kui k Laccaria, Thelephora
e soontaimi!), selle järgi kand-ja kottseente lahknemine kalibr 620-600 milj a t
ventsid ei kattu
Väikestelt Antillidelt ja Mikroneesiast
Tek AM-eellastest. Paraglomus ((((((Archaeospora+Geosiphon)Glomus A+B) Scutellospora-Gigaspora) Pacispora)Diversispora+Acaulospora)

Lactarius, Russula, Amanita
esist ja erinevate gruppide kirjeldamine
AUS-sse introdutseeritud puudel samad endof mis N-Am samal liigil

Phaeocollybia arvatakse Phaeocollybia arvata

Coprinus Petri tassil mo
Neolecta tundub olema juurepatogeen, lõhub j
xxx turbasamblal ja laar
parasiitsed varre-endofüüdid

lüspoorsed. LSU + SSU + RPB2; 89 taksonit; Pezizales euaskomütseetide basaalne, ent parafüleetiline [arv long branch attr]; v apljudele kõrgematele ta
Elaphomycest seostatakse kuuse juurtega, peetakse parasiidiks

ei saadud tuvastada; PCR produkti hulga tuvastuslävi 2% koguhulgast!!!
-818.

n, ent peale seemne-toiduvarude kasutamist palju kiirem kui suureseemnelistel puudel

undajad: põhjalik ülevaade ligniini lagundamine: se

aineid (suurendab) ning AM-seente kooslusi Aafrikas
Oribatida kehapinna
fossilide põhj väh 85 MAT, fülogen järgi u 140 MAT, fossiile leidub ka Euroopas ja Kapimaal. Seemned ei levi hästi. Arv kauglevinud Uus-Kaledoonia

mation Coefficient - põhine analüüs, et tuvastada seoseid suurtest andmemassiividest - eriti kasutatav nn co-existence analüüsides

adel fülogneetiline signaal tugevam; ; lähedaste liikide roll networkis on sarnane
llidel ja kultuuris Cladonia talluse juures mittester gümnoteetsiume, mis sarn teleomorfse perek Myxotrichium omadele. Viitab O maiusele kui kiirele or
oma määramata) nimetati Phialocephala dimorphosporaks
liike
suur viljakehade levik ja liigirikkus lagupuidust 0-1 m eemal, mõned eelistasid gäppe, mõned Arbutuse või Quercuse tüve lähedust; Sama liigi poolt moo

a; AM reeglina ei fasiliteeri ega inhibeeri invas, sest on kõikjal ja mittespets.; Aktinoriissetele ja EcM taimedel nt Männil jt vastup

ohal EcM puud

tentsus kohalikele seen- ja putukkahjuritele. Soovit pikemas perspektiivis asendada vähem invasiivsete liikidega või mitteviljuvate
naceae-Pomaderreae (sh Pomaderris, Siegfriedia, Cryptandria, Trymalium, Spyridium) mood monofüleetilise rühma, mille sõsarperek on Ceanothus

Laccaria, Scleroderma, Cantharellula
Boletus parasiticus!!!, Astraeus, Scleroderma spp, Thelephora sünt. Ja kirjeldused Langermannia gigantea, Lygo
vs Actinomycetes Petri tassil
; edasilevik

ıs sõltub enim suguk. Ökoloogilisest paindlikkusest (levimisvormid, puitumine, temp taluvus)
› ajalool faktoritest. Väiksema BD alale on kergem minna, ekstinkts minim; ökoloogiline e f-naalne BD on suurem suurematel aladel. Kiire evolutsioneeı
. Enim mõjutavad liigiirikkust ajalool ja geogr protsessid; vaja oleks analüüsidesse kaasata fülogeneetilised seosed, pop-struktuur j

egametsas ilma EcM puudeta | Limacella spp. NZL: Po

ıid eriti Caesalpiniaceaele (sh paljud EcM liigid)
Rhizopogon, Suillus, Pisolithus, Thelephora

ıa ja Agaricus sp stimul männil dihhoto | Amanita muscaria, A pantherina, Lactarius deliciosus | Collybia dryophila tapab mä | Collybia dryophila tapal
Suillus collinitus
:8. | vaid POD-ga seeni tı

ülevaade

ruderaalid

Lact subdulcis prod. 100x rohkem kui Xerocomus välitingimustes

iateks | eksootiliste patogeenset
x sees. Sõsarliik Carex pauciflora (sect unciniaeformes)
Thanatephorus ega seostu orhideedega nagu väidetud CurrahEtAl1987

›v pannaldeta hüüfod!
ɪterokandseened Korupis

ıtsiooni korral

ne autokorr 54 m UNIFRAC baasil; OTU-põhiselt on kõik proovid üksteisest väga erinevad

ı Alnicola - paljud liigid spetsiifilised lepa alamperekonna kaupa. Kõik üleminekud on toimunud A. viridisele, aga mitte viridiselt;
viidi-sisene polümorfism ja liikide-vah indelid, mis segavad align;

ıpi fülogeneesikäsitluse lühiülevaade. LINK programmile
2.
ına genoomis laiali. Tek ebavõrdse krossingoveri tulemusena ja võivad muut pseudogeenideks. Koopiad võivad olla üsna erineva järjestusega.
: suur erinevus, ebapiisav proovivõtt | kottseened troopikas ter

Pisolithus
Pisolithus tinctorius
xxx
ıstamiseks. EI illustr.

ıinoh aligneerija

saproobid, väga tihti juurtel; hüüfid ühe- või multituumsed

Piloderma fallax, Hebeloma crustuliniforme

eelistavad kasvada ja sünteesivad oksa Cortinarius glaucopus, Piloderma spp, Suillus bovinus, Paxillus involutus Mycena galopus

del mitte-häiritud aladelt ruderaale välja tõrjuma. Häiringud vahelduvad ajas ja ruumis. Kui on laigusisene kooseksist, peab olema ajalised erinevused (r

Taimaal mükohet orhideed seostuvad paljude EcM seentega. Aphyllorc
Epipogium aphyllum: FRA, RUS, JPN - Inocybe spp, vaid ühes kohas l

al Tuber magnatumile viljakehade baas Tuber magnatum
complex. Mycorrhiza 21: 17-25.
723-735.

Paxillus involutus

omplementaarid; tulemused arusaamatu

isondis, Sarcodon ja Russula cyanoxantha A ja B horisondis
a. Samas eri mäed on eraldatud, võimaldades allopatr. Liigiteket

. Artocarpi Taimaalt on lähimad sugulased Craterocollale Sebacinales sseltsist
palju juhuslikke, ei tehta vahet

de kaupa märksa suuremad erinevused

on podokarpuseliste juuremügarates

elikult annot. Annoteerimata sekventsidest 58% väidet avaldamata; 38% oli peremees, 55% isolats-allikas
; evol. Stabiilsed tunnused on ka eoste kuju, pH eelistus, lehtpuude vs okaspuude eelistus, cys seinapaksus

14 MA vana
egadel varakriidist (Hygr) kuni paleotseenini. LSU või ITS põhjal. Erinev evol-kiirus markergeenil rühmade kaupa

põhjal: Geenipangas domin Russ-Lact ja Cort ja Tom-Thel identifitseerimata keskkonnasekventsid. Inocybe mõnel liigil ITS v vari

Thelephora Thelephora

ud lagupuiduga või põlenud puiduga

Hebeloma radicans jms korjustel

Rhizopogone

uri; Melamp ei takistanud EcM teket

Suilluse ja Boletinuse sünt. EcM Larix laricinal
ae. Konkreetseid sõsarliike pole. Kõrvalartiklis sõsarperek. Spondianthus Aafrikas
onoideae + Ruprechtia-Triplaris
xxx

in tuumade olemasolu AM eostes
a hindamine mol kella baasil: 18S (180 MA) ja rbcL annavad eri tulemuse. rbcL 1+2 (200 MA) vs 3. (90 MA) koodon annavad v erineva tulemuse. Kõi
p vs Bayesia meetodid; visualiseerimine, VIITED
enide mittekonvergentsus, aeg, lahendused, taxa sampling
nolekulaarse evol eri kiiruste arvesse võtmine
28S rDNA kanti membraanile eraldi ja hübridiseeriti eraldi; vale-positiivseid pole, vale-negatiivseid ca 25%

ıte nitraadi reduktaas: NH4 juuresolek (Russula, Lactarius, Gymnoboletus, Amanita
ı -->NE-Am vahel. Paleotseenis kasutasid loomad pms transatlantilist Thulea silda >50 MAT. Beringi sild varajases faasis oli vähetähtis, ent oluline pea
ʒa hinnatud
ıerühmad. Taimedel domin levik (AUS, NZL) S-Am; loomadel (SS-Am, AUS) NZL jm. Mõjutada võisid läänetuuled ja ürgsed saarestikud
eremehe spets pole
EcM Scleroderma spp vs Isoberlinia, A Burkina Faso: Isoberlinia, Brachystegia, Uapaca, Monotes: pms Boletaceae, Russulaceae, Sclerodermataceae, E
sümbioos vs mutualism: terminoloogia, teaduse areng

EMS Microbiol. Ecol. 31: 127-141.
taminated soil. FEMS Microbiol. Ecol. Suillus bovinus, Paxillus

e olemasolust, saproobidel kliimast ja geogr kaugusest
: liike, millest osadel kitsas peremees-ring, teistel lai

ıhmad

Cortinarius sp
Amanita
i on Geopora spp; Pic carthus = Leucangium; P. Pachyascus = Imaia gigantea;
rk külgjuured ECM, paks mantel, norm HN, rakusis kolonis pole
Ceratobas sp.

mikroseened vanal klaasivär mikroseened vanal klaas
-kevade ning suve vahel. Molekulaarne diversiteet. Ka ACE ja Chao1 indeksid uued kottseente harud tı

ıts kambriumis

Orchise liikide OrM sümbiondid vs nende hübriidi sümbiondid: viimas
Laccaria, Suillus patogeenid: Fusarium, jt

ine mõjutaja taimede biomass, maa all mitte; Efekt kõrgematele troofilistele rühmadele läbi otseste toiduallikate.

ɛristusid toidu ja elupaiga jargi
ɛt katabolismi, vähendavad tegelikku katabolismi, endogeilised vähendavad mikroobide biomassi, epigeilised suurendavad
ɛi sõltu toitumiseelistustest; vilets toksiine tootvatel ja funktsionaalse melaniini geeniga Aspergilluse tüvel. Segadieedil suurim reprod saavutus arv eri re

lelites seostub MAT ja MAT-Cvga; kvantitatiivne modulaarsus on palju parem mõõde kui binaarne modulaarsus
Usid sekventside omavah distantsi põhjal Jukes-Cantori algoritmi järgi, põhinedes eelnevatel aligneeringutel. Võimaldab OTUsid defineerida erinevatel
ıevaid sekventsi raamatukogusid omavah geneetilise distantsi järgi. Kiire ja efektiivne versioon. C++ keeles UNIX masinal, sisseehitatud mitmese võrdlu
de võrdlus. Erinevatel eri eesmärk: HOMOVA - molekulaarse erisuse homogeensuse test (nt agregeerituse korral); AMOVA - osak
ıuringud vaja replitseerida. Lugeda kas kindel arv isendeid või st ploti suurus + rarefaction.

pringer, Berlin, 21-40.
ır gen var; lühikesed praimerid, madal annealing temp 36o
mentella pole eriti efektiivne

st läbi seene, mitte eri N ühendite omastamisest. Amino-happeid võeti üles väga vähe, kuigi need olid domineeriv ühend mullas ku

it: Sanger SSU peal annab ökoloogiliselt kohesiivsemaid tulemusi complete linkage ja viletsamaid single linkage. "Habitat" aspekt vate indeksite võrdlus

lestad: eri liigid eelistavad eri seeneliike. Vahet pole EcM, lestad: eri liigid eelistavad er lestad: eri liigid eelistava

cetidae ja Pleosporomycetidae (sh Cenoc, Ord inc.sedis - sõsarrühm Glonium). Patogeenid tek saproobidest, magevee ja ookeaniha

e kokkuviimine INSDs

\ 109:6241-6246.

imad RPB2 ja RPB1; lihheniseerumine tek 4-7 korral ja kadunud 1-2 korda; VK tek 2 korral (2. Neolecta); Laboulbeniomycetes o

klassiülesed ühikuta taksonid

iguezia (L-Am); Dicymbe-Polystemonanthus). Aldina on lähedane perek Cordyla (Aafr -L-Am disjunkts.). Suguk. On tek arv paleotseenis kuivade hõre

ı DNA Piloderma fallax

ofüüdid on rikkad sekundaarsete metabolismiainete poolest. Taimedes patogeenid induts väiksemat metaboliitide hulka kui endo

t Pezicula sekundaarmetaboliidid. Mida patogeensem on seen, seda lühem on latentsusperiood

4 peremeestaimedel, ent 10 promilli vaiksem kui CAM Taimedel

Geosiphon

iversity; electronic version freely available at www.amf-phylogeny.com.

liigi uued genotüübid võivad kohalikud välja tõrjuda või geneet modif. Invas seeneliikide identif on v keeruline sest 1 raske identif morf liigikonts jr, loo

ı toimub ress-de vahetus. Suureneb mõlema fitness. Eeldus: org-del on erinevad ress-vajadused ja väiksemadki erin ress omastamises, madal petmine, tra

lifitseeritud kui kogu-16S rDNA hübridiseerimine (min limiit 10e7 rakku/g), head tulemused + FISH

4 eri 16S rDNA alleeli. Mõni domään rDNAs varieeruvam kui teine; eri praimeritega saab DNA segust kätte eri liigid

ı hulk on DGGE ja TGGEs

taksonoomia

ıtud erinevused

organiseerimise ja omavahelise võrdluse programm. Nõuab sekventsidele ühtlast pikkust ja head kvaliteeti

id Glomus mossega

, vähem kandseened. Morfoloogia, sellepõhine taksonoomia + esimesed molekulaarsed parandused. Osadel kottseene rühmadel unikaalsed anamorfid. N

ropropagatsioon: juurdumiseks IBA parim (10 min 1/1000 IBA parim)

dumine kooslusse muudab oluliselt mikroobide ensümaatilist profiili lepa lisandumine kooslu

Sebacina spp

)ttu Laccaria bicolor

Epipactis microphylla: Tuber spp, Pezizales spp, Russula sp, Hysterangium spp, Se

alhulgas samblikud (polüfüleetiline)

Laccaria

Laccaria

www: mükoheterotroofid ja r mükoheterotroofid ja miksotroofid: ülevaade: EcM võrgustikud -nendega seotus, sp

miksotroofsed taimed: arv. C-toitumine on tek N ja P toitumise käigus

Sebacina spp orhideedel

Leccinum duriusculum

d kui maksasamblad. Arv assots tek konvergentselt maksasammaldes endofüütsed seened mood palju erinevaid struktuure. Tõenäolise

e suurem niiskes kui kuivas tundras. Soojenedes patogeenide ja saproobide BD kasv kliimamuutused tundras kliimamuutused tunc

Rhizoctonia: parasiit vs sümbiont

akkas, PPO, isotsüümanalüüs Suillus

Suillus, Paxillus parasiitne Rhizoctonia

Laccaria, hebeloma, Paxillus

viljakehade levik; vs EC

eeridega

MAT! N ja pH vähemolulised, ent mudelis sees

ite tuvastamiseks kastutatavate head ja vead. Oligote pikkuse ja täpsuse probleem. Arv et väga laiaskaalalist uurimust ei saa arraydega teha. RNA vs DI

egelikult redundantseid liike pole. Suurt liigirikkust võib stimul omnivooria lisaks heterogeensusele ja ress rohkusele ja multidimer

Suillus, Hebeloma

composition. Symbiosis 61: 1-12.
Tuber aestivum Soomes
OrM: troopilistel rohelistel orhideedel isoleeriti juure endofüüdid. Nendeks pms Tu

etus; Himaalajas ka Cort ja Hygroph. MPs Cantharellus tropicalis assots Dendrocalamus bambusega
eae AG-kaupa. Ceratobasidiumil AG-sisene variatsioon tavaliselt <7% ITSis
ephorus ja Waitea teleomorfid): geenipanga ITS sekventside meta-analüüs. Õigem taksonoomias kasutada mitte AG-sid vaid AG subgruppe. Orhideede

Tomentella sp Pisonialt: Nitraadi reduktaasia akt v väike nagu Tylosporal, mis on väiksem kui enamus EcM seentel, Pisolithusel kõrge. Kõik tootsid glu
Pisonia grandis mükobiont; VIITED

Tuber melanosporum
vs saprotroofid
vs ECM-seened
gal hosts. Mol. Ecol. 19: 3008-3017.
Goodyera: enamik assots. Ceratobasidiumiga: enamik liike seotud vaid
Eestis tuhamägadel vs looduses: Orchis militaris -Tulasnella 1 spp kõik
Cypripedium spp orhideed Eestis ja USAs -kõik seotud va Cypripediumil palju Phi

pealiskaudne tumepr Tomentella Boletus edulis, Xerocomus subtomentosus, Suillus luteus, Amanita muscaria , Paxillus involutus
suureneb õhu segunemine madalamates atmosfäärikihtides
a Põhja-Aafrikas;

veget. Paljundamine juurutades: 250 ug IBA opt; parim substraat peenliiv v saepuru; suurem lehepind on parem
valge-vs pruunmädaniku seened. Selget vahet pole. Eriliikidel väga erinev. Va-mä seentel oksalaadi dekarboksülaas, mis ei lase suurtes kogustes tekkida
orchid. Mycorrhiza 19: 525-534.
Cypripedium JPN: Tulasnella 2 spp, mis pole lähedased

Cenococcum sp. Ülevaade, viited
erlin, pp. 107-132.
lehe-endofüütide peamin lehe-endofüütide pea

Ericae spp nov- CAN, kumbki ei mood ErM

suga -> Betula; vastavalt sellele, kellel on anda! Metaanalüüs valguse mõju kohta MH ja autotr taimedel ei andnud olulist valguse e

palju:juhuslikud,ei tehta vahet

133-164.
Paxillus
pogon

J, ITS, LSU tüüpi. Enamus unikaalsed punktutatsioonid, mis üle geenide juhusl jaotunud. Eriti domin A>G transitsioon. ILMSELT
Amanita (15); Russula (1), Coltricia (1), Albatrellus(1 Pinus indig)
e analüüs
Pisolithus, Scleroderma
naper algul märtsi II poolel. Koosseis arv ujutuste stressi tõttu väga vaene -vaid Amanitaceae, Russulaceae ja Boletaceae. Seened saavad arv hapnikku r
nth 4; Gomphus 1 Ramaria 2; Sarcodon 1; Thelephora 1; Scutiger 1; Phyllobolites (Pax; EcM?) 1, Neopax (Pax, EcM?) 1; Gyropo
cuman + Tierra del Fuego: Nothofagus, Alnus, Salix, sissetoodud lehtpuud Populus, Tilia. Lepal Alnicola 1 sp, Inocybe 1; Russula

sh end. Tylopilus affinis), Phaeogyroporus (nüüd Phlebopus) gen nov; Callistosporium (puidult)
iivapinnaselt

virens, Lact delic.; La Plata regiooni kohalikel puudel Alnicola devia, Paxillus argentinus; pampades saproobid ja Amanita ameghinoi; Põhja-Arg: Gyrod

mekesine Paxillaceae: nii EcM kui sapro vormid kogu kontinendil. Linderomyces, Gyrodon, Gyrodon rompelii (sapro või seotud Inga (Caesalp) või Allo
ole -esinevad vaid männiistandikes: Tricholoma spp, Russula spp, Hebeloma, Inocybe, Lact deliciosus
liikide kirjeldused

vice: Washington USA. pp. 204-215.
vella sp, Laccaria tetraspora ja saproobsed kandseened. Puhtas Austrocedruse metsas Nothofaguseta v palju saproobe, ent ka Clavulina spp, Clavulinops
eae), arv EcM ja lähedane Neopaxillusele. Kasvab Manause kandis liivapinnasel
akehi leiti. Fabales ja Salix humboldtiana olid mittemükoriissed nendes kooslustes. Arv et need EcM seeneperek liigid on saproobid. Arv seened adaptee
netum, Psychotria võrreldes terra firme lateriitmullaga (savi). Kirjeldused ebapädevad;
okstel või lagupuidul, meenut Marasmiusi; Eriti Lact igapoensist peetakse parasiidiks puudel, kerg Lactarius sect panuoidei: kasvavad okstel või lagupui
Phlebopus tropicus elab koos juurte lehetäidega tsitrusel
on: bakterite ning AMF kooslused korrel taimekooslusega, ent bakterite ja AMF koosluste korrelatsiooni tingib pH. Partial Protest
ookeanisetete seened
vs katvus graafikud usaldusspiiridega; proge libshuff (perl), proovide (kloonide) arvu determinerrimine
süümid Põhja- ja Kesk-Am-s: pseudorepl.; peamine mõjutaja pH, mikroobide limiteerivad faktorid;
Tuber borchii
üdmisprobed; 16S PCR-rDNA; kogu rRNA, kogu rRNA fragmenteeritult; chaperoni pole vaja PCR-DNAle, ent vaja pikale 16S rRNA ahelale sek str ja
ol. 65: 2614–2621.
leidmise probleemid
sekotioidsete viljakehadega, kasvab eluspuu jalamil, ehituselt lähedane Oudemansiellale nii pseudoriisa kui VK ehituse poolest.
lade vah erinevus põlengueelsel aastal; põletamine ei tõstnud esile ühtki seeneliiki ega gruppi
Piloderma | Piloderma vs CWD
kanarbikulistel
nud VK vs EcM mittevastavuse arusaama
lses skaalas, keskm 0.74% (kuni 2,85%) liigiti. Cenoc isolaate saab ITS ja LSU sekventside järgi 3 krüpt rühma paigutada. 7% liikidel esines polümorfi
eeriv perek Mortierellales liike
[
Boletus rubropunctus mood tuberk EcM
oatrellus hulka, sõsar A. skamanius
perekonnad. Genea sisaldab palju krüptilisi liike Californias. Liigisisesed erinevused kuni 1.0%, eri paikades <2%; liikide vahel alates 3.8%
pets praimerid
emalt kui rohttaimed
524.
Diuris AUS: Tulasnella v kitsad tühmad. Loodusesse viidud inokuleerit
laselt surevad dipterokarbid tulenevad EcM seente suremisest peale raiet.
robial community composition. FEMS Microbiol. Ecol. 75: 291–303.
imine lihtsate matemaatiliste funktsioonidega: log-fn parim
sosyymi transkriptsioon Pleurotuses: stimul korge N, C, Mn, eriti aga Cu ja aromaatsed ühendid, transkriptsioon lakkab pH<5 Pleurotus sajor-caju
ats hindamise kriteeriumid: ; sõltub geogr kauguse skaalast; kehamassi kasvades on lokaalsel skaalal autokorr väiksem; pakuvad vä
poolest divergeerunud erineva kiirusega; kalibreerimine
AUS: enamus liike assots Tulasnella, Serendipita ja Ceratobas; pealse (
ieeruv Agaricus bisporus eri tüvedel

domin ECM

M(DothideoM((LecanoroM+Geoglossaceae+LichinoM)(LeotioM+SordM))))
:eae Dothideomycer incertae sedis
kaotamine: arv mitmekordselt. Pooldab 60 MAT suguk teket kuivades tingimustes (Lavin 2005). Arv noodulid tek üsna varases evol-staadiumis paleog

lest kasvab CWDl

Eperua, Peltogyne, Andira, Dalbergia (Leguminosae), Syzygium (Myrtaceae), Sapotaceae, Lueheopsis (Tiliaceae) mood AM
A: BD, BD näitajate modelleerimine, proovisuurus, kogu liigirikkus, võrdlus, usalduspiirid

ıs))). Juglans levinud P-Am, Andides Kaukaasias, Ida-Aasias. Arv levinud P-Am-st üle Atlandi Euraasiasse

Gymnadenia conopsea - GER 6 pop - otse juurtest klon-sekv - eri pop-

keskel

ırina, Ceuthostoma ja Gymnostoma on monofüleet perek. Tugev biogeo. Aspekt. Gymnostoma ja Casuarina sp. Sh Uus-Kaledoonial. Kasuariiniliste fos

transgeensete taimed

ırcode oli 1.5% erinevusi. Parim liikide eristaja RPB1 geen 1% erin

Laccaria, Suillus cavipes
Laccaria

haruldased torikulised: p
PO mõju Heterobasidion
Heterobasidion
nalüüs Heterobasidion
ɔa ruumi
us spp EMH surevad, ent kuivemates ti Hebeloma, Laccaria, Thelephora, Suillus spp

st amplif-probleemid

ımia: perek Hygrophorus, Camarophyllus, Hygrocybe

ɔarisons, ruutude summa: kasutus ja erandid; parameetrilisi teste voib rakendada ka mitte-normjaotuse puhul
neist 7 Euroopas; Hydnotrya bailii sh Eestis
36.

Tuber aestivum sage Alpi kuuskedel pH üle 7. Nakatatakse Ku seemikuid Wedeni meetodil minimaalse kontamir

kurents suurem kui liikidevaheline
ɔilistel kadakatel, 1.2-3.6 m Populusel, tammedel 1-24m; funktsioneerivad ka väh 24m sügavusel; väh 15m süg on leitud eukalüpti
xxx viljakehad vs ECMseen
Cantharellus cibarius
epikkused hoolimata Tm-st) 16S rDNAle; eri fülogen tasemetel. Proovid looduslikud

osmoses ja sterilis varisel domin bakterid ja kottseened

›odavad seened enim 26*C juures, meti xxx

›pikas väh 30st krüpt liigist. Liigid lokaalse levikuga, ent liikide vahel biogeo mustreid pole tunda

›õhj spoorisis arinevusi eelm uuringutes

›asutada sarnasusindeksit, mis põhineb BD-l mitte vaid liigirikkusel. Bray-Curtise indeks, mantel-test

Ecuadori epifüütsetel domin Tulasnellaceae, ent esineb ka mitmeid Seb

Laccaria bicolor mulla mikroseened vs ECM : mulla mikroseened vs E

Suillus bovinus: võimaline absorbeerima hüüfidega Rb, suhkruid, polüoole, glutamaati, vett, mitte oksaalhapet; e

›gen nov

›33.

› praimerid, kvantit määramine

Caladenia W-AUS: Sebacinales. Spetsiifilisus per se ei mõj orhidee har

›ie RFLP tüüpidele + sarn-põhinev R-statistik progega ANOSIM

Heterobasidion

Hebeloma ssp

›aid kõrgetel taksonoomilistel tasemetel (seltsist ülalpool); seltsi ja sugukonna tasemel oluline konkurents ning kooslused on fülogeneetiliselt koosseisult

›l ühendavalt platool. Hiljem tek eri liigid NCAl. N gunni 40 MAT ?st) ja N menziesii (NZL, 55 MAT AUSst) on arv kauglevinud. Vanimad Nothofaguse

›aginaceae L-Am-st

›llifera: (lõunapoolkera troopika mitte rannas OCE)

Laccaria laccata Fusarium

›lemine, keskmistamine

›e radieerus 80-30 MAT tekketsentriga Australaasias. Paljudes rühmades mitmed kauglevikud üle ookeanide. Myrtaceae endi sõsarrühmadeks Heteropyx

›sioon proportsioonide analüüsiks

Laccaria bicolor

›kaalne mullakeemia, ent mitte geograafia

›eid jälgi

› tasemel suureneb kõrgusega. Arv. Juniperus-Podocarpus efekt. Eri indeksid. Osad põhin harupikkustel. Segav asjaolu eri evol-liirus

Ts bubmollis, Th. Terr xxx

›as männijuures

›normaliseerimine, standardis. Kasutatud hübridis-temp juures piir 87% sekventsi identsuse juures, rohkem mõjutasid üksikult juhuslikult paiknevad valep

›sed ja miinused, rRNAl põhinevate arrayde võimalikkus

Russula aeruginea MMN

Tylospora fibrillosa

›, Russula: v palju troopikas -arvbiogeog fakult: arv EcM seentel fakult sümbiotroofsust per se ei es EcM seentel pinnastruktuurid fakult: arv EcM seentel

Thelephoraceae -v korge D13C ja C konts ja D15N 13C, 15N erinev kui EC

›t N omastavad paljud: kasv orgaanilisel ainel või mitte

13C erinevusi substraati

orhideedel, seenlillelistel: ülevaade

Thanatephorus cucumeris=Rhizoctonia solani -arv. O

Th. Sp. Rhizopogon, Russula orhideed+viited

Tomentella sublilacina: multistage, eelistab orgaanikat
osas eri tulemusi, emt ilma fülogen. Hälbeta
F, ITS4-Tul, LSU-Tom4, SSU1318-Tom

mittesuguliselt paljunevate se mittesuguliselt paljuneva

das liikide arv kasvab morf<biol<fül. Krüptilised liigid, näited Neurospora, Schizoph, SacchM, Lentinula. Seega, enamus seeni po
Kummutavad Finlay ja Fencheli väiteid mikroobide mittebiogeost.
lust ja nende roll oli ilmselt üsna oluline taimede toitumises
mi. Tsesalp kooslused on väga ürgsed ja arv kliimakskooslused. Metsatüübid sõltuvad pms kõrguses müm ja tsesalp rohkusest. Taimede nimekiri kogu
quality annotation of ITS sequences of mycorrhizal fungi. PLoS ONE 6: e24940.
w)

al fungi in wooded savannas and rain forests of Continental Africa and Madagascar. Mol. Ecol. 20: 3071-3080.

gi. Mol. Ecol. 21: 4160–4170.
orests: does fruit-body type matter? Mycorrhiza 19: 403–416.

11.3	16.0	22.6

ol. 195: 832–843.

usta (Myrtaceae), but not *Pinus caribea* (Pinaceae). New Phytol. 175: 321-333.

n kiiremad kui juhuslike levimiste vahelesegamine

oonidel: ülevaade ja statistik

sluste võrdlemiseks samal maalapil. Ka teiste ordin-meetodite kirjeldus

id leidub enim Rio Negro-NW-BRA ja Roraima aladel
ades, kus <2700 mm sademeid.
a-Guyana niisketes metsades. V palju Papiluionaceae liike, er Swartzia endeeme. EcM puudest veel Swartzia, Dicymbe, Pradosia, Aldina, Eperua?. Põh
endeemsus. V palju Papilionidaceae liike

Paxillus, Suillus bovinus

eetiliste eigenvectorite kasutamine variation partitioning analüüsis univar tunnuste jaoks
inokulumi ning närilised, mis muidu seeni levitavad, ei rända metsa ja niidu vahet. Metsas ja niidul eri liigid. Per üleujutus iseenesest ei vähenda ECM-p
: 1022–1033.
22–1134.

Listera/Neottia ovata ja cordata: möl assots pms Serendipitaceae nii ni
Epipactis 4 spp CZ: seonduvad pms kottseentega perek Tuber, Wilcoxi

on > Wilcoxina > Cenoc). Transport toimub kui süsteemis on häiring ja taimede suuruserinevused. Transp toimus ka ilma www-ta
sinikust oli teistelt puudelt. Noored doonorid transportisid seejuures rohkem C kui vanad, ent asijal pole bioloogilist pointi

Rhizopogon luteolus

ılne suhkrusisaldus söötmes 0.5%. Väli Laccaria sp, Elaphomyces sp, Pisolithus mood EcM nii Casuarina (sh equisetifolia), Allocasuarina kui Eucalyptu
ɪrinevad funktsioonid, ülevaade

ɜd ja maasiseste viljakehadega vormid on arenenud maapealsetest nii kott kui kandseened. Arv põhjuseks põud. Ka saproobidel sekotioidseid vorme, ent

ɩt mändide jaoks

ısvöötme metsadega Senegalis Uapaca guineensise ja Afzelia africana puistutes: lühidalt Austrogauteria, Coltricia cinnamomea, Lacta

Phlebopus sudanicus: väidet on EcM, aga tegelikult mood vaid seenmantli männiga, mit Phlebopus sudanicus: vä

ıneo-Congolia ja Zambesian endemismi tsentrites, eriti vihmametsades ja savannides

Thelephora terrestris, Laccaria laccata jpt tundmatute seente EcM süntees ja kirjeldused Picea is
a alt ja selle kuulumine /hebeloma-alnicola klaadi. Arv mood EcM

lla. KAHTLANE
ɔsana liigitekkest

Megacollybia platyphyll

Hebeloma, Setchelliogaster
susgeene; suurim patogeensus kui mõlema levik on lai, väiksem kui lokaalne voi globaalne

parasiidi-peremehe koevolutsioon (lina vs Melampsor

Hebeloma
ete transporterid ja lagundajad Hebeloma spp
Hebeloma

ɜeruv BD mõju võib tuleneda parandatud mullaparameetritest

ıassi fluktueerumine suurem just liigirikastes paikades
ıb koosluse ajalist stabiilsust, produkts, invas resist; vähendab toitainete kadu e leostumist, populats ajalist stabiilsust, vabu limiteerivaid toitaineid

ud seentel kasvab. Seenekoosluse mullaseened Kanadas NAAT transektil: EcM seente BD väheneb põhjapoo mullaseened Kanada

as, esteraas, isotsüümanalüüs Suillus, Paxillus
sotsüümanalüüs xxx
sotsüümanalüüs Suillus, Paxillus

rukamatel ühenditel suurem seente arv m
CO1; ei sobi 18S, 28S
s(occupancy)

ɜ ja seente vahel: anti-nestedness on sage; esineb modulaarsus eriti taimede osas; AM taimedel ohtralt EcMF liike - u 10% kindlalt
usest. JPN segametsas eri p
ɩele. Ei lahenda SSU introni ja Tulasnellade probleemi! ITS3 ja ITS4 analoogid amplifits 100% ka taime DNAd
ıema, Cenoc. Sh Tomentella, Cenoc, Meliniom bicolor kõikjal olemas. Perek-dest domin Cort(14), Russ-Lact(13), Tomentella (6), Piloderma(4). Olemas
ɾey Beatty & Sons, Chipping Norton, A AUS EcM seente f-n ja tähtsus. Coltricia oblectans -peavad saproobiks
Pisolithus tinctorius: EcM teke taime genotüübi spetsiifiline
xxx
Hebeloma cylindrosporum
Pisolithus arhizus, Rhizopogon roseolus and Suillus collinitus
äpid väiksemad ja hõredamalt), Gilb taimed ekstreemselt varju taluvad noores eas, varise mass ja sügavus 3 korda suuremad Gilbertiod metsas vs liigiril

efektiga ega oluliselt takista puude kasvu. Hiline põletamine tekitab puisrohumaa, kus v palju köndistunud <60 cm puittaimi. Teatud puud nagu Erythrop

: 888–895.
Martellia medlockii sünt ja kirjeldus
hizopogonile; okaspuude all Pacific northwest
ıtus
ıaraphysata, Horakiella, mycoclelandia, Reddellomyces, Mattirolomyces AUS kõrbetes. Ei tea, kas paljud on akaatsiate EcM sümb

kohastumusena per põuale, aga ka külmale. EcM seente tekkeaeg arv langeb kokku esimeste imetajate ilmumisega. Osad seened minitseerivad puuseen

Cenococcum geophilum: peremeestaimed ja kasvukohad üle maailma
Hebeloma, Astraeus, Suillus EcM sünt
rfezia, Tirmania, Picoa, Amylascus, Hydnobolites, Delastria, Mukagomyces (Terfeziaceae) perekonna tasemel määramistabelid

use sümbioositeooriaga ja oli selles ise kindel. Sai palju vastaseid. Esimesena peeti EcM seeneks vaid Elaphomyces granulatust 1840ndatel. Peale 1894
ucangium-Fischerula-ga

ndil. Arv. Et uuemad seenehõimkonnad kohastusid jahedama kliima pärast lumepalli-maad

savannid -Acacia, Eucalyptus; eelmäegede nõlvad niiskes -Dipterocarpaceae (hõredalt), kuivemas Casuarina; pilvemets 1000-3000 müm -Nothofagus, L

puude juured!!!
seeneliikidel

NA, fragmenteeritult. Kõrge tihedus SNPde tuvastamiseks. 99% edukus. Väheinformatiivselt seletatud
d palju

Hydnellum ja Sarcodon: korge D15N ja norm D13C 13C ja 15N: arv Phaeoc

M Cenococcumiga
ikroobide poolest mitmekesiseim ja aktiivseim kooslus. Eri koosluste vahel mõj mikroobe enim %Orgaanika, %N, pH

523-630.
Pisol (pärit männilt) ja Sclerod + Shorea mutualistlik kooselu
Amanita
Suillus luteus

liigilises koosseisus ja ohtruses põhj suuri muudatusi toitumisvõrgustikes
Cephaliophora sp spetsi
i: 10% eostest idanes kiiresti Stephensia=Densoca
osa

.S. Department of Agriculture, Portland, Ore, pp. 115-139.

41-2146.

kooslused on nested ja see on loodusl normaalne, käib kaasa koevolutsiooniga. Andmete kogumise artefaktid, indeksid, Soovit tü
urrence: fix-fix model on parim
udelid nishi konservatismi ja habitat filtering jaoks
saprotroofid parandavad orhideede idanemist ja arengut saprotroofid parandavad

xxx
Exophiala, Cladophialophora

neaarsed andmed): viide
Network (mittelineaarsed andmed): tulemus sama

ıasus Morchella ja Caloscypha anamorf Tuber anamorfid: iseloomustus, sarnasus Morchella ja Caloscypha anamorfidega
ɔrtinii

ɛkondades eri fülogeneet päritoluga - basaalsed v tek patogeenidest, ent erin saproobidest

ɔav söötis maade kult.
Thelephora ECM rohkus tugevalt neg korrel juurepatogeenide arvukusega Thelephora ECM rohkus tugevalt neg korrel juurepat

Heteroconium chaet
ıl vrd ümbrusega kõrgem b-glükosidaasi akt
Tricholoma matsutake
Tricholoma matsutake

ıine, praimerite spetsiifilisus x
d, ent nende hulk asendus suht kiiresti kõigepealt sõnajala eostega. Seened olid kivististes septadeta ning ei suudetud rühma tuv krridi-tertsiaari piiril pea
s from a large-scale plot network. University of Chicago Press, Chicago, Pp. 609-628

ɔoloma, Paxillus

on domineeriv pooltes maailma kooslustes, ent tugevam kõrgemal taksonoomilisel tasemel; madalal domin ühtlane jaotus; ülevaa

ıse kohta kõige informatiivsem, muidu MATK. Paljud taksonid levinud kas paleo-või neotroopikas

ʒa. Ei ole siiani arvestanud mikroskaalas kk heterogeensust. Ruumala on palju parem näitaja kui pindala. Suuremate alade puhul z

Hebeloma leucosarx, Paxillus
ilele eri kasu: osad suurendavad rohkem xxx, sh Cortinarius, Hebeloma, Xerocomus, Lactarius helvus, Scleroderma, Inocybe lacera

Hebeloma vrd AM ajas
hüpot: mikroobide B
ıs

ısid taimede funktsioone eri aastaaegadel. AM BD ei omanud positiivseid mõjusid. Teatud AMF liigid andsid taimedele rohkem P kui teised.

ınate AM-seentega, ent tagasiside oma mullaga negat-neutr. Invas kõrrelt saadud seened ei pärssin invasiivne kõrs Cenchrus Botswanas on seotud vaid 1

Taimede kaitsemehanismid ja nende universaalsus juurtes ja lehtedes. Arabidopsis kasutab põgenemistaktikat. Seemnete kaugl v oluline on uurida inter

ɔmi evol: Cantharellales ja Hymenochaetales seltsides esineb nii per kui mitteperf; algul mitteperf, ent perf on tek arv 4 korda isese

ɛerib rohkem muid seeni. SSUs parim kombinatsioon NS31-AML2 ja ilmselt ka NS31-AMDGR. Soovit kasutada kahte kattuvat p
ɔos taimega, vähem taim üksi, suurend Paxillus
ı eritab sümbioosis olles er oksalaati, vähem ka malonaati ja atsetaati, siderofooridest ferrikrotsiini, vähem ferrikroomi. Arv et oksalaadi eritamine võib c
ed ja mänd eksud oksalaati, malonaati ja fumaraati. EcM seente juurdetoomine süsteemi ei suurendanud kogu org-hapete prod, kuid muutis kvaliteeti. P

d on nooremad, neil on suur efektiivne pop suurus. Sealt võib tuleneda incomplete lineage sorting. Puu-põhised NJ ja pars. meetod
ıljud on väga tundmatud.
eerimine ja seente ning bakterite sekveneerimine
0 replikaadiga; detsentreeritud PCA binaarsetele esinevustunnustele
vesi=maismaa>merevesi; v palju korreleerub 15N rohkus C/N suhtega toidus

(Scrophulariaceae)???
Suillus variegatus
CWD: ECM palju rohkem, CWDs hartig net/cortex, mandli d suurem

Suillus variegatus
alkoholi oksidaas: detekteerimine Southern blot meetodil Phaneroch LiP ja AAO probedega LiP, arüülalkoholi oksid

Heterobasidioni tõrje seentega: eriseened kõik vähen

Phlebiopsis gigantea kas

petsialist tasub olla siis kui kumbki pop ei fluktueeru
lemustega sarn; proovivõtu intensiivsus mõjutab vähe d-statistikut
se ja ajalise kattuvuse kaasamine bipartite network-analüüsi. Fülogenees kaasati mõlemal juhul, ent mitte integreeritult. Tuvastasid
evamini kui vastupidi. Lisaks ohtrusele mõj ka fülog seosed ja morf või fenol kattuvused. Tugevaimad vastasmõjud liikide seas esi
d lubjatud pinnast

56-268.

latusest - tulemused erinevad
ende integreerimeine ühtsesse teooriasse
phyllum: läbisegi, eoste värvus perek jagamisel halb tunnus
. Neil liikidel erinev kohanemine looduses. Kui Suillus-rhizopogon välja jätta, siis peamiselt on introduts laia peremees-ringiga liig
seente diversiteet taimedele on positiivne aeglasekasvulistel, etn negatiivne kiirekasvulistele kuu

s vähe liike

des eri aegadel ja eri põhjustel
is suurendavad võimsust. Programm
ula klaadis -ericaceaelt
A Ceratobasidiales [hiljem Sebacinales Weiss 2004] isol india kõrbest AM-klamüdospoorist. Kultuuritunnused: õh kestad, dolipoorid, mitteperfor pare
AT. Mereelukatele maismaatõkke teke ise ei pruugi olla isolatsiooni alguseks -süvamere liikidele piisab madalaveelisest tõkkest
väga erinev. Liikide arv huumuspinnasel suurem kui kummaski lagupuidus

arv pole seotud genoomisuurusega ega sellel ole ka fülogen signaali (genoomisuurus on konserv); Parim liigi-tasemel threshold 99

lepatriinul invasiivsel on kaasas mikrosporidi
(Thanatephorus -multinuc), Ceratobas (1-2 nucl), Waitea anamorfidega. AG rühma Rhizoctonia: Ceratobasi Rhizoctonia: Cerato

ine liigikontseptsioon tihti parafüleetiline DNA fülogeneesi jr; areng eri mandritel arv hiljutine, peale kontinentide drifti Pleurotus ostreatus kom

Piceirhiza bicolorata -üks isolaat mood nii EcM kui ErM

vs ECM levik metsatüü

Laccaria bicolor
1-299.

t . Miombo alates 11000 a.

domin Hydnellum
s kütuste, N akumul väetamise ja metsaraie tagajärjel. Enim on biosfääri mõj maakasutuse muutus. U 50% maismaast on tugevasti modif inimese poolt.
lagunemine oli aditiivne ehk komponentide keskmine
sarrühm; kasvukoha jr arv saprotroofne

oil 355: 341-352.

idele suur tähelepanu. Nende plesiom ja sünapomorf tunnused
ni, iga liigi geenidele 6 probet
gi geenile 10 probet

a: erinev puhastusef, PCR, praimerid, kloneerimine, kimäärid
enduses; -10m AUS+PNG ühenduses; jõgede iseloomustus max ajal; ajastute kestvus
in Russula CBH sekventsid

aid EcM

Piceirhiza bicolorata; Hymenoscyphus; ECM=ericoid?

icolorata sümbiont kuuluvad Helotiales Meliniomyces bicolori-tüüpi mükoriisa isolaatidest mood EcM vaid M. Bicolor s. str. Ja M. Vra
Meliniomyces bicolor jpt lähedased isolaadid sünt EcM vs ErM ja fülogeneetilised seosed

ısest kuni deponeerimise ja andmebaasideni
taimlatest kuuse risosfäärist suur hulk seeni, r

e produktiivsuse ja BD muutuste. Tugevasti mõjutati nematoodide ohtrust ja mükoriisset kolonisatsiooni, vähem seente ja bakterite
ınud mitmekesisus suurendab prod. Statistiliselt eemaldati erinevate liikide efekt eraldi.

tamine geneetiliste pop andmete ruumilises analüüsis; ei sõltu niivõrd proovivõtu disainist kui Moran I ja Mantel test
ıonotaceae. Mikroperekonnad leiavad end mol meetoditega õigustatult. Coltricia spp + Coltriciella spp mood monofüleet rühma Pyrrhoderma, ning (Hyp

(Am): fenoolsete ühendite lisamine induts vastavate ensüümide aktiivsust. Puude alll oli ens akt suurem kui >10m eemal 13C PLFA: olulisim pui
mullaseente (attiivsete ja

Tremellodendron spp on EcM
e ensüümide rohkus kui dominantidel lepal või väiksem PsTs puhul. Arv lepp on valinud endale P-efektiivsed partnerid evolutsioo

ıama, aga 15N erinev huumus-ja min-horisondis. Enamus 13C tuleb kuuselt, mis on vähemuses vrd tammega. EMH biomass 4.8 -5.8 t/ha, samas juuri 7

pink, Piloderma Russula, Lactarius, tuberculate, Piloderma, pink
ıt mütseeli eristamine ECM
Laccaria, Hebeloma
Laccaria bicolor
Paxillus, Suillus variegatus

ikus suhtes erinevus hõimkonna ja alamhõimkonna tasemel Seened: Leotiomycetes,
ıe võimalused laboris ja in situ: membraanide kasutammine, quantum dots; siiani mõõdavad kõik tehnikad ensüümide pot aktiivsus

ʋaleandmeid, andmed puudu. EcM ja NM taimed ning mükoheterotr tek palju kordi
ıenid olemas kõigil maismaataimedel. Hiljem need geenid soodust ka muude juuresümbiooside teket
ora finlandica hiljem) ja Phialocephala fortinii kirjeldused - erinevus Phial dimorphosporast; Chloridium paucisporum (hiljem = C
ıle teke: sagedasem, mida sarnasem DNA, mida pikem loik, mida lyhem polymerisatsiooniaeg, mida suurem tsüklite arv; CHIMERA-CHECK programm

ist, statistikat

ülogenees: basaalne Cedrus (((Pinus(Picea+Cathaya))+(Pseudotsuga+Larix)) + (Tsuga+Pseudolarix+Abies+Keteleeria)). Kalibreering: Pinus-140MYA
ınalüüs vs DNA meetodid
söödavad ECM-seened: ülevaade
Geoglossum-Sarcoleotia on teistest palju basaalsem haru. Rhytismatales ja Lophodermium-Pilidium on võimalikud sõsarrühmad Helot ss-le. Erysiphales

ıud lehtedel olevatel endofüütsetel vormidel
'e aligneeringud
dmatu kottseenega. Üks liik ka looduses ECM, teisi ei tea
OrM: mykoriisadest seente isoleerimine ja seks faasi indutseerimine ning kirjelduse
ga ECM Pezizales: teleomorfi ja anamo Muciturbo: hüpogeiliste viljakehadega ECM Pezizales: teleomorfi ja anamorfi iseloomustus, kasvavad eukalüpti
OrM: mykoriisadest seente isoleerimine ja identifitseerimine: Caladenia spp. Ja lah
ıe, Stylidiaceae
Orhideede sümbiondid austraalias: Ceratobasidium, Tulasnella ja Sebacina vermife
Densospora (syn. Glomus) tubiforme mood EcM, mis meenutab Endogone EcMi: peened hüüfid
Thanatephorus gardneri (Thanatephorus gardneri (isolaadid WARH26 ja 0901)(Rhizanthella gar
et kasvada sygavast mullast maapinnani. Hiljem EcM arv fakultatiivne; taimedel mikroseemned; AM induts koigi liikide kasvu tugevasti, vaid moned Po
Sebacina vermifera EcM Sebacina vermifera EcM süntees Leptospermumiga. Isolaat mood ka O
ula archeri (mitteMR); Geopyxis carbo eukalüptimetsas 1-3 a peale põlengut: pürofiilsetel kottseentel oma suktsessioon. 1a: Anthracobia melaloma, A.
Endogone, Sclerogone mood ECM. Mõned Endogone liigid mitte-MR; üks spetsiifiline vaid männile, teised v ap
EcM süntees Tomentella sp-ga koos In Tomentella sp, Peziza whitei, Labyrinthomyces, Elaphomyces, Laccaria, Sebacina vermifera EcM süntees koos

Rhizanthella slateri endofüüt mood ECM eukalüptide, kasuariinide, liblikõieliste ja astrilaadsetega, Rhiz gardner
OrM: seemnete idandamine juurtest isoleeritud seente abil: Thelymitra spp ja Diuri

r, bakterite molekulaarne liigidefinitsioon (97% SSU = 70% DNA-DNA reass kineetika); 16S rDNA põhjal ei saa vastust funktsioonidele. PCR põhjusta

taimelehtede algupära ja

MANOVA asemel ilma bonferronita
tõenäosus välguks. Seal madalam BD, väiksem C/mass, õhukesem huumus, suurem [N] huumuses ja lehtedes; kiirem lagundamine
probleemid, ämbrid, korrektne katse püstitus

anism, kineetika, kelaatorid, aktiivsus

Phanerochaete
seente-bakterite suhe

kuni 6.5 m raadiuses

RSA: iga orhideeliik on spetsialiseerunud mingile mesilastolmeldajale,
Orhideedel mitmed rühmad on iseseisvalt läinud EcM seentega koosellu, kus on ise

s, Pulveroboletus, Phylloporus tihedad sidemed Kagu-Aasiaga -arvab et tulnud Kagu-Aasiast koos puudega. Paxillus -sidemed L-Am ja NZL Nothofagu
s v liigirikas. Käib läbi kõigi troop perek orientaalbiogeo.Heimiella on seot eri Fagaceae perek-dega; Suillus troop männikutes ü harv; Tylopilus -Austre
the Ecosystem. CRC Press, Boca Rayton, FL, USA, pp. 881-896.
tricus on arv kompleksliik nagu Pisol.; Gyroporus -palju liike N-Am, kosmopoliidid C. Cyanescens ja G. Castaneus. Lähedane Boletinelluse ja Phlebop
s -liikideks tegemisest sõltumatu, põhineb OTUde keskmisel kaugusel; võtab arvesse kõrgemaid taksoneid; normaliseeritud vorm

ikute ja puude seas, seda suurem on seemikute ellujäämus. Selet patogeenidega, kel teatud spetsiifika, mis tõen suurem lähitaksonites.
põhjal sõlmede kauguse jr arv indeksid. Toimib vihmametsa puude kohta Borneol. Plottides fül sarnasemad liigid kui juhuslikult regionaalsest liigifondis

s kooslustes kui arvest RDNA koopiate arvu. See erin 10k-30k/rakk
heterokarüootne, monospoorsetel järeltulijatel mõnikord alleel olemas, mõnikord mitte. Enamasti teised Laccaria liigid ei amplifitseeru SCAR praimerit

Tuber aestivum
TS põhjal. Erinevused viljakehade ja eoste küpsusastmest.
Tuber aestivum jt.
Tuber aestivum - inokul tammedel ja sarapuudel saak alates 5 a; import-inokulum vüib olla kehvem; tuleb rohida
elihhenis kottseen on jaotunud samade seeneliikide vahel

Stictis ja Conotrema: lih

Helvella: H. Aestivalis tõestati ITS põhjal, H. Corium ja H. Dovrensis mitte. Lisaks veel 2 Helvella liiki, mida ar
Thelephora terrestris jt2 liiki kui Thelephora terrestris jt2 liiki kui metsataimlate patogenid ja puudekägistajad
vaimad; troopika suuremat liigirikkust mõjutab vähene väljasuremine
Auriculariales, Sebacinaceae | Sebacinaceae fülogenees | Sebacinaceae fülogenees | Heterobasidiomycota: T
tika ja ökoloogia. Seotud perek Geastru Sebacinales: taksonoomia, si Sebacinales: taksonoomia, süstemaatika ja ökoloogia. Seotud perek Geastrum basa
iüte nii Sebacina kui Serendipita hulgas. Leiti Aafrikast ja Eur-st samu tüvesid, mis viitab reostusele. Sebacina-spets praimerid NS

Phanerochaete

i Sebacinaceae: AUS liivapinnalt ja Jamaika CWDlt
agu Tremella; 2 liiki. Üks kasvab rohttaimede vartel Euraasias ja teine koorega puidul USAs ja okeaanias.

Tuber melanosporum

d fluctuations and underlying mechanisms in terrestrial orchid popula OrM: Goodyera ja Liparis idanevad mullas ja huumusel paremini kui puidul, Tipula
AM ja ECM vs juurepatogeenid: ülevaade. LOENGU

nise-aligneerimise proge VI-Cut
gone uusimas -sõsarrühmaks Mucorales s.str + Umbellopsis
Sis, Ramaria, Russula (domnin2), Sarcodon, Sebacina, Tomentella, Tricholoma lineages
us peab olema tagatud
rtikli kodulehtedel, kodulehel või oma arvutis. Viitab ka mitmetele metaandmete standarditele. Andmete arhiv vajalik, et 1. ülehin

l akumuleerijad
ooni puudumine suureneb

ülevaade

timisest, LK-st, toiduahelast, invasiivsetest, kliimamuutusest; priorittediks ajaline konserv., parasiidi-peremehe seosed, pos liikidev
ne levik, nisi konserveeritus, võime nissi laiendada, taksoni vanus. Paljud klaadid tek troopikas ja üksikud levinud bor vöötmesse. Vanasti troopikat roh

kalibreerimine: tuleb välja, et radiatsioonid toimusid arvatust varem
llouni indeks (LINK vabavarale)

Wilcoxina, Phialophora-like ektendoMR männil

Phialocephala dimorphospora, P fortinii, Phialophora finlandia, Chloridium paucisporun Phialocephala dimorpho

) m/a
sest sama taimeliigil otsesed järglased pms läheduses; taim ei suuda kontrollida mida seen mullas teeb; seent huvitab maximis fotobiontide arvu; taim ki

hulgast parimaid ja halvemaid minema peksta, kui sümbioos on mõlemale kasulikum pikemas perspektiivis; kui on suur ruum ning tugev looduslik valik,
te parasiitideks. ECM püsivust soodustsobivaima partneri valik, pseudovertikaalne ülekanne (lokaalne levik), vastastikune üksteise ärakasutamine

Trechispora alnicola -pa
laguneval kuuse ja männ

rfol põhin taksonoomiat eriti kui ei ole kindel liigisisene varieeruvus

Mycol. 23: 94-104.

Coriolus versicolor

atel aegadel arv jõed toimised puhvrite ja levikukoridoridena

Echinodontinum

a Astraeus; SE-Aasias Calostoma, Gyroporus, Diplocystidiaceae; Aasias või SE Aasias Pisolithus ja Scleroderma perekonnad; ürgr
us, liigiteke ja väljasuremine ei erine
solithuse ja sclerodermaga ühes pundis, mood EcM
dus Kanada arktikast, kus on kodominant paljudel EcM ja AM taimeliikidel: liigikirjeldus. Fülogeneet SSU järgi lähim Loramyces; ITS järgi Mollisia
bp; Täpne protokoll; parimad matchid organismiga, mille DNAga langeb 100% kokku. 100% tulemused ka 2 organismi DNAde segust; võrreldavad tule

us

ilised mikroarrayd: Probed 20 b, varustatud ka 1valepaard-kontrolliga. Disainitud fragmentidele kogu genoomis. Sihtmärk PCR-DNA, 50 b pikkused fra

eksootiliste patogeenide levik troopilistes metsaistanc
oksülaasi aktiivsus mükoriisas palju väi Amanita muscaria
, puu toeusteta
levitud tuulega, vaid üle vahepealsete saarte või mööda Antarktikat. Paljud AUS, PNG ja antarkt saarte külmataluvad alpiinsed liigid pärin NZL-st. Gra
odomeen -õite tekkeks vajaminevad jrk: MADS olemas nii Gnetales, okaspuud kui õistaimed, Gnetales pole katteseemnetaimede sõsarrühm.
alt on teada seonduvat mükohet taimedega
.

pilliroo juurtes kultuur + sek pilliroo juurtes kultuur -
stunud rühmadele. Leiti 35 liiki, sügiseti rohkem kui muul ajal; andmete võrdlemisel kas Chao1 ja ACE liigirikkuse hindajaid
imise, sh konkurentsi ja fasilitatsiooni mõõtmise viisid ja interpreteerimine; ülevaade
a., juured leht ja okaspuudel samaealised, ent lehed okaspuudel pikaealaisemad, v.s. lehisel; SRL suurem lehtpuudel. Juured vahtral
atsiad ja tsesalpiinilised
enis, kus tek sh tsesalpiinilised ja akaatsiad
i tänu keemiale. Muutused aineringes.

Amanita thiersii on s

val metsas. Invadeeritud paikades domineeris VK biomassilt, ent EcM osakaal jäi 0.2 ja 0.5% vahele, ent sagedus oli suurim (20%

anitadel on kadunud geenid CBH ja paljudel vähem endoglükanaase; proteaasid samal tasemel. Katsed söötmetel andsid sama tule
l liigid ja biogeo: sage AUS ja E-NA (puudub W-NA-s). Arv tek Põhjapoolkeral ja alles pleistotseenis liikus SE-Aasia ja PNG kaudu Queenslandi, vahe

: suurim tihedus on maismaal
Am ja viimase 47-13 MA jooksul levis arv merevee kaudu Aafrikasse ja sealt jällegi meritsi üle India ookeani SE Aasiasse. Autorid seostavad seda suurt
Laccaria bicolor
ldastest liikidest, mis moodustavad pika saba

xxx, strateegiad, mädan

Caladenia: palju liike, mille OrM seened kuuluvad Serendipita-Sebacin
oon on troopikas keskm 2x kiirem kui parasvöötmes. See ei sõltu liigitekke kiirusest, ent võib olla seotud mutats-kiirusega (geenitr
t tuulte suuna muutuste tõttu

Pisolithus vs ? Vs Suillus luteus

üübid. Mingit jälge paraseksuaalsusest Cenococcum
Cenococcum
cetes: VK ühe sügospooriga. Kasvab risosfääris Pieris taiwanensis ja Senecio nemorensis
Cymbidium spp Hiinas assots Ceratobasidiumiga, mille kolonis potikat
5S rDNA. Konstruktsioon, n=2*(3), spetsiifilisuse ja signaali optimiseerimine. Temperatuuri tõstmine, mõne reagendi lisamine, suurendab spets
NE Am-aasia; Ramaria -NE Am-Aasia, NW Am-NE Am; Boletaceae -NE am-NW Am, NE Am-Aasia
Suillus
mitmed
mulla mikroseened suud
Pisolithus, Cenococcum jt

4 bp oligod; blotid eraldi; ükshaaval optimumtemp katsetamine. Mõningane ebatäpsus er perek sees.

amiseks liikide jr ???

te N ühendeid kui EcM ja AM taimed - tegu nii suurema SRL kui ErM seentega arv.

iogeograafiaks

maadel biomassi kasvuks

juure- vs risosf vs mulla juure- vs risosf vs m
a N/P=17; Suurim C/N/P tundrates, boreaalsetes metsades ja märgaladel; C, N, P mikroobides väheneb eksponentsiaalselt mullas s
ja levis enne eotseeni Ameerikasse
Ceratobasidiaceae1 ja 2 Ceratobasidiaceae1 ja 2 linidzid mood liigiga Platanthera minor ja puu
Chamaegastrodia sikokianalt Chamaegastrodia sikokianalt eraldatud Ceratobasidium mood potis EcM Abies firm
Thelephoraceae liikide isoleerimine orhideest ja taasinokuleerimine Cephalantherale ning peremeespuule Quercus serrata
matsutake
Hebeloma, Lacc, Lact, Russ mariae, Russ nigricans, Sclerof, Suill, sünt koos Pinus densifloraga. Fail: Morchella
xxx
Monotropastrum humile assotsieerub väga paljude Russula ja Lactarius
matsutake
paljud: kultiveerimine
sarnane inokuleerimine
jaapani söögiseened

ruderaalid, kasvukiirus erinevatel lämmastikuühenditel
ruderaalid, kasvukiirus e

Cephalanthera falcata assots tomentella-thelephora paljude liikidega ja
Cephalanthera falcata: reintrodutseeritud orhideedel kasvavad pms Tom
iti N ja P)
) -nimi Mikola ja Laiho poolt kirjeldatu Wilcoxina mikolae

levik kõrgusgradiendil: 3800 m vs 3200 m rohkem levinud stress, N ja S cycling geenid

ıitüübid, replikatsioonivormid

.inast ja Kagu-Aasiast. Seotud Pinacee, Fagaceae ja Dipterocarpaceae-ga

ɔletaceae atp6 põhjal. Chalciporus on basaalne Boletacaele, Paxillaceae eraldi (sellele basaalne Hydnomerulius pinastri); Scleroderı

ıe- ja loomaliikidest on tegelikult seened. Loomadel ITS2 pikkus (100)195-510(1209) b; GC 5-90%;

ɖoB mullaseened vs. Girc

x ja Schoenoxiphium sõsarrühmana.

ktsionaalne BD vähenevad Antarktikas pooluse suunas; omavahel korrel; Manteli testi uudne kasutamine võrdlemaks Phylochipi ja

ıa, Japan.

s segi)). Aasia on refuugium

Tomentella tüübikirjeldused: T. Punicea, T. Radiosa, T. Cinereoumbrina

Monotropoidne mükoriisa: Monotropa uniflora-Russulaceae: Martellia ja Gymnomyces .

el ja arhedel. Aktinoriisa ja mügarbakterite omad on sõsarad. Korduv horis ülekanne bakterite ja arhede vahel.

Cypripedium, Paphiopedilum CHI assots kitsa ringiga Tulasnelladest. I

earselt suurem; sõltub eelkõige mulla P sisaldusest ja sademete hulgast - troopika vanadel muldadel on P välja leostunud

imum Likelihood Estimator (NPMLE) indeks koosluste võrdlemiseks, mis baseerub paariviisilistel proportsioonide võrdlemisel

Apostasia, basaalne käpaline, eriliigid seotud väga kitsa ringi Ceratoba:

ooniarray

xxx

arbutoidse mükoriisa sünt puhaskultuurist: Thel terrestris, Piloderma bicolor, Cenoc, Pisol

slustes ei korreleeru ühegi taimeliigi ega funktsionaalse rühma puudumise/esinemisega. Liikide kadumine võib end mikroobidele mikroobide PLFA mitme

saa vrd parameetrilise statistikaga

Carbomyces New M

mikroseened: peale preeriran mikroseened: peale pree

Tuber albidum (pos syntees kastanil, tammel ja lepal

Tuber vs konkurendid kasvuhoones

Tuber, Hebeloma fungitsiidid parasiitide v

orella, järgmine on suguk. Nymphaeales. 12 geeni põhjal

ıhedasse.

Corallorhiza trifida juurest isoleeritud l Corallorhiza trifida juurest is Corallorhiza trifida juurest isoleeritud kandseen mood EcM männil. Uuemate uurin

isolaadid tootsid tsellulaasi ja PPO, Tulasnellad vaid tsellulaasi; Orhideed: fotosünt orhideede juurtel pms Ceratobasidium, Thanatephorus=Monilio

ıagine eostega levik

petsialiseerumine eri peremeestaimedele suguk Umbelliferae piires. Kaasneb osaline sobimatus, geogr erinevused
ton, FL, USA, pp. 241-263.
86-297.

Mycosphaerella graminicola: vt pealkiri, levikutsenter

dus

J
m teiste filamentsete kottseente hulgas
lariomycetidae+Hypocreomycetidae+Sordariomycetidae. Algne eluviis arv parasiitne, kust hiljem mitmeid kordi tek mükopar, saproobsed, soolavee, pu
millest väiksem osa, mis asustab juuri, nimetati Rhizoscyphus

seloomustamiseks. Ekstraheeritud 16S rRNA; Sulamistemp ja dissots-temp definitsioonid; vältida tuleks degenereeruvate ja inositooli sisaldavate praime

% DNAd kaob); isopropanoolis pole vahet, kas 1 h voi 24 h, -20*C või +20*C; SDS on efektiivne; puhastamiseks parim geel + kolumn
agenoomika mustritele. Põhifunktsioonid olid eri moodulites. CO2 tõus mõjutab mustreid

uutused ruumilises skaalas
kkonnaproovidest. Ülevaade, soovitused: parim 19bp oligod >1 bp valepaardumise, soovit otsas
kus palju suurem, domin pole; all tugev domin, domin ka üksikud fülogen rühmad
erite diversiteeti mullas mõjutab C-rikkus, C-heterogeensus, konkurents, isolatsioon, vähem kk fluktueerumine ja C üleküllus. Kui isolatsiooni pole ja C
kkonnaproovidest. Ülevaade, soovitused: parim 19bp oligod >1 bp valepaardumise, soovit otsas, VIITED; fülogeneetilised arrayd, funktsionaalsed ja ko

sarnasuskoefitsendid | Suillus grevillei
Suillus grevillei
iki indiv eristada, eri kodominantsed markerid on lokaalselt tugevasti agreg -arv eosed levivad mõnikümmend meetrit. Samas 700 m kaugusel olevad po
Suillus grevillei
isoleerimistehnikad

Orhideedel (C3) v neg 13C, korgem mykohet orhideedel

Pyrolaceae (40-83%) ja Orchidaceae (Platanthera leucostachys: 25-32%) mitmed li
Corallorhiza trifida on poolmükoheterotroof (52% N ja 77% C seente kaudu), ent c

nad biogeogr erinevused, eriti aga merepõhja ja ventide asukatel; produktiivseus seletas u 5%

nt singletonide ja <50sekv-OTUde väljaviskamine ei muuda tulemusi kvalitatiivselt, ent vähendab dispersiooni!

tset ja ökosüs restoratsiooni	

e arvu		
tmine		

endofüüdid, DS arbuskulaarne MR Erikoidne MR Bakterid,protist microcosm EOSTE IDANEMINE

juurtes Populus deltoidesel bakterid ja seened: 454 LSU. Juurtes oli palju Actinobacteria juurtes Populus deltoidesel bakterid ja seened: 454 LSU. J

ammooniumi oksüdeerijad on mullas enamasti arhed, mitt

`S2 seentele, trnF plastiididega eukarüootidele, SSU kõigile. Univ-praimer on paljude hälvetega ning ei oma piisavalt resolutsiooni; Soovitavad kas

bakterid mullas: 454
bakterid mullas: 454

Bakterid risosfääris vs bulk mullas: v erinev

,

hul on ohtrushinnangud vähemtäpsed, sest analüüsitakse ka puhkeolekus rakke; ilmselt erinevused ka rakkude lüüsumisvõimes
gukonnad v ebavõrdselt

a-poolkerale ja seal hiljuti radieerunud. Paljud teised tööstuse pärmid on hübriidid eri liikide vahel, mis on kasutusse jäetud soodsate omaduste tõtt

ıkarüootilele HiSeq NY Central park: eriti prokarüoote kooslusi seletab 22% pH, euk 4.4%; Mantel testi põhjal ka kooslused on tugevalt korreleeri

inimese suuõõnes (saliva, plaque) sadu baktereid

invasiivsed palmid assots väga generalistide seentega invas-mullas

Populus: yle 50 AMF OTU 3 proovialal

itsis 700 km2 alal 200 alal: ruumilist mustrit ei ole; Mulla P mõj neg ja pH, taimedeBD ja kõrgus!! mõj pos liigirikkust; seente fülogen beta-BD kc

ıbanenud alad: enim Hypocreales ja Mortierellales ja Helotiales. Seente elurikkus ei muu Lyman liustiku alt vabanenud alad: enim Hypocreales ja M

ɔmi-analüüsides SSU kimääre palju vähem; Proge ChimeraSlayer

ıtseid järjestusi teistelt bakteritelt

Quercus lehed: meeletult liike. Erinevused linna ja linnaserva vahel

ıuidu magatakse maha patogeenid jm, olulised taksonid; Markerid peavad olema soovit. aligneeritavad et kasutada fülogeneetikas. Soovit tekitada
ı seente hõimk muutused väikesed metagenoom mikroobidel vs mulla soojendamine 2 kraadi
› 2-5 GB andmeid ehk u 5-10 Miljonit Hi-Seq sekventsi

ıkondade ja metabolismiradade avastamine. Amplikonipõhistel on probleem madal reprodutseeritavus ja kvantitatiivsus. Funkts-geenide analüüsi t
e Bakt hk-dele. Amplikoni-põhisel analüüsil kasutati 3 eri barcode SSUs. Mõnel väga tugev primer bias, mis seostub mismatchiga, ent teistel misn
JA. PCR-põhised ja metagenoomiandmed pole omavahel võrreldavad ning ka 454 ja Illumina andmed pole võrreldavad. Väidet PCR alahindab har
is eri aladel eri kottseened; Ca conc suurenedes ens akt vähenes. Bakterite tsellulaase ei avastatud, seega arv. nad varastavad seente tagant

TUde koosseisu; palju unikaalseid OTUsid 52* juures, kõrgematel vähem unikaalseid
›vitavad mitte kasutada Sobs, ega estimatoreid, vaid mitteparameetrilist Shannoni ja Morisita-Horni indeksit, mis ei sõltu sekveneerimissügavusest

eid.

NS31-AML2 454 vs TRFLP: tulemused kvalit ja kvantit sarnased, ent pyro oli tundlikum ja andis märksa rohkem OTUsid. T

s eri hõimkonda kuuluvate organismide kooseksist ja vältimine eri põhjustel, ent ka geog Ruumenis: bakterid, arhed, ciliaadid, seened. paljude eri g
ve on väiksem. Ka Illuminal endal on mitmed seotud vead

valiteedikontrolliga;

pH määrab bakterite BD (unimod pH6-7) ja koosluse stru

ıt (54%) Agaricales, Cantharellales ja Atheliales. Liigirikkus ja BD vähenesid sügavuti; 25 OTUt rohkem pinnapoole, 8 OTUt eelistasid sügavamat
›sits.

domin Hypocreales ja Helotiales, vähem Pleosporales, Xylariales, Mortierellales

iigirikkust ega DNA arvukust, ent oluliselt määrab koosluse str. Helotailes eelsitab happ pH tõus suurendas liigirikkust ja DNA biomassi lokaalselt

ıäärid; suutis eristada ka sarnaseid liike kui liikidevah erin > liigisis erin; liigisis var polnud pürosekv artefakt. Arvatav liigirikkuse alahinnang sul

nide väljajätt suurema mõjuga. Titaniumil võib olla ka suur transversioonide%

singletonid on mitte-target lõigud genoomist; kimääre väga vähe, vead olid sekventsides ebaühtlaselt jaotunud; multi-seq aligneering tõstab samut

ikemad järjestused
ı seepärast et nende kvaliteet on juba algul kesine ja halveneb v kiiresti;

Pürosekv 200 bp SSU

W, Harend H, Guo L, Greslebin A, Grelet G, Geml J, Gates G, Dunstan W, Dunk C, Drenkhan R, Dearnaley J, De Kesel A, Dang T, Chen X, Buegger F, Brearley FQ, Bo

› tõus, induts põud: ohtrusele ja liigirikkusele pole olulist efekti; kooslustes domineerib S bakterid vs CO2, temp, põud: rikkus sama, ent põud muu

›id

amisega on NBC täpseim

Hoog GS, Del-Prado R, Dentinger B, Dieguez-Uribeondo J, Divakar PK, Douglas B, Duenas M, Duong TA, Eberhardt U, Edwards JE, Elshahed MS, Fliegerova K, Furtac

d viletsaid praimkereid.

