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PHYTOSOCIOLOGICAL STUDY OF BEECH AND BEECH-MIXED WOODS IN MONTI SIBILLINI NATIONAL PARK (CENTRAL APENNINES, ITALY)

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Abstract

The results of a phytosociological survey of the woods mainly growing on limestones in the Southern part of the Marches Region (Central Italy), that is part of the Monti Sibillini National Park, are here presented. This area is characterized by a temperate climate (upper mesotemperate and lower/upper supratemperate bioclimatic belts). In order to study the vegetation, 173 phytosociological relevés were carried out through the Braun-Blanquet methodology. All the data obtained were submitted to multivariate analysis. The phytosociological analysis is characterized in nine associations, whereof three are of new description (*Lathyro veneti-Fagetum sylvaticae hieracietosum murorum*, *Cardamino kitaibelii-Fagetum sylvaticae corallorhizetosum trifidae* and *Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae*).

Key words: beech woods, calcareous substratum, Central Apennines, Monti Sibillini, multivariate analysis, phytosociology.

Izvleček

Prikazani so rezultati fitocenološke raziskave gozdov, ki uspevajo predvsem na apnencu v južnem delu pokrajine Marche (srednja Italija), to je v delu Nacionalnega parka Monti Sibillini. To območje označuje zmerna klima (zgornji mezotemperatni in spodnji/zgornji supratemperatni bioklimatki pas). Vegetacijo smo proučili s 173 fitocenološkimi popisi po Braun-Blanquetovi metodi. Vse popisno gradivosmo analizirali z multivariatno statistiko. S fitocenološko analizo smo dobili devet asociacij, od tega so tri novoopisane (*Lathyro veneti-Fagetum sylvaticae hieracietosum murorum*, *Cardamino kitaibelii-Fagetum sylvaticae corallorhizetosum trifidae* and *Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae*).

Ključne besede: bukovi gozdovi, apnenčasti substrat, Srednji Apenini, Monti Sibillini, multivariatna analiza, fitosociologija.

1. INTRODUCTION

Italian beech woods develop on mountain relief belonging to the biogeographical Alpine and Apennine-Balcanic Provinces (Eurosiberian Region) and to the Italian-Tyrrhenian and Adriatic Provinces (Mediterranean Region) (Rivas-Martínez et al. 2004) as highlighted in Figure 1, at altitudes ranging from (200–300 m) 600 to 2000 m a.s.l. (Pignatti 1982, Scoppola & Caporali 1998).

According to Biondi et al. (2002), Italian beech woodlands are placed into two alliances: *Aremonio-Fagion sylvaticae*, widespread on the Alpine ridge and in the Central and Northern Apennines (Credano et al. 1980, Ubaldi & Speranza 1985, Poldini & Vidali 1995, Willner 2002) and *Geranio versicoloris-Fagion sylvaticae*, distributed in the Central and Southern sector of the Italian Peninsula (Bonin 1967–69, Gentile 1970, Brullo 1983, Di Pietro 2002, Pirone et al. 2003, Biondi et al. 2004, Di Pietro et al. 2004, Taffetani et al. 2004, Blasi et al. 2005, Pirone et al. 2005, Rosati et al. 2005, Ciaschetti et al. 2006, Di Pietro 2007, Allegrezza & Biondi 2008, Biondi et al. 2008).

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B. EUROSIBERIAN

Bc. ALPINO-CAUCASIAN

8. Alpine

8a. Mediterranean Alpine, 8b Western Alpine, 8c. Central Alpine
8d. Eastern Alpine

9. Apennino-Balkan

9a. Apennine, 9b. Padanian, 9c. Ilyrian, 9d. Pindan, 9e. Bulgarian

C. MEDITERRANEAN

Ca. WESTERN MEDITERRANEAN

20. Italo-Thyrrhenian

20a. Corsican, 20b. Sardinian, 20c Sicilian, 20d. Coastal West Italian

Cb. EASTERN MEDITERRANEAN

21. Adriatic

21a. Apulian, 21b. Epiro-Dalmatian 21c. Peloponnesian

Figure 1: Part of Biogeographic map of Europe (Rivas-Martínez et al. 2004).
Slika 1: Izsek iz biogeografske karte Evrope (Rivas-Martínez et. al 2004).

These two alliances overlay in correspondence to the Umbria-Marches Apennines (Central Italy). In this biogeographical sector, the beech woods, belonging to the *Geranio versicoloris-Fagion sylvaticae* alliance, are present in the lower supratemperate bioclimatic belt, while the ones included in *Aremonio-Fagion sylvaticae* alliance develop in the upper supratemperate bioclimatic belt (Biondi et al. 2002, Allegrezza 2003, Catorci et al. 2003, Biondi et al. 2004). Furthermore, mountain forest landscape of the Central Apennines includes gorge plant communities belonging to *Tilio platyphylli-Acerion pseudoplatani* alliance (Biondi et al. 2002, Catorci et al. 2003, Paura & Cutini 2006).

The study of beech woods of the Monti Sibillini National Park is part of a wider research comprising the survey of flora, vegetation and plant landscape of such a protected area. Moreover, the work is aimed at completing the set of information related to the mountain forests of the Central Apennines through the analysis of a mountain sector representing the one ridge of Umbria-Marches Apennines, where the altitudes of relief (2200–2400 m) rise to the ecological timberline (located at about 1800–1850 m a.s.l., Pedrotti 1995).

2. STUDY AREA AND FOREST MANAGEMENT

From the geological viewpoint, Monti Sibillini National Park (Central Italy – Figure 2) is mainly formed by limestones, except for the peripheral pedemontane sectors, where sandstone and mar-

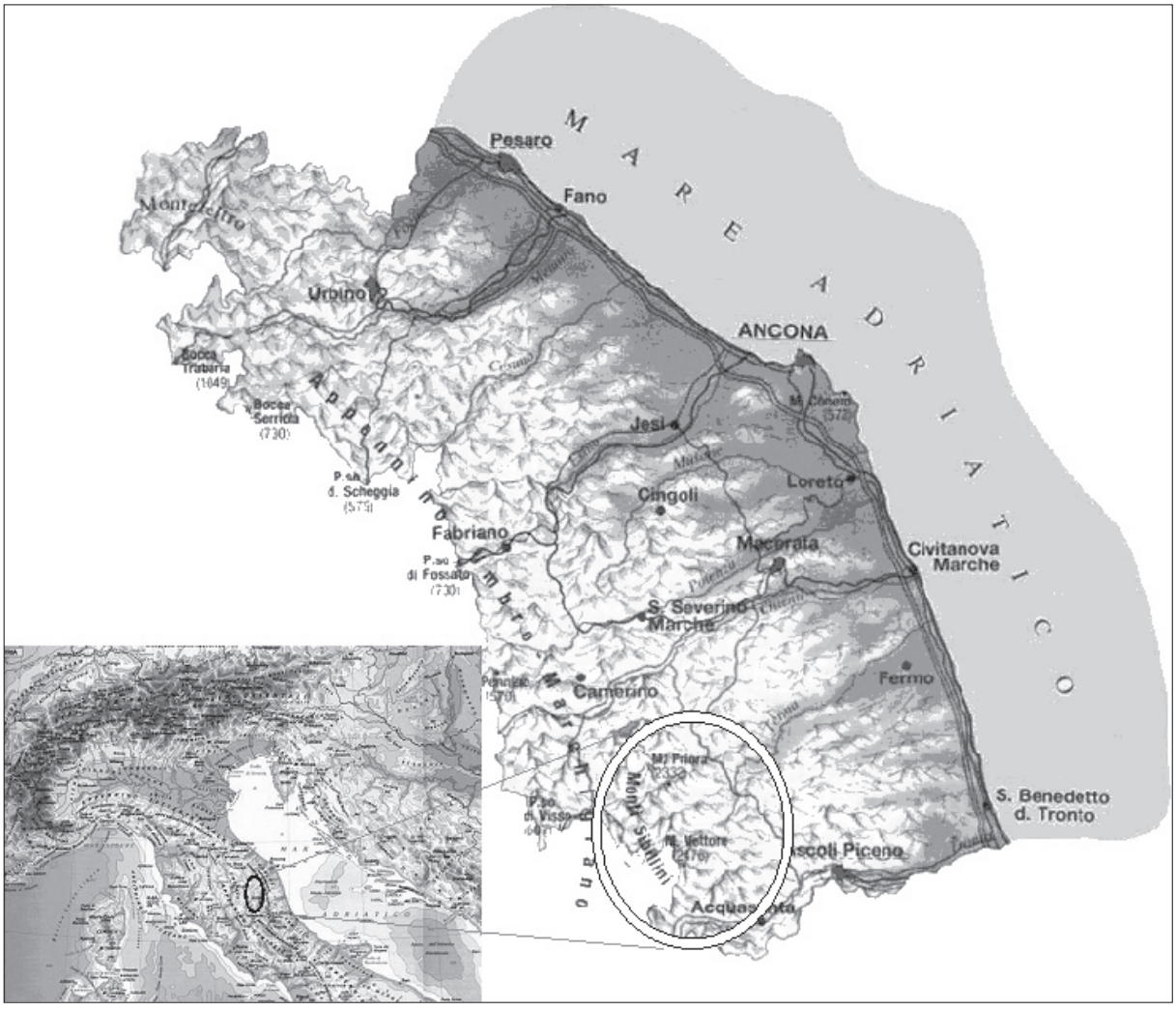

Figure 2: Study area.
Slika 2: Raziskovano območje.

ly-limestone substrata outcrop (AA.vv. 1991). The lowest altitude is about 400 m, while the highest is 2476 m (Monte Vettore).

The bedrock's geochemical features and glacial or post-glacial erosion processes have contributed to the formation of rough morphologies with extremely steep slopes carved by gorges, valleys and rocky walls. Such geomorphological and historical-climatic features as well as the past land use have influenced a very slowly pedogenesis, also favouring the erosion of the most superficial soil layer.

The most widespread soil type in beech woods growing on limestones is Skeleti-Calcaric Phaeozem alternated by Calcari-Mollihumic Leptosol (A.S.S.A.M. 2006). These soils are moderately deep (about 0.5–1.5 m), with quite a fine texture and changeable amount of skeleton. Organic matter content in shallow horizons is high or very high, the reaction is slightly basic, while cationic exchange capacity and base saturation are high (Giovagnotti et al. 2003, Calandra & Leccese 2007). Soils of beech woods, growing on sandstones, are mostly Calcaric Cambisols and secondarily Calcaric Regosols; these soil types are characterized by strong desaturation, low Active Calcium content, pH lower than 6, sandy or sandy-clayey texture and moderate to mean depth (I.P.L.A. 2001, A.S.S.A.M. 2006).

In the study area, woodlands dominated by *Fagus sylvatica* subsp. *sylvatica* are developing from 900–950 m to 1650–1700 (1750) m a.s.l., in correspondence to upper mesotemperate, lower and upper supratemperate bioclimatic belts (Table 1) (Biondi et al. 1995, Catorci et al. 2007). In impluvia of North-facing slopes, the lower limit falls down to 700–750 m, while on watersheds and South-facing slopes, this limit rises up to about 1200 m.

Beech woods in Monti Sibillini National Park extend for overall 8300 ha, of which about 1000 ha are part of upper mesotemperate bioclimatic belt, 5300 ha of the lower supratemperate and 1900 ha of the upper supratemperate bioclimatic belt.

In the study area, beech forests have been affected for centuries by remarkable human pressures, both for the production of firewood and for summer grazing (Sansa 2003). Nowadays, the most widespread management type of Sibillini beech woods is coppice with standard (about 80 %), with the shortest cutting turnover of 25 years and longest of 40, while only about 20 % is managed as high-forest (I.P.L.A. 2001).

However, the lack of economic interest in extensive livestock and mountain forestry in the last 30–40 years has favoured the natural expansion of woodlands as well as their generalized ageing. As a matter of fact, in many Sibillini sectors, beech woods can be considered as old coppice because they have not been cut for one or two turns (40–80 years). Current researches (Vitanzi et al. work in progress) did not highlight the presence of old forests in accordance with the criteria proposed by Franklin & Spies (1991), Di Filippo et al. (2004) and Burrascano et al. (2009).

3. METHODS

The study of Monti Sibillini National Park beech woods was carried out using the phytosociological methodology of the Sigmatist Zurich-Montpellier school (Braun-Blanquet 1931, 1964), integrated with the recent acquisitions in synphytosociology and geosynphytosociology (Géhu & Rivas-Martínez 1981, Theurillat 1992, Biondi 1996, Biondi et al. 2004, Rivas-Martínez 2005, 2005a). In particular, 173 relevés were executed from 2004 to 2008. Then, the relevés table was submitted to multivariate analysis using Syntax 2000 software (Podani 2001). Phytosociological values have been converted according to the Van der Maarel (1979) scale, obtaining a matrix made up of 222 rows (species) and 173 columns (relevés) that was submitted to numerical classification through the Group average algorithm (Orloci 1978), on a similarity matrix, based on chord distance.

Floristic nomenclature follows Tutin et al. (1964–80, 1993) and Conti et al. (2005, 2007). Publications regarding syntaxonomic review and local phytosociological study were considered in order to define the vegetation types (Allegrezza et al. 2002, Biondi et al. 2002, 2004, Allegrezza 2003, Catorci et al. 2003, Blasi et al. 2004, Taffetani et al. 2004, Ballelli et al. 2006).

The phytosociological data obtained were submitted to different processing methods/operations:

- Principal Components Analysis (PCA), using Syntax 2000 software (Podani 2001), of a matrix made up of 4 rows (environmental parameters – geology, altitude, slope angle and morphology – expressed by classes as shown in Table 2) × 11 columns (*syntaxa*), in order to identify the weight of the different local factors defining the forest *syntaxa* distribution;
- calculation of the weighted phytosociological spectrum (Tomaselli 1956) for each *syntaxon*;

phytosociological spectra were carried out starting from species number and their ponderal weight inside the two orders (*Quercetalia pubescenti-petraeae* and *Fagetalia sylvaticae*) and membership class (*Querco-Fagetea*) represented in phytosociological tables attached to this work.

Soil data, related to the identified plant communities were obtained using: a graduated pole for measurement of depth; a field pH-meter; an electromagnetic sieve for textures. Depth, pH and texture values were collected from some sampling areas for each *syntaxon*.

4. RESULTS

4.1 Phytosociological characterization

Multivariate analysis of phytosociological relevés (Figure 3) points out two main groups: I – highhilly mixed woods (*Fagus sylvatica* subsp. *sylvatica* and *Ostrya carpinifolia*) belonging to *Quercetalia pubescenti-petraeae* order; II – mountain woods with a dominance of *Fagus sylvatica* subsp. *sylvatica*, belonging to *Fagetalia sylvaticae* order. Inside cluster II, two sub-clusters can be identified: the first corresponding to *Geranio versicoloris-Fagion sylvaticae* and *Aremonio-Fagion sylvaticae* alliances (sub-cluster IIa), the second belonging to *Tilio plathyphylli-Acerion pseudoplatani* alliance (sub-cluster IIb).

The sub-clusters are further divided into two or more relevés groups corresponding to association, subassociation or variant syntaxonomical levels, which are hereafter defined from a phytosociological viewpoint and described as regards floristic and ecological characteristics.

As for the importance of the environmental parameters for the distribution of the surveyed forest *syntaxa*, the biplot in Figure 4 shows that axes 1, 2 and 3 explain respectively 47.6 %, 31.0 % and 17.6 % of the total variance. This analysis highlights that the variable which better explains the diversity is the geology (38.9 % of the variance), associated to axis 1. As regards the other variables, altitude explains 28.4 % of the variabil-

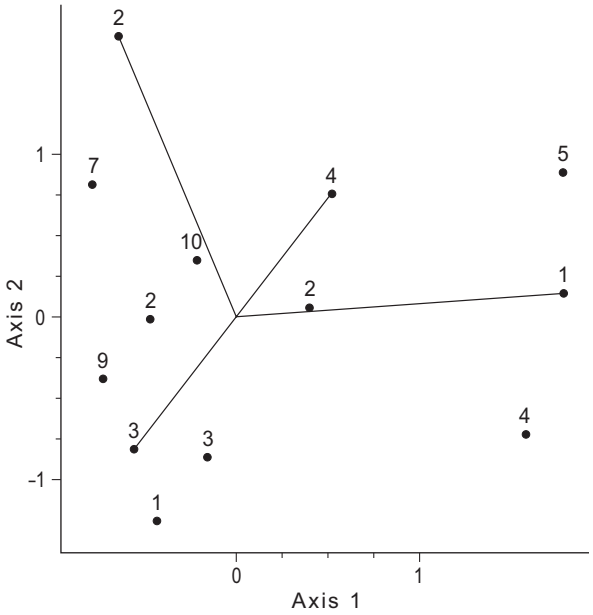

Figure 4: Biplot of environmental features versus considered *syntaxa*.
Slika 4: Dvorazsežnostni diagram rastiščnih dejavnikov in obravnavanih sintaksonov.

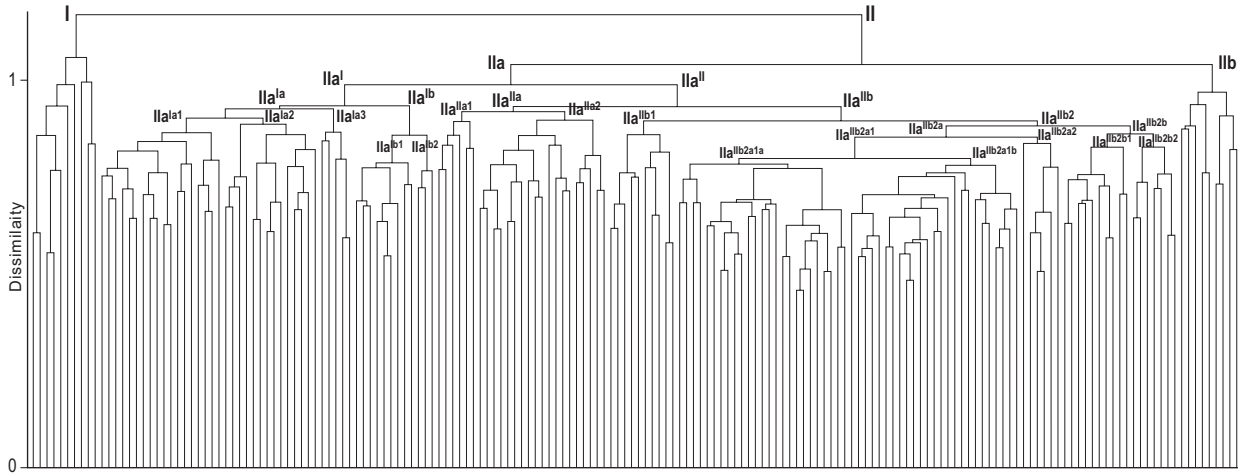

Figure 3: Cluster analysis of the studied forest plant communities.
Slika 3: Klastrska analiza proučevanih gozdnih rastlinskih združb.

ity and is clearly linked to axis 2, while morphology, which explains 21.1 % is linked to axis 3.

Weighted phytosociological spectra highlight that cluster I, ascribed to *Quercetalia pubescenti-petraeae* order, has a *Quercetalia pubescenti-petraeae* weighted cover value of 45–50 % and *Fagetalia sylvaticae* cover value of 30–35 %. Relevés of cluster II, instead, highlight the change of the dominant phytosociological group, which becomes *Fagetalia sylvaticae* order. More in particular, sub-cluster IIa shows values of *Quercetalia pubescenti-petraeae* elements spanning from 7–10 % to 16–18 %, while *Fagetalia sylvaticae* ones range from 65 % to 79 %; sub-cluster IIb has *Quercetalia pubescenti-petraeae* values of 1–5 %, while those of *Fagetalia sylvaticae* are between 81 % and 90 %.

4.1.1 Beech and hop hornbeam mixed woods

Beech and hop hornbeam mixed woods grow mainly on fairly steep North-facing slopes, ranging from 700–750 to 950–1050 m a.s.l. They represent the phytosociological and ecological elements identifying the transition from *Laburno anagyroidis-Ostryenion carpinifoliae* (*Carpinion orientalis, Quercetalia pubescenti-petraeae*) hilly woods to mountain ones referred to *Fagetalia sylvaticae* order. As supposed by Catorci et al. (2003) a number of historical considerations (Reali 1871, Salbitano 1989, Catorci 2007) allow one to hypothesize the past existence of a beech wood type covering North-facing slopes between 600 and 900 m a.s.l. of which actual *Ostrya carpinifolia* and *Fagus sylvatica* subsp. *sylvatica* mixed woodlands could represent the xeric and degraded look, because of human activities and the consequent soil erosion. Such primeval formations could have been mixed woodlands, where *Tilia plathyphyllos* subsp. *plathyphyllos*, *Acer* sp. pl., *Fagus sylvatica* subsp. *sylvatica*, *Carpinus betulus*, *Quercus cerris*, *Ilex aquifolium* and, perhaps, *Abies alba* had a dominant role and where secular forestry and pasture activities allowed *Ostrya carpinifolia* settlement.

***Carici digitatae-Ostryetum carpinifoliae* Catorci, Gatti et Sparvoli 2003**

(Group I, Table 3, relevés 1–7; *holotypus* rel. 20 of Table 2 in Catorci et al. 2003)

Woodland with a dominance of *Ostrya carpinifolia* and *Fagus sylvatica* subsp. *sylvatica*, widespread on North-facing slopes (from NW to E), with slope angle ranging from 10° to 55°, at altitudes from 700 to 900 m (upper mesotemperate biclimatic belt).

This *syntaxon* is characterized by soils with the following features: 50–100 cm depth; 6.2–6.8 pH, tendly clayey texture (35–45 % sand, 20–30 % silt, 25–35 % clay).

From a phytosociological point of view, these woods are characterized by the dominance of *Quercetalia pubescenti-petraeae* elements (45–50 %) associated to a group of *Fagetalia sylvaticae* species (30–35 %).

Floristic analysis enabled classification of such a plant community into *Carici digitatae-Ostryetum carpinifoliae* association, described for the first time by Catorci et al. (2003) in low-mountain woodlands of Macerata Apennines (Central Italy) and mentioned also by Taffetani et al. (2004), who downgrades the association to the subassociation rank (*Lathyro veneti-Fagetum sylvaticae staphyletosum pinnatae*). However, on the basis of the historical (Catorci et al. 2003), physiognomical (hop hornbeam-beech woods *versus* beech woods) and phytosociological characterization (first of all the dominance of *Quercetalia pubescenti-petraeae* elements with respect to those belonging to *Fagetalia sylvaticae*), this placement is considered inappropriate, so the association level is mantained.

Moreover, Catorci et al. (2003) placed these *syntaxa* in *Geranio versicoloris-Fagion sylvaticae*, but the phytosociological framework and the clear division emerging from cluster analysis led to the placement of *Carici sylvaticae-Ostryetum carpinifoliae* in *Laburno anagyroidis-Ostryenion carpinifoliae* (*Carpinion orientalis*).

4.1.2 Beech woods

Beech woods are divided into two main groups referred to different altitudinal intervals (1000–1400 m and 1400–1800 m) and consequently to different bioclimatic belts (lower and upper supratemperate). As better described later on, they are respectively referred to *Lathyro veneti-Fagetum sylvaticae* and *Cardamino kitaibelii-Fagetum sylvaticae* associations, described or confirmed by Biondi et al. (2002) on the basis of phytosociological tables including beech woods growing below 1300–1350 m a.s.l. only and which, therefore, could not represent the whole floristic diversity of Central Apennines beech woods (timberline is placed at about 1800–1850 m a.s.l.). Moreover, a discrepancy was observed between the species

indicated by the authors as characteristic or differential (considered in this work) and those reported in the respective tables.

For such reasons it is considered appropriate to perform a screening and review of such species groups. In particular, Biondi et al. (2002) suggested as characteristic species of *Lathyro veneti-Fagetum sylvaticae* association: *Cyclamen hederifolium* subsp. *hederifolium*, *Lathyrus venetus*, *Sorbus aria* subsp. *aria*, *Galanthus nivalis*, *Scilla bifolia*, *Corydalis cava* subsp. *cava* and *Viola alba* subsp. *dehnhardtii*. In the present study *Sorbus aria* subsp. *aria*, *Corydalis cava* subsp. *cava*, *Galanthus nivalis* and *Scilla bifolia* are not confirmed, because the investigation highlighted that they are widespread between 600 and 1800 m a.s.l. (Table 4), thus they can not be considered as characteristic or differential species of *Lathyro veneti-Fagetum sylvaticae* association (low-hilly beech woods). Furthermore, the above mentioned species groups are integrated with *Polygonatum multiflorum*, *Anemone apennina* subsp. *apennina* and *Anemone nemorosa*, high-hilly and low-mountain geophytes which are found in the study area in the range of 800–1400 m a.s.l. In regard to *Cardamino kitaibelii-Fagetum sylvaticae*, Biondi et al. (2002), in accordance with Ubaldi (1993), list the following characteristic species: *Cardamine kitaibelii*, *C. enneaphyllos*, *Anemone nemorosa*, *Epilobium montanum*, *Polystichum aculeatum*, *Adoxa moschatellina* subsp. *moschatellina* and *Taxus baccata*. *Anemone nemorosa* and *Taxus baccata* are not confirmed as characteristic species in the present study because they proved to be widespread in the lower supratemperate bioclimatic belt and only sporadically in the upper supratemperate bioclimatic belt. Instead, *Cardamine kitaibelii*, *C. enneaphyllos*, *Polystichum aculeatum*, *Epilobium montanum* and *Adoxa moschatellina* subsp. *moschatellina* are confirmed, with the addition of *Lathyrus vernus* subsp. *vernus*.

***Lathyro veneti-Fagetum sylvaticae* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002 *lathyretosum veneti* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002**

(Group IIa^{Ia2}, Table 5, relevés 19–32; *holotypus* rel. 3 of Table 2 in Biondi et al. 2002)

Woodland with a dominance of *Fagus sylvatica* subsp. *sylvatica* and *Acer opalus* subsp. *obtusatum*, that are managed as coppice with standards, widespread on mainly North-facing slopes with an inclination of 5–45° and at altitudes ranging from (750) 900 to 1300 (1400) m a.s.l.