ıevusi pole

Asukoht, eri peremehed ja eri viljumisajad. Mitmed taksonid on tek just peremeestaime järgi

gid, mille poolest albiinod ja FS isendid ei erinenud; lisaks Ceratobasidium, Helotiales, SordM ja mitmed erinevad EcM seened. Albiinodel kõrgem N konts ja d13C; palju

Bakterite mass-sekv planktonist: 516 OTUt (algselt 1067, millest er

DSE: ei tohi nimetada mükoriisaks, pigem võrrelda lehe-endofüütidega. Inh patogeene; kultuuride kirjeldused ja määramistabelid perekondadele;
anud
rev

protistide ökoloogia rev

vs ErM erineva N, P juures vs AM erineva N, P juures

t söövad mullaloomad eoseid, mis on terved peale seedimist -arv levitavad

ntoramaria ja Echinoram. Ja asteroram. Isotoopide 15N sign baasil

GE. Bakterid väga mitmeklesised, sügavuti liigirikkus väheneb; seened liigivaesed, sügavuti liigirikkus v bakterid ja seened. DGGE. Bakterid väga mitmeklesised, sügavuti l

Dark Septate mitmekesisus nulul, pöögil, erikoididel: palju morfotüüpe kultuuris, sh pannaldega kandseen sage; Phialocephala kõigil, eelistatult arktoalpiinses piirkonnas

Terminalia amazoniaca ja Urochloea-rohi erinesid AM koosluste poolest
sem kui mitte-MR taimel ja EmH-ta MR taimel, ka transpordil pealsetesse;
timul erines isolaaditi väga tugevasti. Aasta aega seisnud isolaadid kaotasid sümbioosi võime
Malaisias kolonis väiksem raiutud aladel. AM tek ka Intsia palembanical. Euroopast sissetoodud AM inokulum põhj palju suuremat juurdekasvu k
Malaisias: kolonisatsioon suurem puutumata>valikraiega>lageraiega aladel nii kohapeal kui potikultuurides; samas spooride produktsioon suurim v

anthus, Aphanocalyx, Didelotia, Cryptosepalum), Detariae (Intsia, Afzelia, Eperua), Papilionoideae(Mirbelieae, Aldina, Pericopsis, Swartzia) mooc

on nad võimelised seal ka eksima. Baieesia posterioorne tõen = p
spooride idandamine spooride idanemine bakterite r

vs ECM: diversiteet globaalskaalas, tähtsus tähtsus globaalskaalas

taastumine peale vulkaanipurset, väga tugev positiivne seos näriliste ja muttidega
AM, DS vs ECM Adenostoma /Rosaceae)
Gaultheria shallon: seq domin Sebacina ss Warcup, Capronia, Hymenoschyphus, Phia

bakterite kooslused on häiringutele muutlikud ja toimub k
AM kolonis kevadel madalam kui sügisel, väheneb org aine kasvades
Kapimaa taimede MR staatus: Ericaceae-ErM; EcM pole; NM -Cryophyllidae, Brassic

RNAd teat kohtadest
neetrikud

transp taime

Rhizopogoniga inokuleeritud mullas ebatsuugal kõrge N2 fix tase -

lis, Englerophytum, Delpydora jpt

rühmad: Helicobasidion, Tulasnella, Sebacina, Thanatephorus, Ceratobasidium eristamine dolipoori ja parentosoomi ultrastruktuuri järgi, kultuurimorfoloogia, sh sklerootsi

Penicillium sp, Verticillium sp, cf Phialophora; cf Hymenoscyphus, pms tundmatud

15-20 peal +-stabiilne

inimese soolebakterid: väga mitmekesine seltskond. Helic

d taimede pinnal. Funktsioon, fülogenees, kohastumused, hotspot

bakterid, arhed ja seened taimede pinnal. Funktsioon, fülogenees, k

Structural equation modelling AM seente kooslustes. AM-seeend mõj muid ökosüs komponente ja seeläbi kk-protsesse kliima

iomycetes. Kultuurimorfloogia liigirikkus jäi alla ITS rikkusele. Kultuuri morf ja ITS ei vastanud üks-ühele -erinevused mõlemas suunas, vaid 54% vastas üks-ühele. 90, 9
lehe-endofüüdid: diversiteet kasvab ekvaatori suunas; peremeestaime rühm ja sademed pole olulised. Troopikas OTUdest Sordariomycetes, Dothideomycetes; temp-mets
samblikega seotud seened on fülogeneet allikas taimede endofüütidele. Endofüütide ja parasiitide vahel palju üleminekuid; saproobsuse paljukord

Hymenoscyphuse kompleksi pole lehtedest kunagi leitud; Cenoc on leitud ka lehtedest. Lehtedes ja vartes on palju samu liike, ent lehtedes siiski k
troopikas lehtedel: tähtsus, mitmekesisus. Domin SordarioM ja DothideoM seltsid; entomopatogeenide tähtsustamine endofüütidena: nii elutsüklis
ses

loidid on kohast pikamaalevikuks ja ellujäämiseks mullas; Rhizopogoni eosed palju säilivamad kui Suillusel

ıi. Pomaderrise juurewd domin eukalüpti üle mulla ülakihis. Arv see on v tähtis konkureerides noorte eukalüptidega, mille juured eelist sama sügavust
ort purpurascens (ka Pomaderrisel). Ektendo-tüüp siledatel (sh Clitocybe, Agaricus, Mesophellia, Cort radicatus). Mesoph kahe klaasi vahel EcM süntees

kurendid kõrgemal. Arv er aastatel söödikute saturatsioon on põhj dominantsust uues kasvukohas Aasias. Hübridis harva. Liigiteke allopatriline; SE-Aasia dipterokarbid jõ
Lact brufuselt saadud MHB stimul EcM mood Lacc bicoloriga. 2 tü

Arhede kooslust globaalselt ei mõjuta miski peale soolsus

us edasi mikroobid hakkavad allokeerima N-ensüümidele. Seega enamikus kooslustes or C:N 18-20 on piir, kus edasi mikroobid hakkavad allokeer

ent T-RFLP v vilets. DNA konts enne PCRi ei mõj, ent tsüklite arv mõj: 20-30 tsüklit - ei saa kõiki liike kätte; 50 tsüklit: tekivad artefakt-liigid ar

girikkuse hindamisel, ent võib võrrelda erinevaid uurimispaiku

Terfezia claveryi, Terf boudier

M Afzeliaga
vs juureproov; tuubid: metsamuld: ECM diversit

Petri tass erinev substraat

's ECM-seened

AM network hoiatab teisi seotud taimi lehetäide rünnaku eest, mille järel taimed eritavad keemilisi ühendeid, mis peletavad le

siia ei kuulu.

el, kelle seemnete tihedus on suurem; fungitsiidide kasutamine suurendab taimede dominantsust ja vähendab elurikkust

:s käigus tek fenoolide lagund. Madal redokspot ei võimalda lakaasidel lagundada kompleks-aromaatühendeid
ebatäpsust (ei sobi ABTS), kõdulagunemisjäägid on 3 a pärast lagunemise algust energeetiliselt mittetasuvad; arv et laguens akt tõus EcM seentel

sagedus ja ohtrus sõltuvad positiivselt genoomisuurusest j
Tuber borchii -kvantit PCR

l mullas olevate bakterit eri kõrrelised mõjutavad mullas olevate bakterite ja seente biomassi PLFA jr eri kõrrelised mõjutavad mullas olevate bakterite ja seente biomassi

rim niiskes, N-väetamata rohumaal; kevad>talv>suvi>sügis. Seente osakaal vähenes N-väetades mikroobide arvukus suurim niiskes, N-väetamata rohumaal; kevad>
ıapealset liigirikkust (supresseerides absol dominante), vähendab prod; vähendab mullas seente suht osakaalu ning kiirendab N ringet
mikroobide biomass suurem prim sukts aladel lepa, Equisetumi ja F

; allopatriline, sümpatriline ja peripatriline liigiteke; raske arvestada liikide levila muutumisega aja jooksul; arv tekkivad liigid peaks asustama eri nishe, ent see pole alati n
nilised ja ökol mustrid; tasub edasi uurida molekul tasandil

b nematoode, kogu protsessi kirjeldus, pildid, eritab pleurotiini (bakteritsiid) ja ostreatiini (nematitsiid)
DS: anatoomia, värvimine sudan IV-ga, värvipildid; mikroskleroutsiume palju talvel, kevadtalvel; pigmenteerunud hyyfid kevadtalvel ja kuival suvel, hyaliinsed hyyfid kev
DSE: Aspergillus ustus -voimeline omastama fosfaate mineraalidest ja neid taimedesse transportima. Värvimismeetodid Sheffe ja Sudan 4ga
DSE/Bouteloua. DSE v mitmekesise morfoloogiaga, kolonisatsioonivormid aastaajati erinevad, koloniseerib ka juhteelemente ilma patoloogiliste sümptomiteta, DSE mood

sed Australaasias levinud klaadile
invasiivne sinep Alliaria mõj AM seente kooslusi Acer seemikutel ja vähendab kolonis.
Illumina masina abil mass-sekv mõlemast otsast; said plat
logaritmiline), seda suurem on nestedness.
ɔs eksponentsiaalselt liigi suhete arvusse

ɔNA; Pinus vs Eucalyptus: metsade vahel olulised erinevused

listasid põletamata või harvem põlet alasid

Petri tass

juured vs lehed Lepanthes orhideel. Mõlemis domineerivad Rhizoctonia-Ceratobasidium? Ja Xylaria ilma oluliste erinevusteta. Seentel ei tähel antagonismi ja väikeses juu

Populus, Salix Arizonas: niiskus seletas kõige rohkem koosluse varieeruvust

puuvillataimede juured kult + sekv: Fusarium spp, Nectria, Gliocladium, Diaporthe, Cladosporium spp.

l seosed homoloogse probe seondumisefektiivsuse vahel

petri tass > klaas

Hymenoscyphus: s .

proteiin-polüfenoo .

Hymenoschyphus, Oidodendron: korralik ligninaasne aktiivsus

MHBdel väga erinev spetsiifilisus just seente suhtes. Mõni EcM on

des L-Euroopasse jäänud pop-dest! Euroopasse on alles jäänud need puud, mis elavad üle jääajad ja soojad jää-vaheajad L-Eur efuugiumites!; Eeln

Frankia ja peremeestaimede fülogenees ja biogeograafia. Lahatakse

lgi

ga hüüfid 390 Ma 5 pannal 290 Ma; 6 imetajate soolesümbiondid 150 Ma, 7 vatsaseened 40 Ma: 4 iseseisvat viburi kaotust; kanseened vs kottseened 500 Ma; pärmidel pu

diversiteet, fülogenees, palju gruppe, sekveneeritud LSU. Sh. Sebacinaceae, Phialopho

protroof nii turbasambla kui laukude surevatel lehtedel, männiga ei oma mingit biotroofset suhet

ine + BOX-PCR + sekv diversiteet, mis antagonistlikud Verticilliumile, maasika vs rapsi risosfääris vs bulk soil; 3 ala. Nii eritaimedel kui eri aladel domin eri seente klaad

Lithocarpus densiflorus endof: Lachnum sp, Phialophora sp., unkn sp; taksonitest Helotiales, SordM, Capronia, Umbelopsis

Erica arborea saab mullast ErM seened kätte kui on kasvatatud pinnasel kus ümber po

esinevad tamme endofüütidena, laborikatsed

sed: mida suurem ala, seda liigirikkam. Saarte biogeograafia

tsüaanobaktersümbiondid taimedel ja seentel; Samblikud,

ooseksist pop-dele?

abiomassi kalkuleerimine pole veeseentel usaldatav

kasulikum kahest AM sümbiondist saab taimelt rohkem C kui seened on ruumiliselt eraldatud. Arv ruumiline stratif võimalda
AM diversiteet: peremeheeelistus läbi 2 polvkonna
yks vähestest näidetest, kuidas yht taimeliiki armastav AM-seen pole talle nii kasulik kui on teised, talle mittemeeldivad seened
tiivne tagasiside domineerib positiivse yle, mis pohjustab muutusi mustrilisuses
aimede biomass ; koosluse str. Enchytr puhul Lotus ja Plantago olid peremeheks v spets liikidele. Biomassilt: seened>Bact>Vihmauss>AMF>Coll
pott

us, Inocybe, Tomentella; C. Rubra: Tomentella, Phialophora, Leptodontidium; Epipactis atrorubems: Inocybe, Phialophora, Sebacina, Tuber, Tulasnella, Wilcoxina; Platha
ek Aneura seotud väga lähedaste isolaatidega. Paljud Aneurad jt perek seotud üsna erinevate isolaatidega NM gruppidest. Enamus perekondi seotu
kambriline, CO2 lõksudega

Monotropoid

AM diversiteet-epiparasiidid spetsialiseerunud kindlale klaadile.
Mükoheterotroofide evol ökol: fülogenees, toitumine jms

a, Rhizopogon, Gautieria. Uurimise pikk ajalugu. Jutustab ümber 19 saj teadlaste töid; PILDID. Mikroevolutsiooni tähtsus spetsialiseerumisele kluum teema. Mükohetero

i võrdlemine rarefactioni abil

ed Weissi toodega. Arv et Ceratobasidium on polyfyleet, aga pohiosa asub kukeseente klaadis. Arvavad ka Sebacinaceae kukeseente klaadi koos Tulasnelladega sarn Brun

olithus, Gyrodon, Boletinellus) + (Boletus + Xerocomus + Phylloporus + Tylopilus + StrobiloM, Retiboletus, Leccinum); analüüside põhjal Suillus on tek Rhizopogonist.

kõvas kivis Ophioparma-sambliku all. Sugaval kivimis sambliku-seene hüüfid, Hymenoscyphus ericae aggr., harva teised kottseened

s, Trametes, Fomitopsis
ädanikuseentele vastup .
ik Phellinus pini poolt: iseloomustus + biokeemia
id: ülevaade
ka lisand; viited teistele indiaanlaste seenekasutustele

Petri tass

avah võrrelda, ent K abs-väärtusel pole interpret okoloogias

lest

AM kolonisatsioon eri suktsess aladel erinev: põllumaj-maadel madalam ning ruumiline heterogeensus kõrge, preerias ja metsas kõrgem ning ühtla t, Lactarius quietus, Russula cyanoxantha, fragilis, lutea, lepida; Sclerod vulgare mood EcM Quercus sp-ga eoste polükultuuridega, inokul-aukudes

Crenarchaeota EC xxx

termofiilsetele bakteritele ja arhedele Siberi naftamaardlate õli-vee s

erinev ja konvergentne v.a. troop saartel kus looduslikke põlenguid ei esinenud -seal üksikud invas-liigid

algloomad suurendasid taimekasvu, juurte pikkust ja eripikkust

rasophyllum, Diuris, Disa, Thelymitra -Tulasnellales, sh isolaadid hoopis teistelt taimedelt ja kaugelt L-Aafrikast efektiivsed

er seevastu kannatas nii juurkonkurentsi kui EcM vorgustiku tottu (parim kus polnud ei juuri ega niidistikku). Arv et EcM seened hoiavad ara AM puude pealetungi. Arv o

ud India kaudu Põhja-poolkerale ja Kolumbiasse (cf. Halling1987). Arv Rozites tek ekvatoriaal-aladel, kus üks osa läks kohe põhja, teine lõunasse

ikidest. AUS v palju hüpog endeeme. AUS liigirikkuseks hindab 1278-2450 ja NZL 193-232. Eri rühmade biogeo mustrid. NZL-sse eukalüptidega sisseveetud liigid asust

cas ka mürdilisi

Epacris AUS: kultuuris ja juure-DGGE domin Helotiales, ent palju ka kan

RhodoD AUS: kultuuris domin Helotiales ja Xylariaceae (NM). Paljud He

kitinaasid: AUS ErM isolaatidel esineb kitinolüütiline endo-ja eksoaktiivsus, samuti AUS ErM isolaatidel esineb kitinolüütiline endo-ja eksoaktiivsus, samuti mitte-ErM er

Calluna vulfgaris ja Vaccinium myrtillus: sarnased seenekooslused. Erinevused tulevad

ermifera

aaab ka EcM Ceratobas kaudu mullast.

Epacris pulchella: 2 taime ErM mitmekesisus: kultuurid (vähem liike) vs sekveneerimi

Rhododendronil Austraalias: 3 taime: domin Hymenosc ericae aggr., muud Helotialese

makrofauna kohalolek vähendas tugevasti AM kolonisatsiooni

suur ökoton

ı peremehed v substraat. Somaatilist mittesobivust ei pruugi olla, er allopatrilistel juhtudel. Mol andmed pms suudavad eristada patotüüpe

Phialocephala fortinii: Leedust veel mitu uut krüptilist liiki

ia polnud seega kunagi isoleeritud nagu varem arvati. Põhja-India oli ilmselt suur poolsaar v palju saari, kustkaudu levisid Indiasse ja Madagaskarile ka Aasia vormid. Nalj

7% järgi. Korralikust herbaariumis on võimalik saada väga palju oma keskkonnaproovide heaks

ıse korral annavad vähem kui peaks

palju piiratum. Callistemon on osake Melaleucast. Tasmaanial Melaleuca ja Callistemon. Uus-Kaledoonia Callistemon monofüleet, lähedane N-AUS liikidele. Beaufortia

ing forest biodiversity experiments: general considerations. illustrated by a new large experiment in subtropical China. MethodsEcol Evol. doi: 10.1111/2041-210X.12126.

leniaceae mood AM ja üksikuid viletsalt arenenud EcM juuretippe, mida ei loetud päris EcMks -sellekohane kriitika Warcupi ja McGee aadressil;

EcM vs AM inokulumi potents

inokpot AUS: v tugev ruumiline varieeruvus, mulla häirimine vähendab vaid veidi

inokpot AUS: v tugev ruumilin

ides: sümbioos täiga (aphid) Meliarhizophagus fraxinifolii, mis sööb saare lehti ja juuri. Seene sklerootsiumid täikolooniate ümber. Arv täi saab pe

eri taimedel vahtrametsas sesoonselt

evolutsiooniline mükoriisa teke evolutsiooniline mükoriisa teke

ıdetest -ecm puhul tu 86% taimeliikidest mükoriissed, sh 74% AM, 9% OrM, 2% (6000 liiki) EcM, 1% ErMülevaade taimesugukondade ja elutüüp

lithus, Scleroderma, Castoreum, DescoM, Hydnangium, HymenoG, Hysterangium, Mesophellia, SetchellioG, ThaxteroG, LabyrinthoM, ReddelloM

yx, Englerodendron, Monopetalanthus jpt, ent mitte Macrolobium; II Macrolobieae2: Paramacrolobium, Cryptosepalum; Macrolobieae3: Dicymbe, Polystemonanthus

domineerivad

kasvutasku C-paberiga

Omavahel esines pos koeksistents -arv vertikaalne nishihõive. Vilujuvad eri aegadel

Hebeloma sp võrdlus eri in vitro tehnikate vahel

NH4 oksideerivad bakterid on mõnevõrra erinevad looduslikus pinn

Rhizopogoni eosed idanev

. Idanemiseks pole vaja seenega otsest kontakti -piisab kui seen kasvab tsellofaanil, mis katab söödet. Agarisse siiski püsivaid idandamist soodust ühendeid ei jää

kaob vabade nishide tottu.

ECM diversiteedi põhjustaja

cybe piceina -v õh mantel ja vilets HN), Lactarius spp, Pisol EcM sünt männiga. FAIL: Agaricus camp, Lycoperdon, Hypholoma,

misel: olulist vahet polnud lagundatava oksa lagunemisastmes, kuigi koniidide produktsioon oli erinev

; E USA

odis. Cellubiohüdrolaas oli A1 ja A2 horisondis rohke, kitinaas puidusodis. Kõik puidus olevad morfotüübid omasid tugevat kitinaasi aktiivsust, er Tomentella spp.; lakaas

Lolium perenne,Neotyphodium lolii vs Listronotus bonariensis (herbivoor) vs Microctonus hyperodae (parasitoid). Mükotoksiinid mõjutavad läbi herbivoori ka parasitoidi

Neotyphodium-Festuca süsteem. Endof eri tüved induts eri tasemetel konstitut resist ning ka haava-induts-resist. Kohalik tüvi parim. Peale vigastamist on seeneta taimed v

petri tass

Bakterite mitmekesisus mükoriisadel. Eri seeneliikidel po

männi EcM juurtel: pms Alfaproteobakterid ja aktinomütseedid

itud koosluses ei suutnud T-RFLP tuvastada mitmeid haruldasi liike

tuvastatud!!!

Hymenoschyphus

sümpatrilistel vs allopatrilistel liikidel. Kandseentel presügootne äratundmismehanism, kottseentel postsügootiline (hübriidid viletsad). Seentel peamine liigiteke spetsialise

acollybia: vs lehtede kitkumine vs raiumine vs mõlemad. Mõju 2 seene suhtelisele arvukusele on pöördvõrdeline

el: koloniseerib nii juuretippe kui ka suberiseerunud jämejuuri nn valkja kattega. Identif septade ultrastr järgi. Mantel paks, Hartigi võrgustik vaid 1-kihiline!!!; väidet ECM

ccaria laccata. Puhaskultuuris Pax > Cyl > Laccaria; Cyl inhibeerib mõlemil, eriti Laccarial ECM teket -mantel on õhem ja hartigi võrgustik on imelik. Cyl tungib läbi Lacc

ɔostis, definitsioon; mitmeid eritüüpe tekke järgi. Bakteritel, kandseentel ja kottseentel erinev melaniin. Bakteril neutraliseerib toksilisi fenoole, seob rauda ja kaitseb H2O2

ıerunis, servade poole vähem. Palju liike kattub, ka Madagaskariga. Omapärased liigid Zambias. Pilvikui on Aafrikas kõikidest sektsioonidest, eriti basaalseid, mida mujal

x

ɔn diferents risomorfid

ECM biodegradatsioon ja lignolyys:ylevaade

peremeestaimed, võimalikud sidemed, seente ja kanarbikulaadsete raskemetallide taluv

Cadophora finlandica ja Phialocephala lagund tselluloosi jm polüsahhariide

AM seente tapmine benomüüliga soodustab invasiivse Centaurea sissetungi konkureerides mõne taimega, samas vähendab seda mõne muu taimeg

eerikas (pärist Euroopas Centaura vohamine Ameerikas (pärist Euroopast) võib olla seotud AM-seentega, mis pole peremehe-spets ning peremehe-spets patogeenide puudu

a MHB mobilis paremini Fe ja P kui bulk mullas; bakterid sügavamal mükorisosf mullas efektiivsemad mükorisosfääri seened ja MHB mobilis paremini Fe ja P kui bulk m

Phialocephala fortinii ja Phialophora finlandia suudavad lagund polüsahh tselluloosi, tärklist, ksülaani, rasvhapete estreid, valke, mitte aga fenoolseid struktuure

Reduts lehtedega AM Gentianaceae on miksotroofid 13C ja 15N põhjal ja N konts baasil

5N ülekanne. Seenest Gly ja taimest CO2 märgist kujul. . Seega rohelistel orhideedel mutualistlik mükoriisa. Juhuslik leke välistati. Palju Gly C-st hingati välja; EmH-sse l

omycota, Plasmodiophoromycota. Korgematest seentest pole toendeid. Ülevaade

Haplomitrum (maksasammal): mükotroofsetel jätketel v tihe AM kolonisatsioon: arbuskulid, vesiikuleid ja longitudinaalseid hüüfe pole; spets unik

tav Michaelis-Menteni võrrandiga, kus on selge platoo-efekt

nema

alpitaimede juurte endofüütide määramine: kultuur_RFLP_sekvents. Domin. Leptodontinum, Cistella, Lachnum, Phialophora

hüdrobioloogias peb mikrokosmostega äärmiselt

hüdrobioloogias peb mikrokosmostega äärmiselt

Lehe-endofüüdid: kõrge mitmekesisus mikroskaalas ja lai levik kõikjal

endofüüdid: ülevaade

vähene poorsus suurendab bakterite BS väikeses skaalas,

ujuurtes erineva maakasutusega aladel (kultuur + ITS regioon): odrapõllul ja nisupõllul eri seened, nisul sõltusid sellest kui kaua oli eelnevalt seal nisu või oder olnud. Mid

männilistel; %koloniseeritud

männilistel koos vesiikulitega, eriti rohtunud paigus tõusmetel

a-ja kartuli spets tüved omaette rühmadesse. AG sees on somaatilise mittesobivuse rühmad, mis koosn isolaatidest. Seal eri isolaatidel eri AFLP muster, v sarn muster ja g

AM seente metauuring ITS põhjal: 90% fülotüübid - mandritel v palju endeemsust. Biogeo ja taim kumbki mõj r >50 seente l

Network teooria AM seentel Öpiku andmestiku põhjal: moodulid ja pesitsi paigutus

Frankia: mullaolendid, kes fakult asust juuri; mullast ei su

17 taime juure-endofüüdid ITS: tugev kattumine, 34 OTUt, domin Helotiales. Erikoidset mükoriisat mood vaid mõned Helotailes seltsi esindajad. Samad isendid mood en

ridisatsioon. Valepaardumised ka 40% sarnase DNA puhul; protokoll antud

a

enes peale põlengut osakaal EMH ITSs suurenes peale põlengut kasvuhoone

ıi ja eukalüpti eri liikidel nii kolonis% kui taimekasvu stimul osas. Soovitavad muude puude alt korjatud Sclerodermasid eukalüptide inokuleerimiseks mitte kasutada suure

vs ECM eukalüptidel. Suktsessioon

hizopogon

bakterite ja faagide kooslused on tugevalt seotud; protistic

ʒev mantel; Monotropa mükoriisa, Arctostaphylose arbutoidse mükoriisa kirjeldus; (Moneses uniflora, Pyrola minor, P rotundifolia, Orthilia secunda arbutoidse mükoriisag

ɛne inokul ef on aritm keskmine. Laccaria oli algul rohkem, ent vähenes kiiresti Rhiz arvelt

malt kui teised seened

EcM seened potoroo sitas: pal

, Russuloid, Inocybe

liigirikkus bakteritel veeaugu suurusest sõltub

ıad Rhodopolioid ja Prunuloides klaadides 2 rühmana

bakterite fylogeneesi ja systemaatika probleemid, eriteooriad, kohas

limiteerivad toitained mõj mükoriisa kasutegurit. AM on pos mõjuga kui N/P üle 14. AM pos efekt kaob kui P-rikast mulda N

ɔarafüleetilisuse või incomplete lineage sorting fenomeni tõttu; K2P distantside asemel tuleks kasutada toor-distantse; bootstrap väärtuste ületähtsu

muudetava paksusega

xxx

tubes, perliit, probleemid

Tuber himalayense, T. Indicun

fide hulk on maa sees kiirem kui maapeal

; kordust

ıs

;, mis on vastavalt ITS1, ITS2 ja ITS3 analoogid

EcM seened väidet. Kolonis sõnajalgu NZL kui läheduses on Nothofagus v mänd. Kultuuridega nakatumine ebaõnnestus; lep

lehtel/s kasvavatel seentel kooslusi mõj pöögi isendite geneet kaugus (Mantel) ja puu-siseselt lehtede kaugus

;esti ära kasutada

AM, EcM, ErM puittaimed erinevad C-ökonoomik AM, EcM, ErM puittaimed erinevad C-ökonoomika poolest - kasvukiirus,

16S rDNA geeni koopiate arv kõigub AM-seentel 2-4 korda Glomus intraradicesel

CO2 mõj kooslust 3,5%, osoon 0%; ent katse-aasta mõjutab 42%. S.t. samal põllul eri aastatel võib AMF kooslus suurel määı

ınikutel võrsuda ja regul taimekooslust; kliimamuutuste mõju on raskesti ennustatav, ent arv kasvab rohke mütseeli tootjate hulk;

mide tootmise osakaal erineb ligi 10x

ırtel palju madalam akt kui EcM juurtel

ja Lact quietusel on sarn fosfataasi ja lakaasi akt mustrid -arv sama funktsioon; Xerocomusel muster erinev

poolitatud juuresüsteem veestressi tekitamiseks

um (Stutz), Potentilla hyparctica (Bledsoe); Kobresia myosuroides

tuub

vihmametsa liikidel. Miotseenis olid levinud ka SE aasias, NZL, Patagoonias koos Casuarinaceae-ga

ıe, domin kõrrelised, Asteracee, Eucalyptus, Acacia, Casuarinaceae. Eri ajastutel domin rühmad radieerusid just oma ajastu algul. Kliimamuutuste algul immigr. Adansonia

e. Keskosas vähe endeeme, sest jääajal kliima muutlik ja kitsad endeemid surid välja

se samuti eelistatult. ARISA ülehindab kõvasti liigirikkust
una liigid stimul või supresseerivad eriseeneliike erinevalt. EI K INTERAKTS stat anal-s
hannon BD suurem rohumaadel kui metsas; koosluste vahe rohumaadel ja metsas on suu Seente ja bakterite Shannon BD suurem rohumaadel kui m

ia, Koenigia)
Agropyron: pott jaotatud väetatud ja väetamata pooleks või ühtlane väetus: taim saab sama efektiivselt kätte 15N kui NM-taim; 33P vähem. AM s
Agropyron: kahes kambris -taimekambris olev mittemükoriisne taim saab sama efektiivselt kätte 15N kui AM-taim sealt kuhu juured ei pääse; 33P
opropanool parem kui teised (vahet pole, kas +20*C vs -20*; 1h vs 18h)
sus
vsus tõuseb 2-3 korda defol. Aladel

I. Uniflora: Russulaceae; Sarcodes sanguinea: suilloidid, kantarelloidid

kanarbikulaadsed: ektost erikoidse, arbutoidse ja monotropoidse hypoteetiline teke

Epacris vs Leptospermum AUS: mõned juure-endof liigid kattuvad. Ühe k

ium orchidicola, Epulorhiza, Ceratorhiza, Sistotrema, Moniliopsis
notus, Moniliopsis, MRA, Sebacina, Thanatephorus, Tulasnella, Xerotus.
-parasiit, parasiidiparasiidi koevolutsioon; väga sarnane

50/ml; muld: 6400-38000/g, 4*10e6/t, muld glob>4.5*10e6; meres kogu: 2*10e6;
õrgem: arv. Seotud pare AM taimedel virionide produktsioon märksa kõrgem: arv. Seotud parema kasvuga

x vajadus

ltuuris ektendoMR õhukese mantli ja pooliku hartigi võrgustikuga. Sage rakusisene kolonis; ainult männilistel; Arbutusel puudus

Myxotrichum setosum, Pseudogymnoascus roseus, (mõl Myxotrichaceae), Gymnascell

spesiaalne õhuvoolutiga steriilne

viljakeha tükkidega

potid

idospooride järgi, hüüfiseinte ornamentatsioon. Vrd kandseentega tundlik benomüülile; ei soovita kasut nime Complexipes moniliformis; arvab, et tegu Geopora, Trichopha
a. Sphaerospora, Anthracobia, Trichophaea ei mood ECM ega tunne huvi juurte vastu
nkera, Tricholoma, Astraeus, Lactarius, Laccaria, Tricholoma + lühikirjeldused; Coltricia: vs ECM moodustumine, viljake Erlenmeyer

nteraktsioonid, ülevaade
Cladophialophora spp nov sammaldest
sammaldel seened: sõltub v palju liigist, koest ja aastaajast;
väheneb kui taimel on poolparasiit, AM soodustab parasiidi koloniseerimist

ooniga kaasnes kaasaegsete troop vihmemetsade teke

Xylaria endofmaksasammaldel ja õistaimedel omavah lähedased. Vaid risoidides, mitte talluses. Endofüüdid mood Xylarias omaette klaadi. Arvatavasti on Xylariate endo

maksasammalde risoidide endofüüdid: seenekooslused erinevad suureneva distantsiga, ent latit gradienti pole. Peremehe-spetsiifikat pole

ajude, männi ja kastaniga sisse toodud palju muid seeni. Nimekiri EcM seentest, puidusaproobidest; vrd ka muude troopiliste aladega; rohumaade l

igid samuti

ri Thanatephorus-sümbiont mood EcM eukalüptil

Clinonia borealisel: praimeritega 92 RFLP tüüpi, mis lõpuks andis 10 AM Glomuse haru. Eri metsatüüpides liigilise koosseisu muutust ei olnud. G

konkurente võõr-taimeliik

ucalyptusega, ent ei mood HN ning tapavad Casuarina equisetifolia. Eukalüpti kasv suurenes 13-32 korda, Allocasuarina max 3x, Casuarina max 2 korda. Casuarina juured

ja toitainete eritamist, mis induts VK arengut ja toitaineid

. Cf. Melaneum on hübriid.

emeesringiga v a L aurantiacum s l. Arv evol vanim peremees kask v haab, hiljem tek juurde pöögilised; kanarbikulaadsed; männilised. Peremehe vahetamisega on kaasnen

sots. Urtica dioica ja Epilobium angustifoliumiga. Arv. Juhuslikult levinud veesportlaste meeskonnaga NZLst jendamine suurendas C liikumist. Mida suurem oli saaja-taim, seda rohkem temasse liikus C. Juunis kui lehed puhkesid, liikus rohkem C, viidates

rasitoididele mõju

a infestans, P. Alni, Cryphonectria parasitica, Batrachochytrium, jpt

geensus vs sümbiotroofsus

benomüül väh kolonis; kolonis väiksem karjatatud alal; taimede N, P olid kõrgemad nii karjatatud kui ka benomüülita paikades; karjatatud paigus

vs ECM (antagonistlik v.a. Hebeloma sp) vs Rhizoctonia (ı .

Pi, ilmselt kvantit ei saa anal, andmete analüüsimine, tüüp I ja tüüp II viga, soovit kasut +-1 bp resoluts. Hea meetod, kuna võimaldab suurt replikats

jast sõltub hilisem koosluse struktuur ja massikadu

eriti mitte-ECM puude läheduses tammel

tosperma (tõen peitliigid)

EcM eukalüptid on v konkurentsuivõimelised kohalike puudega vrd. Arv et eosepanga kogunemine on oluline eukalüptide muutumisel invas-ks.

dab taimekasvu

spetskast

orr vs mitte, saavad erinevad tähtsamad muutujad mõjutajateks. Autokorri arvestav mudel pöörab rohkem tähelepanu mesoskaala protsessidele; erii

ktoreid saab kasutada teistes multivar analüüsides

vulgare, Tylopilus chromapes sünt Pinus taeda, strobus.

Arachnitis uniflora mykoriisa morf koos AM seentega; juurte sigipungad koos seenega

Arachnitis uniflora ja Glomus A arbuskulite-vesiikulite moodi moodustiste ultrastruktuur perspex plaadid

sid pms >30 MAT tagasi üle Atlandi või on suured jääaja väljasuremised muutnud vähemmõj NE Am ja SE Aasia sarnasemaks;

ınnanguid ja optimistlikke SE

:orrel mudelit ei või ekstrapoleerida suuremale alale või teistele objektidele

:itada läbi erineva täpsuse ja efektiivsuse. Taimede autokorr väiksem kui loomadel. Soovit esitada nii ruumilise kui mitte-ruumimlise mudeli

ndasid lehe osm pot. Teatud ajal päeval. Efekt polnud seotud parema taime toitumisega. Arv et suurenenud C-nõue põhj suurenenud FS

>160 000 km2 (ligi 40% kõigist kommerts puuistandustest); AUSs looduslikult 320 000 km2 metsamaal.

ıp põhja-Am ja vähem ka saartele

AFLP põhjal mikrosatelliitmarkerite ning SCAR praimerite tegemine. Efektiivne, kiire, ökonoomne, vajab vähe, ent puhast DNAd. AFLP>hübridi:

ıast proovist

ıringid -keskelt sureb, akt rõnga läbimõõt 30..40 cm; jaguneb 3 osaks: 6 cm risomorfide front; tihe mütseeli front; hõreneva ja sureva mütseeli front. Kasv looduses palju ki

seosega liikidele on elupaiga fragmenteerumine eriiti drastiline

arv, et mikrokosmostel on suur tähtsus hüdrobio

AM seened hoiavad õhulõhesid lahti ja lehe turgorit kõrgel

Treubia -algelisimaid maksasamblaid on v keerulises assotsiatsioonis AM-seentega. Diferentseerunud koed ja tugev AM-hüüfide mass

Jungermanniaceae, Aneuriaceae: kandseened

visualiseerimine DiOC6 abil.

maksasammaldel

vaid Acacia sect Phyllodes (syn Racosperma; Austraaliast) mood EcM. Koik akaatsia liigid mood AM. Senegali istandustes domin AM; tihti EcM

Petri tass

erakkude surm kui keskkonnas liigselt C

Petri tass

Dominantsus AM kooslustes on juhuslik protsess, idiosünkraatne ja ei sõltu fülogeneesist; log-normaalne (75%) ja broken sti

pH gradiendiga mullas: ohtrus kattub kõige paremini zero-sum multinomiaalse jaotusega. Võtsid arvesse ruumilist autokorr ja

ɔloma albobrunneum, Tuber borchii, Xerocomus badius: esmane EcM süntees eostest või kultuurist.

Boletus pinophilus, Gautieria c

bakterid 16S rDNA: BD, BD näitajate modelleerimine, proovisuuru

Laccaria laccatalt isoleeritud bakterid stimul vaid L laccata ja L bic

põletamine vs lageraie vs valikraie

kolb

inaktiveerimine, hapestamine, võitlus teiste seentega, patogenees, ligninaaside toetamine

taasidest

bakteritel inimese soolestiku eripiirkondades: suurim erinevus eri in

RE, praimerid Borneman 2000. Seened mullast. DNA extr SDS + PVPP. Sepharose. T-RFLP sarn-limiit 1.25. PCR produkt vaja puhastada ja RFLPks sama kogus. Piigi

üootidest domin seened, eriti Malassezia ja Cryptococcus-sarn pärmid;

ebia centrifuga -vanade kuusikute liigid: eoste langemine ja idanevus palju arvukam Põhja-rootsis kus vanu metsi palju. Monokaarüoniga asustatud puutükkide eksponeerin

ndud puuketastega agari asemel: säilib kauem, reostub vähem

var enamasti väike probleem, ent enamasti v vähe isolaate samast liigist analüüsitud

sh2

Glomus: komp kvant PCR

tammel, %koloniseeritud, vs ECM

V tetraspora, arv et mõni liik võib veel olla

ateerimine: sõltuvus keskkonnast, ekspluatatsiooni def Bronstein2001 jr; stabiliseerivad mehanismid: geneetiline uniformsus???, vertikaalne ülekanne, parasiitide rohkus, su

otroofsus: Rhizina, Pyropyxis -tugevad patogeenid, mitmed on norgad patogeenid (Geopyxis carbonaria, Gyromitra infula; Tricharina praecox var. intermedia); sümptomite

danevus ja idandite ellujäämus vesiagaril: Seemnete idanevust inh Caloscypha fulgens. Idandeid kahjustasid Pyropyxis rubra, Rhizina undulata, Ascobolus carbonarius. Tri

amüloosi, amülopektiini, pektiini, ksülaani lagundamine. Peroksidaasid kõigil; türosinaasid, lakkasid varieeruvad liigiti, isolaaditi

lioksidaasid, ligninaasid, kiire kasv.

katkestati EcM jm kandseente sidemed.

a Norilsk

sügavuti mullas bakterite BD väheneb ja kooslus muutub.

eise järgu tarbijatele ja detritivooridele võis taimede BD otsene mõju olla ka negatiivne. Taimede BD suurendab ka indiviidide arvu, mida ei ole SE

xxx

Frankia pott

Frankia x, turvas

Pyronema, Ascobolus, Peziza: eoste idanemist stimuleerib lühiajaline temp 50*; aluseline reaktsioon; kasvu optimum pH 6-8

suudab idaneda ja kasvada vaid eelsteriilses keskkonnas, muidu jääb kiiretele hallitustele alla
es (ei erine) ja redundantsed (v erinevad); erinevad sidumistemp (tasub proovida eri Tm tõttu)

Clavaria ???

taimlates

skaalade ekstrapoleerimine, mikrokosmoste suu

di; Suillus pole. pH otimum nakatamiseks Tomentellopisis 4.5..6; Paxillus 4.5..5.5. Optimum teravam lupjamisel kui tuha puistamisel

endofüütide kasulikkus. Toksiinide tootlikkus ja mulla N rikkus. Mudel
rohttaimede varre-endo .

inimese soolestikus bakterite kooslus 5 a jooksul muutub

vaheseinu ei leitud

ekasv (kõrgus, diam) kui kontrollil ja VK tek rohkem

taime juurtest tulev C indutseerib AM-seentes geeniekspressiooni ja N ülesvõttu; mujalt tulev C ei indutseeri

Choiromyces on Tuberaceae

Leptodontidium orchidicola isolaadid on endofüüdid nii kasel , kuusel kui potentillal, mittepatogeenne
Leptodontidium orchidicola ja Phialocephala fortinii on endofüütset, mitte-MR seened

ıed: levik noorendikes viljakehade põhjal

hõimkondade kaupa ökoloogiliste strateegiate ja nishi tuv

bakteritel: latituudi gradienti ei tuvastatud T-RFLP baasil.
bakterite kooslused ja metagenoomid ameerika preeria jää

BD , biogeo jms: Võrrelda makroobidega v raske eriti tänı

bakterid kõrgusgradiendil: vahet pole. Arv mõj baktereid ı
ojapõhja bakterite biogeo T-RFLP põhjal - distantsil pole

ıti mullas: 1m-ni seente biomassi osakaal väheneb 2x, algloomadel rohkem; aktinomütseetidel tõuseb 3 mikroobide levik sügavuti mullas: 1m-ni seente biomassi osakaal vä

im kõrbes; mullaloomadest domin kõikjal, eriti troopikas, vihmaussid (v.a. kõrbed, kus domin nematoodid)

eentele NS1, NS2) + kloneerimine + ARDRA + sekv. Kuuse risosfääri bakterid ja seened on erinevad bakterid, seened, 18S (seentele NS1, NS2) + kloneerimine + ARDI

20*20 klassika

ıd kui juhuperemees kaotab palju C, ent saab vähe P 20*20

tsesalpiinilised pole ECM. Üheidulehelistest Kobresia ja Pandanus on ECM.

bonis lõppes puidu ladestumine osaliselt tänu Cl II peroksidaaside tekkele

obasidium sisaldavad kuni 30% melaniini ning seovad edukalt Cu, Cd, eriti eri saviosakeste manulusel

ıbidum eri peremeestaimedel

ıa EI MOOD EcM tammega ega polnud ka biotroofne (?)ja peeti saproobiks

juurepinna endofüüte on rohkem seenmantlis kui NM juurel; eri MR-taime-seene vormid mõjutavad endof levikut; Enim endofüüte kuulub Gymnı

holmikpuu: normaalne Arun-tüüpi Am

MAT, kuigi radiatsioon oli palju hiljem: 60 MAT

ene endoMR sõltus substraadi toitaineterikkusest; alati ilma mantlita; polüspoorne inokul tekitas vaid VK-algmeid

Bacillus 2 spp: parandavad Pisolithuse kasvu, ergosterooli hulka; su
varane vs hiline: Leccinum ja l

AM vs ECM vs non-MR-domin. Kooslused; AM seeneliigi erinev mõju eriperemeestaimedele (ruderaale inhibeeriv)
AM seeneliigi erinev mõju eriperemeestaimedele (ruderaale inhibeeriv)

cM; Pyrola leiti NM Mükoriisatüüpide esmakirjeldused: AM, ErM, OrM Mükoriisatüüpide esmakirjeldused: AM, ErM, OrM, Monotropoid ja EcM

el , pärnal). Rõhutab EcM kasulikkust taimedele. Otsis EcM eriti trühvlite ümbert. Kirjeldas EcM mantlit, Hartigi võrgustikku, juurekarvade puudumist, tipmise meristeemi

asmius androsaceus: geneti suuurus, paiknemine, konkurents
iikide kooseksisteerimine: Mycena galopus ja Marasmius androsaceus näide

vast ja mittevõtvast analüüsist; eelduste mittekontrollimine; post-hoc hüpoteeside püstitamine; jääkide-põhine analüüs; lünklike andmete kasutami

Pseudomonas fluorescens: genotüübid mükoriisas, mükorisosfääris
P. fluorescens: doosiefekt, mõõtmine mullast, kasvatamine
pressivad, et toimub geenide horis ülekanne bakteritelt seentele; spe

palmi lehtede endofüüdid: oluline oli site ja lehe piirkond, ebaoluline aastaaeg

n NLFA16:1w5. PLFAsid ei tohi kasutada OTUdena.

oli juure-endof kasvades steeli rakkudes Eostest seenekultuuride es

Kliima soojenemine ei mõjutanud juureseente liigirikkust ja mitmekesisust tundras. Erinevusi liigirikkuses ja koosluse struktuuris mõjutas happeli

asiteerivad eri Wynnea sp ja Entoloma abortivum il

a veesisaldus suurenes kui mükoriissed juured lõigati läbi:

ıs ja Juniperus kõdus: replitseerimata. Eri seeneharud

iprodioon vähendab taimede kasvu primaarsuktsessioonilisels aimekoosluses

männiokastel: dominRhytismataceae, Strumella (Sarcosomataceae), Phialophora (???), Elytroderma (Rhytism), Phoma (Pleosp); seementel Clados

seeneliigi (perekonna)-spetsiifilised, taimeliik ei ole oluline, supress

svama sama edukalt looduses nii mono-kui dikaarüonitena, mõlemaid sõltuvalt paigast võivad domineerida; invasiivsusel ja kasvukiirusel pole vahet; aastaga võib kasvada

hulk aktiivmuda jääkidel vs metsamullale rajatud istandikes

-LINGID, VIITED, PROGRAMMID

ısvavad aluselisel pinnasel koos Quercus ilexiga sünt põhjal

d on väga liigirikkad; suur vae soolase ja magevee seentel

Sebacinales B: erikooslustes ja kõrgusvöötmetes; fülogeneetiline konserv mitmetes kooslustes, eriti häiritud tüüpides. Mõned Seb A liigid rohttaim

ıeolepiota-Cystoderma, Cyathus, Crucibulum; Hebeloma-Alnicola sõsarperek Galerina, Gymnopilus ja Strophariaceae. Laccaria on tek tumedaeoselistest, ent on säilit paks

ır ja Aus puudel. Chalciporus mood ecm männil, aga mitte pöögil (joonisel kahtlane);

liikide eristamiseks jääb teatud rühmades ITSist väheks resol tõttu)Colletotrichum, Trichoderma harzianum complex). ITS jaoks peaks kasutama !

ed ja mükoheterotroofsed orhideed üksteisest ning muudest taimedest

neg või neutr -+-võrdAM-seente mõju patogeenidele võib olla pos, neg või neutr -+-võrdselt

haabadel AM vs EcM sõltub mullaniiskusest ja niisutamisest. Optimaalse korral EcM, liigniiskes ja liigkuivas rohkem Ami. Eri genetitel ponud ro

järgi monofüleetilised, mida seletab pika ajaga, et praagitaks välja teistele sarnased alleelid. PROGED kanarbik ja Hymenoscyphus põhjustavad mõlemad allelopaatilist efekti samas potis ka

erikoidid inhibeerivad; taime P väheneb

kumidel eriti happelises .

k (43%) tasemel Panamas. Fülog distants v oluline. Mõj patogeenide leviku efektiivsust

liikidel kasvas hästi

Eoste inokul seemnetele vahet

männi sterilis vs steriliseerimata juurtel: Steriliseerimata: domin Cylindrocarpon destr, MRA, Fusarium solani; Steriliseeritud: MRA, Cylindrocarp

a , and Serapias vomeracea assots nii Tulasnella, CeratoB kui ka (vähem) Sebacina-Serendipitaga (mõl rühmad esindatud). Nelja liigi seenekooslus

R. Delica grupiga. Orhideelel piiratud fotosüntees ja arv saavad lisa C seente kaudu

eened; 18S RT-PCR+DG bakterid, seened, AM-seened; 18S RT-PCR+DGGE + klasteranalüüs. Polnud bakterid, seened, AM-seened; 18S RT-PCR+DGGE + klasteranalü

osluste variatsioonile oli minimaalne

kasvutasku

Haaval. Lact pubescens, kase-spets Leccinum spp mood EcM koos rakusisese kolonisatsiooniga. Alpova ja Rhizopogon ja Suillus piperatus, Gyrodon merulioides, Morcl

info; Probleem madala kvaliteediga sekventsidega, mis ei taha klasterduda

vaade

nood mudeli baasil vüttes arvess puude ja põõsaste lähedust ja basaalpinda; isetehtud tarkvara; eri patogeenirühmad reageerisid keskkonnale erinev

nood Cistus spp juurte ümber sklerootsiume, kus elavad Pseudococcus comstocki täid. Viimaseid omakorda levitavad sübiontsed sipelgad

ephurus Rhizoctonia anamorfidega . Thanatephoruse sees paikneb mitu rühma kus on nii 2-kui multituumseid isolaate. Viit nende ristamisele ja patogeensusele; mõlemil pa

ed

inokul

Petri tass: turvas+vermikuliit

kõrgusgradienti mööda. Madalal domin Cryptosporiopsis, kõrgel Phialoce

se ekstrapoleerimine, VIITED

kartulis: Verticillium dahliae, Cylindrocarpon destructans, Colletotrichum coccodes, Plectosporium tabacinum, Alternaria spp.

mügarbakterid: nende taksonoomia ja levik koos peremee

a; Coltricia perennis, cinnamomea, foccicola -kõik seotud tugevasti lagunenud puiduga ja samas mändide manulusega

mittekultivate bakterite tegevuse jälgimine ja tuvastamine: FISH, FI

Frankia pop identif

eb piisavalt proove võtta nii lokaalse skaala kui globaalse skaala uurimiseks: tasakaal nende vahel

kuse pol põhjal -on seot pindalaga Austraalias, koosluste erinevus suureneb kaugusega; ent kogu Austraalia kohta vaid 100 OTUt

Meliniomyces bicolorist eraldatud isolaat ja 2 Mel variablis isolaati on suu

Meliniom variabilis samu geneteid leiti nii männi EcM-dest kui ka Vac

Meliniom variabilis samu geneteid leiti nii männi EcM-dest kui ka Vaccin

Hyphodiskuse klaadi 3 isolaati erinevad oma võime poolest üles võtta NH4

kasvutasku meetod

a, Clavulinopsis, Clavaria, Trichoglossum, Geoglossum on väga madala d13C ja väga kõrge d15N väärtustega võrreldes saproobidega (Cystoderm

Pleurotus) isolaadid olid võimelised tungima Ceratocystise rakkudesse, eriti toitainete puuduse korral

NAl

ides ei mood EcM männiga, ent muudab viimase juured kahveljaks

Phialocephala fortinii uued krüptilised liigid -peremehe eelistust neil ei tuvastatud. Olulised erinevused vana metsa ja majandatud metsa vahel. Majandatud metsas rohkem

RFLP-põhised probed DSE (Phialocephala, tüüp1) populatsioonigeneetika uurimiseks. Phialocephalal kõrge polümorfism (Nei indeks), tüüp1-l madalam. Samad RFLP-pr

Phialocephala: ITS vs RFLP vs ISSR: P fortinii on kompleksliik koosn 4 mikroliigist, mis võivad olla koos samal juurefragmendil. Arv et toimub mikroliigi sisene rekomb,

Phialocephala, Acephala, Phaeomollisia: endofüüdid nii juurtes, vartes kui lehtedes; ITS-fülogenees viletsa toetusega

Phialocephala fortinii-Acephala applanata kompleks: lisaks boreaalsele vöötmele ka Kilimanjaro, NZL, Austraaliast, Antarktikast; Stoyke 1992 ja

Phialocephala: polüfüleetiline perekond

ISSR DSE: Phialophora finlandia - kultuuridest kuusejuurtest eristamiseks. Suurimad genetid väh 3*3 m, genetid omavahel tugevasti kattuvad; samast proovist kuni 5 eri g

trühvel surub all taimkatet allelopaatia mitte parasitismi teel.

paljusid suhkruid puhaskultuuris; ei allu fungitsiididele

tuubid, potid

suletud, õhufiltritega

;t on arvestatud

/ad bakterite üle vees lehti lagundades; seeni eriti korge toitainete konts. juures bakterite osa vähel spets vees lagundamise mootmiseks

palmi Livistona lehtedest: domin Xylaria spp. Jt Sordariomycetes

ay läbi lasta erinevate pesemistemperatuuridega, sest eri probedel eri Tm; külmhübridisatsioon
oogiline kasutamine. Cartapip: vaikude, terpeenide jms pigi eemaldamiseks paberitööstusse minevast puidust.

spetsiifilisus

ite)

aprotroofsed omadused

Eri Frankia tüved v erineva efektiivsusega

idele eostevihm monokarüootidele: (

rhiza bicolorata (EcM), tüüp M. Variabilis = (=variable white taxon) endofüüt palju Meliniomyces on uus parafüleetiline perekond, mis hõlmab Vralstadi liike. Sisald.Rhiz
svu

d kõdu N rikkamast tüübist vaesemasse

erineval C-allikal, eriti Gly vs teised: bromouridiiniga rikastatud substraadid

lokaalses skaalas keskkond seletab 25% ja geogr distants

DSE: ITS + 14RE; avastasid et Phialophora finlandia ja Chloridium paucisporum (Wilcoxi isolaat) on sama RE-mustriga ja arv et tegu on ikkagi ühe liigiga. . Juurtelt leiti

bakterikoosluste RAPD

d ja euk kooslused on mõjutatud mullahorisondist ja vs. Metsa maha võtmine; Üld-euk p mulla bakterid, arhed ja euk kooslused on mõjutatud mull

ädanevates eluspuudes: eriseened eri puudel erinevalt; mõjutab pos niiskus, temp

ligniini ja poly-koniferüülalkoholi lagundamine tugev vrd ECM seentega

2 DS, sh Phialosćephala

sed; organismirühmiti. Tugev ligninaasne aktiivsus vaid valgemädaniku kandseentel, kes toodavad LiP (lag eenduvaid struktuure) ja MnP (aromaatset)

nterpreteerivad sünteesitud suhteid (Masui, McArdle), sünt Lactarius deliciosus männil

eus, granulatus, porosus; Cenococcum=Mycelium radicis nigrostrigosum, 3 eri mükoriisaisolaati sünt männil; FAIL: Chalciporus piperatus, Xeroc

Fagus, Betula, Carya, Corylus. EcM sünt Pinus spp.

Mikro-kk võib olla oluline, er niiskuserikka sambla kaasamine; söödikud võivad mõj seeni erinevalt

Graffenrieda emargi Graffenrieda emarginata mood AM ja DSE Hymenoscyphus ericae rühmaga, mida peavad ekslikult EcMks. Sealsamas olema

Nyctaginaceae: Neea ja Guapira -arbuskuleid pole, hüüfe v hõredalt biogeo arvest elusorg ja tektoonika koevol. Riffide ja meremägede elustiku uurimine on eriti oluline, sest need on vastupidavad, samas kui soontaimed ja kõrgemad loomad

Casuarina (2), Pisonia (3); Tiliaceae (6 perek)???, Intsia, Rhamnaceae???, Scaveola (2; Goodeniaceae)

Friesi intersteriilsusgruppidele. Eristusid ka ITSga, parim rabA geen

AM kolonisatsioon teelehel kõrgem suure taimede BD korral ja looduslikul maa taastumisel vs külvamisel. Inikul metsamullaga ei suurendanud ko

põllumaa rekultveerimine: külvati 4 vs 15 taimeliiki: mikroobide BD idiosünkr põllumaa rekultveerimine: külvati 4 vs 15 taimeliiki: mikroobide BD

Laccaria bicolor + Pseudomonas fl. Laccaria inokul stimul ebatsuug

20*20 plaat

arvukus, laguprod O vs B horis

lepp vs haab: haaval suurem liikide arv ja ühtlus; liikide arv .

Fakultatiiselt AM taimedel on laiem levila ja ökoniss kui NM ja oblig AM taimedel;

Reostusprobleem

N2 fikseerijad puidus: palju, eriti lehtpuus ja keskmistes lagunemisa ınthus, Amherstia, Leonardoxa, Paramacrolobium

Arv lehe-endofüütide mitmekesisus tagab patogeenide vastu tõhusama kaitse
juure-endofüütidel BD väheneb põhjast lõunasse (CAN-USA, N-Mex). Ent muld oli põhjas org-rikkam ja kleepus rohkem juurtele külge; juured p

ɛena j 4) Kõlõma j Kaug-Idas; 5) Beringi väin 6) McKenzie j; 7) Gröönimaa-Kanada arktika vah ala. Samas NW-Am on paik kus on mitmelt poolt tulnud populatsioonide s

ɔliselt tekkinud 3 korda evol. jooksul. Hibet väidab, et pea koik pr-mä seened on dipolaarsed ???. Väidab, et on väga oluline seos okaspuu mädandamisega-täielik möla.

formaalseks kirjeldamiseks

opoliit v. A. Euroopas, 7 eriklaadi, Ameerika ja Vana Maailma rühmad on teistest eraldi monofüleetilised. Tekke kohta erihüpoteesid LSU ja mt DNA põhjal
en homotallism, sageli tek 2-4 tuumsed eosed, mis on aeglasema kasvuga; eoste ristumine palju harvem kui võiks homotalse liigi puhul eeldada; arv lisaks muud mehanism
kute patogeen

taimede liigirikkus seletab 8% AM seente liigirikkusest maapealsete osade järgi ja 23% liigirikkusest maa-aluse liigirikkuse j

ː, Casuarinaceae, Proteaceae-le. Taksonite ränne javäljasuremine kliimamuutuste järgselt. Tasmaanias oligots-s v niiske ja jahe kliima, mis sobis eri Nothof alamperek-dele

ookeanides oli gradiendi tugevus üsna erinev. metaanalüüs. väga asjalik SUPPLEMENT

nevad soolad puhvritena erinevad, sõltuvalt lahustavusest ja transp ef-st. Redoksreakts mullas

ıeeldib Rhizoctonia

Petri dish

15N sisalduse erinevus

CM, Ramaria, Clavulina saprotroofid 14C põhjal. Sowerbyella puhul pseudoreps

iigiti;

AM seene kohalolek stimuleerib rohukõrte lagunemist ja orgaanilise N kättesaamist . Seen kasvas eelistatult rohulaiku vrd teise taimega. See on va
ei suuda orgN omastada;

mükoriisa mõju on eriti tugev siis kui N/P suhe on kõrge (P limiteerib), sõltuvalt taime funktsionaalsest rühmast, mittesteriilse

enide puhul; taimedel mükoriisastumisel on tugev päritav komponent

Juniperus, Cupressus, Platycladus lehtedes AZ vs NC -erinevused nii alati kui liigiti. >98% ITSi olid parimad liikide klastrid. Domin DothideoM j
seenehüüfide endobakterid endofüütidel: mitmekesine sel

mood suurema osa.

vast; N väetamine ei mõju maa alla investeeringutele 2 näd jooksul, ent 1 a hiljem vähenes 60% võrra
boreaalse metsakõrgusgradient põhjustab N, pH jms gradienti läbi v

e EcM taimi, kuigi sealsed tsesalpiinilised mood monodomin kooslusi. Arv et ka tsesalp Daniellia on EcM
s sapro

tsal kohal antagonismi uurides
ilisemad on agressiivsem .

s.

s
lekse, mis levinud nii S-Am, AUS, TAS, NZL, PNG Nothof metsades. Descolea on arv AUS-st levinud Indiasse ja Ida-Aasiasse
ophorus, Humidicutis, Neohygrocybe, Bertrandia on arv saproobid, kuigi on samuti EcM metsades

Tugeval keskk gradiendil AMF on fülogeneet klasterdunud väikeses skaalas.. Ruum ja fülogeneet lähedus mõjut enim kooslu evol-ökol bakteritel: kooslused fülogeneet enamasti sarnasemad kui

taimede ja bakterite liigi-pindala kõver soolasoos on erinev samas 3
produktiivsus gradient mesokosmostes. Erirühmadel U- ja
kooseksisteerimine mikroobidel vs makroobidel: Negatiiv
bakterite üld-BD: 10e10 liiki, 4-6 x 10e30 rakku. Tähtis heterogeen

xxx-web

d Geastrum + Radiigera liigid???

[alassezia, Cryptococcus; antibiootikumid ja haigused põhj tugevaid nihkeid

a olid erinevused eriti suured

: v suguk tase

ruumiline asetus Spartinaga seotud Nitrosomonadales (am

004 lükkas ümber]. ECM-harud paiknevad koos, v a Hysterangium, mis on toetuseta. Phallales on Gomphalese sõsarselts.

vs avamaa

ımaal: 18 rDNA kloonide RFLP+sekv vs kultuurid (rohumaadel sama, kultuuridel palju väiksem BD, RFLP bändid sisald mitmeid seeneliike)
2. v aktiivn FS suvel; 3. "mükoriisa abi"

. Eri klasterdamisalgoritmid ja eri cutoff väärtused annavad erineva klastrogrammi

linidzid, millel oma niss. Kritiseerivad indiviidide/rakkude mittearvestamist mikrobioloogias

s

'M, mood artrokoniide

Xeroc subtomentosuse saproobsed vormid on Bjerkandera adusta ja Mikola Laccaria sporuleeris). Chalciporus piperatus ja Coltricia perennis ensüü

erinev efekt taimede idanemisele; Mitme liigiga inokuleerimine andis üldiselt keskmisi tulemusi v sama häid kui parima liigiga inokuleerides (idan

mmerell BA, Taylor PWJ, Terhem RB, Udayanga D, Vaghefi N, Walther G, Wilk M, Wrzosek M, Xu JC, Yan J, Zhou N. 2014. One stop shop: backbones trees for impo

taimed assots 47-60 seeneliigiga
selt heterotroofsust; Chimaphila käitub nagu autotroof

eri seentega Serendipita, Cerat, Tulasn1 ja Tulasn2 rühmadest: Epul1 - kõikjal v.a. stepis; Epul2 - stepis ja kuivades kohtades; Cerat - niisketes ko
a ja Ceratobasidium domin - kõik väga vormirikkad; orhideedel erinev seene-spetsiifilisuse tase ja keskkonna-eelistuse tase
väetatud pinnasel. Järgnes viljakehade massiline teke ja hiljem EcM vähenemine
mükohet Afrothismia (E mükohet Afrothismia (Burmanniaceae) juurtes on 2 seent: AM-seen ja endofüüt, mis ei tekita mingeid spets str ega taime vastureaktsioone

Tuber albidum ja Tuber aestivı

Pineerliikide (Inocybe, La
seente sagedust ei mõjutanud N ega peremees (pohl vs mustikas), kuid mõ
maaral kevadel kogutud varudest
mikrokosmosed, poollood tingimused, mensur k
geldub evol labiilsus ja lai ring

T. Robustum indutseerib sama
N fikseerimise geenid ja geeniekspressioon Suillus variegatuse ekto
endobakterite BD j aliigiline koosseis männi + Suillus variegatus võ
Arv Rhiz eosed on kuumutami

de eellaste jäänused; Hõredate metsade teke koos tsesalp-dega al kesk-eotseenist. Savannide teke al 16 MAT, kuigi kõrrelised arenesid juba vara-paleots 64 MAT

sringiga (N-Am, E-aasia) ja kitsaga (Pinus strobus)
ga nad jagavad ka mükoriisaseeni
ased kooslused, v.a. D. Maculata. Seente arvul populats kohta ja haruldusele pole seost. Mitme liigi seemned idanesid ka aladel kusvanu taimi pol
ndub vaid 1 liigiga. Kesk-Eur piires ei esinenud regionaalseid erinevusi seente kooslustes liigi piires. Arv et laiem seenering suurendab fitnessi väg
M seened v sporaadiliselt: Network oli nested; arv et orhideede levikumuster ei peegelda seente levikut, kuna on nestedness; fülogeneet ja ökol dista

mikrokosmoste head ja vead uurimaks nematooc

arv et AM-süsteemis C-liikumine taimest taime üldiselt ei toimi. Pettus võib olla, et osad taimed panustavad üh süsteemi vähem, anastomoseeruva

risomorfide noodide poolest. Fülogeneetiliselt 2 v 3 klaadi, mis arv alamliigid
nis kestaga Tomentellad on põuda taluvad

e DNA heterog: IGS2>IGS1>ITS. Kogu maailma populatsioonides geograafiline ja pikem ökoloogiline koondumine klaadidesse. Praimerid. IGSid ja ITS eri alleelidena di
us asustab hoopis mageveekogusid

1 vs 2 vs 3 AM-seent.Mitme seene puhul mõju biomassile aritm. Keskmine eri liikidemõjule
Jaaval: väga erinevate taimede AM kirjeldused

Eotseeni troop per ajal
kombinant, mis avaldub ITS1 ja ITS2 sarnasuses ühele v teisele liigile. Vist tuleks kaasata rohkem geene et seda väita. Mõnedel liikidel lai pereme

a kauem proov on CTAB/merkaptoetanoolis, seda rohkem tuleb inhibiitoreid. PCR sidumistemperatuuriga mängimine
eringi kitsuse. Tuber pärit Lauraasia EUR või Euraasia osast.

etroop vöötmed omav ei erine.
AM seened stimul nodulatsiooni lepal

st, RFLP
e eri liikidele riisil
vs bakterid vs patigeenid: ülevaade; PILDID
vs AM-seened

bakterite liigirikku bakterite liigirikkus DGGE bändide põhjal kõrge
ülevaade rollist ökosüsteemides
roteeriva poti meetod välikatsetes AM ärahoidmiseks
14C kiire liikumine taimelehtedest seenehyyfidesse

AM liigirikkus suurem Plantagol mikrokosmoses, kus 3a polnud taimi kasvanud > Carex flacca > AM liigirikkus suurem Plantagol mikrokosmoses

parasiit
parasiidid vs sümbiondid
kohalikust mullast pärit AM-seened on efektiivsemad, sest on adapteerunud kohalikele vaestele oludele. Toimib N ja P puhul

nirK ja nirS geenide globaalne fülogeo: reageerivad keskk
omastavad, lagundavad ja ise sisaldavad org-happeid. Mõõtmisel raske vahet teha. Muld heterogeenne

2 spp. Nii ekto kui AM seened suurendasid taime kasvu, P sisaldust (ECM rohkem), P omastamine kiirenes, ECM seentel rohkem EMH (tugev ko

Wilcoxina koloniseeritu ECM ja AM sümbioos kui parasitismi-mutualismi kontiinum: sõltuvus genotüüpidest, keskkonnast, konkurentsist, ajafaktorist, ; arv MR moodustu
imata seeneliikide erinevustest; vähene hulk seeneliike pärast raiet või põlengutel kompens ensüümide poolest suurem aliigirikkuse metsas

Phialocephala arvukus kasvab peale põlengut
ots JPN Bletilla striata-ga ja stimul orhidee kasvu agaril. Kolonis juurekarvu, ent ei mood pelotone

5cm tuub

akts domin liigirikkas keskkonnas kus tüved on geneet sarnased ja ressurss on lihtne, ent Pseudomonas bakterite tüvede rikkus ja geneet erinevused
upidavam. Toodi välja ka ühe genotüübi individuaalne efekt antagonistina.

did ja Hymenogaster pms, vähem Tuber ja mitte-ECM seened. Pelotonidest otse vaid Tomentella ja Hymenogaster. Albiinod saavad rohkem C seenelt kui rohelised taimed

Hymenogaster pms, vähem Tuber ja mitte-ECM seened. Pelotonidest otse vaid Tomentella ja Hymenogaster. Albiinod saavad rohkem C seenelt kui rohelised taimed. Arv

EmH: domin. Kottseened, juurtes suht rohkem kandseeni (mulle tundub, et saproobid). Väidet eri kooslused mullas ja juurtel, kuigi suurem osa klaadidest kattusid (ei testi

Cephaloziella varians: kottseened: Helotiales, Chaetothyriales, Onygenales,

RAPD DSE kultuuridele: Phialocephala sama genet mitmetel eri peremeestel kuid mitte läbi 2 aasta

t primerid EF3/4 ja nuSSU 0817/1536 andsid erinevaid tulemusi. Väga palju oli kimäärseid molekule (eri praimeritel 31-40%). Arv et nn. Schadti ja vandenkoornhuyse ba

bakteritel globaalselt: mida poolusepoole on levila keskos

N2 fikseerimine suurem org-mullas kui min-mullas. Eriti suur mulla

mass vähenes 70%; ensüümid aktiivsed sügisel ja kevadel, eri ensüümidel tippakt eriaegadel; PLFA EcM seene biomarker vähenes 2 kuud pärast

eid PCR replikaate ja vähe tsükleid ning PCR produktid hiljem kokku segada

niseerida võivatega samas OTUs

sarnasust, ylesreguleeritud tsütokroom 450 geen, superoksiidi dismutaas, väga vähe olulisi muutusi puhaskultuuris vs 48h infektsioonistaadiumis seene vahel

ceae liikidega

NUDA, Lyophyllum shimeji, Paxillus sp, Pisol, Scleroderma 2spp mood EcM Picea glehnii-ga. Boletus pulverulentus, Geastrum mirabile,Suillus l

erinevad seeneliigiti

NOR: viljumise aeg mõjut

sammaldel - väga palju eri eluviisiga seeni, sh samblaparasiidid, EcM seened, okka-endofüüdid; domin Helotiales

populatsiooni struktuur: ühtsed popid, pole heterote defitsiiti; raske eristada eri populatsioone -arv jääaja rekolonis artefakt. Ühel tüvel 3-4 indiviidi, Estimate S järgi 1 lisa

etrapolaarne: regionaalne ristviljastumine, lokaalne lai diversiteet: ühel tüvel v palju isendeid. ISSR. Geenid: RFLP

semel krossing-over toimub. Fülogeneesis ITS1 ja ITS2 inkongruentsed

roliikide hiljutine kokkuviimine on soodust hübriidide teket. Arv. et hübridis on v tavaline ja oluline evol-mehanism seentel

hi

itada ekstrapol headuse hinnanguks, M-M võrrand on param. Viletsad tulemused

Lehtede bakterid on fülogeneet konserveerunud; Taimede taksonoomia seletab 26% Bak Lehtede bakterid on fülogeneet konserveerunud; Taimede

bakterid: erinevate BD arvutavate progede võrdlus: eri tulemused C

uliselt kontroll-ja kergelt väetatud rohumaadel; üksikutel liikidel stat oluline erinevus rohumaa tüübist r mullabakterid erinevad oluliselt kontroll-ja kergelt väetatud rohuma

kaheks jagatud inhibeeritud teiste EcM se

Cenoc-assotsieerunud kultiveeritud seentel: paljudel seentel esineb peremeespuu-eelistus, ent spetsiifilisust mitte. Kask erineb okaspuudest suht ro

mükoriisaga kaaslevad vt eespoolt

imine taimerakus; Monotropa -er paks mantel, rakusis kolonis; Rhododendron, Gau Pyrola rotundifolia arbutoidse mykoriisa kirjeldus: kandseen, paks mantel, tugev rakus

Biolog(R)domin: Pseudomonas, Variovarax (eriti Tomentellal), acti

poolkõrbes 2 kõrrelisel juurtes v sarn (domin Pleosporales, Agaricales). Kõrrelistel kooslus omavah sarnasem kui Yuccal

nii taim kui seen reguleerivad ainete transporti vastavalt sellele, kui palju vastu saavad

Flavonoidid Moriin ja Hesperi

ɔia jäävad eemale askogeensete hüüfide ultrastr põhjal

ɪldati Pezizalesest

hmas pole kindel.

eukalüpti invasioon arv tänu mürgisele varisele ja allelokemikaalidele. Eukalü eukalüpti invasioon arv tänu mürgisele varisele ja allelokemikaalide

Subarkt soos: peremehespets pole Andromeda, Empetrum ja Vacc uliginos

SSCP AM-seentele

liiga konservatiivne

AM olemasolu seletab 18%-57% taimede BDst v liigirikkusest

spets:taimeosa eraldi

ɔe, ohtruse. Dominante p suurendab ühtmoodi nii harulduste kui tavataimede ja invas .

troopika seemne-seened: vahet pole 4 puuliigil; domin cf Botryosphaera ja cf Clonostachys

proovi koosluse struktuuri ja olemasolevate andmete põhj

roofid TNT bioremediatsioonis efektiivsed

fraga oppositifolia on EcM N-Am, Pedicularis EcM arktikas. Silene acaulisel DSE paks kol. Erandlikke pole illustreeritud!

Neocudoniella radicella kuusejuurtel. Liigikirjeldus ja EcM-moodi struktuuri kirjeldus [tundub, et siiski pole ektoga tegemist, sest mantel väga lai

patriline, polüploidiseerumine, genoomi introgressioon, hübridiseerumine. Kodustamise, substraadi, peremehe spets mõjud. Näidetena Heterobasidion, Melampsora hübriid

ioneerimine pehmemäd <valgemäd<pruunmäd. Arv. Erinevused tulenevad vamä seente efektiivsemast oksalaadi tsirkulatsioonist. Lagundatava puidu d13C ei muutunud 50

hüpoteesid, miks AM kolonisatsioon väheneb taimede tihenedes

eentel arv fakultatiivne. Ei tohiks ranget vahet teha EcM seentel ja saproobidel, vaid EcM seeni tuleks käsitleda ki biotroofi-saprotroofi kontiinumi

protroofide tegevust

ei arvest saproobide olemasolu F-horisondis!!!

ral optimaalne pesemistemp 3,5-5,5* madalam, ka v sarn probedel eri Tm; vs DGGE, membraanhübridis -sama tulemus

lid

; AM seente liigirikkus sõltub taimede liigirikkusest, mulla niiskusest ja liblikõieliste olemasolust; koosluse struktuuri määrab

ivad suuremat suremust ja haigestumist puuliikidel, millelt seened isoleeriti. ITS pea identne. Peremehe-spets tüved tekitasid palju madalama kaits

MHBde PLFA koosseis sõltus samuti kloonide kasvukiirusest ja üh

kuuseokka kõdus: BD kasvab lagunemimse käigus; Lophodermium arvukas algul ja ka hiljem ning aktiivne RNA vs DNA põhjal; lagukiirus eri ku

ei ole Endogone!!! tähtis roll liivaluidetel liiva sidumisel.

hübriidhaaval vs N väetamine vähendab AM kolonis, suurendab ECM kolonis

d; Aneura pinguis: Tulasnellales. Jungermannoidne mükoriisa

Petri tass + seen süsinikpaberil

imaalselt, ent täpsed järj Ecuadoris: Maksasamblad ja orhideed: Tulasnellales sekve Ecuadoris: Maksasamblad ja orhideed: Tulasnellales sekventsitüübid kattuvad minima

Suillus grevillei süntees õnnestub kuusel söepab

n Ecuadori Loja mägimetsade orhideedel. Nii mullal kui epifüütidel. Toetavad elektronmikroskoopilised vaatused

%-99.8%

Mattirolomyces terfezioides: kolonis juuri, kus mood sõlmekesi, ümber juure mood sklerootsiume -just nagu Morchella. Peremeestaimi palju

ı väidetakse. Terfezia ja Robinia vahel pole samuti mingi EcM. Helianthemumi ja Robinia korteksirakud lagundati, eriti kõrgete P konts juures, hüüfid tungisid steeli ja end naria juureseened, palju erinevusi vrd kultuuridega; nested PCR

ja seened -liigirikkus suurem komposti inokul vs kontr DGGE bändid: bakterid ja seened -liigirikkus suurem komposti inol

akusis kolonis

usl jaotunud - arv geogr mustrite tõttu (ei diskuteeri koevol vähest tähtsust)

remehe-spets. Arv et nishide jagamise tõttu pole regionaalses faunas sõsarliigid esindatud!

kaheks jaotatud juuresüsteem

hambasodist leiti väga palju eribaktereid 16S rDNA sekveneerimise

tsioone. Märksa võimsama testi saab kui arvestada eri geeli efekti blokina. Bonferroni probleem paariv vrd

CWD-l ECM moodustamine

SSU, ITS, LSU referentsid

praimerid: degeneratiivsed, katavad terve ITSi ja 800-900 bp LSUd; nested kõigile AM rühmadele

sekventsi proovi kohta oli piisav erinevuste tuvastamiseks; Kvantitatiivsed meetodid töötasid paremini kui kvalitatiivsed (0-1); Kvalit meetodid tö

ist (Rhizoctonia -Tulasnella, ceratobasidium)

ITS varieeruvus: ITS1 varieeruvam kui ITS2; AG-sisene var 0-3%; AG1 jaguneb 3 peremehe-spets alarühmaks, kus rühma sees ITS >99% sarn; AG4 jaguneb 2 peremehe

arvukus suurem risosfääris vs bulk soil; mullatüüp, stress, puu vanus ei lugenud üldine bakterite isolaatide ja aktinomütseetide arvukus suurem Pinu

fikatsioon

arv et Oidiodendron on tamme endofüütne sümbiont arv et ECM seente dikarüootse

merebakterite BD tipp temperaatses N ja S vöötmes talvit

Sulawesi jt Sunda saarteni. Melaleuca parafüleetiline. Levinud Austraalias ja Uus-Kaledoonial (sh perek Callistemon);

atus -Peziza vacinii

DSE biotsiididele palju resistentsem kui ECM seened

a lepp; Mõned männiliigid mood pigem ektendoMR, teised pigem ektoMR v ohukese mantliga; v tugev pos mõju taimekasvule eriti ECM mood puudele vrd EeMR puude

, võis viljuda väh 2 meetri kaugusel elusjuurtest; eoste idandamine noore taime juurtega ei õnnestunud; tüved aja jooksul kaotavad EcM mo Paxillus involutus: tüüpiline ru

undamine ei mõju mullaseente koosluseslе. Mineraalmulla BD suurem kui org.

kitinaas-transform Picea risosf: liigirikkus ja koosluse str sama; mõjutas mullahorisont ja aeg

eostega inokul palju ef-sem ku

eostega inokul palju ef-sem ku

vastupidavus temperatuurile: e

mükofagne kukkurrott sööb pr

Atlantilises BRA vihmametsas domin AM mürdilised; ainsaks uuritud EcM taimeks Coccoloba rosea. Coccoloba on BRA sh Atl vihmametsades l

vad aeglasemalt kui mitteECM peeneimad juured; Seeneosas rohkem N, P, ent kuni 60% kitiini ja seetõttu lagun aegl. ; arv sõltub suktsessiooniga, sest ECM taimed on võ

ndite suurem arv ei suurendanud liigirikkuse soodsat mõju

vs ECM eukalüptidel. Suktsessioon

. taimeparasiidid

ericales: MR tüübid: eriliikidel leidus mitmeid eritüüpe, sh Pyrola -nii arbutoidne ki eri

isel pinnal saab u 33% Tulasnella kaudu

arya ja Quercus radiats-ts Eur ja Am; Crataegus S-Hiinast. Eur-st on puudu külmaõrnemad subtroop perek, suurematel perek suurem tõen säilida. Paleogeenis sama kõikja

ıel

hheniseerunud bulbilide ja sklerootsiumide olemasolu on aluseks edasi lihhenis seente tekkeks

ı metsa mullastik erinev

duses, ensüümid, konkurents, katsed, ülevaade

20*20, ettekasvatatud ja inokuleeritud Petri tass

ErM seened jm kottseened lagundavad kitiini palju paremini kui ECM seened Paxillus

ʼaade kõigist aspektidest

eetakse saproobiks

i ja Jaccardi ei saa kasutada koos eukl distantsiga

l uurimaks, kuidas keskkond ja tunnused on müju avaldanud fülogeneesi käigus sõlmedele

Glomeraceae vs Gigasporaceae domin sõltub mullalõimisest. AM koosluse struktuuri erinevus korrel geogr distantsiga >järelikult on levimine limi

AM kooslus on vastupidav tugeval häiringule; kooslust mõj NM Dianthus ja Carex

ıs kliima jahenemine ja mäetekke protsessid

2ks jaotatud juuresüsteem odral ja vahtral, 3 AM seent; kontrollpool vs AM-pool. 14C söötmine. 2ks jaotatud juuresüsteem odral ja vahtral, 3 AM

ali alles 5 MM juures ja see et efekt oleks max, MM peavad olema hajutatud, mitte grupis koos ega otstes

ıs mõju väiksem

DNA võib sattuda bakteritesse, ent seda ei peeta maj eriti ohtlikuks. Kuni 10% mulla P-st võib olla seotud DNA; Organismid võtavad rakkudesse

Hiinas Pedicularis liigid 90% AM

Rhizopogon + ebatsuuga -N2 fikseeriv Bacillus eriti tuberkuloidse

sküpsust 3 p jooksul; öösel max, päeval min; vsid 2% eostest levib >5 m eemale. Vihm ja niiskus soodust eoste eraldumist; tuul soodustas levimist

kolonisats vastupidine / kolonisats vastupidine DS kolonis-le. Varieerub rohkem. Korrel. Pos temp, sademete, niiskuse, pHga, neg päikesepaistega, N, P, org-aine konts-ga

ıs+Ostrya)))

ı; Orchideae autotr ja seotud CeratoB, Tulasnella ning Leptodontidium (v.a. Gennaria diphylla, mis mõl regioonis seotud Cenoc, Lact, Russ vs Pezi

ybe geophylla ja Hebeloma velutipesiga

sammaldaimede kud sammaldaimede kudedes Lätis arbuskuleid (maksasamblad Conocephalum, Fossombronia), kott- ja kandseente hüüfe mitmet

Aneuria ja Cryptothallus kandseentest endofüüdid: koloniseerivad vaid parenhüümi gametofüüdil, sarnased struktuurid orhidoidse mükoriisaga

3. Seemned ei idanenud hasti ei huumuskihi all metsas ega eri laborisootmetel koos voi ilma seenega. Vaid MRA& suutis idandada moned s Pyrola rotundifolia, P secunda

ıllas ei mõjuta seente BD DGGE jr

mikrolülijalgsete E läbip, d=17cm, h=30 cm

ikute patogeen ja suurendab vastuvõtlikkust Pythiumile

läbimist, peale predaatorite poolt söömist vitaalsus väheneb tublisti; EcM mood võime säilib peale seedekulgla läbimist

Tom sublilacina: eosed levivad

dele;

ndmestikke

piklik, puuta

värskes kõdus Helotiales, Mycena-Marasmius, Cantharellales, samblakõdust ja allpool Capronia, Thelephorales, Helotiales, Umbelopsis (endof Zygomycota), Archaeorhiz

pholoma fasciculare; inokulumi efekt

peenike

tubes, perliit

liikumine ja aineringe: ülevaade, diskuss

avad teatud määral orgaanilist ainet, ent N ja P kättesaamise eesmärgil. Neid ei saa saproobideks pidada.

387

ling, SWE: EcM seened asenduvad Helotialestega, samas bakterite hõimk tasemel rühmad samad

Sarcodon, Suillus; 2 isovormi Amanita, Tricholoma, Piloderma

aga. Arv liigirikkus sõltub kliima stabiilsusest läbi aja. Refuugiumid (ekv põhjapool) vs levikutsentrid (ekv lõunas), VIITED

estsent palju tundlikum kui agaroos-geelelektroforees

Frankia: kehel dominant-genotüübil esineb peremehe-eelis

una on korrelatiivne

Invasiivsed mittepatogeensed mmikroobid: ülevaade (seen

Woollsia pungens erikoidse mükoriisa seened RAPD

esulahuses mõjub õigetele paremini kui valepaarsunud probedele, ent madalama konts juures madalam üldsignaal. normaliseerimine ühe universaalprobe jr. Esinesid mõne

vs ECM , pappel, paju, kk-tingimused, taime vanus, juure osad

paju ja Populus deltoides: Looduses EcM domin mõõduka niiskuse juures, AM domin kuivemates ja niiskemates, ent väldib l

aelis-Menten vähem ebastabiilsed, hinnang väikese nihkega (ülehinnang kuni 6%). Soovit kas mitmeid paralleel ja usaldada neid, mis toodavad platoo poollog skaalas. Ha

purascens. Sh Entoloma sp oli kasulikem kasvule. Paiguti mood EcM ka Leccinum scabrum. Suillus, Rhizopogon, Ripartites ja Cenoc ei nakatanud

AM diversiteet suurem seal kus suurem taimede primaarprod, ent kooslus v erinev. AM koosluse ühtlus suurendas P summaarset ülesvõttu . AM k

ja G-C erinevuste kaotamiseks; vale neg pole, vale-pos 4%; 96% õige; min [DNA]=50ng; 1 valepaardumisega probedel u 8 *C madalam dissots-temp; ent ka õigetel võib

nalüüsi ja UPGMA dendrogramme. Põhim sobib ka koosluste biogeo uuringuteks

bakterite levik mõjutab enim soolsus. Mullas on BD v kõrge, ent fü

Colletotrichum lehe endofüüdid Guyanas: peremehe-eelistust pole

solithus, Scleroderma ja Tricholoma EcM süntees Eucalyptus globulusega. Russula spp ei mood EcM. Kõrgus polnud hea näitaja, mass oli . EcM kolonis ei korrel massiga

Arabidopsise juurtes bakterid on fülogen erinevad vrd mu

eened polüfüleet-parafüleet.
eente algne vorm väga suure töenäosusega
ıütseeli maa seest maapinnale tulekuga, läbikuivamine ja vetikast põhj oksidatiivne stress. PILDID

eri taimedel (paraku eri kasvukohtadest) eri endofüütide kooslused. Mõnedel ka samast kasvukohast eri kooslused Fusariume

bakterid ja arhed Pr Guajaana setetes: pms proteobakterid, Flexibal
bakterid 1300 m sügavusel meres, põhjast 60 m ülalpool sarnanevad

osaceae (v-a Dryadeae), Cupressaceae; Casuarina

AM seente koosluse str väikseses skaalas on 'overdispersed' - eri suguk liigid kipuvad koos esinema; juurte kolonis osas on A
Kooslus on stabiilsem ja peremeestaime biomass suurem kui AM kooslus. koosneb rohkem kui ühe sugukonna liikmetest; Gl

bakterite diversitee xxx + tuhk

pott: 2 inokul taime vahel yks mittemükoriisne

ıt jama

erobasidionil ja Amanital, puudusid Suillusel ja Paxillusel

EcM juurtel 4 korda enam baktereid ja aktinoM kui NM eukalüpti j

võivad taimed käituda parasiitidna seentel, kontrollides neid ja vastutasuks lubades elada. Kõik EcM-evol etapid on looduses nähtavad pealiskauds

mükoriissed taimed kogu maailmas: ülevaade

roll loduses, funktsioonid: toitained orgaanikast, kaitse stressi ja patogeenide-parasiitide eest

RT-PCR bakteritele, mille fenoolne substraat oli rikastatud 13C-ga;

te divergents oli 37 MAT ja levik toimus arv üle N-Atlandi silla; Quercus sect Quercus tek arv W-Am-s ja levis 17 MAT Aasiasse. Quercus tek arv Aasias ja levis üle N-A

;: 20 p vs 90p, risosf vs eemal: DGGE 18S rRNA 1650 bp. Algul risosf domin pleosporales, mitterisosf Eurotiales, Mortierellaceae, hiljem risosf Cryptococcus jt Filobasid
omnivora on Rhizinaceae-sse kuulub patogeen; Phymatrotrichum on saproobne anamorf Pyronemataceae sgk.

ınaosas v tugev migratsioon. Refuugiumid N-Chiloe ja 43*S põhjapool. Areaal ei puutu kokku Alnuse ja tammega, mis on vast NW Argentiinas ja Ekuadoris. Alates 34*S

M seened

› Eur salamandreid, pärit ilmselt Aasiast.

eraldatud reostusalalt vs norm (metallid inhibeerivad rohkem)
orsicum tsistuse põlenud S-plotte
ntega Wullschleaegelia Mycena ja ymnopuse liikidega, Gastrodia similis Resiniciumi liigiga
.laceae, Serendipitaceae, CeratoBasidiaceae: seentekooslus ja orhideede fülogeneetiline str olid seotud vaid epifüütsetel orhideede. Arv. Suuremate

eostega inokul koos seemne ja

Thel: idandamine ei õnnestunu

pott
pott
pott

›lial; ülejäänutel üksikutel juuretippudel ja Amphinemat meenutaval morfotüübil

kuleeriti seen ja liiga palju oli toitaineid

ivergeerunud
accaria, Hydnangium; 9) Lyophyllum p.p.; 10) Entoloma s. Str.; 11) Tricholoma; 12) Catathelasma. Vastupidisi muutusi pole. EcM harud eriti radieerunud

gid läbisegi. RPB1>RPB2>LSU

ıalis ja transp funktsioone

ɔnoomia probleemid Eur nimedega, Paljud seened eri biogeo mustriga: Kosmop, Gondwana, Pantroop, AuS-MAL, Patsif, AUS-Holarktika. Esineb AUS regionaalseid ende

10% seenendeeme on vrd teiste taksonitega v väike

mas EcM plottides jäi lehtedesse rohkesti fosforit vrd sapro-plottidega, ent vähem Ca. Kõdukihi paksus Dicymbe metsas palju suurem kui mujal ja seda kolonis tihedasti E

Mitu uut kandid-divisjoni

bakterid 16S rDNA majandatud vs majandamata rohumaal: majand

B: DGGE: looduslik vs pollooduslik vs kultuurrohumaa (suurem d

riti Liparis liliifolia. On oluline teada, mis faktorid mõj seente arvukust; Enamik Tulasnellasid eelistasid puutumata metsa ja tetud vanuses puitu;

la spp; Liparis: Tulasnella 1sp; Goodyera pubescens: Tulasnella 1 sp (ROHelised). Mõnel taimeindiviidil vaid üks seen, teisel mitu

ida mullas väga vähe ja juuretippudelgi vaid orhideede läheduses. Tomentellade arvukus oli sama paikades, kus orhideed vähe vs palju; Arv et Orh

Looduses geneti piires rametitel, juurtel ja pelotonidel alati sama sümbionti; laboris on võimalik ka mitme liigi pelotonid korraga. Kiireim kolonise

Glomus spp, mis mood viljakehi ja AM AUSs

aceae), Lasiopetlum (Sterculiaceae). ECM DEF v lõdva

ıtli Melaleuca uncinatal. Võib mood viljakehi potikultuuris

uusk. BromodUTP-ga rikastatud N-substraatide ülesvõtt on fülogeneetiliselt määratud. Kooslused eri kõdus erinevad - kuusekõdus fülogen üledisp

i monodomin metsas; EcM kol MD 100% vs 14% segametsas. Arv MD metsas vähem herbivoore, sest Dicymbe seemneid ei eelistata ja mast fruiting. Kaugeim seemik 17

20*20

vate liikide arv v väike

NZL Ericales mood ErM. Pernettya macrostigma (Eric) jagab identse kultuuriga sümbi 'cm sügavusel mullas

Mycelium Radicis Atrovirensi eraldus, kirjeldus, mitte-mükoriisne, pigem patogeen

amma sünt. Betula pendula (L. Scabrum ka haaval); Suillus, Xeroc badius, Boletus edulis, Amanita rubescens ei nakka kaske ega haaba
EcM kaaslevad seened: põhiliselt MRA, vähem Penicillium, Mucor, Verticillium, Aureobasidium pullulans. Aur.b. Ja Vert endofüüdid; MRA, Per
pH optimum Suillus ja Xeroc puhaskultuuridele ja M.R. silvestrisele u 5.0, M:r. Atrovirensile polnud vahet
'irgatum, Amanita rubescens ja Mycelium radicis silvestris alfa, beeta ja gamma mood EcM Pinus montanal

ıeg binoom, jackknife1, log, SV, Weibull. Power alati ülehindab. Ekstrapol parem suurema liigirikkuse juures, kuni 2 korda suurema andmemahu jaoks. Saab k alati mõõd

DSE -ITS -juuretippudes, lagujuurtes, kändudes, elusjuurtes, elustüvedes: erinevad, ent paiguti kattuvad Phialocephala liigid

'it: 147 liiki ja hinnanguliselt u 500. Pakuvad sekventsi-põhises taksonoomias nimedeks esmaleitud sekventsi accession numbri

ı filterpaberitega.

iigile. Afrothismia lii mükohet Afrothismia liigid on kitsalt spetsialiseerunud ühele Glomus liigile. Afrothismia liigid on suurusjärgu nooremad kui
ıd evol plastiidi genoomis või plastiidid puuduvad. MH taimede ja seente koevolutsioon
AM seentel kasvavad mükohet: mõned kitsa, mõned laia seente-ringiga; kasutavad fülogeneet erinevaid seeneklaade

Woollsia pungens: puhaskultuuride baasil määrang: 1 dominantliik 90%; 1 dominantge
ErM seened Woolsia ja Leptospermum terves juurestikus (1 m eemal) juurest saadud l

bakterid-nematooc .

DSE: kasv söötmel väga suure pH amplituudiga; resistentsus kemikaalidele veidi suurem kui Suillus variegatus ja Cenoc ja Wilcoxina

:onda.

rus

eri tunnused mükoriisamoodustajatel (closed pore hilum X2=23.5 P<0.001; apical pore absent X2=11.5 P=0.001) ja saproobidel (open pore hilum,

Frankia: leppade kolonisatsioon ei sõltu eriti substraadi päritolust

Morchella sklerootsiume palju ka lagupuidu juures, kus liiguvad närilised. Pakuvad, et kahjustatud metsas sklerootsiumid võivad juurde tekkida, idaneda ja poolduda

Sebacina vermifera-laadseid seeni on leitud rohttaimede juurtest

ntoloma rhodop, Lact helvus,rufus, Clitopilus (Pax) prunulus, Tricholoma albobrunneum, imbricatum, pessundatum, vaccinum, Rhizop luteolus, r

bakterite liigirikkus ja BD suurem kontroll vs Zn-reostusega alal

erivõimaluste kirjeldamine

onfluens mood haru. Lihhenis Multiclavula on Clavulina-MembrnoM sõsartakson.

Plut), Limacella (Aman), Camarophyllus; Pseudoclitocybe, Pseudoarmillariella (Cantharellula), Omphalina, Arrhenia (Omph), Phaeocollybia, Squamanita, Pleuroflammula (

iigid identsed ITS poolest

Gaultheria: mitme(.

vrd Terflezia (Helianthemum)

network-anal: taimeliigid valiti n vastavalt ohtrusele; MEX taimedel taimede nestedness 2x suurem kui seentel; Öpiku kooslu

planktonis SSU põhjal palju uusi protistide harusid

dolipoori ja parentosoomi pole; Dacrymycetales, Tulasnellales -fragmobasiid vaheseinteta või väga nõrgalt arenenutena

seisvalt 2 korda. S.o. Arenenud Salicaceae-ga sümbioosist. Hymenogaster ja Hebeloma arv laia peremees-ringiga. ITS põhjal raske kõiki liike eristada, sest vahed väikesed

ıoc BD tõuseb
ȝe) on tek korduvalt; LiP ühe korra Polyporales seltsis
ooslusest võimaldab kogu koosluse kõveratõusu hästi hinnata.

EcM kaaslevad seened: Helotiales (3), Alternaria (2), Cladophial (1), Hemimycena (2)

.a. interaktsioonid. Kõikide ens akt kõrgem talvel 2-3-korda. Lakaas, kitinaas, glükosidaas akt suurenesid pärast harvendusraiet. Viletss seisus puude ens akt ühtlaselt mad

, mida Euroopas pole. Iseloomulik Betula rotundifolia alustaimestik ja sellega seot peremehe-spets seened

Festuca paniculata juured

vs ECM Borneol. Mõl esinevad v eri metsatüüpides ja eri pinnasel. Ka mullas sügavuti levik sarnane.

ECM vs AM: Uapaca on pigem ECM kuival pinnal ja AM niiskel pinnal, topeltkolonis harvem kui võiks eeldada; Leptospermum on ECM kui läh
ldina), . Kõrg-Banas paiguti Neea ja Guapira domin 5-10 m põõsastena. Kõikjal Coccoloba väga vähearvukas. Samad liigid v vähearvukalt ka terra firma metsas

ıs ja BD suurem, inokpot parem kui kontr-taimedel -arv et suurenenud EcM kol suurendab puude taluvust parasiidile, rohkem min-aineid parasiidile: ECM kooslus parasiid
gaseened ja sinetused+üraskid: ülevaade kõigist aspektidest

ent s.o. Arvutuslikult aeglane
hja diploidsust, pole aseks leviseid jms.

matsutake: vaja isobutüraati v

xillus vs Tricholomopsis agaril; Hebeloma vs T. sümbioosis tuub

India taimedel India taimedel

lõikheinalistel esinemine lõikheinalistel -metaanalüüs: ei seostu niiskusega ega häiringutega, pos sõltuv [N], neg [P, K]. Olulised adaptatsioonid AM-ta toime tule

funktsionaalsete rühmade arvukus ja suurem liigiline koosseis suure

l: Vaikne ookean eri süg: eri praimerid annavad v erineva pildi; domin Saccharomycetales. Sügavuseti pole erinevust

ekkinud ja taimed surid

ustasid võrgustiku vanemate taimedega: efektiivsus biomassi, N, P osas korrel v tugevasti, ent seda ei mõj üldse EcM kolonis. Taimekasv palju parem vrd mittemükoriisse

eri EcM seentel erinevad e

Chaetothyriales : Chatospira (Cladophialophora, Exophiala ja Capronia sugulased) isol taimejuurtest

Phialocephala fortinii ja Heteroconium suppr Verticilliumi kahjustusi juurtes, ent mitte söötmetel. Eri kultuurtaimedel domin juurtes Ph. Fortinii+

s suurem EcM juurtel kui NM juurtel; risosfääris kui bulk soilis, lepajuurtel kui ebatsuuga juurtel

bakterite kooslused: eri kompostitüüpides suured erinevused; virtsas Ascobolus ja Psathy kompostis seente ja bakterite kooslused: eri kompostitüüp

r kõrvaldamiseks). Üksikud katsed

biogeo bakteritel globaalselt: arv et laialt levinud bakteriC

praimerid AM-seentele SSUsse (spetsiifilised)

endofüüdid pilliroo juurtes, risoomides, vartes vs lehtedes: BD sama. Enamus liike kattub maapealsetes ja maa-alustes osades, ent paaril stat olulis

e levik transektide kaupa. Microberlinia, Tetraberlinia spp, Didelotia kasvasid koos, samas kui Anthonotha ja Uapaca olid eraldi. 6 a jooksul suured muutused mull P-s.

s. Paljude liikide P-eelistuskõverad ei kattu Korupis ja D-es.Arv üldiselt kõrged P tasemed ei soodusta EcM tsesalp domineerimist

kase ja tamme seemikutel pole

AM-seened veetaimedes Lobelia ja Littorella -madal BD eri järvedes: paar Glomuse ja üks Acaulospora klaad; Lobeelia ja littorella (mõl aerenhü

Mikroobne ens aktiivsus palju suurem leppade kui mändide all

ıl suurem ühtlus, hiljem liigirikkus ja ühtlus kahanevad

s rikkal pinnasel AM prod suurim kõrgete rohundite juurres rikkal pinnasel ErM+ECM biomass suureneb lokaalsel toitainete gradiendil kui toiyu on vähem (mõõt

er D, Liu J-K, Maharachchikumbura S, Manamgoda D, Martinsson S, Neves MA, Niskanen T, Nylinder S, Pereira OL, Pinho DB, Porter TM, Queloz V, Riit T, Sánchez-C

,a palju valeinfot, mida aga välja ei praagitud!!!

-63.

n eelnevalt lagundanud .

ırre nii Männil kui Ks. Calocybe gambosa ja Melanoleuca brevipes NM

yophyllum fumosum (arv fakult ja ka ektendo) ja Tricholoma 4 spp mood EcM; Lepista 2 spp, Calocybe ja Melanoleuca ei mood.) Lyophyllum ja

Frankia: isoleerimine puhaskultuuri, eri lepaliikidel eri kasvukohas

Red queen. Vanade aseks org pikk nimekiri: bdelloidid, AM-seened, Ophiostomataceae jt

mood EcM Fragara cocoga. Eluviisi lähemalt ei kirjeldata

ʋasiooni

MHB jt juurtel x

vs benomüül (vähendab), kaptaan (sama)

lla kuuuluvad ka perek. Cejpomyces, Uthatobasidium, Tofispora, Oncobasidium, Ypsilonidium, ; Waitea kuulub Corticiaceae alla.

ıttuvused N-Am ida-lääne ja Eur vs Aasia 2 ja 2 liiki. Tek u 125 MAT

ıellade kui ka EcM seentega (er Sebacina) ja mykohet sotud EcM seentega, millest 90% Sebacina; ITS1OF ja ITS4OF ei tööta Tulasn puhul eriti
›., mujal palju eri Pezizales (sh Tuber, Hydnotrya, Helvella, Genea). Sh taimepop-d ei erinenud haplotüübiliselt
seerimiseks puidust: liigispets probed

› biomass ja ergosterooli konts. Korrel kõvasti.

me produtseerida viljakehi ilma taimsümbiondita
odutseerida viljakehi ilma taimsümbiondita
heliaceae spp, Sebacina sp; eri liigid üsna spetsiifilised

a. Bayesi statistikaaitab veic olukorda lahendada
it liiga jäigaks.

Robimia CO2 suurendab kolonisatsiooni, Rhizobium suurendab kolonisatsiooni

›sum genoomika
ntrollib mitokonder

ergosteroolipõhine kolonis mustikal ja pohlal suurem kõrgema CO2 ja soojuse juures,

vs ECM EMH ehitus, strateegia

bakterite arvukus suureneb ja mitmekesisus erineb EMH juures vrd

suurem kui on ECI pott

ı ja Afzelia seentele -oluline saidi ja häiringu efektid. Tetraberlinia omastab EcM paremini Amhersteae mullast, ent mitte mujalt ja see korrel kasvuga; Afzelia seemikud m

BD, %koloniseeritud, spets praimerid

biogeo taksonitel (klaadidel) erinev: lokaalsed, regionaalsed ja globaalse levikuga liigid. AM BD suurim troopikas

endofüütide ja saproobide seosed. U 66% füllosfääri seentest on ka hiljem saproobid kõdul, väheneb ajas sõltuvalt kergesti omastatavate ühendite

ıii ühe kui kahetuumalised läbisegi
Tolumnia variegata (4 klaadi Ceratobasidiume). Ka idandamiskatsed naitasid, et Ionopsis idaneb ja kasvab vaid oma seentega, mitte Tolumnia seentega; vastupidine oli siis

›oteese

bakterite ja arhede BD hüpersaliinses (kuni 32%) vees. 16S T-RFL

ınninile). Palju muid seeni, sh EcM seeni, mis enamasti mood lakaasi ja reag tanniinile

amisel. Nii Wilcoxina EeMR (marksa rohkem) kui nonMR on seotud N2 fikseerivate Bacillus polymyx Nii Wilcoxina EeMR (marksa rohkem) kui nonMR on seotud N2 fi ımi ja kriidi-tertsiaari plahvatust ja sõltus see rohkem mandrite lagunemisest; neandertaallased eristusid 500 000 a tagasi

ʒylvestris, Abies alba, Tilia, Fagus jt.

nii Tulasnella, Ceratobas kui ka Serendipitaga

opt temp 18-24kraadi

ʌad ka ebatsuugal ECM. Kas k C, pole teada

Erica, Epacrida

ldab hinnata ajaloolisi protsesse ning asjaolusid, mis mõj liigirikkust. Raske siduda ohtrust
eamiseks PCoA vektoriks. Kuvavad korrelatsioone vaid läbi põhivektori

Glomus etunicatum on polüploidne seen, mille igas tuumas on mitu ITS varianti. Kontsertevolutsioon ei toimi hästi. Valikuline tuumade kandmine

ıtseel ja haploidne viljakeha

Rhizopogon, mis dominee

ysed eostega koloniseerijad: Suillus, Rhizopogon, Thelephora. Väikeste saarte dominandid Suillus ja Rhizopogon mood väga vähe biomassi suurtel aladel -arv vähene konk

oletaceae eosed levivad ka kehvasti

roobid üsna laia levikuga -enamus leitud ka Lääne Aafr ja Sri Lankal

Descolea,Descomyces, Setchelliogaster. Maasisesed vormid on tekkinud ja iseseisvalt ka radieerunud palju kordi kõigis klaadides. Naucoria ja Hebeloma mood kumbki p

PLFA: eri okasmetsatüüpides, ruumiline struktuur vaheldub 1…4 m

n on pea kõik noored radiatsioonid. Savannid on isoleeritumad ja nende tükkides esineb rohkem endemismi ning piiratud on levik

aardumisega-keskel kõrvallahtris võistleja; hübridiseerimistingimuste lõdvestamine, helper-oligo lisamine, oligo-A saba (vähem; opt 6 nu) tõstis nii signaali intens kui valep

, Cort glaucopus, Hebeloma 4spp, Laccaria 3spp, Lactarius delic, rufus, Lyophyllum decastes, Melanogaster ambiguus, Paxill invol, Rhizop 4spp, S

za=Tulasnella

eksisteerimine tulenes pea alati lähedastest keskkonna nõudlustest

xxx. Agariga kaetud+turvas+savigraanulid

ühel taimel üle 10 isendi ja 3 eriliiki

introni probleem 18S rDNAs

Uus-Kaledoonia EcM taimed: Nothofagus ja Tristanopsis. Teisel alal Araukaaria mägimetsas >860 müm Tristanopsis vaid AM. Kõigil taimedel sh

katumisvõime väiksem

iigirikkus ja BD ning f-n-rühmade arv, ent proovialati ebastabiilne. Eeldab, et oleks kaasatud kõik ja vaid relevantsed tunnused. F-naalne BD vs F-naalsete atribuutide BD.

ned vs N-väetis

mesokosmose uuringute usaldusväärsus: sõltuvu

d). Efekt arv läbi pH, sest muud nende mineraalide ühendid ei põhj viljumist
g ökol; III Pez endocarpoides, Trichoph hemisphaerioides; IV: Fayodia maura, Lamprospora, Neottiella, Octospora -tuleasemetel juhusl, paljud seot maksasammaldega. S
thracobia spp viljuvd alati põlenud juurte kohal. Arv Anthracobia ja Geopyxis carb lagund juuri; Kõiki muid seeni põlenud metsades v vähe, er EcM seeni. Esines Paxillus,

ised. Nime tuleks rakendada ainult üksuste puhul, mis leitud piirkonnast, kus liik on kirjeldatud. Näited: Megacollybia, Lact volemus, Amanita cae
dust tekitada ristumisbarjääri; kandseente konidiogenees -palju näiteid; seente levimine üle maailma inimese abil. Tuleks ikkagi kus vähegi võimalik kasutada morfoloogili

DSE morfoloogia. Phialocephala fortinii mood HN männiga, kus korteksi rakud on sobivalt moondunud; mantlit pole, rakusis kolonis mõõdukas
nii kottseened kui kandseened (arv Clavaria)

osporum + Quercus obs.

e vaatlustele

nõrgem)
igutine Hartigi võrk

ja N mineralis-ga. Mida EcM taimed vs AM taimed: EcM taimede risodfääris palju suuremad erin vs bulk soiliga kui AM taimede risosf: eriti N miner pot, fosfataaside ak
ılga juures.

Phialocephala fortinii: ITS2: Canadas lõunast põhja ei erine genotüübid; põhjas on rohkem klaade esindatud
Meliniomyces variabilis ja Oidiodendron maius ei suutnud korralikult koloniseerida Meliniomyces variabilis ja Oidiodendron maius ei suutnud korralikult koloniseerida Rh

nad, rahvakeelsed nimed jms

jõeäärses haavikus: AM kolonis max 5-10 a metsas, EcM alates 10-20 a. Arv et haava lehtede keemial allelopaatiline efekt AM-seentele

arv AM eellased ja kaasaegsete taimede eellased koloniseerisid maismaad koos. Nimet. 'oomycetes'
Arg vastavalt. Pisonia grandis oma leviku tõttu on ideaalne seente Pacific biobeo uurimisobj. Arv Aafrika ja AUS EcM taimed on tek iseseisvalt. Hüpot, et Fagaceae on sa

otseenis vihmametsad liikusid kuni 20*N ja toimus liigiteke. Jääajad põhj pidevat vihmametsade taandumist. Mäed ja jõed olid refuugiumideks, kus toimus ka liigiteke. Palj

CMst; juure struktuur hävib. Eriti cenococcumil

bioremediatsioonis

eraldamine, kasvat Petri tass+turvas/vermikuliit
n sümbionte kui saproobe. Kõikide AG-gruppide fülogen suur kamm

sed substraatide vahel kolonis astmes ja eri mükobiontide hulgas. Vaid mõned Ceratobas isolaadid (sh ka muudest orhideedest saadud) stimul idan

:ide pikkus on ü 400 bp

töögiku eri rohttaimed -AM, DSE ja endof sagedused liigiti v erinevad. AM kolonis pH tõustes kasvas, DSE ja endof oma kahanes

liikide määramiseks on fülogen-põhised meetodid paremad kui OTU-põhised
Glomeromycota: kasv mullas, mõju kasvule, fosforile ja patogeenide vastu on evol determineeritud. Gigasporaceae erines teis

tte eri-kk-st pärit sarn proovidega
rdlused üle proovialade, kus tugev ala efekt

stele jm organismidele. PEAB arvestama parasiitidega, tehes toitainete analüüse. PAR vähe, ent liigub läbi palju toitaineid -keystone liigid

le resp-le, mõj taimede maapealset konkurentsi ja suurendavad BD tänu koguprod inh-le. Arv toitaine-rikka kõdu olemasolu kiirendab toitainete tsirkul mullas
maksasammaldel Rhizoscyphus ericae, mis stimul risoidide arengut; spets
ıoks: ülevaade, ei sobi, sest tugev bias BIOLOG: ülevaade, probleemid: inokulumi tihedus, lahjendusefekt,

ıud. Lähedaste liikide vaheline konkurents elimin ühed ja põhj komplementaarsust

est Fusarium-Gibberella-Nectria, Phomopsis ja Colletotrichum muutuvad peale lehtede surma saproobideks, ent Xylaria endofüüdid ilmselt mitte.
ökoloogia teooria kehtib väga paljuski ka bakteritel. Arves

A virus

ri taksonitel sama evol ja ökol mehhanism

mikroseened ECM sate .

Piriformospora indica REV:

Phialocephala fortinii: ühel 3*3m plotil 4 krüpt liiki ja v palju isendeid. Paljud isendid püsisid läbi 3 aasta ja mood väh 3m diam geneteid
Phialocephala: kõik dominantsed liigid levinud kogu Põhja-Poolkeral; Sveits liigirikkaim ala. Kooslus ega BD ei korrel geogr, peremehe ega klima
poud: tamme süvajuured votavad vaid öösiti vett üles ja translokeerivad seda vaid AM ja ECM se spetsiaalne, 3 kambriga

tammel Californias: kuiv vs niiske a; nõgu vs kuiv küngas: AM domin kuival aastal kuivas kasvukohas; EcM seentel ja AM-s

lahtrid
konteiner

substraadi rikastamine 13C-ga, 13C inkorporatsioon DNAsse, rasku

DSE Costa Rica pilvem Costa Rica pilvemetsade epifüütidel -eriti veidi niiskemates Costa Rica pilvemetsade epifüütidel, esines sageli ka seenmantel -eriti maapinnal kasv

bakteri Burkgolderia ambifaria isolaatide genoomide sarn

e (ITS) ARISA=ARDRA. Sekveneerimise polyakryylamiidgeel. Kõrge taust, piikide pikkuse kvantit ar bakterite (IGS) ja seente (ITS) ARISA=ARDRA. Sekveneerimise p
AM inokuleerimine parandab oluliselt India puude kasvu kaevanduspinnasel, suurendab mikroelementide ülesvõttu üh/taim; mitte üh/g taim

ultuuris, kultuurifiltraadid, puhverdatud keskkond

anipul katse. Ka lagupuidu lisamine muuse substraati induts idanemist. Lagupuidus arv saproobne seen, mis stimuleerib, täiskasvanutel monilioidseid rakke tekitav seen, ar
Tulasnella) seen. Eri Tulasnellad eri orhideeliikidelt eelistasid üsna erinevaid agarsöötmeid, enamasti aeglase kasvuga, sageli mood sklerootsiume; Goodyera pubescens: er

ekto-ja erikoidse MR seentel oluline roll tundra-ja boreaalse vöötme C ja N ringes. On

maksasammaldel ja algelistel sõnajalgtaimedel olemas; pär mõnedel maksasammaldel olemas tõestati maksasammaldel Kochi postuladi järgi k
alpi taimedel AM ja DS, nende vahekord

N, P omastamine: ylevaade N, P omastamine: ylevaade
Ericales: erikoidne, arbutoidne, monotropoidne MR. Pyrolatel mantli olemasolu sõltub
side mingite ECM-seentega

e sclerotoidea Helv lacunosal; Psathyrella epimyces Coprinus sppl; Volvariella surrecta Clitocybe nebularisel; Rhodocybe stangliana; Claudopus parasiticus (Ent) Clitocybe

ZelleroM, Pisolithus, Sclerod, Laccaria,

AM seened on kontsentreeritud vihmaussi sitas, ja idanevad seal normaalselt
Casuarina cunninghmina Queenslandis vaid AM. Üleujutatud aladel mood klasterjuuri

Glomales fossiil 460-455 MAT (enne soontaimi!), selle järgi kand-ja kottseente lahknemine kalibr 620-600 milj a t
fülogenees; morfoloogia ja SSU sekventsid ei kattu; paar u .
Glomeromycota: uue haru kirjeldus Väikestelt Antillidelt ja Mikroneesiast

Glomeromycota taksonoomia

ülevaade SSU fülogeneesist ja erinevate gruppide kirjeldan .
baktritest endofüütidel: tähtsam peremeestaime hõimkond

ıkse patogeeniks, sest kinnitub pikkjuurtele

odustamas noiaringe; samuti mütseel muruplatsidel
juuri ja ka Cenococcumi seenmantlit
ıikul

endof Curvularia vähendab termostressi peremeestaimel nii 40*C kui 65*C juures.
ıksonitele tugev toetus; Baieesia annab kõrgemaid näite kui bootstrap. Hea ka bootstrapi modif kui kasutada mitmeti mõistetavaid aligneeringuid

ened, ensüümid, ligniini monomeerid

Glomus fasciculatum arbuskulitega kadakal
Acacia Austraaliast introdutseeritud ja eriti kui veel nakatatud Pisolithus albusega, mõjutab mikroobikooslusi ja -aktiivsust, n
lt leiti pms mulla mikroseeni LSU põhjal
asse ja NZL 30-50 MAT AUSst.

ganaika lagundajale Oidiodendron maius: toodab turbapallidel ja kultuuris Cladonia talluse juures mittester

odust viljakehade laigud 20 -200 m2, enamus liike agreg. Spetsialiseerunud liikidel (25%) viljakehade prod 10%

idi. Arv Pisolithus jt agressivsed tüved võivad muutuda ise invasiivseks kohalikule seenestikule; tahtlik mutualistide introduts on enamike sissetoo

rassidega

perdon ja Tapinella atrotomentosa ei mood EcM kolb
vs Actinomycetes Petri tassil

rumine äärealadel subopt tingimustes eraldatud pop-des suure sex valiku korral. Mitmekesisemates kooslustes rohkem vanu evol-harusid ja liike neis. Hoiduda ebaühtl liigi
a ekstinktsioonid

Frankia IGS primer F16S gtgggaccggcgattgggac. BD ei sõltu kohas
docarpuse-segametsas ilma EcM puudeta

ɔ männi idandeid

ıleks lugeda valgemäd tekitajateks. Jaapia ja Botryobas lagund ligniini, ent neil pole PODe; Eri pr-mä seentel palju koopiaid reducing polyketide s
glomaliin varieerub mikrosaitides ja ka taimede poolt asustatud vs asustamata aladel
glomaliin: ülevaade
vs globaalsed muutused: ülevaade

e seente introduktsioon: näidisliigid, nende päritolu, kahju jms. Nii munasseened, kottseened kui roosteseened. Tingimused epideemiateks

Alnicolas väga palju krüpt liike, mida toetab 3 geeni andmed. Koevolutsiooni asemel on ilmselt tegu hüpetega ühelt alamperekonnalt teisele

klassif rühmadesse koe ja horis vs vertik leviku järgi. Ülevaade ja tähtsus rühmiti. I. Clavicipitaceae -vertik transm; Clavic-endof on entomopatog
Invasiivsed BradyRhizobiumid: AUS akaatsiatega kaasa t
liigisisene geneetiline kaugus SUURENDAB seente vahelist konkurentsi ja VÄHENDAB taime kasvu vastupidiselt ootustele
roll bioremediatsioonis, võimalused, GMOd, taimede juurde toomir

miidikuhilates vs mullas: kõrge BD, näiline suur erinevus, ebapiisav proovivõtt

Petri tass

Petri tass + 20*20 plaat

ıt seemnepank)

:hise caudatall on Russulaceae, Theleph, Clavulina; A. Montanal Russulaceae 66%, Tom, Seb ja Clavul; Cephalanthera exigual vaid Theleporaceae
Hebeloma sp.;

Frankia inokuleerimine ja kasu

DS ja AM arktika rohttaimedel sessoonselt

AM seente: Glomus cf intraradices ja Archaeospora sp kolonisatsioon podokarpuseliste juuremügarates

Aktinoriisa: levik taimedel, N2 fikseerimise kvantiteet, tai

ieeruv. Mallocybe ja Inosperma sekventsid puudusid, mida seletati asukohamaade vähese uurituse või NM-eluviisiga. 37% sagedastest DNA järjes

endof Epichloe ja Neotyphodium suudavad evol jooksul kaasas käia peremehega, tehes ise paraseksi, soodust perem asex levimist. 1a, mitme-a ja puittaimedest peremehe

mittekultiveeritavate bakterite kultiveerimine: söötmes lihtsuhkru as

vs Rhinanthus-parasiit (elab paremini kui peremees on AM)

Holcus lehed vs juured: alfa-BD sama; beeta-BD juurtes kõrgem. Leiti ka Epichloe juurtes. Enamus liike kattusid ja eelistusi kui siis üksikutel see

geneetika: ITS alleelid tavaliselt eri tuumades, aga ka üks tuum võib omada mitut eri varianti

AM BD uurimiseks sobib paremini molekulaarne vs eoste morf jr metoodika, sest sporulatsioon esineb vähestel ja morf on konservatiivne. Kas ee

k variandid erinevad mol kella konstantsusest. Suured erinevused tulid ka taksonite valikust, kus mõnel esinesid pikad harud. 95% usalduspiiri kasutamine. Iga kasuttav ge le 20 MAT. 30 MAT tungisid üle kuivanud Turgai lahe Aasiast Euroopasse loomad, mis arvEur väikuse ja paljude saarte tõttu minetasid varasemad asukad. Aasia ja NE-A

uagarics. Paljudel sünteesitud ka EcM puhaskult
, ajaloolised ja kaasaegsed käsitlused

lagundavad petroo x

veetaimedel; dominandid multi-host. Veeseened nagu Tetracladium jt

sivärvil: Pleosporales, Onygenales, Verticillium, Dothideales
ındramullas. Märgatavad erinevused talve-kevade ning suve vahel. Molekulaarne diversiteet. Ka ACE ja Chao1 indeksid
DSE -Ranunculus adoneus = Phialophora aff gregata; taassüntes maisil

Epichloe ja selle hübriid Neotyphodium
Epichloë: koevolutsioon koos peremeestaimedega, moned pisiliigid levivad ka horisontaalselt, palju hübriide, peaaegu koigil korrelistel
sel samad sümbiondid, ent veidi kitsam peremees-ring. Hübriidil puuduvad tolmeldajad, miska kohasus sellepoolest väiksem
koos/mitte ECM vs patogeenid agaril

ss tõttu
eri taimeliikidel on eri AM-seente kooslused ja erinev BD. Liblikõieliste juurenoodulites on muust juurestikust erinev AM-seente kooslus, kus BD

identsustasemetel. Lisaks Chao1 liigirikkuse hindamine. Pakuvad, et Chao1 kõikumine ei tohi olla 2.5% (stabiilsuse kriteerium) järjestikustel näitudel. EI TOHI kasutada
ıse test
oosluse erinevus kogukooslusest; UNIFRAC - koosluste vaheline fülogeneet erinevus (ühe koosluse kiirem evolveerumine teisest ja eri harude kall

alfa-ja beta proteobakterite fülogenees

i häiring oli vähene. Proteaceeae võtsid üles ka glütsiini ja seega arvatakse, et proteoidne juurestik omab erilist funktsiooni

ist oli parim threshold 97%; ökoloogilise temini koa pealt 98-99%.

ad eri seeneliike. Vahet pole EcM, ErM ja sapro seentel ega melanis vs mittemelanis seentel. Arv ei eelistata v kiirekasvulisi ja pikkade hüüfidega seeni, sest nendesse jääd

ırud tek maismaaharudest

n SordM sõsarrühm; lihhenis seened pole basaalsed - pigem saproobid on.

ndike aladel. Levimine pms seemnetega. Sukulentide bioomist on suguk levinud teistesse, ent v harva tagasi (arv kuivataluvuse tõttu). Üksikud levikuepisoodid on põhj. en

lehe-endofüüdid on rikkad sekundaarsete metabolismiainete pooolest. Taimedes patogeenid induts väiksemat metaboliitide hulka kui endofüüdid.

defin. Host specificity vs host preference; soovit. Kasut. Mol-meetodeid-. Paljud lehe-endof adapt sptes-organitele. Patogeeni ja endofüüdi erinevu

endofüüt Pezicula sekundaarmetaboliidid. Mida patogeensem on seen, seda lühem on latentsusperiood

fülogenees, rõhk perekonnal Geosiphon

ıduslik biogeo on väheu EcM ja AM seente introduts: ülevaade ja ohud: seend ei pruugi soodust peremehe kasvu, võivad stimul invas taimede invasiivsust, er männid a eul

ranspordi madal hind. Seene P saamise ja taime CO2 hanke näide. Seletab, miks ECM-seened ei kasva kõrge P juures ja miks neile meeldib kõrge CO2

taimekõdus kontrollib mikroobide kooslust (PLFA) taime

16S: + SSCP bakterite BD maisi risosfääris

Nematoodide püüdmise moodustised: nii mitmetel kott kui kandseente rühmadel

ısse muudab oluliselt mikroobide ensümaatilist profiili

lepa lisandumine kooslusse muudab oluliselt mikroobide ensümaati

Sebacinales klaadist B ja n-ECM liigid klaadist A on endofüüdid paljudel rohttaimedel; avaldamata andmete põhjal ka EcM mood liigid on endof

ebacina sp, Tomentella spp, Elaphomyces spp (?). Noorte ja vanade taimede sümbiondid kattuvad; ühel taimel kuni 5 eriliiki. Osasid leiti ka ECM tippudel

petsiifilisus ja ekspluateerijate teke

pooljuhuslikult

Neotyphodium-Epichloe kompleks: Hübriidid arv. Toodavad rohkem alkaloide tänu polüploidsusele. Arv. Et hübriidid tek kui mõlemad haploidsed seened on juhusl. Kolo

Tetracladium veeseened on juure-ja lehe-endofüüdid maismaataimedes. Arv. Et nende koniididi kanduvad õhumullidega edasi ja teevad läbi vaheetapi taimekudedes. Muu

maksasammaldes endofüütsed seened mood palju erinevaid struktuure. Tõenäoliselt pole need igivanad, vaid suht uued. Ka paljud seenerühmad on nooremad kui maksasa

dras saprotroofsed kottseened: BD ei muutu, ent soojenemise mõju on kooslustele suurem niiskes kui kuivas tundras. Soojenedes patogeenide ja saj

162 N-fix) woodwideweb

plastpotid; kastmine; liiv+turvas;

CM seened: noores metsas saprotroofide diversiteet suurem, mass väiksem, ECM seentel vastupidi

Penicillium nodositatum moodustab leppadel lisa-seennooduleid. RFLP järgi on ta eraldi liik

NA arrayd annavad v eri tulemusi

ısionaalsusele

Ericaceae: Vaccinioideae ja Cavendishioideae Ecuadori mägimetsades: mõlemad rühm
Cavendishia nobilis: vaid Sebacinales B klaadist
Clavaria sp näidati antigeenidega

ılasnella/Epulorhiza ja Ceratobasidium aff. Cornigerum. Mõl. Rühmad stimul seemnete idanemist vaid mõnedel orhidee liikidel.

mükoriissed OrM seened kuuluvad AG6 ja AG12. Barcodingut ei saa rakendada, sest subAG-de sisesed ja -vahelised erinevused oluliselt kattuvad. SubAG sisene sarn al

ıtamiini süntetaasi +-samapalju

Calluna vulgaris - palju eri Helot harudest seeni; domin Rhizosc ericae.

tubes

mõne seeneliigiga. Laia pm-ringiga taimeliigid pärinevad kitsa ringiga liikidest - tek 2 korda iseseisvalt
:jal; Dactylorhiza baltica: Ceratobasidium albasitensis kõikjal; Epipactis atrorubens: tuhamäel Geopora sp., looduses Trichoph woolhop ja Tulasnel
alophora-endofüüte, mis on arv patogeenid; C. Californicumil ka 3 isolaati Ceratobasidiumit

;, Cenococcum EcM sünt; Macrolepiota procera, Phallus impudicus, Lycoperdon gemmatum, Agaricus campestris ei õn Lactarius deliciosus (arv. I

ı. Tekib oksaloatsetaasi ja glüoksalaadi oksidaasi tulemusena. . Vastuoluliselt teistega arvavad, et oksalaat inhibeerib ligninaase, seevastu va-mä seened lakaaside ja oxac c

lehe-endofüütide peamine vahe okas-ja lehtpuudel. ARV lahknemine ja koevol 300 MAT ???; Okaspuude okastel märgatav endofüütide koevol m

Cryptosporiopsis brunnea ja C. Ericae spp nov- CAN, kumbki ei mood Cryptosporiopsis brunnea ja C. Ericae spp nov- CAN, kumbki ei mood Er
sesoonsus-liigiti erinev, kindla trendita
Gel-Gro meedium AM-ja endofüütide lihtsaks isoleerimiseks juurtest. Võib kasutada ka antibiootikumidega

ɛfekti; seemikud võivad kasu saada suurte puude hüdr vee tõstmisest; Arv. MN on neg feedback, mis võimaldab eriliikidel stabiilselt koeksist.
20*20
2osaline

AM seened tekkinud mol andmete järgi samaaegselt maismaataimedega

kloneerimisvead

onides mütseeliga mööda tüvesid või juurte kaudu. Seeneliigid v erinevad vrd lähedal oleva kuiva maa metsadega. Ka taimede koosseis täiesti erinev
ɔrus 1; Phlebopus (NM), Phylloporus 2; Xerocomus 8; Pulveroboletus (arv NM) 2; Boletus 1; Tylopilus 3; StrobiloM 1; AusrroBol 4; Fistulinella 3
ı 2; Lactarius 1; Nothofagusel Laccaria 3; Tricholoma+Porpoloma 5; Inocybe 11; Hebeloma 1; Alnicola 1; Cortinarius ???; Descolea 1; Austropaxi

lon rompelii, Neopaxillus echinospermus; NW-Arg: Filoboletus gracilis, Heb austroamericanum, Inoc hyperytha; Alnus -palju EcM seeni (Lact, Gyrodon, Russ 3 spp, Cor

ɔphylus (Sapindaceae). Phaeogyroporus -arv parasiit; Boletus, Tylopilus venezuelae; Porphyrellus -arv sapro; Phylloboletus sis pulchra

erunud üleujutustega: 1 vihmaper algul kui ujutusi veel pole 2 mütseel ronib mööda tüvesid üles 3 nematoode püüdvad anamorfid

dul, meenut Marasmiusi; Eriti Lact igapoensist peetakse parasiidiks puudel, kergelt lihheniseerub. Arv et mükoriisa tek juureparasitismist selle näite põhjal

analüüs koosluste korrelatsioon: bakterite ning AMF kooslused korrel taime koosluste korrelatsioon: bakterite ning AMF kooslused ko

Chrysomyxa pirolata nakatab eri Pyrolaceae liike va Chimaphila ja eri kuuse liike. Seen vähendab kuusel käbide hulka 37%, seemnete produktsiooni, tervete seemnete osa

l: India ookean 5 km süg: eri praimerid annavad v erineva pildi; domin Wallemiomycetes ja Malassezia.

tugevate RNA-RNA sidemete tõttu. Fragm kogu RNA parem kui pikk lõik; tulemuste saamiseks pidi püüdmisprobe olema detektorprobel v läh ja detektorprobe olema ma

männilised; Pseudotsuga vs Calamagrostis konteiner

vs ECM kanarbikulistel

sm viljakehades

eri seened tekitavad eri taimedel kas Arum või Paris-tüüpi mükoriisat. Paris-tüüp on vähem efektiivne taimekasvu stimul ja P seisukohalt. P omast

tud taimedel seened püsivad. Soovit inokuleerida eri tüvesid, et suurendada vastupidavust

älja et eri organismide samast kohast uurimine oleks väga tõhus meetod suhtelise autokorr tuvastamiseks

Cerat EcM harusid pole; miksotroofiat üldiselt pole, v.a. erandjuhtudel. Mõned väljahõppavad liigid eenis kui kõrge temp, kõrge CO2 ja N limit faktor. Hiljem paljud kaotasid nodul võime. Küllalt suur spetsiifilisus bakteriliikidele/tüvedele suguk. sees.

Mügarbakterid: eri liblikõielistel erinevad bakteriliigid: al

aktinobakterid 16S rDNA: BD, BD näitajate modelleerimine, proov

AM tipuhüüfide eluiga 5-6 päeva, jooksevhüüfidel pikem. 14C järgi. 14C liigub lehest hüüfi tunni-paariga

des v erin dominandid - nii Tulasnella, Ceratobas, Tetracladium, Leptodontidium, EcM Russula, Terfezia lin, jmt saproobsed Pezizales liigid

siile kogu lõuna-poolkeralt. Suguk. Tek hiliskriidis fossilide põhjal. Gymnostoma ja Casuarina on vanad perek tugeva biogeoga, Allocasuarina suht uus, divergentne ja mod

kuuseokastel CAN: domin Lophodermium piceae, mis on seal palju vormirikkam kui Eur-s; olulised rühmad ka Hypoxylon, Lirula jt. Huvitavates
le mõju: pms neutraalne, harvem negat

probleemid leviku ja elupaikade fragmenteerumise ning inbriidinguga: ülevaade

ei usu et ECM seente dikarüoc

invas ristõieline toodab toksiine, mis inh teistel taimedel AM teket
atsiooniga

del EcM (E. gomphocephala); oluline on hydraulic lift ja juured pinnase stabilisaatorina
ed

metanotroofid ARRAY põhjal erinevad eri taimkatte all. Märksa ro

AM seente intronitele ja LSUle multiplex PCR. Spoorisisest var ei tuvastatud, liigisisene var palju suurem kui Glomus liikidevah var. K mitte-deg

acinalesB liike ja Ceratobasidium. Kõik on parentesoomide järgi eristatavad. K ITS3-Seb + NL4 v LR5

CM sünteesikatsetes: mitmed inhibeerivad

EcM-seotud seened: MRA=Phialocephala fortinii ja Micromucor (pindsteriliseeritutel); steriliseerimata: lisaks Penicillium, Trichoderma, Mortiere

ritama oksaalhapet, eriti inositooli, peptiide,

Chrysomyxa pirolata nakatab sama risoomi kaudu ühenduses olevaid Pyrolaceaeid läbi risoomi levides.

uldust; kui seen on haruldane, on ka spetsiifiline orhidee haruldane. Kaitse peab hõlmama seene jaoks sobivate kasvukohtade kaitset

erinevamad kui juhusl.
e õitolmu leidud 80-83 MAT

xis Mosambiigis ja Psiloxylon Maskareenidel

turvas

paardumised; mõjutas ka vaba energia G; erinevalt teistest leiavad, et alandades sihtmärk-DNA kontsi väheneb valepaardumine; valepaardumine eelkõige distantsiliselt sar

kolbid
Tylospora syntees eostest kasvutaskus

fakult sümbiotroofsust per se ei esine, vaid tegu on eksitustega kas puhaskultuuride või kaugele ulatuvate juurte tõttu

M seentel

des ja tarbijates võib põhj seente suktsessioonistaadium ja substraadi ligniini/tselluloosi konts

rhideedel parasiit, sest ei moodusta pelotone ja koloniseerib vaid risoomi ate seente populatsioonigeneetika: Ophiostoma, Armillaria, Mycosphaerella, Gibberella, Fusarium, Phytopthora jt. Rekombin tuvastamine, tähtsus eri kk-tingimustes, range

le globaalse levikuga, v.a. Aspergillus fummigatus. Arv. Väga konidiaalse levikuga seened võivad olla globaalse levikuga, ent selle taga võib olla i

LK-alalt. Mitmekesisus suurem kui Korupis ja mujal Kesk-Aafrikas

ıja-Guyanas EcM metsi pole. Arv et v vaestel valge liivaga muldadel vaid leguminoossed taimed suudavad domin

suured potid

otentsiaali. Näriliste fekaalide lisamine parandab ECM mood (er augustis kogutud vs maikuused fekaalid)

idul, metsas kui cordata puhul sügavas laanes. Sebacinales OTUd ei kattu, ent mingit fülogen erisust ei esine.
na, Geopora ja Genea; vähem muudega (ka Hydnotrya ja Helvella, Tom, Russ). E. atrorubensi seemikud assots ka Trichophaea liikidega, mida hilj
Oryza juured: kultuur vs otse kloneerides. Otse rohkem, domin kandseened (63%), er Trichosporon, Wallemia!!!, Mycenaceae
(0.5 um võrgu korral). Väidet Wul et al. 2001 ei saanudki leida ülekannet kuna katsid taimed kinni ja seetõttu need ei transpireerinud.

ilma AM seenteta taimesuguk globaalselt, erandid; arvatavasti moned taimed ja seened ei suuda kinnituda omavahel

100 000 eost poti kohta parim;

ıs liikidel. Casuarina liikidel EcM kolonis väiksem ja tihti nõrgalt arenenud HN. Suilloidid ei nakata ühtki. Optimaalne suhkrusisaldus söötmes 0.5%. Välivaatluste põhjal

: need on suht haruldased.

bakterite ja aktinobakterite suktsessioon juurtel ja mullas erinev; ve

ırius, Amanita, Scleroderma

Afzelia: vaid seemikutel

iidet on EcM, aga tegelikult mood vaid seenmantli männiga, mitte midagi kohalike puudega ja AUS akaatsia raport on arvatavasti reostus

tandikus; Type5 = MelinioM. bicolor

la

ra lini); tasakaal: resistentseid populatsioone ründavad agressiivsemad vormid ja norku vorme avirulentsemad

Glomus

s NAAT transektil: EcM seente BD väheneb põhjapoole, lihheniseerunud seentel kasvab. Seenekooslused stat oluliselt seotud taimekooslusega arv

364 357

314 savikuulid 314

ikrokosmis induts kiiremat substr lagunemist, kuna ühed seened induts teisi. BD efekt suurem tselluloosil vrd keerukamatel ühenditel

ebasobivad kombinatsioonid

JPN segametsas eri JPN segametsas eri puuliikidel: AM-taimedel palju EcM seeni ja vastupidi; ainult 44% AM-puude juureproovidest identif AM

s ka Otidea tuomikoskii. Toitainetest mõj EcM kooslust enim NH4. Peremehe-spets liike v vähe

bakterid stimuleerivad OH radikaalide tootmist monedel saprotroof

10 korda rohkem eoseid vaja e

kas metsas; varise lagunemine Gilb metsas >2x aeglasem ja N kättesaadavus 3x väiksem ning mikrofauna mass 5x väiksem. Arv monodomin liigid modif oma keskk nii et

ohloeum peavad vastu ja muutuvad dominantseks, seevastu EcM Caesalp ei pea vastu. Uapaca enam-vähem. Hiljem tuld-taluvate puude varjus rohtu vähem, seega tuld väh

iondid või muude taimedega või saproobid nneid, et linnud neid juh nokiks. Pole teada ühtki mürgist hüpog seent. Vastuoluline, kas seedimine stimul eoste idanemist ja EcM kolonis v arv maasis viljakehadega seen

kirjutas Frank taimepatogeenidest

AM kolonis globaalselt: ei leitud eriti olulisi tegureid. Korrel-anal jaoks n liiga väike. AM pole harvem ökosüsteemides, kus mullas suur C sisaldu

ithocarpus, Castanopsis;

juurepikkus kolonis ECM ja DSE kasvab pajul kiiresti kaugemale liustikuservast

ollybia ECM; Cortinarius sp ja Chroogomphus spp saprotroofi-laadsed mustrid. Saprotroofidel jagunes ära kõdu ja puidu kaupa; samuti liigisisesed erin väiksemad kui liik

juure-endofüüdid on nested osa risosfääri mikroobidest; oluline roll taime immuunsüste juure-endofüüdid on nested osa risosfääri mikroobidest; o

aliseerunud keriloomade püüdmiseks

rpa shanori: 10% eostest idanes kiiresti

OrM: Ceratobasidium vs Spiranthes: morf ja aktiini paigutus mykoriisa tekkel ning lagundamisel

üp9 nullmudelit, ent mitte tüüp1;

orhideede idanemist ja arengut (Lenzites, Trametes)

Chaetothyriales: Phialophora, Exophiala, Cladophialophora on seotud fülogen.

Cephaloziella Antarktikas: tallus kolonis Rhiz. Ericae poolt kõikjal saartel . Minimaalne geneet varieeruvus.

EcM-kaaslejad: AscoM'Porter'; Phialocephala fortinii jt Helotiales, Chaetothyriales, Cryptococcus, Gibberella-Fusarium

seemnete endofüüdid on eri perekondades eri fülogeneet päritoluga - basaalsed v tek patogeenidest, ent erin saproobidest.DOTUR ja Sequencher a
N-Am endof ja endolihhenikoolsete seente arvukus sõltub veg-per pikkusest, mitte laiuskraadist ega sademetest; Pezizales on keskm 16%, Arizona
eri taimede lehed vs samblikud: lehtede ja samblike endof sarnasemad kui surnud lehtede ja lagunevate lehtede seened. Väga suured erinevused se

ogeenide arvukusega

Heteroconium chaetospira (Chaetothyriales) mood ErM struktuure rodo Heteroconium chaetospira (Chaetothyriales) mood ErM struktuure rododе

suletud, õhufiltritega

ale asteroidi mõned (?) aastad valitsesid palünoloogilistes andmetes vaid seeneeosed, ent nende hulk asendus suht kiiresti kõigepealt sõnajala eostega. Seened olid kivististe

de probleemidest ja meetoditest

bakterikooslused ja liigirikkus on ajas stabiilsemad kui on
väheneb. Suurematel saartel liigirikkus ja liigiline koosseis palju sarnasem ja ajaliselt sta prokarüootidel liigirikkus-pindala seos madalam, ent võib

Glomus mosseae: kolonisatsioon ja efektiivsus sõltub suuresti taime genotüübist

vs ECM diversiteet: Salix; vs kk-tingimused, vs aastaajad; vs N, P sisaldus; mõõtmine
pajul, vrd ECM kasu, %koloniseeritud; võrdlus ajas Petri tassid püsti
BD on suurem tähtsus vaestes ökosüsteemides kui rikastes hüpot: mikroobide BD on suurem tähtsus vaestes ökosüst
AM eriliigid mõjutavad eri taimi erinevalt, loodes seega suure koeksistentsi võimaluse

AM diversiteet tõstab taimede BDd, biomassi, P sisaldust, vähendab mulla P sisaldust, eri AM seente erinev kasu eri taimeliikidele
AM seened soodust P ülesvõttu, mullastruktuuri (peatasid erosiooni), mitmete taimeliikide ellujäämust süsteemis ning taimeliikide ühtlust. Eri seen
2 taime omavahelist konkurentsi mojutavad eri-AM-seened, mis individuaalselt mojuvad ka erinevalt. 3 AM-seene koosmoju keskmine

-2 AM seeneliigiga; pos invasiivne kõrs Cenchrus Botswanas on seotud vaid 1-2 AM seeneliigiga; positiivne-neutr tagasiside oma mullaga. Samas kohalikud liigid seondu

aktsioone laiemalt, mitte vaid 2 osapoole vahel, vaid kaasata ka muud seonduvad. Taim-patogeen + mükoriisa,antagonist,patogeen2. Taimede kaitsemehanismid ja nende u

isvalt

horisontaalne geeniülekanne: ülevaade. Ülekanne eriti aktiivse elute
aari koos, sest OTU- AMF seentele 8 SSU ja LSU praimeri paari katsetused. NS31-AM1 amplifitseerib rohkem muid seeni. SSUs parim kombinats

lla oluline C tõmbaja
axillus reageeris erinevalt toitainete stressile kui oli nonMR või sümbioosis

x

id kehvemad kui diagnostilised nagu BLOG

13C rikastatud süsinikuga taimedest RNA ekstraheerimine ja seent 13C rikastatud süsinikuga taimedest RNA ekstraheerimin
Agrostis, Poa, Festuca -väga erinevad AM sümbiondid samal põllul, samas kui väetamine, lupjamine ei mõju, aga insektitsiid mõjub

männil palju ektomükoriisa all, isegi >50%; sesoonne varieerumine: klamüdospoore enim suvel, väh kevadel; arbuskuleid enim kevadel, väh suvel

aas: detekteerimine Southern blot meetodil Phaneroch LiP ja AAO probedega

davad liigirikkust, BD kändudel -kultuuride baasil. Eriti drastiliselt mõjub Trichoderma harzianum svab kuuse juurtes rakkude sees ja mood pinnal õhukese mantli. Hartigi võrgustikku ei täheldatud. Taimed ise kasvasid jõudsalt ja olid hea tervisega

asümm taimede ja tolmeldajate vahel
nevad dominantidel

gid
skedele; Liigirikkamatel puudel oli kõrgem ensümaatiline pot. Aktiivsus; kõrgem ensüm pot aktiivsus korreleerus suurema taimekasvuga; Theleph

Cryptosporiopsis spp nov Pezicula klaadis -ericaceaelt
Piriformospora indica -sarn 18S rDNA Ceratobasidiales [hiljem Sebacinales Weiss 2004] isol india kõrbest AM-klamüdospoorist. Kultuuritunnused: õh kestad, dolipoorid

%, perek tasemel 95%. 97% peksab kokku liiga palju liike. Mõnedes genoomides 16S kc rDNA: 1-15 koopiat, pms 1-7; koopiate arv pole seotud g

id, mis tapavad teisi lepatriinusid
basidiaceae (Thanatephorus -multinuc), Ceratobas (1-2 nucl), Waitea anamorfidega. AG rühmad ja nende siseselt ISGd -erinevused DNAs ja biol fu

leks: ristumise baasil morfoloogilised liigid on samad bioloogilised liigid, bioloogiline liigikontseptsioon tihti parafüleetiline DNA fülogeneesi jr; areng eri mandritel arv hil

Piceirhiza bicolorata -üks isolaat mood nii EcM kui ErM
Laccaria bicolor ja Mel bicolor mood eksperim tingimustes paunakesi kan

oides

x
Muutused albeedos ja kõrbestumine. Pms inimasustus vähendab biodiversiteeti elukohtade hävitamise ja fragmenteerimisega

erinevad AM seened soodustavad taimede produktiivsust eri viljakusega keskkonnas. Seente liigiline koosseis (sampling effect) ja head seened mõ
Agrocybe praecox stimul Vaccinium corymbosumi kasvu paremini kui R.

Campylobacter spp identifitseerimiseks array: 2 geeni, iga liigi geen
Listera spp identifitseerimiseks array: 1 geen, iga liigi geenile 10 pr

bakteritel eri keskkondades: shotgun sekveneerimine. Eri klassidel s

Hymenoscyphus; ECM=ericoid?

enamus juure isolaate ja Piceirhiza bicolorata sümbiont kuuluvad Helotialeste hulka enamus juure isolaate ja Piceirhiza bicolorata sümbiont kuuluvad Helotialeste hulka, er avastus, et ErM ja ECM seened on osaliselt kattuvad (Cadophora finlandia) loob uued

taimlatest kuuse risosfäärist suur hulk seeni, millest mõned (Cylindrocladium) assots juuremädanikuga ja teised võimalikud biokontrolli agendid

e elurikkust. Suurenesid N2O emissioon ja P leostumine.
AM-seente realiseerunud mitmekesisus suurendab prod. Statistiliselt eemaldati erinevate liikide efekt eraldi.

hodontia + Schizophoraga)

sniidul puu all vs eemal; vähe mõjutas fenoolide lisamine, tugev mõju männiokaste lisamisel. Fenoolide 13C PLFA: olulisim puisniidul puu all vs eemal; vähe mõjutas fenoo
a inakt -rDNA põhjal) diversiteet sõltub mitte taimede liigirikkusest, vaid unimodaalselt mullaressursside rohkusest. Taimede liigirikkus mõjutas koosluste struktuuri, ent se
eri peremeestel: spetsiifikat ja peremehe-eelistust pole. Kultuuri ja otsese s

supresseerib ECM puuseemikutel

niliselt

-12.3 kg/ha. ECM seente ja saprotroofide eristamine PLFA 18: 6,9 jr värsketest -5 kuud seisnud proovidest. Huumuses vahe palju suurem ehk saproobe palju rohkem

M seentest

läbivoolusüsteem konstantse kasvukiirusega

Dothideomycetes, Sordariomycetes domin. Kandseentest domin Agaricales, Aphyllophorales, Boletales. Sesoonsed muutused esinesid klassi-ja madalamatel takson-tasem
st ehk Vmax; temperatuuritundlikkus kõigil protsessidel, laborite vahel pole võrreldav

Phialophora finlandia (Cadophora finlandica hiljem) ja Phialocephala fortinii kirjeldused - erinevus Phial dimorphosporast; Chloridium paucispor
ile viited

Cryptosporiopsis on pms Pezicula ja Neofabraea anamorfid. Esinevad tammel, haaval ja ka Ericaceael ilma ErMta. endof Populuse juurtes, mitte-patog.

paikneb Helotiales ss. Sees. Helotiales ss. Esindab kõikvõimaliike troofilisi vorme v.a. samblikke

ed: Thanatephorus spp, Ceratobasidium spp, Tulasnella spp, Sebacina vermifera
dega, peale põlengut mood viljakehi. Mantel õhuke, HN fragmentaalne. Sarn Ruhlandiella. Puhaskult sünt ECM paljude peremeestaimerühmadega
edased perek -Sebacina vermifera; Diuris spp. -Tulasnella calospora

ra. Eri triibustel ja perek pms eri rühmad. Eri taksonitel v erinev spetsialiseerituse tase. Idanemisel spetsiifilisus samuti väga varieeruv
l vaheseinteta, ent mood klamüdospoore. EcM tekkis Eucalyptus, Leptosp, Melaleuca, Pinus kesyia, Quercus ilex, Brunonia (Brunoniaceae), Poran
dneri OrM partner) mood EcM Melaleucal
ezizales spp. induts paari liigi kasvu (Lobelia gibbosa, L simplicaulis) juhul kui need seened olid seotud kas eukalypti voi Melaleucaga, Laccaria oli patogeenne.
Sebacina vermifera EcM süntees Leptospermumiga. Isolaat (RT42, C734) mood ka OrM Microtis rara albiinodega, mis jäid ellu. Teised Sebacina
Maurilabra (mitteMR), Peziza tenacella (mitteMR), Pulvinula archeri (mitteMR); Geopyxis carbonaria (mitteMR, Morchella elata (mitteMR); 1-3 a Pyronema omphalodes
ljud Austreaalia taimedel
Inuleaega (sh Podotheca angustifolia, Gnephosis aff. Skirrophora, Waitzia citrina)

i isolaat1 sarn Sebacinaceae; Rhiz gardneri isolaat2 = arv Thanatephorus spnov gardneri (mood ka ECM eukalüptil ja Melaleuca uncinatal)
s spp vs Tulasnella calospora jpt. T calospora on parisperemeesseen, mille isolaatidel v erinev efektiivsus seemnete idandamisele. Ei soltu e OrM: seemnete idandamine ju

atud nihe ei võimalda obj hinnata B BD proovis

ı segatud olek mitmel ta: .