This *syntaxon* is characterized by soils with the following features: 100–150 cm depth; 6.0–7.0 pH, clayey/tendly clayey texture (25–35 % sand, 25–35. silt, 40–50 clay).

From a phytosociological point of view these woodlands are characterized by the dominance of *Fagetalia sylvaticae* elements (65–70 %) associated to a remarkable *Quercetalia pubescenti-petraeae* species group (15–20 %).

Floristic analysis allowed such a plant community to be placed in the *Lathyro veneti-Fagetum sylvaticae lathyretosum veneti* subassociation described for the first time by Biondi et al. (2002) for the Central Apennines low-mountain and signaled by other authors (Allegrezza 2003, Catorci et al. 2003, Biondi et al. 2004, Taffetani et al. 2004) for the Umbria-Marches Apennines (Central Italy).

Floristic comparison between the tables of *Lathyro veneti-Fagetum sylvaticae* and *Carici digitatae-Ostryetum carpinifoliae* highlights that the two associations are not well distinguished if only characteristic species are considered (characteristic species of *Lathyro veneti-Fagetum sylvaticae* well separate these beech woods from the high-mountain ones, but they are substantially present in *Carici digitatae-Ostryetum carpinifoliae*). This lack of differentiation seems to be further evidence that beech-hop hornbeam woods originate from degradation (alteration of structure and composition of tree and shrubs layers) of low-mountain beech woodlands. From a floristic point of view, the differentiation between the two *syntaxa* is due to the different weight of *Quercetalia pubescenti-petraeae* species group.

More detailed analysis of groups of relevés forming sub-cluster IIa^{Ia} highlighted the lower rank phytosociological units, described as follows.

***Lathyro veneti-Fagetum sylvaticae* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002 *lathyretosum veneti* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002 *galium aparine* variant**

(Group IIa^{Ia3}, Table 5, relevés 33–37)

Relevés 33–37 of Table 5 differ from those of typical subassociation for the presence of open site and ruderal type species. These beech communities grows on slopes with outcropping rock, often in morphological conditions of impluvium or in areas recently managed as high-forest, with high Nitrogen content. This peculiar ecological

connotation is well emphasized by the variant of differential species block: *Galium aparine* (expression of high organic matter content and disturbance of soil), *Digitalis lutea* subsp. *australis, Ribes alpinum* (expression of high light availability within the forest community) and *Doronicum columnae* (expression of rocky surfaced substratum).

***Lathyro veneti-Fagetum sylvaticae* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002 *hieracietosum murorum* (Allegrezza 2003) stat. nov. (=*hieracio racemosi-fagetum sylvaticae luzuletosum sylvaticae* Allegrezza 2003)**

(Group IIa^{Ia1}, Table 5, relevés 1–18; *typus* rel. 2 Table 37 in Allegrezza 2003)

Relevés 1–18 of Table 5 differentiate, as regards the ones ascribed to the typical subassociation, for most constant occurrence and higher cover values of some acidophilous species (*Hieracium murorum*, *H. racemosum*, *Potentilla micrantha*, *Rosa arvensis, Cephalanthera rubra, Luzula forsteri*, *L. sylvatica* subsp. *sylvatica, Hypericum androsaemum, Carex sylvatica* subsp. *sylvatica* and, in the tree layer, *Quercus cerris* or, locally, *Castanea sativa*).

Local characteristics of such phytocoenosis are similar to those of the typical subassociation, except for the soils developed on chert-rich bedrocks, such as the Calcari Diasprini Formation (AA.vv. 1991), or the deeper, partially decalcified and clay enriched colluvial soils accumulated on gentler slopes, partially decalcified and/or subjected to clay illuviation.

This *syntaxon* is characterized by soils with the following features: 100–150 cm depth, 5.8–6.2 pH, clayey texture (20–30 % sand, 25–35. silt, 45–55 clay).

The above said floristic-ecological features led to the definition of a new subassociation named *Lathyro veneti-Fagetum sylvaticae hieracietosum murorum*, of which *Rosa arvensis*, *Carex digitata, C. sylvatica* subsp. *sylvatica*, *Hieracium murorum*, *Potentilla micrantha*, *Luzula forsteri* and *Platanthera chlorantha* are differential species.

It must be clarified that *Hieracio racemosi-Fagetum sylvaticae luzuletosum sylvaticae*, described by Allegrezza (2003) for Monte San Vicino (Marches Region), that develops on the same substratum type, in this work is downgraded to the subassociation rank (*Lathyro veneti-Fagetum sylvaticae hieracietosum murorum*). Indeed, as pointed out in the synoptic table (Table 5), characteristic and differential species of the typical subassociation still occur and, moreover, there are no remarkable differences regarding acidophilous species between the new proposed subassociation and *Hieracio racemosi-Fagetum sylvaticae luzuletosum sylvaticae*, while the main differences are due to the lower floristic richness of Allegrezza (2003) relevés. Characteristic species of *Hieracio racemosi-Fagetum sylvaticae luzuletosum sylvaticae* are used as differentials of subassociation in *Lathyro veneti-Fagetum sylvaticae hieracietosum murorum*, except for *Digitalis lutea* subsp. *australis* and *Pteridium aquilinum* subsp. *aquilinum* because they are marginal species, and for *Lactuca muralis*, *Cephalanthera longifolia* and *Ilex aquifolium* because widespread with the same frequency also in the typical subassociation.

***Solidagini-Fagetum sylvaticae* (Longhitano et Ronsisvalle 1974) Ubaldi, Zanotti, Puppi, Sparanza et Corbetta 1987 ex Ubaldi 1993 *luzuletosum sylvaticae* Catorci, Ballelli, Iocchi, Paura et Vitanzi 2008**

(Group IIa^{Ib1}, Table 7, relevés 1–9; *holotypus* rel. 15 of Table 11 in Catorci et al. 2008)

Woodland with a dominance of *Fagus sylvatica* subsp. *sylvatica*, managed as coppice with standards or high-forest, growing on sandstone North-facing slopes (from E to WNW) with an inclination of 10–45°, at altitudes ranging from 800 to 1200 m.

This *syntaxon* is characterized by soils with the following features: 100–150 cm depth, 5.0–6.0 pH, tendly silty/tendly clayey texture (50–60 % sand, 30–40 silt, 10–20 clay).

From a phytosociological point of view these woodlands are characterized by the dominance of *Fagetalia sylvaticae* elements (73 %) associated to a small group of species belonging to *Quercetalia pubescenti-petraeae* order (9 %); acidophilous species are also well represented (13–15 %).

Catorci et al. (2008) placed such woodlands into *Solidagini-Fagetum sylvaticae* (described by Ubaldi et al. 1987, Ubaldi 1995), but Biondi et al. (2008) observed that the association is not well described because the typical subassociation represents a strongly impoverished aspect of acidophilous beech woods. Such an observation led Biondi et al. (2008) to describe the new association *Potentillo micranthae-Fagetum sylvaticae*, widespread on the Laga Mountains arenaceous Flysch, in the lower supratemperate bioclimatic belt.

Floristic analysis of the relevés of Table 7 highlights that the species suggested as characteristic

or differential of *Potentillo-Fagetum* are absent or only sporadically present. For such reason it should be appropriate to mantain the placement of Monti Sibillini beech forests growing on sandstone substrata in *Solidagini-Fagetum* and, in particular, in *Solidagini-Fagetum sylvaticae luzuletosum sylvaticae* subassociation, described for the first time by Catorci et al. 2008.

A more detailed analysis of relevés groups composing cluster IIa^{Ia} enables one to highlight a phytosociological lower rank unit, described as follows.

***Solidagini-Fagetum sylvaticae* (Longhitano et Ronsisvalle 1974) Ubaldi, Zanotti, Puppi, Sparanza et Corbetta 1987 ex Ubaldi 1993 *aceretosum pseudoplatani* Catorci, Ballelli, Iocchi, Paura et Vitanzi 2008**

(Group IIa^{Ib2}, Table 7, relevés 10–12; *holotypus* rel. 21 of Table 11 in Catorci et al. 2008)

Relevés 10–12 of Table 7 differentiate from the other part of the table because of the occurrence of *Tilio-Acerion* alliance species (*Saxifraga rotundifolia* subsp. *rotundifolia*, *Fraxinus excelsior* subsp. *excelsior*, *Acer pseudoplatanus*, *Tilia platyphyllos* subsp. *platyphyllos*, *Acer platanoides*, *Polystichum setiferum*) which identify *Solidagini-Fagetum sylvaticae aceretosum pseudoplatani* subassociation. As described by Catorci et al. (2008) such subassociation develops on very steep slopes (45–70°), in impluvia with a great amount of outcropping rocks and represents the catenal contact between *Solidagini-Fagetum* and *Ornithogalo sphaerocarpi-Aceretum pseudoplatani* (*Tilio-Acerion* alliance) described for the Monte dell'Ascensione gorges (Southern Marches) by Taffetani (2000).

***Cardamino kitaibelii-Fagetum sylvaticae* (Ballelli et Biondi 1982) Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 ex Ubaldi 1993 *cardaminetosum kitaibelii* subass. nova**

(Group IIa^{IIb2a1b}, Table 8, relevés 1–25; *typus* rel. 7 of Table 8)

Woodland with a dominance of *Fagus sylvatica* subsp. *sylvatica*, mainly managed as high-forest, widespread on mainly North-facing slopes (from WNW to E) with an inclination of 15–60°, at altitudes ranging from (1200) 1400 to 1650 (1700) m (upper supratemperate bioclimatic belt).

This *syntaxon* is characterized by soils with the following features: 50–100 cm depth, 5.5–6.5 pH, tendly clayey texture (35–45 % sand, 25–35 silt, 25–35 clay).

From a phytosociological point of view these woodlands are characterized by the dominance of *Fagetalia sylvaticae* order elements (80–85 %) associated to a small group of species belonging to *Quercetalia pubescenti-petraeae* order (4–5 %).

Floristic analysis consented to the placement of such vegetation into *Cardamino kitaibelii-Fagetum sylvaticae* association, described for the first time by Ubaldi et al. (1987) for the Northern Marches Apennines and signaled by other authors (Biondi et al. 2002, 2004, 2008, Di Pietro 2002, Catorci et al. 2003, Pirone et al. 2003, 2005, Ciaschetti et al. 2006) for the Central Apennines sector of the Italian Peninsula.

According to the International Phytosociological Nomenclature Code (Weber et al. 2002), in the present work the typical subassociation is proposed with the *cardaminetosum kitaibelii* epithet (*typus* rel. 7 of Table 8).

A more detailed analysis of relevé groups forming cluster IIa^{Ia} allowed one to highlight some phytosociological lower rank units, described in the following paragraph.

***Cardamino kitaibelii-Fagetum sylvaticae* (Ballelli et Biondi 1982) Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 ex Ubaldi 1993 *cardaminetosum kitaibelii* subass. nova *sorbus aucuparia* variant**

Relevés 26–35 of Table 8 (Group IIa^{IIb2b1}) are characterized by the occurrence of a high number of species belonging to *Fagetalia sylvaticae* order (82 %) and a smaller number of elements referred to *Quercetalia pubescenti-petraeae* order (7 %). Thus, this is a variant of *Cardamino kitaibelii-Fagetum sylvaticae cardaminetosum kitaibelii*, which develops on convex morphologies (broad ridge) in areas with outcropping rock and shallow soil. Such variant is characterized by *Sorbus aucuparia* subsp. *aucuparia*, *Sorbus aria* subsp. *aria* and *Laburnum alpinum*, and describes a semi-open forest situation.

***Cardamino kitaibelii-Fagetum sylvaticae* (Ballelli et Biondi 1982) Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 ex Ubaldi 1993 *cardaminetosum kitaibelii* subass. nova *polystichum setiferum* variant**

Relevés 36–42 of Table 8 (Group IIa^{IIb2b2}) are characterized by the presence of a high percentage of *Fagetalia sylvaticae* order species (79 %) and a small group of *Quercetalia pubescenti-petraeae* order (8 %). Therefore, it represents a variant of

Cardamino kitaibelii-Fagetum sylvaticae cardaminetosum kitaibelii, developing in "*impluvia*", where outcropping rock and deep soil pockets, often covered by detritic matter, are alternated.

Such variant is characterized by *Polystichum setiferum* and *Asperula taurina* subsp. *taurina*; in the tree layer *Acer pseudoplatanus*, *A. platanoides* and *Fraxinus excelsior* subsp. *excelsior* occur, showing a possible transition towards gorge formations referred to *Tilio-Acerion*.

***Cardamino kitaibelii-Fagetum sylvaticae* (Ballelli et Biondi 1982) Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 ex Ubaldi 1993 *anemonetosum nemorosae* subass. nova**

(Group IIa^{IIa2}, Table 9, relevés 7–25; *typus* rel. 16 of Table 9)

Relevés of Table 9 differ from those of the typical subassociation by the relatively high number of elements belonging to *Quercetalia pubescenti-petraeae* (about 10 %), a rate that in *Lathyro veneti-Fagetum sylvaticae* is about 15–20 %, while in *Cardamino kitaibelii-Fagetum sylvaticae cardaminetosum kitaibelii* it is around 4–5 %. Stational characteristics of such subassociation are similar to those of typical subassociation, except for altitudinal range. In fact, the thermophilous aspect of this association is connected to an altitudinal interval ranging between (1100) 1200 and 1400 m.

Floristic composition and altitudinal range allow one to define a new subassociation named *Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae,* of which *Anemone nemorosa*, *Epipactis leptochila*, *Hepatica nobilis*, *Acer opalus* subsp. *obtusatum* and *Luzula sylvatica* subsp. *sylvatica* represent the differential species. This subassociation defines catenal contact between *Lathyro veneti-Fagetum sylvaticae* beech woods and those of *Cardamino kitaibelii-Fagetum sylvaticae*. Being a catenal contact, connected to an altitudinal gradient, transition between these *syntaxa*, is generally shaded and its significance can be better undertstood if, together with differential species, also the weight of *Quercetalia pubescenti-petraeae* elements and serial contacts are considered, as mentioned later on.

This *syntaxon* is characterized by soils with the following features: 50–100 cm depth, 5.5–6.5 pH, tendly clayey texture (35–45 % sand, 25–35 silt, 25–35 clay).

Inside this subassociation, a facies at *Orthilia seconda* is identified, which differs also for the occurrence of *Luzula forsteri* and *Polypodium interjectum*.

***Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi 1993 ex Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 *anemonetosum nemorosae* subass. nova *festuca heterophylla* variant**

Relevés 1–6 of Table 9 differ from *Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae* for the presence of some sub-acidophilous species, which identify a new variant named *Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae Festuca heterophylla* variant, characterized by: *Festuca heterophylla* and *Hieracium murorum*. This variant develops on sub-acid soils, probably due to the accumulation of organic matter.

***Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi 1993 ex Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 *corallorhizetosum trifidae* subass. nova**

(Group IIa^{IIb2a1a}, Table 10, relevés 1–25; *holotypus* rel. 8 of Table 10)

Relevés of Table 10 are different from those of typical subassociation for the occurrence of some high-altitude beech woods species, which identify a new subassociation, named *Cardamino kitaibelii-Fagetum sylvaticae corallorhizetosum trifidae*, of which *Actaea spicata*, *Corallorhiza trifida*, *Polystichum lonchitis* and *Silene dioica* are proposed as differential species. In such subassociation, species belonging to *Quercetalia pubescenti-petraeae* order are nearly absent, favouring the ones of *Fagetalia sylvaticae* order, which exceed 90 %. This subassociation mainly develops on slopes, in an altitudinal belt close to the upper ecological timberline, from (1600–1800 m a.s.l.). Such woodlands are structurally managed as high-forest, often with signs of geotropism.

This *syntaxon* is characterized by soils with the following features: 50–100 cm depth, 5.5–6.5 pH, tendly clayey texture (35–45 % sand, 25–35 silt, 25–35 clay).

***Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi 1993 *ex* Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 *corallhorizetosum trifidae* subass. nova *moehringia trinervia* variant**

Relevés 26–31 of Table 10 (Group IIa^{IIb2a2}) differ from the ones ascribed to *Cardamino kitaibelii-Fagetum sylvaticae corallhorizetosum trifidae* for the presence of some nitrophilous and helio-

philous species, which identify a new variant, named *Cardamino kitaibelii-Fagetum sylvaticae corallhorizetosum trifidae Moehringia trinervia* variant, characterized by *Moehringia trinervia*, *Lamium maculatum*, *Myosotis nemorosa*, *Aegopodium podagraria, Campanula micrantha* and *La-mium garganicum* subsp. *laevigatum*. This variant develops in correspondence with the most exter-nal ramifications of woods as well as on its marginal areas, or in situations characterized by high brightness in the undergrowth and high Nitrogen content in the soil (probably because cattle use these areas as a rest place during the hottest hours of the day).

Impoverished facies of *Cardamino kitaibelii-Fagetum sylvaticae*

(Group IIa^{IIb1}, Table 11, relevés 1–10)

Relevés of Table 11 are characterized by a general decrease of floristic richness due to two different situations which originate the same phenomenon in terms of floristic composition. In the first case, there are occurrences of quite high values of *Laburnum anagyroides* subsp. *anagyroides* and *Brachypodium rupestre*, indicators of openings in the tree layer and/or of an early stage of the forest population. In the second case, species impoverishment is due to the accumulation of thick litter (10–15 cm) on the soil, which prevents the development of the smallest nemoral species. It must be noticed that such situations are frequently associated with woods that have not been cut for many decades, but that can not be considered old-growth forest yet.

***Aceretum obtusati-Pseudoplatani* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002**

(Group IIb, Table 12, relevés 1–9; *holotypus* rel. 1 of Table 6 in Biondi et al. 2002)

Woodland with *Acer pseudoplatanus*, *Fraxinus excelsior* subsp. *excelsior* and *Tilia platyphyllos* subsp. *platyphyllos* dominance, generally unmanaged, growing in deep valleys and narrow and steep impluvia, with high levels of edaphic and atmospheric moisture, with slope angles of 20–55°, at altitudes ranging from 1000 to 1400 m.

From a phytosociological point of view these woodlands are characterized by the dominance of *Fagetalia sylvaticae* order and *Tilio-Acerion* alliance species.

Floristic analysis allowed such phytocoenosis to be placed into *Aceri obtusati-pseudoplatani* association, described for the first time by Biondi et al. (2002) for the Central and Northern Apennines woodlands and signaled by other authors (Paura & Cutini 2006, Catorci et al. 2008) for the Central-Southern Apennines sector of the Italian Peninsula.

5. DISCUSSION

The results of phytosociological analysis emphasize that the floristic and phytocoenotic diversity of beech woods is substantially related to an altitudinal gradient and, secondarily, to geo-pedological aspects (Figure 5).

In particular, it was possible to highlight a clear trend in the ratio between the number of elements of *Quercetalia pubescenti-petraeae* and *Fagetalia sylvaticae* orders, as previously partly discussed, which can be a good support system for phytosociological diagnosis.

Indeed, *syntaxa* with *Ostrya carpinifolia* dominance (*Scutellario columnae-Ostryetum carpinifoliae* Pedrotti, Ballelli & Biondi 1982 *ex* Pedrotti et al. 1980*, Aceri obtusati-Quercetum cerridis*, etc.), belonging to the upper mesotemperate belt, show a group of *Quercetalia pubescenti-petraeae* species higher than 70–75 % (Ballelli et al. 1982, Ubaldi & Speranza 1985, Catorci & Orsomando 2001). This percentage decreases around 45–50 % for *Carici digitatae-Ostryetum carpinifoliae*, which identifies a transition from *Quercetalia pubescenti-petraeae* to *Fagetalia sylvaticae*. Inside this last order, *Lathyro veneti-Fagetum sylvaticae* is characterized by the occurrence of *Quercetalia pubescenti-petraeae* elements, never lower than 15 % and never higher than 25 %, while *Cardamino kitaibelii-Fagetum sylvaticae* shows values of *Quercetalia pubescenti-petraeae* elements ranging from 3 to 5 % as regards the typical subassociation, from 8 to 12 % for *Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae* subassociation (growing at lower altitudes) and lower than 3 % for *Cardamino kitaibelii-Fagetum sylvaticae corallorhizetosum trifidae* (microthermal subassociation).

A further control and screening system of syntaxonomical aspects can derive from the analysis of mantle shrub vegetation that, on the basis of the previous set of knowledge (Catorci & Orsomando 2001, Allegrezza 2003, Biondi et al. 2004, Catorci et al. 2007, 2008) and of the current studies, shows significant correlations with the considered forest types. Such correlations are shown in Table 13.

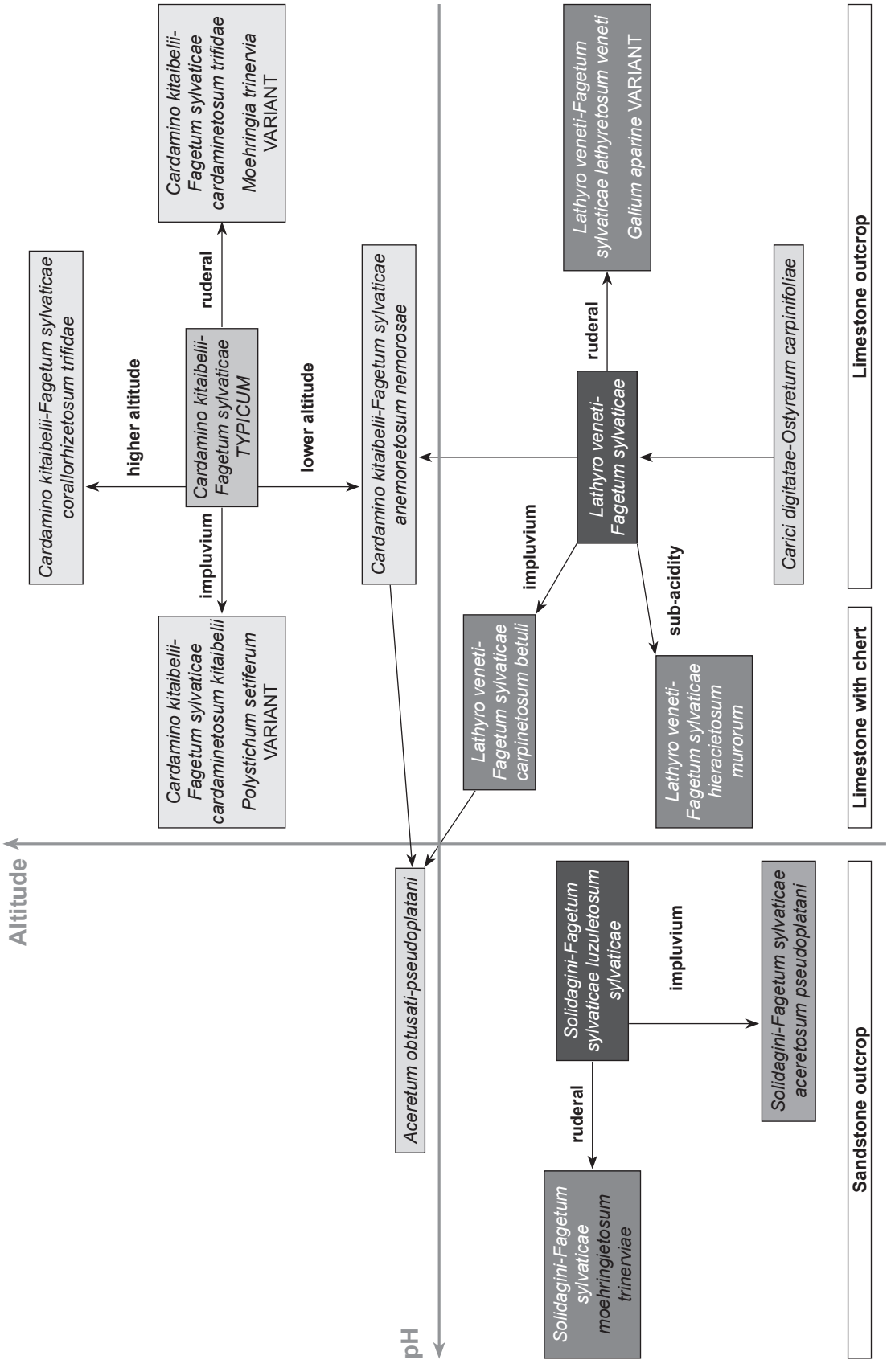

Figure 5: Scheme of ecological relationships between different identified *syntaxa*.
Slika 5: Shema različnih obravnavanih sintaksonov v odvisnosti od rastiščnih dejavnikov.

6. CONCLUSIONS

Phytosociological placement of *Fagus sylvatica* woods of Monti Sibillini National Park confirmed the syntaxonomical scheme as defined by Biondi et al. (2002), allowing, however, for a more complete understanding of Central Apennines beech woods from an ecological and diagnostic viewpoint, thanks to the wider altitudinal interval considered.

Moreover, this work emphasizes that forest structure, management types, felling frequency and other parameters related to the historical soil use assume a remarkable role in the floristic characterization of these woodlands, as also highlighted by Bartha et al. (2008). The continuation of the research in this direction can supply important indications for management, a fundamental aspect because the surveyed beech woods are included into a National Park and almost completely into Natura 2000 Network sites, according the Habitat Directive 92/43/CEE (in which investigated beech woods are part of priority Habitat "9210 – Apennines *Taxus* and *Ilex* beech woods").

On the whole, the beech forest ecosystem of the Sibillini massif is composed of about 250 species representing 13 % of the Monti Sibillini National Park flora (Ballelli et al. 2010, in press). Among these species as deserving of attention in terms of rarity, threat and vulnerability, are *Asarum europaeum, Convallaria majalis*, *Corallorhiza trifida*, *Euonymus verrucosus*, *Scutellaria altissima,* etc.

Finally, we can say that the beech forest diversity is an important core for the Monti Sibillini biodiversity.