: sõltub enim mulla C:N suhtest

seente-bakterite suhe sõltub enim mulla C:N suhtest

seejuures f.ülogen sarn pole mõju; õietolmu kinnitumiskoht oli veidi konserveerunum; iga perek v alamperek oli spetsialiseerunud teatud seenerüh

:seisvalt tek mükoheterotroofsed liigid; Teised taksonid on jällegi putukate petised kas läbi nektari puudumise või seksuaalse petmise (putukaliigi-spetsiifiline), mis on palj

ısega. Gyroporus castaneus, Phlebopus portentosus kosmopoliidid

alaasias v palju liike. Boletus spectabilis ja B. Xylophilus kasvavad puidul. Paxillust vaid 2 liiki. Pakub et ka Eugenia syn Syzygium mood EcM

usega (=Phaeogyroporus). Mitmed Boletinelluse liigid ja Phlebopus tropicus on arv seotud hoopis AM-puude ja täidega. Horakiella on Sclerod sugulane, Chamonixia on C

st võetud liigid

AM inokulumi pot on EcM Tsuga aladel väiksem Thuja jaoks. AM kolonis piisavus oli määrav Thuja kasvu jaoks. Tsugal elu

:ega, teised seened jm organismid kunagi ei amplifitseeru. Saadi kergesti kätte ka mükoriisadest.

; pH ja Ca konts peavad olema üle teatud piiri; steriliseeritud muld nakatamiseks parim; mittesteriilne vajab suuremat eoste kontsi.

ıhenis ja mittelihhenis saproobne kottseen on jaotunud samade seeneliikide vahel

nplif ka Helvella-spets praimerid. Kultiv ei õnnestunud

'remellales, Auriculariales, Sebacinaceae

ıalselt. Jaguneb kaheks grupiks: 1. S. Vermifera+ Piriformospora AM-taimedes + er Sebacinales: taksonoomia, süstematika ja ökoloogia. Seotud perek Geastrum basaalse

Seb1, NLSeb1R, NLSeb2R. Isolaadid juurtes samad liigid kui EcM, ErM ja OrM seentel

taime juurekultuuride tegemine Agrobacterium rhizogenes abil

ıria ainult puidus, ent mitte steriiltingimustes. Liparise kasv värskepuidusöötmel koos seenega parim. Goodyera idanemiseks sobivad paremini täiskasvanust eraldatud seen

AM vs juurepatogeenid: ülevaade. LOENGUD

ıata tulemused, 2. meta-analüüs; 3. uued üsimused; 4. suurem tsiteerimine ja kasu; 5. uued õpetamis ja õppimisvõimalused; andmekadude vähend.

vahelised seosed; NC põhjustavad tegurid

kem, paljudel puuduvad adaptats-võimalused külmemaks kliimaks, troopikas rohkem aega liigitekkeks ja segeli suurem evol-kiirus

juureseened rohumaadel: PDA isolatsioon, morf + ITS sekveneerimine: liigirikkus, BD (Brillouni indeks: LINK VABAVARALE) erinev sesoonselt ja erikasutusega rohur

Phialocephala dimorphospora (mantliga endof, stimul kasvu pH3 juures, mitte pH 5.7), P fortinii (steelis, lagund rakke, inh kasvu pH 5.7 juures, pH3 sama), Phialophora f

indlustab end kõikvõimalike kk-muutuste jasuhtes ja optimis kasvu heterog kk-s, võimaldades võimalikult rohket sümbiontide hulka

samas head levimistingimused

ırasiteerib nurmikal ja moodustab noiaringe murul

ıiokastel. Männil domin seenel ja kuusel bakterid, hiljem hakkavad bakterid enam domin. Mikroobide biomass suureneb ajas.

Epacris AUS: kultuuris domin Helotiales, leiti ka Cenoc-basaalne takson

kottseened maksasammalde endofüütidena Antarktikas

ıe peremees Pinaceae, Fagales, Fabaceae või Salicaceae

Kanada arktikas paljudel EcM ja AM taimedel: dominPhialocephala fortinii, P. Sphaeroides, vähem Leptodontidium orchidicola

emused keskkonna DNA kloonimisega, v.a. Andmebaasis mitteleiduvad liigid

ıgmendid

lekes. Nende kahjustused kohalikel puudel, kohalike seente adapteerumine eksootiliste puudega ja tagasileviku ohud

duaalset levikumustrit paljuski varjutavad väljasuremised. Tuulega võivad levida v väikeste seemnetega taimed nii mööda läänetuuli, aga ka vastu koos tsüklonitega. Ka lin

Lycopodiaceae sporofüüdid ja gametofüüdid mood AM. Gametofüüdid on mükoheterotroofid ja seonduvad vaid nende Glomuste rühmadega, mis

pilliroo juurtes kultuur + sekv ITS; juurtes suurim BD kuival pinnal (Cylindrocarpon, Trichoderma), nii kival kui märjal juurtes (Bjerkandera adusta, Arthrinium); lehtedes

AM mol BD pilliroo juurtes: kas praimereid nii tava-Glomustele kui ka spetspraimerid eristunud rühmadele. Leiti 35 liiki, sügiseti rohkem kui muı

eriti pikaealised - 2.5a

ıaproob (vb ka lähedased liigid armillariiformis ja nauseosa) oma kasvukoha ja C-ühendite kasutamise ning 13C poolest. Kasvab rohumaadel, kus

proovidest); ei mõjutanud teiste seente liigirikkust; eri EmH-liivaproovides biomass jäi 0 ja 5.6% vahele (keskm 2%) RT-PCR põhjal

muse. Ka kõigil teistel EcM rühmadel on CBH puudu vrd lähedaste saproobsete rühmadega
tades Aasias peremeestaimi. Siiski on tundmata PNG-s! Eur-s arv. väljasurnud

atmosfääri mikroobid: dormantsed aga v paljud ka aktiivs
e meretasemete kõikumistega 47-4 MAT Gnetum ja Welwitschia eraldusid umbes 130 MAT, Gnetales ja Pinaceae umbes 275 MAT
Petri tass
mikroobide liigirikkus-ala suurus väikesed z-väärtused tul

ikutüübid, massikadu kasel, männil, definitsioonid

a hulka
iiv) ja troop pop-de väiksusega

juuretippudest leiti väga palju EcM-kaaslevaid seeni (25, millest 23 Helotiales)
JPN kõrguse kasvades AM BD ja kolonisats väheneb

klaasist: 35*25*1,7
280*150*15

tsetes stimul taimekasvu

lavad EcM seentest palju paremini lagundada glükoosamiini ja atsetüülglükoosamiini ning nende tanniniseerunud ühendeid. Seepärast arv, et saproobid on vajalikud minera

puudel Etioopias AM
Podocarpus ja Juniperus erinevad AM-seente akumul liigirikkuse ja AM koosluse struktuuri poolest Etioopias
mitmekesisus Prunus africanal: v palju Glomus spp, 1 Archaespora sp; teisi ei olnud arv praimerite tõttu

kolonisatsioon palju kõrgem luite vs segamännikus

Rododendroni varis lagun aeglasemalt kui lehtpuudel ja sisald rohkem tan
Rhododendron maximum ErM seened metsas: pms Helotiales,,Capronia ja

Gaulthria: MR diversiteet 2 kasvukoh x

juure- vs risosf vs m juure- vs risosf vs mulla seente BD hernel: juurtis vähim, mullas rohkem; kooslused muutuvad haigetel taimedel
ügavuti

dega mükoriisat. EktoMükoriisa süntees Cerat1 linidziga
naga

esculenta, Lepiota, Collybia confluens, Clitocybe gibba, Chalciporus jpt saproobid ja EcM seened
Eripära, ECM ja vK inokulaat, aeg

e morfotüüpidega JPN eri paigus
mitmete võrdlus
vrd ECM seentega, fakultatiivne mükotroofsus
kolb, edasi pott

erinevatel lämmastikuühenditel
Phialocephala vs ECM vrd Ericaceae lähedus

ühe Russula liigiga
nentella ja Russula liigid. Taimed jäid ellu kõige valgemates tingimustes

mangroovidel CHN. AM kolonis madalam sügavamal vees; liikide määramine mudas olevatest eostest

nataceae eraldi ja Suillineae eraldi

lling: kontrollis EcM seened Cortinarius, Atheliales, girdling: Helotiales, Serendipitaceae, Ganodermataceae. Bakteritel muutused väiksemad: vähe

a Geochipi andmeid. Phylochip võtab dominante ja sõltub ikkagi PCR ja DNA eraldimise kõrvalekalletest; Phylochipi ja Real-Time PCR andmed e

Phialocephala fortinii Asparagus officinalisel: PILDID, arv -patogeeni ja kommensaali vahepealne; penetratsioon juurekarvade kaudu paisunud apressooriumi abil 7-10 p p

Eri liikidel seened kattuvad vähe, eri perekondadel üksikute eranditena. Juurtest otse kloneerimine ITS + mtLSU

sidiumi ja/või Botryobas liikidega (A. nipponica eri paigus kindla Cerat liigiga)(sõsarperek Neuwiedia seot Tulasn-BeratoB) - seega arv SeratoB on

ekesisus sõltub taimede biomassist, mis omakorda on seotud taimede liigirikkusega Tilmani plottides; s mikroobide PLFA mitmekesisus sõltub taimede biomassist, mis oma

exico kõrbes -EcM taimi pole teada ja eluviis teadmata

eriramulla kuumutamist domineerisid Podospora, Trichoderma, Penicillium. 70*C ja 85*C vähendasid oluliselt liigilist mitmekesisust. Ka tuha lisamine vähendas liikide arv

astu liigispets MHB d=5*18; vermikuliit

troopikas sõltuvus mükoriisast ja AM kolonis vähenevad sukts staadiumitega. Mida väiksem on seemne mass, seda suurem on sõltuvus Amst ja se

troopikas sõltuvus mükoriisast ja AM kolonis vähenevad sukts staadiumitega. Mida väiksem on seemne mass, seda suurem on sõltuvus Amst ja se

gute andmete põhjal on tegu Tomentella liigiga

psis, Tulasnella (+ 2 Sistotremat). Orhideede seemned idanesid metsakõdu all sama halvasti kui laboris, v.a. Üksikud erandid. Need, kus ida Orhideede seemned idanesid n r Lähis-Ida

Rhododendron Hiinas: pms kottseened isoleeritud. Vaid pooled fülotüüpid

tukasümbiontsed rühmad

erite kasutamist

bakterid mullaprofiilis: 18S RFLP+sekv. Ülakihis liikide ja fülogen
heterogeensus väike, on tugev konkurents ja log-normaaljaotus, kus üks neist on, siis väga suur diversit bakterite diversiteeti mullas mõjutab C-rikkus, C-heterogeensus, ko
ogu-genoomi arrayd

pid pole üldse eristunud -arv geenivah esineb järkjärguliste lühikeste eoste levikutena

süsinikuringe. Väga palju C mullas glomaliinina, mis on väga pika elueaga

Helotiales endofüüdid Deschampsial ja Ericaceae liikidel suures osas kattuvad. Mõlematel liikidel parandasid endof N omastamist, k.a. Ph. Fortinii
iigid on N-miksotroofid, kuid mitte C-puhul (v.a. Orthilia secunda v varjukas metsas Pyrolaceae (40-83%) ja Orchidaceae (Platanthera leucostachys: 25-32%) mitmed liigid
on spetsialiseerunud vaid Tomentella liigile

geneti tihe(seente võitlus, konkurents pindsteriliseerimin(taimekasvu r ECM inokuleerimine (ja kasvatamin(ECM eraldus, säilitus

Juurtes oli palju Actinobacteria. Baktereid juurtes mõjutas sesoonsus, seeni mitte. Bakterite ja seente kooslus korreleerus 6%

te bakterid: 454 metatranskriptoomi uuring
sutada altern univ-praimerit parema resolutsiooniga. Leidsid takson-spetsiifilised thresholdid eri organismidele ja markeritele

tu, ent need on ökol. vähem kohased.

tud (R2=28%) . Paljud euk ja prok OTUd on tugevas korrelatsioonis (R <0.77). Enamus OTUsid unikaalsed, ei vastanud GreenGenes ja

rrel taimede funktsionaalse beta-Bdga; seente Fülo-BD suureneb kõrgusega!!. Seenekooslust seletas enim mulla pH ja P. 61% seente-BD

Mortierellales ja Helotiales. Seente elurikkus ei muutu liustikust kaugenedes, ent bakteritel väheneb. Seente elurikkust ja koosseisu mõjut

standard lahendused bioinf analüüsiks ja OTUde nimetamisel, et oleks võrreldavad.
ı võrra: denitrifikatsioon kasvab, geenide suht G+C content kasvab, CO dehüdrogenaas, respiratoorsed geenid kasvavad, bakterite ja seen

ıkistab praimeri disain. Shotgun võimaldab assembleerida täisgenoome dominantsetest organismidest; Array puhul geenide/organismide
ıatch-seost pole. Vähim-kallutatud ülevaate annab Illumina-põh metagenoom.
ıldaste liikide ohtrust vrd metagenoomiga.

. Uued praimerid Bakteritele ja Arhedele

aimeliigid ja mulla vanus määravad suure osa AMF kooslusest, ent nende osakaal jääb ebaselgeks

geenide produktide kokkusegamine ühiseks NGS analüüsiks. Lühemad jupid tulevad rohkem esile. Altern praimerite vahel on teatud eripä

ktuuri

: mulda. 600-1000 sekventsi proovi kohta pole piisav

t. Eri bakterirühmadel erinev pH optimum; mõj ka kooslust

ht madal; kvantit ebatäpsus tuleneb arv PCR probleemisest; soovit kasuta väh 2 PCRi ja väh 2 rmtk ning kvantiteedi määramiseks kasuta

i OTUde arvu vrd paarikaupa laigneeriniguga; >90% artefaktsetest OTUdest olid singletonid, ent esines ka üksikuid doubletone ja triplet onito G, Anslan S, Abell S, Abarenkov K. 2014. Global diversity and geography of soil fungi. Science 346: 1078.

dab tugevasti koosluse str.

lo M, Garcia MA, Ge ZW, Griffith GW, Griffiths K, Groenewald JZ, Groenewald M, Grube M, Gryzenhout M, Guo LD, Hagen F, Hambleton S, Hamelin RC,

del orhideedel N ja vähematel C miksotroofsus

namus olid kimäärid). Barcoding kriteerium 99%, prooviti ka 98% ja 97%,ent erilist vahet polnd

liigisisene antagonism

omavaheline asetus, mikroskaalas, konkurents, kooselu

liigirikkus väheneb; seened liigivaesed, sügavuti liigirikkus väheneb. Seentel 18S rDNA, Kowalchuk 1999 praimerid ja metoodika

DS jaoks:pikk

kui kohalikud AM seened. Intsia kasvule AM seentest rohkem kasu kui Ec Intsia palembai Intsia palembanica saab EcM seened kui kasvab Dipterokarpide lähed

valikraiega alal tugevas korrelatsioonis ECM kolonisatsiooniga (Intsia)

d EcM. Kahtleb raportites, mis on tegelikult valed. Aafrikas olid arv. dipterokarbid olemas enne leguumide EcM teket.

mõjul

kas eri arvu sümbiontide hulk mõj taimekasvu. Teor lähenemine

Sebacina spp: v väiksed genetid, samas juures palj 30..60 s H_2O_2 Capronia Gaultherial

:a normaalne suktsess; redundantsust on v raske mõõta. Suurtes kooslustes on portfolio efekt = sampling effect

:aceae, Crassulaceae, Proteaceae, Santalaceae, Zygophyllaceae, Restionaceae, Cyperaceae. Erikoidid seal kasvavad läbisegi muude taimedega

taimekasv ja ECM mood parem noortel nulgudel mullal kus orgaanika eemaldatud

Azospirillum

iumide jr; Sebacinad 1-või 2-tuumalised, orhideedes kultiveeritavaid Sebacinasid polnud, esines vaid Tulasnella

Pisolithus

Pisolithus

vanad vs noored kultuurid: N omastamine

ob pylori vähendab teiste liigirikkust

ohastumused, hotspot

amuutustes

5 ja 99% ITS identsust barcoding kriteeriumina. Endofüütide puhul ei saa kasutada säärast kriteeriumit üldse. Domin LeotioM, DothideoM, SordarioM. Soovit

SordM, DothM, boreaalne mets: DothM, SordM. Fülogeneet BD troopikas väiksem kui parasvöõtmes

lne teke eriti parasiitidest ja ka teistest, ent harva vastupidi; VIGA: ei võetud analüüsi mullasaproobe

a unikaalseid; endofüüdid suht spets, samas kui epifüüdid on pms generalistid-saproobid; Spetsiifika on pms perek-tasemel; Biogeo: bor
; kui levikus . Nii patog kui endof seened eelistatult levivad putukakahj kaudu lehtedesse

näited

hirvesitaga: vaja väh 10e6 eost, parem juba 10e7

kahe klaasi vahel EcM süntees

ıudsid sinna India subkontinendilt hilis eotseenis
ive 5st induts dihhotoomsete harun teket ilma auksiini osaluseta männil

e (3%); metaandmete vähesus inh analüüsi; hydrothermal vendid on suurima arhede linidzirikkusega- arv arhed seal tek.;

rima N-ensüümidele. Seega enamikus kooslustes on mikroobid C-limiteeritud. Mikroobide ensümaatiline toodang erineb taimede omast;

v kimääride läbi. Seetõttu proovide kokkusegamine on halb lahendus

i: kuivatamine kiirendab eoste idanemist agaril. Idanemine parem askusest valla pääsenud eostel

ECM kultuuristamiseks parim osmium Afzelia africana -tsesalpiiniline-ECM süntees õnnestub vaid sama pu
eet

huumuse lisades juurte kasv väheneb, eemaldades suureneb

agaril: ECM vs mikro-ja makrosaprotroofid. ECMküllalt ülekaalus

ehetäisid, ent meelitavad parasitoide

Amanita muscaria Uus-Meremaal tamme ja kase pargis. Genetid v suured ja kattuvad, samas ka v väikeseid geneteid. Arv A. Muscaria levib ja nakatab ka eos kevadel v vanadel puudel on seotud ainete taasomastamisega surevatest kudedest; ka EcM seente genoomides pole tõendeid laguens olen

a spets funktsioonide olemasolust

i PLFA jr

·talv>suvi>sügis. Seente osakaal vähenes N-väetades

Rhacomitriumi risosfäärides vrd teiste taimede ja palja mullaga

ii; hübridisatsioon kui liigitekke mehanism

vadel ja kuival suvel; lipiidkehad niiskel suvel ja sygisel

d v palju lipiiditilku. Pakutakse mutualistlikku kooselu

:oole jõudvaid liigikõveraid. Vigadeparandus kahandab OTUsid 10x

ECM konkurents	N, P sisaldus, r .

inolulumi potentsiaal linnast vs maalt võetud pinnasega, erinev vrd or ıres või lehetükis võis olla koos 4 eri seent

Scleroderma Gnetumil: parandab P ja N kättesaadavust, seda ka nõrga P-

inokuleeritud tammedel püsivad Scleroderma ja Pisolithus väh 2 a nii tavap MMN-segu ja ka viljakehatükkidega (Scleroderma, Pisolithus: v hea

taimekasv vs ECM kolonisatsioon vs eri väetishulgad

liigisisene antagonism

Rhizopogon vesiculosus ja vinicolor: üks R vesic genet ühendab väh 19 puud ja 21 m vahemaal; R vinic genet ühend väh 10 puud ja 12

Rhizpogon spp sõsarliigid eri sügavusel

ıa stimul ka patogeene (surub peremehe kaittsevõime maha) ja AM seeni

ıistel jäävaheaegadel on mitmed teised puuliigid kaugele põhja levinud, ent praegu refuugiumites vaid. Jääaegadel Eur-s palju steppi kui

: kõiki taimerühmi eraldi. Palju avaldamata andmeid.

ıngumine sekundaarselt; kands hargn 440 Ma; Lecanorales 240 Ma; homobas klaadid ca 200 Ma, Pezizales suguk 150 Ma

ıra jt

ebatsuuga seemikute koloniseerimine teoste ECM seente poolt palju aeglasem, kui puu inokuleeritud Rhizopogoniga

id. Pms kottseened, v vähe kandseeni Trichosporales. BD suurim bulk soilis

Russula brevipesil ei esinenud 230-1090 m kaugustel populatsioonidel mingit erinevust. Arv et see näitab ef näriliste või tuule abil levimist

Russula brevipes: geneti suurus 3-18m

le ammu ühtki Ericalest kasvanud. Erica vs Quercus mullast saadud tüübid olid v suures osas kattuvad. Arv elavad ErM seened kas saproobidena või puude enc

erikoididele: saavad erikoide MR

Geosiphon, Gunnera, Cycas, sõnajalad, sammaltaimed

Tuber melanosporum: mikrosat (viletsad tulemused) + RAPD: ühe puu ümber keskm 2 genetit, geneetiline varieeruvus kasvab puusisene < puudevaheline < pa

ıb stabiliseerida mutualismi

ıembola>Enchytr

metsamuld

Tulasnella spp Cryptothallus mirabilisel, taassüntees mikrokosmoses, 14C kanne pere

ınthera chlorantha: Tulasnella, Ceratobasidium, Phialophora; Epipactis helleborine: Ceratobasidium, Sebacina, Tuber; E. distans: Ceratob, Tulasn; E. palustris: (

d Sebacina-Serendipita rühmaga või kottseentega (niisketel aladel, sh rabades)

substraat, mirolaineahj biomass

troofe v paljudes taimede taksonites. Monotropoidide peremehevahetused on v erinevad taimepatogeenide peremehe vahetusest; sõnajalgadel gametofüüdi staa

s1998. Qrv on parentesoomi aukude olemasolu labiilne tunnus: tek ja kadunud korduvalt. Arv on kukeseentel holobasiid tek iseseisvalt. Kantharelloidid on eral

EcM harudest tek mükoparasiidid jt par.

metüülamiini ja ettekasvatatud Paxillus Petri tassis + puu

saprotroofid

ısem

sse lisati ka tanniini või tanbarki; Pluteus cervinus, Lactarius de Kõikide seente mõju taime kõrgusele, diameetrile ja massile oli positiivn

segus: 16S rRNA: uued liigid, substraadi utilisatsioon

algloomad pärssisid Paxilluse kasvu Petrikal algloomad suurendasid taimekasvu, juurte pikkust ja eripikkust; Paxillus suurendas ta

n www eriti c EcM noored taimed kasvavad paremini ja on suurema elumusega, ent eelistatumad herbivooride poolt paikades, kus pole juurkonkurentsi suurte p

muld eri lehtpuude alt inokulaarina okaspu .

Üks Paxilluse tüvi mõjutab eri seemnepangast kuuskede NO3 omastamist, juurte aren

P lisamine: seentest oli kasu madalate dooside juures, alates 16 mg/kg muutus NM ta

ka sealset NothoF. Eukalüpti istandike seened kogu maailmas. Eoseid levitavad ka lüliJ.

EcM seentest eukalüptile oli kasu vaid siis kui muld oli väga kuiv; muidu kontroll ja I

dseeni DGGE põhjal. Helot puhul kult vs DGGE annavad v sarn tulemusi
lotiales (Dermataceae, Hyaloscyphaceae) NM. DGGE juurtest tuvastas %-rohkem ErM isolaate
ıdofüütidel, kuigi mitte 2 kottseenel (2 kandseenel Agaricalese ja Tremellalese hulgast esines)
l sisse metsa, vaheala ja nõmme vahel. Domin. Helotiales ja Sebacinaceae. Juurtes üldse v palju saproobseid ja EcM kandseeni. EcM kandseened eriti metsaala

ne juurest (rohkem). Dominandid ja seega potentsiaalsed MR moodustajad samad, pms Helotiales. Lisaks 1 AM-seen (Arv. Oportunistlik koloniseerija) ja 8-10
d, Xylariaceae jpt kottseened, vaid paar identifitseerimata kandseent. Kult vs juurest sekv annab eri tulemused, ent mitte siiski väga. Juure DGGE annab vähem

veestress , eri seened, Kuusk (Ecm stimuleerib) vs mänd (mõjub vähem)

dipterokarpuselised olid suuremad ja lehepind oli suurem kui lisati kõdu dipterokarpidel EcM inokul palju kasu kasvu ja ellujäämus

akad biogeogr ühendused S-Am-ga

alamsuguk tek vara-paleotseenis v varem

Laccaria sp. Inokuleerimine inhibeeris Thelephora kolonisat mass: mändi mõjutasid paremini Laccaria spp, kuuske Thelephora (mitteoluline)

kask tsellofaanile, kus kasvab seen

tsiaal: aastaajast ei olene AUS. Mirbelia diletata ja Eucalyptus calophylla reageerisid v erinevalt sama proovi mullale, seega arv. Et seonduvad eri liikidega. To
e varieeruvus 10-cm skaalas, mulla häirimine vähendab EcM inokpot Mirbelial, ent mitte Eucalyptil. Arv MR hüüfid olid inokulumiks selles mullas

avarjau ja seen suhkruid

oide kaupa: NM pms parasiitidel, karnivooridel, klasterjuursetel, hüdrofüütidel. Definitsioon ja diagnoos EcM ja AM taimedele, ülevaade
M. Lisaks obs istandikes kaht kottseent: 1 mood koniide ja oli must; teine mood pisikesi pükniidiume eoskottidega

lepp: seemened sterilis H2O2-veeagar-agarsööde-edasi

vs. 2 ja 4 kuud peale inokuleerimist; vs N-väetamine

-erinevused minimaalsed

Hebeloma sp võrdlus eri in vitro tehnikate vahel-erinevused minimaal

nases, küntud pinnases ja suktsessioonilisel pinnal

Suillus pungens genetid enne ja peale tulekahju: täielik kontrast-suured vanad genetid asendusid uute väikestega

ad iga 4 aastaga pärast seismist järjest paremini

vs ECM diversiteet

i akt puidus minimaalne! ensüümide aktiivsus erines tugevasti nii liigiti kui substraaditi ja interakts. Arv et EcM seentel võib esineda tugev kõdulagund akt talve

elumust ja kasvukiirust. A) ergovaliin B akumul? B) viletsamas seisus herbivoorid?
reelgi vastuvõtlikumad lehetäidele, endof-taimedel tekib tugev lisaresist ning loliini sünt tõuseb 2x. N-väetamine suurendab seenega taimel haava-induts resist te

saproobide kultuuride säil

kasv parem iso x
biomass Pisolithus: liigisisene ECM moodustamise varieeruvus
lnud erilist vahet

juurte hoidmine füsiol soo

erumine substraadile, vähe polüploidiseerumise ja hübridiseerumise tagajärjel spets. Aseks liigid tek korduvalt, pms noored ja pms tugevalt spetsialis. Arv. esin

Armillaria vs Megacollybia antagonismikatsed

[. Sek koloniseeris ka kandseene ECM -hartigi võrgustiku rakkude vahel. Sellinsed struktuurid püsivad suvest talveni ja arv on aluseks kevadisele viljakehade t
:aria mantli, e Cylindrocarpon destructans vs Paxillus involutus, Laccaria laccata. Puhaskultuuris Pax > Cyl > Laccaria; Cyl inhibeerib mõlemil, eriti Laccarial l

! vastu, Ultravioleti ja insektitsiidide eest, aitab pindadele kinnituda, vs hüperosmootne shokk, vs kõrge temp; . Seentel rakuseinte küljes, apressooriumis tekital

pole teada. Arv paljud Russula liigid on peremehe-spets;

x
Scleroderma sinnamariensega inokul soodustab Gnetum gnemon taimed

vus: ülevaade

a konkureerides. Eri taimede risosfääris eri pH ning DCA põhjal eri mikroobide kooslused
ımisega Ameerikas

ıllas; bakterid sügavamal mükorisosf mullas efektiivsemad kui poindmises mullas
paarumistestid

iikus 2.6% taime fix 14CO2st. Taimest liikus C palju rohkem kui vastupidi

:aalsed seenepaksendid, millel lühike eluiga

household bleach, 15 sek_70%rtanool, 15 sek

: ettevaatlik olema, sest mõjureid on v palju
: ettevaatlik olema, sest mõjureid on v palju

kuna pärisb levimist ja konkurentsi
a kauem oli nisu enne olnud, seda patogeensemad olid sealsed seened nisule. Pms kottseened: Phialophora cf gregata ja Gaumannomyces graminis, kandseentel

Rhizopogon: istandikes äsjaistutatud puudele Rhizopogoni spooride i

AM vs ECM

:upp võib tulla Rhizoctonia solani-Thanatephorus AG3 eristab tubaka-ja kartuli spets tüved omaette rühmadesse. AG sees on somaatilise mittesobivuse rühmad,

ECM seened vs Heterobasidion: Paxillus suurim inhibeerija

evikut

ıudeta siiani isoleerida;

dof Stylidiumil, EcM polnud

Armillaria vs Hypholoma: antagonismikatsed

ECM seened kasvavad paremini 3% agarsöötmel kui vedelsöötmel

Petri tassis vedel MMN

VAM vs ECM

kõrgus vs MR eosed

riski tõttu

Scleroderma spp: männi ja eukalüpti kolonis eri liikidel ja sama liigi isolaatidel erinev

le ja bakterite kooslused nõrgalt seotud; võrgustikud faagide, bakterite ja protistide vahel.

ga, sh P. Minoril sageli tugev mantel; Monotropa mükoriisa, Arctostaphylose arbutoidse mükoriisa kirjeldus; Calluna ja Erica carnea erikoidne mükoriisa. Pyrol

Cenococcum vs teised CWDs

CWD: ECM vs NON_ECM

Endogone ECM parandab taimekasvu

Laccaria laccata, Hebeloma crustulinif, Rhizopogon rubescens parandavad taime kas

Tuber sp. Endogone flammicorona, Rhizopogon sp: süntees. Rhizopogon kiirendab n

Pyrola ja Chimaphila populatsioonid on vähe divergeerunud. Paiguti väga suured kloonid

ju liike, eriti kandseened. Peaaegu kõik maasiseste viljakehadega; Zelleromycese eose orı

Eostega potoroo sitas: palju liike, eriti kandseened. Peaaegu kõik maa

stumused, liigiteke,

erinevalt töödeldud pinnasel

N-väetada. P-vaese mulla N-väetamine suurendab mükoriisa mõju, sest taimed allokeerivad rohkem maa alla.

stamine; jäikade v valede läviväärtuste kasutamine; barcoding gap vale inerpretatsioon - on lokaalne gap ja nn. globaalne gap üle kõigi ta

N, biomass: mi tsellofaanil

pöögilehtedel mikrokosmis + perliit

x

ECM vs saprotroof lehekõdul, N, P sisaldus, respiretsioon

ı tammel (sünt eostega). EcM eristamatu

Tuber himalayense, T. Indicum tammel (sünt eostega). EcM eristamat

tospermum mood EcM siis kui on Männi või Nothofaguse lähedal, muidu mood AM.

lehtede lagunemine

ːal muutuda. Vb hoopis eraldusmeetodi efekt?

veestress: juurte kasv peatus peale uputamist ja paljud juured surid, eriti kuusel. O2 p

mänd adapteerus aeglasele uputamisminekule paremini kui kuusk. Männil tekkisid ju

vaid pikkjuurtele

veestress jämejuurtel: nii kuusk kui mänd toodavad "lenti-rakke". Kuusekasv pidurdu

ı jt, pliotseenisBrassicaceae, Ranunculus, eirti Cenopodiaceae. Eucalyptus oli eotseenis levinud ka Lõuna-Am-s; Eukalüpti puhul lükatakse ümer Ladiges et al 2 netsas; koosluste vahe rohumaadel ja metsas on suurim liivasel pinnasel. Mida suurem on MAT, seda väiksemad erinevused on rohumaa

uurendab P kättesaamist eriti laigu-töötluses
ʾ ei saa NM taim üldse. Vahet pole, kas N ja P on kontsentreeritud laiguna või ühtlaselt

:indlasti ErM liigi 2 isendit leiti mõlema taime juurtest

Suillus variegatus, genetite Cs sisaldus ei erinenud

Suillus antagonism

Suillus varieg somatic incompatibility genetite eristamiseks
x x

Morchella sp mütseeli/vee segu
N-seotud ensüümide aktiivsuse mõõtmine vs lupjamine
la dankaliensis (Gymnoascaceae) mood Vacciniumil ErM. Kõigil esines tugev tsellulolüütiline aktiivsus
Cantharellus sp.
Cantharellus spets kasvukambris, vajab lisaglükoosi

Sphaerosporella, Laccaria, Pisolithus mood eCM pigem toitainetevaeses tingimuses,
x

seente suktsessioon eelinokuleeritud vs kaevanduspinnasele ümber istutatud: inokulandid hääbuvad 3a jooksul ja kohalikud seened votavad yle :

aea, Sphaerosporella või Humariaga, arv EEMR mood mitmed lähedased liigid ja mükoriisat üldse palju rohkem liike kui leitud

viljakehast ja ECMst eraldatud kultuuride võrdlus, ECM moodustami
ECM suktsessioon konteinerites 4 a jooksul parim jäätmemuda;

robirohi vs AM

füütsus evol küllalt uus nähtus

inokul Tuberiga stimul kõiki taimekasvuparam. 4.5 ja 10 a

n vs n+n: ECMs vaid dikarüoot: n sureb voi redikarüotiseerib eelmise; Petrikal

liigid Euroopast

ülevaade

lomusA 67% kloonidest

tegelesid vastureaktsiooniga ning epidermise rakud kollapseerusid. Sama Pisolithus ja Scleroderma sobivad Allocasuarina ja Eucalyptusega, ent ei mood HN n

Eukalüptid Hiinas: Pisolithuse püsimine (moned pysivad, teisi pole tuvastat Eukalüptid Hiinas: Pisolithuse püsimine (moned pysivad, teisi pole tu

ud oluliselt kiirenenud evol gapdh kodeerivas osas

C-tõmbele läbi lehtede

Armillaria 2 sp

on benomüülil oluline roll suuremas taimede produktsioonis; mõnede taimede arvukus muutus seoses benomüüli lisamisega (stat mitteoluline)

AM vs ECM (antagonistlik v.a. Heb .

biomass, kõrgu eri arengulooga L.b. S238 osad vs ECM võime ja taimekasv

EcM seente suurem BD suurendab Acacia mangiumi kasvu ja nodulatsio

N, P kõrgem tammel kui on ECM vs AM

Tomentella sp inokul püsib ja suureneb ka mittesteriilsetes pottides. Vrd kontr paranc

4 ECM Seenega inokuleerimine eraldi 6 puuliigile. Inokuleerimise efekt parem, mida

Tomentella sp kolonis Afzeliat kiiremini kui Scleroderma. S Tomentella suurendab Afzelia kasvu, koinokul Sclerodermaga tulemust ei paranda, er

N saastudes taime N konts tõuseb, P sisaldus väheneb, kasv samuti väheneb, ECM m

n põhjust ka multikollin. Kui algmuutujad võtavad arvesse suurema osa variatsioonist nii et spat autokorr on mitteoluline, siis pole vaja s

Tuber melanosporum soodust 2 tamme liigi kasvu, ellujäämust, N, P omastamist ning

ECM kolonisatsioon, lühijuurte osakaal ja koigi ainete sisaldus suurem korgematel te

saprotroofid substraadi pärast

Rhizopogoniga suurem fotosüntees ja ohulohede juhtivus, madalam leheturgor; hebel
Rhizopogoniga suurem fotosüntees, hebelomaga korgem lehe osmotne potentsiaal+vä
Rhiz stimul taime fotosünteesi. Heb ja Rhiz suurendasid lehe osm pot. Teatud ajal pä

smikrosat-probedega>duplekside erald>kloneerimine>sekv

ülevaade

irem kui agaril tõen akt transp tõttu fronti. Looduses 90 cm a-1; vrd teiste ringjate saproobidega ruderaalne, sest jääb neile antagonismikatsetes alla ja looduses

loogias (vs Carpenter, 1996)

varjutamine ja girdling mõj erinevalt suhkrute rohkusele lehtedes ja juurt

Paxillus vs Fusarium: oksalaadi tähtis roll

: ja AM valistavad teineteist

Petri tass: Suillus grevillei + 11 peremeest, ilma C

ck (25%) mudelid seletasid AM-seente liigirikkuskõveraid parimini;
ı selle põhjal pH mõj AM-seenekooslusi palju enam kui taimeliik. Levimine piirab seeni väga vähe
othii, Scleroderma polyrhizum, Tuber borchii, Xerocomus badius: esmane idandamine ja EcM süntees eostest männil tavalises PVC konteineris

Leccinum suur eoste massiga vees

s, kogu liigirikkus, võrdlus

olori EcM mood ja puude kasvu; Hebeloma ja unident1 EcM mood pärssis

50% etanooli 20*C; fikse
säilitamine

imeste vahel ja mukoosa ning .. Vahel; uued klaadid. Kõikvõimalikud programmid BD võrdlemiseks: rarefaction, ekstrapoleerimine, S-Libshuff, DPCoA. Sekv

pikkus kvantit näitaja. CA

nine

taimedes: N rohkem noiaringi joonel; P väljas>sees>joonel

1…5a taimed; vs ECM vs AM vs mõlemad; biomass, N,P-sisaldus

uured genetid ECM sümbioos kui vastastikune parasitism ja ekspluateerimine: sõltuvus keskkonnast, ekspluatatsiooni def Bronstein2001 jr; stabiliseerivad meh
ta biotroofid (Anthracobia maurilabra, macrocystis; Trichophaea hemisphaerioides), paljud pole yldse biotroofid (Anthracobia macrocystis, Ascobolus carbona
chophaea abundans ja Anthracobia spp inh juure kasvu sporaadiliselt. Sph Pezizales vs seemnete idanevus ja idandite ellujäämus vesiagaril: Seemnete idanevus

Pinnasetüüp mõj enim ülemist ja kõige alumist horisonti.

Mis kasutatud!!

vs pH, N sisaldus
kuusk ja kask www: 13C netotransport vaid 2%, sellestki pool juurtesse; kui algul an
N sisaldus, juurte hingamine

Alnus vs Pinus; vs Frankia; vs K, N, P

ISSR ektomükoriisadele, SCAR marker ühele Suillus collinitus indiviidile. Suilluse genetid püsivad 1.5 a peale inokuleerimist

rus, sellest tingitud vead

pH mõju: biom eri pH

Piloderma vs Paxillus & pink: konkurents asustuse pärast

seen oli võimeline sümbioosis kasvama sell .

teatud pH väärtustel ründavad mullast Cenococcum ja Tomentellopsis

Tomentellopsis, Piloderma ja Paxillus on võimelised kasvama läbi mi

vaid pisut; enamus tüvesid käib kaasas kogu elu; sugulastel sarnasemd bakterid kui mittesugulastel; dieedil olevatel paksudel sarnasus ka

Tuber maculatum esmane süntees Pinus strobusega. Eriti vermikuliidilisa astamine metaanalüüsi ja C-lisamise katsete põhjal

. Lokaalselt mõjutas kooslust ja liigirikkust enim pH (unimodaalne Ph7 juures)
inukitel. Tax elurikkus ja funktsionaalsete geenide rikkus korreleeruvad;

u skaala erinevustele nii ruumiliselt kui fülogeneetiliselt

muud asjaolud
rolli, määrab pH
iheneb 2x, algloomadel rohkem; aktinomütseetidel tõuseb 3x; bakteritel +-sama, sügavamal suureneb varieeruvus. Haruldasemad PLFA piigid on sügavamalt ka

RA + sekv. Kuuse risosfääri bakterid ja seened on erinevad haigete istikute juurtel vrd tervetega

hüüfid vs ECM vs taimeosad: eri aminohapete sisaldus sõltuvalt seensümbiondist: kü

lehis vs mänd: Suillus spp. 32P ja 14C ülekanne. Mänd kui juhuperemees kaotab palj
inkompatibiilne ECM annab 2 -4 korda vähem C ja 50 korda vähem P

Laccaria (väikesed) vs Xerocomus (suured)

early vs late stage: vs mulla juurkontaktide läbilõikamine.Isoleerimata kase seemikutel Lact pubescens, L glyciosmus, Leccinum sagedasem; isole

networking: modulaarsus ja nestedness sõltuvad assots intiimsusest, mitte par v mutualimusest; eri networkide sidumine; mu

oascaceae

ECM inokuleerimine et kasvaks mets voi söögiseened: vilets ülevaade

inokuleerimismeetodid: ylevaade. Kinnistel katsetel CO2 probleem. K
kasvutasku meetod: taim paberil, kilekotti, 2 polüester plaadi vahele

ıurendavad ECM% akaatsial Bacillus 2 spp: parandavad Pisolithuse kasvu, ergosterooli hulka; suurendavad ECM%
Lact pubescens ei levi eostega noortele taimedele; Inocybe, Laccaria ja Hebeloma kolonis eostega noori taimi holpsasti; eosed idanesid ka sama hasti mullas, m

kultuuride säilitamine -10*C juures pos kultuuride säilitamine -10

; Pyrola leiti NM

arengut. Leidis EcM eriti hästi arenenuna lubjarikkal pinnasel; materdab Gibelli ja Hartigi eelnevaid töid; oletab, et EcM mood mitmed eri seened;

kase ja vahtra seemikud 25 erimullal: molemad liigid tugevas korrelatsioonis
Mycena galo Mycena galopus vs Marasmius androsaceus

ne; fülogeneesirekonstr robustsus

ja bulk mulla Pseudomonas fluorescens: genotüübid mükoriisas, mükorisosfääris ja bulk r Pseudomonas fluorescens: genotüübid mükoriisas, mükorisosfääris ja
metsaistanduses: doosiefekt, MHB, mütseeli segamine istanduse mull
etsiifilisus võib esineda nii seeneliikide vahel kui liigisisseselt; võivad hõlbustada ka patogeenide sissetungi samad seened. Kasud: idanemine, müc kasv, mulla k

Hebeloma: eoste odandamine: juured
haploidne ja diploidne mütseel (Suillus luteus, S. Granulatus, Sclerod
spooride idandamine: puusüsi, Rhodotorula sp

Suillus luteus Paxillus, Pisolithus, Thelephora ei tekita antagonismijooni, mis võib olla söötme viga

imene tegemine: MacroLepiota procera, Agaricus sylvaticus, Amanitopsis plumbea, Russula alutacea, Laccaria bicolor, Sarcodon imbric

ine vs aluseline põhjakivim

Laccaria inokul taimedel ei arenenud teisi mükoriisasid, ent Hebelomaga asustatutel arenes. Hebeloma kolonis ka palju madalam

iprodioon vähendab taimede kasvu primaarsuktsessioonilisels aimekoosluses

porium sp, Geopyxis sp (Helot) (kolonis seementel 1-2%)

Paxillus peab 8a vastu , Hebeloma ja thelephora <2a tamme Paxillus stimul tammede kasvu eriti poustel suvedel

seerivad teisi seeni

juured >80 cm, eriti tüve suunas; homokaarüonid ei kaota ristumisvõimet peale pikka seiamist

vs inokuleeritud vs aktiivmuda jäägid vs metsamullaga inokuleeritud

säilitamine

nede juurtes puudest 20 m eeemal.

u eosekesta

.

99-100% barcoding threshold

lli AM ja EcM eelistuses.

herbivoorid vähendavad AM ja ektomükoriisa kolonisatsiooni; AM ja ECM vähenda svanud Nardus strictal

Laccaria amethystina: väikesed genetid

Heterobasidion vs Trichoderma-oluli .
Heterobasidion asustab märksa enam supresseeritud puid

mass earlystage vs latestage: toitainete vajadus

xxx T. matsutake filterpaberi vahel, niisutatud N FEA

Tuberid parandavad tsistuste kasvu

ult enne külvi

maasikapuu: ArbM struktuurid ECM seentega, AM ja Hymenoschyphus paiguti tung

on, Monocillium
sed olid erinevad; 13C ja 15N signaal üheskoos viitavad osalisele mükohet-le Orchis purpureal.

üs. Polnud olulisi erinevusi aastaajati ega eri pestitsiidide kasutamisega

NO3-imemine-mikroelektroodid

hella conica, Gyromitra, Lycoperdon, Mutinus, Dictyophora, jpt muude pu Hebeloma, Cort, Tricholoma, Scleroderma, Pisol, Pax, Laccaria, Amanita, Leccinum,

ökoloogilised seosed liikide vahel on evolutsiooniliselt konserveerunud. Viirustel>bakterid>eukarüoodid; sümbiontidel, eksp
alt; Ei võtnud arvesse ruumilist autokoori;

alju sekventsigruppe, Thanatephorusel vastasid AG-dele. Grupisisene ITS <2% var. LSU analüüs lükkas ümber AG kui evol ühiku kasutamise

Lactarius delici Lactarius deliciosus, L. Sanguifluus, Pisolithus, Rhizopogon, Suillus s

<120 päeva +2C

xxx mass, [C;N] xxx

phala. ARISA fragmentide rohkus kõrgemal vähenes, et NS

Salix herbacea viljakehadest tükkide eraldamine ja ECM süntes

staimedega. Endemism; funktsioonid

SH + mikroautoradiograafia, 13C-PCR, 13C-PLFA, Br-deoksüU jt

ıtelised taimest seende transportima 13C ja seenest Vacciniumisse 15N. EcM-isolaat suurendas ainsana taime 13C fikseerimist

ıiumi juurtest; M. Bicolor leiti vaid männilt (n=2). Geneteid on väga tihedalt ja arv nad on väiksed. Geneetiline distants ei korrel füüs dis

4 ja Gln; efektiivsus sõltub kasvukiirusest substraadil

kasvutasku meetod

a, Panaeolus, Mycena, Entoloma). Hygrocybe pole kultiveeritav. Hygrocybe eelistab kasvada samblaga.

juhuslik kolonisatsioon

Suillus granulatus>P. Tinctorius=Cenoc=kontr

krüpt liike arv metsade istutamise tõttu. Acephala applanata basaalne, eelistab kuuske mustikale

obed ei andnud tulemusi teistel Phialocephala liikidel

aga liigivah mitte. ITS oli vahetegemisel vilets, muud regioonid andsid ühesuguse hea tulemuse

Zijlstra 2005 isolaadid ei kuulu sinna rühma; ekslikult peetakse EcM taksoniteks; kritiseerivad töid, kus täheldatakse DSE pos mõju tain

DSE: Phialophora finlandia, suurimad genetid vähemalt 3*3 m; eri genetid omavahel tugevasti läbisegi, samast proovist max 5 eri genetit

Tricholoma populinum ja Tr. Scalpturatum haava istandikes Prantsusmaal. Iga-aastase üleujutusega aladel v palju väikeseid ja geneet v sarnaseid geneteid; häiı

Hebeloma: väikesed mobiilsed genetid, ulatuslik inbreeding

Lactarius deliciosus männil: kasv kiirem inokuleeritud seenega; sõltub mullast; ECM

biomass Lactarius deliciosus, tingimused

Tricholoma matsutake stimul Pinus densifolia kasvu

matsutake: P/V, SH sööde glükoosita, kiire ECM teke
Tweeni voi mineraaloli lisamine -aeglustas kasvu, suurendas ergoster

Hebeloma cylindrosporum: ECM vs viljakehad: sarnane, ent ECMst väga vilets PCR

Daldinia loculata: eripuudel eriisendid, samal puul enamasti sama isend. 3 geeni sekveneerimine ja alleelid. Paariline enamasti koniid ja väga lähedalt

juurtega inokul ebatsuuga istikud: lepp ja Calamagrostis -minimaalne,
6 kuud 3*C, metsas juurte
biomass: raiesmikul suurem hoolimata väikesest ECM hulgast ja BDst

vihmaussid parandavad kase kasvu ja lehtede [N] mesokosmoses

Tuber, Boletus edulis, Tricholoma matsutake: kultiveerimine, VIITEI

ECM vs Otiorhyncus (Coleoptera)

eosed levivad eostevihm monokarüootidele: eosed levivad väga kaugele, ent elamistingimused ei loba eksootilistel liikidel kanda kinnitada

osc. Ericae = erikoid MR; M. Vraolstadii = EcM; Cadophora finlandia = EcM, M. Bicolorata = Piceirhiza bicolorata (EcM), tüüp M. Variabilis = endofüüt pal

10% bakterite kooslusest

palju P. Fortinii kuid ei ühtki P dimorphospora isolaati

biomass	agaritükkidega

ahorisondist ja vs. Metsa maha võtmine; Üld-euk praimeritega tuli 93% seened: palju kimääre

eri istutusmeetodid. Neg mõjutab rohtude hulk. Mändi ja ebatsuugat mõj eri istutusvi	
	istandusest

ECM stimuleer	Petri tassil agarsubstraadil

chrysent, Russula fragilis, puellaris. ILLUSTR

s ka Tulasnella, mida tuvastati SEM järgi

Pisolithus vahendab N liikumist Casuarina ja Eucalyptuse vahel. Mõl taime biomass j

l hävivad kiiresti

olonisatsiooni
D idiosünkraatiline, erinev 5 riigis, erinev 3 a jooksul, erinev töötlustes, ent kõikjal +-efektid. Arv. Tulenes täpsest maakasutusest enne. Umbrohte eelnevalt ei h

ga kasvu, MHB mitte (arv sest inokul peale ECM inokul). MHB kadus ris Laccaria bicolc Laccaria bicolor + Pseudomonas fl. Laccaria inokul stimul ebatsuuga

mass jt

EcM kolonis Cenococcumiga korrel taime kasvu ja P omastamisega

lepp vs haab: h lepp vs haab: haaval suurem liikide arv ja ü .

astmetes valgemädaniku korral

eenemad

xxx

suur ristumispaik

id

ärgi.

. Eukalüptide esiletõus algas ü hiljuti seoses põlengute sagenemisega

taimed pms hapestavad mulda ATPaasidega, selleks et saada kätte P, Fe. Reaktsioon

Suillus pictus: suured genetid; mükoriisana võib olla suur ja toota vähe viljakehi ja vastupidi. Suures skaalas genetite paiknemine läbisegi, ent mitte samadel ju

Suillus ja Thelephora mõjutavad erinevalt d15N akumuleerumist taimesse vrd mitteko astu üldlevinud arvamusele, et AM seentele on parim nakatada max peremehi, et ära elada.

rohttaimed: konkurentsis N sisaldus väheneb, N omastamine suurem kui yhtlaselt jaotatud vrd yksikhunnikuga, AM-st polnud tolku

etes tingimustes ja kompleksse inokulumi korral. MR tüüp, seen mükoriisa mõju on eriti tugev siis kui N/P suhe on kõrge (P limiteerib), s

Pinus radiata populatsioonid: eri geogr genotüübid assots eri seenekooslusega

ECM seente biodiversiteeti võib ülal hoida juurte "teadlik" s looduslikult kasvaval nulul korreleerus Cenococcumi rohkus valges taimede väiksem

EcM seentel pole täheldatud indiviidi-põhist adapteerumist

a SordarioM eri rühmad. Mõni Pezizalese liik. Kultuuridest sekv

tskond, pole tõendeid koevolutsioonist; seente jaoks fakultat.

veereziimi. N reostus ja puude koorimine vähendab seentesse minevat C, ent ei mõj bakterite arvukust üldse. pH tõus iseenesest suurendab bakterite osakaalu. S

viljakehade ja puude 13C sisaldus

Phellinus tremulae: puu kohta keskm .

inokulumi suurus on tähtsal kohal antagonismi uurides

saprotroofidel suktsessiooniline rida: hilisemad on agressiivsemad; eri inokulumi suurus

ECM ja VK ECM ja VK Paxillus erinevad isolaadid inokuleeritud tammedel ja pöökidel ECM ja VK Paxillus erinevad isolaadid inokuleeritud tammedel ja pö

kasvutasku, membraaninokuleerimine

se str., Ei uurinud OTU läheduse kui artefakti efekti. Juurekooslus oli nested osake mullakooslusest i juhuslik; mõnedes kohtades ka erinevamad = üledispersioon (eriti toitainerikkamates paikades). Habitat filtering tähtsam kui konkurents koosluse str seisukoha

3cm ---300m skaalas. Baktereid tuleb ala kasvades vähe juurde, taimi rohkem kui loomi jms. Bakterikooslus sarnasem keem sarn aladel, taimeliigid baktereid ei
ı opt-trendid, MITTE_OLULINE!
ne assots oluline pea alati. Fingerprinting ülehindab ja puudulik proovivõtt ning taksonoomia alahindavad mustrit
ıne keskkond 1mm3 skaalas; tähtis primaarprod -küürukõver; liigisiseselt on biogeogr str, v suur erinevus levimisvõimes; kiire evol-võime nii mutatsioonide, ko
mida väiksem on mittekolonis juurte osakaal, seda vähem on ka Rhizopogo mida väiksem on mittekolonis juurte osakaal, seda vähem on ka Rhizo
Lact deliciosus: peamine istandustes site effect, seejärel isolaadi ja algse kolonisats efektid
Laccaria amethystina: EcM ja VK vahel suured erinevused, aastaaegade ja aastate vahel vähe kattuvust. Ühel juurefragmendil sageli mit

ımonia ox) - Z-väärtus muutub geograafilises skaalas. Koosluses peamine tegur niiskus%

Laccaria vs Thelephora avamaal | kõrgus, juure, ı konteineris, avamaal: erinev doos (1:100 optimaalne)

Pyrola rotundifolia: varjus vs valguses kasvamine ei mojuta taime kasvu; kasv väga a

imide aktiivseus nagu EcM seenel. Hebeloma ja Laccaria ureaasi aktiivsus. Ntx Lactarius rufusel v tugev liigisisene varieeruvus

ıemine)

rtant phytopathogenic genera. Fung. Div. 67: 21-125.

htades ja stepis, ent mitte kuivades kohtades; Serendip - soodes ja stepis, aga mitte päris veesega kuival

ım sarapuul

Tuber albidum Tuber albidum ja Tuber aestivum eostega sarapuul

Shorea parviflora seemikud metsas vs raiealal (parem kasv valgustingimuste tõttu, EC

ccaria) ja Hebeloma eosed idanevad kergesti Salixi juurtel; Russula ja Cortinarius ja Inocybe dulcamara mitte. Idanemine hea ka 1 kuu m

ıjutas tugevasti metsatüüp. 2 liiki Serendipitat olid tugevasti ühte liiki eelistavad. TRFLP

atsed, vaatluskatsed: levik, kestvus, liikide & gener arv jms stat

liigi eoste idanemist; ka glukoroonhape ja n-butüraat, aga mitte teised sarnased Tricholor T. Robustum indutseerib sama liigi eoste idanemist; ka glukoroonhap

ədes, mis korjatud lagupuidu alt

ɔi Tomentellopsis submillis mükoriisades ei sõltu seeneliigist ega metsa produktiivsusest. Domin Burkholderia, Pseudomonas

sele üsna vastupidavad, arv Rhiz olivaceotinctus on er kohastunud ruderaalse eluviisiga. Võib-olla mõjutab suurem hüdrofoobsuse teke eri seente konkurentsi h

Suillus granulatus: RAPD eristab paremini kui SI

nud

ga toitainetevaestel ja põuariskiga aladel

ants (jagatud seeneliigid) olid omavah pos seotud

männi ja kuuse järelkasv kannatab tugevasti mustika juurkonkurentsi all

didel parasit seeni

d hüüfid võimaldavad efektiivsemalt toitaineid transada ja stimul signalisatsiooni

karüootses mytseelis, homokarüoodis alati identne, kuigi 150 koopiat. Kontsert-evol. IGS palju informatiivsem kui allosüümid esring, teistel ja 'hybriidil' kitsas. T cingul ja T inocybeoides on arv tek 10k a jooksul

em Carex flacca monokultuuris ja paljal mullal kui Festuca rubra ja 12 taime segakultuuri puhul. Arv. Tegu AM-seente negatiivse mõjuga enamusele bakteritele

, kus 3a polnud taimi kasvanud > Carex flacca > 12 taimeliiki > Festuca Plantago biomass suurem mõnede taimede kasvukoha all vrd teistega

liikidesisene ja liikidevah võitlus mullas

eraldi.

onnale erinevalt. nirK geene mõj eriti mulla niiskus. Sarnased ökosüsteemid üldjuhul klasterdusid.

Thelephora oluline vähenemine 3 a jooksul inikulumi potentsiaal raiesmikult võetud mullaga: kask vs ebatsuuga:

rrelatsioon P omastamisega) ECM vs AM. Nii ekto kui AM seened suurendasid taime kasvu, P sisaldust (ECM ro

metsa istutatud ECM taimed surid. raiesmikul ja metsaserval kasvasid hästi

ıdes taimsed toitainete omastamise protsessid asenduvad seene omadega Wilcoxina koloniseeritud kuuse seemikute 15N omastamine ja kasv on suurem kui A

xxx

Varis mikrokosmoses: vs "huckleberry" vs tamme vs männi vs sega varis: taimekasv

8st koinokuleeritud liigist kasvab 3, kolonisatsiooni vähene 1,2,4,8 ECM liiki ei suurenda taime biomassi vrd üksikliigi efektiga; vahe eripinnasel

juure areng

l suurendavad koosluse funktsionaalset erinevust ja teise bakteriliigi kasvu inhibitsiooni ning kasvu kompleksel toiduallikal. Lihtsal toid

l. Arv et orhideedel toimub ECM seentele lülitumine rohelistel taimedel, hiljem tek mükohet ja kitsam spets
et orhideedel toimub ECM seentele lülitumine rohelistel taimedel, hiljem tek mükohet ja kitsam spets

tud). N eff pole

pleegitatud 0.6% Na-hüpokloritiga
DSE kultuuridele: Phialocephala sama genet mitmetel eri peremeestel kuid mitte läbi 2 aasta: dominantsed ja haruldased genetid

saalsed taksonid on kimäärid, sest selles töös läjksid basaalsed kimäärideks
a, seda suurem on levila (Rappoport!); paljud bakterite OTUd kattuvad lõuna- ja põhjaparasvöötmes

kõdupuidus. Min-muld siiski tähtis, sest massina on seda palju

girdl juba (mõju EmH-le kiire ja EcM ning juurtele mõjub pika viivitusega); EcM seente biomarker korrel tugevasti PheOx aktiivsusega

metaanalüüs: ka minimaalnne EcM kolonis parandab taimekasvu. Efekt ei sõltu %kol

uteus kolonis, ent ei mood HN; Lyophyllum sp ja Chalciporus piperatus ei kolonis üldse. Lepista spp.kollane mütseel

ab eoste suurust. Varem viljuvad liigid ja kuivemal ajal viljuvatel on suuremad eosed

aks Phellinus nigrolimitatus: populatsiooni struktuur: ühtsed popid, pole heterote defitsiiti; raske eristada eri populatsioone -arv jääaja rekolonis artefa

Trichaptum abietinum: regionaalne ristviljastumine, lokaalne lai diversiteet: ühel tüvel v palju isendeid. ISSR. Geenid: RFLP

männioksale, mille juurdumine indutseeriti 0.05% Na-5kloro-3indool taksonoomia seletab 26% Bakt koosluse var, f-n tunnused 13% ja nende ühisosa 10%

:hao1, Sace jt; VIITED

adel; mitmetel liikidel stat oluline erinevus rohumaa tüübist ning paiga efekt. Arv et kerged muutused mulla toitainetes mõj oluliselt taimekooslusi, ent ei mõjuta

konkurents EcM kooslustes ja katsetes: kas määrab taim v seen? Metoodika

Rhizopogon 2 liigi vahline konkurents. Üks idaneb kiiremini ja surub teise maha võrreldes üksikinokulatsioonidega

konkurents EcM seentel sõltub keskkonnast, arv. Et tugevam konkurent on kasulikum ka taimele

ente poolt, mis on enne kasvamas. Ent üks liik Rhizopogone ei suuda teisi inhibeerida

EcM mõju kasvule parem niiskes vs kuivas mullas

ıhkem

is kolonis, haustorite seedimine taimerakus; Monotropa -er paks mantel, rakusis kolonis; Rhododendron, Gaultheria, Cassiope -mantlita erikoidne MR. Kasvav

ınomycetes

Helianthemum: Cenococcum: 5 pindsteriliz sklerootsiumi

AL:CA

diin induts Suillus bovinus eoste idanemist

:le. Eukalüpt mõjutab risosf bakterite kooslust DGGE ja funktsionaalset mitmekesisust neg. AM seened potikatses vähendavad eukalüpti efekti teistele taimedel

sum ja Vacc vitis-idaeal. Plot mängis suuremat rolli kui peremeestaim; Domin Helotiales, Serendipita, Chaetothyriales al tehaks kindlask, kust proov võiks pärineda ja kas tegu võib olla reostusega

gutine ja HN väga nõrgalt arenenud ja intratsell kolonis ulatub endodermisesse

paplil; Epichloe, Ophiostoma novo-ulmi, Saccharomyces, Phytophthora alni

% massikao järel, mistõttu arv, et seentel oluline ka CO2 pime-fikseerimine; autolüüsi faasis toimub glükoneogenees, mis kompens 13C väärtusi,

l. Kui juur sureb, siis EcM seen saab esimesena jaole ressurssidele, EcM seente evol saproobidest ei toimunud kindlasti pika hüppega

ECM seentel pms vältivad interakts omavahel, pms dominantidel; vähem esineb positiivset koeksistentsi ??? Tanniini ja N lisamine muudab mitm

4 eraldamine

enim taimede funktsionaalsete gruppide olemasolu

ereaktsiooni taimedel

tlasi ka seentest

uuseloonide vahel sama ja kooslus kah. Endof muutuvad saproobideks ja lagundasid ise 1/3 kuni 45% massist. Domin mfg Helotiales, ka

%koloniseeritud; väheneb suurlinna läheduses, korreleerub okkakahjustustega

orava sitaga: Rhizopogon, Tuber, Sclerogaster -sama hea mükoriisa n

süsinikpaberil Petri tassis

alselt, ent täpsed järjestused mitte grupisiseselt liikidel kattuvcad!; orhideedel ja kanarbikulistel Sebacinales liigid ei kattu!, ent grupi-sees küll; puudel AM-seen

eril, vahest areneb normaalne ECM

odermisesse, põhj tugevat taime vastureakts; mõju taimekasvule polnud; Termin: Terfezioidne assotsiatsioon kul vs kontr

liigirikkama ECM kooslusega istikud metsast on väiksema juurdekasvuga kui madala
tsuuga ja kuuse noortaimed (5a) peale ymberistutamist ja eri juurekontakti rezhiimi. T

kaheks jaotatud juuresüsteem: vs väetamine

Rhizopogon 2 spp genetid ECM järgi: SCAR praimerid GCG ja CAC kordustele. Vaja 5 markerit genetite tuvastamiseks. Maksimaalne geneti läbimõõt 13.5 m

e jr, eriti streptokokke (arv PCR artefakt, mistõttu lõigati streptokoki-restriktaasiga DNA katki IRW). Paljud bakterid ei kasvanud kultuuris

Laccaria sp: monokaarüonid vs dikaarüonid

x CWD-le

ötasid diskreetsetel juhtudel hästi, ent gradientide puhul kehvasti; Kvalit puhuks oli vaja palju rohkem andmeid. PCoA ja NMS sarnase e

alginaadi ja hüdrogel kerakesed -ei vigasta seent, kontrollitud tingimu

okaste eemaldamine looduslikul männil vähendas pealsete juurdekasvu järgneval aast

valgusallika tugevus mõjutab kahe seeneliigi proportsionaalset osakaalu ja juurte koguarvu nulul. Cenoc talub hästi varju ja v

-spets alarühmaks; Agde vaheline hmoloogia <96%; AG4-sse kuuluvad ka hüpovirulentsed isolaadid, mis fülogeneetiliselt on sarnased 2-tuumaliste Ceratobasid

s edulis risosfääris vs bulk soil; normaal vs vulkaanilisel pinnasel, vanadel vs noortel puudel, närimata kui näritud puudel. Pseudomonas fluorescens sama, ent k

Clitocybe, Lepista: nitrifikatsioon suureneb ed genetid inkorpor endisse haploidseid eoseid et säilitada potentsiaali

i

ga; laialt levinud v paljudes Ameerika istandustes, v vähe leitud metsast Wilcoxina v tugev pos mõju taimekasvule eriti ECM mood puudele vrd EeMR puude
deraal. Kolonis. Kaevatud maad, põlenud alasid, metsataimlaid, väetamine stimul., võis vi Paxillus involutus: tüüpiline ruderaal. Kolonis. Kaevatud maad, põlen

i klamüdosp inokul mittesteril tingimustes EcM%le; mida rohkem eoseid (10e9) seda par eostega inokul palju ef-sem kui klamüdosp inokul mittesteril tingimus
i klamüdosp inokul mittesteril tingimustes (poolsteriilselt klamüdosp pare eostega inokul eostega inokul palju ef-sem kui klamüdosp inokul mittesteril tingimus
osed=oiidid>klamüdosp (arv Helotiales spp)>>hüüfid

Pisolithus sp ühest viljakehast saadud er monokaarüonide ristamisel saadud dikaarüo
Pisolithus sp ühest viljakehast saadud er monokaarüonide ristamisel saadud dikaarüo
Pisolithus: mor .

ns Mesophellia, Zelleromycese ja Labyrinthomycese eoseid. Eosed idanevad ja mood EcM vaid siis kui rott on need ära söönud. Arv. Et rott on v efektiivne eo

aialt levinud. VIITED.

õimelised min-aineid seente vahendusel paremini kätte saama kui AM taimed; hüpotees: ECM seened lagundavad esimesena peremehe surnud juuri

Populus tremula: optimaalse nakatamise leidmine seemikut

ECM, AM stimuleerivad

koidne kui ei midagi

l. Täielik liiginimekiri: paju???

is ECM vs saprotroof mikrokosmoses: hüpoklorit Petri tassis turvas+vermikuliit

ja Rhizopogon.

Armillaria sp konkurents: Armillaria spp. Eri paigus

teeriv

1 seent; kontrollpool vs AM-pool. 14C söötmine. AM-seentel liigispets voime suurendada taimekasvu. Tugev korrelatsioon AM kolonisatsiooni ja 14C saamise

terveid DNA ahelaid, mis lagundatakse monomeerideks või väiksemateks juppideks ja seejärel tehakse oma RNA ja DNAd

ECM periidiumis (mullas ja sees palju vähem)

a. Eri taimeliikidel tipp-ja madalhetked eri kuudel. Arbuskulite, vesiikulite ja hüüfide arvukus kõikus samuti iseseisvalt eri liikidel

Tricholoma matsutake VK vs EcM ISSR: 12 genetit esines 3 a jooksul 38st. Nõiaringid koosnesid 1 -4 genetist. 1 genet mood mitu ringi üksteisest 11,5 m eem

zaceae Makaroneesias

es maksasammalde ja pärissammalde perekondades

Cenococcum: ei mood ECM 2 pajuga, lepaga ja kadakaga

isoleeriti juurtest mitmeid seeni, sh MRA1, pannaldega kandseen, MRA2, MRA3. Seemned ei idanenud hasti ei huumuskihi all metsas ega eri laborisootmetel

Tomentella sublilacina vs Rhizopogon sp eoste idanemisel: Rhizopogon idanes kiiremini ja alustas kiiremini kolonis, ent mõne aja pärast hakkas

l paljute mullaselgrootute seedetraktis ja kitiinkestal. Võimalik levimiskaugus. Eosed vitaalsed peale esimest seedekulgla läbimist, peale predaatorite poolt söön

ECM seente 13C korreleerub seente N-ühendite kasutusega. Mida mi

T. Sublilacina, Rhizopogon: spooridest 2milj

zomycetes

Suillus variegatus vs Hypholoma fasciculare; inokulumi efekt

Suillus variegatus vs Hypholoma fasciculare; inokulumi efekt

ECM vs sapro x

ECM vs sapro toitainete liikumine ja aineringe: ülevaade, diskuss

ECMvs SAPRO antagonism

mullaseened; vs girdling, SWE: EcM seened asenduvad Helotialestega, samas bakterite hõimk tasemel rühmad samad

stus kas Alnus rubra v A viridise suhtes

ıte osa v vilets)

d valepositiivsed RNA-DNA dupleks paardumise omapärade tõttu

Phialophora inokul mänd säilitas peale rauakaevandusele ist Complexipes, Phialophora inokul männil suremus väiksem kui Suillus, Pisolithus < k

AM vs ECM paplil, pajul, eri kk-tingimused, taime vanus, juure eri piirkonnad

ka äärmusi. Eksperimentaalselt mõl eelistasid parasniisket. Arv EcM tõrjub AM välja sobivates tingimustes

ruldaste liikide rühmit

kooslused erinevad peremeestaimeti ja koosluseti ning sõltuvad, kas taim on mono või polükultuuris

varieeruda palju kordi sama probega

logen-BD madal. Vaja rohkem metaandmeid sellisteks analüüsideks

plajud EcM seened stimul eukalüpti massi 90-225% kontrolliga vrd. Kasvu ei stimul.

Laccaria monokarüoodid on mõned võimelised mood ECM ebatsuuga

llas ja juurtes; BD madalam

tammetõrud Laccaria>Hebeloma>Cortinarius anomalus; orgaanika lisamine suurendab

kter-grupp, aktinobakterid
d pigem setete anaeroobsetele bakteritele, suurem BD kui pinnapool

max kasv istutatutel

M-liigid fülogen klasterdunud
omeraceae ja Gigasporaceae komplem mõjudega

külmutus, gene-clean

taimekasv palju kole kiire: vt Finlay et al., 1988

2 Piloderma vaheline konkurents erinevate N ja tuhasuse as taimekasv parim kui rohkem N ja tuhka

juurtel

cistaceae: Fumana, Tuberaria Ameerikas ECM-taimed

e mükoriisa läbi AUS taimedel. Kuna esialgu uued sümbiondid peaksid käituma ebaefektiivselt, siis on tugev valik nende vastu. Uued se

Tuber vs Festuca mulla aurutamine: efek vs mulla auruta spoorinokulatsioon 10*6/ml Tuber

Tuber melanosporum vs T. brumale (parem kuivemas)

tuberiga inokuleeritud tuberi pinnasel sarapuukloonidega: tuber vs muud. Noortel juurtel domineeerib Scleroderma, Tuber vanematel

: gradienttsentrifuugimine. 13C DNAs 2x, rRNAs 10x vahe

kuuse eriliigi hybriidid on väiksema fotosünteesivoimega kui molemad vanemliigid

Atlandi silla Am-sse, kus divergeerus ja hiljem levis üle Beringi silla tagasi.

Collybia fusipes: väikesed genetid, mitu ühel puul; IGS1,2 vs SI: veic eritulemused
liales, Pleosporales, Hypocreales. DGGE bändi taga võib olla 5 eri seeneliiki

põhjapool sademeid ebapiisavalt praegu ja ka jääajal. Jääaeg ei põhj nii suuri flukt kui Põhjapoolkeral.

kasvunõudluste tõttu

HgCl ja CuSO4 töötasid, muud mitte (H2O2 ja ClO4 ei proovitud)

saviga yhes tykis annab norm tulemuse vaid sisetingimustes, mitte kasvuhoones;

d agaril koos juureekstrakti ja eraldatud juuretükkidega; õnnestus potis eluspuu juurtel

eostega inokul koos seemne ja saviga yhes tykis annab norm tulemus

eri kasvusubstraadid, söötmed, nõud, tingimused, seeneliigid; eri inok

Thel: idandamine ei õnnestunud agaril koos juureekstrakti ja eraldatu

Thelephora: spoorinokulatsioon. Kontaminatsioon inhibeerib, ELUSju

ECM vs patogeenid: liigisisene varieeruvus

mass
mass

spoorinokulatsioon; tavaperemees vs juhuperemees vs tõrjumine
metsamuld vs raiesmik vs istandus (kõige väiksem inokulumi potentsi

eeme. Kuivades AUS piirk levinud puguseened . AUS endeemide hulk eri taksonites v erinev: pms Amanita, Torrendia, Cortinarius s.l., Laccaria; saproobid pm

cM hüüfid, eriti Thelephoroid sp

pH mõjutab

männid inokuleeritud eri seentega vs ilma omandavad eri kasvukohtades eri männid inokuleeritud eri seentega vs ilma omandavad eri kasvukohta

amata alal suurem BD, suurem liigirikkus, kollektorkõver järsem. Sarnasusindeksid proovidele. Proovide DNAde kokkupeksmine, et saada üle PCR nihkest (W

ominantsus): vahet pole, sest vähe proove

ideede dünaamika sõltub seene dünaamikast, mis omakorda sõltub pude dünaamikast. Orhideed olid nakatunud Ceratobasidium-mädanil

erija oli alati ka efektiivseim kasvu soodustaja; Pärast väga kuiva suve, loosusliku populstsiooni genetitel vaheldus Tulasnella liik. Labor

ers.

.4 m emapuust Dicymbel. Arv EcM eluviis mõj Dicymbet MD metsas paremini kui teisi puid

Corallorhiza; vs ECM seene ja peremeestaime olemasolu

ionte koos rohttaimedega Asteraceae, Araliaceae ja Rubiaceae hulgast ıic ja Mucor nii endofüüdid kui parasiidid sünteesides. MRA võib moodustada seenmantlit ja HN moodi moodustisi, aga steelis rakusis l

thiamiin, aminohapped ja B-vitaminid ja Mä-juured stimul

ɛtava pop jaoks

Hebeloma cavipes: taimlas indiviidid läbisegi, duurim hõlmab palju seemikuid ja katab 20-30 m

Glomuse liigid ja arv. Afrothismia liigiteke on korreleetunud peremehe vahetusega sõsar-seeneliikide vahel

15N mõõtmine ja hea seos mükoriisatüübiga

ɛnotüüp (95%)

ErM seened Woolsia ja Leptospermum terves juurestikus (1 m eemal) juurest saadud kultuuride põhjal. Palju selliseid isolaate, mis hiljem ErM sünteesida ei õı

bakterid-nematoodid-kiskjanematoodid: BD idiosünkraatiline efekt biomassile

Wilcoxinale parem turvas-vermikuliit-MMN kui Petri tassi agarsööde metsanduses metsanduses EcM inokul kasutamine. Eriti troopikas ja kõr

istandustes vs ECM: üleva puhaskultuuris jm kasvatuste tarbeks; inokuleerimismeetodid

, apical pore +/-)

inokulumi potentsiaal

Eri eCM seei Eri eCM seened mõj erinevalt Mä ja Kuuse kasvu

oseolus, Scleroderma aurantium sünt Pinus sylvestris. FAIL: Chalciporus piperatus, Clitocybe geotropa, clavipes, infundibuliformis, Lepi

eritaimed, mükoriisa, sklerootsiumid, ı eri kasvusubstraadid, söötmed, nõud, tingir viljakehade, ECM säilitar

leesikas: paljur leesikas: paljundamine vosudega: juurdumus 10 näd 66% 1% IBAga

Arctostaphylos, Arbutus

istandikes

(Inoc), Auriscalpium (Russula)

mineraalained, vegetatiivne inokuleerimine MMN pH 7

ses ka oluline nestedness taimedel

l. Arv et maasisesed vormid eriti rohkelt rühmades, mi on äsja ja kiiresti radieeruvad.

poud: Suillus hoiab taime kasvu korgemal poua ajal, ECM kolonisatsioon ei vähene,
Terfezia mood ECM kuldkanniga MEA söötmel; Terfezia ei soodusta juurte teket ku
Helianthemum-mikropropagatsioon, meristeempaljundus

alad. Hüpot, et EcM seened käituvad talvel saproobidena. Pakuvad, et Clavulina Cinerea on eriti saproobsete omadustega. PROBLEEMID: kas ens akt EcM se

kuusk:boori vähendamine-pole oluline

edal teised ECM puud; AM kui pole ECM puid; AM "ultramafic" pinnasel. Mõl liigil mõl MR tüübi kolonis v var

liga: pms kottseened, mis omavah sugulased, jmuidu oli ka muid, sh Cenoc, Geopora cooperi, Rhiz rubescens, Tom pilosa. Arv kottseened on arvukamad paras

perliit-turvas 9:1

Tuber melanosporum: pop-gen distance decay 5 m; samal puul võib olla mitu seeneindiviidi; vaba ristumine 90 m piires (ala suurus). Os

Tricholoma matsutake: IRAP: seeneringid koosnevad mitmest genetist. Arv. Et uued genetid tulevad shirosse seksuaalsete eoste levimisega. Samas uued geneti

ECM vs Tricholomopsis agaril ja sümbioosis mass; T. rutilans üks tüvi stimuleerib, teine inhibeerib

ekuks -juurtes aerenhüüm, klonaalne kasv, osadel kambrilised juured, aminohapete omastamine

endavad biomassi, vähendab juhuslikku varieeruvust

kolonis suurem puudele lähemal kui kaugemal

süsteemiga Hebeloma spp, omapärased mikrokosmid, kuhu terve plaadi peal olid EcM seened et

eoste idanemise efektiivsused. Võrdlused taimeseemnete dormantsuse ja pikaealisusega. Kiidab Brunsi artiklit

MRA, Fusarium sp, Heteroconium sp. 5-l taimel seente peremehe-spets pole

ides suured erinevused; virtsas Ascobolus ja Psathyrellaceae. Komposti töötlusel on mõju väiksem

)TUd on laborireostus; ohtrus ja sagedus on väga tihedalt seotud;

sed erinevused juurtes vs mujal või üleujutatud vs mitte-üuj mullas. Domin Cladosporium sp; seltsidest Sordariales; klassidest SordM ja I

P ja eriti N väetamine vähendab EcM kolonis;

xxx juured, pealsed Tricholoma tridentinum: erinevad meetodid: vja metsamulda ja tahket

imiga) kolonis 28-85%; Isoetesel 0%

pistokstega pal pistokstele
IBA stimuleerib männi juurdumist ja ECM teket ; 5ym TIBA stimul juurte teket, seer

N ja poud ei mojuta ECM kolonisatsiooni ega liigilist koosseisu
mistehnika kahtlane, saproobide lahutamine peale proovide pikka seismist!!!); EMH produktsioon suurim keskel, kus lühikesed rohundid domin, sealh korrel se

taimekasv eri lehekõdu tüüpidel mitteaditiivne, idiosünkraatiline

García M, Sousa FD, Stefańczyk E, Tadych M, Takamatsu S, Tian Q, Udayanga D, Unterseher M, Wang Z, Wikee S, Yan J, Larsson E, Larsson K-H, Kõljalg

image analüüs eri halltoonitasemetega

saproobid on v erinevad laguaktiivsuse poolest, suutes lagundada tselluloosi ja õlgesid, võimelised kasvama laktoosil, Mõned EcM seene
eri morf Frankiad

elektronmikroskoopia

Robinia: AM, Rhizobium, korge CO2 ja kombinatsioonid paremad kui niisama,

samas [N, 15N] väiksem

koloniseerimata juurtega.

ood EcM paremini Afzelia enda ja põllumaj-mullas ?! ent mitte Amhersteae mullas. Kumbki ei mood EcM mahavõetud metsa mullal; Arv Amhersteae ja Afzelia

kadumisega. Xylariaceae-endofüütidel on lisaks ka ligninolüüt omadused ja nad püsivad kauem

ski voimalik

P ja sekveneerimine sarn tulemustega, mitmed DGGE bändid on kimäärsed artefaktid; v madal liigirikkus. Reassotsiatsioonikineetika võrdlus, diskussioon

kseerivate Ba Wilcoxina kultuuris kasvab vabalt läbisegi Phialocephala, Phlebia gigantea Wilcoxina pH opt 6.5-7 populatsioonide erinevus metallireostusega ja kontrollaladel

süntees ebatsuugal jt okaspuudel, sh Lyophyllum, Suillus, Rhizopogo
juurekaela diameeter spetsiaalse anduriga
Lactarius deliciosus > L sanguifluus: Pinus pinaster > P sylvestris. Er

eostesse ei näi paikapidavat

rib pärast kuumust juurtel, on eoste poolest suurema kuumataluvusega urentsivõime

mänd vs hirss; ECM parandab männi positsiooni ja supresseerib hirssi

aar tugevalt toetatud klaadi; arv ei toimu selektsioon maasis ja maapeals vahevormide vastu; maasiseste vormide tekkides ITS var ei muutunud

mullaorganismidega neutraalne tagasiside; oluline ellujäämise ja kasvu jaoks voistlus

tagant (proovid 1m vahemaadega)

aardumiste hulka; Soovitavad mängida eraldi justnimelt oligoA sabaga; ei soovita fragmenteerimist (kontrollimatu valepaardumine!)
Sclerod citrinum, Suillus 5spp, Thel terr, Xeroc chrysent mood EcM. Tricholoma 4spp, Lycoperdon 2spp, Lepista nuda, Inoc maculipes,

taimekasv suurem ecM taimedel ja oietolmu lisandiga taimedel, suurem N, P sisaldus
taimekasv suurem ecM taimedel ja surnud nematoodi lisandiga taimedel, suurem N, I
kask 25 min H2O2 h, d, mass, lehe petri tassil+ tsellofaan

Nothof VAM
EcM Hebelomaga nakatatud pinnases on Pythiumi nakatumisvõime väiksem

generalist ECM-seened suurendavad süsteemi taimede koguproduktiivsust vrd ilma E

generalistid ECM-seened leeendavad taimedevahelist võitlu generalistid ECM-seened leeendavad taimedevahelist võitlust segakultuuris
metsakasvatuses, kommertsinokulum

s skaalast, füüsikaline sobimatus, interpretatsioon; dimensionaalanalüüs

phaerosp hinnulea. Pez kõdulagundajad. Üksikute liikide ökol. Tuleasemete elementanalüüs. EcM seentest sagedad Laccaria spp

, Laccaria. Suured pH erinevused vs põlenud la vahel.

sarea,

st liigikonts, sest s o praktiline

O2 transport veestressis jurte kaudu: mänd -läbi ohukanalite steelis; kuusk -läbi koor

tiivsus. EcM puudel üldiselt madalam pH kui AM puudel risosf vrd bulk soil, ent see võib olla okaspuude" efekt. Risosf pH korrel tugevasti vihmausside arvuk

EcM-Rhizopogoni efekt männile sõltub genotüübist ja on päritav, sõltub

hododendroni juuri. Rhizosc. Ericae koloniseeris rhododendroni juuri, mood ErM, aga kuusel oli endofüüt. Demonstreeriti ka üheskoos. M. Variabilis kolonisee

Tuber: ECM: vaja klooramfenikoli eoslahus ja vermikuliit-eoste mass

anud EcM seened Dipteroc N-Aafr-s. Paleogeenis. Arv siiski praegused Lõuna-poolkera EcM-kooslused on fragmendid ammusest ühtsest floorast (lk 149). Ex

jud vihmametsade taksonid sh EcM leguumid diverg miotseenis-pliotseenis, ent muidu liigid eri vanusega. Liigiteke ja endemism pms mägialadel

alternatiivsed meetodid	lehealgete arv j	agaritükk	mullast puhaslultuuri

nemist; mõju taimede kasvule isolaaditi väga erinev. Dendrob orhideel stimul elumust ja kasvu hoopis Vanillast saadud Tulasnellad, ent

test.

iifilisus palju väiksem kui varem arvati

, representatiivsus

seente fitness võitluses endi ja teistega

stada tuleb, et bakterid asex organismid.

Phialocephala fortinii: ühel 3*3m plotil 4 krüpt liiki ja v palju isendeid. Paljud isendid püsisid läbi 3 aasta ja mood väh 3m diam geneteid
aatiliste muutujatega

seentel (perek tase) erinevused aastati ja kasvukohati ning EcM vs EmH
inokuleeritud Pisolithuse kiire väljatõrjumine kohalike seent parim: linnamuda+Pisolithus

EcM inokuleerimine annab 5 aastat hiljem 3 eri puuliigile väga erinevaid
biomass, N, P, eksponentsiaalne söötmerezhiim: parim 12 mg N/puu kokku
4-16 nädal, ma p-v-l ettekasvatatud

usgradientfuugimine, spetsliikide määramine bakteritel, hilisem funktsionnalgeenide otsing

avatel ning epifüütsetel veidi kuivemates tingimustes

asuse ruumiline autokorr ulatub kuni 50 m-ni

polyakryylamiidgeel. Kõrge taust, piikide pikkuse kvantit arvestamine, kerge varieeruvus replikaatide seas, geeli mõõtmist ei replitseeritud, regiooni pikkused til
AM inokuleerimine parandab oluliselt India puude kasvu kaevanduspinnasel, suurend

vs ECM seened puhaskultuuris, kultuurifiltraadid, puhverdatud keskkond

v Tulasnella
ndalt isoleeritud seen suurendab kasvu enim, idaneb ka asümb; Corallorhiza odontirhiza: idanemiseks vaja külmastratif; Liparis: idanemiseks suvaline Tulasnella

x

nastavad eelistatult aminohappeid mineraalse N üh asemel ja suudavad mõnevõrra omastada N kitiinist ja muudest kompleks-or-ühenditest. EcM seentel puudul

kas ektomykoriissete või erikoid MR-seente kasv ja sümbioosi teke kas erikoididel või kasel

mullast; Kõik Pyrolaceae liigid on seotud EcM taimedega; Ei ole õnnestunud näidata radioakt C liikumist Salixist Pyrola rotundifoliasse. Arv et Pyrolatel pole e odoral; Xerocomusparasiticus Sclerodermal -arv et võib-olla toimub parasiteerimine ka mükoriisadel

Laccaria ja Thelephora koinokuleerimine oli 12 kuud hiljem parem kui kumbki seen e

väikesed genetisuurused K-strateeg-seentel

l kui geogr kaugus fülogen BDle. AUS-sse introdutseeritud puudel samad endof mis N-Am samal liigil

turbasammal sureb kui Lyophyllum palustre seda koloniseerib; Galerina parasiteerib

katteseemnetaimed: N parasiit vs sümbiont

valgus: varjukartlikud liigid kasvavad kiiremini ka varjus kui varjutaluvad muid aegla

nulla toitaineid (suurendab) ning AM-seente kooslusi Aafrikas

gümnoteetsiume, mis sarn teleomorfse perek Myxotrichium omadele. Viitab O maiusele kui kiirele orgaanika lagundajale

dud taimeliikide invasiivsust stimul; paljudes kohtades mutualistidel on unikaalne funktsioon

ECM kasvu ei mütseeli ja vee segu

x

ECM vs Actinomycetes: peamiselt inhibitsioon kontseptsioonist

t

mändidel koige paremini (suurim elumus ja kasv) kui inokul mannimetsamulda vs pul

pH taimejuurte ümber

ynthase geeni, mida va-mä seentel ainus koopia. Muudelt genoomiomadustelt vamä ja prmä seened sarnased

erinevad spoori ja mütseeli inokulumi kontsentratsioonid

Russula subsect foetineae Indias Dipterokarpuste metsas: suurimad genetid >70 m pikad [arv ISSR pole piisav eristamaks geneteid]. On ka väiksemaid genetei

eellased; II tihe asustus kõigis taimekudedes, k-a jurtes ja seemnekestades -nt Phoma; III lehtede ja varte seened, infekts sporaadiline; IV

ulnud Rhizobiumid: IGS, nifD ja nodA fülogeneesi põhjal domineerivad POR kohalikel taimedel

ıe

mass

e jt on saproobid v Helotiales

Tuber mela Tuber melanosporum: veget faas haploidne, mükoriisades vaid 1 MAT-tyyp; VK gleeba on alati üks MAT-tüüp, eosed poole

biomass kolbis: IAA aktiivsus, ECM petri tassis

vs CO2; vs veestress; ECM, juure mõõdud, lehe [N]

imede rakendus metsanduses, põllumaj ja keskk stabilis. Mükoriisaseentel oluline roll muu mineneraaltoitumise kohalt

tustest pärines eri kontinentidelt. Parim ITS barcoding vahemik on 96-97%. Inocybe on identif ka rohujuurtest, mida arv et see on kas mu

d

semel ksülaan, lisaks palju vitamiine, seleniit,org-happed. Pms uued alfaproteobakterid ja atsidobakterid

Melampyrum oli palju parema kasvuga ja reprod mykoriisse Melampyrum oli palju parema kasvuga ja reprod mykoriissetel mandidel kui mitte-M

ntel

listada liigisisest BD rühmasisesele Bdle? AM liigikontseptsioon; erinevate v erin tuumade olemasolu AM eostes

en tahab oma evol mudelit

ECM seened kasvavad reeglina palju paremini NH4>glutamiin>glutam

Am ning Eur ja NW-Am disjunktid on v vanad ja tek enne Thulea silla katkemist. Ei saa väita, et NE-Am ja Aasia vahel oleks liikide suunaga liikumine. Eur-NV

Burkina Faso: Isoberlinia, Brachystegia, Uapaca, Monotes: pms Bole

cortinarius sp
Amanita muscaria: kattuvus???

ECM +-MHB vs patogeenid agaril

on väga väike ja eri liikidel v sarn. Glomus intraradicesi arvukus korreleerub taime N-sisaldusega

silendatud kõverat ega seega permutatsioone

utatud esinemine). LIBSHUFFID jms pole eriti võimsad. Unifraci indekseid ei saa usaldada ℓakse jkinni

deemide rohkust

Mõned seente metaboliidiid inh fotosünteesi

ıs võib olla ühes geenis; Juurte-endof kolonis on pms laiem, mitte nii lokalis kui lehtedes-vartes; endofüütidel-parasiitidel v palju sarnast

kal. Sama liigi uued genotüübid võivad kohalikud välja tõrjuda või geneet modif. Invas se EcM ja AM seente introduts: ülevaade ja ohud: seend ei pruugi soodu

genotüüp. Oluline osa sellest on pärilik hübriidide järgi. Ühel liigil küll, ent teisel mitte.

EcM seened parandasid 2 dipterokarbi liigi kasvu ja P konts. Liigispets erinevused ta

list profiili

! Arv. Et ErM ja endof kattuvad

Laccaria bicc Laccaria bicolor: introdutseeritud vs kohalikud tüved

Laccaria

ınis mitte-tavapärast peremeest. Peremeestaimede omavah hübridis on ainus moodus, et hübriidsed seened leviks liigipiirest edasi

davad küsitavaks saproobidel ja endofüütidel vahetegemise

Leccinum duriusculum: noores metsas suur genet, vanemates palju väiksemaid: rajaja efekt -1m kasvukiirus a-1

mblad. Arv assots tek konvergentselt

proobide BD kasvab, Hypocreales kasvab, ent Lecanorales, Helotiales, Geoglossales, Rhytismatales kahaneb

Rhizoctonia
antgonism, probleemid, analüüs

ECM vs Rhizoctonia uued meetodid mass

mulla mesofau mulla mesofauna parandab, sõltuvalt f-n grupist taimekasvu ning N-si

ad assots nii kottseentega kui Sebacinalestega, ent vaid Cavendishioidid mood rakkudevahelisi hüüfe ja õhukese seenmantli

81%. Arv et sekventsid , mis on >95% identsed kuuluvad samasse AG-sse või subAGsse.

jämedus

xxx

lla sp (arv nonEcM

Deterrimus) viljakeha tükkidega 18-a kuuskede inokuleerimine mitmed EcM seente kultuurid stimul seemnete idanemist

lehüdrogenaasi abil hoiavad tasakaalu. OXAc lisaks Mn kelaator.

uster. Patogeenid ja endof tihti v lähedased. Mõnedseened üldiselt endof, aga introdutseeritult patogeenid (Ophiostoma, Cyphonectria). P

M

C ülekanne Betula>Pseudotsuga metsamullal

juured vs lehed vs varred; N, 13C, 14C, mass, lehepind, fotosünteesi intensiivsus

ebatsuuga vs kask, ECM amelioratsioon

fotosünteesi aktiivsus suurem juurkontaktiga puukestel kui isoleeritud puukestel

; Boletellus 2, Tricholoma 1; Leucopax (peab NM); Amanita:???; Inocybe 3; Cortinarius 5; Russula 23; Lactarius 19; Scleroderma 1 (S. s

llus 2; Russula 3

t 2 spp, Inoc, Alnicola 2 spp); Subtroop metsades vaid Allophylus edulisega -Gyrodon rompelii; Salix humboldtiana lodud: Heb austr., Neopax ech.; Lõuna-Bra

rrel taimekooslusega, ent bakterite ja AMF koosluste korrelatsiooni tingib pH. Partial Protest analüüs
ıkaalu 5-61% võrra. Nakatunud käbidel idanes 8-19% seemnetest

mikropropagats mikropropagatsioon: pärn vs Tuber borchii

ärgistatud mitte RNA. Kogu-RNAle ei mõjunud traditsioonilised signaali ja spetsiifilisust tugevdavad meetodid peale formamiidi, Puhastamata mullaekstrakt inl

taimede konkurents mineraalainete p steriliseerimine + seejä N, P, juured, pealsed vs AM ; Pseudotsuga vs Calamagrostis

metsamullal konteineris

amine ei seostu 5kolonis, kasvu stimul-ga. Seente kaudu toimus P saamine eri AM-seened tekitavad eri taimedel kas Arum või Paris-tüüpi mükoriisat. Paris-tüür

Dipterokarbid: poolvarjus kasvavad seemikud kõige paremini. Fagace fa-proteobakterid (Rhizobium, Rradyrhiz. Jt) ja troopikas lisaks beeta-proteob. (Burkholderia spp -fix. N ka rohujuurtes)

erinevate okaspuude seemnete idanemine eri soo mikropaikades: erisamblad on olulis

visuurus, kogu liigirikkus, võrdlus, usalduspiirid

Mükoriisa on oluline taimede transpiratsioonis ja fotosünteesis

od hübriide, levik lihtsam

t Phellinus

kuuse ja lehise pistikud: Kuusel Laccaria ja Boletinus Cavipes ning eriti IBA soodust
lehise noored loikmed: Laccaria soodustab juurte, mitte kalluse teket; NAA ja ethefor

antagonism
xxx, tuuma ülekanne
Heterobasidi antagonism
otsed genetid inkorpor endisse haploidseid eoseid et säilitada potentsiaali, sest on tugev konkurents, vähe toitaineid ja vähe vaba ruumi

Cantharellus: spooride idandamine ja viljakeha tükkide kultiveerimine
hkem taimedega aladel kui mullas. Kerged erinevused 10 -50 cm 10-kaupa kihtides

Kastani mikropropagatsioon seemnetest ja seejärel pungadest. ECM hilisem süntees I

ener praimereid, mis arv on põhj spoorisis arinevusi eelm uuringutes

mulla mikroseened vs ECM sünteesikatsetes: mitmed inhibeerivad

ella. V sarnane Cornus canadensise juure-endofüütidele. Väga vähe leitud ka Verticillium fungicolat

xxx antagonism

Laccaria vs Fusarium, tugevam kui vähe C-ühendeid; kultuurifiltraadid inhibeeivad idanemist

Populus: F1 põlvkonna võime moodustada ECM

liikide paiknemine juhuslikult mass

nasemate DNAdega; graafiline esitlus klaster/puu kujul erikeskkondades leiduvate geenide kohta

glutaaraldehüüd fosfaatpu
Tylospora: väga kerge ku

Laccaria amethystina mükoriisast puhaskultuuri eraldamine
arutelu

inokulumi potentsiaal: väga erinev BD võrreldes päritolukohaga

elt mitterekombin seeni polegi teada. Fülogen liigikontsepts langeb kokku morf-ga, ent peenem. Spetsialiseerumine eri peremehele, peremehe eri kudedele, regio

nimtegevus

Shorea spp: EcM kolonis ja kasv on parem valguse käes kui varjus, ent enamus liike

mineraalide sis eelkasvatus, ümberistutus koos inokulaadiga

emas staadiumis üheltki liigilt ei leitud. Seemned idanevad ka hästi ilma sobiva seeneta ja kasvukohtades, kus liiki looduslikult ei kasva.

vahet pole sterilis ja mittester pinnasel. Mittester pinnasel kasvab ka muud seened; Külm 100 000 eost poti kohta parim; vahet pole sterilis ja mittester pinnasel

Allocasuarina all palju seeni, mis samad eukalüptide ja akaatsiatega; Casuarinade all v vähe liike ja harva

idi erinev ka peale Ps. Fluorescens inokul ja fungitsiid imazalili kasutamist. PsF ise vähenes aja jooksul tunduvalt

Phlebopus sudanicus: väidet on EcM, aga tegelikult mood vaid seenm

genetid kuni xxx-genetide määrang

peale inokuleerimist avamaal

ECM soodusta mycobeads

Robinia: AM, ECM, Frankia parem kui niisama, koik kombinatsioonid paremad kui y

parim kui oli ECM + seemned. Seeme mõjutas rohkem kui ECM

niidutaimed: eri koloniseerimine, suremus, konkurents võimaldab koeksistentsi

estades mullaparameetreid, selet 20%. Leiti EcMF ka paikadest, kust peremehi polnud - arv idanemisvõimelised eosed

liikidevah antagonism 692 693, 697,698 res

eraldus

säilitus

suurem seente arv mikrokosmis induts kiiremat substr lagunemist, kuna ühed seened induts teisi. BD efekt suurem tselluloos

/I-seened; Ruumiline autokorrel üle 10 m.

idel

t inokul mittester pinnast (10 000 000-40 000 000), ja MR kolonis mittesteril 2 korda vai 10 korda rohkem eoseid vaja et inokul mittester pinnast (10 000 000-

: vaid v vähesed liigid saavad seal elada. Vaid EcM elustiil pole eeldus monodomin-ks, ent soodust faktor. Arv et monodomin soodust ka varjukas ja ühtl võra,

ıem ja toimub suktsess. 20-a-katse.

ed tek kohastumusena per põuale, aga ka külmale. EcM seente tekkeaeg arv langeb kokku esimeste imetajate ilmumisega. Osad seened minitseerivad puuseemr

s. AM biomass juurtes mulla pindmises 10 cm kihis 4 g/m2 kõrbes kuni 44 g/m2 rohumaadel.

idevah sama perek sees

luline roll taime immuunsüsteemi kujunemisel

orhideedel vs saprotroofid (soodustavad idanemist)

nnavad erinevaid tulemusi OTUdeks tegemisel sama barcodega; eri perekondadel liikidel erinevad ITS erisused liikide vahel. Eluviisi ma
ıs ca 50% isolaatidest
ente klassides taime hõimkondade kaupa. Ligi 25% Männi lehe-endofüütidest lagundas edasi ka okkakõdu (sh ülejäänust 66% olid single

Thelephora ECM rohkus tugevalt neg korrel juurepatogeenide arvukusega

ndronil, samas juure-endofüüt paljudel muudel taimedel ja saproob mullas

matsutake: P/V, SH sööde glükoosita, kiire ECM teke

Tricholoma matsutake + Pice abies, Pinus sylvestris ok; erit

es septadeta ning ei suudetud rühma tuvastada

ı pidev ühtlane valikusurve
olla sarnane taimede ja loomadega. Ei ole siiani arvestanud mikroskaalas kk heterogeensust. Ruumala on palju parem näitaja kui pindala

N, P, mass: sõl paju pistokstele

pikkused, N,P agaritükkidega; AM-ristiku juurefragmentid glutaaraldehüüd

eemides kui rikastes

mass, N, P sisaldus

AM amelioratsioon

ıed mõjutasid taimede funktsioone eri aastaaegadel. AM BD ei omanud positiivseid mõjusid. Teatud AMF liigid andsid taimedele rohkem P kui teised.

vad rohkemate AM-seentega, ent tagasiside oma mullaga negat-neutr. Invas kõrrelt saadud seened ei pärssinud kasvu, ent kohalikult taimelt saadud seened pärs

ıniversaalsus v oluline on uurida interaktsioone laiemalt, mitte vaid 2 osapoole vahel, vaid kaasata ka muud seonduvad. Taim-patogeen + mükoriisa,antagonist,

gevusega kohtades, biodegradatsioon-kiire konjugatsioon ja originaalbakteri häving
sioon NS31-AML2 ja ilmselt ka NS31-AMDGR. Soovit kasutada kahte kattuvat paari koos, sest OTU-rikkus ja koosseis täiendavad teine

AM-seened

e ja seente ning bakterite sekveneerimine: DNA, rikastatud RNA ja rikastamata RNA annavad eri tulemusi - näitab mikroobide aktiivsus

; Varieerus eri taimeliikidel

juurdekasv väiksem topelthuumuse kihil ja väiksema %ECM korral
eri kogus Al:talub üsna hästi

ora terrestrise ensüm aktiivsust soodustas teiste EcM seeneliikide manulus. Ensüümide akt korreleerus taimede N-sisaldusega.

, mitteperfor parentosoomid; klamüdospoorid; kolonis juurekorteksit

;enoomisuurusega ega sellel ole ka fülogen signaali (genoomisuurus on konserv); Parim liigi-tasemel threshold 99%, perek tasemel 95%.

unktsioonis. Võrreldavad liikidena

jutine, peale kontinentide drifti

arbikuliste juurtes

vs inokuleeritud L. bicolor-istandikus ei lase teistel liikidel ı eelnevalt L. bic x

õjutavad taimekoosluste funktsiooni. Osad seened soodust taimede prod kui palju P allikaid oli mängus.
ericae ja Phialocephala fortinii ja O. Maius -arv komplement-efekt

ıidele 6 probet
obet

selged substraadi/elukeskkonna eelistused. Ringpuu

uhmerdamine enne CTAE

: Hymenosc. Agregaati. Erikoidse ja ECM isolaadid enamasti samades klaadides ning 100% ITS Idga. Muude taimede juureseened pms eraldi: Lachnum, Pyren suunad mükoriisa uuringutes, eriti geeniekspressiooni osas, Huvitav valdkond ErM seened lehtmetsades

olide lisamine, tugev mõju änniokaste lisamisel. Fenoolide lisamine stimul eriti seeni

e efekt oli väheoluline. Domin Epicoccum sp, Capronia sp, Agaricales sp, Mortierella sp, Metharhizum sp, Fusarium sp. Teiste hulgas ka EcM ja endofüütsed

ekv põhjal väga erinevad tulemused

ECM vs erikoidMR

CO2 vs N tasemed: polnud erilist mõju

vedel N2

biomass: ECM sama

N, P, K, suhkrute sisaldus, biomass

vedel N

kasv parem kui spets seenekamber

kasvab paremini kui lisada biotiiti või KCl K allikana

etel. Mullastikus suhtes erinevus hõimkonna ja alamhõimkonna tasemel

um (hiljem = C. Finland.). Määrati P. Dimorphospora (Richard ja Fortin) Ph. Fortiniiks - arv. = Melini MRA. Chloridium ja Phialophora

thera (Euphorbiaceae), Goodenia, Acacia, Pultanaea, Pomaderris, Trymalium (Pom), Thomasia (Sterculiaceae) ja Stylidium (Stylidiacea

Lobelioideae mõned 1a Austraalia liigid mood EcM (Lobelia heterophylla), teised mo

isolaadid mood ainult OrM ja olid endofüüdid

(mitteMR); Lachnea vinosobrunnea (MR); Peziza whitei ja Muciturbo (mõl MR); 2a Boudiera tracheia (MR); Plicaria alveolata (MR); Plicaria endocarpoides

eucalyptus +Endogonaceae. Kasv suureneb 10 korda

urtest isoleeritud seente abil: Thelymitra spp ja Diuris spp vs Tulasnella calospora jpt. T calospora on parisperemeesseen, mille isolaatidel v erinev efektiivsus s ımale (Cerat, Tul, Serendip, Tricharina v Peziza). Ristumine sõsarliikide vahel vaid parapatrilistel, mitte sümpatrilistel liikidel; interaktsi

u kordi tek. Nii maa pealse kui -aluse petmise korral limiteerib petetavate rohkus. Spetsialiseerumine on arv. üks liigitekke mehhanismidest

Gyroporuse v ka Leccinumi sugulane. Sclerogaster, Octavianina, Wakefieldia mood Octavianinaceae. Calostoma on arv seotud Sclerodermatalesega ja arv mood

ımusel ja kasvul pole vahet Thuja ja Tsuga laikudes

Tuber aestivum: produktsioon Rootsis

Thelephora terrestris jt2 liiki kui metsataimlate patogenid ja puudekägist

elt. Jaguneb kaheks grupiks: 1. S. Vermifera+ Piriformospora AM-taimedes + erikoidne ja jungermannoidne mükoriisa + OrM; 2. S. Incrustans, S. Epigaea, Tre

juurekultuuridele inokuleerimine

ıed kui protokormiseened. Goodyera kasvu stimul ka mitmed temalt mitte-isol seened. Tipularia protokormidel, mükoriisadel ja CWD-l sama 14C muster

. Vaja kasut DOIsid ja neid andmete kasutamisel ka viidata!

põlenguseentel valitseb konkurentsi hierarhia, kus varasemad tõrjutakse välja hilisemate poolt.

naadel. BD suurem märtsis-mais (kui liigirikkus suurim ja domin Fusarium ja DSE sp1 olid vähe). Liike vähem ja dominantsus suurim jaanuaris, septembris. Fu

inlandia (ektendoMR, stimul kasvu mõl, er pH3 juures), Chloridium pauci Phialocephala dimorphospora (stimul kasvu pH3 juures, mitte pH 5.7), P fortinii (stee

puidus ja agaril; monokaarüonite dikarüotiseerimine mitmest eri kohast, mo saprotroofi puusse inokuleerimine punnide abil

x +kirjeldus

juurkonkurents preerias karmim kui metsas haavale, ent mitte Boutelouale. Haab ECM-puu

idudega transp oluline

ka eelnevalt on teada seonduvat mükohet taimedega

ja vartes vähe seeni. Risoomis Trichodermat pole)
ıl ajal; andmete võrdlemisel kas Chao1 ja ACE liigirikkuse hindajaid. AM kolonis vaid taimi, mis kasvasid kuivemal pinnasel. Ühes Taimes 6-10 liiki

soodustab rohttaimede kasvu

Amanita phalloides invad N-Am: VK enamasti leitud teede ääres, ent mõnes kohas ka sügaval metsas. Invadeeritud paikades ed; arvukus väheneb vertikaalselt; suurim tihedus on maismaal

biomass: Laccaria eritüved: mono-ja dikaarüonid-käituvad sarnaselt, tüveti suured eri

lenevad eelkõige tuvastamata haruldastest liikidest, mis moodustavad pika saba

ECM seened juurte koloniseerimise pärast. ECM ja hüüfistiku asendumine, topeltkolonisatsiooni anatoomia

Cenococcum: levib primaarse suktsessiooni aladele vegetatiivselt. Lähedastel aladel mõned identsed genotüübid. Mingit jälge paraseksuaalsusest pole. Mida vä

lliseerijad, kust EcM seened annavad N taimele

niine. ErM juured said rododendroni pinnaselt paremini kätte N ühendeid kui EcM ja AM taimed - tegu nii suurema SRL kui ErM seente
ı Serendipita vähem ka EcM-seeni, Phlebia ja Mycena galopus. Juurtest identifitseeriti palju lakaasi-sarn peroksidaase

sterilis., spets toide

mitmetes systeemides: matsutake, eri väetiskogused-oluliselt ei mõjut

pealse kõrgus inokuleerimine kolbi (p/v; MNC sööde)

lepal EcM mood eelduseks on nakatumine Frankiaga. EcM seened suurendavad veel

Kalmia (Ericaceae) inhibeerib

nesid alpha mullaseened vs. Girdling: kontrollis EcM seened Cortinarius, Atheliales, girdling: Helotiales, Serendipitaceae, Ganodermatac

ei klapi

peale inokuleerimist. Mikrosklerootsiumite teke ja sisald. palju polüfosfaati ning glükogeeni, mis arv. taimest saadud

n orhideedega primaarselt seotud.

Na-hüpoklorit 10 min kehvem kui Hg-Cl 3 min

leesika seemne leesikas + mfg seened sh kuuseriisikas (Lactarius sanguifluus), Rhizo

akorda on seotud taimede liigirikkusega Tilmani plottides; samas muutused mikroobikooslustes ei korreleeru ühegi taimeliigi ega funktsionaalse rühma puudum

u

kasvuhoones Tuber borchii vs Hebeloma sinapizans, Laccaria, kontaminand eose suspensioon: Tuber
ECM: Tuber vs Hebeloma

eda suurem on kolonisatsioon

eda suurem on kolonisatsioon

netsakõdu all sama halvasti kui laboris, v.a. Üksikud erandid. Need, kus idanemine toimus Tulasnella, Thanatephorus ja Ceratob v harva patogeensed EcM taim

populatsioonidünaamika, geneetilise distantsi, pop jagunemise teooria, metoodika, kitsaskohad: ülevaade
Mycosphaerella graminicola: vt pealkiri, levikutsenter Lähis-Ida; samal lehel enamasti erigenetid

lest mood katseliselt ErM. Phialocephala fortinii ja üks kandseen mood mõnikord coile meenutavaid struktuure

diversiteet ning liigirikkus palju suurem, domin pole; all tugev domin, domin ka üksikud fülogen rühmad
nkurents, isol bakterite diversiteeti mullas mõjutab C-rikkus, C-heterogeensus, konkurents, isolatsioon, vähem kk fluktueerumine ja C eleküllus. Kui isolatsioon

üldkatvus vs d, h, mass, %ECM

Suillus grevillei
Suillus grevillei 2 metsas 2 aastal. Aastati genetid prod viljakehi eri paigus; genetid suuremad 35 a lehise monokultuuris kui >85a lehise-segametsas. Arv viima
ISSR e SCAR mikrosatelliitmarkerid (3) Suillus grevillei jaoks -3 markerit ei võimalda kõiki indiv eristada, eri kodominantsed markerid on lokaalselt tugevasti

Kalmia (erikoid) vs kuusk | kuusk vs kalmia allelopaatilised ühendid (fenoolsed orgaanilised happed): tugevalt pä

l on N-miksotroofid, kuid mitte C-puhul (v.a. Orthilia secunda v varjukas metsas: 28%). Ei korrel valgustingimustega. Pyroloidid seotud paljude eri EcM seente

KK muutus ECM mõjul	ECM mood. Eelc	Stabiilsed isotoobid	Süsiniühendic	Mineraalained

SILVAs olevatele; samas Ameerikas enamik laiemaid fülotüüpe 90% tasemel kattub. Central Parki BD akumulatsioon on vaid 6% m

ıst seletas SQRT-sekventside arv. Eri seeneharudel erinev trend kõrguse suhtes ja taimede-BD suhtes. Glomeromycota ja taimede-BD

as eri taimede lähedus vähem kui baktereid.

te hõimk muutused väikesed

sarnasus. Suht-ohtrus vs. abs ohtrus. Pushib oma arraysid

ärad koosluse str tuvastamises. Ruumenis eri hõimkonda kuuluvate organismide kooseksist ja vältimine eri põhjustel, ent ka geogr. e

da madalaimat näitu(???)

one!! Kimääre+kontaminatsiooni 0.03%

Hansen K, Harrold P, Heller G, Herrera G, Hirayama K, Hirooka Y, Ho HM, Hoffmann K, Hofstetter V, Hognabba F, Hollingsworth PM, Hong SB, Hos

13C: kottseened ja ikkesseened fraktsion 13C erinevalt PLFA ja aminohapete koostises.

14C-rRNA eraldamine gradie 14C-rRNA eraldamine gradienttsentrifuugiga, kvantifitseerimine, array lii

Põhja-AUS Cairnsi läh: Eucalyptus grandis: vanad puud ligi 100% EcM kolonis ja 2-20% AM kolonis, noortel puudel 10-9

AM vs ErM taimed erineva N, P juures

Ramaria: subgen Lentoramaria ja Echinoram. Ja asteroram. Isotoopide 15N sign baasil. I

14C hingamine väga vanas m 14C hingamine väga vanas mükoriisas sarnane sellega, mis noores

OrM: Goodyera repens vs Ceratobas cornigeru OrM: Goodyera repens vs Ceratobas cornigerum: MR t

luses mitte üle 30 m eemal. Na Intsia palembanica saab EcM seened kui kasvab Dipterokarpide läheduses mitte üle 30 m eemal. Nakatumine juba 1 kuu pär

spooride idandamine bakterite mõjul

BD mõjutaja: takistab mittesobivate taimede kasvu

dikarüootne mütseel vs sobiv pinnas (vulkaanilisel alal)

NH4NO3 mõju mullamikroobidele: Laccaria tõ

N omastamine: vana vs noor kultuur

kasutada ITS + 1400bp LSU endof uuringutes. LSU 4-geeni-puu selgroona. PROGED .

eaalses liike vähem, ent klasse rohkem; Lihhenikoolsed seened on tähtis allikas endofüütide BDle. Leiab vajadust ühtlustada proooviv

introdutseerimine

Ca-oksalladi kristalliseerumine

Piloderma fallax muudab mulla juurte ümber vrd mitte-MR juurte ümbrusega toitainetevaesemaks, er K, Mg, Fe, Mn, Al, SO4, NO3 poolest

P jt ainete liikumine mööda tubulaarseid vakuoole: ülev

mida rohkem valgust, seda rohkem EcM tek. 10-30% norm päikesevalgusest on kriitiline vahemik

15N taimedes, seentes, mullas üle kõrgusvööndite: kõrgemal 15N kasvab taimedes ja see

inokpot Minnesota tammesavannis vs N väetamine; vs resistant prop inokpot Minnesota tammesavannis vs N väetamine; vs r

ECM kooslus N gradiendil: kõikjal Cenococcum; kõrge

ıliigi alt korjatud seente isolaa Afzelia africana -tsesalpiiniline-ECM süntees õnnestub vaid sama puuliigi alt korjatud seente isolaatidega: Scleroderma spp.

4 ECM seene kas 4 ECM seene kasvu fraktaalgeomeetia eri C ja N söötm

sobiv substraat

ECM EMH jaoks võetakse koguproovist kohe PLFA18:2w6,9 ja ergo nin

tega. Kardetakse Nothofaguse metsade pärast nasolu kohta

pole märke Suillus tomentosuse 'kivisöömisest' kui vaadelda seene kinnitumist mineraalipinnale

13C, 15N sama hemipar ja peremeestaimel, N konts tugevqsti korrel er vaikse N sisald peremeestaimel

13C: Taimede siseselt mõjutab 13C väga palju ökofüs tegureid

DSE: Aspergillus ustus -voimeline omastama fosfaate n

märgitud fosfaati suudab transportida Tuberi viljakehas

delta C13, N15, S34: ohureostus mojutab tugevasti metsi, delta N15 suureneb kovasti taimedes ja huun

pajul nii am kui ecm soltusid enim ajast ja kohast kui N-väetamisest

EcM seente suurem diversiteet suurendab org P, aga mi

iginaal juureproovidega

inokulumi potentsiaal: võõr-vihmaussid???

väetamise korral

%kolonis)

sobiv N/P

N/P väetise erihulk

hüpaporiin 10..1000 ym tekib eukalüpi juurte läheduses, mitte-peremeestaimed ei mõjuta; juurekarvad kaovad; muid mõjusi

m . Mõl liigid ühendasid igast vanuseklassist puid omavahel; Ühel puul tuvastati max 8 R vesiculosuse genetit. Networki teooria are

lehekõdu

N söötmes piiratud

va tõttu, mis võib olla teine faktor liikide vähenemisel

ebatsuuga seemikute koloniseerimine teoste ECM seente poolt palju aeglasem, kui puu inokuleeritud Rhizopogoniga

lofüütidena. Kõigil Erica juurtest eraldatud agari-morfotüüpidel esines ErM mood võime. Pms identifitseerimata Helotiales. Puudusid Oidiodendron ja Hyı ıikade vahe; ent distantsi kasvades nii puupiires, puude vahel samal pollul kui eri poldudel ge distants ei suurene. Üldse polümorfism väga väike: arv vana

emehest maksasamblasse Tulasnella spp Cryptothallus mirabilisel, taassüntees mikrokosmoses, 14C

Ceratob, Sebacina, Tulasn; Dactylorhiza majalis: C 13C erinev eri troofsusega orhideedel: mykoheterotr, autotroofid metsas vs niidul; seotud ecm-seenteg v

sink strenght seen N, P väetamine, mõõtmine

dium mükohet; Aratundmismehhanismid ja C transpodi füsioloogia

kordselt labiilse troofsusega seltskond

kägistamisega väheneb männi EcM kolonis ja EcM ei moodusta mütseeli niivõrd. Suureneb MRA hulk

valgus väh 25%, kuigi Cenoc mood EcM ka väiksem a valgustatuse juures

aminoisobutüraat, aminometaan

ECM seened lagundavad kive ja võtavad Ca pms apatiidist. Nulul 95% Ca apatiidist, vahtral 60% ECM seened lagundavad kive ja võtavad Ca pms apatii

15N: muld vs lehed Nothofaguse metsades CHL

ECM kolonis, BD madal põllumaj-akti maadel < 5 -10 a mahajäetud põld < mets, preeria. ECM kolonis ühtlus suur põlluma

e. Pseudoreplits disain, n=50. Paljude seente koosinokul andis parema tulemuse, eriti massile, veidi ka kõrgusele ja diameetrile. Arva

ıimekasvu [P], [N], [Fe], vähe algloomad pärssisid Paxilluse kasvu

›uudega. Elumus vahepealne kui puudub nii juurte kui vanempuude EcM seente mytseeliga kontakt ja korgeim kui on ainult mytseelivorgustikuga kontakt.

substraat-inokulaat pärineb ECM puude lähedalt

13C: seente 13C rikkus viljakehades on ar v. Põhjustatud eelistatult 13C-rikaste süsivesikute omastami

ıgut, aga mitte NH4 ega aminohapete omastamist

Üks Paxilluse tüvi mõjutab eri seemnepangast kuusked

im sama suureks ning sisald sama palju P. Descolea ja Laccaria mood viljakehi potis, eriti madalat

P lisamine: seentest oli kasu madalate dooside juures, a

EcM taimed samamõõtu. Mid

EcM seentest eukalüptile oli kasu vaid siis kui muld oli väga kuiv; muidu kontroll ja EcM taimed samamõõtu. Mida niiskem

ıdel (29% sagedus kõigist). Cf. Cenococcumi isolaat (95% sarnane) leidus kõikjal palju

kandseent (arv. Saproobid). Kultuuris vaid kottseened
ı liike kui kultuuride sekv

13C: taimelehtedes toimub 13C diskrimineerimine nii difusioonis kui RUBISCOs. Üleva

PAH degradeerimine ECM seente poolt -vedelkultuur, suur soltuvus subs

15N hulk korreleerus vastuypidiselt ECM kolonisatsiooniga troopika 3 seeneliiki kasutasid efektiivselt nii org kui anorg N-allikaid. Esines interaktsi

e mõttes. Pms Pisol, Sclerod ja Tom tüved

Thelephora: vaba juurestik

N, P hulk, N/P, põhjalik kirjeldus

N, P mõju mükoriisa tekkele ja hulgale

ohutu ruumiline varieeruvus 15 EcM vs AM inokulumi potentstsiaal: aastaajast ei olene AUS. Mirbelia diletata ja Eucalyptus calophylla reageerisid v erinev

inokpot AUS: v tugev ruumiline varieeruvus 10-cm skaalas, mulla häirimine vähendab EcM inokpot Mirbelial, ent mitte Euc

e kahtlastest teadetest -ecm puhul tulenevad pms HN mittetähtsustamisest

ECM teke: juure apikaalmeristeem kattub ohukese mantliga, seejärel tekib hartigi vorgustik ja paksem mantel, juurekarvad l

N hulk, mükoriisa teke. Kõrge N>intratsellulaarne kolonisatsioon, ta N, mõju mükoriisa tekkele, mikro-ja makroelementide s

sed

ECM konkurents ECM konkurents

P säilitamine polüP-na samasugune nii veget mütseelis l seende sattunud C seende sattunud C paikneb seenmantlis ühtlaselt, seen c

el ja puidus EcM seened ei pruugi ise lagundada, vaid seda teevad saproobid

Clavulina jt talveseened metaboolselt aktiivsed talvel, C

eket, kontr-taimedel mitte; samas kontr-taimedel on kiirem biomassi taastamine peale biomassi hävitamist: trade-off

litamine agaritükkidel steril dest vees

olalahuses

tselluloosi ja selle osade mittedegradeerimine ECM ja erikoide MR seente

aevad kompens-mehanismid

ootmisele

ECM teket -mantel on õhem ja hartigi võrgustik on imelik. Cyl tungib läbi Laccaria mantli, ent mitte läbi Paxilluse seenmantli. Mitte-MR juurtel arenesid k

o osmootse surve, kaitse UV, kuivamise, ensüm lüüsi, kõrge temp, oksüdantide, toksiliste metallide, arv ka fungitsiidide eest. Patogeenidel allelopaatias, to

taimede BD

e kasvu

sisaldus erivanusega ECM juuretippudes

transport P transport

ECM biodegradatsioon ja lignolyys:ylevaade

liigisisene varieeruvus metaboolsetes ja füsiol pro liigisisene varieer liigisisene varieeruvus metaboolsetes ja füsiol protsessi

mükorisosfääri seened ja MHB mobilis paremini Fe ja I

Phialocephala fortinii ja Phialophora finlandia suudavad lagund polüsahh

Orhidee annab seenele rohkem C kui ise vastu saab

Goodyera repens: Goodyera repens: seene (Ceratobasidium cornigerum) j

hüüfid on võimeli hüüfid on võimelised elus-samblast toitaineid välja ime

polnud sarn ITSe. Enamus seeni olid patogeense iseloomuga

Rhizopogon toodab palju Oksalaati vrd Hebelomaga ja parandab oluliselt taimede P-toitumist erin Rhizopogon toodab palju Oksalaati vrd Hebelomaga ja

nokuleerimine erikontsentrats spooride sobiv kontsentratsioon

mis koosn isolaatidest. Seal eri isolaatidel eri AFLP muster, v sarn muster ja grupp võib tulla kaugelt alalt

Kongo Ituri taimestik: 15N ja 13C negatiivsemad alustaimestikus vrd ülarindega

N-ühendite imemine, transport: ülevaade

ainevahetus: ülev ainevahetus: ülevaade

N

Suillus viljakehi tohutult-arv saab kohalikust mullast lisa C-ühendeid, vähendab Suillus viljakehi tohutult-arv saab kohalikust mullast lisa C-ühendeid, väh

Na, Cl, SO4 stress

vs VAM

/. Tehti suurt vahet ka männi j Scleroderma spp: männi ja eukalüpti kolonis eri liikidel ja sama liigi isolaatidel erinev. Tehti suurt vahet ka männi ja eukalüp

Eukalüpti EcM seened eukalüpti liikide vahel ei vali, ent mändi ei nakata. Samuti ei lähe eukalüptile Suillus ja Rhizopogon

a rotundif eoste idanemise kirjeldus??????

vu, er Rhiz Kõigi kolme seene inokul ef on aritm keskmine. Laccaria oli algul rohkem, ent vähenes kiiresti Rhiz arvelt
änni kasvu palju efektiivsemalt kui teised seened

siseste viljakehadega; Zelleromycese eose ornament kadus peale seedimist; kui panna eukalüpti seemikute juurtele, idanesid ja mood EcM väh 7 liiki

seene viljakehade toiteväärtus loomadele: enamusele ei

EcM ja saproobid eristusid hästi. Parasiidid kas vahepealsed või ekstreemselt 13C vaesed

pinnase töötlemine: ebaselge

ıksonite

N väiksem ECM-taimes

P omastamine

N akumuleerumine lehekõdusse	respiratsioon	lehekõdus balanss

tu

orav Spermophilu orav Spermophilus sööb palju Elaphomycest: eoseid ei

EcM taimede kasvukiirus korrleerub C allokatsiooniga mükorii

ECM koosluste tähtsus metsa ökosüsteemides: mobiliseerivad elemente mullaorgaanikast, kuigi ilmselt otseselt ei lagunda polümeer

ıuudus tuli 2* kiiremini 15*c kui 6*C juures; hiljem juured taastusid
uresteelis spets ohukanalid. Adapteerumisajaga juurte elumus palju suurem
ıs, ent männil mitte. ,kuusel ksüleemi juurdekasv pidurdus järsult

15N: NM>AM>ECM>ERM. Globaalselt 15N kasvab temperatuuriga 0-30*, N kons-ga l

!003 ajaskaala. Niiske metsa eukalüptid v liigivaesed -pärit niiskest ajast. Eukal haaksid radieeruma al 60 MAT, Casuarinaceae 47 MAT, ent põhirad hiljeı ja metsa vahel

Agropyron: pott jaotatud väetatud ja väetamata pooleks
Agropyron: kahes kambris -taimekambris olev mittemü

kõdu lisamine: suurendas kolonisatsiooni, vähendas liigirikkust

pinnasekoorimine vs huumus vs nende serv: sama

ülevaade, viited x

Cantharellus: CO_2, aeratsioon
Cantharellus: mitte-liigniiskus, hapnikku, CO_2, Pseudomonas florescens

Wilcoxinale pole vahet (kolonis 95-99%); turbal sama hästi kui turba vermikuliidi segul v a Pisolithus. Taimekasvu ei mõj inokul ja kasv 20 näd

pH; sesoonsus

algul E-strain; hiljem (3a) Suillus, MRA, Tuber. Lühijuurtel seened asenduvad üksteisega, mitte et juured sureks

ne männiga ja leesikaga+kirjeldus

hea kui kaevanduspinnasele lisada turvast, halvem kui väetada või lisada muda

13C, 15N, 2H, 18O kasutamine koetasandist indiviidi ja ökosysteemitasandini: ylevaade

pärast inokul.; aladel kus muud EcM taimed olid kasvama jäänud, oli EcMF BD suurem

seente toiteväärtu seente toiteväärtus võrreldav köögiviljadega, enamus ar

Hebeloma: mono vs dikaarüonid-sama

toiteväärtus Za toiteväärtus Zambia seentel: Zambezi aladel 39

EcM kolonis sõltus fertiilsusest ja konkurentsist, aga mitte varjutamisest. Kuuse EcM moodustamist stimuleeris ja männil in

ing tapavad Casuarina equiset Pisolithus ja Scleroderma sobivad Allocasuarina ja Eucalyptusega, ent ei mood HN ning tapavad Casuarina equisetifolia. Eu

vastatud)

15N: eristuvad kõrrelised ja N fix liblikõielised. Puudel N fix liigid ei eristu EcM puudest ja AM puude

ECM% sõltub seene genotüübist; juurte koguarv taime genotüübist eri arengulooga L.b. S238 osad vs ECM võime ja taimekasv

oni; eksperim küll vildakas ja sampling efekti mõju; kõikidel juhtudel mitu liiki parem kui eri monokultuurid

tamme ECM kolonis on palju tamme läh> Helianthemumi läh > eemal (>20 m)

N, P kõrgem tammel kui on ECM vs AM. Cenoc ei soo

EcM kolonisatsiooni mõjutab paiga ajalugu: sõltub seal varem kasvanud taimedest ja nende poolt mõjustatud mulla Abiootil

dab taime kasvu, eriti juurestiku arengut. Inokuleerides on kogu ECM kolonis suurem
väiksemaseemneline on taim. Eri taimeliikidele eri seened efektiivsemad
nt on on parem kui ainuüksi Sclerodermat inokul. Kasu eelkõige juurestiku arengule

13C ülevaade glob: 13C fraktsioneerimine suurem troopikas ja eriti suurema vee kättesa

norfotüüpide arv väheneb koos juuretippude arvuga

Arvavad, et lagunemisega C-sisaldus suureneb ja seega mikroobid eraldavad edasiseks la
juurtes vs lehtedes 15N: erinevatel taimedel +/- 1 promill - oluline

pat autokorr arvestada.

PAH ja klorineeritud yhendite biodegr vamä (enamasti tugevam kui ECM

; leevendab veestressi (veepot keskpäeval positiivsem) mperatuuridel

P, N mõju

omaga madalam lehe turgorkorgem lehe osmotne potentsiaal
iiksem taimekasv+suurem toitainete kontsentratsioon
eval. Efekt polnud seotud parema taime toitumisega. Arv et suurenenud C-nõue Rhiz stimul taime fotosünteesi. Heb ja Rhiz suurendasid lehe osm pot. Te

sisemus sureb. Eri ringide kokkupuutudes surevad mõlemad; suurte takistuste ületamisel fragmenteerub ja enam ei ühildu, sest külgkasv on min.

es ning EcM surnud juurt varjutamine ja girdling mõj erinevalt suhk varjutamine ja girdling mõj erinevalt suhkrute rohkusele lehted

14CO2 liikumine ühest taime 14CO2 liikumine .

Suillus grevillei: sobiv peremees, ultrastruktuur ei lisatud
Suillus grevillei: sobiv peremees, ultrastruktuur

Mullatüüpidel EcM kolonisats ja EcM sõltuvus Acacia holosericea on väga erinevad. Vaid koguN mõjutal

14C liikumine noortesse vs v 14C liikumine noortesse vs vanadesse ECM vs non-ECM juuretippudesse
hemitselluloosi>tselluloosi>okaste>humiinainete lagundamine ECMseente pool hemitselluloosi>tselluloosi>okaste>humiinainete lagundamine ECMseent

10 ECM seent pu 10 ECM seent puhaskultuuris kõrge vs madal C, orgaan
eritud: polüvinüül-laktofenool, säilitatud 4% glutaaraldehüüd

13355 bakteri sekventsi

CO2 ja O3 vs peremees ja mulla horisont:: Mullakiht ja pereme

taime vanus sisaldus taimes: ECM vs AM

anismid: geneetiline uniformsus???, vertikaalne ülekanne, parasiitide rohkus, suured genetid???, filtreerimine e partnerite valik sobivuse jr, kauplemine???,
rius, Peziza echinospora, endocarpoides, petersii, praetervisa, tenacella, violacea, Pulvinula archeri, Scutellinia 3 spp, Trichophaea abundans). Sphaerospo
inh Caloscypha fulgens. Idandeid kahjustasid Pyropyxis rubra, Rhizina undulata, Ascobolus carbonarius. Trichophaea abundans ja Anthracobia spp inh ju

SIP mullas rikastatud tselluloosi lagundajatele. 12C domin kandseened; 13C domin pion

pH NH4 ja NO3 radioaktiivsed
dis kuusk 100% C seenele, siis hiljem vaid tühise kuusk ja kask www: 13C net kuusk ja kask ww kuusk ja kask www: 13C netotransport vaid 2%, sellest
hingamine; vs NH vs NH4; NO3

13C: mullaorg ja juurte CO2 13C: mullaorg ja juurte CO2 hingamise 13C mojutab enim ilmastik 1-4 pa
N, P, K mõju Frankiale, N ülekanne lepalt männile
delta C13 ei muutu kui mikroobidele sööta eriC-ühendeid
aeg

15N fraktsioneerimine eri taimedel erinev ning soltub suuresti N-allikast ja mykoriissustasemest. Pohl s

15N fraktsioneerimine erinev eri seeneliikidel ja EcM vs erikoidse MR seentel. Erinevused kq substraa

14C Rhododendron > Clavar 14C Rhododendr 32P Clavaria > Rhododendron

respiratsioon vs eri pH 14C, respiratsioon vs pH 14C, respiratsioon vs pH

piisav aeg

N-saaste

ttesteriilse metsahuumuse ja n Tomentellopsis, Piloderma ja Paxillus on võimelised kasvama läbi mittesteriilse metsahuumuse ja nakatama mändi; Suillus p

15N mullas: erinevad mullaühendid on eri rikastatusega nii mullas kui ka taimekudedes,

uurea kogunemine Terfezia viljakehadesse, nitraadi red

ECM

ıob kiiremini

ıga pinnasel parem taimekasv (kõrgus, diam) kui kontrollil ja VK tek rohkem

taime juurtest t taime juurtest tulev C indutseerib AM-seentes g ıdunud, mis viitab nested mustrile; sügaval arv. C-limitatsioon

llalt erinev		15NH3-aminohapete mõõtmine taime eriosades	
		14C woodwidewebi uurimise	14C woodwidewebi uurimiseks
u C, ent saab vähe P	Suillus spp. Peremehe valik ja P, C ülekanne	lehis vs mänd: Su	lehis vs mänd: Suillus spp. 32P ja 14C ülekanne. Mänd
		inkompatibiilne E	inkompatibiilne ECM annab 2 -4 korda vähem C ja 50

eritutel Laccaria, Inocybe, un early vs late stage: vs mulla juurkontaktide läbilõikamine.Isoleerimata kase seemikutel Lact pubescens, L glyciosmus, Lecci

ltitroofilised netw;

Kui on ka seen, siis see lagundab ja hingab ning eritab seeläbi CO2. Kasvutasku meetod.

⅙ akaatsial
ida oli hoitud 6 kuud 18 kraadi juures

*C juures pos

P: ECM ühiku kohta 3x parem kasel kui AM vahtral

EcM seened reageerivad positiivselt biomassi tootlikkuse ja hingamisega
enamus EcM seer enamus EcM seeni reageerivad positiivselt C/N vahe su

bulk mullas. Mükoriisas ja mükorisosfääris rohkem 16S rDNA tüüpe (5 vs 2), parem P lahustamine, rohkem siderofoore, vähem HCN antibiootikumi (mü
adga, pinnase auruga desinfits MHB doos, ECM doos
conduktiivsus, harunemine ja kolonis,

erma aurantium, Tricholoma pessundatum) koloniseerisid kolbides mändi ja kuuske võrdselt hästi, ent kahtlustas, kas see nii ka looduses toimib.

atus,

lehekõdu lagundamine ja vee: .

mu

Nitrifikatsioon mõjutab tugevasti pos d15N lehtedes ja lehed-muld. AM ja EcM puud sa

monokaarüonid kasvavad kiiremini NO3 ja NH4-rikast

15N puudel, puhmastel, rohunditel ja seentel. Lehtede tase sõltub positsioonist tüves, EcM seentes kõrg

15N korgem rohumaade mull 15N korgem rohu 15N korgem rohumaade mullas kui metsas; N konts Nf

N, isotoobid

N, isotoobid

vad lehtede kahjustusi. Taimede varuianete kas ja fotosünteesi regul puhverdavad

herbivoorne stress vähendab

		glükogeenigraanu N ja P deponeerimine sesoonselt
Thelephora, Laccaria omavad vedelkultuuris väga piiratud naftaleeni degradeeri	Thelephora, Laccaria omavad vedelkultuuris väga piiratud naftaleeni degr	
	latestage: piisav hulk suhkrut, parajalt mineraalair latestage vs earlys	N, P vajadus liigiti, N/P
matsutake shiro	T. matsutake	

isid läbi tanniniseerunud rakukestade, ent mingeid sümbiootilisi struktuure ei tekkinud. Taimed väga tugevas stressis ja paljud surid

13C: puidulagundaja seened on 4 promilli keskm rikastunud vrd puiduga; Kitiin on 2 promilli rikastunu

seened on palju tugevamad NO3-imejad kui taimed ma

mullaorgaanika ei koosne mitte niivõrd ligniinijääkidest, kui mükoriissete

, Lact, Thel, Cenoc, Gyrodon, Haaval. Lact pubescens, kase-spets Leccinum spp mood EcM koos rakusisese kolonisatsiooniga. Alpova ja Rhizopogon ja

väetamine inhibeerib potis viljakehade teket

oluateerijatel > muudel; spetsialistide seas oli see rohkem evol konserveerunud.

spp. Lact sp paiguti suurendavad mändide kõrgust. Üldiselt vahet pole eostega ja mütseeliga inokuleerimisel; vahest eostega parem L delic. Substraadina t sisaldus CWDs vs eri mullahorisontides

juurte vertik jaotus: kuusk > pöök > tamm; samas toitai

kõrgendatud CO2 tõttu mullas suurem CO2 hingamise tõttu; rohkem hüüfe, suu CO2 varieerimine N ülesvõtt: CO2 vs Laccaria vs Suillus

Meliniomyces bicolorist eraldatud isolaat ja 2 Mel variablis isolaati on suutelised taimest

tantsiga

13C ja 15N seentel: ylevaade 13C ja 15N seent 13C ja 15N seentel: ylevaade

Hygrocybe, Clavulina, Clavulinopsis, Clavaria, Trichoglossum, Geoglossum on väga ma

nekasvule

inguteta alal v suured (>10 m populinum ja >6m scalpt) ja geneet erinevad genetid. Aastane geneti kasv 0,35m. Scalpturatumil 2 erinevat isendite rühma,

areneb paremini steriliseeritu ECM areneb paremini steriliseeritud pinnasel

substraaditingimused mõju ECM mood mõju ECM moodustamisele laboris söötmest välja jäetud

ooli hulka, ja tekitas tihedaid struktuure

N ühendite omastamine Hebeloma cyl poolt. Parimad C

ECM seened ei suuda tuhast .

P: ECM seened ei suuda tuhast omastada

, v üksikud Wilcoxina ja DSE; ebatsuuga, leesikas, kask ja paju suurimad

pookumine???

raiesmikul: juurkontakt, spooride eluvõime,

judel taimedel

15N: muld sõltub pms pos latituudist; lehed negatiivselt sademete hulgast; mulla ja lehte
15N: EcM seentel kõrgem kui mullas, kübarates 1-2 promilli võrra kõrgem kui jalas, jalas sama mis mu
EcM inokul ei muutnud tugevasti väetatud eukalüptil ülesvõetud d15N profiili, sest ARV
15N Keenia savannides: eri taimed ei eristu; arv et vee kattesaadavus mojutab oluliselt 15N rohkust ja r

metallide sidumine

P vs metallid

risti-koloniseerimine raskemetallide mõjul

N03 ja NH4 sisaldus eri mullahorisontides

nitrogenaasi aktiivsus mädanevates eluspuudes: eriseen

isid erinevalt; eriviiside ja eripuuliked eri dominant seened

14C ligniini ja poly-koniferüi 14C ligniini ja poly-koniferüülalkoholi lagundamine ErM seentel tugev vr

Chosenia (Salicaceae) mood EcM ja vähe AM JPN-s. EcM rohkem kuival rähkpinnasel vrd niiske üleuj pinnaga. Salix sach

kaseseemikute istutamine erimuldadele: igal mullal erinevad seened, mullal kus kaski polnud, ecM kolonisatsioon madalaim

ECM seente kasv palmitaadi, oleaadi, trioleiini, linooli ja linoleeni peal: v

15NO3 kandub 1 kuu jooksul üle märgistatud mändidel
ja Transp on er suur kui Casuarina on Frankia noodulitega ja ECM > ECM > kontroll. Kui on nii F Pisolithus vahendab N liikumist Casuarina ja Eucalyptu
N liikumine Eukalüptist kasuariini sõltub suurel määral

Pax invo: peremehe-spets ei sõltu krüpt liigist ega kultiveerimise ajast. Tõen käituvad isolaadid looduses te

AM kolonisatsioon teelehel , aga mitte ECM kolonisatsioon kuusel ja pöögil, kõrgem suure taimede BD korral. Looduslikul
ävitatud, vaid külvati taimed peale

kasvu, MHB mitte (arv sest inokul peale ECM inokul). MHB kadus risosfäärist 4 a jooksul pea täielikult, Laccaria vähenes kõvasti. Bioloogiplaadid näita
13C liigub eri ECM-seeneliik 13C liigub eri ECM-seeneliikidesse erinevalt: Pilodermasse tunduvalt väh
def

14C: männil mullahingai 14C: männil mullahingamine kulmin 26-60 h pärast söötmist. S
EcM kolonis Cenococcumiga korrel taime kasvu ja P o

13C ja 15N metaanalüüs toetab, et saproobid ja EM seened erinevad 13C ja 15N poolest. C erinevused
15N fraktsioneerimine toimub seentes pms NH4+ ioonide selektiivses või mitteselektiivses kasutamises

13C fraktsioneerimine saproc 13C fraktsioneerimine saproobidel soltub kasvufaasist: P1 -13C rikastumi

areng N, P

NH4 ja NO3-le erinev, Al vältimiseks pH tõstmine. Mulda ka orgaanilised happed (pms 2-lisaelek taimed pms hapestavad mulda ATPaasidega, selleks et

Collembola: vähendab
ırefragmentidel

Seene kolonisatsioon vähendas lehe 15N 0.5-3.5 promilli, sõltuvalt kas nitraadist või am
ɔloniseeritud taimega, taimeosade, seene ja mükori 15N: Suillus ja Thelephora mõjutavad erinevalt Suillus ja Thelephora mõjutavad erinevalt d15N akumu

15N Tundras: seened transpordivad 15N vaeseid ühendeid taimesse ja ise rikastuvad 15N
13C: kliimamuutuste CC 13C: kliimamuutuste CO2 eksperimentides saproobid vaesustu
15N taimedes,mullas globaalselt, lokaalselt: ülevaade. NH4 v NO3 suht 15N muster sõltu

15N: EcM ja saproobid sama mustriga otse liustiku serval. Arv. Peremehe-spets liigid su
saprotroofid vs ECM seened 13C ja 15N sisalduse erinevus
15N mullaprofiilis: EcM metsa mullas suurem vahe kui AM mullas - arv seened sügavam
15N: viljakehades seletab jala ja kübara erinevusi hüdrofoobsusega: hüdrofoobsetel on se
Saprotroofid saavad suure osa C-st otse agarist, mistõttu soovit kasutada vedelkultuuri. K

14C: arvavad, et Otidea on ECM, Ramaria, Clavulina saprotroofid 14C põhjal. Sowerbyella puhul pseu
13C ja 15N: ektomükoriissuse tuvastamine, levik seentes, taimedes
14C põhjal ligniini ei kasuta seened energiaallikaks, vaid lagundavad selleks, et tselluloo
15N ja 13C diskrimineerimine eri metabol9ismiprotsessides: ülevaade
Koguprimaarproduktsioonist läheb taimedel maa-alla 27-68%, seentesse 1
15N: kuuse väga suur 15N varieeruvus sõltub arv kasvukohast ja sõltuvusest EcM sümbi
madalad 15N väärtused EcM seentel näitavad arv võimet lagund proteiine; isotoobimustrid arktika taim

15N ja 13C toiduahelates. 15N ülespoole rohkem keskm 3.8 promilli, 13C rikastumine vaid 2-l esimese

õltuvalt taime funktsionaalsest rühmast, mittesteriilsetes tingimustes ja komplekse inokulumi korral. MR tüüp, seeneperek mõju väi

a kasvuga ECM seente biodiversiteeti võib ülal hoida juurte "teadlik" selektiivne suretamine juhul kui ECM seened on erineva konkure

Rhizopogoni liigid ja männiliigid Californias ei ole spetsiifilised allo-ja sünpatrilisuse seisukohast; Inokul mändide kasv kiire

mineraalide lagundamine E-horisseenehüüfide poolt on suurem madalama mullatoitainete sisald al mineraalide lagundamine E-horisseenehüüfide poolt on

kivimiproovid seenehyyfidega. Erivanused. Mida vanemad, seda rohkem hüüfe.