Syntaxonomical scheme

QUERCO-FAGETEA Br.-Bl. 1948 em. Ohba 1974
- ***Quercetalia pubescentis-petraeae*** Klika 1933
  - *Carpinion orientalis* Horvat 1958
    - *Laburno anagyroidis-Ostryenion carpinifoliae* (Ubaldi 1995) Blasi, Di Pietro et Filesi 2004
      - *Carici digitatae-Ostryetum carpinifoliae* Catorci, Gatti et Sparvoli 2003
- ***Fagetalia sylvaticae*** Pawlowski in Pawlowski, Sokolowski et Wallish 1928
  - *Geranio versicoloris-Fagion sylvaticae* Gentile 1969
    - *Lathyro veneti-Fagetum sylvaticae* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002
      - *lathyretosum veneti* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002
      - *Galium aparine* variant
      - *hieracietosum murori* (Allegrezza 2003) Catorci, Vitanzi et Ballelli *stat. nov.*
  - *Aremonio-Fagion sylvaticae* (Horvat 1938) Torok, Podani et Borhidi1989
    - *Solidagini-Fagetum sylvaticae* (Longhitano et Ronsisvalle 1974) Ubaldi, Zanotti, Puppi, Sparanza et Corbetta 1987 ex Ubaldi 1993
      - *luzuletosum sylvaticae* Catorci, Ballelli, Iocchi, Paura et Vitanzi 2008
      - *aceretosum pseudoplatani* Catorci, Ballelli, Iocchi, Paura et Vitanzi 2008
    - *Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi, Zanotti, Puppi, Speranza et Corbetta 1987 ex Ubaldi 1993
      - *cardaminetosum kitaibelii* subass. nova
      - *Sorbus aucuparia* variant
      - *Polystichum setiferum* variant
      - *anemonetosum nemorosae* subass. nova
      - *Festuca heterophylla* variant
      - *corallorhizetosum trifidae* subass. nova
      - *Moehringia trinervia* variant
- *Tilio platyphylli-Acerion pseudoplatani* Klika 1955
  - *Ostryo carpinifoliae-Tilienion plathyphylli* Košir, Čarni et Di Pietro 2008
    - *Aceretum obtusati-pseudoplatani* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002

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APPENDIX:

sporadic taxa

Table 3 – *Carici digitatae-Ostryetum carpinifoliae*

Rel. 1: *Epipactis microphylla* +; **Rel. 2**: *Geranium robertianum* +; *Epipactis muelleri* +; *Asperula taurina* subsp. *taurina* +; *Primula veris* subsp. *suaveolens* 1; **Rel. 3**: *Rhamnus alpina* subsp. *alpina* r; *Silene italica* subsp. *italica* r; *Acer platanoides* +; *Cardamine enneaphyllos* r; **Rel. 4**: *Prenanthes purpurea* +; **Rel. 5**: *Helleborus foetidus* subsp. *foetidus* r; *Ulmus glabra* +; *Asplenium trichomanes* subsp. *quadrivalens* r; **Rel. 6**: *Digitalis lutea* subsp. *australis* +; *Scutellaria columnae* subsp. *columnae* +; *Viola alba* subsp. *dehnhardtii* +; *Sorbus torminalis* +; *Cardamine enneaphyllos* +; *Lilium martagon* +; *Anemone ranunculoides* +; *Saxifraga rotundifolia* subsp. *rotundifolia* +; *Ajuga reptans* +; *Geum urbanum* +; *Dactylis glomerata* subsp. *glomerata* +; **Rel. 7**: *Ligustrum vulgare* +; *Euonymus verrucosus* +; *Prunus avium* subsp. *avium* +; *Malus sylvestris* +.

Table 5 – *Lathyro veneti-Fagetum sylvaticae*

Rel. 1: *Ligustrum vulgare* r; **Rel. 3**: *Veronica officinalis* +; **Rel. 5**: *Listera ovata* +; **Rel. 6**: *Fraxinus excelsior* subsp. *excelsior* +; **Rel. 9**: *Corallorhiza trifida* +; **Rel. 11**: *Salix caprea* +; **Rel. 13**: *Cytisophyllum sessilifolium* +; *Stellaria nemorum* (s.l.) +; **Rel. 15**: *Vincetoxicum hirundinaria* subsp. *hirundinaria* +; *Asplenium onopteris* +; **Rel. 17**: *Hypericum montanum* +; **Rel. 18**: *Brachypodium rupestre* +; **Rel. 19**: *Phyllitis scolopendrium* subsp. *scolopendrium* +; **Rel. 21**: *Staphylea pinnata* +; **Rel. 23**: *Festuca altissima* +; *Stellaria media* subsp. *media* r; **Rel. 24**: *Hordelymus europaeus* +; *Senecio ovatus* subsp. *alpestris* +; **Rel. 30**: *Chaerophyllum temulum* +, *Sambucus nigra* +, *Sedum cepaea* +; **Rel. 31**: *Primula veris* subsp. *suaveolens* +; **Rel. 32**: *Salvia glutinosa* +; **Rel. 33**: *Lapsana communis* +, *Campanula rapunculus* +; **Rel. 34**: *Ribes multiflorum* +.

Table 7 – *Solidagini-Fagetum sylvaticae*

Rel. 1: *Salvia glutinosa* r; **Rel. 2**: *Poa nemoralis* subsp. *nemoralis* +; *Viola alba* subsp. *dehnhardtii* +; *Fragaria vesca* subsp. *vesca* r; **Rel. 5**: *Laburnum alpinum* +; **Rel. 6**: *Crataegus laevigata* +; **Rel. 7**: *Pulmonaria apennina* r; **Rel. 8**: *Fraxinus excelsior* subsp. *excelsior* r; *Sorbus aria* subsp. *aria* r; **Rel. 9**: *Athyrium filix-femina* +; *Pyrola minor* +; **Rel. 10**: *Aegopodium podagraria* r; *Polystichum setiferum*+; *Epipactis leptochila* r; *Adenostyles glabra* subsp. *glabra* r; **Rel. 11**: *Heracleum sphondylium* subsp. *ternatum* r; **Rel. 12**: *Campanula trachelium* subsp. *trachelium* r.

Table 8 – *Cardamino kitaibelii-Fagetum sylvaticae typicum*

Rel. 4: *Helleborus foetidus* subsp. *foetidus* +; **Rel. 6**: *Veronica hederifolia* subsp. *hederifolia* +, *Cystopteris fragilis* +; **Rel. 7**: *Veronica hederifolia* subsp. *hederifolia* +; **Rel. 11**: *Dactylis glomerata* subsp. *glomerata* +; **Rel. 13**: *Dactylis glomerata* subsp. *glomerata* +, *Bunium bulbocastanum* +, *Rumex alpestris* +; **Rel. 14**: *Helleborus foetidus* subsp. *foetidus* +; **Rel. 21**: *Veronica chamaedrys* subsp. *chamaedrys* 1; *Luzula forsteri* +; **Rel. 25**: *Lamium galeobdolon* subsp. *montanum* +;*Veronica chamaedrys* subsp. *chamaedrys* +; **Rel. 26**: *Ostrya carpinifolia* +; **Rel. 28**: *Campanula rapunculus* r; **Rel. 29**: *Arabis turrita* +; *Emerus majus* (s.l.) +; **Rel. 30**: *Ribes uva-crispa* r; **Rel. 31**: *Lamium garganicum* subsp. *laevigatum* +; **Rel. 32**: *Laserpitium latifolium* r; **Rel. 33**: *Rumex alpestris* +; **Rel. 34**: *Cardamine heptaphylla* +; *Prunus avium* subsp. *avium* +; *Populus tremula* +; *Laserpitium latifolium* +, *Salix caprea* 1; **Rel. 37**: *Hordelymus europaeus* +; **Rel. 39**: *Milium effusum* +; *Lathyrus venetus* +; *Hedera helix* subsp. *helix* +; **Rel. 40**: *Arabis turrita* r; **Rel. 41**: *Alliaria petiolata* +; **Rel. 42**: *Valeriana tripteris* subsp. *tripteris* r.

Table 9 – *Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae*

Rel. 1: *Arum maculatum* +; *Polystichum setiferum* +; *Brachypodium sylvaticum* subsp. *sylvaticum* +; *Senecio alpinus* +, *Silene conica* +, *Aegopodium podagraria* +; **Rel. 3**: *Senecio alpinus* 1, *Silene conica* +, *Arabis turrita* +, *Veronica chamaedrys* subsp. *chamaedrys* +, *Chaerophyllum temulum* +; **Rel. 4**: *Epipactis muelleri* +; *Fraxinus excelsior* subsp. *excelsior* +; **Rel. 5**: *Rubus idaeus* +; *Silene italica* subsp. *italica* +; **Rel. 7**: *Corydalis pumila* +; *Acer campestre* +; **Rel. 8**: *Clematis vitalba* r; **Rel. 9**: *Galium aparine* +; **Rel. 10**: *Galium aparine* +; **Rel. 13**: *Pteridium aquilinum* subsp. *aquilinum* +; **Rel. 14**: *Asplenium trichomanes* subsp. *quadrivalens* +, *Cotoneaster integerrimus*

+; **Rel. 15**: *Asplenium trichomanes* subsp. *quadrivalens* +, *Primula veris* subsp. *suaveolens* +; **Rel. 17**: *Carpinus betulus* +; *Quercus pubescens* subsp. *pubescens* r; **Rel. 19**: *Potentilla micrantha* +; **Rel. 20**: *Crataegus laevigata* r; **Rel. 21**: *Ruscus hypoglossum* +; *Salix caprea* 1; **Rel. 22**: *Aegopodium podagraria* +, *Listera ovata* r; *Scrophularia scopolii* +; **Rel. 23**: *Polystichum lonchitis* +; *Platanthera chlorantha* r; *Salix caprea* r; **Rel. 25**: *Pulmonaria apennina* r; *Rhamnus alpina* subsp. *alpina* +.

Table 10 – *Cardamino kitaibelii-Fagetum sylvaticae corallorhizetosum trifidae*

Rel. 4: *Laserpitium latifolium* +; *Solidago virgaurea* subsp. *virgaurea* +; **Rel. 5**: *Valeriana tripteris* subsp. *tripteris* +; **Rel. 6**: *Cystopteris fragilis* +; **Rel. 7**: *Anemone apennina* subsp. *apennina* +; *Epipactis leptochila* +; **Rel. 10**: *Veronica officinalis* +; *Ribes uva-crispa* +; **Rel. 11**: *Paris quadrifolia* +; **Rel. 12**: *Orthilia secunda* +; **Rel. 13**: *Fragaria vesca* subsp. *vesca* +, *Sesleria nitida* (s.l.) r; **Rel. 14**: *Daphne mezereum* +; *Rosa arvensis* +; *Geum urbanum* r; **Rel.15**: *Festuca altissima* +; *Brachypodium sylvaticum* subsp. *sylvaticum* r; *Fragaria vesca* subsp. *vesca* r; **Rel. 17**: *Veronica montana* +; **Rel. 20**: *Ranunculus ficaria* subsp. *bulbifer* +; **Rel. 21**: *Epipactis muelleri* +; **Rel. 22**: *Ranunculus ficaria* subsp. *bulbifer* +; **Rel. 24**: *Rubus idaeus* +, *Crocus vernus* subsp. *vernus* +; **Rel. 25**: *Lamium galeobdolon* subsp. *montanum* +; **Rel. 29**: *Luzula sylvatica* subsp. *sylvatica* +; **Rel. 30**: *Veronica hederifolia* subsp. *hederifolia* +; *Calamintha nepeta* subsp. *nepeta* +; *Dactylis glomerata* subsp. *glomerata* +.

Table 11 – Impoverished facies of *Cardamino kitaibelii-Fagetum sylvaticae*

Rel. 1: *Hypericum montanum* +; *Potentilla micrantha* +; **Rel. 2**: *Juniperus communis* subsp. *communis* +, *Sedum cepaea* +; **Rel. 3**: *Gagea lutea* +; *Veronica chamaedrys* subsp. *chamaedrys* +, *Moehringia trinervia* +, *Campanula micrantha* +; **Rel. 4**: *Polystichum aculeatum* +; **Rel. 6**: *Sambucus nigra* +; *Geranium robertianum* +; *Ilex aquifolium* +; **Rel. 7**: *Brachypodium sylvaticum* subsp. *sylvaticum* +; *Rosa arvensis* +; **Rel. 8**: *Aremonia agrimonoides* subsp *agrimonoides* +; *Hepatica nobilis* +; **Rel. 9**: *Geranium nodosum* +; *Euonymus latifolius* +; **Rel. 10**: *Aegopodium podagraria* +; *Cardamine heptaphylla* +; *Sorbus aucuparia* subsp. *aucuparia* +.

Table 12 – *Aceretum obtusati-pseudoplatani*

Rel. 1: *Allium ursinum* subsp. *ursinum* +; *Lathyrus vernus* subsp. *vernus* +; *Thalictrum aquilegifolium* subsp. *aquilegifolium* +; *Polygonatum verticillatum* r; *Viola alba* subsp. *dehnhardtii* +; *Primula vulgaris* subsp. *vulgaris* r; *Silene conica* r, *Ranunculus ficaria* subsp. *bulbifer* 1, *Sambucus nigra* +; **Rel. 2**: *Senecio ovatus* subsp. *alpestris* +; **Rel. 3**: *Aegopodium podagraria* +; *Paris quadrifolia* +; *Laburnum alpinum* +; *Polystichum aculeatum* +; *Festuca altissima* +; **Rel. 5**: *Sesleria nitida* (s.l.) 1, *Ceterach officinarum* subsp. *officinarum* +; *Dryopteris filix-mas* +; **Rel. 6**: *Bromus ramosus* +; *Valeriana tripteris* subsp. *tripteris* +; *Hieracium murorum* +; *Geum urbanum* +; *Primula veris* subsp. *suaveolens* +; **Rel. 7**: *Heracleum sphondylium* subsp. *ternatum* +; *Ribes multiflorum* +; *Fraxinus ornus* subsp. *ornus* +; *Fragaria vesca* subsp. *vesca* +; *Lamium maculatum* +; **Rel. 8**: *Rosa canina* +, *Elymus caninus* subsp. *caninus* +; **Rel. 9**: *Actaea spicata* +; *Epipactis leptochila* +; *Alliaria petiolata* +; *Lonicera caprifolium* +; *Moehringia trinervia* +, *Eranthis hyemalis* 1, *Chaerophyllum aureum* +, *Silene italica* subsp. *nemoralis* +.

Table 1: Bioclimatic belts of the study area.
Tabela 1: Bioklimatski pasovi obravnvanega območja.

Bioclimatic belts	Altitudinal range (m a.s.l.)	Annual average T (°C)	Annual average rainfall (mm)	N° months with average T<10 °C	N° months with minimum T<0 °C	Thermotype	Ombrotype	Drought stress (N° months)	SDS	Cold stress (N° months)	YCS	Lenght of growing period (N° days with minimum T>6°C)
Upper Meso-temperate	600–1000	11–13	850–1100	6	1	Upper Meso-temperate	Lower humid	-	0–20	6–7	400–500	190–220
Lower Supra-temperate	1000–1400	9–11	1100–1300	6	3	Lower Supra-temperate	Upper humid	-	-	7–8	500–600	160–190
Upper Supra-temperate	1400–1800	7–9	1300–1500	8	4	Upper Supra-temperate	Lower hyper--humid	-	-	8–9	600–700	120–150

Table 2: PCA matrix of environmental parameters classes.
Table 2: PCA matrica razredov rastiščnih dejavnikov.

		Classes
Geological *substrata*	Limestone	1
	Calcari Diasprini Formation	2
	Sandstone	3
Altitude (m a.s.l.)	600–1000 m	1
	1000–1400 m	2
	1400–1800 m	3
Slope (°)	> 45°	1
	15–45°	2
	< 15°	3
Morphology	*expluvium*	1
	slope	2
	impluvium	3

Table 3 (Tabela 3): *Carici digitatae-Ostryetum carpinifoliae* Catorci, Gatti et Sparvoli 2003.

		Relevé number	1	2	3	4	5	6	7		
		Altitude (m a.s.l.)	700	770	660	840	730	890	650	P	F
		Aspect	NW	NNW	NE	NE	NNW	NW	ENE	r	r
		Slope (°)	10	10	25	35	55	10	20	e	e
		Area (m²)	300	200	250	250	300	400	300	s	q
		Cover (%)	100	100	100	100	100	100	100		
		Characteristic species of the association *Carici digitatae-Ostryetum carpinifoliae*									
H caesp	Eurasiat.	*Carex digitata*	1	1	2	1	1	.	1	6	86
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	+	.	2	1	r	+	+	6	86
G rhiz	Eurimedit.	*Ruscus aculeatus*	.	+	.	+	.	+	+	4	57
P scap	Europ.-Caucas.	*Tilia platyphyllos* subsp. *platyphyllos*	.	.	+	.	1	1	1	4	57
P caesp	S Europ.-Sudsib.	*Staphylea pinnata*	.	.	.	+	.	+	+	3	43
		Differential species of the sub-alliance *Laburno anagyroidis-Ostryenion carpinifoliae*									
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	1	+	1	1	1	+	1	7	100
H scap	Paleotemp.	*Sanicula europaea*	+	.	+	1	3	+	1	6	86
G bulb	Orof. C Europ.	*Lilium bulbiferum* subsp. *croceum*	+	+	r	r	r	.	.	5	71
G rhiz	Endem.	*Helleborus bocconei* subsp. *bocconei*	.	.	r	.	.	+	.	2	29
T scap	Endem.	*Melampyrum italicum*	.	.	.	+	.	.	+	2	29
		Charact. species of the alliance *Carpinion orientalis*									
P scap	SE Europ.	*Ostrya carpinifolia*	2	1	3	3	4	3	4	7	100
P scap	SE Europ.	*Acer opalus* subsp. *obtusatum*	2	2	2	1	2	1	2	7	100
NP	C Europ.	*Emerus majus* (s.l.)	.	.	+	+	+	+	+	5	71
		Charact. species of the order *Quercetalia pubescenti-petraeae*									
P caesp	Subatlant.	*Daphne laureola*	+	+	+	+	+	+	+	7	100
G bulb	S Europ.	*Cyclamen hederifolium* subsp. *hederifolium*	2	2	2	1	1	.	+	6	86
P scap	S Europ.-Sudsib.	*Fraxinus ornus* subsp. *ornus*	2	2	2	1	2	+	.	6	86
G rhiz	S Europ.-Sudsib.	*Lathyrus venetus*	+	+	+	+	+	+	.	6	86
P caesp	S Europ.-Sudsib.	*Cornus mas*	.	+	+	1	+	+	1	6	86
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	.	1	1	1	+	+	.	5	71
G rhiz	Circumbor.	*Hepatica nobilis*	.	+	+	+	+	+	.	5	71
H scap	C Europ.	*Melittis melissophyllum* subsp. *melissophyllum*	.	+	+	+	.	+	+	5	71
P caesp	Europ.-Caucas.	*Lonicera xylosteum*	.	.	+	+	+	+	+	5	71
P caesp	Medit. mont.	*Euonymus latifolius*	.	.	+	+	.	+	+	4	57
G rhiz	Eurasiat.	*Cephalanthera longifolia*	.	+	.	r	.	.	+	3	43
P caesp	C Europ.	*Viburnum lantana*	.	.	+	+	.	.	+	3	43
P caesp	C Europ.	*Crataegus laevigata*	.	.	+	+	.	.	.	2	29
P caesp	Eurasiat.	*Euonymus europaeus*	.	.	.	.	+	.	+	2	29
G rhiz	Paleotemp.	*Epipactis helleborine* (s.l.)	.	.	.	.	.	+	2	2	29
P caesp	SE Europ.	*Quercus pubescens* subsp. *pubescens*	.	.	.	.	1	.	.	1	14
P scap	N Eurimedit.	*Quercus cerris*	.	.	.	.	.	1	.	1	14
P scap	Eurimedit.	*Sorbus domestica*	.	.	.	.	.	.	1	1	14
H ros	Paleotrop.	*Polypodium interjectum*	.	.	.	.	.	.	1	1	14
		Transgressive species from the order *Fagetalia sylvaticae*									
H scap	Eurosib.	*Viola reichenbachiana*	1	+	+	+	1	.	+	6	86
H caesp	Paleotemp.	*Melica uniflora*	.	+	+	+	+	+	+	6	86
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	2	3	2	2	.	1	.	5	71
G rhiz	Eurasiat.	*Neottia nidus-avis*	+	+	r	r	.	.	2	5	71
P scap	Europ.-Caucas.	*Carpinus betulus*	4	3	.	.	1	+	1	5	71
H caesp	Europ.-Caucas.	*Festuca heterophylla*	+	.	+	.	+	+	1	5	71
G bulb	Europ.-Caucas.	*Scilla bifolia*	.	+	.	+	+	+	.	4	57
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	.	+	r	r	.	+	.	4	57

		Relevé number	1	2	3	4	5	6	7	Pres	Freq
H scap	Endem.	*Pulmonaria apennina*	.	+	.	r	.	+	2	4	57
H scap	Europ.-Caucas.	*Lactuca muralis*	.	.	.	+	1	+	2	4	57
G rhiz	Circumbor.	*Anemone nemorosa*	.	+	.	+	.	+	.	3	43
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	.	.	+	.	1	.	+	3	43
G rhiz	Europ.-Caucas.	*Galium odoratum*	+	1	.	.	1	.	.	3	43
P scap	Europ.-Caucas.	*Acer campestre*	.	+	.	.	.	.	+	2	29
G bulb	Paleotemp.	*Dactylorhiza maculata* subsp. *fuchsii*	.	.	+	r	.	.	.	2	29
G bulb	Eurosib.	*Gagea lutea*	.	.	+	.	.	+	.	2	29
G rhiz	C Europ.	*Cardamine bulbifera*	.	+	.	.	.	+	.	2	29
G rhiz	C Europ.	*Euphorbia dulcis*	.	.	r	.	+	.	.	2	29
P caesp	Eurimedit.	*Ilex aquifolium*	.	.	.	+	.	1	.	2	29
G rhiz	Europ.-Caucas.	*Mercurialis perennis*	.	.	.	+	.	+	.	2	29
H scap	Orof. Eurasiat.	*Salvia glutinosa*	.	.	.	.	1	.	2	2	29
H caesp	Eurasiat.	*Bromus ramosus*	.	.	.	.	.	+	2	2	29
Ch suffr	Europ.-Caucas.	*Euphorbia amygdaloides* subsp. *amygdaloides*	.	.	.	.	.	+	+	2	29
G rhiz	Eurasiat.	*Cephalanthera rubra*	.	.	.	.	.	.	2	1	14
		Character species of the class *Querco-Fagetea*									
P lian	Eurimedit.	*Hedera helix* subsp. *helix*	1	1	1	+	1	1	1	7	100
NP	S Medit.-Subatl.	*Rosa arvensis*	+	+	+	+	+	.	+	6	86
P caesp	Europ.-Caucas.	*Corylus avellana*	2	2	1	+	1	+	.	6	86
H ros	Europ.-Caucas.	*Primula vulgaris* subsp. *vulgaris*	+	.	+	+	+	+	+	6	86
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	+	+	+	.	r	+	.	5	71
G rhiz	SE Europ.	*Anemone apennina* subsp. *apennina*	1	+	1	.	+	.	+	5	71
H rept	Eurosib.	*Fragaria vesca* subsp. *vesca*	+	.	+	+	.	+	+	5	71
NP	N Eurimedit.	*Rubus hirtus*	.	+	+	+	+	1	.	5	71
H caesp	Paleotemp.	*Brachypodium sylvaticum* subsp. *sylvaticum*	.	.	+	+	r	.	1	4	57
G rhiz	Eurimedit.	*Cephalanthera damasonium*	.	.	r	+	r	.	2	4	57
H scap	Eurasiat.	*Cruciata glabra* subsp. *glabra*	.	.	r	.	+	.	+	3	43
H scap	Eurosib.	*Hieracium murorum*	+	.	+	.	.	.	1	3	43
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	.	.	r	r	.	1	.	3	43
T scap	N Medit.	*Cardamine graeca*	+	+	.	.	.	+	.	3	43
G rad	Eurimedit.	*Tamus communis*	+	.	.	.	.	+	2	3	43
H caesp	Eurimedit.	*Luzula forsteri*	+	.	.	.	.	+	.	2	29
P lian	S Europ.-Sudsib.	*Lonicera caprifolium*	.	.	+	+	.	.	.	2	29
G rhiz	Circumbor.	*Polystichum setiferum*	.	.	.	r	.	+	.	2	29
		Accompanying *taxa*									
P caesp	Paleotemp.	*Crataegus monogyna*	.	.	+	.	+	+	+	4	57
P scap	Stenomedit.	*Quercus ilex* subsp. *ilex*	1	1	+	.	.	.	.	3	43
H ros	Cosmopol.	*Asplenium adiantum-nigrum* subsp. *adiantum-nigrum*	+	+	.	.	.	.	.	2	29
P caesp	Orof. SW Europ.	*Cytisophyllum sessilifolium*	+	.	r	.	.	.	.	2	29
P caesp	Circumbor.	*Juniperus communis* subsp. *communis*	.	.	.	.	+	.	+	2	29
		Sporadic *taxa*	1	4	4	1	3	11	4		

Table 4: Plant species frequency in different altitudinal ranges within the present study: black – very frequent; grey and dark grey – rare or not frequent; white – absent.
Tabela 4: Frekvenca rastlinskih vrst v različnih višinskih pasovih: črna – zelo pogosto, siva in temno siva – redko; bela – vrsta ni prisotna.