14C-ligniin (DHP) 14C-ligniin (DHP)

seened eelistavad happelist pinda hõrge C/N suhtega. Seega, nii pH kui ka C/N suhe otseselt mõj mikroobide osakaalu

Korupis ja Zambias EcM ja AM puud ei erine 15N poolest. Uapaca lehestikus 15N väiks

15N diskrimineerimine soltub N kogusest. Risomorfid rikastuvad 15N rohkem kui puud. Mida suurem

delta 15N palju suurem seenmantlis kui mittemükoriisses juures; suurem kui mullas; sügavuti kasvab

15N Euroopa metsades, vs N vaetamine; vaetamata aldel tugev 15N kyllastumine sygavamal mullas. Ko

75% juurtesse saadetud süsinikust hingatakse ise või sümbiontide kaasabi

vool mulda lakkab puude koorimisel

viljakehade ja puude 13C sisaldus

N2 fikseerimne Tansaanias: indikaator 15N

15N taimede AM vs ECM staatuse hindamiseks. Frankia ei tee vahet

15N fraktsioneerimine mullas, seentes ja taimedes. Frakts er NH4><NH3, NH4 lendumine, nitrifikatsio

ökidel: eri-isolaadid koloniseerivad tamme ja pööki; 10st inokulandist vaid üks koloniseerib; ECM langeb kokku viljakehadega; kasvuhoonest avamaale is

Pisolithus-eukalüpti mükoriisa tekib kunsttingimustes 4 päevaga, alates mantlist ning juuretipust juuremütsist

terved (mitte aga lõigatud) juuretipud eritavad keemilisi ühendeid, mis stimuleerivad vaid sobivate ECM-seente kasvu nende ılt. Arv sõltub elupaiga heterogeensusest

mõj. Skaala bakteritele liiga suur

njug kui lod valiku teel; väike väljasuremus arv, OTU ja liigidefin
opogoni poolt kontamin. EmH hulk on hea proxy hindamaks EcM kolonis. Samas võitlus seente vahel käib pigem juuretippude pärast.

u genetit. Indiviidid 2 m raadiuses olid geneetiliselt sarnasemad kui juhusl.;

doosiefekt
pH muutumine optimaalsuse suunas

eglane väljakaevatud ja ümberistutatud taimedel. Looduslikus kohas koikjl ymber paju. Lepa juures ei kasva. Leiavad, et Pyrolate hea kasv pea täielikus v

varase staadiumi seened nakatavad perem taimi ilma lisa Glc sootmes, samas kui hilise st saaned tahavad lisa-Glc ja sel juhu ülevaade 13C ja 15N: taimedes CO2 diskrimin pms Rubiscos, mõj õhulõhede juhtivus, a

CM juuri ja tüüpe rohkem)

nöödudes, ent 1 aasta pärast vilets. II staadiumi seentel juba kuuga idanemine kehv ja aasta pärast ei idanenud enam. Arv, et suurte pu

e ja n-butüraat, aga mitte teised sarnased Tricholoma liigid. Neil ei indutseeri idanemist ka sama liigi mütseel

N fikseerimise geenid ja geeniekspressioon Suillus vari

oopiski

Cenococcumi respiratsioon ECMst madalatel veepotentsiaalidel kõrgem k

kelaatimine, metallide kahjutustamine, hapestamine

13C kandub juurtes vaid 13C kandub juurtes vaid 4-5 meetri kaugusele puutüvest; kaug

teoreetiline taime kasu vaatenurgast x x

oksalladi jt orgaaniliste hapete roll mullas: liiga madal kontsentratsioon la
raiesmik vs mets.ülevaade
väga sarnane segametsas ebatsuugal suurem ECM BD
32P sisaldus ECM taimedes suurem vrd non-M 32P sisaldus ECM taimedes suurem vrd non-MR taime
hkem), P omastamine kiirenes, ECM seentel rohkem EMH (tugev korrelatsioon P omastamisega)
15N: EcM seeneliikidel v erinev N-ühendite ülesvõtmisvõime - suurem (Wilcoxina) või v

mphinema = DSE = kontroll Wilcoxina koloniseeritud kuuse seemikute 15N Wilcoxina koloniseeritud kuuse seemikute 15N omasta

viletsam vrd kontrolliga, varis inh ka collembolate arvukust, ent mitte lestade arvukust,
eripuudel, seeneliikide individuaalne mõju väga erinev, koosmõju ennustamatu
P vs pH

areng, suhkrud
termiidid valivad ränimineraale oma kodade ehituseks r
lul liigirikkus inhibeeris v polnud oluline. Arv et antagonistlikud interakts domin liigirikkas keskkonnas kus tüved on geneet sarnase

OrM: Cephalanthera damasonium rohelised vs a OrM: Cephalanthera damasonium rohelised vs albiinod

N2 fikseerimine suurem org-mullas kui min-mullas. Erit

eksudeerivad nii juured kui AMF hüüfid. Osakaalu raske hinna
; bakteried ja sapr seeni girdl ei mõj; tsellulaaside ja proteaaside tippakt on sügisel, mis korrel juurte ja lehtede suremusega; girdl väl

Thelephora terrestrise mõju on eri Pinus contorta semneperekondadele erinev nii taimede biomassi kui EcM
onis. Eriti tugev efekt ebatsuugal, eukalüptil, tammel. Inokul efekt suurem, mida lühem katse. Publikatsioonide 'bias'

kt. Ühel tüvel 3-4 indiviidi, Estimate S järgi 1 lisaks

atsetaadiga

orgaaniliste ja anorgaaniliste ainete omastamine ECM s a mikroobikooslusi

a saproobsuse jada

le

15N lehtedes Mt Kinabalu: madalas (700 m) madalam kui kõrgel 1700-3100), lehtedes ja

Laccaria bicolor tapab collembolaid ja transpordib 15N

EcM matid suurendavad mikroobide biomassi ja mitme ensüümi aktiivsust mattides, ent erinevusi pole kui kaaluda mikroobse biom

13C: saproobidel fraktsioneerimine pehmemäd <valgemäd<pruunmäd. Arv. Erinevused tulenevad vamä
13C ja 15N diskriminatsioon eristab ECM seeni ja saprotroofe (+3.5 vs puit); vs lehed vs kõdu, muld; r

lagundamine EcM seentel arv fakultatiivne. Ei tohiks ranget va

ECM kolonisatsioon vähenes kõigil seentel männiokaste lisamisel
ECM seened pidurdavad okaste lagunemist, sest tombavad ära vett, mis omakorda tingib lagundamise aeglustumise
ıeid neid interaktsioone. Positiivsed on kahtlased, sest võivad tuleneda seente genetite ülekattuvusest: plotte 80 ja igast ca 6 proovi; bonferronit ei kasut!!!

1986 (Tomentelloidid)

ı Sarcosomataceae ja Agaricales
%koloniseeritud; väheneb suurlinna läheduses, korreleerub okkakahjustustega

noodustamine kui eostega viljakehast (20-33%)

ıed ühised paljudel liikidel;
N sisaldub Cenococcumi vakuoolides oluliselt rohkem l

Xerocomus badius-mantel väga mikro-ja makroelement

15N: produktiivsuse gradiendil erinevate mükoriisatüüpidega taimed käituvad erinevalt.

ıma liigirikkusega istikud raiesmikult peale ümberistutamist
Tais-juurekontaktiga puudel suurim EcM diversiteet, ent väikseim kasv

www: arv noored taimed ei saa suurtelt puudelt märkimisväärselt C, mis t

ı

Quercus robur -Piloderma fallax: tamme transkriptid vahetult enne ECM mood: ca 50 ülesregul, mfg

Suillus variegatus ja mänd erinvad oma substraati eritatavate ainete pooles

efektiivsusega; See kui palju variatsiooni meetod katab, ei näita meetodi headust;

ısed, mõni seen peab vastu 9 kuud +4C juures

ıal, käbide teket, ECM seente viljakehade prod, tuberk ECM osakaalu (mitte oluliselt), samaks jäi ECM kolonisats, juurte kasv, ergosterooli sisaldus

vajab ilmselt vähem C kui Lactarius
diumite ühele harule (siiski Thanatephoruse sees); mõningate eranditega ITS fülogenees toetab AGsid

koloniseeris pigem nõrgestatud taimi

15N eristab troofilisi tasemeid Calif estuaari ja laguuni soolasoodes. Mixing mudeli pohjal hindavad mc ektendoMR puhul MR teke algab Hartigi võrgustikust, ka pikkjuurtel on rakusis kolonis. Mükoriisa teke männil vs kuusel 1

ga

ud alasid, metsataimlaid, väet Paxillus involutus: tüüpiline ruderaal. Kolonis. Ka Paxillus involutus Paxillus involutus: tüüpiline ruderaal. Kolonis. Kaevatu

tes EcM%le; mida rohkem eoseid (10e9) seda parem EcM%; parim on eosed ja seemned korraga mulda panna, P vaetamine 40 kg/ha parem kui mittevaet

tes (poolsteriilselt klamüdosp parem); mida rohkem eoseid (10e9) seda parem taime kasvule; parim on eosed ja seemned korraga mulda panna

nid erinevad üksteisest tugevasti taime transpiratsiooni reguleerijatena, õhulõhede juhtivuse muutjatena ning abina põuast taastumisel. 9 10st olid paremal

nid erinevad üksteisest tugevasti taime hüdraulilise juhtivuse ja risosfääri veepotentsiaali reguleerijatena ning abina põuast taastumisel. 10 10st olid parema

seenetüvi1*seenetüvi2*taimeliik

C liikumine viljakehadesse sc .

C liikumine viljak .

ste levitaja, läbides päeval 1 k mükofagne kukkurrott sööb pms Mesophellia, Zelleromycese ja Labyrinthomycese eoseid. Eosed idanevad ja mood EcM va

ele

ECM kolonisatsioon m-1ja biomass taMMEL suu ECM kolonisatsioon m-1ja biomass taMMEL suurem kõrge CO2 korral,

oksalaat: mõõtmi oksalaat: mõõtmine; Paxillus toodab eriti NO3 ja väike
H14CO3->oksalaat

ECM vs AM: piisav taime vanus: suktsessioon

Paxilluse üks tüvi, mis on mükoriisne, erineb genoomi ja ITS poolest väga vähe kahest teisest tüübist, ometi on transkriptoo

saprotroofid vs ECMseened: saprotroofid vs EC saprotroofid vs ECMseened: roll looduses, ensüümid, k

14CO2 taimest seende vs sap 14CO2 taimest seende vs saprotroofi manulus; vs kõdulaikude koloniseer

Monotropa hypopitys vajab idanemiseks vanade taimede lähedust või paju lähedust, sest assots Tricholoma cingulatumi ja T

ErM seened jm k ErM seened jm kottseened lagundavad kitiini palju pare

samblike mineraalide lagundamine -arv oluline roll algs

kõrged väetise konts ei võimalda dipterokarpidel EcM moodustada Ca: EcM kolonis parandab dipterokarpide seemikutel e

vahel

Rhizopogon + ebatsuuga -N2 fikseeriv Bacillus eriti tub

al. Enamasti genetite suurus <3 m . Vkde all alati sama geneti EcM tipud. EcM tipud kuni 40 cm Vkdest eemal. Üks genet kolonis kuni 7 peremeespuu ju

koos voi ilma seenega. Vaid MRA& suutis idandada moned seemned. Kui idanemine toimus, siis sporaadiliselt

18O: seente veiljakehade veemajandus: kuivaperioodil vesi tuleb kas otse risomorfide ka

Tom subl domineerima. Rhizopogon püsis kauem kui substraati väetati oravapabulatega. Taime toitainete rohkus mõj seente konkurentsi.

nist vitaalsus väheneb tublisti; EcM mood võime säilib peale seedekulgla läbimist

ineraal-N rikkamal pinnasel kasvab seen, seda jõue ECM seente 15N korreleerub ECM seente 13C ECM seente 13C korreleerub seente N-ühendite kasutu

P edasi-tagasi liikumine, transport ühest kolonisatsiooni

32P: Suillus vs Hypholoma; vs inokulumi suuru 32P: Suillus vs Hypholoma; vs inokulumi suurus

P ülekanne

ECM vs sapro toi ECM vs sapro toitainete liikumine ja aineringe: ülevaad

mullaseened; vs girdling, SWE: EcM seened asenduvad Helotia

ECM seened võimaldavad kobresia myosuroides-l üles ontr rauakaevanduses; kasv Complexipes, Pisolithus >Suillus > Phialophora, kontr

fungitsiidid, AM inhibitsioon

paju ja Populus deltoides: Looduses EcM domin mõõduka niiskuse juures, AM domin kuivemates ja niisk

seentes on väga palju toitained vrd muu mullaga Puerto

Shorea parvifolia ECM ja ektendoMR on mõl sagedased EEMR on kaugematel juureotstel, õhukese mantli ja tugeva rakusi

AM diversiteet suurem seal kus suurem taimede primaa

EcM kolonis ei korrel massiga.

Populus 3 spp: vs CO2 tõus: liigiti erinevad EcM, Populus 3 spp: vs CO2 tõus: liigiti erinevad EcM, AM ja juurte prod muu

aga, teised mitte. Vahevormid. Eelnev uurimus männiga sai samadel seenetüvedel erinevaid tulemusi

N tuhas

EcM kolonis suurim 18 kg/ha P korral.

EcM kolonis suurim 18 kg/ha P korral.

sobiv peremees

mittesobival peremehel akumul tanniinid ja mantel õhuke ning hüüfid lüüsuvad

Phytophthora cinnamomi muldadel Eucalyptus marginatal tek vähem EcM kui norm-mullal; E. Calophylla -vahet pole. Liiva

ensümbiondid saavad see EcM evolutsioon: arv, et EcM on tek saproobidest mitmeid kordi iseseisvalt. Ei ole kodustatud parasiidid.

bruche

Tuber: mulla desinfekteerimine

RT-PCR bakteritele, mille fenoolne substraat oli rikastatud 13C-ga; gradi juurte ergost sisald ja "paksu mantliga ECM kolonis väheneb kui taime lehed ära kitkuda. Seos aastasisene. Eelmise aasta k

13C: puuvoorik saab kadakas 13C: puuvoorik saab kadakast 61 protsenti oma sysinikust

signaalmolekulid risosfääris signalisatsioon, sümbioosi aktivatsioon, regulatsio ECM vs taim

15N temp vs troop: troopikas (v.a. BRA cmpinades) 15N rohkem lehtedes ja mullas, mis

ECM teke väiksem kui taimel suur N,P, vähe C
e vaid sisetingimustes, mitte kasvuhoones;
kulumivõimalused substraat, sööde
d juuretükkidega; õnnestus potis eluspuu juurtel
juured stimuleerivad

patogeenidest vabanemine
mullaniiskus: eriliigid käituvad erinevalt
N, P kombinatsioonide mõju 2 ECM liigi kolonisatsioon
P erinev mõju eritüüpidele P erinev mõju eritüüpidele

sobiv peremees

peremehe valik, õige peremehe lähedus
iaal liikide osas õige peremees või õige peremehe kohalolek juhuperemehe koloniseerimisel

s laiemalt levinud. Crisp2004 fütoendeempiirk-des endeemseid seeni pole teada. Ülemere Euk istandustes palju uusi patogeene, ent EcM seened tulevad p

Globaalne metaanalüüs EcM vs saproobid: mõlemil on 13C muster seotud eelkõige laius
15N Alaskas: Lehtede N sõltus mulla orgN-st; 15N lehtedes üldisest fertiilsusest. Hüüfid
pH
des eri efektiivsusega kohalikke seeni. Rohkem nakatuvad kontr ja Pisolithus, eriti männimetsas vs ster, mittester põllumaj, põletatud paigus. Kohalikud se

/alther,1994). Mitu uut kandid-divisjoni

kuga
is elasid seenevahetuse üle vaid suurimad isendid

Pinus edulis Arizonas: 5 liiki Geopora-sarn seeni. Arv see tuleneb v põuasest aastast. AM taimede eemaldamine suurendas
Salix, Betula > Corallorhiza

Alnus glutinosa kannatab palju paremini üleujutamist kui kask; ei kasva happelisel turvasel, kus ei mood ka aktinoriisa mida suurem on EcM kolonis, seda efektiivsem 32P yle

kolonis.

nii EcM seente kui saproobide kasvu

mükoriisa teke: mänd paljasjuursed > plastpotid >> kasvuhoone; kuusel polüetüleen rullid > plastpotid > paljasjuursed

15N proports tundra ökosysteemis: seened=MitteMR>EcM>ErM taimed; Arv et N fraktsion toimub N

nestunud (sh Phialocephala, Phallales sp). Domin Helotiales, Hymenoscyphus. Dominantliik kattuv; üks genet kattuv

peale põletamist taimekasv kiirem, ent mükoriisa teke aeglasem. Juuretippe rohk, ent kolonis madalam.

; nat mullaga inokul MR moo Wilcoxinale parem turvas-vermikuliit-MMN kui Petri tassi agarsööde gmäestikes puud ei kasva ilma inokuleerimata

peremees, inokuaadi hulk, muld

ECM vs väetamine

ısta nuda, personata,nebularis,inversa, Hygrophoropsis aurantiaca, Leucocort (Cortinellus) bulbiger, Lepiota clypeolaria, Cystoderma

nine isoleerimiseks

peremees, temperatuur, nõu, substraat, sööde

Rhizopogon nakatab monda leesikat voi maasikapuud vaid kokultuuris pärisperemehaga(männiga, aga mitte ebatsuugaga)

sobiv peremees

sobiv peremees

sobiv peremees

sisaldus taimes; vs veestress

N: EcM-s ja EMH-s erinev N-ühendite konts. (EMH-s

peale pouda palju kiirem taastumine
ldkannil

entel või seotud bakterite ja saproobidel? hea disain. Kas talv ja kevad käituvad pidevalt nii?

iteeritud puudel, sest need on stressi all (ka muud stressorid Arizonas -herbiv, konkurents,

peremehe kaitsemehhanismide, sh peroksidaaside mahasurumine

a suuremaid geneteid tuvastati läbi 2 aasta id on vanadest geneetiliselt üsna erinevad. Arv, et matsutake levikul on eostel väga suur roll

15N proports tundra ökosysteemis: MitteMR>EcM>ErM taimed; 15N hulk suureneb mullas sygavuti; /

kolonis suurem puudele lähemal kui kaugemal

te kasvatatud ja hiljem viidi laial alal kontakti

Hebeloma spp, Russula spp, Inocybe lacera, Scleroderr

ülevaade: ECM C transport. Mitmetel ECM seentel puuduvad C importer

DothideoM. Lisaks v palju EcM-seeni nii lehtedelt kui mullast, Sebacina verifera

teke kasel ja tammel <3 näd peale idanemist, potis, kus juurkontaklti pole -5-6 näd.

N väetamine stimul Paxilluse kasel ja Scleroderma tamı

: inokulaati

T. tridentinum

kuivamisel kasvab kiiresti vaid trehaloosi kontsentratsioon, külmas kasval ıtel lisa-pos-efekt taimedele, ent TIBA inhibeeris ECM teket

‹e juurte biomassiga; AM prod suurim kõrgete rohundite juurres rikkal pinnasel ErM+ECM biomass suureneb lokaalsel toitainete gradi

U, Abarenkov K. 2014. Improving ITS sequence data for identification of plant pathogenic fungi. Fung. Div. 67: 11-19.

15N : uurea ja NH4NO3 vaetamisel erinevus taime 15Ns (uureaga suurem); Mittevaetatud alal 15N suu

ɛd suutsid lagundada tsellobioosi ja lihheniini ainult siis kui lisa-glük Tricholomataceae: Lyophyllum fumosum (arv fakult ja ka ekte

ARG sissetoodud metssead ja hirved levitavad mändidega sissetoodud seeni ja soodust seega invasiooni

bakterid Nfix-sümbiondid

ECM vs AM: EM ECM vs AM: EMH ehitus, RM, transport, sink, source

sobivus bakteritele: eri substraadid, eriseened, eksudaadid

ECM seente kasv ja mõju bakteritele

sõltuvalt seemiku kaugusest emapuust-oluline

a EcM seened ei kattu. Arv et EcM tsesalpidel mullale spets pole eriti oluline, sest tulemused erin Newbery omast. Gnetu afr mood EcM vaid Sclerod sinn

Aminohapete 15N varieerub 20 promilli ulatuses, ent on erinev eri kudedes ja eri mullas

Pseudotsuga istutatud raiesmikule eri kaugusele puudest: kaugus mõjutab %kol ja liigirikkust

15N: diskrimineerimine erinevates biol, biokeem protsessides; taimekoed on muutustele
15N lehtedes: üle kontinentide posit seotud nitrifikatsiooniga ja N depositsiooniga; arv. I

Paxilluse puhaskultuur eraldab vermikuliidist NH4 ja Ca
Paxilluse puhaskultuur eraldab vermikuliidist NH4 ja C

opt temp 18-24kraadi, 29 väga halb
varise lisamine suurendas EcM kolonis vaid siis kui muu muld oli steriliseeritud. Muidu sama. Varise lisamine soodustas ka
n, Amanita, Lactarius delicios süntees ebatsuugal jt okaspuudel, sh Lyophyllum, Suillus, Rhizopogon, Amanita, Lactarius deliciosus moodustavad ka ebats

inevad meetodid. Mütseelilahı Lactarius deliciosus > L sanguifluus: Pinus pinaster > P sylvestris. Erinevad meetodid. Mütseelilahusega inokul kasvuhoone

CO2 mõju diversiteedile ja liigirikkusele ei olnud, ent mida suurem N min

EmH vs EcM; vs EmH vs EcM; vs CO2, N väet: dominandid ja koosluse

ECM aitab männil vrd hirsiga paremini P omistada

e vähendamine, eriti preerias vrd metsas

Hyster clathroides, Elaph granul, Gymnopus dryophilus, ocior, Clitopilus prunulus, Boletus 3spp ei mood EcM Pinus pinastriga

ECM seened omastavad oietolmust ligi 80 -90% N, P

P sisaldus

ECM seened omastavad surnud nematoodidest ligi 2/3

lehekõdu N, P muutus

N,P, mõõtmismeetodid, omastamine lehekõdust

EcM Hebelomaga nakatatud pinnases on Pythiumi nakatumisvõime väiksem

koos teiste mullaorganismide metsamulla tarimine istutusalale

ECM-ta. Eriti homogeensel pinnasel. Varjutatud nulusse topimus ühesuunaline 14C kanne ebatsuugast.

generalistid ECM-seened leeendavad taimedevahelist võitlust segakultuuris

x

e (palju aeglasem ja vähem efektiivne)

Mixing mudelid: Kahe isotoobiga ja 3 toiduallik Mixing mudelid: Kahe isotoobiga ja 3 toiduallikaga mu

Mixing mudelid: Kahe isotoobiga ja 3 toiduallikaga mu

Mixing mudelid: Kahe isotoobiga ja 3 toiduallik Mixing mudelid: Kahe isotoobiga ja 3 toiduallikaga mu

EcM taimed vs AM taimed: EcM taimede risodfääris palju suuremad erin vs bulk soiliga kui AM taimede risosf: eriti N miner pot, fosfataaside aktiivsus.

ka mullatüübist - arv et puude genotüübid ja mulla-heterogeensus tagab mikro-koevolutsiooni

ris kuusejuuri endof. Kõik seened suutsid lagundada turbasammalt, eriti O. maiuse isolaadid.

jõeäärses haavikus: AM kolonis max 5-10 a metsas, EcM alates 10-20 a. Arv et haava lehtede keemial allelopaatiline efekt

obasidium vs Ericales; soovit uurida Arillastrumi EcM.

Geenid, mis kodeerivad EcM teket on Tuberil ja Laccarial üsna erinevad. EcM seened on minetanud ensüü geenide aktivatsiooni uurimine

13C ja 15N toiduahelas mullas: d13C sama, d15N kasvab ahelas ylespoole; koik soltub vaga palju koh

MHB mõju

Ceratobasidiumid stimul suremust

15N, 13C jt: stabiilsed isotoobid on võimsad riistad uurimaks troofilist positsiooni ja C liikumist toidual

13C: Hemiparasiit Striga spp 13C: Hemiparasiit Striga spp saavad 28-35 protsenti C oma peremehelt fluorestseerimine fluorestseerimine hindamaks vitaalsust

tulemusi. Olulised interaktsioonid.

söötme kogus sõltuvalt aastaajast ja taimesuurusest: eksponentsiaalreziim

väetamine eksponentsiaalne vs normaalne väetamine; seentekasv,

substraadi rikastamine 13C-ga, 13C inkorporatsioon DNAsse, raskusgradientfuugimine, spetsliikide mä

13C kasutamine mikroobide 13C kasutamine mikroobide funktsionaalsetes uuringutes

hti väljaspooli andmebaasides olevaid: spetsiifilisus? intron? artefakt?

lab mikroelementide ülesvõttu üh/taim; mitte üh/g taim AM inokuleerimine parandab oluliselt India puude kasv

hapestumine, mitte AB tootmine

a, kasvu stimul olul paremini vaid samalt liigilt isol seen

tsellulaasne ja ligninolüütiline aktiivsus, mistõttu arv. Et õige EcM seene ei saa ekto-ja erikoidse ekto-ja erikoidse MR seentel oluline roll tundra-ja bore

seenmantli mood on vaja hapnikku, thigmotroops seenmantli mood on vaja hapnikku, thigmotroopse asja olemasolu (silikoo

N, P omastamine: ylevaade

MR olemasolu obligaatne

Casuarinaceae: EcM ja noodulite teke sõltub v palju Casuarina ja Allocasuarina liigist ning mullaomadustest. Allocasuarinal
Põhja-AUS: eukalüpti hõredad metsad: basaalpinnalt domin EcM puud, juurtel 24-55% EcM kolonis ja 6-22% AM kolonis.

varise tüüp mõjutab EcM mood: Banksia lehekõdul ei mood, ent eukalüpti ja akaatsia kõdul moodustab. Cenoc ja Hysterang

eraldi voi kontroll. Parem igal juhul steriliseeritud agropinnasel. Koinokulatsioon algul pohjustas tohutu juurtesüsteemi arengu

peremeest tapmata; Gerronema parasiteerib laanikul ja maksasambla Blasia risoididel

sed liigid; ruderaalsetel väikeseseemnelistel puudel algne kasv aeglasem, ent peale seemne-toiduvarude kasutamist palju kiirem kui suureseemnelistel puud naskult vs kontroll vs mitme puhaskult korraga inokul. Suremus suurim kontrollil ja Pisolithusel

pH muutumine

glomaliin varieerub mikrosaitides ja ka taimede poolt asustatud vs asustar

taimed, mükoriisaseened vs globaalsed muutused: ülevaade

piisav hulk mütseeli

d, seega arv Russula sp levib eostega

transport seente vahendusel taimest taime kahtluse all sest liiga palju on h

15N: diskrimineerimine eri N ühendite transformatsioonil; mida vähem on sademeid, sed

juurte DSE

mükorisosfääri organismide roll bioremediatsioonis, võimalused, GMOd, taimede juurde toomine

trentsimine vähendab EcM seente VK produktsiooni. Lactarius

taime ja seene genotüübid

EMH kasv on jõudsam E-hor EMH kasv on jõudsam E-horisondi mullas kui turbas, samuti läheb E-hori
eriseened eelistavad kasvada ja sünteesivad oksalaati erimineraalidele eriintensi eriseened eelistav eriseened eelistavad kasvada ja sünteesivad oksalaati er

ks; eostega inokuleeritud taimedel tuvastatakse pms vaid üht MAT-tüüpi trühvleid, ilmselt teist (isast) on v vähe nii et ei tuvastatagi;

IAA eraldamine, juure morfol IAA aktiivsus (puhaskultuuris)

saproobsed kottseened fraktsioneerivad 13C nii liigispetsiifiliselt kui C3 ja C4 substraadispetsiifiliselt. I

töögi ECM palju mineraalainete rikkam kui männi ECM

c vs CO2

ıllast või mõnel liigil on ka säärane mitteobli EcM eluviis.

R. EcM seened ei takist paras Melampyrum oli palju parema kasvuga ja reprod mykoriissetel mandidel kui mitte-MR. EcM seened ei takist parasiidiga nal

agarsöötme muutmine happelisemas voi aluselisemalks

tioon=valk=NO3 söötmel. N-ühendite kasutamine polnud seotud kasvukoha N ühenditega. Membı ECM seened kasvavad reeglina palju paremini NH4>gl
V-Am disjunktid tek samuti arv üle Thulea silla, ent NE-Am surid välja

taceae, Russulaceae, Sclerodermataceae, Euagarics. Paljudel sünteesitud ka EcM puhaskult

KK hapestub, antibiootikumid

15N sisaldus kasvab mulla toiduahelas ylespoole (3-5 lyli). Sama liigi d15N muster oli sama eri mullahı

guaanosaarel taimed omast efektiivselt kusihapet ja ammooniumi. Taimedel üsna erinev
15N: seentel, mis isoleeritud vihmametsast või savannist, polnud vahet puhaskultuuri 15
15N Austraalia konnumaal: mitteMR taimed tunduvalt rohkem 15N kui EcM, ErM ja AM taimed; MR
AUS niiskes põõsastikus (wallum) mükoriissetel taimedel ja NM-taimedel erinev 15N si
15N on AM ja EcM taimedel AUS savannis ja mussoonimetsas erinev. Mussoonmetsas l

nii infektsioonis kui vastureaktsioonis. Kontiinum teiste eluvormidega nii evol. kui ontogen.

13C ja 15N: 47-67 protsenti 13C ja 15N: 47-6 13C ja 15N: 47-67 protsenti Cst puuvoorikutes tuleb pe

ıst peremehe kasvu, võivad stimul invas taimede invasiivsust, er männid a eukal. Sama liigi uued genotüübid võivad kohalikud välja tõrjuda või geneet mo

imedel. Suurimad taimed siis kui EcM ja väetist ei pandud.

Hygrophoraceae: teised peale Hygrophoruse on arv biotroofid tundmatute partneritega. K

N: pigmentide teke

puudevaheline üle N: B-fix

ECM mõju patogeenidele N

mulla mesofauna parandab, sõltuvalt f-n grupist taimekasvu ning N-sisaldust ECM-seente puudumisel, aga mitte kohalolekul. Nii ECM-seened kui mesofa

Pisonia grandis mükobiondi kasv eri N allikaga söötme

puu vanus: Tuber

poud ei mojutanud ECM kooslust ega ka ergost hulka, ent keskmiselt suu

'aljud saproobid nafu Fomes foment võivad olla pikka aega latentsed endofüüdid. Arv. et teatud endof arvukuse saavutamine üõhjust

C transport: ülevaade; sesoonselt võib suund olla erinev; kevadel PsTsuga -> Betula, suv

13C ülekanne Betula>Pseudc 13C ülekanne Betula>Pseudotsuga metsamullal

13C vs 14C; www transport 13C vs 14C; www N mõõtmine

ülevaade ECM se ülevaade ECM seente mineraal-ja C-toitumisest, WWW

14C, 13C netoliikumine kase 14C, 13C netoliikumine kasest ebatsuugasse, eriti 3 vs 2 aastal, eriti kui e

ebatsuuga istikutel metsas, vs trenched mullas. Kontrollis BD, liigirikkus, ühtlus suuremad, rohkem RM-tüüpe, taimede foto

sinnamrense; Gnetum, arv ka teistel puudel)

ısilia -Neea, Guapira: Russ puiggarii; Nothofaguse metsad seenerikkad. Ei kattu üldse Alnuse ega Salixi seenestikuga. Subalp Nothof metsades seeni palju ıibeeris hübridisatsiooni tugevasti vt>

N, P omastamine; Pseudotsuga vs Calamagrostis; vs AM

kanarbikulistel puude lähedus

› on vähem efektiivne taimekasvu stimul ja P seisukohalt. P omastamine ei seostu 5kolonis, kasvu eri AM-seened tekitavad eri taimedel kas Arum või Par

ȝae ja Pinaceae juurte lisamine Dipterokarbid: poolvarjus kasvavad seemikud kõige paremini. Fagaceae ja Pinaceae juurte lisamine ei nakatanud seemikuid selt erinevad eriokaspuude idanemiseks ja kasvuks, moni neist sammaldest kasvab CWDl

AM tipuhüüfide eluiga 5-6 päeva, jooksevhüüfidel pikem. 14C järgi. 14C

avad juurte teket; lehisel pole suurt vahet
n olid viletsad. Head tulemused ka 1 -10 ym IBAga

N vs pigmendid

Hebeloma, Laccaria, Thelephora mood ECM ka vee all olevatel juurtel, Suillus spp mitte. Samas olemasoleva ECM üleujut

e

Paxillusega

mikroseente mitteosalus laborikatsetes

.

Suillus bovinus: võimaline absorbeerima hüüfidega Rb, suhkruid, polüoole, glut Suillus bovinus: v Suillus bovinus: võimaline absorbeerima hüüfidega Rb,

sademete erinev mõji %ECMle liiva-ja tuhapinnasel (?)
põuakahj ALADE puudel madalam liigirikkus, diversiteet ja ECM kolonis kui põua poolt mittekahj ALADE puudel. ECM k

peremeestaime geneetika

Orgaanilise kompleksi lagundamine EcM seente poolt: 3 hüpot

N, P defitsiit

hvris
ltiveerida otse ECMst

väetamise, lupjamise mõju
13C, 15N erinev saprotroofidel ja ECM seentel; erin aastaajati, paiguti, aastati, liikide vahel, perek vah
Gly ylesvott eri seentel erine Gly ylesvott eri seentel erinev, eriti hea Suillus spp-l; 13C transport juurte
D15N: sarnane aminohapetes ja valkudes ning v erinev kitiinis EcM seentel; Erinevused viljakeha 15N

13C erinevusi substraatides ja tarbijates võib põhj seente suktsessioonistaadium ja substraadi ligniini/ts ɔoniti. Heterotalsed vs homotalsed seened eri intens mittesug tsüklitega

15N: Castanopsis madalam kui AM-puud; d15N mullas ja orgaanikas tugevasti korreleeı

ei talu täisvalgust. Mõnel liigi Shorea spp: EcM kolonis ja kasv on parem valguse käes kui varjus, ent enamus liike ei talu täisvalgust. Mõnel liigil v tugev

reostus vs viljakehade toodand vs noor/vana mets
erinevad **ainul**t N03 ja NH4 kontsentratsioonid: parim

peale kobraste poolt põhj üleı peale kobraste poolt põhj üleujutisi säilib sadakond aastat metsa asemel kõrgerohu-niit, kuhu okaspuud tagasi ei leviarv seet

Arv. et orhideede levimist mõj seemnete levik ikkagi! Alternatiivselt võib kasvukoht mõjuda kohasusele hilisemas arengufaasis

www: transport väga vähene, sporaadiline, ei sõltu taime suurus

temperatuur: Rhizopogon ja Suillus opt kasv puhaskult ja EcM mood 25*C
l. Mittester pinnasel kasvab ka muud seened; Külmutatud eoseid on vaja 100 korda rohkem ja kuivatatud eoseid 10 korda rohkem, et saada sama head tule

EcM seente mütseelimatid ja nendega seotud noored puud võimaldavad mändidel rohumaid invadeerida. Samas tammedel ja

ıantli männiga, mitte midagi kohalike puudega ja AUS akaatsia raport on arvatavasti reostus

ʏksik, koik kolm koos parim, suurim ka N2 fix

aminohapped, glü aminohapped vs NH4

parim kui oli ECM + seemned. Seeme mõjutas rohkem

699	699		N mõju
	315		

il vrd keerukamatel ühenditel

suurem seente arv mikrokosmis induts kiiremat substr lagunem

EcM kooslust mõj enim NH4.

EMH kasv on jõudsam vähesema mulla P korral; väga t

40 000 000), ja MR kolonis mittesteril 2 korda vaiksem

sügav varis, aeglane toitainete ringe, massviljumine, vilets levik; noortel oluline EcM, varjutaluvus, suured seemned, pikaealised lehed. Monodomin metsa ıeid, et linnud neid juh nokiks. Pole teada ühtki mürgist hüpog seent. Vastuoluline, kas seedimine stimul eoste idanemist ja EcM kolonis või mitte. Ka putu

13C alaniin: EcM seened saavad mulda süstitud alaniini kätte ja hingavad viljakehade ka

väidavad, et ECM-seened saavad viljakehade C taimedelt kohe, eri sümbi
EcM seened ei omasta radioakt märgitud lehekõdust C ühendeid. Võib-ol
N väetamine ei mõjuta taimede investeeringuid mükorii
mükoriisa vähene mükoriisa väheneb N ja P (tugevamini) väetades, kasva

14C DHP -synteetilise ligniir 14C DHP -synteetilise ligniini eraldi märgitud piirkondade lagundamine. I

13C, d15N mükoheterotroofsetel taimedel just nendega seotud ECM seentega kõige sarnasem. Pohjend
13C ja 15N: arv Phaeocollybia ECM korge 15N tottu, mis arv tuleneb N hankimisest sygavalt mullast r

vakuolaarsete N t N-inklusioonide sisaldus hüüfides eri CO2 ja N juures

vedelkultuuris kasvatatud puudel olemasoleva EcMde mantlid hävinevad, säilib vaid Hartigi võrgustik. Vee all tekkivad uue

hüdrofoobsed matid: kuiv, palju õhku, kiirem lagunemine iäramine blastN abil pole usaldusväärne - konstrueeriti miinimum-evolutsiooni puu.BlastN lähim vaste pole enamasti fülanal põhjal

etonid!)

söötmest välja jäetud

:i JPN isolaat vähendab taime kasvu ja N conc

ECM seente E-horisondi kivimite lagundamine ja meta

a. Suuremate alade puhul z väheneb. Suurematel saartel liigirikkus ja liigiline koosseis palju sarnasem ja ajaliselt stabiilsem kui väik

kk-tingimused: Salix Repens

peremeestaime genotüüp, päritolu, päritolu*substraadi viljakus

kk-tingimused: Salix Repens vs VAM

mineraalainete kadumine

eri P/N; AM vs ECM vs aeg

sissid kohaliku taime kasvu

patogeen2. Taimede kaitsemehanismid ja nende universaalsus juurtes ja lehtedes. Arabidopsis kasutab põgenemistaktikat. Seemnete kauglevimise vajadus

eteist

Paxillus koos taimega, vähem taim üksi, suurendab oluliselt oksalaadi pro

Hebeloma eritab sümbioosis olles er oksalaati, vähem ka malonaati ja atse

muskoviidi ja horneblende lagundamine: EcM seened ja

e taset

15N ökosysteemide toiduahelates, metaanal: 15N prop soltub enim eritatava N jaagi ainest, taimtoit=lo

97% peksab kokku liiga palju liike. Mõnedes genoomides 16S koopiad üsna divergentsed

inimasustus on vii inimasustus on viimastel ajal muutnud oluliselt nii N, C

spetsgeenide avaldumine

3I panekut

Piceirhiza-võime lagundada orgaanilist ainet, surnud juuri & mütseeli

ıopeziza (erandiks Phialocephala, kus kõigi taimede juure endofüüdid

32P inokuleerimine puusse puuritud auku ja det 32P inokuleerimine puusse puuritud auku ja detekteerin

seened, AM-seened

erikoidide mitteesinemine (v.a Cenococcum)

EMH kuusikus vs kuuse-tam EMH kuusikus vs EMH kuusikus vs kuuse-tamme segametsas. Kuusikus s

tuvastamine PIXE analüüsiga

ergosterooli, valkude ja kitiini kontsentratsioon sõltuval

IAA ECM vs non-MR sama

NO3, NH4 hulga varieerimine; NO3 mõjub EM-le pare

P omastamine otse apatiidist ECM seente poolt: enamv

K, Sr ülesvõtt on tihedas seoses ECM kolonisatsioonig

mükoriisa tekkeks vajalikud geenid olemas kõigil maismaataimedel. Hiljem need geenid soodust ka muud

finlandia mood ecm

e) taimedega; alati kaasnes parem kasv peremeestaimel

ood endoMR EcM seentega, kolmandad AM. EcM on monedele liikidele hadavajalik, et kasvada sygavast mullast maapinnani. Hiljem EcM arv fakultatiiv

(mitteMR); 2-3a Discinella terrestris ja Aleurina sp (mitteMR), Pulvinula tetraspora (MR); 3 a Nothojafnea cryptotricha ja Labyrintomyces varius (mõl M

eemnete idandamisele. Ei soltu eriti sellest, kas isol sama liigi juurest voi mitte. Muud seened ei stimul idanemist lehtede lagundamiskiirus 300 päeval (ent mitte 20 päeva

seente-bakterite seente-bakterite suhe sõltub enim mulla C:N su

onid tolmeldajatega veavad seetõttu liigiteket; orhideed leidsid sobiva seene ka kaugelt istutusalalt - seega nende roll liigitekkes väi

EcM. Monospets. Chlorogaster ja Diplocystis

ajad

mellodendron, Tremelloscypha, + ECM + OrM. 3. vahepeal S. allantoidea, Efibulobasidium, Craterocorolla -biotroofseid vorme ei teata; Arv Sebacinales

Casuarinal N lisamine ja taimekasvukiirus määrasid d15N

13C rDNA bakterid, rikastatud 13CO2

ısarium eelistas jaanuari, septembrit ja kõrge häiritusega mulda. DCA lõi lahku eelkõige mullatüübi, mitte kuu järgi

elis, lagund rakke, inh kasvu pH 5.7 juures, pH3 sama), Phialophora finlandia (stimul kasvu mõl, er pH3 juures), Chloridium paucisporum??? (stimul kasvu

www: arv C ülekanne soltub taimekooslusest; arv seenepoolne investeeri

AM ja ECM teke. ECM tekkinud iseseisvalt mitmetes rühmades ja tagasi pöördumine saprotroofideks, mitte parasiitideks. I

Calostoma cinnabarinum on pisolithuse ja sclerodermaga ühes pundis, mood EcM

mineraalide lagundamises EcM seente roll minimaalne või puudub

domineeris VK biomassilt, ent EcM osakaal jäi 0.2 ja 0.5% vahele, ent sagedus oli suurim (20% proovidest); ei mõjutanud teiste see nevused taimekasvule, kolonisatsioonid, ECM morfoloogias

C ja P ülekannet ei toimu eri Pisolithuse isolaatide vahel; sama

14C woodwidewebi uurimise 14C woodwidewebi uurimiseks

14C liikumine ECM juurtesse on suurem; suur sis 14C liikumine ECM juurtess 14C liikumine EC .

ärskem on ala, seda vähem on genotüüpe, ühe ala piires suurim genotüübisisene kaugus 78m; genotüübid läbisegi, ent vaid ühel juhul samas proovis 2 geno

ECM mõjul 15NH3 ja 15NH4 ülesvõtt suurene ECM mõjul 15NH3 ja 15NH4 ülesvõtt suureneb

mulla mikroseened suudavad EcM seentest palju parem

Pisolithus suudab omandada N tanniinist kui seda on tö

ega arv.

vs erikoidse MR seened

a

kolb, MNC sööde, steriilsed tingimused söötmesse ei lisatud

gi taimekasvu ja Frankia N fik lepal EcM mood eelduseks on nakatumine Frankiaga. EcM seened suurendavad veelgi taimekasvu ja Frankia N fikseerimist

Erinevate lämmastikühendite mõju ECM-seentele ja sap

Kalmia (Ericaceae) lähedus

ceae. Bakteritel muutused väiksemad: vähenesid alphaproteoB ja Aci mullaseened vs. Girdling: kontrollis EcM seened Cortinarius, A

pogon vinicolor, Poria terrestris; Cenoc ja Piloderma fallax ei moodustanud ECM

ise/esinemisega. Liikide kadumine võib end mikroobidele eriti tunda anda vaestel mineraalmuldadel

Tuber tõrjus teised seened välja

fungitsiidide mõju

EcM vs Sap: 15N muutub sügavuti -4..+5; arv. Tricholoma saab kõik C peremehelt, Lact

EcM vs Sap: Tuber melanosporum, brumale ja rufum on kogu aja kui VK areneb, EcM.

edele ja AM-taimedele kultuurtuubides. V sageli mood rakusis kerakesed monilioidsete hüüfidega. EcM ega HN ei olnud ergosterool ei lagune mullas ei puhtal kujul ega ka rakumembraanide osan

ıi pole ja C heterogeensus väike, on tugev konkurents ja log-normaaljaotus, kus bakterite diversiteeti mullas mõjutab C-rikkus, C-heterogeensus, konkurer

üldkatvus (opt. 30…40%)

ses juurte jaotus ebaühtlasem ja rohkem auke. Viljakehad samas klastris võisid kuuluda eri genetitele. Max geneti läbim 7 m ja 11 m vanas ja noores mets
agreg -arv eosed levivad mõnikümmend meetrit. Samas 700 m kaugusel olevad popid pole üldse eristunud -arv geenivah esineb järkjärguliste lühikeste eo

ırsitakse juurte kasvu

AM süsinikuringe. Väga palju C mullas glomaliinina, mis on väga pika elu

C3, C4 ja CAM taimede 13C erineb. Orhideedel (C3) v neg 13C, korgem mykohet orhideedel

ɛga -pms Piloderma, Pezizales, Thelephora-Tomentella). Arv C saamiseks on keerukamad viisid ja esineb C kaotusi vrd N-ga

metallid, stressorid, kemik viljakel	seente eluiga	geneetika, genoomika, ekspressioon	hüüfistruktuiur proovid, EcM hinnang, biomass

fülogenoomika: toidutööstuse pärmiliikide fülogeograafia genoomide baasil. Sacch uvarum p

ıadalam kui ameerikas bakteritel ja 25% madalam eukarüootidel. Väidavad, et kliimal ei ole olulist mõju bakteritele ja toetavad Baas-Beckingi l

) ei koprreleeru

SWE kuusikute vanusereas - BD k

monospoorse kultuuri sisene ITS varieeruvus tavaliselt minimaalne; eranditeks Laetiporus, A

risus segab.

aka K, Houbraken J, Hughes K, Huhtinen S, Hyde KD, James T, Johnson EM, Johnson JE, Johnston PR, Jones EB, Kelly LJ, Kirk PM, Knapp DG, Koljalg U, Kovacs

Hebeloma velutipes: dikaarüon sisaldab kaht monokaarüonit (lahknevad 50/50), mille ITSid on vaid 92% ide

Seega ülekandeahelates oluline just molekulitasemel isotoopide võrdlus

kide tuvastamiseks

)% EcM ja 2-60% AM. Ei tuvastatud mulla aga muu rolli erinevustele. Suurem sademetehulk korrel AM rohkusega

Zn-tolerantne Suillus bov suurendab taimekasvu nii kontroll kui Zn-reostuse juures, samas kui 1 Zn-tundlik seen suurendab taimekasvu vaid kontrollmullas, Zn-reostus

AM vs ErM taimed erineva N, P juures

EcM liikidel (Sg Ramaria) 15N korrel EcM sügavuse asustusega

mikroproovid, mikrokaardid,

Hydnum: ITS liigisisene

saaste vs viljakehade esinemine

risomorfide tüübid

dark septate seente jkultuuri morfoloogia

Al vähendab kasvu eriti mittemükor taimedel; ECM vähendab teistealuseliste katioonide leostumist; leelismetallide lisamine vähendab Al neg efekti. Mitte-ECM taimed

modelleerimine-MR taimed stabiilsemad

vananedes ECM funktsionaalsus ei kao! VRD TEISI!!!

taime 32P ylesvott palju ef-sem kui mitte-MR taimel ja EmH-ta MR taimel, ka transpordil pealsetesse;

ast idanemist. Tuubidega eraldatud idanditel ei tek EcM. Intsia kasvule AM seentest rohkem kasu kui EcM seentest > kontr kõigi P väet tasemete juures. Shorea EcM t

koloniseeritus Malaisisas: Intsia Shorea

ECM puud troopikas: Dipterocarpaceae

ECM taimed troopilises Lääne-Aafrikas

juuretippude eluiga mood 2 kuud, ent mõned tipud >3 a (5%); risom juuretippude eluiga mood 2 kuud, ent mõned tipud >3 a (5

Sebacina spp: v väiksed genetid, samas juures palju sarnasemad seq kui erijuurtes

hübriidide tüübid, näited, kaitsevajadused
usis 7x; Cortinarius spp vähenes 75x

AM ja EcM kolonis kevadel madalam k

Hispaania maasiseste viljakehadega see

taimekasv ja ECM mood parem noortel

Tricholoma matsutake geneetiline struktuur varieerub mööda metsade füüsilist kontakti, mitt

Rhizoctonia kompleksi rühmad: Helicobasidion, Tulasnell

glutamiini omastamine
liigisisene RAPD
vs keskkondlik: vananemisest tingitud muutused N omastamises

CO2 stimul ja O3 nõrgalt i CO2 stimul ja O3 nõrgalt inh EcM seente VK biomassi haavikus. Leccinum spp suurenesid enim, ent mõnedel liikid

mikroobide biomass ATP ja SIR järgi. I

võttu, DNA analüüsi jms. Troopikas domin SordM (kult-põhjal) on haruldased DNA-põhistes uuringutes; morfotüüpideks jaotamist tuleb vältida

N-reostus vs ECM

Ca-oksalladi kristalliseerumine

raade

eluiga 80-100% EcM juurtel all 3 kuu, NM juurtel alla 2 kuu

mikrokosmos kahe klaasiga ja 1 cm vah

näitab orgN ülesvõtu suurenemist

resistant propagule (BD väiksem)

N: Russula cf. Amoenolens; madal N: Cortinarius subgen Telamonia; lisaks Sarcoschypha, Entoloma, Lophiostoma

d=2,8x20*9*3*4*2*3; rnd 10 tippu, san

. Jt

Metsas taim=ühik, laboris substraat: r=5

%koloniseeritud, liike ei määratud

netel

fraktaalgeomeetria: pikkus vs tihedus-p

%koloniseeritud

vs okka-(mõnd stimuleerib, teist inhibeerib) ja kõrreekstrakt (inhibeerib):

g sellest lahut maha, mis peale inkub alles jääb. Leiti, et PLFA reageerib kiiremini, s.t ergosterool lagun aeglasemalt; inkub väh

ECM EMH jaoks võetakse koguproovis

rasvhapete põhjal: bakterid vs seened; e

kasvu mootmismeetod: 14atsetaat>ergo

seente biomassi hinnangud: PLFA

soolastress: Scleroderma hõlbustab soolastrees üleelamist Coccolobal -väheneb NA ja Cl omastamine, suurenebtoitainete omastamine

PLFA

PLFA: mikroobide biomass suurem prir

nineraalidest ja neid taimedesse transportima.

olevad hüüfid ja seda ka metal märgitud fosfaati suudab transportida Tuberi viljakehas olevad hüüfid ja seda ka metaboliseerida; arv et Tuberi viljakeha iseseisvub pea

.

r200

%koloniseeritud

itte anorg P kättesaadavust ega mitte N kättesaadavust

%koloniseeritud/juure pikkus

%koloniseeritud

d ei teata

ndus

tanniin: Hymenoscyphus: suud .

%koloniseeritud morfotüübiti

nenosc ericae

matsutake looduslik viljakehade produk

mutualismi stabiilsuse ja suurima kasu tagab aeglane evolutsioneerumine

ergosterooli mõõtmine j abiomassi kalk

RAPD: Tuber melanosporum -regioonit

pudelikael seoses jääajaga Tuber melanosporum: mikrosat (viletsad tulemused) + RAPD: ühe puu ümber keskm 2 genetit, geneetiline v

Pisolithus liigisisene sõltuvalt peremeestaimest ja kasvukohast %koloniseeritud liigiti

: kanne peremehest maksasamblasse

vs saproobidega

juuretippude eluiga seeneliigiti %koloniseeritud, ergosterool

r = 2,3*30(n=2*5); biomass

ECM dormantsed poua ja külma ajal dormantsus

Cu, Cd, Zn, Pb, Ni mõju amiinide omastamisel vs ECM vs kontsentratsioonid

Zn, Cu, Ni, Cd-taluvus isolaad .

dist. Nulul 95% Ca apatiidist, vahtral 60%; mõõdetud Ca/Sr

saprotroofid

j-maal, heterog mahajäet maadel ja preerias, ühtlane metsas; AM kolonisatsioon eri suktsess aladel erinev: põllumaj-maadel ma %kolonis asemel ECM juuretippude ko

ECM kolonis Hebeloma cylindrosporumi poolt ei aita eriti lühiajalise põua vastu, kuid oluliselt suureneb juurtele kinnituva materjali hulk, juurte eripind

ıtavasti mõjus ka inokulaadi lisamine, sest need katsed, kus EcM ei mood, oli taime mass kontrollist suurem

AM vaher seevastu kannatas nii juurkonkurentsi kui EcM vorgustiku tottu (parim kus polnud ei juuri ega niidistikku). Arv et EcM seened hoiavad ara AM puude peale

%

sega substraadist või läbi anaplerootilise rikastatud Co2 fikseerimisest

e NO3 omastamist, juurte arengut, aga mitte NH4 ega amiı Üks Paxilluse tüvi mõjutab eri seemnepangast kuuskede NO3 omastamist, juurte arengut, aga mitte NH4 ega

lates 16 mg/kg muutus NM taiı Descolea ja Laccaria mood viljakehi potis, eriti madalate P lisade juures. VK sisaldasid kuni 70% taime P-st

EcM seentest eukalüptile oli kasu vaid siis kui muld oli väga kuiv; muidu kontroll ja EcM taimed samamõõtu. Mida niiskem oli muld, seda vähem mood EcM

transformatsioon koralse päritoluga fluorestseeruvate valkudega

ıade C-ühendite 13/12C: Lipiidid ja Ligniin v madala 13Cga ; juurte hingamine v 13C diskrimineeriv, muu hingamine mitte.

veestress , eri seened, Kuusk (Ecm stimuleerib) vs mänd (mõjub vähem); liiv vs huumus (kuivab aeglasemalt risomorfide esinen 3 klassi horisonditi potis

r=4*10(n=10*6)transekt
r=4*15(n=10)

PAH degradeerimine ECM seente poolt -vedelkultuur, suur soltuvus substraadist

15N hulk korreleerus vastuypidiselt EC

ɔon liigi ja N-ühendi diskrimineerimise vahel.

ergosterool: pentaani abil mõõtmine: vä

resistentsed puud: 50%, vastuvõtlikud t

%koloniseeritud

mükoriisa teke juuretippude arv

valt sama proovi mullale, seega arv. Et seonduvad eri liikidega. Tohutu ruumiline varieeruvus väikeses skaalas
calyptil. Arv MR hüüfid olid inokulumiks selles mullas

harv prahipaikadel, sagedam normaalse

kollapseeruvad, ECM areneb tipust aluse suunas. ECM teke: juure apikaalmeristeem kattub ohukese mantli
sisaldus vs ECM mükoriisa teke

.

RAPD autokorrelatsioon kuusel

kui ECM-s, mütseelis pigem monoP. Erinevus Hartigi võrgu ja mantli polüP vahel: HV-s rohekem K, vähem Mg. Eriti K ja P vahel tugev korrel, teised mono-ja divalen on tugev imeja; 32P jaoks on taim tugev imeja. Tundub, et taim reguleerib P ülesvõttu seene poolt vastavalt vajadusele: seen pimedas ei omastatud P ega transportinud c

Cenoc jt suveseened aktiivsed rohkem suvel

seentel on kadunud voi vahenenud mitokondri genoom; paljudel mitokonder asendunud hydrogenosoomiga, c

Sveitsis üle 30 a: aastane kogutoodang kasvanud ja nihkunud keskm 10 p edasi; kogutoodang sõltub pos aastasest ke

%

Pisolithus liigisisene, ECM moodustamise võime, kasu taimele %koloniseeritud

morfotüpiseerimine tuvastab palju rohke

e poolt

risomorfidehulk, frkvents

Morchella rotunda kuusel: koloniseerib nii juuretippe kui ka suberiseerunud jämejuuri nn valkja kattega. Identif septade ultrastr järgi. M

konidiofoorid, ent ECM taimedel mitte. Paxillus hoiab ära ECM taimedel Cyl rünnaku ka lähedastes mitte-MR paigus, Cyl hüüfid moonduvad

melaniinid: keemiline koostis, definitsioon; mitmeid eritüüpe tekke järgi. Bakteritel, kandseentel ja kottseentel erinev melaniin. Bakteril neutraliseerib toksilisi fenoole,

r=5 (n=(3*3)*2

ECM juuretippude C-ühendite sisaldus vanuse järgi

xxx

risomorfide sisestruktuur -ei erine pikkustpidi; kanalhüüfid

erikoidse mükoriisa seente peremeestaimed, võimalikud sidemed, seente ja kanarbikulaadsete raskemetallide taluvus: ülevaade

liigisisene varieeruvus metaboolsetes ja füsiol protsessides liigisisene varieeruvus metaboolsetes ja füsiol protsessides EcM seentel tuvastatud pea igas uuringus

AM seente tapmine benomüüliga soodustab invasiivse Centaurea sissetungi konkureerides mõne taimega, samas vähendab seda mõne muu taimega konkureerides. Eri

P kui bulk mullas; bakterid sügavamal mükorisosf mullas efektiivsemad kui poindmises mullas

liigisisene: RAPD; homo vs dikarüootne

tselluloosi, tärklist, ksülaani, rasvhapete estreid, valke, mitte aga fenoolseid struktuure

a taime vastastikune 13C 15N ülekanne. Seenest Gly ja taimest CO2 märgist kujul. . Seega rohelistel orhideedel mutualistlik mükoriisa. Juhuslik leke välistati. Palju Gl

ma

Tricholoma scalpturatum Euroopas: 2 krüptilist liiki, lähedalasuvad ppulatsioonid ka üsna eri

parandab oluliselt taimede P-toitumist erinevate mineraalide lisamise (v-a CaCO3) korral. Arv. P omastamist parandab hoopis H+, mis eraldub koos oksalaadiga, ent m

inokuleeritud Rhizopogoni suhtelise hulga vähenemine 2 aastal vrd 1 aastaga %koloniseeritud

puud

Rhizoctonia solani-Thanatephorus AG3 eristab tubaka-ja kartuli spets tüved omaette rühmadesse. AG sees o

inimpopulatsioonide levik, geneetiline muutlikkus

endab oluliselt mulla normaalset C-sisal Suillus viljakehi tohutult-arv saab kohalikust mullast lisa C-ühendeid, vähendab olulise Suillus viljakehi tohutult-arv saab kohal

Armillaria vs Hypholoma

Na-stress taluvus NaCl -le kuivatatud +80oC, gravimeetriliselt kaa ligniini ja mangaani peroksidaaside DNA erinevused

kasvuhoone: d=1*10 n=2/taim; kolonise

›ti eri liikidel nii kolonis% kui taimekasvu stimul osas. Soovitavad muude puude alt korjatud Sclerodermasid eukalüptide inoku Scleroderma spp: männi ja eukalüpti ko

juurepikkuse koloniseerimine

1…5a puud, sagedusklassid

Pyrola ja Chimaphila populatsioonid on vähe divergeerunud. Paiguti väga suured kloonid

piisa, sest ei suuda eose kesta seedida ega kitiinist N omastada. Muidu väga varieeruv liigiti, ajaliselt ja piirkonniti. Mõningaid mikroelemente kuhjub seentes, teisi ei a

seente biomass suureneb tundras kui vä

VP, MnP Pleurotus ostreatus -Mn2+ mojul mone 4st isosüümist transkriptide arv kasvab, monel langeb

tubulaarsed ja sfäärilised vakuoolid: N, K, P hoidmine, tra

hüpogeilised seened: eri eelistused raie

erinevate kemikaalide mõju ECM, bakterite, aktinomütseetide arvule

%koloniseeritud morfotüübiti ;mütseeli

Zn taluvus: Suillus luteus >, S bovinus > Paxillus; Zn-tehaste lähedustes peaaegu kõik genotüübid Zn-resistentsed, keskel nii ja naa, kaugel sensitiivsed. V palju isolaat

x, suur proportsioon seenebiomassis

vs taimekasv

KMnO4 põhjal, pöördvõrdeline taime k

Suillus: Zn, Cu, Ni, Cd taluvus looduses ja laboris Suillus: metallireostus vs kontrollalal

Hebeloma transformeerimine Agrobacteriumiga: matseraat , opt temp 23*c

kolonisatsioon sõltus kõdutüübist; maap

söö, sest need ei seedu; seedib kitiini, seenes palju kättesaamatut N

sadesse -< taimed pole C-limiteeritud; arv. Et taimed saadavad lisa-C seentele, et see vahetada N, P vastu EcM taimede kasvukiirus korrleer

re; ammutavad ka lähtekivimitest mineraalseid toitaineid org-hapete eritamisega; MHB abistavad murendamisel; www-d aitavad seemikutel võr

ECM tipud ei sure ECM tipud ei sure talvel, Thelephora ris

üleujutus: alla 15 mm veetasemest anaeroobsed tingimused; korduvate üleujutustega männi juured adapteeru üleujutus: alla 15 mm veetasemest anaeroobsed tingimuse

veestress: juurte kasv peatus peale uputamist ja paljud juured surid, eriti kuusel. O2 puudus tuli 2* kiiremini 15*c kui 6*C juures; hiljem juured taastusid

mänd adapteerus aeglasele uputamisminekule paremini kui kuusk. Männil tekkisid juuresteelis spets ohukanalid. Adapteerumisajaga juurte elumus palju suurem

veestress jämejuurtel: nii kuusk kui mänd toodavad "lenti-rakke". Kuusekasv pidurdus, ent männil mitte. ,kuusel ksüleemi juurdekasv pidurdus järsult

lehtedes, N-mineralis-ga; ent langeb sademetehulgaga,

m. Arv kõrbeliigid tek rannaliikidest

; või ühtlane väetus: taim saab sama efektiivselt kätte 15N kui NM-taim; 33P vähem. AM suurendab P kättesaamist eriti laigu-töötluses
koriisne taim saab sama efektiivselt kätte 15N kui AM-taim sealt kuhu juured ei pääse; 33P ei saa NM taim üldse. Vahet pole, kas N ja P on kontsentreeritud laiguna võ

kõdu lisamine: suurendas kolonisatsioon

kui ühe puuliigi okkaid nüliti, läksid seda eelistanud seened üle teisele (männilt kuusele); kontrollalal kyllalt suur peremehe-eelistus

1.5*1.5*6 (n=10*4); biomass

genetite Cs sisaldus viljakehades ei erinenud

kuni 300

r=1,4*15 (n=5*3*3*2); ülemine vs alum

491 492

osakaal

Suillus variegatus liigigsisene

ülevaade, viited

ülevaade, viited

sklerootsiumide arv

Cantharellus

Sphaerosporella, Laccaria, Pisolithus m

ECM sesoonsus

suvaliselt

olireostusjäätmetel: inokuleeritud seente asendumine kohalikega kiire; ECM moondunud, eriti norkadel konkurentidel

eritaimlates ja eri-okaspuuliikidel väga

makromorf., potikasvatus

Wilcoxina Vrd kandseentega tundlik benomüülile;

Sphaerosporella brunnea õhuke ECM e

%koloniseeritud

x

%koloniseeritud: parim kui kaevandusp

ninohappeid

Hebeloma vk tek vaid kui seen on puuga sümbioosis. Temp flukt ei mõj VK arvukust, ent mõj ilmumisaega. Külmashokk kontsentreerib

ülevaade

EcM ja AM kolonisatsioon ei erinenud

söödavat seeneliiki, pms Cantharellus, Termitomyces, Lactarius, Amanita. Fenoloogia; madal valgusisaldus; suht kõrgem Termitomycesel ja Ca

hibeeris konkurente võõr-taimeliik

ıkalüpti kasv suurenes 13-32 korda, Allocasuarina max 3x, Casuarina max 2 korda. Casuarina juured tegelesid vastureaktsiooniga ning epidermise rakud kollapseerusid.

st; Sarcodes ja Pterospora v kõrgete 15N väärtustega, Pyrola picta vahepealne kõigi ülejäänud puude ja Mhdega. Arctostaphylos madalad 15N väärtused nagu teistel pu

mantlirakkude pinna glükoproteiidid metallide sisujatena

liigisisene Zn taluvus varieeruv .

%koloniseeritud

Armillaria:2000a Armillaria sp; mutatsioonid

Laccaria bicolor: arv erine sekundaarne haploidsus, geenide kadumine kultiveerimise käigs %koloniseeritud vs kontaminant

veestress: Cenococcum kaotab vähem elektrolüüte juuretippudest kui Lactarius subdulcis

RT-PCR -eukalyptia ja Pisolithuse mük

seenkomponent h seenkomponent hõlmab ca 30% biomas

dusta N omastamist mullast vrd teiste seentega

istest omadustest, arv katioonidest ja huumusest. Varemkasvanud taimede efekt ei sõltunud taimede fülogen seostest

Inokuleerides Tomentella sp mittesteril

Tomentella sp kolonis Afzeliat kiiremin

adavuse korral

N saastudes ECM morfotüüpide arv väh

gundamiseks anorg N. Seetõttu toimub org-materjalisest selektiivne 14N eemaldamine ja orgaanika ise muutub 15N-rikkaks

PAH ja klorineeritud yhendite biodegr vamä (enamasti tugevam kui ECM sentel; taluvus palju suurem) ja ECM seente poolt (sümbioosis männiga); puhaskultuurid

Na mõjub seente kasvule ja mükoriisa tekkele suurtes kogustes halvasti, eriti Na-tsitraat %

Tuber melanosporum soodust 2 tamme liigi kasvu, ellujäämust, N, P omastamist ning leevendab veestressi (veepot keskpäeval positiivsem)

ECM kolonisatsioon suurem korgemate

Paxillus, Suillus -eri tüvedel eri EMH ja risomorfide areng
xxx
saprotroofidel: võ fraktalite kaupa mõõtmine

PCB-70% ECM seeni lagundab; kottseened ja Rhizopogon mitte; teised samaväärsed Phanerochaetega

PLFA: mikroobide biomass, seente/bakt

Rhizopogoniga suurem fotosüntees ja ohulohede juhtivus, madalam leheturgor; hebelomaga madalam lehe turgorkorgem lehe osmotne potentsiaal

atud ajal päeval. Efekt polnud seotud parema taime toitumisega. Arv et suurenenud C-nõue põhj suurenenud FS

RAPD Laccaria bicolor; genetiline sidusus: palju väikeseid kromosoome

Cenococcum geophilum 8 geeni põhjal. Klaadisiseselt peab olema toimunud rekombinatsioon

Cenococcum: gpd, ITS, CgSSU intron: , mt SSU: kongruentsed tulemused. Intron tekkinud ühel korral. Arv
ülevaade

mükoriisa eluiga l .

es ja juurtes ning EcM surnud juurte ning koloniseeritusele ja BD-le

AM seened hoiavad õhulõhesid lahti ja lehe turgorit kõrgel

ECM ultrastruktuur: Suillus grevillei + 11 eri peremeest
ECM ultrastruktuur: Suillus grevillei eri peremeestel C kü

Pisolithus-Eucalyptus EcM 4, 7, 12, 21 päeval -eri mustrid. PILDID, SLAIDID

plotiti mitmete taimede juured kokku ja

› EcM kolonis ja sedagi ü vähe. Suurem EcM kolonis stimuleerib noodulite teket

Mullatüüpidel EcM kolonisats ja l

200 random/puu

ECM juuretipu eluiga mõõdetuna 3 vanuseklassis vs 14C allokatsioon: liigiti arinev, er vanuse järgi

e poolt

%koloniseeritud

seentel arv et on mitokondriaalne konflikt emas-ja isas mitokondri ning tuuma vahel. See seletab kiiret liigite

pruunmädaniku seened ja EcM seened on genoomika põhjal kaotanud suure osa lignotsellulo

ıiline vs org+mineraalN; kasv, mineralisatsioon: eriliikidel varieerub. Julged interpretatsioonid

10 ECM seent puhaskultuuris kõrge vs

ɛes mõj koguseene-kooslust enim, CO2 ja O3 efekt marginaalne, arv mõj saproobe ja MR-seeni erinevalt

ECM vs AM: %koloniseeritud

kõrvalproduktide andmine, lai peremeesring kummalgi poolel!!!. Teooriat toetab: mükoheterotr!!!, ECM mittestabiilsus!!!, antagon suhet isel evol kiirenemine red quee

›rella on ECM

ıure kasvu sporaadiliselt. Sphaerosporella tekitas teatud nakkussümptomeid idanditel, ent ei inh kasvu.

eersed kottseened. Arv. Mullaproovi eraldamisega katkestati EcM jm kandseente sidemed.

:ki pool juurtesse; kui algul andis kuusk 100% C seenele, siis hiljem vaid tühise osa ja sai 15N vastu ka vaid tühise osa. Mehhanism ebaselge

ergosterool ja konvertkoefitsent

ıeva enne, mis naitab, et lagundamisel eralduv CO2 on suht tyhise osakaaluga, smas kui juurte ja seotud mikroobide hingamine holmab >65protsendi eralduvast CO2st

kitiin/ergosterool

mikroobide levik sügavuti mullas: 1m-n

ISSR ektomükoriisadele, SCAR marker ühele Suillus collinitus indiviidile. Suilluse genetid püsivad 1.5 a pea

klonaalsetel taimedel küllalt suur geneetiline erinevus, popid koosn pea alati mitmetest genotüüpidest, mis tä
uudab N saada aminohapetest ka nonMR olles; Eriti tugev diskrimin nitraadi 15N -arv, et mida tugevam on looduses 15N diskr, seda suurem osakaal on nitraadil; Trans
diti (NH4, Glu, NO3, Gly) ning oluline koosmoju. Erikoidse MR seen diskrimineeris 15N eriti tugevasti. Frakts voib soltuda voi mitte substraadi konts-st. Arv et igasug
Clavaria: Ericaceae

%koloniseeritud
Tylospora fibrillosa
liigisisene varieeruvus r=5*10(n=2*5); makromorf ITS põhjal;

ole. pH otimum nakatamiseks Tomentellopisis 4.5..6; Paxillus 4.5..5.5. Optimum teravam lupjamisel kui tuha puistamisel

%koloniseeritud, RFLP

ent mineraal-N puhul võib see tugevasti kõikuda; NO3 üldiselt rikastatuim, sest senitrif käigus produkt vaesustub; spets ühendite isot mõõtmin

uktaasi suurem aktiivsus hüüfides
heterosügootsuse allikate vahel vahe tegemine peale pudelikaelu ja kitsaskohti: pidev migratsioon vs järgulin

Tuber maculatum esmane süntees Pinus strobusega. Eriti vermikuliidilisaga pinnasel parem taimekasv (kõrgus, diam

geeniekspressiooni ja N ülesvõttu; mujalt tulev C ei indutseeri

IGS RFLP meetod geneti määramiseks ECMs

mikroobide levik sügavuti mullas: 1m-n

Real-time PCR monel juhul mittesteriiln

ECM seentel mik risomorfide kasv

kui juhuperemees kaotab palju C, ent saab vähe P
korda vähem P

lehis vs mänd: Su %koloniseeritud

num sagedasem; isoleeritutel Laccaria, Inocybe, unkn1 ja Unkn2 sagedasemad. Arv mitte-isol sagedasemad kolonis risomorfidest ja mütseelist kui isol-tute kolonis eos

%koloniseeritud

raskemetallide mõju AM seentele, ECM seentele , ErM seentele ja saproobidele. Mõjumisviisid, ülesaamisviisid, resistentsed tüved; melaniini ja kitiini tähtis roll detok
Cladosporidium ja Aureobasidium sisaldavad kuni 30% melaniini ning seovad edukalt Cu, Cd, eriti eri saviosakeste manulusel

Terfezia arenaria, claveryi, Tirmania pinoyi sünt Helianthemumil. Taimekasv ja EcM vs rakusisene endoMR sõltus s risomorfide struktuur eriliikidel väga pohjalikult. Tsentraa

%kolonisatsioon korreleerus pos koguP

CO2 konts tõusule. Efekt erineb tüveti eri liikidest

EcM seened reageerivad positiivselt bio

ıurenemisele hingamisega, eksudats, biomassiga, C-tarbimise efektiivsusega, N omastamisega. Erandiks Amanita muscaria, Pil

enamus EcM seeni reageerivad positiivs

r=1,4*O (n=5*3*3*3*3*2+2*45)

Zn ja Cd akumuleeruvad pms seenmantli, hartigi vorgustiku ja juure korteksirakkude rakuseinas

rgine Laccariale), rohkem patogeenide kasvu inh tüüpe, rohkem EcM seente kasvu stimul tüüpe (laia spetsiifikaga, kitsa spetsii

Pseudomonas fluorescens: genotüübid r

r=2*12; %koloniseeritud 100 juhuslikus

spooride idanemine

Cd: vähendas koigii organismide hulka, tuhk neutraliseeris cd efekti, tuhk suurendas hingamist 2x, Cd vähendas eriti seente osakaalu ja suurendas aktinomütseetide om

lehekõdu lagundamine ja veesisaldus suurenes, hüüfide ko

iprodioon vähendab taimede kasvu primaarsuktsessioonilisels aimekoosluses
seente viljumine, eriti saproobidel ja EcM lehtpuude seentel on nihkunud nii varasemaks kui ka hilisemaks

veestress vs ECM: ülevaade -hormoonid, transpir reguleerimine, Cenoc -füüsiline kaitse, vee omastamine pooridest, kaudselt muude mineraalainete läbi, VIITED

Heterobasidion annosum on suuteline nakatama ja kasvam

%koloniseeritud parim aktiivmuda jääki

r=5*25(n=20)+mfg lisaproovid sügavam

rn väärtustega

. monokaarüonid kasvavad kiiremini NO3 ja NH4-r .

gem kui taimedes. N ülesvõtt puudel toimub orgaanikakihist pms, sõltumata juurte levikust. SAPROD: Mycena, Rhodocollybia asema, Cystoderma

ix>Aut orhidee>muud taimed>muld; Epipactis ja Cephalanthera (nagu Mykohet taimed) omasid d15N ja d13C suuremaid vaartusi kui muud taimed; Listera ovata ja Pla

1 per puu

herbivoorid vähendavad AM ja ektomükoriisa kolonisatsiooni; AM ja ECM vähendavad lehtede kahjustusi. Taimede varuianete kas ja fotosünteesi regul puhverdavad
herbivoorne stress vähendab, n . %koloniseeritud

Thelephora, Laccaria omavad vedelkultuuris väga piiratud naftaleeni degradeerimise aktiivsust lagunematuteks vaheproduktideks, samas kui Lactarius, Paxillus, Cenoc			
Heterobasidion vs Trichoderma-oluline roll antibiootikumidel eriti happelises keskkonnas			
			kasv agaril: earlystage vs latestage erisu
mittesobilik MR: maasikapuu: ArbM struktuurid ECM seentega, AM ja Hymenoschyphus paiguti tungisid läbi tanniniseerunud			maasikapuu: ArbM struktuurid ECM se
bakterid, seened, AM-seened; 18S RT-PCR+DGGE + klasteranalüüs. Polnud olulisi erinevusi aastaajati ega eri pestitsiidide kasutamisega			
	anastomoseerumine: selle eeldused, geenid, tähtsu	anastomoseerumine: selle eeldused, geenid, tähtsus füsiolo	
		Ceratobasidiales: parentesoom perforeeritud, Sebacina ver	
d vrd tselluloosiga; Arv kandseened eelistatult metabolis 12C samas kui 13C laheb polymeerides. Lagundatud ligniin on u 3,5 -4 promilli 15N vaesem kui lagundatud			
	Cortinariust ei saa RFLP põhjal eristada. ITS vähe	divergeerunud, ent mtLSU annab hoopis paremaid tulemu	
dala NO3-juures. NO3-transferaas: seenel alati aktiivne			
seente hüüfijääkidest, mis ei lagune.			
		lepal: vaid Alpova	lepal: hartigi vorgustik ja ECM arv
Suillus piperatus ei mood ecm. Juurte juurde agaritüki panemine kiirendas seene veget kasvu		Hebeloma, Cort, Tricholoma, Scleroderma, Pisol, Pax, La	
madaldatud temperatuur inhibe madaldatud temperatuur ja väetamine inhibeerivad potis viljakehade teket; lühendatud päev stimuleerib. Korreleerub taime kasvu seisku			
ırvas+vermikuliit parem kui kompostitud männikoor. Kasv plastkonteinerites			

%koloniseeritud, morfotüübid
r=2,5*15 eri horisondid (n=72+48); arv

nete saamises sügavalt mullast need puud üksteisest ei erine, kuigi tammel min-mullas v palju juuri

juuretippude arv, %; vs CO2; hüüfi kog

viljakehade alt

t seende transportima 13C ja seenest Vacciniumisse 15N. EcM-isolaat suurendas ainsana taime 13C fikseerimist

dala d13C ja väga kõrge d15N väärtustega võrreldes saproobidega (Cystoderma, Panaeolus, Mycena, Entoloma). Hygrocybe pole kultiveeritav.

matid matid: %kaetud

Mycocosm portaal seente genoomide analüüsiks

1,5a puud, r=1*10 (n=2*7*3); makromo

veestressi vastu ei aita silikoon ega antitranspirant

Rhizopogoni 2 liigi populatsioonide geneetiline distants suureneb kaugusega

RFLP-põhised probed DSE (Phialocephala, tüüp1) populatsioonigeneetika uurimiseks. Phialocephalal kõrge
Phialocephala: ITS vs RFLP vs ISSR: P fortinii on kompleksliik koosn 4 mikroliigist, mis võivad olla koos s

mis arv olevat krüpt liigid. Genetite eristamisel RAPD 2x efektiivsem kui ISSR ja >10x efektiivsem kui IGS2-RFLP. Samad genetid tuvastati mitmel eri aastal mõl liigil

matsutake: IGS1 -1 dominantne alleel Jaapanis ja 4-5 haruldast

x

klasside kaupa laboris

Hebeloma puhul viljakehad näitavad hästi mütseeli asukohta; peale v kompetitiivne PC kompetitiivne PCR: Hebeloma puhul vil

Hebeloma cylindr Hebeloma sp: IGS2.1 väga muutlik võrreldes muuga

koloonia ligikaud 10*10*10: EMH

Daldinia loculata: eripuudel eriisendid, samal puul enamasti sama isend. 3 geeni sekveneerimine ja alleelid. F

IGS RFLP meetod geneti määramiseks

ln, Glu, Ser, Gly, uurea, Ala, NH4. NO3 keskpärane. Oluline aja efekt. Eri monokaarüonitel eri N ühendite omastamisef erinev. Aminoh omastatavus korreleerus, ent r

ergosterool

Tuber melanosporum: EcM seenmantel vs Hartigi v; HN-s pms transportergeenid ülesregulee

palju suurem kolo meshbag+liiv vs tuhk; tuhas seente-bak

juurtega inokul ebatsuuga istikud: lepp j

raiesmikul, juuretippudel r=2,5* 30 (n=684) 200 juhuslikku tippu

taim

Tuber, Boletus edulis, Tricholoma matsutake: kultiveerimine, VIITED

de d15N oli nõrgalt pos seotud (r=0.39)
llas risoidel; vihm langetab viljakehade 15N järgm v ülejärgm päeval; saproobidel 15N sama mis mullas; Puitulagund seened 0-1 promilli kõrgem kui puidus; Viljakel
/ liiga palju min-aineid ja taim sai ise kätte. Ricinuse d15N on u 1promilli võrra mafalam kui NM taimel arv seetõttu , et transpiratsioonivoog A
ıustrilisust nii mullas kui taimedes

Suilluse agrobacterium-transformatsioon

biogeograafia: tuumamarkerid annavad rohkem ja laialdasemaid voimalusi kui mt-markerid

xxx metallide tundlikkus vs metallid
Zc, Cd eritasemed, vs risti-koloniseerimine, kriitika %koloniseeritud %vs eri Cd Zn tase

r=5*30, eri horisondid; aktiivsete juuret

ed eri puudel erinevalt; mõjutab pos niiskus, temp
r=5*38 (horisonditi; n=70)
pH, niiskus, temperatuur kui kofaktorid r=5*38 (horisonditi; n=486)

koguhulk puul
d ECM seentega

alinensisel EcM mõl pool. Mõl liigid jagasid sama 4 MR-tüüpi, millest väh 2 kandseened ja 1 Cenoc
kaseseemikute istutamine erimuldadele:
%koloniseeritud
ja DS: %koloniseeritud

ähene ja varieeruv

t teistele EcM ja AM taimedele, er. Üheaastastele taimedele, +-võrdsel kujul. Arv läbib suur osa 15N läbi mulla toiduahelate
se vahel. Transp on er suur kui Casuarina on Frankia noodulitega ja ECM > ECM > kontroll. Kui on nii Frankia kui ECM, siis transp toimub pms Casuarinasse hoolim
nii mükoriissest kolonisatsioonist kui kiirikbakterite olemasolust. Voog on kasuariini arv seetõttu, et tal on suurem N vajadus

seeneniidistiku modulaarsus, ühendused, transpor

eisiti

maa taastumisel ECM ja AM kolonis kõrgem kui külvamisel. Inokul metsamullaga ei suurendanud kolonis

sid erinevust mulla ja risosfääri ning eri Laccaria bicolor + Pseudomonas fl. Laccaria inokul stimul ebatsuuga kasvu, MHB mitte (arv sest inokul peale ECM inokul). M
em kui muudesse. 13C liikus iseseisvalt mullahorisontidest

makromorf, RFLP

Suillus varieg kohalolek stimul mullahingamist, mis kompens kõrgemat FS-aktiivsust
mastamisega

EmH hinnang ja k EmH hinnang ja kasv sõltub mulla struk

tulenevad eri substraatidest. N erinevused arv eri N allikatest ja translokatsioonist. Seavad kahtluse all ainult 13C ja 15N põhjal seente troofsuse määramise.
vrd nitraadi ja org N-ga. D15N sama seene piires korreleerub biomassiga ja söötmes kogu N kasutamisega. Arv seente kasvades läheb osa assimil N söötmesse tagasi

ne, P2 13C diskrimin. Arv et see soltub C omastamisest erinevate C kanalite kaudu, mis lylitatakse sisse eri kasvufaasis. . Arv, et loodusest korjatud seeneproovidega t

mt, nu LSU, SSU tähelepanu pööratud resupinaatsetele seentele, palju vigu

Grupp I intron; hibbett arvab, et on toimunud horisontaalne ylekanne

Ceratobasidium bicorne -1-tuumaline Rhizoctonia: tõen homotallism, sageli tek 2-4 tuumsed eosed, mis on a

taimed pms hapestavad mulda ATPaasidega, selleks et saada kätte P, Fe. Reaktsioon NH4 ja NO3-le erinev, Al vältimiseks pH tõstmine. Mulda ka orgaanilised happe

Collembola eelistab mõnda ECM seent

mooniumist. EcM tippude 15N suurenes0-2.3 promilli. EcM kol ja %N korreleerusid 15Nga juuretippudes. Seened, millle NO3 omastamise efe

leerumist taimesse vrd mittekoloniseeritud taimega, taimeosade, seene ja mükoriisa jagamine taimeks ja seeneks 15N mustri alusel

Veestress: N ühendite konts mullas mõjutab taimede veekasutusefektiivsust. Suur transpireerimine on sageli seotud mitte kõrgendatud CO2 vajadusega kui hoopis min

N poolest; NM taimedel 15N sama mis mulla toitainetel. 61-86% N tuleb tundra taimedesse EcM seente kaudu

vad rohkem kui EcM seened, sest sapr kasut vana C. Cort ja Inoc kasut sügavamast mullast C ja N; Russ ja Lact kasut uuemat C ja N kõdust; E

ub nitrif ja denitrif tähtsusest

udavad rohkem N peremehele anda (siin pm-spets korreleerub risomorfilisusega ja ka taksonoomiaga. Taimede 15N on liustiku servast kaugene

nal mullas põhj 15N rikastumist; häiringud ja makrofauna vähendavad vahel erinevusi; savimullad on rikastunud 15N-ga vrd liiv ja silt-mullad;

elgelt erinevamad mustrid, sest niidistikus rohkem kitiini; samaaegselt kõrge 13C ja 15N näitab, et Vkde valgus on mõlema poolest kõrged; 13C

Ka puhaskultuurides erinesid seened 15N poolest. Russulaceaediskrimineerivad 15N arv omastamisel substraadist

doreps

arvavad, et Otidea on ECM, Ramaria, C

ektomükoriissuse määramine isotoopide

si ja muid C-ühendeid paremini kätte saada. Seentes kitiini ja proteiini osakaal mõjutab kõvasti 15N väärtust, sest kitiin on 10promilli vaesem

1-21%. Allokatsioon EcM seentesse sõltub v tugevasti allok maa alla. Väidet kõik looduslikud uuringud on allokats EcMi ülehinnanud (15-21%)

iontidest

edel: EcM ja erikoidse MR taimedel neg, AM taimedel ja NM taimedel pos d15N. Vasturääkiv l lülil (selgrootuteni) 5st

ike

entsivõime ning kasulikkusega. See aitab vältida ka arengut parasitismiks. Mudel.

EcM seentel pole täheldatud indiviidi-põhist adapteerumist

em ja EcM kolonis väiksem lõunapoolsetel liikidel ja pop-(Rhizopogoni liigid ja männiliigid Californias ei ole spetsiifilised allo-ja sünpatrilisuse seisukohast; Inokul mä

suurem madalama mullatoitainete sisald aladel ja korreleerub ECM tippude arvuga ning EMH ohtrusega O-horisondis

kivimiproovid seenehyyfidega. Erivanus

puud investeerivad maa alla augustis 6 x rohkem kui juunis; augustis EcMdmood 39% mikroobsest biomassist mulla

sem kui caesalp all ja arv N transform teistsugune Uapaca all kui mujal. Korupi kohta stabiilsed isotoobid räägivad vastu, et EcM pole siiski olu

on seene osakaal juures, seda suurem on 15N. Arv, et N transport labi HN ei moj iseenesest fraktsion.NO3 ja NH4 diskrimin erinevalt.

oigi taimede (EcM, ErM, AM) juurte 15N sisald kasvab sygavuti yhepalju, aga palju vahem vorreldes mullaga; Selet mulla proffili d15N sellega, et sygavamal seentest

l välja, 25% läheb kasvuks

mulla hingamine ja ECM seente viljakel

Uapaca , Monotes (Dipterocarpaceae) j

ECM taimed ida-aafrika savannis: Caes

15N taimede AM vs ECM staatuse hinc

on, denitrifikats, metabolism; Vâidet mullas domin mittekattes N, mis annab 15N osakaalu ja see aja jooksul ai muutu. Labiilne N muutub, aga seda on vahe; Sygaval n

Grupp I intronite horisontaalne ylekanne kottseentel toen viiruste kaasabil

stutades peaaegu kõik kaovad

ECM ja VK Paxillus erinevad isolaadid

suunas

kvalitatiivne

adekvaatsem: igast proovist kindel arv j

ITS-tüüpide diversiteet: lokaalses skaalas väike, vaid monel liigil suur (Laccaria spp, Tricholoma flavovirens

NaCl -soolatolerantsed Paxilluse eri tüved käituvad erinevalt: üks võtab soola üles ja säilitab selle kõrvalt funktsiooni; teine ei võta soola üles ja

hübriidid Flammulina liikidel: ITS1 ühelt vanemalt ja ITS2 teiselt vanemalt. Mõl alleelid sam

Ramaria LSU mitu eri alleeli eri pikkusega (1-bp polümorfism)

%koloniseeritud

liigisisesed ja liikidevahelised erinevuse

arjus ei seletu millegagi, ent pakuvad 1. C kandmist mööda risoome; 2. v aktiivn FS suvel; 3. "mükoriisa abi"

ıl voivad nakatada ka mitte-peremeestaimi. Cenoc isolaat nakatas okaspuid, aga mitte yhtki lehtpuud. Kui lisada liiga palju Glc, on taime kasv inhib arv seente eritatud

kultuuris EcM kandseened ei tooda koniide; Lima ssimil-kiirus; maapinna lähedal CO2 võetakse respireeritud molekulidest - seetõttu madalam; 13C rohkem sügaval mullas; 15N troopikas 6.5 v

Tuber spp: aeglane kasv, kipuvad kõngema, statistika kul

uude keemia ja varase staadiumi seente mütseel võib paremini mõjuda hilise staadiumi seente idanevusele; 48% mõju idanemisele oli puu genot

egatuse ektodes, mis korjatud lagupuidu alt

arv et AM-süsteemis C-liikumine taimest taime üldiselt ei

veestress: mulla veesisaldus üldiselt väiksem preerias kui metsas; koikuvam kui vosas ja metsas, tugev aastaajaline fluktuatsioon

SCAR praimerite konstrueerimine EST andmebaasi põhjal Hebeloma cylindrosporumile. 6 markerit suudava

:ui Lactariusel

ülevaade

:male ei ulatu. Peenjuurte eluiga keskm 4.5 a

parasitism…mutualism

PAH biodegr on risosfääris kiirem kui bulk mulllas, ent MR hüüfide olemasolu inhibeerib lagunemist, arv MR seened võtavad ära lagundajatele vajalikud mineraalaine

org-happed metallide sidumiseks. Oksalaat võetakse rakku sisse

200 random ECM

dega

väiksem (Cenoc) vrd NM juurtega. Puudus EcM seeneliikide ja ühendite vah interaktsioon

EcM kolonis korrel biomassiga

mine ja kasv on suurem kui Amphinema = DSE = kontroll

ECM ja AM sümbioos kui parasitismi-r

vs lämmastikväetis

r=2,8*5(n=20*2)+1 cm3 random; rando

r=1,4*15 (n=5*4*2); frekvents

10*10*8 (n=3*5); random 25/n

ning suurendavad mineraalide paisuvust

d ja ressurss on lihtne, ent komplementaarsus pääseb domineerima kui ressurss on kompleksne ja geneetiline erinevus tüvede vahel suur

: N sisald albiinodel suurem, D15N korgem kui muudel taimedel, arv saab osa C ja N Thelephora sp1lt, millel on juurtega sama ja lehtedest 2-3 yh vaiksem D15N (sam

ti suur mulla kõdupuidus. Min-muld siiski tähtis, sest massina on seda palju

ta

ıendab nende akt., sügisel PerOx akt väheneb - ARV SOM ja FOM lagundajad vahelduvad; puudel on tugev mõju mikroobikooslustele ja nende

%koloniseeritud morfotüübiti

Heterobasidion annosum cDNA rmtk: geenidel vähe sarnasust, ylesreguleeritud tsütokroom 450 geen, superc

M kolonis osas

Thelephora terrestrise mõju on eri

NOR: viljumise aeg mõjutab eoste suurust. Varem viljuvad liigid ja kuivemal ajal viljuvatel on suuremad eosed

Trichaptum: mitu ITS ja IGS varianti. Dik org-s kummaski tuumas erinev ITS v IGS versioon. 85% juhtudes

hübriidid Coniophora puteana kolmel krüptilisel liigil: ITS1 ühelt, ITS2 teiselt vanemalt ja ef

Lyophyllum shimeji=L. Fumosum EcM mood juurutatud vartel. Mood puhaskultuuris ka viljakehi

ıeente poolt puhaskultuuris, pigmentide sõltuvus N-allikast liigisisene ja liikidevaheline varieeruvus N-ühendite omastamises

arvutamine agarilt

EcM mõju kasvule parem niiskes vs kuivas mullas

15x15*3*12; fragmendid ..100 tippu

16 cm3; %koloniseeritud tüübiti

Tüvede eristamine PCA ja x2 testi abil üht tüüpi märgistusega genoomse DNA abil.

eukalüpti invasioon arv tänu mürgisele varisele ja allelokemikaalidele. Eukalüpt mõjutab risosf bakterite kooslust DGGE ja funktsionaalset mitmekesisust neg. AM see

ı mullas pole seoseid EcM suhtelise ohtruse osas. V tugev neg seos C/N suhtega

elevCO2 -kvantitatiivselt seeni CO2-ro

.

ıassiga.

Trichaptum abietinum: 3 ortoloogset ITS1 regiooni (pseudogeenid, hübridisatsioon, heteromeersetes kromos

taimed + ECM + saprotroofid TNT bioremediatsioonis efektiivsed

i seente efektiivsemast oksalaadi tsirkulatsioonist. Lagundatava puidu d13C ei muutunud 50% massikao järel, mistõttu arv, et seentel oluline ka CO2 pime-fikseerimine

ı=3); 13C sisaldus ei muutu puidu lagunemisel, ent CO2 stabiilne isotoop muutub

het teha EcM seentel ja saproobidel, vaid EcM seeni tuleks käsitleda ki biotroofi-saprotroofi kontiinumil. Kui juur sureb, siis EcM seen saab esi

ECM kolonisatsioon vähenes kõigil seentel männiokaste lisamisel

puhaskultuurid. Männiokkad söötmesvähendavad Amanit

ECM seentel pms vältivad interakts omavahel, pms domin

2000 m2; 80 plotti, >420 proovi kokku;

Tomentella sp

mükoriisa mõju herbivooridele: spetsialistidele positiivne, generalistidele negatiivne; sõltus ka herbivooria tüübist. Mõjutab nii toitainete kooss

r=2.5*15 n=?; %koloniseeritud; vähene

hübriidhaaval vs N väetamine vähendab

kui väetada; N-vakuoolid vaid noortes ja keskealistes rakkudes

Al säilitamine polyP vakuoolides, seened ise pole tundlikud korge Al taseme suhtes tsütoplasmas

Xerocomus badius-mantel väga mikro-ja makroelementiderikas vrd teiste seentega, eriti P, K, Mg, Zn; Hygr suured vakuoolid -sisaldavad n, väikesed vakuoolid -polyI

viabiilsus: mootmine fluorestseiin diatse noored puud

Nii taimedel kui ECM seente viljakehadel tõusis N konts. EcM ja ErM taimedel ja Orthilial v tugev pos mõju 15N-le, ent Pyrolal tugev neg mõj

200 random

200 random

iletaks varjutamise voi juurkonkurentsi efekti

Laccaria sp: monokaarüonid vs dikaarüonid: sarnane, dikaarüoni om 5 palli

Quercus robur -Piloderma fallax: tamme transkriptid vahetult enne ECM mood: ca 50 ülesregul, mfg

st kõvasti. Mükoriissel taimel on eritamine 2-8 korda suurem kui mitte-MR taimel; eritamise maksimum on 17 p peale inokul.

okaste eemaldamine looduslikul männil

Thanatephorus cucumeris=Rhizoctonia solani -Agde ITS varieeruvus: ITS1 varieeruvam kui ITS2; AG-sisen

one taimeliigi panust toitumisel kasut org-mat tekkes arv et ECM seente dikarüootsed genetid inkorpor arv et ECM seente dikarüootsed genetid inkorpor endisse

viljakehade Hg sisaldus Helsinkis: max niidusaprotroofid, min ECM ja puidusaprotroofid

Üldbiotsiidid (MetBr, SMDC jt) lükkav ECM tipu eluiga ca 3a kõik männi 2harulised tipud on ECM, ju

d maad, põlenud alasid, metsataimlaid, väetamine stimul., võis viljuda väh 2 meetri kaugusel elusjuurtest; eoste idandamine noore taime juurtega ei õnnestunud; tüved a

EcM%le; arv et klamüdosp ei ole nii vastupidavad sailitamisele kui eosed

Pisolithus sp ühest viljakehast saadud er monokaarüonide Pisolithus sp ühest viljakehast saadud er monokaa Pisolithus sp ühest viljakehast saadud er monokaarüonide

Pisolithus sp ühest viljakehast saadud er monokaarüonide Pisolithus sp ühest viljakehast saadud er monokaa Pisolithus sp ühest viljakehast saadud er monokaarüonide

Pisolithus: ECM moodustamise ja taime kasvu stimuleerimise võime %koloniseeritud

risomorfid Pisolithus: monokaarönidel puudusid tä risomorfid Pisolithus: monokaarönidel puudusid täielikult

C liikum .

aid siis kui rott on need ära söönud. Arv. Et rott on v efektiivne eoste levitaja, läbides päeval 1 km

ektomükoriisa vs mulla DNA: liiga vähe

EMH lugemine = EMH lugemine = PLFA 18:2w3,6; DG(

NaCl: Paxillus involutus leevendab hübriidhaaval stressi sümptomeid, ent ei vähenda Na ega Cl taimes. Efekt pigem läbi oluliselt parema varsustatuse K+ ioonidega

varieerus tugevasti aastaajati; %kolonis sama ECM kolonisatsioon m-1ja biomass taM

.

inokulumi eluvoime: turvas/vermikuliit (4kraadi juures parem kui toatemp; 4o Pisolithu inokulumi eluvoime: turvas/vermikuliit

kaltsifoob Paxillus akumuleeril .

ECM vs AM: juure pikkuse %

ericales: MR tüübid: eriliikidel leidus m alleelide divergeerumine ja geenitriiv. Erinevused survega geenidest. Metsapuude näited

mika väga erinev kase juurega kokku viies mittemükoriisse Paxilluse üks tüvi, mis on mükoriisne, erineb genoomi ja ITS poolest väga vähe kahest teisest tüübist, ometi
Paxillus involutus G 21.5Mb
EMH uurimise m EMH uurimise metoodika ja faktid: täie
:onkurents, katsed, ülevaade
imine 14C sisaldus

: terreumiga PILDID
emini kui ECM seened Paxillus ja Rhizopogon.

es mehaanilises erosioonis ja vaid biotiidi leostamisel, arv ilma samblikuta on erosioon suurem, PILDID

Intsia: Nagu enamus troopika puid, populatsioonid väheerinevad, pop sees suur varieeruvus. Diskussioon
elkõige Ca ülesvõttu

veestress , eri seened, mõju taimekasvule, N, P sisaldusele. Eriseened mõjuvad veidi erimoodi

liigitekke mehhanismid: saartel suurem ökoloogiline võimalus, sama ka suure häiringu korral mujal. Polüploi

Pleurotus eripopulatsioonid

›erkuloidse ECM periidiumis (mullas ja sees palju vähem)

ıri, samas kui igal puul 1-2 seeneindiviidi. Üle pika maa Eostega levikul v oluline roll matsutake levimises, sest ISSR genotüüpidel pole proovipaiga järgi mustrit.

mikrolülijalgsete BD mõjutab taime kasvu vähesel määral, suurema liigirikkuse juures enam ei mõjutagi. Ka taastumine põuast sarnane madala ja kõrge BD-süsteemide

udu sügavalt mullast või võtavad puujuured seda sügavalt üles; Rhizopogon jt +_ sekotioidsed seened on vähese transpir-ga, ent Amanita raiska

ECM seente ruumiline autokorrel: olem

300 random juuretippu/puu

sega. Mida mineraal-N rikkamal pinnasel kasvab seen, seda jõuetum on ta kasutama valke ja aminohappeid puhaskultuuris (Lact theiogalus) ja vastupidi (Cortinarius sp

EcM seente koosluste uuringuks on vaja

sekveneeritud 14 seene genoomis kõige sagedasemad dinukleotiidsed mikrosatellidid: AC; AG; AAC; AAG;

itsentrist teise

x

x (antag)

le, diskuss

ılestega, samas bakterite hõimk tasemel rühmad samad

võtta märgist glütsiini ja 15N taime transportida (rohkem kui kontr-taimes). Samas 13C ei lähe taime seene kaudu.

Cenococcum: eripaigus palju unikaalseid alleele, a .

ECM vs AM
emates, ent väldib ka äärmusi. Eksperimentaalselt mõl eelistasid parasniisket. Arv EcM tõrjub AM välja sobivates tingimustes
Ricos.
seentes on väga palju toitained vrd muu

sese kolonis-ga, HN hästi arenenud

rprod, ent kooslus v erinev. AM koosluse ühtlus suurendas P summaarset ülesvõttu . AM kooslused erinevad peremeestaimeti ja koosluseti ning sõltuvad, kas taim on r

monoterpeenid inhibeerivad EcM seente kasvu. Eri ühenditel samasugune time seeneisolaatidele. Saproobidele mõjusid terpeenid vähem

kandseente lakaasi geenide diversiteet mulla eri horisontides: suurim O-horis: seal pms saproobide oma, min
tused. EcM hulk suurenes vaid P. Albal (79%), AM 2-38%, jp 35-84. Suurenes juurte allokats miner-mulda ja ühtlasi C liikumine mulda

Laccaria monokarüoodid on mõned võimelised mood ECM

Laccaria>Hebeloma>Cortinarius anoma

evolutsioon kiireneb lihhenis vs mittelihhenis Omphalinadel -nii 28S rDNA ja ITSs eriti AA ja TT saitides, k

Fusarium: esinevad spets kromosoomid, mis kannavad edasi peremeeste nakatamise võimet;

orhideedel Sebacina-Epulorhiza anamorfidel monilinioids

Tuber sp

puud: iga 200 random (n=120)

O-hor 15*15(n=3*5)

15*15*5(n=3*1*5); tuhas vs norm

koesobivusreaktsi sagedusklassid

sel mullal mõl tek v vähe EcM. 2 eukalüptoi liigi vahel tugev peremehe-spetsiifika

cistaceae: Fumana, Tuberaria, Lechia A

Tselluloosi lagund supresseeriti koevol käigus. Pigem võivad taimed käituda parasiitidna seentel, kontrollides neid ja vastutasuks lubades elada

mükoriissed taimed kogu maailmas: üle

Festuca stimuleerib Tuberit

%koloniseeritud, morfotüübid

enttsentrifuugimine. 13C DNAs 2x, rRNAs 10x vahe juurte ergost sisald ja "paksu mantliga ECM kolonis väheneb kui taime lehed ära kitkuda. Seos aastasisene. Eelmise aasta kitku juurte ergost sisald ja "paksu mantliga E

PCA ühtlustus vs reostustase r=3*O (n=5*5*4); sklerootsiumid, biom

ECM vs taim muutus taimsete hormoonide mõjul, kasvu kiirendab rutiin

Laccaria bicolor/ samal indiviidil 2 IGS2 alleeli, mis erinevad suure indeli poolest. IGS sisald v palju mikrosa

viitab N-ringe avatusele ja N rohkusele; mullaprofiilis troopikas vähem erinevusi (v.a. campina), mis näitab suht N-rikkust mullas

%koloniseeritud

vaid kaptaan ei inh taime ja Pisolithus kasvu

ainult benodalin vähendas ECM moodustamist istandikus; benodalin inh ECM seeni, benomyl vaid suurtes kogustes, PCNB inh Pisolithust aga mitte Thelephorat, capta

mullaniiskus: eriliigid käituvad erinevalt %koloniseeritud

nile %koloniseeritud

%koloniseeritud

varajaste koloniseerijate ilmumine kaskede ümber: Laccar

koesobivusreaktsioonid: Paxillus: mänd vs lepp

Laccaria bicolor: algmete areng kasvutasku meetodil; Laccaria laccata: Petri tassis vermikuliidi ja männiga tekib küps viljakeha küpsete

Rhizopogon jt ma %koloniseeritud, klasside kaupa

on/pole

ms AUS-st. Amanita phalloides invasiivne. Saproobidel peremehe-spets madal

kraadiga ja keskmise temperatuuriga; 15N keskmise temperatuuriga ja sademetega (kõik opt-min kõveratena). Erinevused kõikjl. Normalis. Nul
e 15N oli 6 promilli vaesem kui viljakehades ja N konts 2x madalam; Picea mariana N tuli keskm 53% seente kaudu (8-92%), ent see ei seostur
%

ened kolonis pms kiiresti kasvavate pikkjuurte harusid, inokul seened aga lähedasi juuretippe

Pinus edulis Arizonas: 5 liiki Geopora-sarn seeni. Arv see tuleneb v põuasest aastast. AM taimede eemaldamine suurendas EcM kolonis

MR vs metallistress. Eri stressimaandamisvõimalused. Tuleb uurida eraldi niitaime kui seene adapteerumist, konstitutiivset võimet. Eristada mükoriisa üldkasu lisakasu

:svott Alnus viridisel vrd mitte-MR taimedega; noodulid ise ei vott midagi yles

pH optimum Suillus ja Xeroc puhaskultuuridele ja M.R. silvestrisele u 5.0, M:r. Atrovirensile polnud vahet

taimeekstraktide mõju seenekultuuride kasvule

Tuber uncinatum ja Tuber aestivum on eri liigid ITS ja mikrosatelliit DNA põhjal. Erinevalt T. Melanosporu

DSE -ITS -. ITS erinevus liigi sees <2 (3)%; liikide vahel märksa rohkem

transp seenest taime; arv ErM eriti ja EcM seened votavad pigem orgaanilist N otse varisest); mykoriissetes juurtes rohkem 15N kui lehtedes; Arv min N vahesus on ee

%koloniseeritud kõik MR-tüübid

risomorfide tekkeks on vaja kõrget O2 kontsentratsiooni j

Mürklitel USA keskosas: viljumise ohtrus sõltub niiskete päevade arvust 30 p enne viljumist. Viljumise algus sõltub mulla ja õhutemp-s

peale põletamist taimekasv kiirem, ent mükoriisa teke aeglasem. Juuretippe rohk, ent kolonis madalam. Domin Wilcoxina

peale põletamist taimekasv kiirem, ent r

Cenococcum: taimeekstraktide, pH jms mõju puhaskultuuris

Wilcoxina EeMR eluiga u 2a Soomes, nonMR juuretipul palju vähem istandikes konkurentsitingimustes

maasiseste viljakehadega seente eosed püsivad mullas kev

pH mõju seenekultuuride kasvule

massi mõõtmismetoodika vedelkultuuri

Arctostaphylos, Arbutus, pallides

koesobivusreaktsi sagedusklassid

koesobivusreaktsi sagedusklassid

koesobivusreaktsi sagedusklassid

ITS; LRoR, LR21; LR3; LR5; LR7; ITS liigisisene erinevus Ganoderma <2% üle laia geogr regiooni; liikide

veestressi mõjud

gridling

ergosterooli analüüs mikrolaine meetodi

tunduvalt väikemad konts.). Uurea osatähtsus EMH-s v su EMH-s ekspresseeruvad mitmed geenid teisiti kui EcM-s. EcM-s ja EMH-s erinev N-ühendite konts. (EMH-

poud: Suillus hoiab taime kasvu korgemal poua ajal, ECM kolonisatsioon ei vähene, peale pouda palju kiirem taastumine

B: mitte lisades suureneb Cenococcumi osatähtsus %koloniseeritud

NCl puhul Hebeloma crustuliniforme vähendab kuusel okastes NaCl konts. Ja võimaldab kordi suuremat vee konduktsiooni. EcM puudel palju suurem klorofülli konts
ECM seened suurendavad taimejuurte apoplasti veetransporti ja juurte konduktiivsust
Zn kaevanduste Suillus luteuse populatsioonid on sama kc Zn kaevanduste Suillus luteuse populatsioonid on sama kompleksed AFLP põhjal kui kontrollaladel

Tuber melanosporum: ITS sarn >99%; SCAR markerid ei oma mingit erinevust Prantsusmaal

Tricholoma matsutake: IRAP: seeneringid koosnevad mitmest genetist. Arv. Et uued genetid tulevad shirosse

ECM vs Tricholo arv, %koloniseeritud

Arv, N fraktsion toimub mikroobne N transform, N ylesvotul taimesse, **eri taimed kasut eri N yhendeid, eri taimed votavad N eri sygavusest (er pinnavesi erinev)**

viljakehade biomass liigiti erinevates tai

10x10x10, 200 rnd tippu n=3*4*3 + 3*

na, Laccaria spp, Cenoc. Salix reinii idanditel, mis moodustasid võrgustiku vanemate taimedega: efektiivsus biomassi, N, P osas korrel v tugevasti, ent seda ei mõj ülds

id, ECM seened eelistavad glc fru-lr; Glc inh Fru

lõhestunud populatsioonid geneetilise mitmekesisuse (heterosügootsuse) mõõtmine

kaasaegne pop gen mitmekesisuse e heterosügootsuse mõõtmisviis: indivvide võib olla vähe, ent lookusi vaja

EcM kolonis vähendab lehtede herbivooriat putukate poolt. Arvatavasti sõltub ka herbivoori tüübist ja spetsialiseeritusesrt

Korupi taimestik: domin EcM tsesalp. E

mel kolonis, ent vähendab teiste liikide oma; P ja eriti N väetamine vähendab EcM kolonis

%koloniseeritud

o koigi mono-ja diheksooside kontsentratsioon, eriti sahharoos ja trehaloos; aastaajati koigub enim rafinoosi sisaldus, toustes maksimumini talveks veeseente proovid taimelehtedel

N ja poud ei mojuta ECM kolonisatsiooni ega liigilist koosseisu

endil kui toiyu on vähem (mõõtmistehnika kahtlane, saproobide lahutamine peale proovide pikka seismist!!!); ErM+ECM bioma ErM+ECM biomass suureneb lokaalsel

EMH mootmine I EMH: viz vs PLFA

ıreneb mullas sygavuti, vaetades muster teine; vaetades manni okaste 15N touseb; Arv uureaga pohjustab frakts NH3 lendumine; Soovitavad kasut nitraati vaetise moju

ıdo) ja Tricholoma 4 spp mood EcM; Lepista 2 spp, Calocybe ja Melanoleuca ei mood.) Lyophyllum ja saproobid on v erinevad laguaktiivsuse

aseksuaalsete org vs seks org DNA: mutatsioonid, genoomi ülesehitus. Aseks org püsimajäämise eeldused ja

endobakterid

kaptaan ja benomüül vs ektendo ja AM

taim

ohtrushinnang

Fusariumil ja selle teleomorfil Gibberellal on mitteortoloogsed ITS sekventsid kottseente mükooside vastu: nimed ja mõjuviis: ergosterool, EF2, kitiini süntees, valgu süntees jt

vs N-väetamine: väheneb; aastati väga v

Lyophyllum shimeji võime produtseerida viljakehi ilma taimsümbiondita
Hebeloma spp võime produtseerida viljakehi ilma taimsümbiondita

hübriidide teke, ohtlikkus, eeldused

, EMH kasv: ülevaade

ECM vs AM: EM

ECM vs AM: EMH ehitus, RM, transpo

Suillus+Gomphidius

rasvhapped: bakterid vs seened

%koloniseeritud

amariensega. Gnetum võib fasilit Amhersteae kasvu

ECM mantli, korteksi ja steeli läbimõõt

antioksüdandid Cd vastu -glutatioon ja Cd kiire vedamine vakuooli S-prot abil

Pseudotsuga istutatud raiesmikule

mükoriisa isolaatide määramine kultuuritunnuste kask. 3 levikutsentrit peale jääaega: Uural, Alpid ja Louna-Skandinaavia, cpdNA pohjal; programmid

metallireostusala

tulenevalt metallistressist

r=1*20(n=3*6*3)

Buchwaldoboletus lignicola toodab puhaskultuuris fertiilseid viljakehi, peetakse seetõttu saproobiks

Suilluse agrobacterium-transformatsioon

tundlikumad kui muld pärast häiringuid; pms mõjutajad taimedele: maakasutus)sajandeid), liigisisesed var, MR assots, kliima eriti sademed; E

Et parim korrelatsioon on d15N vs nitrifikats/mineralisats

a

svu vrd vermikuliidi ja sterilis varise lisamisega.

suugal ECM. Kas k C, pole teada

Rhizopogon: ei leevenda veestressi

><50%

s OK ent v varieeruv; alginaatgeel ei kõlba, steriilne ettesüntees ei sobi, sest ECM arv kahaneb kõvasti. Parim turvas+vermikuliit kasvuhoones, ent ettekasv aeglane, ku

ı pot, seda väiksem oli diversiteet. Muutus ka koosluse str. Arv CO2 rikastatus võimaldab uutel liikidel invadeerida olemasolevat süsteemi

str muutuvad. EmH: Tylospora D, Thel; EcM: Russula G. Kokku domin Thelephoroid 63; Sebacina 11; Russula 9

erikoidse MR retseptoritel

Glomus etunicatum on polüploidne seen, mille igas tuumas on mitu ITS varianti. Kontsertevolutsioon ei toim

Armillaria: diploidne mütseel ja haploidne viljakeha

Cortinariaceae (sõsar arv Gymnopilus) jaguneb kolmeks kindlaks klaadiks: 1. Cortinarius+Thaxterogaster+Hymenogaster pp + Protoglo

taimede geenitehnoloogia ülevaade

PLFA
otsene DNA amplifitseerimine

N, P

ECM-seentel N-inhibitsioon

1 random juuretükk: n=1600 ;osakaal, t

Kandseentel Sümpatrilisi mikroliike üllatavalt palju. Allopatrilistel liikidel pole olnud arv vajadust tekitada ri

O2 transport veestressis jurte kaudu: mänd -läbi ohukanalite steelis; kuusk -läbi koore (palju aeglasem ja vähem efektiivne)
delite puhuks korrektsed mass-tasakaalu valemid koos usualdusintervalli, SE arvutamisega. Proge.
delite puhuks valemid, mis arvestavad allikate C, N jms konts erinevusi
delite puhuks korrektsed mass-tasakaalu valemid
EcM puudel üldiselt madalam pH kui AM puudel risosf vrd bulk soil, ent see võib olla okaspuude" efekt. Risosf pH korrel tugevasti vihmausside arvukuse ja N mineral

EcM-Rhizopogoni efekt männile sõltub genotüübist ja on päritav, sõltub ka mullatüübist - arv
Phialocephala fortinii: ITS2: Canadas lõunast põhja ei erine genotüübid; põhjas on rohkem klaade esindatud

vaadeldi, et Taimed ja Cenococcumi ECM peavad vastu pikale põuale, ECM küll ei suuda piisavalt vett varuda, ent arv suudab paksude seintega vastu seista kuivamise

AM-seentele

imid, mis lubavad taimede rakuseina lagundada; Geenid, mis kodeerivad EcM teket on Tuberil ja Laccarial üsna erinevad. EcM seened on mir sümbioosigeenid

apealsest varise 15N vaartustest; 15N prop kasvab sygavuti, d13C sama mullaprofiilis; vt vajaliku mat hulk!

helas. Troofilise taseme fraktsioneerimine järvedes on C: 0.4 promilli; N 3.4 promilli. Uuritavad liigid ja kontroll peaksid olema fülogeneet seotud; järveökosys-s vaja h

seente fitness	seente fitness	seente fitness

x

Alnirhiza cystidiobrunnea: kultuurimorfoloogia

fluorestseerimine hindamaks vitaalsust
viabiilsus: variabiilne ajas ja ruumis, sol

poud: tamme süvajuured votavad vaid öösiti vett üles ja translokeerivad seda vaid AM ja ECM seente, mitte parasiitide hüüfid hüüfipikkus/cm3

%koloniseeritud morfotüübiti

juhuslikel juurejuppidel %koloniseeritu
taimekasv puud

äramine bakteritel, hilisem funktsionnalgeenide otsing substraadi rikastamine 13C-ga, 13C ink

u kaevanduspinnasel, suurendab mikroelementide ülesvõttu üh/taim; mitte üh/g taim

OrM: seemnepaki meetod: nailonitükk+seemned filmiklap

xxx

aalse vöötme C ja N ringes. Omastavad eelistatult aminohappeid mineraalse N üh asemel ja suudavad mõnevõrra omastada N kitiinist ja muudest kompleks-or-ühendite
n, juur vms) ja veidi C

arktikataimedel +-

. esineb EcM sagemini kui Casuarinal, noodulitega on lood vastupidi. Noodulite teke sõltub paljuski mulla P sisaldusest

gium levinud mineraalmullas, valged ja pruunid tüübid orgaanika vahel.

liigisisene ITS

parasiit vs sümbiont

endof Curvularia vähendab termostressi peremeestaimel nii 40*C kui 65*C juures.

del

%koloniseeritud

isendisisene ITS varieeruvus 0…0.6% (3 b)

ECM moodustub mändidel koige parem

vaid POD-ga seeni tuleks lugeda valgemäd tekitajateks. Jaapia ja Botryobas lagund ligniini, e

nata aladel

taimed, mükoriisaseened vs globaalsed muutused: ülevaade

%koloniseeritud (puu, juuretipud)

ingamist ja muidu transporti. AM ja ECM seened voivad ses suhtes ka erineda

ła kõrgem on lehtedes 15N

mükorisosfääri organismide roll bioremediatsioonis, võimalused, GMOd, taimede juurde toomine

glyciosmus v sage trentsi s trentsimine vähendab EcM seente VK produktsiooni. Lactarius glyciosmus v sage trentsi servades ja NM??? Entolor

pärast trentsimist kadusid viljakehad. Lactari glyciosmus viljus eriti kaeve ääres

üheainsa Pisolithuse tüvega ECM moodustaminie sõltub männil tugevasti seemnepartii päritolust. Eriti tugeva

taimel ja seenel ECM moodustamiseks rohkus genotüübi arv ja % sõltuvalt taime ja seene genotü

taimede varis: Cenoc reageerib kõigile pos; Cenoc > Laccaria > Pisol > Rhizopogon puhaskult; ECM-dena männil Rhizopogonit inh kõik variseliigid, ent ebatsuugal m isonti rohkem 14C, kas ka prop, ei tea. EMH kvantit hinnang autoradiograafiag

:imineraalidele eriintensiivsusega skaneerimine hüü skaneerimine hüüfide tiheduse mõõtmis

Terfezia boudieri ja T. Pfeilii viljakeha isolaadid c Terfezia boudieri ja T. Pfeilii viljakeha isolaadid omavad ı

Tuberaceae-suur liigisisene ITS polümorfism

Laccaria amethystina: pop-gen põhjal popid ei eristu peremeestaime järgi ja 500 km skaalas c

SCAR praimerite konstrueerimine AFLP ja minisatellit-probede ning sekveneerimise põhjal Tuber magnatum

: Nii MAT+ kui MAT- genotüübid suudavad VK i Tuber melanosporum: veget faas haploidne, mükoriisades vaid 1 MAT-tyyp; VK gleeba on al

IAA sünteesi aktiivsus puhaskultuuris %koloniseeritud

Eri seentel ka rasvhapetel eri fraktsioneerimine. Troofiline frakts veidi neg või veidi pos; Collembolad, kes seeni söövad, on mõjutatud ka seeneliigist ja C3, C4 taimesu

137Cs/134Cs erinevus mullas näitab seente mütseeli paiknemist samas mullas VK sisalduse baasil; saprotro 137Cs/134Cs erinevus mullas näitab seente mütseeli paikı

A, v oluline site-efekt

juhuslikud juuretükid: osakaal

AM seente: Glomus cf intraradices ja Archaeospora sp ko

ECM juuretipu eluiga keskm 139 päeva, viited suurele mõõtmiste varieeruvusele (kuni 5 a)

okaste rookides asendusid risomorfirikkad tüübid siledamate tüüpidega, seente biomass ja penjuurte mass vähenes, kolonisatsioon 100%

eri sookooslustes 2 aastal

katumist; ilma taimeta Melamp suri; Melamp ei takistanud EcM teket

% segmente koloniseeritud

kasvukiirus agaril : vs pH, temp, veepot utamiin>glutatioon=valk=NO3 söötmel. N-ühendite kasutamine polnud seotud kasvukoha N ühenditega. Membraanil vedelsöö ECM seened kasvavad reeglina palju pa

MHB lagundavad petrooliumh .
herbivooria stimuleeritud: efekti tugevus sõltub töötluse ajast ehk eri herbivooridel on ilmselt eri mõju EcM seentele

metsaseente kasvanuse edendamine rev

	Cortinarius sp liigisisene
A. muscaria	A. muscaria liigisisene

seente liikidevaheline hübridiseerumine: uued peremehed, suurenenud virulentsus, AM-seened Epichloe vs N

supressioonitsooni laius

oris -arv et liiguvad eluea jooksul ringi. Vihmaussid eristusid toidu ja elupaiga jargi

15N ülesvõtt, Pisonial sh suht madal -arv. Tomentella pole eriti efektiivne
N mustrites; EcM taimed, mis kasvasid proteiinil, olid 15N-vaesemad kui proteiin ja glutatioonil kasvanud taimed olid 15N-rikkamad kui gluta
taimede juured olid 15N rikkamad kui pealsed, mitteMR juurtes ja pealsetes sama. Mullaprofiilis 15N ei erinenud. Vaidet toimub 15N diskrimin N transpordil seenest t
gnatuur, mis tuleneb arvatavasti N transpordist läbi seene, mitte eri N ühendite omastamisest. Amino-happeid võeti üles väga vähe, kuigi need o
NO3 rohkem. Erinevus taimede vahel, mis omastavad rohkem või vähem NO3Mussoonmetsa kõrgemad 115N väärtused võivad tuleneda kõrges

aastati, kogu liigirikkuse ennustamine indeksite abil

frekvents vs biomass

eremeestaimest; v tugev korrel puuvooriku ja peremehe 15N vaartustel. Puuvooriku 13C 2 promilli vaiksem kui C4 peremeestaimedel, ent 10 promilli vaiksem kui CAM

dif. Invas seeneliikide identif on v keeruline sest 1 raske identif morf liigikonts jr, looduslik biogeo on väheuuritud, endeemseid liike vähe teada, liigikonts jama. Arv ba

Kõrge 15N väärtus võib tuleneda kitiini lagundamisest

IGS rekombineerub meioosis; IGS1 heterodupleksside moodustumine tandemjärjestuste tottu PCRl

viljakeha

Leccinum duriusculum: noores metsas suur genet, Leccinum duriusculum: noores metsas suur genet, vanema

Rhizoctonia: haploidsed vs diploidsed
607,610,615 (var)

ıuna vähendavad mulla org-aine sisald. Taimekasvu ja mesofauna rikkuse ning kogu biomassi vahel ei tuvast seost. ECM ei stimul olul ühegi mesofauna taksoni biomas

tel: org N parem kui anorg N

Pisonia grandis mükobiondi kasv eri N

poud ei mojutanud ECM kooslust ega ka ergost hulka, ent keskmiselt suurendas N-kehade hulka, mono-ja disahh hulka, vähendas glukogeeni ja tärklise hulka; X. chys

Cenococcum sp rDNA ITS ja intron
Cenococcum ITS 2D struktuurid .

ab lehtede vananemist

%koloniseeritud AM

el vastupidi ja sügisel PsTsuga -> Betula; vastavalt sellele, kellel on anda! Metaanalüüs valguse mõju kohta MH ja autotr taimedel ei andnud olu

V, C, N, P ülekanne taimest taime

batsuuga oli varjus, liikumine mööda N, C gradienti
sünteesi aktiivsus kontrollis kõrgem, korrelatsioonis seente liigirikkusega

rnd 100 juuretippu

ühel haploidsel seeneindiviidil mitukümmend SSU, ITS, LSU tüüpi. Enamus unikaalsed punl

eri populatsioonid Maailmas

kultuuriomadused

vähem

Manause läh üleujutatud aladel (valge liivaga, toitaineterikka settega) puuduvad EcM taimekooslused, kuigi v üksikud Amanita nauseosa, Gyrodon ja Pulveroboletuse

M

pind: r=2m; n=900; Piloderma: esinemis
x

is-tüüpi mükoriisat. Paris-tüüp on vähem efektiivne taimekasvu stimul ja P seisukohalt. P omastamine ei seostu 5kolonis, kasvu stimul-ga. Seente kaudu toimus P saami

EcMga. Arv selektiivraiega aeglaselt surevad dipterokarbid tulenevad EcM seente suremisest peale raiet.

seene mütseeli bi seene mütseeli biomass kõigub sesoons

rDNA koopiate arv on erinev ja pikkus isolaadisiseselt varieeruv Agaricus bisporus eri tüvedel

%koloniseeritud

liigub lehest hüüfi tunni-paariga AM tipuhüüfide eluiga 5-6 päeva, jooksevhüüfidel pikem. 14C järgi. AM tipuhüüfide eluiga 5-6 päeva, jooksevhüüfidel pikem.

Arv et reost pinnast koloniseerivad lokaalsed kõrgema vastupidavusega EcM seeneliigid

transgeensete taimede mõju: pms neutraalne, harvem negat

raskemetalle (Cs näited) akumuleerivad ECM seened rohkem kui saprotroofid. Substraadist saavad seened kätte 10x rohkem Cs kui taimed; ECM taimedes vähem Cs,

253 249-250dif

ei usu et ECM seente dikarüootsed genetid inkorpor endisse haploidseid eoseid et säilitada potentsiaali, sest

Hebeloma, Laccaria, Thelephora mood ECM ka vee all olevatel juurtel, Suillus spp mitte. Samas olemasoleva ECM üleujutamine ei tapa mükoriisasid. Suillus spp EM patogeen Zymoseptoria pseudotritici on tek kahe patogeeni ristumisel u 380 põlvk e 200 a tag

AM seente intronitele ja LSUle multiplex PCR. Spoorisisest var ei tuvastatud, liigisisene var palju suurem ku

%koloniseeritud

benomüül ei lase agarsöötmele välja kasvada enamustel ECMs olevatel kottseentel, teisi inhibeerib tugevasti; ei mojuta kand-ega ikkesseeni

Suillus bovinus: võimaline absorbeerima hüüfidega Rb, suhkruid, polüoole, glutamaati, vett, mitte oksaalhapet; eritama oksaalhapet, eriti inositooli, peptiide,

rythmA geeni tuvastamina Laccaria bicoloril, mis interakt AP180 regiooniga. Toimib mükoriisas vesikulaartr

%koloniseeritud

kooslus erinev, põuakahj ALADEL v sarn, mujal mitmekesine; %kolonis kõrgeim keskm-kahj puudel

% kolonis põuakahj ALADEL madalam

Laccaria ssp liigi-ja perekonnasisene

Laccaria vs Fusarium,

peremeestaimel moodustada ECM

eesi 1)toimub siis kui taimedelt ei saa C; 2)lagund selleks, et kätte saada min-aineid, mitte C; 3)siis kui just palju C liigub juurtesse

arv vajab Boletus edulis viljakeha tekkeks3,5-14M EcM tippu või 363-1800 km EmH

r=1,25*15 (n=5*3*3*2+2*45); arv mor

el, peremeestaimede vahel. Suur N konts var; Thelephoraceae -v korge D13C ja C konts ja D15N; Chalciporus korge D13C; Agaricus spp, Collybia sp -v korge D15N,

st pealsetesse oli minimaalne; Aminohapete ylesalla transp on kas yhendispetsiif voi hingatakse Gly-st tulnud C lihtsalt valja; Igatahes on iga lisa C suureks abiks toitum

mustris liikide vahel ning jala ja kybara vahel arv setottu et kybaras on rohkem N aminoh ja valkude naol; kitiini, valkude ja aminohapete 15N erinev eri liikidel; kuivat

Laccaria amethystina liigisisene

arv morfotüübiti

arutelu liigiti

proovide hulk ja sellest tulenevad probl

elluloosi konts

r=5*40 (n=3*5)

mittesuguliselt paljunevate seente populatsioonigeneetika: Ophiostoma, Armillaria, Mycosphaerella, Gibbere

Liigikriteeriumid seentel ja kuidas liikide arv kasvab morf<biol<fül. Krüptilised liigid, näited

:itud nitrifikatsiooniga ja mineralisatsiooniga (posit)

korrel taimekasvu ja EcM kolonis vahel, teistel pole

õhusaaste	inhibitsiooni põhjused reostatud piirkonnas	r=1,25*13(A)(n=10*25); koguarv, Cen(
10kg/ha N03		koguarv, %koloniseeritud
	hulk liigiti	r=1,25*13(A)(n=16); koguarv, %koloni

:õttu, et niidul pole ECM-seente inokulumi ning närilised, mis muidu seeni levitavad, ei rända metsa ja niidu vahet. Metsas ja niidul eri liigid. Per üleujutus iseenesest ei

sest ega fotosünteesitava C kogusest, ent oleneb seeneliigist (Rhizopogon > Wilcoxina > Cenoc). Transport toimub kui süsteemis on häiring ja t

pH mõju EcM seentele ja EcM moodustumisele: opt 5.5-6.5. Wilcoxina domineeris kui pH>6, muidu domin 'valge' tüüp
temperatuur: Rhizopogon ja Suillus opt kasv puhaskult ja EcM mood 25*C
:must kui värskete eostega.

a rohumaadel väga madal inokpot mändide jaoks
bakterite ja aktinobakterite suktsessioon juurtel ja mullas erinev; veidi erinev ka peale Ps. Fluorescens inokul ja fungitsiid imazalili kasutamist. PsF ise vähenes aja jook

Phlebopus: sklerogenees -sees polyfosfaadid ja glykogeen

arv
peremees-parasiidi interaktsioonide modelleerimine metapopulatsioonide tasandil: pole superpatogeene; patc

kui ECM

695, 696,699,
318

ist, kuna ühed seened induts teisi. BD efekt suurem tselluloosil vrd keerukamatel ühenditel

tugev seos EMH koguse ja taime P vahel EMH kvantit hinnang skanneerimise ja

d võivad 2000 a jooksul muutuda. Arv et monodomin kooslused toimivad läbi posit tafgasisidemete ıkad ja vihmaussid neelavad eoseid, ent selle mõju idanemisele pole teada

Risomorfide eluiga EcM seentel keskm 11 kuud ja seda ei mõjuta N Risomorfide eluiga EcM seentel keskm 11 kuud ja seda ei

ıudu välja

ıondid eri vanuse C-ga eri N-reziimi all, väidavad, et ECM-seened saavad viljakehade C taimedelt kohe, eri sümbiondid eri vanuse C-ga eri N-reziimi all, ent mõõtmisv

la siiski aminohappeid omastatakse, ent sealne süsinik läheb hingamiseks

sadesse

b CO_2 mõjul: metaanalüüs %kolonis on vähereageeriv tunnus väeta

Rongas ja beeta-sidemes aeglasem

juurepikkus kolonis ECM ja DSE kasva

lavad, et arv toimub seene rakusisaldiste purskumine taimerakkudesse, mistottu on MH taimes rohkem D15N; võrdluseks ka muld, CWD, muud taimed;

ıagu sealsetel taimedelgi; Cortinarius sp ja Chroogomphus spp saprotroofi-laadsed mustrid. Saprotroofidel jagunes ära kõdu, va 13C ja 15N: arv Phaeocollybia ECM; C

Terfezia suurendab Helianthemumil transpir ja FS aktiivsust, klorofüll a ja b kontsi

raskemetallide sagedusjaotus mükoriisa eriosades-koondunud mantlisse ja risomorfi raskemetallide sagedusjaotus mükoriisa eriosades-koondu

vedelkultuuris kasvatatud puudel olemasoleva EcMde mantlid hävinevad, säilib vaid Hartigi võrgustik. Vee all tekkivad uued mükoriisad omavad vaid Hartigi võrku.

hüdrofoobsus vs hüdrofiilsus-mütseel: vee, pindaktiivsete

hüdrofoobsed matid: kuiv, palju õhku, kiirem lagunemine sõsarliik. NJi analüüs sõltub rohkem aligneeringust kui Bayesi metoodika, ent resolutsioon on palju parem (arv liiga julge); täisautomaatne aligı

PCR produkti pikkus: 18CrDNA ja erinevus kõiksugu organismidel otsene DNA amplifitseerimine

krridi-tertsiaari pi krridi-tertsiaari piiril peale asteroidi mõı

mittesüstemaatiline

ECM seente E-horisondi kivimite lagundamine ja metallide vaesustumine/rikastumine, orgaanilised happed mullas

esel saartel. Ka kaugusega väheneb koosluste sarnasus 10 -2000 m skaalas

% koloniseeritud+morfotüübid

taimel ECM efektiivsus

arv / juure pikkus

ECM vrd AM %koloniseeritud

eraldi arbuskulid, vesiikulid, hüüfid

; mõnedel taimedel

duktsiooni ning ka lagunemist. Oksalaadi hulk seotud enim hingamisega, EMH kogupikkusega. Vaja mõõta eraldi juure ümber. Ei eristata hapet ja sooli

taati, siderofooridest ferrikrotsiini, vähem ferrikroomi. Arv et oksalaadi eritamine võib olla oluline C tõmbaja

EcM seened ja mänd eksud oksalaati, malonaati ja fumaraati. EcM seente juurdetoomine süsteemi ei suurendanud kogu org-hapete prod, kuid muutis kvaliteeti. Paxillu

ı NM mänd kiirendavad muekoviidi ja hornblende lagundamist, Pax invol kiirendab eriti muskoviidi lagundamist. Kättesaadud K ja Mg talletati hüüfides ega transatud t

AM: freq; %colon

omtoit>kodutoit, taksonoom kuuluvus, elupaik magevesi=maismaa>merevesi,

raskemetallide sisaldus viljakehades Lapimaal: sulatite ääres kõrgem

%koloniseeritud

hartig net/cortex, mantli d

%koloniseeritud

Al: AlPPP teke, kelaatimine, seen talub üsna hästi

Piriformospora indica -sarn 18S rDNA Ceratobasidiales [l

total DNA mullast

Pleurotus ostreatus komleks: ristumise baasil morfoloogilised liigid on samad bioloogilised liigid, bioloogilin

%

osakaal
5*5*20 (n=5*6)

, S tsükleid, levivad tehnogeensed ühendid ja raskemetrallid. Globaalne soojenemine toimub pms foss kütuste, N akumul väetamise ja metsaraie tagajärjel. Enim on bio:

Piceirhiza-Hymenoscyphus: taksonisisene

nine Sarcodes sanguineas, aga mitte teistes taimedes.

%koloniseeritud

1cm lõikudel %koloniseeritud

sügavusjaotus ühtlasem kui tammikus, üldse kuni 70 cm süg olulisel määral. 13C mütseelis sügavuti sama, ag EMH kuusikus vs EMH kuusikus vs kuuse-tamme segame
tuvastamine PIXE analüüsiga elementide tuvastamine PIXE analüüsiga
eriECMseente riomorfid sisaldavad erineval määral raskemetall ja muid elemente: PIXE analüüs. Tugev solt eriECMseente riomorfid sisaldavad erineval määral rasker
lt pinnase toitainete sisaldusest hüüfide, ECM eluiga ergosterool vs kitiin, valkude sisaldus a
mütseeli sesoonsus ja eluiga, kasv sõelkoti-sissekasv; ergosterool, rasvhap

mini ergosterool
ähem ergosterool
K, Sr ülesvõtt on tihedas seose .

trambitud pinnasel ergosterooli sisaldus

e juuresümbiooside teket

populatsiooni-ja liigisisene: puud, ülevaade

ECM puud austraalias: Myrtaceae, Casu

ne; taimedel mikroseemned; AM induts koigi liikide kasvu tugevasti, vaid moned Pezizales spp. induts paari liigi kasvu (Lobelia gibbosa, L simplicaulis) juhul kui need

R)

Endogone, Sclerogone mood ECM. Mõned Endogone liigid mitte-MR; üks spetsiifiline vaid männile, teised v apljud Austreaalia taimed

Muciturbo ja Ruhlandiella mood viljakehi puhaskultuuris koos eukalüptiga al) tugevas korrelatsioonis lehtede algse N sisaldusega. Taimeliikide lehtede segamise efekt idiosünkraatiline

PLFA

htest

seente-bakterite suhe sõltub enim

ke; arv. et seened mängivad rolli orhideeliikide ko-eksisteerimisele

on kandseentest algelisim ECM seened jt on kaotanud ECM võime sekundaarselt

x

viljakehade väheneb kui väetada: Cortir

ı pH 5.7 juures, pH3 sama), Cenoc (stimul kasvu pH 5.7 juures, pH3 mitte, sest polnud ECM).

Paxillus obscurosporus isolaatidel v erinev mõju taime kasvule ja mullahingamisele. Suurem

ıg uude taimesse on ef-sem ja pikaajalisem kui invest säilituskudedesse

ECM püsivust soodustsobivaima partneri valik, pseudovertikaalne ülekanne (lokaalne levik), vastastikune üksteise ärakasutamine

Coriolus puidul

kottseened Antarktika maksasammaldes

ente liigirikkust; eri EmH-liivaproovides biomass jäi 0 ja 5.6% vahele (keskm 2%) RT-PCR põhjal

Amanita phalloides invad N-Am:

%koloniseeritud

isolaadi anastomoseerunud rametite piires aga toimub.

ECM seened juur klaaside vahel %pinnast koloniseeritud

otüüpi. Alleelid olid alati haploidsed SSCP järgi Cenococcum: levib primaarse suktsessiooni aladele vegetatiivselt. Lähedastel aladel mõned identsed genotüü

iini lagundada glükoosamiini ja atsetüülglükoosamiini ning nende tanniniseerunud ühendeid. Seepärast arv, et saproobid on vajalikud mineraliseerijad, kust EcM seened
ödelnud saprotroofid. N limiteerimisel N peremehesse ei transpordita

juuretippude arv meetri kohta: segamän

liigiktiteerium ITS >99% id liigiktiteerium ITS >99% id; metsas EC

erikoidse MR see erikoid: %segmente koloniseeritud

heterotallism on matsutakel. Distantsiga suureneb geneetiline erinevus pop vahel, ent kõrguste vahe pole olul

15*15*10 käärid
5*5*5 (n=64*2)

%koloniseeritud kasutades erimeetodeid

potis

kuna varustavad vajalike mineraalidega
protroofidele. N-troofsuse jaotused biomass kolbis (?)

Wilcoxina mikolae polüspoorne kultuur on võimeline viljakehi tekitama sümbioosis peremeestaimega 4 kuud peale inokuleerimist klaas

%osakaal

theliales, girdling: Helotiales, Serendipitaceae, Ganodermataceae. Bakteritel muutused väiksemad: vähenesid alphaproteoB ja AcidoB

Tuber porchii: 4 aasta toodang

%koloniseeritud

mõju ECM-le

% koloniseeritud

tarius osa kõdust, sest peenjuurtel ja mükoriisadel eri muster. Viljakehades fraktsion suureneb jalast kübarasse ja lamellidesse. N-limiteeritud sü

Peenjuurtel ja EcMdel v sarnane 15N ja 13C muster, v.a. 15N talvel EcMdes 5promilli kõrgem

Tulasnella, Thanatephorus ja Ceratob v harva patogeensed

2 trühvli liigi sünt 2 trühvli liigi sünteesitud EcM morfome

populatsioonidünaamika, geneetilise distantsi, pop jagunemise teooria, metoodika, kitsaskohad: ülevaade
Mycosphaerella graminicola: vt pealkiri, levikutsenter Lähis-Ida

ia, seega seda ei saa kasutada seente elusbiomassi näitajana

ergosterool ei lagune mullas ei puhtal ku

its, isolatsioon, vähem kk fluktueerumine ja C ülekullus. Kui isolatsiooni pole ja C heterogeensus väike, on tugev konkurents ja log-normaaljaotus, kus üks neist on, siis

%koloniseeritud

RAPD põhjal: Suillus liigisisene
as. Aastast flukt seostati, et eri genetid toodavad viljakehi eri aastatel
iste levikutena

kalmia allelopaatilised ühendid .
ieaga

söötmed looduskaitse fakte

ärineb S-Am Nothofaguse ja Cyttaria juurest, ent korra levinud Põhja-poolkerale ja seal hiljuti radieerunud. Paljud teised tööstuse pärmid on hübriidid

ıüpoteesi. Taimkate ei mõj kumbagi analüüsi.

ιasvab, EmH biomass max 10-30 a metsades enne hõrendamist spergillus sp, kus >1% sekventse tunduvalt erinevad.

; GM, Kurtzman CP, Landvik S, Leavitt SD, Liggenstoffer AS, Liima

:ntsed. Arv. On tegu vana hübriidliigi, mitte korduvate uute hübridis sündmustega, sest s. O laialt levinud. Need 2 ITS tüüpi on sarnased eri biol liikidele ega mitte. Mõlemaid genotüüpe vaid 1 (pseudorepl)

saaste vs viljakehad

del Al vähendas P omastamist. Hebeloma ei talunud Al
d toitainetevaeses kk-s, muutuvas kk-s ebastabiilsemad

ek 20 p jooksul peale idanemist metsas. Kontakt elus juurtega v oluline nakatumiseks
all: 1 kuuga, mida lähemal suurele puule, seda kiirem kolonisatsioon

, Euphorbiaceae (Uapaca), Caesalpiniaceae, Fabaceae (Pericopsis), Myrtaceae, Nyctaginaceae (Neea)

: ülevaade

%); risomorfide eluiga u 7 kuud

PDA

hübriidide tüübid, näited, kaitsevajadused

:ui sügisel, väheneb org aine kasvades. [Arv kevadel nooremad juured]

nte liigirikkus. ECM peremeestaim on juurde pandud meelevaldselt ilma igasuguse maasisese vaatluseta

nulgudel mullal kus orgaanika eemaldatud

e linnulennult üle mägede

a, Sebacina, Thanatephorus, Ceratobasidium eristamine dolipoori ja parentosoomi ultrastruktuuri järgi, kultuurimorfoloogia, sh sklerootsiumide jr; Sebacinad 1-või 2-tuumalised

MMN

mardikate ja põrnaikate BD Honduurases ekstrapoleerimine Chao2, jacknife ja bootstrap abil. Proovide arvu suurendades suureneb Chao2 pooltel juhtudest (vahemi

lel ka vähenes (Paxillus). Pigem vähenes varase st seentel ja kasvas hilistel seentel

N-väetatud metsas väiksem kui muidu, efekt eriti tugev väheviljakatel aladel a

ECM langus Lääne-Euroopas
ECM seente kaitse, osa maailma toidumajanduses
xxx

net

nad DNA

5*20(2)/2(n=3*5)

ole eriti usaldusväärne

MMN ei lämmastikusisaldusega: ei avaldanud erilist mõju ECM vs mikro-ja makrosaprotroofide antagonismile

st kohe PLFA18:2w6,9 ja ergo ning sellest lahut maha, mis peale inkub alles jääb. Leiti, et PLFA reageerib kiiremini, s.t ergosterool lagun aeglasemalt; inkub väheneb ka bakte
eri keskkonnad
sterool

looduslike rohumaade taastamine: aastati muutub üldkatvus ning eri taimerühmade osakaal: kõrreliste hulk, juurte biomass, mikroobide biomass kasvab, rohundite o

. 18:2w6,9 on parem kui ergosterool ja qPCR: olemas suurel hulgal kandseentest, ohtralt, liigiti varieeruvus väike. ITS koopiate pg DNA KOHTA! Var.

Tansaania: Katavi NP dominCombretum jt mopane puud. Kasutataval maal basaalpind, puude arv ja BD suurem kui kaitsealal -arv et tegu on kahe koosluse seguga

n sukts aladel lepa, Equisetumi ja Rhacomitriumi risosfäärides vrd teiste taimede ja palja mullaga

peroksidaasid vs kemikaalid valge-mädanik-seentel. ülevaade, JOONISED, kineetika, pseudokineetika

le algme moodustumist, suutes ilma peremeestaimetagi kasvada

delta C13, N15, S34: ohureostus mojutab tugevasti metsi, delta N15 suureneb kovasti taimedes ja huumuses; S34 leostub kergesti

tanniin: Hymenoscyphus: suudab lagundada paremini kui ECM seened, siiski inhibeerib kasvu, ent stimuleerib PPOde aktiivsust
proteiin-polüfenooli on ErM seened võimelised lagundama, ent ECM seened mitte
piiratud N-ga MMN

tsioon Rootsis

uleerimine pole veeseentel usaldatav

i väga väike erinevus, erv tegu pudelikaelaga viimasest jääajast, arv põhj viljakehade hiline valmimine
varieeruvus kasvab puusisene < puudevaheline < paikade vahe; ent distantsi kasvades nii puupiires, puude vahel samal pollul kui eri poldudel ge distants ei suurene. Üldse polün

agar

guarv N-jaot tõttu

tungi. Arv on www eriti oluline varjutaluvatele EcM puudele

Uus-Kaled sklerofüllimetsad on hävimas

ı aminohapete omastamist

PAH degradeerimine ECM seente poolt -vedelkultuur, suur soltuvus substraadist

M kolonisatsiooniga

iksem põllu kui niidumullal

aimed: 35%

l alal AUS troopikas

ga, seejärel tekib hartigi vorgustik ja paksem mantel, juurekarvad kollapseeruvad, ECM areneb tipust aluse suunas.

P säilitamine polüP-na samasugune nii veget mütseelis kui ECM-s, mütseelis pigem monoP. Erinevus Hartigi võrgu ja mantli polüP vahel: HV-s rohekem K, vähem Mg. Eriti K olemasolevat taime; samas mitte-ECM juurtes P kuhjus

er naaeroobsetel seentel; teistel mitok geenid rannanud tuuma. Seavad kahtluse alla senise seente polvnemise

eskm sad-hulgast, toodangu algus sõltub augusti max temperatuuridest

saproobide kultuuride säilitamine agaritükkidel steril dest vees

MMN

em EcM seeni kui T-RFLP. Prooviti 3 eri praimeripaari ITS regioonile, sh 58A2, NSI1, NLB4. T-RFLP tekitas kaheldava õigsusega mustreid, mida ei tuvastatud hiljem sekvene

lantel paks, Hartigi võrgustik vaid 1-kihiline!!!; väidet ECM. Sek koloniseeris ka kandseene ECM -hartigi võrgustiku rakkude vahel. Sellinsed struktuurid püsivad suvest talveni

seob rauda ja kaitseb H2O2 vastu, Ultravioleti ja insektitsiidide eest, aitab pindadele kinnituda, vs hüperosmootne shokk, vs kõrge temp; . Seentel rakuseinte küljes, apressoori

d on eriseentel väga erineva läbimooduga

taimede ris AM seente tapmine benomüüliga soodustab invasiivse Centaurea sissetungi konkureerides mõne taimega, samas vähendab seda mõne muu taimega konkureerides. E

Centaura vohamine Ameerikas (pärist Euroopast) võib olla seotud AM-seentega, mis pole peremehe-spets ning peremehe-spets patogeenide puudumisega Ameerika y C-st hingati välja; EmH-sse liikus 2.6% taime fix $^{14}CO_2$st. Taimest liikus C palju rohkem kui vastupidi

miombo ökosüsteemide majanduslik tähtsus aafrikas kõrge: mesindus, seened. Palju LK ja demogr probleeme, korruptsioon

ineva struktuuriga

iille $CaCO_3$ kiiresti haarab

n somaatilise mittesobivuse rühmad, mis koosn isolaatidest. Seal eri isolaatidel eri AFLP muster, v sarn muster ja grupp võib tulla kaugelt alalt

ikust mulla Suillus viljakehi tohutult-arv saab kohalikust mullast lisa C-ühendeid, vähendab oluliselt mulla normaalset C-sisaldust

MMN

eritud juuretippude arv proovis
lonis eri liikidel ja sama liigi isolaatidel erinev. Tehti suurt vahet ka männi ja eukalüpti eri liikidel nii kolonis% kui taimekasvu stimul osas. Soovitavad muude puude alt korjatu

miombo kasutamine: pms puusöe põletamine, ohud põllustamine, viljapuude saagimine. Põletama peaks kohe peale vihmaperioodi, mitte kuivvaper lõpus

maasiseste viljakehadega seened: Austraalias leiti korraga yle 150 uue liigi; provialade uurimine inimtundides

kumuleeru üldse. Seentes palju Se

etada. Kui soojeneb, kasvab seente ja juurte biomass vaid igikeltsa aladel, mitte kanarbiku-maadel. Liivakottidesse kasvas enamasti EcM mütseel isotoopide järgi. Mütseeli pro

nsport rakust rakku: ylevaade

suhtes, üldjuhul raiudes diversiteet ja biomass vähenevad

pikkus: fluorestsentsvärvid

Friesi sööde: palju vitamiine
asvukiirusega

inna kulukotte juured ei koloniseerinud.

ub C allokatsiooniga mükoriisadesse -< taimed pole C-limiteeritud; arv. Et taimed saadavad lisa-C seentele, et see vahetada N, P vastu

suda ja regul taimekooslust; kliimamuutuste mõju on raskesti ennustatav, ent arv kasvab rohke mütseeli tootjate hulk;

somorfid kasvavad 2*C juures 0,4 mm/p; erinev eri kuusekloonide seas
d; korduvate üleujutustega männi juured adapteeruvad; seente hüdrofoobsed risomorfid koguvad ohumulle; ja jäävad ellu isegi 13 cm allpool veetaset. Üksikhüüfid surevad, ent

Hagem MMN

õi ühtlaselt

ıi, vähendas liigirikkust

ıine osa

MMN eri dextroosi sisaldusega

MMN

Sphaerosporella, Laccaria, Pisolithus mood eCM pigem toitainetevaeses tingimuses, Wilcoxinale pole vahet (kolonis 95-99%); turbal sama hästi kui turba vermikuliidi segul v

MMN

olireostusjäätmetel taasmetsastamine männiga: inokuleeritud seente asendumine kohalikega kiire; ECM moondunud, eriti norkadel konkurentidel

erinev, Frankia-taimedel väga erinev, enne välja istutamist puudub

MMN

namusel puudel nii steriilses kui mittesteriilses (viletsam) kk-s 2.5 g/l Glc juures. Paks mantel Pinus ponderosa, Larix laricina; rakusisest kolonis polnud. Viitab tugevale tselluld

innasele lisatud turvast

› VK prod ühele ajale

metsas ja selektiivraie aladel kasel ja vahtral

ıntharellusel; olulised vitamiinide ja aminoh allikad. Hädapärane toit näljaajal

. Samas Casuarina seenmantel oli hästi välja arenenud, kuigi õhuke.