	600-800	800-1000	1000-1200	1200-1400	1400-1600	1600-1800
Cornus mas						
Bromus ramosus						
Lonicera caprifolium						
Ruscus aculeatus						
Sorbus torminalis						
Quercus pubescens subsp. *pubescens*						
Euonymus europaeus						
Sorbus domestica						
Quercus ilex subsp. *ilex*						
Asplenium adiantum-nigrum subsp. *adiantum-nigrum*						
Cytisophyllum sessilifolium						
Carpinus betulus						
Quercus cerris						
Campanula persicifolia subsp. *persicifolia*						
Corylus avellana						
Crataegus monogyna						
Asplenium trichomanes subsp. *quadrivalens*						
Tamus communis						
Acer campestre						
Hedera helix subsp. *helix*						
Carex digitata						
Fraxinus ornus subsp. *ornus*						
Cyclamen hederifolium subsp. *hederifolium*						
Primula vulgaris subsp. *vulgaris*						
Ostrya carpinifolia						
Crataegus laevigata						
Luzula forsteri						
Ilex aquifolium						
Lilium bulbiferum subsp. *croceum*						
Lonicera xylosteum						
Viburnum lantana						
Cardamine graeca						
Tilia platyphyllos subsp. *platyphyllos*						
Prunus avium subsp. *avium*						
Polypodium interjectum						
Helleborus bocconei subsp. *bocconei*						
Lathyrus venetus						
Daphne laureola						
Acer opalus subsp. *obtusatum*						
Anemone apennina subsp. *apennina*						
Luzula sylvatica subsp. *sylvatica*						
Laburnum anagyroides subsp. *anagyroides*						
Euphorbia dulcis						
Brachypodium sylvaticum subsp. *sylvaticum*						
Euonymus latifolius						
Melittis melissophyllum subsp. *melissophyllum*						

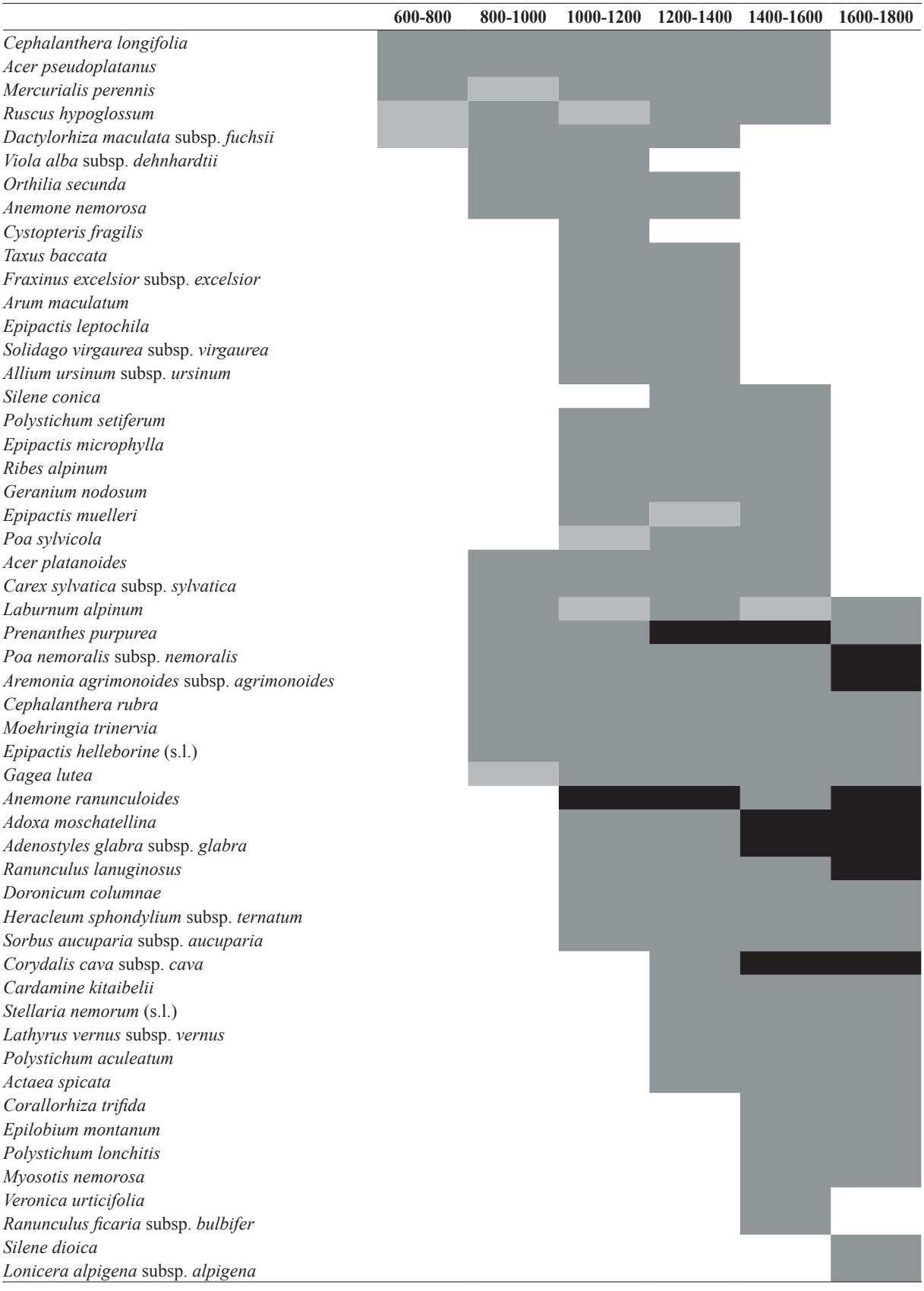
600-800
800-1000
1000-1200
1200-1400
1400-1600
1600-1800
Cephalanthera longifolia
Acer pseudoplatanus
Mercurialis perennis
Ruscus hypoglossum
Dactylorhiza maculata subsp. fuchsii
Viola alba subsp. dehnhardtii
Orthilia secunda
Anemone nemorosa
Cystopteris fragilis
Taxus baccata
Fraxinus excelsior subsp. excelsior
Arum maculatum
Epipactis leptochila
Solidago virgaurea subsp. virgaurea
Allium ursinum subsp. ursinum
Silene conica
Polystichum setiferum
Epipactis microphylla
Ribes alpinum
Geranium nodosum
Epipactis muelleri
Poa sylvicola
Acer platanoides
Carex sylvatica subsp. sylvatica
Laburnum alpinum
Prenanthes purpurea
Poa nemoralis subsp. nemoralis
Aremonia agrimonoides subsp. agrimonoides
Cephalanthera rubra
Moehringia trinervia
Epipactis helleborine (s.l.)
Gagea lutea
Anemone ranunculoides
Adoxa moschatellina
Adenostyles glabra subsp. glabra
Ranunculus lanuginosus
Doronicum columnae
Heracleum sphondylium subsp. ternatum
Sorbus aucuparia subsp. aucuparia
Corydalis cava subsp. cava
Cardamine kitaibelii
Stellaria nemorum (s.l.)
Lathyrus vernus subsp. vernus
Polystichum aculeatum
Actaea spicata
Corallorhiza trifida
Epilobium montanum
Polystichum lonchitis
Myosotis nemorosa
Veronica urticifolia
Ranunculus ficaria subsp. bulbifer
Silene dioica
Lonicera alpigena subsp. alpigena

Table 5 (Tabela 5): *Lathyro veneti-Fagetum sylvaticae* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002 *lathyretosum veneti* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002, *hieracietosum murori* subass. nova and *Galium aparine* variant.

		Relevé number	1	2	3*	4	5	6	7	8	9	10	11	12
		Altitude (m a.s.l.)	750	840	1080	1190	1230	1290	990	1085	1105	1100	1160	911
		Aspect	NE	N	N	NE	N	NNE	N	E	E	E	NE	NE
		Slope (°)	20	30	40	20	30	35	15	5	10	10	35	15
		Area (m^2)	300	400	400	400	400	400	250	250	250	200	300	400
		Cover (%)	100	100	100	100	100	100	100	100	100	100	100	100
		Characteristic species of the association *Lathyro veneti-Fagetum sylvaticae* and differential of the subassoci-												
G rhiz	SE Europ.	*Anemone apennina* subsp. *apennina*	1	1	1	+	1	1	.	.	1	+	+	1
G rhiz	S Europ.-Sudsib.	*Lathyrus venetus*	+	+	+	1	+	1	+	+	+	.	.	+
G bulb	S Europ.	*Cyclamen hederifolium* subsp. *hederifolium*	1	1	1	+	+	.	+	1	+	r	.	+
H ros	Eurimedit.	*Viola alba* subsp. *dehnhardtii*	.	+	+	.	r	.	+	.	.	.	+	.
G rhiz	Circumbor.	*Anemone nemorosa*	.	.	.	+	.	.	+	+	.	.	+	+
G rhiz	Eurasiat.	*Polygonatum multiflorum*	.	+	.	.	.	+	.	.	.	+	.	.
		Species of the *Galium aparine* variant												
H scap	Endem.	*Digitalis lutea* subsp. *australis*	.	.	.	.	r	.	.	.	.	.	.	.
NP	Eurosib.	*Ribes alpinum*	.	.	.	.	.	.	.	+	.	r	.	.
T scap	Eurasiat.	*Galium aparine*	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Orof. SE-Europ.	*Doronicum columnae*	.	.	.	.	.	.	.	.	.	.	.	.
		Diff. species of the subass. *hieracietosum murorum*												
NP	S Medit.-Subatl.	*Rosa arvensis*	r	+	+	+	+	+	+	+	+	+	+	.
H caesp	Eurasiat.	*Carex digitata*	1	1	+	.	+	+	1	1	1	+	+	+
H scap	Eurosib.	*Hieracium murorum*	r	.	+	.	+	+	r	+	r	r	.	.
H caesp	Europ.-E Asiat.	*Carex sylvatica* subsp. *sylvatica*	+	.	+	.	.	+	+	.	.	+	.	.
H ros	Eurimedit.	*Potentilla micrantha*	.	r	+	+	.	.	+	.	+	.	+	+
H caesp	Eurimedit.	*Luzula forsteri*	.	r	+	.	r	.	+	.	.	+	r	.
G bulb	Eurosib.	*Platanthera chlorantha*	r	.	r	.	r	.	.	.	.	.	.	+
		Charact. species of the alliance *Geranio versicoloris-Fagion sylvaticae*												
P scap	SE Europ.	*Acer opalus* subsp. *obtusatum*	3	1	2	2	1	2	.	+	.	+	+	1
P caesp	Subatlant.	*Daphne laureola*	+	+	.	+	+	+	+	+	+	+	1	.
G rhiz	Europ.-Caucas.	*Anemone ranunculoides*	.	.	.	.	+	.	.	+	.	+	.	.
H scap	Endem.	*Pulmonaria apennina*	.	.	.	+	.	.	+	+	+	.	.	.
H scap	Europ.-Caucas.	*Ranunculus lanuginosus*	.	.	.	.	.	.	.	.	.	.	r	.
G rhiz	Eurimedit.	*Ruscus hypoglossum*	.	.	.	.	.	.	r	.	.	.	.	.
G rhiz	Orof. SE Europ.	*Cardamine kitaibelii*	.	.	.	.	.	.	.	.	.	.	.	.
		Charact. species of the order *Fagetalia sylvaticae*												
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	3	5	4	5	5	5	5	5	5	5	5	4
H scap	Paleotemp.	*Sanicula europaea*	+	2	.	1	1	+	1	+	+	r	+	+
H scap	Eurosib.	*Viola reichenbachiana*	+	+	+	1	+	+	+	+	+	+	1	+
H caesp	Europ.-Caucas.	*Festuca heterophylla*	+	+	+	+	+	+	.	+	+	+	+	.
H caesp	Paleotemp.	*Melica uniflora*	+	+	.	.	.	.	+	r	+	.	r	+
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	r	.	+	.	.	.	+	+	+	r	+	+
H scap	Europ.-Caucas.	*Lactuca muralis*	.	+	+	+	r	.	+	.	.	.	r	+
G rhiz	Eurasiat.	*Neottia nidus-avis*	+	r	+	.	1	+	r	r	r	.	r	.
G bulb	Eurasiat.	*Lilium martagon*	1	+	+	+	r	.	+	+	+	r	r	.
G bulb	Europ.-Caucas.	*Scilla bifolia*	.	+	.	+	.	+	+	.	+	.	+	+
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	.	+	+	.	r	.	+	.	+	+	+	.
G rhiz	C Europ.	*Euphorbia dulcis*	+	+	.	.	.	.	+	+	+	.	r	.

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
980	970	1100	1125	1150	1170	640	930	910	1250	800	1280	1100	1230	1290	898	960	1030	1034	937	1270	1200	1265	1400	1400		
ENE	NE	N	NNE	NW	WSW	N	NW	NW	ENE	NE	E	N	N	NNE	NNW	S	S	SW	SE	NW	ENE	NE	N	E	Pres	Freq
45	15	45	20	30	45	20	45	30	50	20	40	20	20	55	40	45	25	30	45	22	20	15	40	35		
300	400	200	200	200	400	300	250	350	350	300	300	250	250	200	350	300	300	200	300	200	400	400	500	400		
98	100	98	100	100	98	100	99	100	100	100	100	98	100	100	98	98	100	98	98	90	100	100	100	100		
ation *lathyretosum veneti*																										
1	1	+	1	1	+	+	1	+	1	+	1	1	1	1	1	1	1	+	1	1	.	.	+	+	33	89
+	1	.	+	+	+	.	+	1	1	+	+	+	+	.	+	1	1	1	1	1	+	1	.	.	30	81
+	+	+	+	.	+	+	.	1	.	1	.	+	.	1	+	.	1	1	.	.	+	+	+	.	26	70
+	.	+	+	+	.	+	+	+	.	.	+	.	.	.	+	+	+	.	+	.	.	.	.	.	17	46
+	.	.	.	+	+	.	+	+	.	+	.	.	+	.	+	.	+	.	+	+	+	.	.	.	17	46
.	+	.	.	+	.	+	.	.	+	.	+	+	.	.	+	.	.	+	.	.	.	+	.	+	13	35
.	.	+	+	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	+	1	+	.	+	+	11	30
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+	+	6	16
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	5	14
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	4	11
+	+	+	+	+	+	+	.	.	.	r	.	.	.	.	+	.	.	.	.	.	.	.	+	.	21	57
1	.	+	+	+	.	+	.	.	.	r	.	.	.	.	.	.	+	.	.	.	.	.	.	.	18	49
+	1	.	.	.	+	.	.	.	.	+	.	.	.	.	+	.	.	+	.	.	1	.	.	.	15	41
+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	9	24
.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	24
+	.	.	.	.	+	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	24
.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	14
2	1	+	+	+	1	2	2	1	1	1	1	1	+	.	.	+	.	+	+	1	1	2	2	2	32	86
.	.	1	1	1	+	+	1	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	.	+	32	86
.	.	+	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	+	+	+	+	+	12	32
+	.	.	.	.	.	.	+	.	+	.	.	+	+	.	+	.	+	.	.	.	.	.	.	.	11	30
.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	+	+	.	+	.	7	19
.	.	.	.	.	.	.	.	.	.	1	.	+	1	+	.	+	.	.	.	.	.	.	.	.	6	16
.	.	.	.	.	.	.	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	4	11
5	3	4	5	5	5	3	4	4	5	5	5	4	5	5	5	5	5	5	5	3	5	4	5	4	37	100
+	+	+	+	+	2	+	+	1	1	+	+	2	2	1	3	2	3	+	1	+	+	.	.	+	34	92
1	+	.	1	1	+	.	1	+	+	1	+	+	+	+	+	+	1	+	.	+	.	+	+	.	32	86
+	+	+	+	1	+	+	1	2	1	.	+	.	+	.	+	+	1	+	+	+	+	+	.	.	30	81
+	.	1	1	+	1	1	2	1	+	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	30	81
+	.	+	.	.	+	+	+	+	+	+	+	.	+	+	+	.	+	+	+	.	+	+	1	+	27	73
.	.	+	+	1	+	+	1	+	+	+	+	+	+	+	+	1	+	+	+	+	.	.	+	.	27	73
+	.	+	.	.	.	.	.	.	.	r	+	+	r	.	+	.	.	+	+	+	+	+	+	+	23	62
+	.	.	.	.	.	+	+	+	1	1	+	+	+	+	.	.	.	.	.	+	.	+	.	.	22	59
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+	.	.	.	+	.	.	+	.	.	+	+	+	+	+	.	.	.	.	.	.	.	+	.	.	15	41

		Relevé number	1	2	3*	4	5	6	7	8	9	10	11	12
Ch suffr	Europ.-Caucas.	*Euphorbia amygdaloides* subsp. *amygdaloides*	r	r	.	.	.	.	.	.	.	.	.	.
G rhiz	C Europ.	*Cardamine bulbifera*	r	.	.	.	.	.	.	.	.	.	.	.
H scap	Europ.-Caucas.	*Prenanthes purpurea*	.	r	.	.	.	.	r	+	.	.	.	.
G bulb	Paleotemp.	*Dactylorhiza maculata* subsp. *fuchsii*	.	.	.	+	.	.	.	+	+	+	+	.
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia*	.	.	.	.	.	.	.	.	.	.	.	.
H caesp	Circumbor.	*Poa nemoralis* subsp. *nemoralis*	.	.	+	.	+	.	.	.	.	+	r	.
P caesp	Eurimedit.	*Ilex aquifolium*	+	.	.	.	.	.	.	.	.	.	.	.
G bulb	Eurosib.	*Gagea lutea*	.	.	.	+	.	.	.	+	.	.	.	+
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	.	.	.	.	.	.	.	.	.	.	.	.
T scap	Subcosmop.	*Geranium robertianum*	.	.	.	.	.	.	.	.	.	r	.	.
P scap	Paleotemp.	*Taxus baccata*	.	.	.	.	.	.	.	.	.	.	+	.
G rhiz	Eurasiat.	*Cephalanthera rubra*	.	.	.	.	+	.	.	+	.	+	+	+
P scap	Europ.-Caucas.	*Acer platanoides*	.	.	.	.	.	.	.	.	.	.	.	.
P scap	Pont.	*Prunus avium* subsp. *avium*	.	+	.	+	+	+	.	.	.	.	+	.
G rhiz	Circumbor.	*Polystichum setiferum*	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Europ.-Caucas.	*Mercurialis perennis*	+	.	.	.	.	.	.	.	.	.	.	.
G bulb	Eurasiat.	*Allium ursinum* subsp. *ucrainicum*	1	+	.	.	.	.	.	+	.	.	.	.
G rhiz	SE Europ.	*Cardamine enneaphyllos*	r	.	.	.	.	.	.	.	.	.	.	.
G rhiz	C Europ.	*Arum maculatum*	.	.	.	.	.	.	r	r	.	.	.	.
Ch rept	Circumbor.	*Orthilia secunda*	.	.	.	.	r	+	.	.	+	.	.	.
G rhiz	Subcosmop.	*Dryopteris filix-mas*	r	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Paleotemp.	*Epipactis leptochila*	.	.	r	+	+	.	.	.	.	.	.	.
H caesp	Eurasiat.	*Bromus ramosus*	.	.	.	.	.	.	.	.	.	.	.	.
P scap	Europ.-Caucas.	*Tilia platyphyllos* subsp. *platyphyllos*	.	.	.	.	.	.	.	.	.	.	.	.
Ch scap	Europ.-Caucas.	*Stellaria holostea* subsp. *holostea*	.	.	.	.	.	.	.	.	.	.	.	.
P scap	Europ.-Caucas.	*Carpinus betulus*	+	1	+	.	.	.	.	.	.	.	.	1
G bulb	Eurasiat.	*Allium ursinum* subsp. *ursinum*	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Paleotemp.	*Heracleum sphondylium* subsp. *ternatum*	.	.	.	.	.	.	.	.	.	r	.	.
G rhiz	Eurasiat.	*Actaea spicata*	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	C e S Europ.	*Epipactis muelleri*	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Orof. S Europ.	*Aconitum lycoctonum*	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	N Medit. mont.	*Geranium nodosum*	.	.	.	.	.	.	.	.	r	r	.	.
P caesp	Europ.	*Sorbus aucuparia* subsp. *aucuparia*	.	.	.	.	.	.	.	.	.	.	.	.
H scap	NE Medit. mont.	*Adenostyles glabra* subsp. *glabra*	.	.	.	.	.	.	.	.	.	.	.	.
P caesp	Orof. S Europ.	*Laburnum alpinum*	.	.	.	.	+	.	+	.	.	.	.	.
G rhiz	Circumbor.	*Adoxa moschatellina*	.	.	.	.	.	.	.	.	.	.	.	.
G bulb	C Europ.	*Corydalis pumila*	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Europ.-Caucas.	*Lamium galeobdolon* subsp. *montanum*	.	.	.	.	.	.	+	.	1	.	.	.
H scap	Eurosib.	*Thalictrum aquilegifolium* subsp. *aquilegifolium*	.	.	.	.	.	.	.	.	.	.	.	.
G bulb	Europ.-Caucas.	*Corydalis cava* subsp. *cava*	.	.	.	.	.	.	.	.	.	.	.	.
		Transgressive species from the order *Quercetalia pubescenti-petraeae*												
G rhiz	Circumbor.	*Hepatica nobilis*	+	1	+	1	+	1	+	+	+	+	+	1
P scap	S Europ.-Sudsib.	*Fraxinus ornus* subsp. *ornus*	1	.	1	1	+	.	.	.	.	+	1	1
P caesp	C Europ.	*Crataegus laevigata*	+	+	+	1	.	.	+	1	+	+	.	.
G rhiz	Europ.-Caucas.	*Galium odoratum*	.	.	.	.	+	.	+	.	.	r	.	.
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	+	+	+	+	.	+	.	+	.	1	.	.
P scap	SE Europ.	*Ostrya carpinifolia*	.	.	.	.	.	.	+	.	.	+	+	2
P caesp	Medit. mont.	*Euonymus latifolius*	+	.	.	.	.	.	.	.	+	.	.	.
G bulb	Orof. C Europ.	*Lilium bulbiferum* subsp. *croceum*	.	r	+	+	.	.	.	+	.	r	r	+
H scap	C Europ.	*Melittis melissophyllum* subsp. *melissophyllum*	+	r	+	.	.	.	.	.	.	.	.	.
G rhiz	Eurasiat.	*Cephalanthera longifolia*	r	.	+	.	.	.	.	.	r	.	.	.
G rhiz	Endem.	*Helleborus bocconei* subsp. *bocconei*	.	r	.	.	.	.	.	.	.	r	.	.
P caesp	C Europ.	*Viburnum lantana*	r	.	.	+	+	+	.	.	.	.	.	.
P caesp	Europ.-Caucas.	*Lonicera xylosteum*	+	.	.	+	+	.	.	+	+	.	.	.

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+	+	1	+	.	+	.	1	+	.	+	+	.	.	.	+	.	+	.	+	.	.	+	.	.	21	57
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+	+	+	.	.	+	.	.	.	.	+	.	+	+	.	.	.	.	.	+	1	+	.	.	1	18	49
2	2	1	1	.	.	.	.	.	.	1	.	1	1	.	1	.	.	.	.	+	1	.	.	.	14	38
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		Relevé number	1	2	3*	4	5	6	7	8	9	10	11	12
G rhiz		*Epipactis helleborine* (s.l.)	.	.	.	.	.	.	.	.	.	.	.	.
NP		*Emerus majus* (s.l.)	+	.	.	.	r	+	.	.	.	.	.	+
P caesp	S Europ.-Sudsib.	*Cornus mas*	+	+	1	.	r	.	.	+	.	.	.	.
Ch suffr	Subatl.	*Helleborus foetidus* subsp. *foetidus*	.	.	.	.	.	.	.	.	.	.	.	.
P scap	N Eurimedit.	*Quercus cerris*	.	1	1	1	.	.	.	.	.	.	.	1
H scap	Eurasiat.	*Campanula persicifolia* subsp. *persicifolia*	.	.	+	.	.	.	.	+	+	r	r	.
P caesp	S Europ.-Sudsib.	*Euonymus verrucosus*	.	r	+	.	.	.	.	.	.	.	.	.
P caesp	Paleotemp.	*Sorbus torminalis*	+	+	+	.	.	.	.	.	.	+	.	.
H ros	Paleotrop.	*Polypodium interjectum*	.	r	.	.	.	+	.	.	.	.	.	.
H ros	Eurimedit.	*Silene italica* subsp. *italica*	.	.	.	.	.	.	.	.	.	.	.	.
H caesp	Euromedit.	*Poa sylvicola*	.	.	.	.	.	.	.	.	.	.	.	.
H ros	Circumbor.	*Polypodium vulgare*	.	.	.	.	.	.	.	.	.	.	.	.
		Charact. species of the class *Querco-Fagetea*												
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	+	+	1	+	+	+	+	+	+	.	+	+
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	+	1	+	.	r	+	+	1	1	+	1	.
P lian	Eurimedit.	*Hedera helix* subsp. *helix*	+	+	.	.	.	.	1	1	+	.	+	1
NP	N Eurimedit.	*Rubus hirtus*	+	.	.	.	.	.	1	.	+	+	+	.
G rhiz	Eurimedit.	*Cephalanthera damasonium*	.	r	+	.	1	.	.	.	.	.	.	+
H rept	Eurosib.	*Fragaria vesca* subsp. *vesca*	.	r	.	.	.	.	r	.	r	+	+	+
H caesp	Paleotemp.	*Brachypodium sylvaticum* subsp. *sylvaticum*	+	.	.	+	.	.	.	.	+	r	r	.
P scap	Europ.-Caucas.	*Acer campestre*	.	r	.	1	+	.	.	.	+	+	+	.
H ros	Europ.-Caucas.	*Primula vulgaris* subsp. *vulgaris*	+	+	.	.	.	.	+	+	+	.	.	.
H ros	NE Stenomedit.	*Aremonia agrimonoides* subsp. *agrimonoides*	.	.	.	.	r	.	.	r	.	+	r	+
H rept	Europ.-Caucas.	*Ajuga reptans*	.	.	+	.	.	.	+	+	.	.	.	+
P caesp	Europ.-Caucas.	*Corylus avellana*	1	.	.	.	.	.	.	+	+	.	.	+
G rad	Eurimedit.	*Tamus communis*	+	.	+	.	.	.	r	.	.	.	.	.
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	.	.	.	.	.	.	.	r	r	.	.	.
T scap	N Medit.	*Cardamine graeca*	.	.	.	.	.	.	.	.	.	.	.	.
P lian	Europ.-Caucas.	*Clematis vitalba*	.	.	.	.	.	.	.	.	.	+	.	.
H scap	Europ.-Caucas.	*Hieracium racemosum*	.	+	.	.	.	.	.	.	.	.	.	.
P lian	S Europ.-Sudsib.	*Lonicera caprifolium*	r	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Eurimedit.	*Ruscus aculeatus*	+	.	.	.	.	.	.	.	.	.	.	.
H scap	Eurasiat.	*Aquilegia vulgaris* auct. fl. ital.	.	.	+	.	.	.	.	.	.	.	.	.
H scap	Circumbor.	*Geum urbanum*	.	.	.	.	.	.	.	.	.	.	.	.
		Accompanying *taxa*												
H scap	Eurasiat.	*Cruciata glabra* subsp. *glabra*	.	r	+	+	r	.	.	+	+	.	r	+
T scap	Eurasiat.	*Moehringia trinervia*	.	.	.	.	.	.	.	.	.	.	.	.
P caesp	Circumbor.	*Juniperus communis* subsp. *communis*	.	+	.	.	r	+	.	.	.	.	.	+
G rhiz	Eurosib.	*Aegopodium podagraria*	.	.	.	.	.	.	.	r	.	.	.	.
G rhiz	Cosmopol.	*Pteridium aquilinum* subsp. *aquilinum*	.	.	.	.	.	.	1	.	.	.	.	.
H bienn	S Europ.-Sudsib.	*Arabis turrita*	.	.	r	.	.	.	.	.	.	.	.	.
P caesp	Paleotemp.	*Crataegus monogyna*	.	.	.	.	.	.	.	.	.	.	+	.
H scap	Europ.	*Laserpitium latifolium*	.	.	.	.	.	.	.	.	.	+	.	.
H ros	Cosmop. temp.	*Asplenium trichomanes* subsp. *quadrivalens*	.	.	.	.	.	.	.	.	.	.	.	.
		Sporadic *taxa*	2	0	1	0	1	1	0	0	1	0	1	0

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	Pres	Freq
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2	0	2	0	1	1	1	0	1	0	2	2	0	0	0	0	0	3	1	1	2	1	0	0	0		

Table 6: Synoptical table of *Fagus sylvatica* subsp. *sylvatica* communities of lower supratemperate bioclimatic belt: Lv-Fs l v – *Lathyro veneti-Fagetum sylvaticae lathyretosum veneti* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002; Lv-Fs h m – *Lathyro veneti-Fagetum sylvaticae* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002 *hieracietosum murori* subass. nova; Hr-Fs l s – *Hieracio racemosi-Fagetum sylvaticae luzuletosum sylvaticae* Allegrezza 2003.

Tabela 6: Sinoptična tabela združb vrste *Fagus sylvatica* subsp. *sylvatica* spodnjega supratemperatnega bioklimatskega pasu: Lv-Fs l v – *Lathyro veneti-Fagetum sylvaticae lathyretosum veneti* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002; Lv-Fs h m – *Lathyro veneti-Fagetum sylvaticae* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002 *hieracietosum murori* subass. nova; Hr-Fs l s – *Hieracio racemosi-Fagetum sylvaticae luzuletosum sylvaticae* Allegrezza 2003.

			Lv-Fs lv	Lv-Fs h m	Hr-Fs l s
		Characteristic species of the association *Lathyro veneti-Fagetum sylvaticae* and differential species of the subassociation *lathyretosum veneti*			
G rhiz	S Europ.-Sudsib.	*Lathyrus venetus*	V	V	II
Ch suffr	Europ.-Caucas.	*Euphorbia amygdaloides* subsp. *amygdaloides*	IV	I	II
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	II	III	I
H ros	Eurimedit.	*Viola alba* subsp. *dehnhardtii*	II	II	I
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	V	V	.
G rhiz	Europ.-Caucas.	*Galium odoratum*	V	II	.
G bulb	Europ.-Caucas.	*Scilla bifolia*	III	III	.
H scap	Europ.-Caucas.	*Prenanthes purpurea*	III	I	.
G rhiz	SE Europ.	*Cardamine enneaphyllos*	I	I	.
G rhiz	Orof. SE Europ.	*Cardamine kitaibelii*	II	.	.
		Acidophilous species			
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	IV	IV	IV
H scap	Eurosib.	*Hieracium murorum*	I	III	V
NP	S Medit.-Subatl.	*Rosa arvensis*	I	V	I
H caesp	Eurimedit.	*Luzula forsteri*	I	II	IV
G rhiz	Cosmopol.	*Pteridium aquilinum* subsp. *aquilinum*	I	I	V
H scap	Europ.-Caucas.	*Hieracium racemosum*	I	I	V
G rhiz	Eurasiat.	*Cephalanthera rubra*	I	II	I
H caesp	Europ.-E Asiat.	*Carex sylvatica* subsp. *sylvatica*	I	I	.
P scap	N Eurimedit.	*Quercus cerris*	.	II	II
NP	W Eurimedit.	*Hypericum androsaemum*	.	I	I
H ros	Eurimedit.	*Potentilla micrantha*	.	II	.
P caesp	Stenomedit.	*Erica arborea*	.	.	III
		Charact. and diff. Species of the alliance *Geranio versicoloris-Fagion sylvaticae*			
P caesp	Subatlant.	*Daphne laureola*	V	IV	III
P scap	SE Europ.	*Acer opalus* subsp. *obtusatum*	IV	V	II
G bulb	S Europ.	*Cyclamen hederifolium* subsp. *hederifolium*	III	IV	II
H scap	Europ.-Caucas.	*Ranunculus lanuginosus*	I	I	I
H scap	Endem.	*Pulmonaria apennina*	II	II	.
G rhiz	Eurimedit.	*Ruscus hypoglossum*	II	I	.
G rhiz	Europ.-Caucas.	*Anemone ranunculoides*	I	I	.
		Charact. species of the order *Fagetalia sylvaticae*			
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	V	V	V
H scap	Eurosib.	*Viola reichenbachiana*	V	V	V
H scap	Paleotemp.	*Sanicula europaea*	V	V	II
H caesp	Paleotemp.	*Melica uniflora*	V	IV	V
H scap	Europ.-Caucas.	*Lactuca muralis*	V	III	V
H caesp	Europ.-Caucas.	*Festuca heterophylla*	IV	V	V
P scap	Paleotemp.	*Taxus baccata*	III	I	I

			Lv-Fs l v	Lv-Fs h m	Hr-Fs l s
G rhiz	C Europ.	*Euphorbia dulcis*	II	III	I
G bulb	Paleotemp.	*Dactylorhiza maculata* subsp. *fuchsii*	II	II	III
P caesp	Eurimedit.	*Ilex aquifolium*	II	I	III
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	I	I	III
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	V	III	.
G bulb	Eurasiat.	*Lilium martagon*	IV	III	.
G rhiz	C Europ.	*Cardamine bulbifera*	IV	I	.
G rhiz	Eurasiat.	*Neottia nidus-avis*	III	III	.
H caesp	Circumbor.	*Poa nemoralis subsp. nemoralis*	II	II	.
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia*	II	I	.
T scap	Subcosmop.	*Geranium robertianum*	II	I	.
G bulb	Eurosib.	*Gagea lutea*	II	I	.
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	II	I	.
G rhiz	Subcosmop.	*Dryopteris filix-mas*	II	I	.
G rhiz	Circumbor.	*Anemone nemorosa*	I	II	.
P scap	Pont.	*Prunus avium* subsp. *avium*	I	II	.
H scap	Paleotemp.	*Heracleum sphondylium* subsp. *ternatum*	I	I	.
G rhiz	C e S Europ.	*Epipactis muelleri*	I	I	.
G rhiz	Europ.-Caucas.	*Mercurialis perennis*	I	I	.
G rhiz	C Europ.	*Arum maculatum*	I	I	.
G rhiz	Paleotemp.	*Epipactis leptochila*	I	I	.
Ch rept	Circumbor.	*Orthilia secunda*	I	I	.
T rept	Cosmopol.	*Stellaria media* subsp. *media*	I	.	I
H rept	Eurasiat.	*Veronica officinalis*	.	I	I
P scap	Europ.-Caucas.	*Acer platanoides*	III		.
G rhiz	Circumbor.	*Polystichum setiferum*	III	.	.
H caesp	Eurasiat.	*Bromus ramosus*	II	.	.
P scap	Europ.-Caucas.	*Tilia platyphyllos* subsp. *platyphyllos*	II	.	.
Ch scap	Europ.-Caucas.	*Stellaria holostea* subsp. *holostea*	II	.	.
G rhiz	Eurasiat.	*Polygonatum multiflorum*	I	.	.
G rhiz	Orof. SE-Europ.	*Doronicum columnae*	I	.	.
G rhiz	Eurasiat.	*Actaea spicata*	I	.	.
G bulb	C Europ.	*Corydalis pumila*	I	.	.
G bulb	Eurasiat.	*Allium ursinum* subsp. *ursinum*	I	.	.
H scap	Orof. S Europ.	*Aconitum lycoctonum*	I	.	.
H scap	Orof. Eurasiat.	*Salvia glutinosa*	I	.	.
H ros	Circumbor. temp.	*Phyllitis scolopendrium* subsp. *scolopendrium*	I	.	.
H caesp	Subatl.	*Festuca altissima*	I	.	.
P caesp	S Europ.-Sudsib.	*Staphylea pinnata*	I	.	.
H caesp	Europ.-Caucas.	*Hordelymus europaeus*	I	.	.
G bulb	Eurasiat.	*Allium ursinum* subsp. *ucrainicum*	.	II	.
P scap	Europ.-Caucas.	*Carpinus betulus*	.	I	.
G rhiz	N Medit. mont.	*Geranium nodosum*	.	I	.
H scap	NE Medit. mont.	*Adenostyles glabra* subsp. *glabra*	.	I	.
P caesp	Orof. S Europ.	*Laburnum alpinum*	.	I	.
H scap	Europ.-Caucas.	*Lamium galeobdolon* subsp. *montanum*	.	I	.
H scap	Eurosib.	*Thalictrum aquilegifolium i aquilegifolium*	.	I	.
P caesp	Europ.	*Sorbus aucuparia* subsp. *aucuparia*	.	I	.
P scap	Europ.-Caucas.	*Fraxinus excelsior* subsp. *excelsior*	.	I	.
H scap		*Stellaria nemorum* (s.l.)	.	I	.
G rhiz	Circumbor.	*Corallorhiza trifida*	.	I	.
		Transgressive species from the order *Quercetalia pubescenti-petraeae*			
G rhiz	Circumbor.	*Hepatica nobilis*	IV	V	II
P caesp	C Europ.	*Crataegus laevigata*	III	IV	II
H caesp	Eurasiat.	*Carex digitata*	I	V	II
G rhiz	Eurasiat.	*Cephalanthera longifolia*	I	II	IV

			Lv-Fs lv	Lv-Fs h m	Hr-Fs l s
H scap	Endem.	*Digitalis lutea* subsp. *australis*	I	II	III
P caesp	Europ.-Caucas.	*Lonicera xylosteum*	I	II	II
P scap	S Europ.-Sudsib.	*Fraxinus ornus* subsp. *ornus*	III	IV	.
P caesp	Medit. mont.	*Euonymus latifolius*	III	I	.
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	II	III	.
P scap	SE Europ.	*Ostrya carpinifolia*	II	III	.
G rhiz	Endem.	*Helleborus bocconei* subsp. *bocconei*	II	I	.
G bulb	Orof. C Europ.	*Lilium bulbiferum* subsp. *croceum*	I	III	.
H scap	C Europ.	*Melittis melissophyllum* subsp. *melissophyllum*	I	II	.
P caesp	C Europ.	*Viburnum lantana*	I	II	.
P caesp	S Europ.-Sudsib.	*Cornus mas*	I	II	.
Ch suffr	Subatl.	*Helleborus foetidus subsp. foetidus*	I	I	.
G rhiz		*Epipactis helleborine* (s.l.)	I	I	.
H ros	Paleotrop.	*Polypodium interjectum*	I	I	.
H ros	Circumbor.	*Polypodium vulgare*	I	.	III
NP		*Emerus majus* (s.l.)	.	II	III
H ros	Eurimedit.	*Silene italica* subsp. *italica*	.	I	III
H scap	Eurasiat.	*Campanula persicifolia* subsp. *persicifolia*	.	II	.
P caesp	Paleotemp.	*Sorbus torminalis*	.	I	.
P caesp	S Europ.-Sudsib.	*Euonymus verrucosus*	.	I	.
H caesp	Subatl.	*Brachypodium rupestre*	.	I	.
P caesp	Eurasiat.	*Euonymus europaeus*	.	I	.
H caesp	Europ.-Caucas.	*Hypericum montanum*	.	I	.
H scap	Eurasiat.	*Vincetoxicum hirundinaria* subsp. *hirundinaria*	.	I	.
		Charact. species of the class *Querco-Fagetea*			
P lian	Eurimedit.	*Hedera helix* subsp. *helix*	IV	III	III
NP	N Eurimedit.	*Rubus hirtus*	IV	II	V
H rept	Eurosib.	*Fragaria vesca* subsp. *vesca*	III	III	IV
H ros	Europ.-Caucas.	*Primula vulgaris* subsp. *vulgaris*	II	II	II
P scap	Europ.-Caucas.	*Acer campestre*	I	III	II
G rad	Eurimedit.	*Tamus communis*	I	I	III
P lian	S Europ.-Sudsib.	*Lonicera caprifolium*	I	I	I
G rhiz	SE Europ.	*Anemone apennina* subsp. *apennina*	V	V	.
H caesp	Paleotemp.	*Brachypodium sylvaticum* subsp. *sylvaticum*	III	II	.
G rhiz	Eurimedit.	*Cephalanthera damasonium*	III	II	.
H ros	NE Stenomedit.	*Aremonia agrimonoides* subsp. *agrimonoides*	I	III	.
P caesp	Europ.-Caucas.	*Corylus avellana*	I	II	.
T scap	N Medit.	*Cardamine graeca*	I	I	.
P lian	Europ.-Caucas.	*Clematis vitalba*	I	I	.
G rhiz	Eurimedit.	*Ruscus aculeatus*	I	I	.
H scap	Eurasiat.	*Aquilegia vulgaris* auct. fl. ital.	I	I	.
H scap	Eurasiat.	*Cruciata glabra* subsp. *glabra*	.	III	IV
H rept	Europ.-Caucas.	*Ajuga reptans*	.	III	I
G bulb	Eurosib.	*Platanthera chlorantha*	.	II	III
H scap	Circumbor.	*Geum urbanum*	I	.	.
G rhiz	Eurasiat.	*Listera ovata*	.	I	.
P caesp	SE Europ.	*Quercus pubescens* subsp. *pubescens*	.	.	III
P scap	SE Europ.	*Castanea sativa*	.	.	III
H caesp	Eurasiat.	*Anthoxanthum odoratum*	.	.	I
G bulb	NW Stenomedit.	*Cyclamen repandum* subsp. *repandum*	.	.	I
		Accompanying *taxa*			
T scap	Eurasiat.	*Moehringia trinervia*	II	I	.
G rhiz	Eurosib.	*Aegopodium podagraria*	II	I	.
H scap	Europ.	*Laserpitium latifolium*	I	I	.
H ros	Cosmop. temp.	*Asplenium trichomanes* subsp. *quadrivalens*	I	I	.

			Lv-Fs lv	Lv-Fs h m	Hr-Fs l s
H bienn	S Europ.-Sudsib.	*Arabis turrita*	I	I	.
H scap	Endem.	*Campanula micrantha*	I	I	.
H caesp	Cosmopol.	*Cystopteris fragilis*	I	I	.
P caesp	Circumbor.	*Juniperus communis* subsp. *communis*	.	II	II
P caesp	Paleotemp.	*Crataegus monogyna*	.	I	II
H ros	Cosmopol.	*Asplenium adiantum-nigrum* subsp. *adiantum-nigrum*	.	I	II
NP	Eurasiat.	*Rosa canina*	.	I	II
H ros	S Europ.-W Asiat.	*Ceterach officinarum* subsp. *officinarum*	I	.	.
H caesp	Orof. S e C Europ.	*Moehringia muscosa*	I	.	.
H scap	Eurasiat.	*Lamium maculatum*	I	.	.
H ros	W Europ. (Subatl.)	*Primula veris* subsp. *suaveolens*	I	.	.
H scap	C Europ.	*Senecio ovatus* subsp. *alpestris*	I	.	.
T scap	Eurasiat.	*Chaerophyllum temulum*	I	.	.
P caesp	Europ.-Caucas.	*Sambucus nigra*	I	.	.
NP	Eurosib.	*Ribes alpinum*	.	I	.
H caesp	Endem.	*Sesleria nitida* (s.l.)	.	I	.
P caesp	Eurasiat.	*Salix caprea*	.	I	.
P caesp	Orof. SW Europ.	*Cytisophyllum sessilifolium*	.	I	.
H ros	Subtrop. nesicola	*Asplenium onopteris*	.	I	.
NP	Europ.-Caucas.	*Ligustrum vulgare*	.	I	.
Ch suffr	Eurasiat.	*Genista tinctoria*	.	.	II

Table 7 (Tabela 7): *Solidagini-Fagetum sylvaticae* Ubaldi, Zanotti, Puppi, Speranza et Corbetta ex Ubaldi 1993 *luzuletosum sylvaticae* Catorci, Ballelli, Iocchi, Paura et Vitanzi 2008 and *aceretosum pseudoplatani* Catorci, Ballelli, Iocchi, Paura et Vitanzi 2008.

		Relevé number	1	2	3	4	5	6	7	8	9	10	11	12		
		Altitude (m a.s.l.)	925	1025	1040	930	930	970	960	1040	1070	1080	1220	1220	P	F
		Aspect	WNW	NW	NE	NNW	NNE	NNW	NNW	W	W	NNE	N	NE	r	r
		Slope (°)	35/40	65	50	20	30/35	45	40/45	45	40	70	65/70	50	e	e
		Area (m^2)	200	300	300	250	250	200	250	300	200	350	250	250	s	q
		Cover (%)	100	100	100	100	100	100	100	100	100	100	100	98		
		Characteristic species of the association *Solidagini-Fagetum sylvaticae and differential species of the subassociation *luzuletosum sylvaticae***														
H scap	Eurosib.	*Hieracium murorum* *	1	+	1	+	+	1	+	1	+	.	+	+	11	92
H caesp	Eurimedit.	*Luzula forsteri*	1	+	+	+	+	r	+	.	.	+	r	r	10	83
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	1	1	1	1	1	1	.	1	1	.	+	+	10	83
H scap	Europ.-Caucas.	*Prenanthes purpurea* *	.	+	+	.	+	+	r	1	+	+	+	r	10	83
G rhiz	Circumbor.	*Hepatica nobilis*	+	.	r	.	r	r	r	.	.	.	.	1	6	50
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	.	+	+	.	.	.	.	1	+	+	.	.	5	42
Ch rept	Circumbor.	*Orthilia secunda*	r	r	.	r	.	.	.	.	r	.	.	.	4	33
		Charact. species of the ass. *Solidagini-Fagetum sylvaticae* and diff. species of the sub-ass. *aceretosum pseudoplatani*														
P scap	Europ.-Caucas.	*Acer platanoides*	.	.	.	.	.	.	.	.	r	.	1	1	3	25
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	.	.	.	.	.	.	.	.	.	1	1	1	3	25
P scap	Europ.-Caucas.	*Tilia platyphyllos* subsp. *platyphyllos*	.	.	.	.	.	.	.	.	.	.	.	2	1	8
		Charact. species of the alliance *AremonioFagion sylvaticae*														
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia*	r	+	.	.	.	.	.	.	.	+	+	1	5	42
G rhiz	Europ.-Caucas.	*Anemone ranunculoides*	.	+	.	.	.	.	.	+	.	+	.	+	4	33
G rhiz	Eurimedit.	*Ruscus hypoglossum*	.	.	.	.	.	r	.	.	+	.	.	.	2	17
		Charact. species of the order *Fagetalia sylvaticae*														
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	4	5	5	5	5	4	5	5	5	5	5	4	12	100
H caesp	Europ.-Caucas.	*Festuca heterophylla*	+	+	+	+	+	r	+	+	+	+	+	1	12	100
H scap	Eurosib.	*Viola reichenbachiana*	+	.	+	+	+	.	+	.	+	+	+	+	9	75
G bulb	S Europ.	*Cyclamen hederifolium* subsp. *hederifolium*	.	+	.	r	r	.	+	+	.	1	+	1	8	67
H caesp	Paleotemp.	*Melica uniflora*	.	.	+	r	r	.	1	+	.	+	+	1	8	67
H scap	Paleotemp.	*Sanicula europaea*	2	+	+	+	.	.	+	.	.	.	+	+	7	58
G rhiz	Eurasiat.	*Cephalanthera rubra*	+	+	+	.	+	.	.	+	.	+	.	+	7	58
H scap	Europ.-Caucas.	*Lactuca muralis*	r	.	r	r	r	.	r	.	.	.	r	r	7	58
G rhiz	S Europ.-Sudsib.	*Lathyrus venetus*	+	.	.	+	+	+	r	.	.	+	.	+	7	58
P caesp	Eurimedit.	*Ilex aquifolium*	.	+	+	+	1	1	+	+	.	.	.	.	7	58
G bulb	Europ.-Caucas.	*Scilla bifolia*	+	+	.	+	.	+	.	.	+	.	+	.	6	50
G rhiz	N Medit. mont.	*Geranium nodosum*	.	r	+	.	.	.	.	.	+	1	+	r	6	50
G rhiz	Europ.-Caucas.	*Galium odoratum*	.	.	.	+	.	.	+	.	+	+	+	+	6	50
H rept	Eurasiat.	*Veronica officinalis*	+	+	+	r	.	.	.	.	.	.	r	.	5	42
P scap	Eurosib.	*Populus tremula*	2	1	.	.	.	.	1	.	.	r	.	1	5	42

G rhiz	Circumbor.	*Anemone nemorosa*	.	+	.	+	.	.	.	.	+	1	.	+	5	42
P scap	SE Europ.	*Acer opalus* subsp. *obtusatum*	.	.	r	1	1	1	.	.	.	.	.	1	5	42
G bulb	Paleotemp.	*Dactylorhiza maculata* subsp. *fuchsii*	r	.	.	.	r	.	r	.	r	.	.	.	4	33
G bulb	Eurosib.	*Gagea lutea*	.	.	+	.	.	.	.	+	.	+	.	+	4	33
G rhiz	C Europ.	*Cardamine bulbifera*	.	.	.	.	.	.	.	.	+	1	+	+	4	33
P caesp	Europ.	*Sorbus aucuparia* subsp. *aucuparia*	.	.	.	.	.	.	.	r	r	1	.	+	4	33
G rhiz	Eurasiat.	*Neottia nidus-avis*	.	r	.	.	r	.	.	.	.	.	.	r	3	25
G rhiz	Subcosmop.	*Dryopteris filix-mas*	.	.	.	r	.	.	.	.	.	1	+	.	3	25
G bulb	Eurasiat.	*Lilium martagon*	.	.	.	.	.	r	.	.	.	+	.	+	3	25
P scap	Pont.	*Prunus avium* subsp. *avium*	+	.	.	.	+	.	.	.	.	.	.	.	2	17
G rhiz	Circumbor.	*Oxalis acetosella*	.	.	.	+	.	.	+	.	.	.	.	.	2	17
Ch suffr	Europ.-Caucas.	*Euphorbia amygdaloides* subsp. *amygdaloides*	.	.	.	.	r	.	.	.	.	+	.	.	2	17
G rhiz	C Europ.	*Euphorbia dulcis*	.	.	.	.	.	.	+	.	.	.	.	r	2	17
G rhiz	Eurasiat.	*Polygonatum multiflorum*	.	.	.	.	.	.	.	.	.	r	.	+	2	17
P caesp	Subatlant.	*Daphne laureola*	.	.	.	.	.	.	.	.	.	.	r	r	2	17
		Charact. species of the ord. *Quercetalia pubescenti-petraeae*														
H caesp	Eurasiat.	*Carex digitata*	+	+	+	+	+	1	1	+	+	+	.	+	11	92
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	.	+	.	+	1	1	+	+	+	.	+	+	9	75
H scap	Eurasiat.	*Campanula persicifolia* subsp. *persicifolia*	r	+	+	.	.	.	.	.	+	r	r	r	7	58
NP		*Emerus majus* (s.l.)	r	.	.	r	r	r	.	.	.	.	.	.	4	33
H caesp	Europ.-E Asiat.	*Carex sylvatica subsp. sylvatica*	.	+	.	.	+	.	.	.	.	+	+	.	4	33
P scap	SE Europ.	*Ostrya carpinifolia*	.	.	.	.	+	.	+	.	.	1	+	.	4	33
P caesp	Medit. mont.	*Euonymus latifolius*	.	.	.	.	.	+	.	.	.	+	+	1	4	33
P scap	S Europ.-Sudsib.	*Fraxinus ornus subsp. ornus*	+	.	.	.	1	1	.	.	.	.	.	.	3	25
G rhiz	Eurasiat.	*Cephalanthera longifolia*	.	.	.	.	r	.	.	.	.	.	r	r	3	25
		Charact. species of the class *Querco-Fagetea*														
NP	N Eurimedit.	*Rubus hirtus*	r	+	r	+	+	+	1	+	+	1	+	+	12	100
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	1	+	1	+	1	1	1	+	.	+	+	.	10	83
P scap	SE-Europ.	*Castanea sativa*	1	1	2	1	.	.	.	2	+	1	.	1	8	67
H ros	NE Stenomedit.	*Aremonia agrimonoides* subsp *.agrimonoides*	+	.	+	.	r	r	+	.	.	.	+	+	7	58
G rhiz	SE Europ.	*Anemone apennina* subsp. *apennina*	+	.	1	.	1	.	1	1	.	.	+	+	7	58
P lian	Eurimedit.	*Hedera helix* subsp. *helix*	+	+	.	+	+	+	1	.	.	.	.	.	6	50
H ros	Europ.-Caucas.	*Primula vulgaris* subsp. *vulgaris*	+	+	r	r	.	.	.	.	.	.	.	+	5	42
H scap	Eurasiat.	*Cruciata glabra* subsp. *glabra*	+	.	.	+	.	r	r	.	.	.	.	+	5	42
NP	S Medit.-Subatl.	*Rosa arvensis*	.	.	+	r	+	.	r	.	.	.	.	+	5	42
H rept	Europ.-Caucas.	*Ajuga reptans*	+	+	.	.	.	.	r	.	.	.	.	+	4	33
G rad	Eurimedit.	*Tamus communis*	r	.	.	.	.	.	.	.	.	+	r	r	4	33
H ros	Eurimedit.	*Potentilla micrantha*	r	.	.	.	r	r	.	.	.	.	.	.	3	25
H caesp	Paleotemp.	*Brachypodium sylvaticum* subsp. *sylvaticum*	r	.	.	.	.	.	.	.	.	.	+	r	3	25
		Accompanying *taxa*														
G rhiz	Cosmopol.	*Pteridium aquilinum* subsp. *aquilinum*	r	.	.	+	+	+	+	+	+	.	.	.	7	58
Ch frut	Circumbor.	*Vaccinium myrtillus*	.	.	.	+	1	1	+	3	+	.	.	+	7	58
		Sporadic *taxa*	1	3	0	0	1	1	1	2	2	4	1	1		

Table 8 (Tabela 8): *Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi, Zanotti, Puppi, Speranza et Corbetta ex Ubaldi 1993 *cardaminetosum kitaibelii* subass. nova *Sorbus aucuparia* subsp. *aucuparia* variant and *Polystichum setiferum* variant.