ıudel.

.

sist ja 80 rRNA transkriptidest 7 p vanuses ECMs. Kasv 0 -7 p lineaarne

potti Afzelia africanaga on kogu ECM kolonis suurem

i kui Scleroderma. Scleroderma kolonis on madalam kui Tomentella oma koos inokuleerides

Eukalüpti istanduste MR seend Hisp: Hydnangium carneum, Hymenogaster , Labyrinthomyces, Lacc fraterna, Pisol albus, Ruhlandiella berolinensis, Setchelliogaste

ıeneb N saastudes taime N konts tõuseb, P sisaldus väheneb, kasv samuti väheneb, ECM morfotüüpide arv väheneb

PAH ja klorineeritud yhendite biodegr vamä (enamasti tugevam kui ECM sentel; taluvus palju suurem) ja ECM seente poolt (sümbioosis männiga); puhaskultuurid l temperatuuridel

;. Algul levivad hüüfilehvikud, hiljem isehõrenemine, risomorfid jämenevad. Variselaikude lisamine suurendas tugevasti mütseeli hulka ning selle fraktaalgeomeetrilisi näitajaid

vermikuliit+puutükid
vedelkultuur
terite osakaal suurem väetamata heinamaadel. Efekt ka seeneliikidele: vs väetis; muld vs lehekõdu. BD mullas ei muutu, ent kõdus väetamisega väheneb; liigirikkus väheneb mõ

Cenoc => 3 tugevalt toetatud liiki, millel arv eri fpüsiol omadused; eri liigid samast proovist

maksasammalde kasvatamine ja regeneratsioon steriilses vees ja liivas

lluses-tõrjumisreaktsioon

sealt juhuslik valik (tagab suure n plotis); %

EcM sõltuvus Acacia holosericea on väga erinevad. Vaid koguN mõjutab EcM kolonis ja sedagi ü vähe. Suurem EcM kolonis stimuleerib noodulite tek

metsamajanduse mõju: põletamine vs lageraie vs valikraie

ket seentel

taimede, loomade liikuvus, kohanemisvõime on suurem, BD väiksem suurematel laiuskraadidel, sest Milankovitschi tsükkel mõjutab rohkem

osi lagundavatest ensüümidest ja oksidoreduktaasidest

Hagem: valem

Fomitopsis rosea ja Phlebia centrifuga -vanade kuusikute liigid: eoste langemine ja idanevus palju arvukam Põhja-rootsis kus vanu metsi palju. Monokaarüoniga asu

n hypot jr, spetsialistidel kiirem evolkiirus; arv spets ja palju VK tootvad seened on parasiidid???;

i bakterite hulk väheneb 100..500x; seentel 30..70x, algloomadel 500..1000 korda ıle inokuleerimist

h, et üksikud popid rajatakse ikkagi sex levistega
sport labi EcM seene voib muuta tublisti d15N; Arv erikoidse MR seened transpordivad taime madala 15N sisaldusega N kui neid kasvatatakse NO3 voi GLU
;une katse looduses interpret 15N mustrit seoses konkreetse yhendi N-toitumisega ei ole moeldav

1 proovist random 1 m juuri
kasv toitainetega turbal sama kiire kui paljal turbal, ent palju aeglasem kui agaril. Sümbioosis mütseeli kasv 2…5 korda kiirem

e on mitte-usaldusväärne; rikastumine mööda mullaprofiili, kuna põhja kuhjub7uhutakse rikastunud org-aine

ı; pop jaotus alapop-deks vs mitte

ı) kui kontrollil ja VK tek rohkem

i seente biomassi osakaal väheneb 2x, algloomadel rohkem; aktinomütseetidel tõuseb 3x; bakteritel +-sama, sügavamal suureneb varieeruvus

ıe muld inhibeerib vrd steriilse mullaga

tega

ısifitseerimisel. Raskemet mõj ka seenekolooniate kuju ja strateegiat. Arv EcM seente kasutamine koos taimedega on v paljutõutav bioremediatsioonis

invasiivsed eukalüptid RSAs: mitmed liigid levivad vaikselt koldest eemale ja transformeerivad maastikku. Kasutatud ornamentaalselt, varju
substraadi toitaineterikkusest; alati ilma mantlita; polüspoorne inokul tekitas vaid VK-algmeid

lne paks hüüf tühjeneb, umbritsevad peenemad hüüfid väga paksu seinaga ja kaetud glükoproteiididega. Ümbr. hüüfides väga palju mitokondreif ja P-vakuoole, tsentraalhüüf ei

, pH, lahustN, vahtral ka K, Fe, %orgaanika, lahustP

ɔmassi tootlikkuse ja hingamisega CO_2 konts tõusule. Efekt erineb tüveti eri liikidest
selt C/N vahe suurenemisele hingamisega, eksudats, biomassiga, C-tarbimise efektiivsusega, N omastamisega. Erandiks Amanita muscaria, Piloderma spp

nükoriisas, mükorisosfääris ja bulk mullas. Mükoriisas ja mükorisosfääris rohkem 16S rDNA tüüpe (5 vs 2), parem P lahustamine, rohkem siderofoore, vähem HCN antibiootik
st

MMN, eri tardained, puusüsi

a.

ɔguhulk vähenes kui mükoriissed juured lõigati läbi:

ıa sama edukalt looduses nii mono-kui dikaarüonitena, mõlemaid sõltuvalt paigast võivad domineerida; invasiivsusel ja kasvukiirusel pole vahet; aastaga võib kasvada juured >8

ıdel vrd metsamulla ja kontrolliga

nalt

atanthera olid nagu muud taimed; Ophrys omas vahepealseid vaartusi; Mitmed orhideed said palju N seene kaudu, teised mitte; Cephalanthera, listera ja arv ka Epipactis saavad occum, Suillus, Rhizopogon ei lagunda sedagi. Fluoreeni ja püreeni ei lagunda ükski. ECM männi juuresolek aeglustab fluoreeni degradats arv Gadgili efekti, mitte niiskuse väl

.

MMN

MMN, filterpaber

entega, AM ja Hymenoschyphus paiguti tungisid läbi tanniniseerunud rakukestade, ent mingeid sümbiootilisi struktuure ei tekkinud. Taimed väga tugevas stressis ja paljud surid

ogias; somaatiline sobivus

rmifera: mitteperfor parenthesoom
tselluloos. Kogu seene ja kitiini 13C muster sama

ısi. Paljudel seentel suure liigisisene varieeruvus

Crone suhkruta
ccaria, Amanita, Leccinum, Lact, Thel, Cenoc, Gyrodon, Haaval. Lact pubescens, kase-spets Leccinum spp mood EcM koos rakusisese kolonisatsiooniga. Alpova ja Rhizopog
ımisega. Väike, ebaselge mõju ka peremeestaimel

morfotüübiti, alla 5 jäeti välja

MMN: retsept

Hygrocybe eelistab kasvada samblaga.

orf, biom, RFLP, 3 eri sekventsi

polümorfism (Nei indeks), tüüp1-l madalam. Samad RFLP-probed ei andnud tulemusi teistel Phialocephala liikidel
amal juurefragmendil. Arv et toimub mikroliigi sisene rekomb, aga liigivah mitte. ITS oli vahetegemisel vilets, muud regioonid andsid ühesuguse hea tulemuse

mõl kasvukohast

SH: matsutake

ljakehad näitavad hästi mütseeli asukohta; peale viljakehade kadumist ühe aasta jooksul on kadunud ka mütseel; seal kus viljakehi pole, pole ka mütseeli

Paariline enamasti koniid ja väga lähedalt
ECMs
nitte valkudega (BSA, zelatiin). Kokkupandud dikaarüonitel samade ainete omastatavus vahepealne. Kooseksisteerivatel metsikutel dikaarüonidel samuti paiguti üsna erinev N

viide spets RM söötmele, mis sobib kottseentele ja stimul paksu mantli teket

ritud

ja Calamagrostis -minimaalne, v üksikud Wilcoxina ja DSE; ebatsuuga, leesikas, kask ja paju suurimad

hade lagunemisel eralduv NH4 on v vaene (-36--40 promilli) 15N osas; Kui viljakeha kaotab lagunedes 2% N, siis d15N langeb 1promilli võrra; seente kiire säilitamine omab se
M taimel suurem ja

vs metallimõjude tuvastamine
Pachlewska, Ingestad pine

ippude arv

igal mullal erinevad seened, mullal kus kaski polnud, ecM kolonisatsioon madalaim kõigi seente ja alamrühmade BD maailmas, Inglismaal ja troopikas. Ekstrapoleerimine taim:seen, putuk:seen, peremehe-spetsiifika, uued liigid ekspeditsioonidelt jm

ata sellest kumba taime on N väetatud. NO3 ja NH4 efekt sama

t, signalisatsioon: ylevaade

põllumaa rekultveerimine: külvati 4 vs 15 taimeliiki: mikroobide BD idiosünkraatiline, erinev 5 riigis, erinev 3 a jooksul, erinev töötlustes, ent kõikjal +-efektid. Arv

IHB kadus risosfäärist 4 a jooksul pea täielikult, Laccaria vähenes kõvasti. Bioloogiplaadid näitasid erinevust mulla ja risosfääri ning eri töötluste vahel: diskriminantanalüüs

tuurist. Liivas 4x vähem ergosterooli kui looduslikus mullas ja väetamise efekt ergost-le vastupidine

ja reassimil, mis muudab täpse D15N interpret keerukaks uleb alati kaasa votta tykike substraati.

eglasema kasvuga; eoste ristumine palju harvem kui võiks homotalse liigi puhul eeldada; arv lisaks muud mehanismid

Seisellide väikesaarte floora ja fauna võrdlus ning kaitseväärtus

d (pms 2-lisaelektroniga), mis puhverdavad pHd rakus ja tekivad raku liigses aluselistudes. H(2)PO4 puhverdab pHd nii mullas kui rakus. Erinevad soolad puhvritena erinevad,
Russula ja Cortinariuse erealdamine viljakehast -> agarsöötmele -> mittereostunud tükid vedelasse MMNi, kus 3 kuu jooksul hakkab cälja kasvama. Parim kasv ilma C-ta või g
teisele, eriti meeldib Rhizoctonia

ktiivsus on erinev, annavad taimele ja saavad ise erineva isotoobiväärtuse

eraalainete kattesaamisega mullalahusest; Arv, et EcM seened suudavad oluliselt parandada taime veemajandust läbi selle, et annavad mineraalaineid

cM seentel kuni 12% kogu-C-st ja 50% valkude C-st pärineb mullast

edes u 4promilli kõrgem. Seletavad seda suurema kasuga EcM seentelt

arv et ECM ja AM seentel on 15N frakts sarnasel printsiibil;
C-d mõj arv lipiidide muster;

Clavulina saprotroofid 14C põhjal. Sowerbyella puhul pseudoreps
ega
kui prot. EcM seened arv transpordivad 15N-vaeseid aminohappeid taimedesse, ise rikastudes 15N-ga;

Koguprimaarproduktsioonist läheb taimedel maa-alla 27-68%, seentesse 1-21%. Allokatsioon EcM seentesse sõltub v tugevasti allok maa alla. Vä ndide kasv kiirem ja EcM kolonis väiksem lõunapoolsetel liikidel ja pop-del.

sed. Mida vanemad, seda rohkem hüüfe.

põhk, 14C-ligniin (DHP)

as; seente viljakehadesse augustis EcMdmood 39% mikroobsest biomassist mullas; seente viljakehadesse jõuab C 3-4 p pärast 13C rikastamist,

lisemad kui AM seened P omastamisel

parinev mittelagun N yhendid; seentest taimedesse laheb pigem 14N. Arv vaetatud metsades N kyllastus pohj juurte suuremat 15N kui mullas; mykoriisad on 1.7-2 promilli 15N

hade biomass väheneb drastiliselt puude koorimisega,

a osad Caesalpinoideae on ECM Tansaanias

alpinaceae, ülevaade.
lamiseks. Frankia ei tee vahet

nullas d15N rohkem kui pinnal arv varise tottu ja kitiini tottu; vananedes ja madanedes NH4 lendub, pohjustades 15N sisalduse kasvu; isotoopide jargi ei tohi vaita, et eri taime

Hagem + turvas + perliit

uuretippe

, Lactarius deliciosus). T flavovirens arv liikide kompleks, sest seal leiti väikeses skaalas 3 tugevalt toetatud klaadi, kus ITS erinevus rühmade vahel 4-7 ja rühmade sees <2.5%

ı elab ka edasi

ıamoodi

MMN, eri pH tõstetud h2so4 ja naoh-ga

pigmentide tottu

ıcella NM toodab

õrra kõrgem kui temp - N tsükkel troopikas avatum; Arv. et top-predaatorite 13C annab märku maa-aluste ja maapealsete ökol suhete tugevusest;

Tuber spp: parim isoleerimiseks woody plant medium

üübil ja oluline roll ka seene viljakeha-indiviidil

toimi. Pettus võib olla, et osad taimed panustavad üh süsteemi vähem, anastomoseeruvad hüüfid võimaldavad efektiivsemalt toitaineid transada ja stimul signalisatsiooni d eristada 10/12 monokarüootsest eri VK saadud kultuuridest. Samad markerid sobivad ka teistele Hebeloma liikidele, ent mitte nii hästi

d PAH biodegr on risosfääris kiirem kui bulk mulllas, ent MR hüüfide olemasolu inhibeerib lagunemist, arv MR seened võtavad ära lagundajatele vajalikud mineraalai

nutualismi kontiinum: sõltuvus genotüüpidest, keskkonnast, konkurentsist, ajafaktorist, ; arv MR moodustudes taimsed toitainete omastamise protsessid asenduvad seene omad

m 4 tüübist: RFLP

a mis Trudell, 2003). Albiinod on taiesti seentest soltuvad ja roh miksotroofid saavad 48,7 protsenti Cst seentelt; arv albiinode vahene fitness esialgu takistab nende laia levikut

e ens protsessidele

oksiidi dismutaas, väga vähe olulisi muutusi puhaskultuuris vs 48h infektsioonistaadiumis seene vahel

Pinus contorta semneperekondadele erinev nii taimede biomassi kui EcM kolonis osas

t ITS1 ja IGS2 samad; 95% juhtudest ITS1 ja ITS2 versioonid samad -mingil tasemel krossing-over toimub. Fülogeneesis ITS1 ja ITS2 inkongruentsed

-alfa ning beta-tubuliini mõlemad alleelid olemas

x

juurte vähenemine õhu saastatusega

ned potikatses vähendavad eukalüpti efekti teistele taimedele

hkuses enam ergost. Põhjal

oomides: jamps), ent muu sama; mch, ITS1, ITS2

; autolüüsi faasis toimub glükoneogenees, mis kompens 13C väärtusi,

ımesena jaole ressurssidele, EcM seente evol saproobidest ei toimunud kindlasti pika hüppega

a, Tylopiluse, Leccinumi, Scleroderma, Pisolithuse kultuuri pindala; Suillus, Lactarius, Cenococcum ei muutu; pineenidkõik inhibeeritud (vähem Suillus, Lactarius affinis; okkal

ıantidel; vähem esineb positiivset koeksistentsi ??? Tanniini ja N lisamine muudab mitmeid neid interaktsioone. Positiivsed on kahtlased, sest võivad tuleneda seente genetite üle

65 a männi istandikus kas eri proovivõtustrateegiaid: mulla T-RFLP vs 1 vs 2 vs 3 juuretippu proovist. 25% liikidest ei leitud mulla DNAd analüüsides ja 25% jäi leidmata 2 v

eis kui ka repellendid

b suurlinna viljakehade arv ja biomass, ECM %koloniseeritud väheneb suurlinna läheduses, korreleerub okkakahjustustega

AM kolonis, suurendab ECM kolonis

MMN

P, (Al)

ɛtaadiga. Vitaalus suurim aprillist juunini ning novembris (GER); päris pinnalähedal ja B-horisondis, vahepealsetes madalam

u. AM taimedel ja EcM VK-del mõju polnud v nõrgalt pos.

vähendas pealsete juurdekasvu järgneval aastal, käbide teket, ECM seente viljakehade prod, tuberk ECM osakaalu (mitte oluliselt), samaks jäi ECM kolonisats, juurte kasv, er

Eesti taimkatte elemendid: haruldaste taimede levik (pms Lä-Saaremaa, Hiiumaa), levilapiirid jm haruldust põhjustavad faktorid

e var 0-3%; AG1 jaguneb 3 peremehe-spets alarühmaks, kus rühma sees ITS >99% sarn; AG4 jaguneb 2 peremehe-spets alarühmaks; Agde vaheline hmoloogia <96%; AG4-s haploidseid eoseid et säilitada potentsiaali

uurekarvad ei tähenda alati ECM puudumist; arv aastatevah vahe kolonis% sõltub ilma kuivusest; ektendoMR puhul MR teke algab Hartigi võrgustikust, ka pikkjuurtel on rakus

ja jooksul kaotavad EcM mood võime; kasv eri C ja N allikatel; kasvab hästi steriliseerimata metsamullal ja autokl turbal; vitamiinidest vajab vaid tiamiini nagu teised lehiksee

kuuse geneetiline muundamine ei mõju mullaseente kooslusesle. Mineraalmulla BD suurem kui org.

ristamisel saadud dikaarüonid erinevad üksteisest tugevasti taime transpiratsiooni reguleerijatena, õhulõhede juhtivuse muutjatena ning abina põuast taastumisel. 9 10st olid par

ristamisel saadud dikaarüonid erinevad üksteisest tugevasti taime hüdraulilise juhtivuse ja risosfääri veepotentsiaali reguleerijatena ning abina põuast taastumisel. 10 10st olid p

nii MMNl kui kasvutaskus; kombineeritud dikaarüonitel väga suured varieeruvused, 1/3 ei moodustanud yldse risomorfe, teistel väga erinev läbimoot. Vanadel risomorfidel tse

e proove, sarnane, vale interpretatsioon

GE intens = quant PCR = DGGE kloonide arv (mitte alati!)

Populus tremula EcM sünteesiks ainuke sobiv MMN + vitamiinid

MMEL suurem kõrge CO_2 korral, varieerus tugevasti aastaajati; %kolonis sama

.

itmeid eritüüpe

maasiseste viljakehadega seente mitmekesisust enamuses Eur maades v vähe uuritud, mistõttu on ka puudulik kaitsekorraldus. Lihtsalt pole teada harulduse põhjused

on transkriptoomika väga erinev kase juurega kokku viies mittemükoriissest tüvest võrreldes kolmanda tüvega, kusjuures pole teada kas teine tüvi on non-ECM või ei sobi kase

lik ülevaade

dide omadused ei pruugi olla aditiivsed. Mõjutab sümbiontide -tolmeldajate divergeerumine

MEA

es. Põuakartlikumad hoopis haruldased liigid ning ka liigid, mis lihtsates kooslustes toler, keerukas aga mitte. Idiosünkr efektid Arv liigirikkus-ökosüs fn suhe on teravam maape

ub

atu alates 8 m. Eri liikidele erinev. Biomassi/esinemissageduse erinev jaot eri liikidel

EcM seente viljakehade diversiteet kahaneb N saastudes. Eriti tundlikudCortinarius, Lactarius, Russula, Hebeloma, Tricholoma. N taluvad Lact theiogalus, Laccaria

ECM seente 13C korreleerub seente N-ühendite kasutusega. Mida mineraal-N rikkamal pinnasel kasvab seen, seda jõuetum on ta kasutama valke ja aminohappeid puhaskultuu

a sobilikke töö disaine, keskk andmeid, ja nende põhiseid mudeleid; distaalsed vs proksimaalsed muutujad, ; tuleb tekitada globaalseid andmestikke

; AAT. Sõltub ka GC sisaldusest

mullaga Puerto Ricos. Seente biomass v kõrge

nono või polükultuuris

miombode säästev majandamine Malawis: seentest saadav tulu on päris suur: teine koht kalakauba järel

-mullas pms ECM seente sh Russula oma. Russula lakaase esines igas horisondis

Populus 3 spp: vs CO2 tõus: liigiti erinevad EcM, AM ja juurte prod muutused. EcM hulk suurenes vaid P. Albal (79%), AM 2-38%, jp 35-84. Suurenes juurte allok

M ebatsuugaga, teised mitte. Vahevormid. Eelnev uurimus männiga sai samadel seenetüvedel erinevaid tulemusi ılus; orgaanika lisamine suurendab

ıus võiksid muudustuda T-T dimeerid. Arv põhjus suurenev UV kiirgus seoses mütseeli maa seest maapinnale tulekuga, läbikuivamine ja vetikast põhj oksidatiivne stress. PILD

mida suurem BD, seda raskem invasiivsel raiheinal (Lolium multiflorum) kanda kinnitada, samas kui biomass ei avalda mingit vastunõju

võivad üle kanduda ka võrdlemisi eraldatud kaugetele tüvedel. Muud kromosoomid ei kandu.

orhideedel Sebacina-Epulorhiza anamorfidel monilinioidsed rakud

Kongo Ituri: prim metsas rohkem >10cm dbh puuliike nii ala kui indiv kohta vrd sekund-metsaga. Sek-metsas eriti vähe Gilbertiodendroni ja Julbernardiat, mis domi

ımeerikas ECM-taimed

. Kõik EcM-evol etapid on looduses nähtavad pealiskaudse mükoriisa läbi AUS taimedel. Kuna esialgu uued sümbiondid peaksid käituma ebaefektiivs

vaade

ECM kolonis väheneb kui taime lehed ära kitkuda. Seos aastasisene. Eelmise aasta kitkumine ei loe

ıass kitiini ja ergosterooli põhjal mullas vs juurtel

ı ja juure eksudaadid, zeatiin muudab hüüfide morfoloogiat

atelliite, mis on sarn teiste seente IGSle (Collybia ja Trich matsutake)

MMN

an: efekti polnud; benodalin ja captan inh roosteseeni

ʼia, seente levikukiirus: Hebeloma 16 cm/a; Inocybe 7,5 cm/a; aeglasem B. Pubescensi puhul.

eostega. SLAIDID

biodiversiteet sõltub suurel määral maakasutusest. Arengumaades rajatakse uusi põlde seoses kasvava rahvastiku ja tulevikus vabakaubanduse soodustamisega, kuna

llnivoole ja teadmata seente eluviisi ennustamine >90% tõenäosusega -mitmed liigid on vales rühmas. Arv saproobide EcM-mustrit põhj arv pool-biotr
ıud mulla fertiilsusega; suurem sõltuvus korreleerus suurema orgN ülesvõtuga;

ıst metallistressi puhul. orgaanilised happed metallide kelaatimiseks hüüfiseintele või mitte eritamine vältimaks liikuvaks muutumist. PILDID

thiamiin, aminohapped ja B-vitaminid ja Mä-juured stimul nii EcM seente kui saproobide kasvu
mist on T. Uncinatum heterogeenne, ITS sisene identsus madal, 94%

elduseks eri MR gruppide eristamiseks; Arv et kadakas on EcM sygavamal mullas kuna 15N muster sarn EcM taimedele; N konts EcM>AM=ErM

a palju niiskust
t. Viljumisaja pikkus sõltub konkreetsetest mullatemperatuuridest ja selle kestusest. Viljumine Carya, Tilia ja Ulmus americana tüvedele lähemal kui juhusl, ent Quercus spp, C

nükoriisa teke aeglasem. Juuretippe rohk, ent kolonis madalam.

Hagem

ettekasvatamiseks

vadeni palju rohklem vrd maapealsete viljakehadega seentega; Maasisestel seentel eoseid rohkem ka sügavamal, 3-6 cm mullakihis, samas kui maapealsetel enamasti varisel. Ce

invasiivsed liigid: kasu ja kahju levikul mutualistidest, konkurentidest, vaenlastest, abioot kk sobivusest ja nende interaktsioonidest. Lähedas

eri söötmete võrdlus, lisandite võimalused

seente kaitse: tähtsaim säästlik ja kõiki pooli arvestav metsamajandus. Palju peab põhinema teadusuuringutel. Väga oluline mõista seente autökoloogiat

vaheline >6%

MMN pH 7

il: palju kiirem, täpsem

-s tunduvalt väikemad konts.). Uurea osatähtsus EMH-s v suur

okastes NaCl puhul

Arv. Et Tuber indicum koloniseerib Euroopat pms läbi saastatud istikute e seksuaalsete eoste levimisega. Samas uued genetid on vanadest geneetiliselt üsna erinevad. Arv, et matsutake levikul on eostel väga suur roll

MMN

taimede ja selgroogsete loomade BD tulipunktid. Endeemsete liikide arv, suhe pindalasse, ohukategooriad; sh Madag ja Uus-Kaledoonia
, mykoriisatyyp (arv osad mykoriisatyybid votavad pigem orgaanilist N otse varisest)

imekooslustes

4*3; kolonis suurem puudele lähemal kui kaugemal
e EcM kolonis. Taimekasv palju parem vrd mittemükoriisse süsteemiga

 >50, et usaldusl. Hinnata

EcM tõestati 10 perek: Anthonotha, Aphanocalyx, Berlinia, Didelotia, Gilbertiodendron, Julbernardia, Microberlinia, Monopetalanthus, Tetraberlinia, Afzelia. EcM puude arv ei

Morizet ns

toitainete gradiendil kui toiyu on vähem (mõõtmistehnika kahtlane, saproobide lahutamine peale proovide pikka seismist!!!); EMH produktsioon suurim keskel, kus lühikesed r

taimekasv eri lehekõdu tüüpidel mitteaditiivne, idiosünkraatiline; taimelehtede algupära ja segatud olek mitmel tasandil avaldab lagundamisele idiosünkraatilist efekti (efekti po

uuringuteks, kuna s o stabiilsem

poolest, suutes lagundada tselluloosi ja õlgesid, võimelised kasvama laktoosil, Mõned EcM seened suutsid lagundada tsellobioosi ja lihheniini ainult si
Frankia: isoleerimine puhaskultuuri
ı vastavus seks vajalikkuse hüpoteesidele: Mülleri ratchet, Kondrashov hatchet, Red queen. Vanade aseks org pikk nimekiri: bdelloidid, AM-seened, Ophiostomataceae jt

varieeruv

Boletus sp viljumine saepurul + kaerateradel, puhaskultuuride kasv erisöötmetel
rukise ekstrakt + Ohta sööde: Lyophyllum shimeji võime produtseerida viljakehi ilma taimsümbiondita
rukise ekstrakt + Ohta sööde: Hebeloma spp võime produtseerida viljakehi ilma taimsümbiondita

ort, sink, source, EMH kasv: ülevaade

Uus-Meremaa EcM taimed: Leptospermum, Kunzea, Nothofagus. Seente perek nimekirjad nii kohalike puude kui sissetoodute all. Amanita muscaria kolonis ka nati

kuusel on eri aladel erinev, sõltub seeneliigist. Mantel 16.5 -29 (max 70) ym, korteks 84 -104 ym, steel 123 -166 ym. Rikkalikemal mullatüüpidel oli suurem korteksi, steeli, kc

eri kaugusele puudest: kaugus mõjutab %kol ja liigirikkust

Wilcoxina pH opt 6.5-7

põhjal

cM vs AM mustrid võivad olla toitainete-rikkas keskkonnas teistsugused ja neid tuleb teisiti interpreteerida; arv. sademed suurendavad mikroobset akt

ivamis-ja reostumisoht seega suurem. Sphaerosporella hyaliinne ECM alatine kontaminant

i hästi. Valikuline tuumade kandmine eostesse ei näi paikapidavat ossum; 2. Hebeloma+Naucoria+Hymenogaster pp; 3. Descolea,Descomyces, Setchelliogaster. Maasisesed vormid on tekkinud ja iseseisvalt ka radieerunud palju kordi kõigis kl

MMN

vaja…

aksonite kaupa

stumisbarjääri; kandseente konidiogenees -palju näiteid; seente levimine üle maailma inimese abil. Tuleks ikkagi kus vähegi võimalik kasutada morfoloogilist liigikonts, sest s c

is-ga. Mida suurem on AM kolonis, seda väiksem on risosf erinevus bulk soilist. MR tüüp on üks olulisemaid taime f-naalseid tunnuseid

v et puude genotüübid ja mulla-heterogeensus tagab mikro-koevolutsiooni

ele

metsade säästlik majandamine Morchella spp. Korjamist silmas pidades. Pole otsest retsepti, kuna eri liigid on eri öko strateegiatega.

ıetanud ensüümid, mis lubavad taimede rakuseina lagundada;

MMN

ädasti leida õige baasväärtus -pikaealiste I taseme tarbijate ; mitut isotoopi võib samas segamudelis kasutada kui C/N on sama (kui eeldatakse, et C ja N omastamine on samasu

keystone-liikide uuem kontsept ja diskussioonid

BIOLOG: ülevaade, probleemid: inokulumi tihedus, lahjendusefekt, representatiivsus

invasiivsus: mükoriisa roll taimede invasiivsuses - invasiivsed taimed pms NM või väikese kasvuefektiga. Paljud suruvad kohalikku mükorii ltuvus liikidest

d

orporatsioon DNAsse, raskusgradientfuugimine, spetsliikide määramine bakteritel, hilisem funktsionnalgeenide otsing

PO sooe Cortinariuste kultuuri eraldamiseks ja kasvatamiseks. Kas sama soodet ka Lactarius deliciosuse veget myc kasvatamiseks vedelkultuuris

i vahel

st. EcM seentel puudub tsellulaasne ja ligninolüütiline aktiivsus, mistõttu arv. Et õige EcM seene ei saa saproobina olla. Arv et EcM seente tihe hüüfimass on tingitud konkuren

Nothofagus Austraalias: ülevaade

BASM (väga rikas sööde)

Acacia Austraaliast introdutseeritud ja eriti kui veel nakatatud Pisolithus albusega, mõjutab mikroobikooslusi ja -aktiivsust, mulla toitaineid

Oidiodendron maius: toodab turbapallidel ja kultuuris Cladonia talluse juures mittester gümnoteetsiume, mis sarn teleomorfse perek Myxotrichium omadele. Viitab O maiusele

taimede invasiivsus ja invasiooni seosed mutualistidega: Ficus-liblikas parimini uuritud; introduts. Liikidel võib spetsiifilisus muutuda; AM

invas sõnastiku definits: invasiivne - kui levib ise >100 m eemale v >6m 3 a jooksul; naturalization, aliens, transformers, weeds

invasiivsed paljasseemnetaimed - pea eranditult Pinaceae ja Araucariaceae-Podocarpaceae; teistest paistavad andmete põhjal olulisel kohal E

invasiivsed liigid RSAs: Pinus spp, Acacia spp, Populus spp jpt

sissetoodud metsanduseliikide omadused: parem puit, kiirem kasv, lihtsam majandamine, seemnete/seemikute saadavus, suurem resistentsus

MMN
MMN
x

ini kui inokul mannimetsamulda vs puhaskult vs kontroll. Mitme puhaskult korraga inokul mood rohkem ECM kui monokult

ent neil pole PODe; Eri pr-mä seentel palju koopiaid reducing polyketide synthase geeni, mida va-mä seentel ainus koopia. Muudelt genoomiomadustel

eksootiliste patogeensete seente introduktsioon: näidisliigid, nende päritolu, kahju jms. Nii munasseened, kottseened kui roosteseened. Tingimused epideemiateks

mükorisosfääri organismide roll bioremediatsioonis, võimalused, GMOd, taimede juurde toomine

na sericeum trentsides sees.

asti mõjub %kolonis, vähem EMH-le.
üpidest
itte [arv teine liik]

a

eks

multikar paarikaupa tuumasid; eoste monosp isolaadid on multikar, kui isolaadid kohtuvad, tekib multituumne paarikaupa tuumadega mütseel

on pop gen-str v sarnane

nile viljakehade baasil. Kuna viljakehas olevad eosed ei ole heterosügootsed, samas eri viljakehad on, arv. tegu iseviljastamisega (nagu T melanosporum)

lati üks MAT-tüüp, eosed pooleks; eostega inokuleeritud taimedel tuvastatakse pms vaid üht MAT-tüüpi trühvleid, ilmselt teist (isast) on v vähe nii et e

Björkman

ibstraadist. Arv. Seentest tulevad rasvhapped sünteesitakse ümber

nemist samas mullas VK sisalduse baasil; saprotroofid, Hydnum, Xerocomus, Lactarius F ja O horisondis, Sarcodon ja Russula cyanoxantha A ja B horisondis

lonisatsioon podokarpuseliste juuremügarates

mittekultiveeritavate bakterite kultiveerimine: söötmes lihtsuhkru asemel ksülaan, lisaks palju vitamiine, seleniit,org-happed. Pms uued alfaproteobakterid ja atsidobakterid

entsiaal. Suilloidid kasvavad ka suht kuivas, opt temp koigile 23 kraadi, 30 juures oluline kasvu pidurdus

ECM seened kasvavad reeglina palju paremini NH4>glutamiin>glutatioon=valk=NO3 söötmel. N-ühendite kasutamine polnud seotud kasvukoha N ühenditega. Membraanil ve

Neotyphodium, munasseened, paraseksuaalsus

puhverdatud vs mittepuhverdatud sööde

tioon. 15N põhjal väidavad, et eukalüptid on EcM seentest vihmametsa mullal ja inorg N olemaolul vähem sõltuvad kui muidu
taime; mulla NH4 ja aminoh 15N oli sama mis kogumullal, aga NO3 15N oli v korge. Poleng suurendas NH' hulka 90x, NO3 60x ja aminoh 5 korda, ujutamine suurendas aminc
olid domineeriv ühend mullas kui häiring oli vähene. Proteaceeae võtsid üles ka glütsiini ja seega arvatakse, et proteoidne juurestik omab erilist funktsi
st N turnoverist ja mulla kõrgest 15Nst 2)kõrge 15N ja selle madala diskrimineerimise tõttu; 3) madala seente osatähtsuse tõttu taimede N-toitumises. A

1 Taimedel

rcoding ait EcM ja AM seente introduts: ülevaade ja ohud: seend ei pruugi soodust peremehe kasvu, võivad stimul invas taimede invasiivsust, er männid a eukal. Sama liigi uue

invasiivsel Hypericumil P-Ams sissetoodud populatsioonidel väiksem sõltuvus sümbiontidest kui euroopa populatsioonidel. Katse vaid Glon

tes palju väiksemaid: rajaja efekt -1m kasvukiirus a-1

PDA, HA

si

Pisonia grandis mükobiondi kasv eri N allikaga söötmetel: org N parem kui anorg N; PDA on hea sööde

enteron: arabitool ja sahharoos kasvasid ja mannitool, glukogeen, tärklis langesid pouaga; L subdulcis-mannitool, glc, fru, sahharoos kasvasid pouaga,

Gel-Gro meedium AM-ja endofüütide lihtsaks isoleerimiseks juurtest. Võib kasutada ka antibiootikumidega

ılist valguse efekti; seemikud võivad kasu saada suurte puude hüdr vee tõstmisest; Arv. MN on neg feedback, mis võimaldab eriliikidel stabiilselt koek

ktutatsioonid, mis üle geenide juhusl jaotunud. Eriti domin A>G transitsioon. ILMSELT kloneerimisvead

MMN, PDA…

viljakehi leiti. Fabales ja Salix humboldtiana olid mittemükoriissed nendes kooslustes. Arv et need EcM seeneperek liigid on saproobid. Arv seened adapteerunud üleujutustega

ssagedus

ne kuni 100% ultuses G intraradices puhul, teistel eri kombinatsioonides ef väiksem. Ka Paris-tüübi puhul ilma arbuskuliteta toimus vähene P-ülekanne, s.t. fosfaadi transporter

elt suuresti: suurim sügisel ja kevadel, väiksem talvel ja suvel. Kõigis horisontides ühtmoodi, ent sügavamal erinevused väiksemad. Kokku mineraalmullas väh sama suur aktiivı

Kagu-Aasia biodiversiteet eri geoloogilistel mikrokontinentidel, hetkeseis, kaitse ja tume tulevik

14C järgi. 14C liigub lehest hüüfi tunni-paariga

transgeensete taimede mõju: pms neutraalne, harvem negat

Sr kui mitteMR; Cs leostub aeglaselt, seened toovad pidevalt põhjast üles. Eriti palju kõduhorisondis, seente viljakehades sõltub mütseeli asukohast mullas

haruldased torikulised: probleemid leviku ja elupaikade fragmenteerumise ning inbriidinguga: ülevaade

on tugev konkurents, vähe toitaineid ja vähe vaba ruumi
H surevad, ent kuivemates tingimustes ilmuvad taas

invas ristõieline toodab toksiine, mis inh teistel taimedel AM teket

puusüsi + tomati juured

eukalüpti ja männi istandikud tekitavad v erineva mikrokliima vrd looduslike metsadega, mis mõj putukaid. Eukalüpti istandused saavad kohalikest metsadest patog

;asi. Ei ristu vanemliikidega ja omab sugulise paljunemise võimet
ıi Glomus liikidevah var. K mitte-degener praimereid, mis arv on põhj spoorisis arinevusi eelm uuringutes

Hagem + tetratsükliin, 100 mg/l; +-2 ppm benomyl

ranspordis

Caladenia W-AUS: Sebacinales. Spetsiifilisus per se ei mõj orhidee haruldust; kui seen on haruldane, on ka spetsiifiline orhidee haruldane. K

ı; puudel keskm kahj kõrgeim, suure ja vähese kahj korral madalam. Arv optimaalsusteljel; aastaringide järgi ECM kolonis hinnangu andmine (kahtlane)

EcM seente globaalne liigirikkus 7000-10000; arv vajab Boletus edulis viljakeha tekkeks3,5-14M EcM tippu või 363-1800 km EmH;
rfotüübiti
, mis arv tuleneb korgest N konts; Varise saproobidel tugev korrel N konts ja D15N vahel; Arv et eri EcM seente 15N vahe tuleneb peremehesse transpordi efektiivsusest ja pa
nisel
amistemp ei moj D15N mustrit
MMN koos või ilma orgaanilise N-ga
eemid, andmete sidumine; arv morfotüübiti

ella, Fusarium, Phytopthora jt. Rekombin tuvastamine, tähtsus eri kk-tingimustes, rangelt mitterekombin seeni polegi teada. Fülogen liigikontsepts langeb kokku morf-ga, ent pe

l Neurospora, Schizoph, SacchM, Lentinula. Seega, enamus seeni pole globaalse levikuga, v.a. Aspergillus fummigatus. Arv. Väga konidiaalse levikug

ococcum, ° hävimisohus ECM-seened
ainult lisatud NO3 või NH4
seeritud hävimisohus ECM-seened

vähenda ECM-potentsiaali. Näriliste fekaalide lisamine parandab ECM mood (er augustis kogutud vs maikuused fekaalid)

aimede suuruserinevused. Transp toimus ka ilma www-ta (0.5 um võrgu korral). Väidet Wul et al. 2001 ei saanudki leida ülekannet kuna katsid taimed ksul tunduvalt

arv kliimamuutuste tõttu sureb aastaks 2050 välja 11-33% liikuvatest ja 34-58% sessiilsetest organismidest. CO_2 emissioonil põhinev kliimamuutus on olulisem häv

ogeensusgeene rohkem kui peremeestel resistentsusgeene; suurim patogeensus kui mõlema levik on lai, väiksem kui lokaalne voi globaalne

MMN

ADOBEga

ı mõjuta N fertilis; paljud risomorfid elasid >21 kuu
AM biomass juurtes mulla pindmises 10 cm kihis 4 g/m2 kõrbes kuni 44 g/m2 rohumaadel.

vead suured ja C fraktsioneerimine mitmetes kohtades

ımise suhtes

ıb pajul kiiresti kaugemale liustikuservast

Cortinarius sp ja Chroogomphus spp saprotroofi-laadsed mustrid. Chroogomphus arv parasiit Suillustel

nud mantlisse ja risomorfi

ainete, kunstsubstraatide mõju

neering annab parema resolutsiooniga tulemuse vrd käsitsi aligneeringuga (arv käsitsi jäetakse kahtlased kohad välja)

SH: matsutake
männikoore ja tweeni lisamin estimuleerib vegetatiivset kasvu

ned (?) aastad valitsesid palünoloogilistes andmetes vaid seeneeosed, ent nende hulk asendus suht kiiresti kõigepealt sõnajala eostega. Seened olid kivististes septadeta ning ei s

Tsiili Nothofaguse metsades: invasiivsed liigid Pinus radiata istandikest: Amanita muscaria, A. Rubescens, Pax involutus, Xerocomus rubellus; kohalikest liikidest d

invasiivsus mikroobidel, mis seotud taimedega v mitte. Mikroobid võivad mõj ka taimede invas.; häiringute vs mittehäiringute taimedeinvasi

s reageeris erinevalt toitainete stressile kui oli nonMR või sümbioosis
aime, kuigi need oli mineraalinäljas

seente raskemetallisisaldus Lapis

Heterobasidioni tõrje seentega: eriseened kõik vähendavad liigirikkust, BD kändudel -kultuuride baasil. Eriti drastiliselt mõjub Trichoderma harzianum ıiljem Sebacinales Weiss 2004] isol india kõrbest AM-klamüdospoorist. Kultuuritunnused: õh kestad, dolipoorid, mitteperfor parentosoomid; klamüdospoorid; kolonis juurekor

e liigikontseptsioon tihti parafüleetiline DNA fülogeneesi jr; areng eri mandritel arv hiljutine, peale kontinentide drifti

sfääri mõj inimasustus on viimastel ajal muutnud oluliselt nii N, C, S tsükleid, levivad tehnogeensed ühendid ja raskemetrallid. Globaalne soojenemine toimub pms foss kütuste

MMN

etsas. Kuusikus sügavusjaotus ühtlasem kui tammikus, üldse kuni 70 cm süg olulisel määral. 13C mütseelis sügavuti sama, aga 15N erinev huumus-ja min-horisondis. Enamus 1

netall ja muid elemente: PIXE analüüs. Tugev soltuvus ka sellest, mis soelkotis oli (apatiit vs liiv vs tuhk)
astaajati ja liigiti varieeruv; vs mineraalainete rohkus
ped, sõelkotist väljas-sõelkotis, 13C eristamaks saprotroofidest

vedelsööde läbivoolukultuuris

pöögi ECI trambitud pinnasel ergosterooli sisaldus pöögi ECMl väheneb; suurem on paikade erinevus; taimkate on tugevasti häiritud, SOM ja varis vähenevad

uarinaceae, Rhamnaceae, mimosaceae, Fabaceae, Euphorbiaceae, Sterculiaceae, Thymeliaceae, Apiaceae, Rubiaceae, Goodeniaceae, Stylidiaceae

seened olid seotud kas eukalypti voi Melaleucaga, Laccaria oli patogeenne.

Endogone, Sclerogone -mitteMR liigid kasvavad hästi, ECM liigid viletsalt -hääbumisoht. Czapeki söötmel (retseptoi pole) taimelehtede algupära ja segatud olek mitmel tasandil avaldab lagundamisele idiosünkraatilist efekti (efekti pole)

mulla C:N suhtest

seente kaitse: eri kooslused. Britannias eriti rohumaad ja pargikooslused; hõrendikud kogu Maailmas v väärtuslikud seente poolest. Enamasti ka muude taksonite po arius kaob, niisutades tuleb Cortinarius just juurde, põuaga kaob, ent peale põuaaastat on eriti palju

genotüüpide arv stimul kasvu

eksootiliste patogeenide levik troopilistes metsaistandekes. Nende kahjustused kohalikel puudel, kohalike seente adapteerumine eksootiliste puudega ja tagasileviku

mullamikroobid hõlbust invas taimede invasiooni. Paljud invas taimed muudavad mullamikroobide kooslusi tänu keemiale. Muutused aineringes.

VK enam Amanita phalloides invad N-Am: VK enamasti leitud teede ääres, ent mõnes kohas ka sügaval metsas. Invadeeritud paikades domineeris VK ıbid. Mingit jälge paraseksuaalsusest pole. Mida värskem on ala, seda vähem on genotüüpe, ühe ala piires suurim genotüübisisene kaugus 78m; genotüübid läbisegi, ent vaid üh

annavad N taimele. EcM seened siiski suudavad ac-Glcamiini omastada veidi

nikus suurem kui luitemännikus kanarbikulaadsete tõttu arv.
M kolonis suurem kui vahep alal > rabas (ca 50'%), juurte tihedus metsas=vahealal >> rabas

PDA, MMN

line

d
MNC glükoosita

nõus

PDA

steemides ülesvõtul fraktsioneerimist pole. Leotia lubrica muster on nagu EcM-seentel; Chalciporus: kõrge 13C nagu saproobidel ja kõrge 15N nagu E

l EcM taimedele ja AM-taimedele kultuurtuubides. V sageli mood rakusis kerakesed monilioidsete hüüfidega. EcM ega HN ei olnud

etria on erinev pärnal. Seene koe osakaal 79 vs 37%; seene RNA osakaal 64 vs 35%; ergosterooli konts 1,62 yg/mg vs 0.72 yg/mg ujul ega ka rakumembraanide osana, seega seda ei saa kasutada seente elusbiomassi näitajana

s väga suur diversiteet dominantsuseta

eri liikide vahel, mis on kasutusse jäetud soodsate omaduste tõttu, ent need on ökol. vähem kohased.

d, orhideedes kultiveeritavaid Sebacinasid polnud, esines vaid Tulasnella

kus 5-15); 15-20 peal +-stabiilne

:ite ja saproobide biomass. Arv näitab see siiski kõigi juurega seotud seente biomassi: kott ja kands; ergo ja PLFA kadusid eri horis samaväärselt, kuigi min-mullast p

sakkal, mulla tihedus langeb. Muutused eriti pindmises 10 cm mullas. 12 a jooksul taimkate nagu loodusl, muld sügavamal siiski mitte

. 500-14000; qPCR ei tuvasta kõdus suuremat koopiate arvu kui mullas; mullas kandseente ITS koopiaid 67G-910G/g biomassi kohta

norfism väga väike: arv vana pudelikael seoses jääajaga

: ja P vahel tugev korrel, teised mono-ja divalentsed metallid esinesid vastavalt kontsentr söötmes. PolüP graanuleid rohkem kui söötmes KPi vrd MgPi v NaPi. Ainu eerimisega. Re3konstrueeritud koosluses ei suutnud T-RFLP tuvastada mitmeid haruldasi liike

i ja arv on aluseks kevadisele viljakehade tootmisele

umis tekitab osmootse surve, kaitse UV, kuivamise, ensüm lüüsi, kõrge temp, oksüdantide, toksiliste metallide, arv ka fungitsiidide eest. Patogeenidel allelopaatias, t

Eri taimede risosfääris eri pH ning DCA põhjal eri mikroobide kooslused
s

d Sclerodermasid eukalüptide inokuleerimiseks mitte kasutada suure riski tõttu

d mood vaid 10% biomassist ja mütseeli iga on seega 50a. Obs, et müts elab talve vabalt üle. Arv et kliimasoojenemisega arkt tundrad muutuvad sarnasemaks leeder kuivades taastuvad aeglaselt

a Pisolithus. Taimekasvu ei mõj inokul ja kasv 20 näd

ılüütilisele ja fenooloksidaasi aktiivsusele

r (kõik AUS seened). Lisaks Sebacina, Thelephora jt teadmata päritoluga seened. Lacc fraterna nakatab ka Cistaceae spp. Paljud kõdusaproobid on samuti kaasa tul

(äkki substraadi siledusest tingitud???)

ölemal juhul

‹et

statud puutükkide eksponeerimine

na, kütteks ja ehituspuiduks. Kuivatavad maapinda ja stimul põlenguid kanna P

umi (mürgine Laccariale), rohkem patogeenide kasvu inh tüüpe, rohkem EcM seente kasvu stimul tüüpe (laia spetsiifikaga, kitsa spetsiifikaga olid ektomükorisosfääı

30 cm, eriti tüve suunas; homokaarüonid ei kaota ristumisvõimet peale pikka seiamist

l palju C seene kaudu (Ceph 85 procenti tihedas poogikus); Arv et eri taimede 15N soltub erityypi mykoriisadest;

nenemise tõttu nagu Koide2003 pakub

d

on ja Suillus piperatus ei mood ecm. Juurte juurde agaritüki panemine kiirendas seene veget kasvu

ühendite omastavusvõime

eega vähe tähtsust; Seletavad peremeestaime madalat 15N juures oleva glutamaadi süntetaasi fraktsioneerimisega. Glu-Gln liigub seene ja taime vahet pidevalt; Arv u

s. Arv 5.1 miljonit, siiski jäävad 1.5 miljoni juurde

. Tulenes täpsest maakasutusest enne. Umbrohte eelnevalt ei hävitatud, vaid külvati taimed peale

sõltuvalt lahustavusest ja transp ef-st. Redoksreakts mullas
glükoosiga.

iidet kõik looduslikud uuringud on allokats EcMi ülehinnanud (15-21%)

N rikkamad kui mitteMR juured => seenmaterjal on 3-11 promilli enam rikastunud vrd taimega. Arv et taimedevah erinevused tulenevad pigem juurdumissyg kui eri

d saavad mullast eri yhendeid, pigem on tegu erineva juurdumissygavusega; N2 fikseerivatel taimedel pakub 5 promillist vehet kui kriteeriumi; tuleb valida oiged taus ó

ned

ega pea tot; fotosünteesi mõj seene poolt; ükski AM-seen ei stimul kõigi taimeliikide kasvu; N, P konts ei pruugi korreleeruda biomassiga ega fitnessiga; kontroll-töö

: ja www funktsioneerimist

eotis: Suillusele mõju positiivne, Amanitale neg; Erinevused koloonia tiheduses ja läbimõõdus; ECM kolonisatsioon vähenes kõigil seentel

ekattuvusest: plotte 80 ja igast ca 6 proovi; bonferronit ei kasut!!!
õi 3 juuretippu analüüsides. 1 juhusl juuretipp andis väga viletsa tulemuse; juuretippude eristamise intensiivsus vs ekstensiivsus. Palju proove ja 1 tipp annab sama tu

gosterooli sisaldus

se kuuluvad ka hüpovirulentsed isolaadid, mis fülogeneetiliselt on sarnased 2-tuumaliste Ceratobasidiumite ühele harule (siiski Thanatephoruse sees); mõningate eran sis kolonis. Mükoriisa teke männil vs kuusel 1a vs 2-3 a seemikutel

ned; EcM looduses vaid viljakehade all, mujal v harva; nakatab kõiki EcM taimi v.a. lepp; inokul jääb püsima põlengutel ja taimlates;

emal kui mitteMR taim. Erinevused isolaaditi RM moodustamises. Mitmekordsed erinevused kasvukiiruses
aremad kui mitteMR taim. Efekt oli suuresti seotud seene risomorfide jämeduse ning mütseeli ulatusega

ntraalne tsütoplasmata hüüf

d, kas nt leiuef. Tuleb kaitsta ka inimhäiringutega kooslusi, sest mitmed liigid tahavad just seda

ga

ɛal kui maa all

, Pax, Hygroph olivaceo-albus. Koosluse koosseis muutub enne rohustu muutumist. Arv, et Euroopas on seente BD vähenemine samuti seotud N-ga
ıris (Lact theiogalus) ja vastupidi (Cortinarius spp.)

‹ats miner-mulda ja ühtlasi C liikumine mulda

ID

in ürgmetsas

selt, siis on tugev valik nende vastu. Uued seensümbiondid saavad seega kanda kinnitada uutel peremeestaimedel nagu AUS taimed

ı saavad odavamalt toota ja arenevad paremad võimalused ekspordiks. Arenenud riikides võib subsiidiumide kaotamine olla pos või neg.

oofne toitumine värskest CO2-süsinikust või mikroobidest-mullaloomadest.

eltis, Juglans, tüvedest kaugemal kui juhusl. Väidet peremehe efekt, ent võib-olla varise efekt nococcumi ja morchella sklerootsiume palju tuha sees (tek enne põlengut); Morchella sklerootsiume palju ka lagupuidu juures, kus liiguvad närilised. Pakuvad, et ka

telt liikidelt võib vaenlasi varsti juurde yulla

i sõltu mulla P-st (erin Gartlan 1986). Puude levik transektide kaupa. Microberlinia, Tetraberlinia spp, Didelotia kasvasid koos, samas kui Anthonotha ja Uapaca olid ohundid domin, sealh korrel see juurte biomassiga; AM prod suurim kõrgete rohundite juurres rikkal pinnasel

le)

is kui lisa-glükoosi anti; saproobidel lisa-glükoos inh laguaktiivsust!

ivseid puid

ogujuure diam

tiivsust ja seeläbi mõjut taimede 15N; arv et taimed on paremad indikaatorid kui muld; enrichment factor aitab mullahet õle saada; NO3 vs N laadides. Naucoria ja Hebeloma mood kumbki paar tugevalt toetatud klaadi; arv ei toimu selektsioon maasis ja maapeals vahevormide vastu; maasiseste vormide tekl

› praktiline

ıg eri ressurssidest). Stabiilseid isotoope peab rakendama koos otseste toiduratsiooni mõõtmistega. Tuleb tasandada ajalist ja ruumilist heterogeensust

sat maha, võimaldades jätkuvat invas.

ıtsist lagundatud org-ühenditele. Seente tegevuse tõttu polümeeride N sis väheneb ja rasklagunev org aine ladestub. Arv, et N depositsioon aitab ladestunud C õhku p (suurendab) ning AM-seente kooslusi Aafrikas

kui kiirele orgaanika lagundajale

reeglina ei fasiliteeri ega inhibeeri invas, sest on kõikjal ja mittespets.; Aktinoriissetele ja EcM taimedel nt Männil jt vastupidi. Arv Pisolithus

cM puud

kohalikele seen- ja putukkahjuritele. Soovit pikemas perspektiivis asendada vähem invasiivsete liikidega või mitteviljuvate rassidega lt vamä ja prmä seened sarnased

ei tuvastatagi; Nii MAT+ kui MAT- genotüübid suudavad VK intits.

edelsöötmel. C-rohkus söötmes ei mõjuta kasvukiirust

oh osakaalu; Proteaceae proteoidsed juured on v efektiivsed mfg N omastamisel mullast

ooni

AUS EcM taimed olid N-vaesemad, samas kui Aafrikas toimus ka taimedel N-rikastumine d genotüübid võivad kohalikud välja tõrjuda või geneet modif. Invas seeneliikide identif on v keeruline sest 1 raske identif morf liigikonts jr, looduslik biogeo on väh

nus mossega

:sist.

: 1 vihmaper algul kui ujutusi veel pole 2 mütseel ronib mööda tüvesid üles 3 nematoode püüdvad anamorfid

eid on ka mitte-arb-rakkudes.

ıe biomass kui org-mullas.

:enid ja sümbiondid, männid reeglina mitte. Oht on geneetilise materjali segunemises ja hübriidide tekkes, mis võimaldab herbivooridel peremeesliigi vahetust

:aitse peab hõlmama seene jaoks sobivate kasvukohtade kaitset

iga minN rikkusest. Arv et sygisene D13C vahesus viljakehades tuleneb madalast temp,niiskusest ja kiirgusest enem. Spetsialiseerumine eri peremehele, peremehe eri kudedele, regiooniti. Heterotalsed vs homotalsed seened eri intens mittesug tsüklitega

a seened võivad olla globaalse levikuga, ent selle taga võib olla inimtegevus

kinni ja seetõttu need ei transpireerinud.

itaja kui maakasutuse intensiivistamine

suudetud rühma tuvastada

omin Cort, Tricholoma, Paxillus

ioonid

teksit

e, N akumul väetamise ja metsaraie tagajärjel. Enim on biosfääri mõj maakasutuse muutus. U 50% maismaast on tugevasti modif inimese poolt. Muutused albeedos ja

3C tuleb kuuselt, mis on vähemuses vrd tammega. EMH biomass 4.8 -5.8 t/ha, samas juuri 7 -12.3 kg/ha. ECM seente ja saprotroofide eristamine PLFA 18: 6,9 jr vä olest liigirikkad

ohud

biomassilt, ent EcM osakaal jäi 0.2 ja 0.5% vahele, ent sagedus oli suurim (20% proovidest); ei mõjutanud teiste seente liigirikkust; eri EmH el juhul samas proovis 2 genotüüpi. Alleelid olid alati haploidsed SSCP järgi cM seentel. Collybia butyracea ja Clitopilus prunulus on tüüp. saproobid; Tricholoma spp: väga kõrge 15N

ɔeaks rohkem kaduma

lt KPi puhul konts suurendamine mõj polüP pos oitainede kontsentreerijana, apressoriumides.; tricyclazole inh melaniini sünteesi

netsadele ja kanarbikumaadele.

nud. Tõestatud N-poolkera seeni eukalüptide istandustest ei leitud. . EcM eukalüptid on v konkurentsuivõimelised kohalike puudega vrd. Arv et eosepanga kogunemi

ri tüübid), vähem inh EcM teket, nihF ja natibiootikumide tootlikkus sama. Arv et bulk mulla B on reservuaar abilisi EcM seentele mitteMR staadiumi läbimiseks

ırineerimine tõstab 15N kõrgele. Arv et N muutmine seene poolt omab samavõrd tähtsust kui N ülesvõtt ja N transform omab v tähtsat rolli transpordil niidistikust ki

N yh kasutamisest

staliigid;

ıtluste ja fitnessi mõõtmise probleemid

lemuse, mis poole vähem proove ja 2 tipp = 1/3 proove ja 3 tippu. Tuvastamata jäi igal juhul 16-23% liikidest. Jackknife1,2; bootstrap ECM puhul v viletsad. Domir ıditega ITS fülogenees toetab AGsid

hjustatud metsas sklerootsiumid võivad juurde tekkida, idaneda ja poolduda

l eraldi. 6 a jooksul suured muutused mull P-s.

H4 ülesvõtt vs 15N on uuringuti varieeruv!; regionaalses skaalas 15N sõltub mulla N rohkusest, mulla nitrifikats, N deposits;

kides ITS var ei muutunud

›aisata CO_2 na

; jt agressivsed tüved võivad muutuda ise invasiivseks kohalikule seenestikule; tahtlik mutualistide introduts on enamike sissetoodud taimeliik

euuritud, endeemseid liike vähe teada, liigikonts jama. Arv barcoding aitab tuvastada invas liike. Arv need seened, mis on maapealsete viljakehadega ja levivad tuule

a kõrbestumine. Pms inimasustus vähendab biodiversiteeti elukohtade hävitamise ja fragmenteerimisega irsketest -5 kuud seisnud proovidest. Huumuses vahe palju suurem ehk saproobe palju rohkem

-liivaproovides biomass jäi 0 ja 5.6% vahele (keskm 2%) RT-PCR põhjal

ine on oluline eukalüptide muutumisel invas-ks.

ibarasse

ıandid EMH vs ECM v erinevad

‹ide invasiivsust stimul; paljudes kohtades mutualistidel on unikaalne funktsioon

e või putukatega, on pot invas. Tuleb vältida inokul kõrge konkurentsivõimega seeni ja inokul kitsa peremehe-seeni, mis on kasulikud, hea kolonis-võimega, ent vähe

se levikuvõimega ning madala pika-aj konkurentsivõimega

Table S3. Best linear regression models of richness of soil biota.

FINLAND					ESTONIA				
variables	R2	R2adj,cumul	F-value	P-value	variables	R2	R2adj,cumul	F-value	P-value
1 Fungi richness									
Herb cover	0.307	0.289	17.30	0.001	P. sylvestris BA	0.644	0.634	-63.29	<0.001
Tree BA	0.119	0.397	-7.92	0.007	Tree richness	0.152	0.783	25.21	<0.001
Understorey richness	0.089	0.476	6.80	0.014	P. tremula BA	0.027	0.806	4.99	0.036
Soil C/N ratio	0.045	0.512	-3.73	0.058	Proportion of EcM trees	0.019	0.822	-3.93	0.042
P. sylvestris BA	0.040	0.544	3.50	0.073					
1.1 EcM fungi richness									
A. glutinosa BA	0.272	0.254	-14.60	0.003	P. sylvestris BA	0.535	0.522	-40.28	<0.001
Soil pH(KCl)	0.225	0.471	16.98	0.001	A. glutinosa BA	0.116	0.631	-11.35	0.003
Tree diversity (Shannon index)	0.131	0.598	13.05	0.002	Understorey richness	0.045	0.669	4.93	0.031
P. abies BA	0.028	0.618	2.94	0.109	Soil Ca concentration	0.048	0.713	5.99	0.019
Soil P concentration	0.019	0.629	-2.04	0.161					
PCNM1	0.056	0.684	7.12	0.018					
1.2 Mycoparasite richness									
PCNM1	0.233	0.213	11.82	0.001	Soil pH(KCl)	0.075	0.048	-2.83	0.084
L. sibirica BA	0.048	0.242	-2.51	0.108	Proportion of EcM trees	0.072	0.096	-2.86	0.106
Herb cover	0.073	0.300	4.15	0.059					
1.3 Plant pathogen richness									
Herb cover	0.436	0.422	30.16	<0.001	Soil C/N ratio	0.637	0.627	-61.47	<0.001
Soil C/N ratio	0.123	0.536	-10.61	0.002	Proportion of EcM trees	0.092	0.713	-11.47	0.004
PCNM1	0.025	0.550	2.22	0.156	P. tremula BA	0.014	0.719	1.79	0.197
Soil N concentration	0.044	0.587	4.25	0.041	Soil pH(KCl)	0.018	0.731	2.40	0.136
Coppice amount	0.023	0.601	-2.27	0.159	Tree BA	0.027	0.754	-3.98	0.060
Tree BA	0.049	0.647	-5.53	0.023	PCNM1	0.025	0.775	4.00	0.068
1.4 Saprotroph richness									
Tree BA	0.319	0.301	-18.25	0.001	Tree richness	0.422	0.406	25.60	<0.001
Soil N concentration	0.099	0.387	6.45	0.021	P. sylvestris BA	0.106	0.501	-7.67	0.017
P. abies BA	0.123	0.504	-9.94	0.004	Soil pH(KCl)	0.044	0.534	-3.38	0.070
Soil C/N ratio	0.060	0.556	-5.37	0.020	Soil Ca concentration	0.064	0.591	5.63	0.033
P. sylvestris BA	0.033	0.581	3.13	0.085					

2 Cercozoa richness											
Herb cover		0.183		0.162	8.72	0.006	Soil C/N ratio	0.337	0.318	-17.75	0.001
Soil pH(KCl)		0.163		0.311	9.46	0.010	Soil Ca concentration	0.162	0.469	-10.94	0.003
Tree BA		0.095		0.395	6.26	0.018	P. sylvestris BA	0.100	0.561	8.21	0.009
Coppice amount		0.055		0.439	4.78	0.040					
B. pendula BA		0.054		0.489	4.26	0.044					
PCNM1		0.058		0.442	4.15	0.052					
3 Chlorophyta richness											
Tree BA		0.351		0.335	-21.12	<0.001	A. glutinosa BA	0.134	0.109	5.41	0.022
P. abies BA		0.070		0.391	4.58	0.030	Tree BA	0.096	0.184	-4.24	0.049
Soil C/N ratio		0.089		0.470	-6.70	0.011	PCNM1	0.070	0.237	3.32	0.077
							P. tremula BA	0.062	0.282	3.10	0.083
							Soil Ca concentration	0.053	0.321	2.83	0.090
4 Ciliophora richness											
Coppice amount		0.455		0.441	32.57	<0.001	Soil Ca concentration	0.602	0.590	52.90	<0.001
Understorey richness		0.131		0.564	12.05	0.004	Soil C/N ratio	0.114	0.699	-13.62	0.001
Soil N concentration		0.046		0.602	4.62	0.033	Soil N concentration	0.083	0.780	13.53	0.003
Tree richness		0.034		0.629	3.66	0.069	P. abies BA	0.021	0.797	3.81	0.054
Herb cover		0.032		0.655	3.68	0.049	A. glutinosa BA	0.017	0.811	-3.30	0.083
5 Collembola richness											
Soil C/N ratio		0.203		0.182	9.93	0.002	PCNM12	0.179	0.155	7.62	0.008
PCNM21		0.142		0.311	8.25	0.007	PCNM1	0.149	0.288	7.55	0.006
PCNM2		0.129		0.432	9.09	0.002					
6 Nematoda richness											
L. sibirica BA		0.095		0.072	4.11	0.047	Soil C/N ratio	0.209	0.196	-9.64	0.003
Coppice amount		0.071		0.122	-3.23	0.072	Soil P concentration	0.055	0.220	2.04	0.153
7 Total microbial biomass											
PCNM1	0.681		0.672		83.07	<0.001	Soil P concentration	0.292	0.273	14.51	0.001
Soil P concentration	0.048		0.714		6.70	0.018	Soil C/N ratio	0.111	0.369	-6.31	0.016
8 Bacterial biomass											
PCNM1	0.693		0.685		88.02	<0.001	Soil P concentration	0.216	0.193	9.63	0.004
Soil P concentration	0.046		0.725		6.69	0.016	Soil C/N ratio	0.185	0.365	-10.49	0.003
							Soil N concentration	0.071	0.424	4.43	0.042

8.1 Actinobacterial biomass									
Soil P concentration	0.539	0.527	45.55	<0.001	A. glutinosa BA	0.292	0.272	14.43	0.001
PCNM1	0.031	0.547	2.72	0.098	Soil Ca concentration	0.146	0.405	8.84	0.011
					Soil C/N ratio	0.079	0.473	-5.41	0.023
9 Fungi biomass ergosterol									
Soil N concentration	0.653	0.644	73.29	<0.001	Soil N concentration	0.677	0.668	73.46	<0.001
Soil P concentration	0.130	0.772	22.83	<0.001	Carbon concentration	0.090	0.754	13.17	0.005
Understorey richness	0.022	0.789	4.22	0.043					
9.1 Saprotroph biomass ergosterol									
Soil N concentration	0.635	0.626	67.94	<0.001	Soil N concentration	0.484	0.470	32.89	<0.001
Soil P concentration	0.129	0.752	20.90	<0.001	P. sylvestris BA	0.042	0.498	2.99	0.091
Understorey richness	0.025	0.772	4.36	0.050	Carbon concentration	0.085	0.576	7.20	0.013
					Soil C/N ratio	0.046	0.614	4.28	0.047
					Soil Ca concentration	0.047	0.656	4.88	0.036
9.2 EcM fungal biomass ergosterol									
PCNM1	0.521	0.509	73.29	<0.001	Soil N concentration	0.654	0.644	66.04	<0.001
A. glutinosa BA	0.085	0.586	-22.83	<0.001	P. sylvestris BA	0.089	0.728	11.78	0.003
Soil N concentration	0.050	0.628	4.22	0.043					
10 Bacteria to fungi ratio									
Soil N concentration	0.261	0.242	-13.77	0.002	Soil C/N ratio	0.624	0.613	-58.02	<0.001
					Soil Ca concentration	0.083	0.690	9.67	0.003
11 SAP to EcM fungi ratio									
A. glutinosa BA	0.376	0.360	23.48	<0.001	A. glutinosa BA	0.129	0.104	5.19	0.030
Tree diversity (Shannon index)	0.114	0.463	8.46	0.014	Soil Ca concentration	0.265	0.358	-14.85	0.001
					P. sylvestris BA	0.071	0.417	4.44	0.047

Table S5. Best multivariate models for community composition of soil biota.

FINLAND					ESTONIA				
variables	R2	R2adj,cumul	F-value	P-value	variables	R2	R2adj,cumul	F-value	P-value
1 Fungi community									
PCNM1	0.172	0.151	8.09	<0.001	Soil C/N ratio	0.168	0.144	7.08	<0.001
B. pendula BA	0.051	0.182	2.50	0.001	Soil Ca concentration	0.086	0.210	3.90	0.001
Soil Mg concentration	0.049	0.213	2.49	0.001	T. cordata BA	0.051	0.242	2.42	0.001
1.1 EcM fungi community									
PCNM1	0.100	0.076	4.31	0.001	Ericoid cover	0.135	0.110	5.44	<0.001
B. pendula BA	0.093	0.150	4.37	0.001	Soil Ca concentration	0.065	0.153	2.77	0.001
Tree BA	0.051	0.182	2.49	0.001	T. cordata BA	0.053	0.185	2.33	0.001
P. abies BA	0.053	0.218	2.69	0.001					
1.2 Mycoparasite community									
Soil Mg concentration	0.102	0.079	4.44	0.001	Soil N concentration	0.079	0.053	3.01	0.003
PCNM5	0.050	0.107	2.24	0.014	Soil Ca concentration	0.062	0.091	2.47	0.009
					Soil pH(KCl)	0.062	0.131	2.56	0.014
					PCNM17	0.069	0.181	3.04	0.007
1.3 Plant pathogen community									
PCNM1	0.095	0.072	4.10	0.001	Soil N concentration	0.133	0.108	5.37	<0.001
L. sibirica BA	0.045	0.094	1.97	0.001	Soil Ca concentration	0.089	0.176	3.87	0.001
1.4 Saprotroph community									
PCNM1	0.227	0.207	11.47	<0.001	Soil C/N ratio	0.204	0.181	8.96	<0.001
Soil Mg concentration	0.051	0.240	2.68	0.001	Soil N concentration	0.088	0.250	4.20	0.001
					Soil pH(KCl)	0.079	0.313	4.12	0.001
2. Cercozoa community									
Soil pH(KCl)	0.079	0.055	3.33	0.001	Soil pH(KCl)	0.122	0.097	4.88	0.001
					Ericoid cover	0.062	0.137	2.60	0.001
3 Chlorophyta community									
PCNM1	0.093	0.070	4.01	0.001	Herb cover	0.076	0.048	2.71	0.001

4 Ciliophora community									
Soil Ca concentration	0.167	0.146	7.83	<0.001	Ericoid cover	0.126	0.101	5.05	<0.001
Soil pH(KCl)	0.051	0.178	2.50	0.002	Soil pH(KCl)	0.055	0.133	2.29	0.001
PCNM5	0.049	0.209	2.49	0.005					
PCNM6	0.049	0.241	2.56	0.001					
5 Collembola community									
PCNM1	0.075	0.051	3.15	0.003	Soil pH(KCl)	0.085	0.059	3.27	0.001
PCNM5	0.058	0.087	2.38	0.014	Ericoid cover	0.079	0.104	2.75	0.001
6 Nematoda community									
Soil P concentration	0.064	0.040	2.66	0.005	Soil N concentration	0.120	0.095	4.78	0.001
					Soil pH(KCl)	0.067	0.140	2.81	0.001
					P. tremula BA	0.063	0.182	2.78	0.001
					T. cordata BA	0.056	0.220	2.59	0.001