		Relevé number	1	2	3	4	5	6	7*	8	9	10	11	12	13	14	15
		Altitude (m a.s.l.)	1570	1438	1600	1520	1650	1495	1515	1570	1580	1600	1580	1600	1575	1575	1600
		Aspect	NNE	N	N	NNE	NNE	NNE	NNE	ENE	ENE	E	NNE	ENE	NNE	N	N
		Slope (°)	30	45	40	60	45	45	45	34	35	40	35	45	25	20	25
		Area (m^2)	150	400	200	300	300	400	300	400	400	400	300	400	300	300	400
		Cover (%)	100	98	100	95	98	100	100	100	100	100	100	98	97	100	100
		Characteristic species of the association *Cardamino kitaibelii-Fagetum sylvaticae* and differential species of the															
G rhiz	SE Europ.	*Cardamine enneaphyllos*	+	+	1	+	.	1	1	1	+	+	+	+	+	+	+
G rhiz	Circumbor.	*Adoxa moschatellina*	+	+	+	.	+	.	+	+	+	+	+	.	+	+	+
G rhiz	Eurasiat.	*Lathyrus vernus* subsp. *vernus*	.	+	.	+	.	+	.	.	+	.	.	+	.	.	.
G rhiz	Orof. SE Europ.	*Cardamine kitaibelii*	+	.	+	.	.	.	+	.	.	+	.	+	.	+	.
H scap	Eurasiat.	*Epilobium montanum*	.	+	.	+	.	.	+	.	+	.	.	.	+	.	.
G rhiz	Eurasiat.	*Polystichum aculeatum*	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+
		Species of the *Sorbus aucuparia* subsp. *aucuparia* variant															
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
P caesp	Europ.	*Sorbus aucuparia* subsp. *aucuparia*	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
P caesp	Orof. S Europ.	*Laburnum alpinum*	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
		Species of the *Polystichum setiferum* variant															
G rhiz	Circumbor.	*Polystichum setiferum*	.	.	.	+	+	1	+	.	.	+	.	.	+	+	+
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
P scap	Europ.-Caucas.	*Acer platanoides*	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
P scap	Europ.-Caucas.	*Fraxinus excelsior* subsp. *excelsior*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Orof. SE Europ.	*Asperula taurina* subsp. *taurina*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		Charact. species of the alliance *Aremonio-Fagion sylvaticae and diff. of the suballiance *Cardamino kitaibelii-***															
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia**	.	+	.	.	.	+	.	1	.	+	.	.	1	1	.
H scap	Europ.-Caucas.	*Ranunculus lanuginosus**	.	.	.	+	+	.	+	+	.	.	.	.	+	+	1
H ros	NE Stenomedit.	*Aremonia agrimonoides* subsp. *agrimonoides**	.	+	+	.	.	+	.	.	.	+	.	.	.	.	.
G rhiz	Europ.-Caucas.	*Anemone ranunculoides**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Eurimedit.	*Ruscus hypoglossum**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H scap	NE Medit. mont.	*Adenostyles glabra* subsp. *glabra*	.	+	.	+	+	+	.	+	+	+	+	+	+	+	+
H scap	Endem.	*Pulmonaria apennina*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	N Medit. mont.	*Geranium nodosum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G bulb	Paleotemp.	*Dactylorhiza maculata* subsp. *fuchsii*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		Charact. species of the order *Fagetalia sylvaticae*															
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5
G rhiz	Europ.-Caucas.	*Galium odoratum*	+	+	+	+	+	2	+	1	1	1	2	2	3	3	2
H scap	Eurosib.	*Viola reichenbachiana*	+	+	+	+	+	+	+	+	+	1	+	+	1	1	2
H scap	Europ.-Caucas.	*Lactuca muralis*	+	+	+	+	+	+	+	1	1	+	1	+	+	+	+
G rhiz	C Europ.	*Cardamine bulbifera*	.	+	+	+	+	1	+	1	+	1	1	+	2	2	2
G bulb	Europ.-Caucas.	*Corydalis cava* subsp. *cava*	+	1	+	+	1	2	1	+	+	1	2	+	1	+	2
H scap	Europ.-Caucas.	*Prenanthes purpurea*	.	+	.	.	.	+	+	.	.	+	.	+	+	+	+
G bulb	Eurasiat.	*Lilium martagon*	.	.	.	.	.	+	+	.	+	.	+	.	+	+	+
G bulb	Europ.-Caucas.	*Scilla bifolia*	+	+	+	+	+	+	.	+	.	+	+	.	.	+	.
G rhiz	Europ.-Caucas.	*Epipactis microphylla*	+	+	.	.	+	+	+	.	+	+	.	.	+	.	+
G rhiz	Subcosmop.	*Dryopteris filix-mas*	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
H scap	Paleotemp.	*Heracleum sphondylium* subsp. *ternatum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H caesp	Circumbor.	*Poa nemoralis* subsp. *nemoralis*	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
1560	1420	1440	1300	1510	1390	1425	1450	1400	1540	1370	1320	1420	1450	1450	1470	1680	1720	1300	1320	1200	1250	1390	1285	1330	1340	1340		
NNE	ESE	NW	N	NNE	NE	N	NE	NE	NNE	NE	N	N	NW	ENE	NNW	NE	NW	N	N	NE	NW	NE	E	NE	NNE	NE	Pres	Freq
55	15	20	30	35	25	25	25	25	30	20	15	40	45	55	30	30	40	20	20	45	25	30	20	45	25	25		
400	400	400	250	250	300	250	400	250	300	250	300	250	400	400	400	250	300	400	350	200	250	300	300	250	300	300		
98	100	100	100	97	95	98	97	98	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
subassociation *cardaminetosum kitaibelii*																												
+	.	+	+	+	1	1	1	+	+	+	.	+	r	+	.	1	+	+	+	1	1	+	.	+	.	r	36	85,7
.	+	+	+	.	+	+	+	+	.	.	+	.	r	+	+	+	.	+	.	+	+	+	.	.	.	+	29	69
.	+	.	.	+	.	+	.	.	+	+	.	+	1	+	.	+	.	+	+	.	.	.	+	.	+	.	18	42,9
+	.	.	.	.	+	.	.	+	.	+	+	.	.	.	.	1	1	.	+	.	.	+	.	+	.	1	17	40,5
.	.	+	.	.	.	.	+	.	.	.	.	+	r	.	r	.	.	.	.	+	+	.	.	.	.	.	12	28,6
.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	+	.	.	.	.	.	.	.	+	.	.	7	16,7
.	.	.	.	.	.	.	.	.	.	+	+	+	+	1	1	1	+	1	1	+	.	1	+	.	1	1	16	38,1
.	.	.	.	.	.	.	.	.	.	+	+	1	+	1	+	1	1	2	+	.	.	+	.	+	+	.	14	33,3
.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	+	.	.	.	.	1	+	+	+	+	.	10	23,8
.	.	.	+	1	+	1	1	+	+	+	.	.	.	r	.	.	.	.	.	1	.	1	r	.	+	+	22	52,4
.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	1	.	.	.	1	1	1	1	1	.	.	8	19
.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	1	+	+	1	7	16,7
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	1	+	1	5	11,9
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	+	.	+	3	7,14
-Fagenion sylvaticae																												
.	.	.	.	+	+	+	.	+	+	+	+	.	+	+	.	.	+	.	.	1	1	+	r	.	+	.	21	50
.	+	1	.	.	+	.	.	.	.	.	r	+	.	r	+	.	+	.	1	.	.	r	.	+	r	.	19	45,2
+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	r	r	.	r	.	.	.	.	.	.	+	r	12	28,6
.	.	.	+	+	+	.	.	.	.	+	+	.	.	+	+	.	.	r	r	.	+	+	.	+	.	.	12	28,6
.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	.	+	4	9,52
+	.	.	.	r	.	.	r	r	r	+	+	+	r	1	1	1	2	1	1	+	1	1	.	.	1	+	32	76,2
.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	+	+	+	r	r	.	+	.	.	.	.	.	8	19
.	.	.	.	.	.	.	.	.	.	.	r	+	.	.	r	.	.	.	.	+	+	r	.	.	.	.	6	14,3
.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	3	7,14
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4	42	100
2	1	1	+	1	1	1	1	+	+	1	1	1	1	+	2	2	2	1	1	+	2	1	1	1	1	1	42	100
+	+	+	+	1	+	+	1	+	1	+	+	1	+	+	1	+	+	r	r	+	+	+	1	+	+	1	42	100
1	1	+	.	+	+	+	+	+	+	+	+	1	1	+	+	1	1	+	+	+	1	+	+	+	+	+	41	97,6
+	+	.	+	+	+	+	+	+	+	+	1	+	r	+	+	.	+	1	1	1	+	+	1	+	1	1	39	92,9
+	2	2	.	.	.	+	+	+	+	+	+	1	+	.	.	+	1	.	.	.	1	+	+	+	2	2	34	81
.	.	.	.	.	+	.	.	+	+	1	+	r	+	.	+	+	1	1	.	3	2	+	r	.	+	+	25	59,5
.	+	.	.	.	.	.	+	.	.	r	.	+	.	+	+	+	r	.	1	+	.	+	.	r	r	+	21	50
.	.	.	+	.	+	.	+	+	.	.	.	.	+	.	.	+	.	+	.	.	+	.	+	.	+	.	20	47,6
+	+	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15	35,7
.	.	+	+	.	.	.	.	.	+	.	.	.	r	.	+	+	+	r	r	+	.	1	.	r	1	1	15	35,7
.	.	.	.	.	.	.	.	.	.	+	.	r	.	r	r	1	+	+	+	+	1	+	+	+	+	r	15	35,7
+	.	.	.	+	+	.	.	.	.	+	+	+	1	+	.	+	+	.	.	.	.	.	+	+	+	.	14	33,3

		Relevé number	1	2	3	4	5	6	7*	8	9	10	11	12	13	14	15
H caesp	Europ.-Caucas.	*Festuca heterophylla*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Orof. SE-Europ.	*Doronicum columnae*	.	.	.	.	+	.	.	+	+	+	+	+	1	+	+
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	C Europ.	*Euphorbia dulcis*	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
G rhiz	Eurasiat.	*Neottia nidus-avis*	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
T scap	Subcosmop.	*Geranium robertianum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
G bulb	Eurosib.	*Gagea lutea*	.	.	.	.	+	.	.	.	+	+	.	.	.	.	+
Ch suffr	Europ.-Caucas.	*Euphorbia amygdaloides* subsp. *amygdaloides*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
P scap	SE Europ.	*Acer opalus subsp. obtusatum*	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.
H scap	Orof. S Europ.	*Aconitum lycoctonum*	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
G rhiz	C e S Europ.	*Epipactis muelleri*	+	.	.	.	.	.	+	+	+	.	+	+	.	.	.
Ch scap	Europ.-Caucas.	*Stellaria holostea* subsp. *holostea*	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.
H scap		*Stellaria nemorum* (s.l.)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Eurasiat.	*Polygonatum verticillatum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Circumbor.	*Polystichum lonchitis*	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.
G bulb	Eurasiat.	*Allium ursinum* subsp. *ursinum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
P caesp	Eurimedit.	*Ilex aquifolium*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Eurasiat.	*Polygonatum multiflorum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	C Europ.	*Arum maculatum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NP	Eurosib.	*Ribes alpinum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G bulb	C Europ.	*Corydalis pumila*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Europ.-Caucas.	*Mercurialis perennis*	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.
H scap	Paleotemp.	*Silene dioica*	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
G rhiz	Eurasiat.	*Cephalanthera rubra*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H rept	Eurasiat.	*Veronica officinalis*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Paleotemp.	*Epipactis leptochila*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T rept	Cosmopol.	*Stellaria media* subsp. *media*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
P caesp	Orof. S Europ.	*Lonicera alpigena* subsp. *alpigena*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
P scap	Europ.-Caucas.	*Ulmus glabra*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H caesp	Subatl.	*Festuca altissima*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		Transgressive species from the ord. *Quercetalia pubescenti-petraeae*															
G rhiz	Circumbor.	*Hepatica nobilis*	.	+	.	.	.	+	+	+	1	+	+	+	+	+	.
G rhiz		*Epipactis helleborine* (s.l.)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
H caesp	Euromedit.	*Poa sylvicola*	.	.	.	.	.	+	+	+	+	.	+	+	1	+	+
P caesp	Medit. mont.	*Euonymus latifolius*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
H caesp	Europ.-E Asiat.	*Carex sylvatica* subsp. *sylvatica*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.
G rhiz	Endem.	*Helleborus bocconei* subsp. *bocconei*	+	.	.	.	.	.	.	+	.	.	.	+	+	.	+
H scap	Endem.	*Digitalis lutea* subsp. *australis*	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
P caesp	C Europ.	*Crataegus laevigata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H scap	C Europ.	*Melittis melissophyllum* subsp. *melissophyllum*	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+
G rhiz	Eurasiat.	*Cephalanthera longifolia*	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
H ros	Paleotrop.	*Polypodium interjectum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H caesp	Subatl.	*Brachypodium rupestre*	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
H caesp	Eurasiat.	*Carex digitata*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Orof. S Europ.	*Calamintha nepeta* subsp. *nepeta*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H ros	Eurimedit.	*Viola alba subsp. dehnhardtii*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G bulb	Orof. C Europ.	*Lilium bulbiferum* subsp. *croceum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		Character species of the class *Querco-Fagetea*															
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	+	.	+	.	.	1	1	+	1	1	1	1	+	+	+
H scap	Paleotemp.	*Sanicula europaea*	.	+	.	.	.	.	.	.	.	.	.	+	2	.	.
H caesp	Paleotemp.	*Melica uniflora*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
P caesp	Subatlant.	*Daphne laureola*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NP	N Eurimedit.	*Rubus hirtus*	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	Pres	Freq
+	+	.	.	.	+	.	.	+	+	+	+	1	+	.	+	.	+	+	+	.	.	.	r	.	.	.	14	33,3
+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	13	31
.	.	.	.	+	.	.	.	+	.	+	r	.	+	.	.	+	r	.	+	+	+	+	+	r	.	.	13	31
.	.	.	+	.	.	+	.	+	.	r	.	.	.	.	+	.	.	+	+	.	.	+	r	r	.	+	12	28,6
.	.	+	+	r	+	.	.	.	.	r	.	.	r	r	r	.	r	.	.	.	+	.	.	.	.	.	11	26,2
.	.	.	.	.	.	+	.	.	.	.	r	.	r	.	+	.	.	.	.	+	+	.	r	+	r	r	11	26,2
.	+	.	+	+	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	10	23,8
.	.	.	.	.	.	.	.	.	.	.	r	r	.	r	r	+	.	+	+	+	+	.	.	.	.	.	9	21,4
+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	+	.	.	1	.	.	.	8	19
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	r	+	+	+	.	.	.	.	8	19
.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	16,7
.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	r	.	7	16,7
.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	+	+	.	.	.	.	+	+	.	+	.	7	16,7
.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	+	7	16,7
.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	r	r	.	.	.	.	+	.	.	.	.	6	14,3
+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	1	1	2	.	.	.	.	6	14,3
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.	1	+	+	+	6	14,3
.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	+	.	r	r	.	.	.	.	.	.	.	5	11,9
.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	r	4	9,52
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	r	.	.	.	.	.	.	+	.	4	9,52
.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	4	9,52
.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	7,14
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	3	7,14
.	.	+	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	7,14
.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	3	7,14
.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	4,76
.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	4,76
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	2	4,76
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	2	4,76
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	2	4,76
+	.	.	.	.	.	.	.	.	.	+	.	+	r	1	.	r	.	+	+	.	+	.	+	.	.	.	20	47,6
+	.	.	.	+	.	+	+	.	+	+	.	.	r	+	+	+	r	.	+	+	1	.	+	1	+	.	18	42,9
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	23,8
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	+	1	+	6	14,3
.	.	.	+	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	6	14,3
1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	.	.	.	.	.	5	11,9
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	11,9
+	.	.	.	.	.	.	.	.	.	.	.	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	5	11,9
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	+	.	+	.	4	9,52
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	7,14
.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	3	7,14
.	.	.	.	.	.	.	+	.	.	.	.	.	+	r	.	.	.	.	.	.	.	.	.	.	.	.	3	7,14
.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	4,76
.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	4,76
.	.	.	.	r	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	4,76
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	2	4,76
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	r	.	.	.	2	4,76
+	1	1	.	.	.	+	.	+	+	.	r	.	.	.	.	.	.	1	1	+	+	+	+	+	+	+	28	66,7
.	.	.	+	+	+	+	.	.	+	+	1	.	.	.	.	.	.	1	1	2	3	+	1	.	2	2	18	42,9
+	1	.	.	.	.	.	.	+	.	+	.	.	.	+	+	1	+	+	+	.	+	+	+	+	+	+	16	38,1
.	+	+	+	.	.	.	+	+	.	+	r	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	14	33,3
.	+	+	.	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	1	+	.	.	+	.	2	1	13	31

		Relevé number	1	2	3	4	5	6	7*	8	9	10	11	12	13	14	15
NP	S Medit.-Subatl.	*Rosa arvensis*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
G rhiz	Eurimedit.	*Cephalanthera damasonium*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H rept	Europ.-Caucas.	*Ajuga reptans*	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.
H caesp	Paleotemp.	*Brachypodium sylvaticum* subsp. *sylvaticum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	SE Europ.	*Anemone apennina* subsp. *apennina*	.	.	.	.	.	.	.	+	+	+	.	.	.	+	+
H scap	Europ.-Caucas.	*Hieracium racemosum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Eurosib.	*Hieracium murorum*	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
H ros	Eurimedit.	*Potentilla micrantha*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H ros	Europ.-Caucas.	*Primula vulgaris* subsp. *vulgaris*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Circumbor.	*Geum urbanum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
H scap	Eurasiat.	*Cruciata glabra* subsp. *glabra*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G bulb	S Europ.	*Cyclamen hederifolium* subsp. *hederifolium*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
		Accompanying *taxa*															
T scap	Eurasiat.	*Moehringia trinervia*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T scap	Paleotemp.	*Silene conica*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H scap	Eurasiat.	*Lamium maculatum*	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+
H rept	Eurosib.	*Fragaria vesca* subsp. *vesca*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G bulb	Eurasiat.	*Ranunculus ficaria* subsp. *bulbifer*	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.
H caesp	Endem.	*Sesleria nitida* (s.l.)	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
H bienn	Eurasiat.	*Myosotis nemorosa*	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.
G bulb	Eurimedit.	*Crocus vernus* subsp. *vernus*	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.
H scap	Endem.	*Campanula micrantha*	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
H scap	C Europ.	*Senecio ovatus* subsp. *alpestris*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Eurosib.	*Aegopodium podagraria*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		Sporadic *taxa*	0	0	0	1	0	2	1	0	0	0	1	0	3	1	0

Table 9 (Tabela 9): *Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi, Zanotti, Puppi, Speranza et Corbetta ex Ubaldi 1993 *anemonetosum nemorosae* subass. nova *Festuca heterophylla* variant.

		Relevé number	1	2	3	4	5	6	7	8
		Altitude (m a.s.l.)	1328	1371	1448	1249	1193	1388	1215	1206
		Aspect	N	ENE	SSW	NNW	N	N	N	NNW
		Slope (°)	50	30	20	10	35	15	10	25
		Area (m^2)	300	300	200	150	400	300	300	400
		Cover (%)	100	98	100	100	95	100	90	98
		Characteristic species of the association *Cardamino kitaibelii-Fagetum sylvaticae and differential species**								
G rhiz	Circumbor.	*Hepatica nobilis*	+	+	2	+	+	.	+	.
G rhiz	Circumbor.	*Anemone nemorosa*	.	+	+	+	+	.	+	+
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	+	+	+	+	4	+	.	.
G rhiz	SE Europ.	*Cardamine enneaphyllos**	1	.	+	1	.	+	+	.
P scap	SE Europ.	*Acer opalus* subsp. *obtusatum*	+	.	.	.	+	.	+	1
G rhiz	Circumbor.	*Adoxa moschatellina**	.	.	+	.	.	+	+	.
H scap	Eurasiat.	*Epilobium montanum**	.	+	.	+	+	.	.	.
G rhiz	Paleotemp.	*Epipactis leptochila*	.	.	.	.	.	.	.	.
G rhiz	Eurasiat.	*Lathyrus vernus* subsp. *vernus**	+	+	.	.	.	.	.	.
G rhiz	Eurasiat.	*Polystichum aculeatum**	.	.	.	.	.	+	.	+
G rhiz	Orof. SE Europ.	*Cardamine kitaibelii**	+	.	+	.	.	.	+	.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	Pres	Freq
.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	+	r	r	.	.	.	+	.	+	.	13	31
+	.	+	+	+	+	.	+	+	r	+	r	.	.	.	.	.	.	.	.	.	.	r	+	.	r	.	13	31
.	.	.	+	.	.	.	+	+	.	+	+	.	+	r	.	r	.	+	+	.	.	.	+	.	r	.	12	28,6
.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	.	+	+	.	.	.	.	.	.	.	.	.	9	21,4
.	+	.	.	.	.	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	8	19
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	14,3
.	.	.	.	.	.	.	.	.	+	.	.	r	+	+	.	.	1	.	.	.	.	.	.	.	.	.	5	11,9
.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	r	.	r	.	4	9,52
.	.	.	.	.	.	.	.	.	.	.	.	r	r	.	.	+	r	.	.	.	.	.	.	.	.	.	4	9,52
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	r	.	4	9,52
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	r	.	.	.	3	7,14
.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	r	.	.	.	.	.	.	.	.	3	7,14
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.	+	.	.	+	.	+	+	.	+	.	.	r	+	r	.	.	.	.	.	.	.	.	.	.	.	.	8	19
.	.	.	.	.	.	.	.	.	.	r	+	.	.	+	r	.	.	.	.	.	.	.	r	+	r	r	8	19
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	6	14,3
.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	.	.	+	.	+	.	.	r	.	.	.	5	11,9
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	9,52
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0	0	0	0	0	2	0	0	0	2	1	0	1	2	1	1	1	1	5	0	0	1	0	3	1	1	1		

9	10	11	12	13	14	15	16*	17	18	19	20	21	22	23	24	25		
1265	1390	1342	1353	1050	1193	1200	1345	1360	1345	1440	1240	1280	1350	1320	1400	1450		
NE	ENE	WNW	WSW	W	N	NNE	WNW	WNW	N	WNW	N	N	E	N	ESE	WNW	P	F
31	35	45	33	35/40	20	40	30	30	45	35	50	25	60	55	30	15	r	r
150	150	400	400	400	300	400	400	200	350	200	200	400	400	400	300	350	e	e
100	100	93	95	100	100	98	100	100	100	95	95	100	100	100	100	100	s	q
of the subassociation *anemonetosum nemorosae*																		
+	.	.	.	+	1	+	1	+	1	+	1	+	+	r	+	+	20	80
.	+	1	+	+	+	+	+	+	.	+	+	+	+	+	.	+	20	80
+	.	.	.	1	+	+	+	.	.	+	.	+	+	r	.	+	16	64
+	.	+	.	+	.	+	.	+	+	.	+	1	.	+	.	+	15	60
.	1	+	+	.	1	.	+	1	+	.	1	.	.	.	.	.	12	48
+	+	.	.	+	+	.	+	.	+	+	.	.	.	.	+	+	12	48
+	+	.	+	.	.	+	.	+	.	.	.	.	+	.	r	.	10	40
+	+	.	+	.	.	+	+	.	.	.	+	r	r	r	r	.	10	40
.	.	+	+	.	.	.	.	.	.	.	.	r	+	+	+	+	9	36
.	.	+	.	+	.	+	.	.	.	+	.	+	.	+	.	.	8	32
.	+	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	6	24

		Relevé number	1	2	3	4	5	6	7	8
		Species of the *Festuca heterophylla* variant								
H caesp	Europ.-Caucas.	*Festuca heterophylla*	+	+	1	+	+	+	.	.
H scap	Eurosib.	*Hieracium murorum*	.	1	1	.	1	+	.	.
		Character species of the alliance *Aremonio-Fagion sylvaticae and diff. of the suballiance *Cardamino kitai-***								
G rhiz	Europ.-Caucas.	*Anemone ranunculoides**	+	+	+	.	+	+	.	1
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia**	1	1	+	+	+	+	.	.
H scap	NE Medit. mont.	*Adenostyles glabra* subsp. *glabra*	.	.	.	+	.	+	.	+
G rhiz	N Medit. mont.	*Geranium nodosum*	.	+	.	.	.	+	.	.
G bulb	Paleotemp.	*Dactylorhiza maculata* subsp. *fuchsii*	.	+	.	.	.	+	.	.
H scap	Europ.-Caucas.	*Ranunculus lanuginosus**	+	.	+	.	.	.	.	.
		Charact. species of the order *Fagetalia sylvaticae*								
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	5	5	5	5	5	5	5	5
H scap	Europ.-Caucas.	*Lactuca muralis*	+	.	+	+	+	+	+	+
G rhiz	Eurasiat.	*Neottia nidus-avis*	.	+	.	.	.	.	+	+
H scap	Europ.-Caucas.	*Prenanthes purpurea*	+	+	+	+	+	3	.	.
G bulb	Europ.-Caucas.	*Scilla bifolia*	+	+	.	+	.	.	+	+
G rhiz	Europ.-Caucas.	*Galium odoratum*	1	1	+	.	.	.	.	.
H scap	Eurosib.	*Viola reichenbachiana*	+	.	1	+	+	.	.	.
H caesp	Circumbor.	*Poa nemoralis* subsp. *nemoralis*	+	+	+	.	.	+	.	.
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	+	.	+	.	1	.	.	.
H ros	Paleotrop.	*Polypodium interjectum*	+	.	.	.	.	.	.	.
H caesp	Eurimedit.	*Luzula forsteri*	.	+	.	.	.	+	.	.
G bulb	Eurosib.	*Gagea lutea*	.	.	.	.	+	+	.	.
Ch rept	Circumbor.	*Orthilia secunda*	.	.	.	.	.	.	1	.
H scap	Paleotemp.	*Heracleum sphondylium* subsp. *ternatum*	+	.	.	.	.	.	.	.
G rhiz	Europ.-Caucas.	*Epipactis microphylla*	.	.	.	.	+	.	.	.
G rhiz	Eurasiat.	*Cephalanthera rubra*	.	.	.	.	.	.	+	+
G rhiz	C Europ.	*Euphorbia dulcis*	.	.	.	.	.	.	.	.
G rhiz	C Europ.	*Cardamine bulbifera*	+	1	+	+	.	.	.	.
G bulb	Eurasiat.	*Lilium martagon*	.	.	.	.	.	.	.	.
H scap		*Stellaria nemorum* (s.l.)	+	+	.	.	.	.	.	.
P scap	Europ.-Caucas.	*Acer platanoides*	1	.	.	.	+	.	.	.
T scap	Subcosmop.	*Geranium robertianum*	+	.	.	.	.	.	.	.
H caesp	Subatl.	*Festuca altissima*	.	.	.	1	+	.	.	.
P caesp	Europ.	*Sorbus aucuparia* subsp. *aucuparia*	.	.	.	.	.	+	.	.
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	.	+	.	.	.	.	.	.
NP	Eurosib.	*Daphne mezereum*	.	.	.	.	.	.	.	+
P caesp	Orof. S Europ.	*Laburnum alpinum*	.	.	.	.	.	.	.	.
Ch suffr	Europ.-Caucas.	*Euphorbia amygdaloides* subsp. *amygdaloides*	.	.	.	.	.	.	.	.
H scap	Europ.-Caucas.	*Lamium galeobdolon* subsp. *montanum*	.	.	.	.	.	.	.	.
P scap	Pont.	*Prunus avium* subsp. *avium*	.	.	.	.	.	.	.	.
NP	Eurosib.	*Ribes alpinum*	.	.	.	.	.	.	.	.
G rhiz	Eurasiat.	*Actaea spicata*	.	.	.	.	.	.	.	.
H scap	Orof. S Europ.	*Valeriana tripteris* subsp. *tripteris*	.	.	.	.	.	.	.	.
G rhiz	Europ.-Caucas.	*Mercurialis perennis*	.	.	.	.	.	.	.	.
G rhiz	Circumbor.	*Corallorhiza trifida*	.	.	.	.	.	.	.	.
G rhiz	Eurasiat.	*Polygonatum verticillatum*	.	.	.	.	.	.	.	.
P caesp	Orof. S Europ.	*Lonicera alpigena* subsp. *alpigena*	.	.	.	.	.	.	.	.
Ch scap	Europ.-Caucas.	*Stellaria holostea* subsp. *holostea*	1	.	.	.	.	.	.	.
P scap	Paleotemp.	*Taxus baccata*	.	.	.	.	.	.	.	.
		Transgressive species from the order *Quercetalia pubescenti-petraeae*								
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	.	.	+	.	+	.	r	+

9	10	11	12	13	14	15	16*	17	18	19	20	21	22	23	24	25	Pres	Freq
.	.	.	+	+	+	+	.	.	.	+	+	.	.	.	.	.	12	48
.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	5	20
belii-Fagenion sylvaticae																		
.	+	+	.	+	1	+	+	.	+	.	+	+	+	.	+	+	18	72
+	.	+	+	.	.	+	+	.	+	.	+	.	+	r	.	+	16	64
.	.	+	.	.	+	.	.	+	.	+	.	+	+	+	.	.	10	40
.	+	.	.	.	.	.	.	.	.	.	.	1	+	.	+	+	7	28
.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	3	12
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	8
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	25	100
+	+	.	.	.	+	+	+	.	+	+	+	r	+	+	+	.	19	76
.	.	+	+	.	+	+	+	.	+	.	+	r	r	+	r	r	15	60
.	.	+	.	.	.	+	+	+	.	+	+	+	.	r	.	.	14	56
.	+	+	.	.	+	+	+	.	.	.	.	.	+	+	.	+	13	52
.	.	+	.	.	.	+	+	.	1	1	+	+	+	+	.	.	12	48
.	.	.	.	.	.	+	.	.	.	+	1	+	+	+	+	+	12	48
.	.	.	.	.	+	+	+	.	+	+	+	.	.	.	+	.	11	44
.	+	.	.	.	.	+	.	.	+	.	r	r	.	r	.	.	9	36
.	.	.	.	.	+	+	+	+	.	+	+	.	.	.	.	.	7	28
.	.	.	.	+	.	.	+	1	+	.	+	.	.	.	.	.	7	28
.	.	.	+	.	+	+	.	.	.	.	.	.	.	+	.	+	7	28
.	.	.	.	.	.	+	1	1	+	1	.	.	.	+	.	.	7	28
.	.	.	.	.	.	.	.	.	.	.	.	r	+	r	+	+	6	24
.	.	+	.	.	+	.	+	.	.	.	.	.	+	+	.	.	6	24
.	.	.	+	.	+	+	+	.	.	.	.	.	.	.	.	.	6	24
.	.	+	.	.	+	+	+	.	.	.	+	.	.	+	.	.	6	24
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	20
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.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	4	16
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.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	4	16
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.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	r	3	12
.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	+	+	3	12
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.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	.	.	2	8
.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	2	8
.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	2	8
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	2	8
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	2	8
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.	+	.	.	.	+	.	.	1	+	1	1	+	1	+	+	1	15	60

		Relevé number	1	2	3	4	5	6	7	8
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	2	+	.	.	.	.	1	.
H scap	Endem.	*Digitalis lutea* subsp. *australis*	.	.	+	.	.	.	r	.
P scap	S Europ.-Sudsib.	*Fraxinus ornus* subsp. *ornus*	.	.	.	.	+	.	+	.
H caesp	Eurasiat.	*Carex digitata*	.	.	.	.	.	.	.	.
G rhiz	Endem.	*Helleborus bocconei* subsp. *bocconei*	+	.	+	.	.	.	+	+
G rhiz	Eurasiat.	*Cephalanthera longifolia*	.	+	+	.	.	.	.	.
P caesp	Europ.-Caucas.	*Lonicera xylosteum*	.	.	.	+	.	.	+	.
H caesp	Subatl.	*Brachypodium rupestre*	.	+	.	.	.	.	.	.
H caesp	Euromedit.	*Poa sylvicola*	.	.	.	.	.	+	.	.
G rhiz	Paleotemp.	*Epipactis helleborine* (s.l.)	.	.	.	.	.	.	.	.
H scap	C Europ.	*Melittis melissophyllum* subsp. *melissophyllum*	.	.	.	.	.	.	.	.
P caesp	C Europ.	*Viburnum lantana*	.	.	.	.	.	.	.	.
NP		*Emerus majus* (s.l.)	.	.	.	+	.	.	.	.
G bulb	Orof. C Europ.	*Lilium bulbiferum* subsp. *croceum*	.	.	.	.	.	.	.	.
P caesp	Medit. mont.	*Euonymus latifolius*	.	.	.	.	.	.	.	.
P scap	SE Europ.	*Ostrya carpinifolia*	.	.	.	.	.	.	.	.
		Charact. species of the class *Querco-Fagetea*								
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	.	.	+	.	1	1	+	.
G rhiz	Eurimedit.	*Cephalanthera damasonium*	.	.	.	.	.	.	+	.
H scap	Europ.-Caucas.	*Hieracium racemosum*	+	.	.	.	.	1	+	.
P caesp	Subatlant.	*Daphne laureola*	+	+	+	1	+	.	.	.
NP	N Eurimedit.	*Rubus hirtus*	+	+	.	.	.	.	.	.
H caesp	Paleotemp.	*Melica uniflora*	.	.	.	.	+	+	.	.
H scap	Paleotemp.	*Sanicula europaea*	+	.	2	.	.	.	.	.
NP	S Medit.-Subatl.	*Rosa arvensis*	.	.	+	+	.	.	.	.
H ros	Europ.-Caucas.	*Primula vulgaris* subsp. *vulgaris*	.	.	.	.	.	.	.	.
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	.	.	.	.	.	.	.	.
G bulb	S Europ.	*Cyclamen hederifolium* subsp. *hederifolium*	+	+	.	.	.	.	.	.
H rept	Europ.-Caucas.	*Ajuga reptans*	.	.	.	.	.	.	.	.
H ros	NE Stenomedit.	*Aremonia agrimonoides* subsp. *agrimonoides*	.	.	.	.	.	.	.	.
G rhiz	S Europ.-Sudsib.	*Lathyrus venetus*	.	.	.	+	+	.	.	.
G rhiz	SE Europ.	*Anemone apennina* subsp. *apennina*	.	.	.	.	.	.	.	.
G bulb	Paleotemp.	*Platanthera bifolia*	.	.	+	.	.	.	.	.
H scap	Eurasiat.	*Cruciata glabra* subsp. *glabra*	.	.	.	.	.	.	.	.
P lian	Eurimedit.	*Hedera helix* subsp. *helix*	.	.	.	.	.	.	.	.
		Accompanying *taxa*								
T scap	Eurasiat.	*Moehringia trinervia*	+	+	+	.	.	+	.	.
H scap	Endem.	*Campanula micrantha*	.	.	+	.	+	+	.	.
H caesp	Endem.	*Sesleria nitida* (s.l.)	.	.	.	.	.	.	.	.
H scap	Sudsib.	*Veronica chamaedrys* subsp. *chamaedrys*	.	+	+	.	.	+	.	.
P caesp	Circumbor.	*Juniperus communis* subsp. *communis*	.	.	+	.	.	.	.	.
H rept	Eurosib.	*Fragaria vesca* subsp. *vesca*	.	.	+	.	.	.	.	.
P caesp	Medit. mont.	*Amelanchier ovalis* subsp. *ovalis*	.	.	.	.	.	.	.	.
		Sporadic *taxa*	6	0	5	2	2	0	2	1

9	10	11	12	13	14	15	16*	17	18	19	20	21	22	23	24	25	Pres	Freq
.	.	.	.	.	.	+	.	1	+	.	.	.	.	.	.	.	6	24
.	.	.	.	.	+	+	+	.	.	.	r	.	.	.	.	.	6	24
.	.	.	.	.	+	.	+	+	.	.	r	.	.	.	.	.	6	24
.	.	.	.	.	+	.	.	+	.	.	.	+	+	+	.	+	6	24
.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	5	20
.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	5	20
.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	4	16
.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	3	12
.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	3	12
.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	r	3	12
.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	.	+	3	12
.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	3	12
.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	2	8
.	+	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	2	8
.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	r	2	8
.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	4
.	1	+	+	1	+	+	+	.	.	.	.	+	+	1	.	+	15	60
+	1	.	.	.	.	+	+	+	+	+	+	r	r	.	+	r	13	52
.	.	.	.	.	+	+	.	+	+	+	+	+	.	r	r	.	12	48
.	.	.	+	.	.	+	.	.	.	+	+	+	.	+	.	.	11	44
.	.	+	+	+	+	+	.	.	+	+	1	.	+	.	.	.	11	44
.	.	.	.	.	+	.	.	.	.	.	.	r	+	+	+	+	8	32
.	.	.	.	+	.	.	.	.	.	1	+	1	+	.	.	.	7	28
.	.	.	.	.	+	.	.	+	.	+	+	.	.	.	+	.	7	28
.	.	+	.	+	.	.	.	.	.	.	+	+	+	.	+	+	7	28
.	.	.	.	.	.	+	+	+	.	.	.	.	r	r	.	.	5	20
.	.	.	.	.	.	.	.	.	.	.	.	r	+	.	.	.	4	16
.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	+	4	16
.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	+	4	16
.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	3	12
.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	+	3	12
.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	2	8
.	.	.	.	.	.	.	r	.	.	+	.	.	.	.	.	.	2	8
.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	.	.	2	8
.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	6	24
.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	4	16
.	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.	4	16
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	12
.	.	.	.	.	r	.	.	+	.	.	.	.	.	.	.	.	3	12
.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	3	12
.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	3	12
1	1	0	0	1	2	2	0	2	0	1	1	2	3	3	0	2		

Table 10 (Tabela 10): *Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi, Zanotti, Puppi, Speranza et Corbetta ex Ubaldi 1993 *corallorhizetosum trifidae* subass. nova *Moehringia trinervia* variant.

		Relevé number	1	2	3	4	5	6	7	8*	9	10	11
		Altitude (m a.s.l.)	1650	1620	1630	1650	1350	1670	1640	1680	1600	1620	1660
		Aspect	W	N	E	E	ENE	N	N	N	N	NW	N
		Slope (°)	30	25	25	50	30	45	45	50	30	50	40
		Area (m^2)	400	400	300	100	400	200	400	400	400	400	400
		Cover (%)	100	100	100	100	100	100	100	100	100	100	100
		Characteristic species of the association *Cardamino kitaibelii-Fagetum sylvaticae and differential species of the**											
G rhiz	SE Europ.	*Cardamine enneaphyllos**	+	+	+	1	1	1	1	+	+	1	2
G rhiz	Circumbor.	*Adoxa moschatellina**	.	+	+	.	.	+	+	.	+	+	+
G rhiz	Eurasiat.	*Lathyrus vernus* subsp. *vernus**	+	.	.	+	1	+	+	+	.	r	.
G rhiz	Eurasiat.	*Polystichum aculeatum**	.	.	.	.	+	1	+	+	+	+	+
H scap	Eurasiat.	*Epilobium montanum**	+	.	+	.	.	+	+	.	+	.	+
G rhiz	Orof. SE Europ.	*Cardamine kitaibelii**	.	.	.	.	.	.	.	.	.	.	+
H scap	Paleotemp.	*Silene dioica*	+	.	+	+	.	+	.	+	.	+	.
G rhiz	Circumbor.	*Corallorhiza trifida*	.	+	.	+	+	.	+	+	+	.	.
G rhiz	Eurasiat.	*Actaea spicata*	.	.	.	.	.	+	.	.	.	+	+
G rhiz	Circumbor.	*Polystichum lonchitis*	+	.	+	.	.	+	.	r	+	r	.
		Species of the *Moehringia trinervia* variant											
H scap	Eurasiat.	*Lamium maculatum*	.	+	+	.	.	.	.	.	.	.	+
H bienn	Eurasiat.	*Myosotis nemorosa*	.	.	.	.	.	.	.	.	.	+	.
T scap	Eurasiat.	*Moehringia trinervia*	.	.	.	.	r	.	.	.	r	.	.
H scap	E Medit. mont.	*Lamium garganicum* subsp. *laevigatum*	.	.	.	.	.	+	.	.	.	.	.
G rhiz	Eurosib.	*Aegopodium podagraria*	.	.	.	.	.	.	.	.	.	.	.
H scap	Endem.	*Campanula micrantha*	.	.	.	.	.	.	.	.	.	.	.
		Charact. species of the alliance *Aremonio-Fagion sylvaticae and diff. of the suball. *Cardamino kitaibelii-Fage-***											
H ros	NE Stenomedit.	*Aremonia agrimonoides* subsp. *agrimonoides*	+	.	1	1	+	+	.	.	+	r	+
H scap	NE Medit. mont.	*Adenostyles glabra* subsp. *glabra*	.	+	.	+	+	+	+	+	+	+	+
H scap	Endem.	*Pulmonaria apennina*	.	.	+	.	.	+	.	.	.	r	+
G rhiz	Europ.-Caucas.	*Anemone ranunculoides**	+	+	.	+	+	+	+	.	r	+	+
H scap	Europ.-Caucas.	*Ranunculus lanuginosus**	.	.	.	.	+	+	+	+	+	+	.
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia**	.	.	+	+	+	+	r	+	+	r	+
		Charact. species of the order *Fagetalia sylvaticae*											
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	5	5	5	5	5	5	5	5	5	5	5
G rhiz	Europ.-Caucas.	*Galium odoratum*	.	+	2	1	1	1	1	+	1	2	+
G rhiz	C Europ.	*Cardamine bulbifera*	.	1	1	+	1	+	+	+	+	+	1
G bulb	Europ.-Caucas.	*Corydalis cava* subsp. *cava*	.	.	+	+	+	+	.	+	1	+	1
H scap	Europ.-Caucas.	*Lactuca muralis*	.	+	.	.	1	+	+	+	+	+	+
H caesp	Circumbor.	*Poa nemoralis* subsp. *nemoralis*	+	+	+	1	+	+	+	+	.	+	+
G bulb	Europ.-Caucas.	*Scilla bifolia*	+	1	.	+	+	+	.	+	.	.	.
H scap	Eurosib.	*Viola reichenbachiana*	+	.	+	.	+	+	+	+	1	+	1
H scap		*Stellaria nemorum* (s.l.)	.	+	.	.	.	.	+	.	.	.	1
G rhiz	Eurasiat.	*Neottia nidus-avis*	+	+	+	.	+	+	+	+	+	r	+
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	.	.	.	+	+	+	r	+	r	+	+
T scap	Subcosmop.	*Geranium robertianum*	.	.	.	.	.	.	.	.	+	r	+
G rhiz	Europ.-Caucas.	*Epipactis microphylla*	.	+	.	.	+	+	r	r	r	.	.
G rhiz	Subcosmop.	*Dryopteris filix-mas*	.	.	.	.	.	+	+	.	+	+	.
G bulb	Eurasiat.	*Lilium martagon*	.	.	.	+	.	.	+	+	+	.	.
Ch suffr	Europ.-Caucas.	*Euphorbia amygdaloides* subsp. *amygdaloides*	.	.	.	+	.	.	+	+	.	+	.
G rhiz	Eurasiat.	*Cephalanthera rubra*	.	.	.	.	.	.	.	r	.	+	.
H scap	Europ.-Caucas.	*Prenanthes purpurea*	.	.	.	.	.	1	+	+	+	+	.

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1680	1600	1620	1630	1650	1650	1620	1700	1720	1710	1740	1740	1730	1710	1680	1680	1720	1710	1700	1650		
N	N	NNE	ENE	N	N	N	W	N	WSW	N	N	N	W	SW	S	SW	S	S	S	P	F
20	60	30	30	45	45	25	40	40	45	40	20	30	35	20	35	45	40	40	45	r	r
400	400	400	400	200	200	200	200	150	150	400	400	150	200	150	400	400	200	200	400	e	e
100	100	100	98	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	s	q
subassociation *corallorhizetosum trifidae*																					
2	+	+	+	1	1	1	1	2	1	2	1	2	2	1	.	.	.	.	.	26	84
.	+	+	+	+	+	+	+	1	1	.	+	2	1	+	+	1	1	+	.	24	77
1	1	.	r	.	.	.	.	.	.	.	.	.	.	.	1	+	.	+	1	14	45
+	+	+	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	13	42
.	+	+	.	+	.	.	+	.	.	+	+	.	.	.	.	+	+	.	.	14	45
.	r	.	.	+	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	4	13
+	.	r	+	+	.	+	.	+	.	+	.	+	+	+	+	1	+	.	+	20	65
.	r	.	r	.	+	.	+	+	+	+	+	+	.	+	.	.	.	.	.	16	52
+	.	+	1	+	+	.	.	+	.	.	+	.	.	.	.	.	.	.	.	10	32
.	+	.	.	+	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	11	35
.	.	.	.	.	.	.	+	.	+	.	+	.	1	+	+	+	+	+	+	13	42
.	.	.	.	.	.	.	.	+	.	+	.	.	+	+	+	+	+	+	.	9	29
.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	+	+	+	9	29
.	.	.	+	.	.	.	.	+	.	+	.	+	.	+	+	1	+	+	+	11	35
.	.	.	.	.	.	.	+	.	.	.	.	.	+	+	.	+	.	+	.	5	16
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	4	13
nion sylvaticae																					
+	+	+	+	.	1	+	.	.	.	+	+	+	.	+	.	+	1	+	+	22	71
+	.	.	r	+	+	.	+	+	.	1	+	+	2	+	.	.	.	.	.	20	65
+	.	r	+	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	9	29
+	.	+	.	+	+	.	+	.	+	+	.	1	+	+	+	+	+	.	+	23	74
+	r	+	r	.	.	.	+	.	.	+	1	+	+	1	+	.	.	.	+	18	58
.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	32
5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	31	100
1	1	1	2	2	2	3	3	3	2	3	2	2	1	1	1	2	2	1	1	30	97
1	r	+	1	+	+	+	+	2	1	1	+	2	2	1	+	1	.	.	1	28	90
+	.	.	+	1	1	2	2	3	2	2	1	2	1	+	+	1	1	+	.	25	81
+	+	+	r	+	.	.	+	+	+	1	+	.	.	+	+	+	+	+	+	24	77
+	+	+	r	.	.	.	.	.	+	.	+	.	.	+	+	+	+	+	+	22	71
+	.	.	.	.	+	+	2	2	2	+	1	1	1	+	+	1	1	1	.	21	68
1	+	1	+	.	+	+	+	.	.	.	+	.	.	+	.	+	+	.	1	21	68
+	+	+	.	+	1	.	+	+	+	1	+	3	1	1	1	+	+	+	+	21	68
+	r	r	+	.	.	.	.	.	+	+	+	.	.	.	+	+	.	+	.	20	65
+	r	.	.	.	.	.	.	.	+	.	.	.	.	.	1	+	.	+	+	15	48
+	r	r	+	+	+	.	.	+	.	.	.	.	.	.	+	+	+	+	+	15	48
+	+	r	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	12	39
.	r	+	+	+	1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	12	39
.	r	r	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	9	29
+	r	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	9	29
+	+	.	r	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	7	23
.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	19

		Relevé number	1	2	3	4	5	6	7	8*	9	10	11
Ch scap	Europ.-Caucas.	*Stellaria holostea* subsp. *holostea*	.	.	.	+	.	.	.	.	.	.	.
P caesp	Orof. S Europ.	*Laburnum alpinum*	.	.	.	.	+	.	+	+	.	+	.
H caesp	Europ.-Caucas.	*Festuca heterophylla*	.	.	.	.	.	.	.	.	.	.	.
NP	Eurosib.	*Ribes alpinum*	.	.	.	+	.	.	.	.	.	.	.
G bulb	Eurosib.	*Gagea lutea*	.	.	.	.	.	.	.	.	.	.	.
P caesp	Orof. S Europ.	*Lonicera alpigena* subsp. *alpigena*	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Europ.-Caucas.	*Mercurialis perennis*	.	.	.	.	r	.	.	.	.	.	.
G rhiz	C Europ.	*Euphorbia dulcis*	.	.	.	.	.	.	+	+	.	.	.
P caesp	Europ.	*Sorbus aucuparia* subsp. *aucuparia*	.	.	.	.	.	.	.	+	.	.	.
G rhiz	Circumbor.	*Polygonatum odoratum*	.	.	.	.	.	.	.	.	.	.	+
H scap	Paleotemp.	*Heracleum sphondylium* subsp. *ternatum*	.	.	.	.	.	.	.	.	.	.	.
T rept	Cosmopol.	*Stellaria media* subsp. *media*	.	.	.	.	.	.	.	.	.	.	.
G rhiz	Orof. SE-Europ.	*Doronicum columnae*	.	.	.	.	.	.	.	.	.	.	.
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	.	.	.	.	1	.	.	.	.	.	.
		Transgressive species from the order *Quercetalia pubescenti-petraeae*											
H scap	Endem.	*Digitalis lutea* subsp. *australis*	.	.	.	.	r	.	.	.	.	.	.
G rhiz	Paleotemp.	*Epipactis helleborine* (s.l.)	.	.	.	.	.	+	.	.	.	.	.
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	.	.	.	.	.	.	.	.	+	.	.
G rhiz	Circumbor.	*Hepatica nobilis*	.	.	.	+	.	.	.	.	.	.	.
H ros	Eurimedit.	*Viola alba* subsp. *dehnhardtii*	.	.	+	.	.	.	.	.	.	.	.
H ros	Eurimedit.	*Silene italica* subsp. *italica*	.	+	.	.	.	.	.	.	.	.	.
G Par	Circumbor.	*Monotropa hypopitys*	.	.	.	.	.	.	.	.	.	.	.
H caesp	Euromedit.	*Poa sylvicola*	.	.	.	.	.	.	.	.	.	.	.
		Charact. species of the class *Querco-Fagetea*											
NP	N Eurimedit.	*Rubus hirtus*	1	+	1	+	.	.	r	+	r	r	.
H ros	Eurimedit.	*Potentilla micrantha*	.	+	+	+	r	.	.	.	.	r	.
G rhiz	Eurimedit.	*Cephalanthera damasonium*	+	+	.	.	r	.	r	+	r	+	+
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	.	1	.	.	1	.	.	+	+	.	+
H rept	Europ.-Caucas.	*Ajuga reptans*	.	.	+	.	.	.	r	.	+	+	+
H scap	Paleotemp.	*Sanicula europaea*	.	+	.	.	.	.	.	.	+	+	+
H scap	Eurosib.	*Hieracium murorum*	.	.	.	+	r	.	.	.	.	.	+
H caesp	Paleotemp.	*Melica uniflora*	.	.	.	.	1	+	r	.	+	r	.
H scap	Eurasiat.	*Cruciata glabra* subsp. *glabra*	.	.	.	.	.	.	.	.	.	.	.
H scap	Europ.-Caucas.	*Hieracium racemosum*	.	.	.	.	.	.	+	+	.	.	.
		Accompanying *taxa*											
T scap	Eurasiat.	*Galium aparine*	.	+	+	+	.	.	.	.	.	.	.
H scap	Paleotemp.	*Alliaria petiolata*	.	.	.	.	.	.	.	.	.	.	.
H scap	S Europ.-Sudsib.	*Anthriscus nemorosa*	.	.	1	.	.	.	.	.	.	.	.
H scap	Eurasiat.	*Scrophularia scopolii*	.	.	.	.	.	.	.	.	.	.	.
T scap	Paleotemp.	*Lapsana communis*	.	.	.	.	.	.	.	.	.	.	.
G bulb	W Europ.	*Bunium bulbocastanum*	.	.	.	.	.	.	.	.	.	.	.
		Sporadic *taxa*	0	0	0	2	1	1	2	0	0	2	1

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Pres	Freq
.	.	.	r	.	.	.	.	.	.	.	+	.	.	1	.	.	.	.	+	5	16
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	13
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+	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	10
+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	10
+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	3	10
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.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	2	6
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.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	5	16
+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	4	13
.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	3	10
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.	r	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	6
.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	2	6
+	+	r	1	+	.	+	+	.	.	+	+	.	.	+	.	.	.	.	+	19	61
.	.	+	.	.	.	.	.	.	+	+	+	+	.	+	+	+	+	.	+	15	48
+	.	.	r	.	+	.	.	.	.	.	.	.	.	.	+	.	.	+	1	14	45
+	.	+	+	.	.	.	.	.	.	1	+	.	.	.	1	+	.	.	1	13	42
.	.	+	.	.	+	.	+	.	.	+	+	.	.	.	.	.	.	.	+	11	35
.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	8	26
.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	+	7	23
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	7	23
.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	4	13
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	6
.	.	.	.	.	.	.	.	.	+	+	.	.	+	2	+	+	+	+	.	11	35
.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	+	+	7	23
.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	.	6	19
.	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	3	10
.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	+	.	.	3	10
.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	+	.	3	10
1	2	3	3	0	1	0	0	1	1	1	0	2	1	0	0	0	1	3	0		

Table 11: Impoverished facies of the association *Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi, Zanotti, Puppi, Speranza et Corbetta ex Ubaldi 1993.

Tabela 11: Osiromašeni facies asociacije *Cardamino kitaibelii-Fagetum sylvaticae* Ubaldi, Zanotti, Puppi, Speranza et Corbetta ex Ubaldi 1993.

		Relevé number	1	2	3	4	5	6	7	8	9	10		
		Altitude (m a.s.l.)	1219	1241	1285	1222	1355	1168	1438	1510	1480	1499		
		Aspect	N	N	N	NNW	WNW	NNE	NNW	NNW	NNW	NW	Pres	Freq
		Slope (°)	20	20	25	35	25	23	20	15	33	30		
		Area (m²)	400	400	400	250	400	400	400	400	400	400		
		Cover (%)	88	98	87	88	95	95	95	99	95	95		
		Diagnostic species of the impoverished facies of the association *Cardamino kitaibelii-Fagetum sylvaticae*												
H caesp	Subatl.	*Brachypodium rupestre*	2	1	2	1	+	+	+	+	+	+	10	100
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	+	+	+	+	.	.	.	+	.	.	5	50
		Charact. species of the alliance *Aremonio-Fagion sylvaticae and diff. of the sub-all. *Cardamino kitaibelii-Fagenion sylvaticae***												
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia**	+	+	+	+	.	.	.	.	.	.	4	40
G rhiz	Europ.-Caucas.	*Anemone ranunculoides**	.	.	+	.	.	.	+	.	+	+	4	40
H scap	NE Medit. mont.	*Adenostyles glabra* subsp. *glabra*	.	.	.	.	.	.	+	+	+	+	4	40
G rhiz	Eurimedit.	*Ruscus hypoglossum**	.	.	.	.	.	.	+	+	.	+	3	30
		Charact. species of the order *Fagetalia sylvaticae*												
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	5	5	5	5	5	5	5	5	5	5	10	100
H scap	Europ.-Caucas.	*Lactuca muralis*	+	+	+	+	+	+	+	1	+	+	10	100
G rhiz	Europ.-Caucas.	*Galium odoratum*	1	+	+	1	.	2	2	1	1	+	9	90
H scap	Eurosib.	*Viola reichenbachiana*	+	+	.	+	+	2	1	+	+	+	9	90
H scap	Europ.-Caucas.	*Prenanthes purpurea*	+	+	+	.	+	.	+	+	+	+	8	80
P scap	Europ.-Caucas.	*Acer platanoides*	+	+	.	+	+	+	+	.	1	1	8	80
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	+	+	.	+	.	.	+	+	+	1	7	70
G rhiz	C Europ.	*Cardamine bulbifera*	+	.	.	+	+	+	+	+	.	+	7	70
G rhiz	SE Europ.	*Cardamine enneaphyllos*	.	+	.	.	.	.	1	1	+	+	5	50
H caesp	Europ.-Caucas.	*Festuca heterophylla*	+	+	+	.	+	.	.	.	.	.	4	40
G bulb	Europ.-Caucas.	*Scilla bifolia*	+	+	.	+	.	.	.	+	.	.	4	40
G rhiz	Eurasiat.	*Neottia nidus-avis*	.	.	+	.	.	+	+	+	.	.	4	40
G rhiz	Orof. SE Europ.	*Cardamine kitaibelii*	.	.	.	.	.	+	+	1	1	.	4	40
G rhiz	Circumbor.	*Anemone nemorosa*	+	.	+	.	.	+	.	.	.	.	3	30
G rhiz	Eurasiat.	*Cephalanthera rubra*	.	+	+	+	.	.	.	.	.	.	3	30
G rhiz	Orof. SE-Europ.	*Doronicum columnae*	.	+	.	.	.	+	.	.	+	.	3	30
G rhiz	Eurasiat.	*Actaea spicata*	.	.	.	1	.	.	.	.	+	+	3	30
G rhiz	Paleotemp.	*Epipactis leptochila*	.	.	.	.	+	+	+	.	.	.	3	30
G rhiz	C Europ.	*Euphorbia dulcis*	.	.	.	.	.	.	+	+	.	+	3	30
G rhiz	Circumbor.	*Adoxa moschatellina*	.	.	.	.	.	.	+	.	+	+	3	30
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	+	.	.	+	.	.	.	.	.	.	2	20
G rhiz	Europ.-Caucas.	*Epipactis microphylla*	.	.	+	.	+	.	.	.	.	.	2	20
G rhiz	Circumbor.	*Polygonatum odoratum*	.	.	.	.	.	.	+	+	.	.	2	20
G bulb	Europ.-Caucas.	*Corydalis cava subsp. cava*	.	.	.	.	.	.	.	1	+	.	2	20
H scap		*Stellaria nemorum* (s.l.)	.	.	.	.	.	.	.	+	+	.	2	20
P scap	Europ.-Caucas.	*Ulmus glabra*	.	.	.	.	.	.	.	.	1	2	2	20
G rhiz	Circumbor.	*Polystichum setiferum*	.	.	.	.	.	.	.	.	1	1	2	20
G rhiz	Eurasiat.	*Lathyrus vernus* subsp. *vernus*	.	.	.	.	.	.	1	.	.	.	1	10
		Transgressive species from the order *Quercetalia pubescenti-petraeae*												
G rhiz	Paleotemp.	*Epipactis helleborine* (s.l.)	.	+	.	+	+	+	.	+	+	.	6	60
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	+	+	.	.	.	1	.	+	.	.	4	40

		Relevé number	1	2	3	4	5	6	7	8	9	10	Pres	Freq
P scap	S Europ.-Sudsib.	*Fraxinus ornus* subsp. *ornus*	+	.	.	.	.	+	+	.	+	.	4	40
H ros	Eurimedit.	*Silene italica* subsp. *italica*	+	+	+	.	.	.	.	.	.	.	3	30
P scap	SE Europ.	*Acer opalus* subsp. *obtusatum*	+	.	+	.	.	.	.	.	.	.	2	20
H scap	Endem.	*Digitalis lutea* subsp. *australis*	.	+	.	+	.	.	.	.	.	.	2	20
G bulb	Orof. C Europ.	*Lilium bulbiferum* subsp. *croceum*	.	.	.	.	.	.	+	.	.	+	2	20
		Character species of the class *Querco-Fagetea*												
H scap	Europ.-Caucas.	*Hieracium racemosum*	+	1	1	.	+	.	+	+	.	.	6	60
P caesp	Subatlant.	*Daphne laureola*	+	+	.	+	.	+	+	+	.	.	6	60
H scap	Eurosib.	*Hieracium murorum*	+	1	2	.	.	+	.	.	.	.	4	40
NP	N Eurimedit.	*Rubus hirtus*	.	.	.	.	.	.	+	+	+	+	4	40
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	1	1	+	.	.	.	.	.	.	.	3	30
H scap	Paleotemp.	*Sanicula europaea*	+	.	.	.	+	.	.	+	.	.	3	30
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	.	+	.	+	.	.	.	.	.	.	2	20
H caesp	Paleotemp.	*Melica uniflora*	.	+	.	.	.	.	+	.	.	.	2	20
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	.	+	.	.	.	.	+	.	.	.	2	20
H rept	Europ.-Caucas.	*Ajuga reptans*	.	.	.	.	.	.	+	+	.	.	2	20
G rhiz	S Europ.-Sudsib.	*Lathyrus venetus*	.	.	.	.	.	.	+	+	.	.	2	20
		Accompanying *taxa*												
H bienn	S Europ.-Sudsib.	*Arabis turrita*	+	+	+	.	.	.	.	.	.	.	3	30
NP	Circumbor.	*Rubus idaeus*	+	.	.	+	.	.	.	.	.	.	2	20
H scap	Sudsib.	*Veronica chamaedrys* subsp. *chamaedrys*	.	.	.	.	.	.	.	.	+	+	2	20
NP	Eurasiat.	*Rosa canina*	.	.	.	.	.	.	.	.	+	+	2	20
		Sporadic *taxa*	2	2	4	1	0	3	2	2	2	3		

Table 12 (Tabela 12): *Aceretum obtusati-pseudoplatani* Biondi, Casavecchia, Pinzi, Allegrezza et Baldoni 2002.

		Relevé number	1	2	3	4	5	6	7	8	9		
		Altitude (m a.s.l.)	1040	1380	1260	1150	1250	1150	1160	1200	1200		
		Aspect	SE	E	NNE	E	ENE	NNE	NNW	E	N	Pres	Freq
		Slope (°)	50	55	30	31	65	30	25	25	20		
		Area (m²)	250	300	150	400	400	100	400	200	200		
		Cover (%)	98	100	100	98	100	100	100	100	100		
		Characteristic species of the association *Aceretum obtusati-pseudoplatani*											
P scap	SE Europ.	*Acer opalus* subsp. *obtusatum*	+	1	1	2	2	2	2	1	3	9	100
G bulb	Europ.-Caucas.	*Corydalis cava* subsp. *cava*	2	2	1	.	+	+	.	+	.	6	67
G bulb	Europ.-Caucas.	*Galanthus nivalis* subsp. *nivalis*	1	2	.	+	.	+	+	.	+	6	67
G rhiz	SE Europ.	*Cardamine enneaphyllos*	.	+	+	1	.	+	+	+	.	6	67
G rhiz	Orof. SE Europ.	*Asperula taurina* subsp. *taurina*	+	.	+	.	+	.	.	.	+	4	44
H scap	Endem.	*Pulmonaria apennina*	.	.	.	.	.	.	+	.	+	2	22
		Characteristic species of the alliance *Tilio plathyphylli-Acerion pseudoplatani*											
H scap	Orof. S Europ.	*Saxifraga rotundifolia* subsp. *rotundifolia*	+	2	+	+	+	+	+	.	.	7	77
P scap	Europ.-Caucas.	*Fraxinus excelsior* subsp. *excelsior*	1	2	+	1	.	1	.	+	+	7	77
P scap	Europ.-Caucas.	*Tilia platyphyllos* subsp. *platyphyllos*	.	1	1	3	3	+	.	.	1	6	66
P scap	Europ.-Caucas.	*Acer pseudoplatanus*	.	2	+	2	1	.	1	.	1	6	67
P scap	Europ.-Caucas.	*Acer platanoides*	1	.	1	.	2	.	.	.	.	3	33
P scap	Europ.-Caucas.	*Ulmus glabra*	.	1	1	.	1	.	.	.	.	3	33
G rhiz	Circumbor.	*Polystichum setiferum*	1	2	.	.	.	.	.	.	.	2	22
		Characteristic species of the order *Fagetalia sylvaticae*											
P scap	C Europ.	*Fagus sylvatica* subsp. *sylvatica*	4	3	4	5	3	2	3	5	2	9	100
G rhiz	Europ.-Caucas.	*Galium odoratum*	+	+	2	1	+	1	+	3	3	9	100

		Relevé number	1	2	3	4	5	6	7	8	9	Pres	Freq
H caesp	Europ.-Caucas.	*Festuca heterophylla*	+	+	+	+	+	+	1	+	+	9	100
H scap	Europ.-Caucas.	*Lactuca muralis*	+	+	+	+	.	+	1	+	+	8	89
H caesp	Paleotemp.	*Melica uniflora*	+	2	+	.	+	2	1	1	1	8	89
G rhiz	Europ.-Caucas.	*Mercurialis perennis*	r	+	+	2	2	.	+	1	.	7	78
G rhiz	Orof. SE-Europ.	*Doronicum columnae*	r	1	.	+	1	+	+	+	.	7	78
H scap	Eurosib.	*Viola reichenbachiana*	+	+	+	.	.	.	+	+	+	6	67
NP	Eurosib.	*Ribes alpinum*	+	.	.	+	.	1	+	+	+	6	67
G rhiz	Europ.-Caucas.	*Anemone ranunculoides*	+	.	.	+	.	+	+	+	+	6	67
H scap	Paleotemp.	*Campanula trachelium* subsp. *trachelium*	.	.	.	1	1	+	1	+	+	6	67
G rhiz	C Europ.	*Arum maculatum*	+	+	+	.	.	.	+	.	+	5	56
G rhiz	C Europ.	*Cardamine bulbifera*	+	1	.	1	.	.	+	+	.	5	56
G bulb	Europ.-Caucas.	*Scilla bifolia*	+	.	+	.	+	.	+	+	.	5	56
T scap	Subcosmop.	*Geranium robertianum*	+	.	1	.	.	1	.	+	1	5	56
G rhiz	C Europ.	*Euphorbia dulcis*	r	.	.	+	+	.	+	.	.	4	44
G rhiz	Circumbor.	*Adoxa moschatellina*	.	+	+	.	.	.	.	+	+	4	44
P scap	Paleotemp.	*Taxus baccata*	.	.	.	.	1	2	3	.	+	4	44
H scap		*Stellaria nemorum* (s.l.)	1	.	2	+	.	.	.	.	.	3	33
H caesp	Circumbor.	*Poa nemoralis* subsp. *nemoralis*	.	+	.	.	.	+	+	.	.	3	33
G bulb	Eurosib.	*Gagea lutea*	.	.	+	+	.	.	.	+	.	3	33
G rhiz	Circumbor.	*Anemone nemorosa*	.	.	.	+	.	+	+	.	.	3	33
G rhiz	Eurasiat.	*Neottia nidus-avis*	.	.	.	+	.	+	.	+	.	3	33
P scap	Europ.-Caucas.	*Acer campestre*	.	.	.	.	.	+	+	.	1	3	33
G rhiz	C e S Europ.	*Epipactis muelleri*	.	.	.	.	.	+	.	+	+	3	33
G rhiz	Orof. SE Europ.	*Cardamine kitaibelii*	+	+	.	.	.	.	.	.	.	2	22
H scap	NE Medit. mont.	*Adenostyles glabra* subsp. *glabra*	r	.	+	.	.	.	.	.	.	2	22
G bulb	C Europ.	*Corydalis pumila*	.	+	+	.	.	.	.	.	.	2	22
H scap	Europ.-Caucas.	*Prenanthes purpurea*	.	+	.	+	.	.	.	.	.	2	22
G bulb	Eurasiat.	*Lilium martagon*	.	+	.	+	.	.	.	.	.	2	22
G rhiz	Eurasiat.	*Polygonatum multiflorum*	.	.	+	.	.	.	.	.	+	2	22
G rhiz	Circumbor.	*Polygonatum odoratum*	.	.	.	+	+	.	.	.	.	2	22
G rhiz	Europ.-Caucas.	*Epipactis microphylla*	.	.	.	.	.	.	.	+	+	2	22
		Transgressive species from the order *Quercetalia pubescenti-petraeae*											
G rhiz		*Epipactis helleborine* (s.l.)	+	.	.	+	+	+	+	+	+	7	78
H scap	Endem.	*Digitalis lutea* subsp. *australis*	.	+	+	+	+	+	.	+	+	7	78
G rhiz	Circumbor.	*Hepatica nobilis*	.	+	+	2	1	+	1	.	.	6	67
P caesp	Paleotemp.	*Sorbus aria* subsp. *aria*	.	+	+	+	+	+	.	.	.	5	56
P caesp	Medit. mont.	*Euonymus latifolius*	.	+	.	.	+	1	1	.	+	5	56
P scap	SE Europ.	*Ostrya carpinifolia*	1	.	.	.	1	2	2	.	.	4	44
P caesp	S Europ.-Sudsib.	*Euonymus verrucosus*	.	.	.	.	+	.	+	+	+	4	44
H scap	C Europ.	*Melittis melissophyllum* subsp. *melissophyllum*	.	+	.	1	1	.	.	.	.	3	33
G bulb	Orof. C Europ.	*Lilium bulbiferum* subsp. *croceum*	.	+	.	.	+	.	.	.	+	3	33
NP		*Emerus majus* (s.l.)	.	.	.	+	+	+	.	.	.	3	33
P caesp	C Europ.	*Crataegus laevigata*	.	.	.	.	.	.	+	+	+	3	33
H scap	Paleotemp.	*Sanicula europaea*	r	.	.	.	.	.	.	.	+	2	22
H caesp	Euromedit.	*Poa sylvicola*	.	+	.	+	.	.	.	.	.	2	22
P caesp	Eurasiat.	*Euonymus europaeus*	.	.	.	+	.	.	.	1	.	2	22
P caesp	S Europ.-Sudsib.	*Laburnum anagyroides* subsp. *anagyroides*	.	.	.	.	1	.	1	.	.	2	22
P caesp	C Europ.	*Viburnum lantana*	.	.	.	.	.	+	.	+	.	2	22
Ch suffr	Subatl.	*Helleborus foetidus* subsp. *foetidus*	.	.	.	.	.	+	.	.	+	2	22
		Characteristic species of the class *Querco-Fagetea*											
T scap	N Medit.	*Cardamine graeca*	2	1	+	1	1	2	2	+	+	9	100
P caesp	Subatlant.	*Daphne laureola*	r	+	.	+	1	+	+	+	+	8	89
G rhiz	Eurimedit.	*Cephalanthera damasonium*	.	+	+	.	+	+	+	+	+	7	78
P caesp	Europ.-Caucas.	*Corylus avellana*	.	.	+	+	1	1	1	+	1	7	78
H scap	Europ.-Caucas.	*Ranunculus lanuginosus*	+	.	+	.	.	+	+	.	+	5	56

		Relevé number	1	2	3	4	5	6	7	8	9	Pres	Freq
P lian	Eurimedit.	*Hedera helix* subsp. *helix*	+	.	.	1	+	.	+	.	+	5	56
G rhiz	S Europ.-Sudsib.	*Lathyrus venetus*	.	+	+	1	.	.	.	1	+	5	56
P lian	Europ.-Caucas.	*Clematis vitalba*	.	.	.	+	+	.	+	+	+	5	56
H caesp	Paleotemp.	*Brachypodium sylvaticum* subsp. *sylvaticum*	r	+	.	.	+	.	.	.	.	3	33
G bulb	S Europ.	*Cyclamen hederifolium* subsp. *hederifolium*	1	.	.	+	+	.	.	.	.	3	33
H scap	Eurasiat.	*Aquilegia vulgaris*	r	.	.	.	+	.	.	.	.	2	22
NP	N Eurimedit.	*Rubus hirtus*	.	+	1	.	+	.	.	.	.	3	33
G rhiz	SE Europ.	*Anemone apennina* subsp. *apennina*	.	+	+	.	+	.	.	.	.	3	33
H ros	NE Stenomedit.	*Aremonia agrimonoides* subsp. *agrimonoides*	.	.	.	.	.	+	.	1	+	3	33
H caesp	Orof. SE Europ.	*Luzula sylvatica* subsp. *sylvatica*	.	.	.	.	1	.	.	.	+	2	22
H scap	Circumbor.	*Solidago virgaurea* subsp. *virgaurea*	.	.	.	.	+	.	.	.	1	2	22
H ros	Eurimedit.	*Potentilla micrantha*	.	.	.	.	.	.	.	+	+	2	22
		Accompanying *taxa*											
T scap	Eurasiat.	*Galium aparine*	r	.	1	.	.	+	+	+	.	5	56
H scap	E Medit. mont.	*Lamium garganicum* subsp. *laevigatum*	+	.	+	.	.	.	.	+	+	4	44
H caesp	Cosmopol.	*Cystopteris fragilis*	r	+	.	.	.	.	+	.	.	3	33
T scap	Eurasiat.	*Veronica hederifolia* subsp. *hederifolia*	.	.	+	.	.	+	.	.	+	3	33
H scap	Europ.	*Laserpitium latifolium*	.	.	.	+	+	.	.	.	+	3	33
H bienn	S Europ.-Sudsib.	*Arabis turrita*	.	.	.	.	+	.	.	.	+	2	22
NP	Circumbor.	*Rubus idaeus*	.	.	.	.	.	+	.	+	.	2	22
T scap	Eurasiat.	*Chaerophyllum temulum*	.	.	.	.	.	+	.	.	1	2	22
G bulb	W Europ.	*Bunium bulbocastanum*	.	.	.	.	.	.	.	+	+	2	22
		Sporadic *taxa*	9	1	5	0	3	5	5	2	8		

Table 13: Scheme of the correlation between shrubberies coenoses and the considered woods *syntaxa*.
Tabela 13: Shema korelacije med robnimi grmovnimi združbami in obravnavanimi gozdnimi sintaksoni.

	Shrub plant communities	**Principal species**
Scutellario columnae-Ostryetum carpinifoliae violetosum reichenbachianae	*Spartio juncei-Cytisetum sessilifolii* ***Cytision sessilifolii***	*Spartium junceum, Cytisophyllum sessilifolius, Lonicera etrusca, Emerus majus* subsp. *majus* and *Juniperus communis*
Carici digitatae-Ostryetum carpinifoliae	*Cytiso sessilifolii-Crataegetum laevigatae* ***Berberidion vulgaris***	*Cytisophyllum sessilifolius*, *Crataegus monogyna, Juniperus communis, Emerus majus* subsp. *majus* and *Rosa canina*
Lathyro veneti-Fagetum sylvaticae lathyretosum veneti	*Cytiso sessilifolii-Crataegetum laevigatae* ***Berberidion vulgaris***	*Crataegus laevigata, Cytisophyllum sessilifolius, Rhamnus cathartica*, *Juniperus communis* and *Viburnum lantana*
Lathyro veneti-Fagetum sylvaticae hieracietosum murori	Grouping *Erica arborea* and *Pteridium aqulinum* ***Cytision sessilifolii***	*Erica arborea, Pteridium aquilinum* subsp. *aquilinum, Juniperus communis, Cytisophyllum sessilifolius* and *Rosa canina*
Solidagini-Fagetum sylvaticae luzuletosum sylvaticae	Grouping *Cytisus scoparius* subsp. *scoparius* and *Juniperus communis* ***Berberidion vulgaris***	*Crataegus laevigata, Cytisus scoparius* subsp. *scoparius*, *Juniperus communis, Vaccinium myrtillus*and *Erica arborea*
Cardamino kitaibelii-Fagetum sylvaticae anemonetosum nemorosae	*Rhamno alpinae-Amelanchieretum ovalis* ***Berberidion vulgaris***	*Crataegus laevigata, Rhamnus alpina* subsp. *alpina, Rhamnus cathartica*, *Juniperus communis* and *Laburnum alpinum*
Cardamino kitaibelii-Fagetum sylvaticae cardaminetosum kitaibelii	*Rhamno alpinae-Amelanchieretum ovalis* ***Berberidion vulgaris***	*Rhamnus alpina* subsp. *alpina, Amelanchier ovalis* subsp. *ovalis, Cotoneaster integerrimus, Juniperus communis* and *Laburnum alpinum*
Cardamino kitaibelii-Fagetum sylvaticae corallhorizetosum trifidae	Grouping *Sorbus aucuparia* subsp. *aucuparia* and *Lonicera alpigena* subsp. *alpigena* ***Berberidion vulgaris***	*Sorbus aucuparia* subsp. *aucuparia, Rosa pendulina, Juniperus nana, Lonicera alpigena* subsp. *alpigena* and *Laburnum alpinum*