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Notes on heterobasidiomycetes of St. Helena

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Abstract

In total, 7 species of heterobasidiomycetes are reported for the first time from St. Helena. A new genus *Dendrogloeon* (*Auricularilaes*) is introduced for the new species *D. helenae* based on both DNA and morphological data. *Saccoblastia media*, sp. nova, is the sole representative of the *Pucciniomycotina*, so far found in the study area.

Introduction

This paper summarizes the first data on heterobasidiomycetes of St. Helena.

Material and methods

Eighteen specimens of heterobasidiomycetes were collected by one of us (LR) in February 2014. They are preserved in herbarium K, with some duplicates in H. Collecting localities are listed in Ryvarden (2015). DNA and morphological methods follow Miettinen et al. (2012).

Species list

Calocera furcata (Fr.) Fr.,

Specimens: LR 49525, 49573, 49457, 49478, 49509.

C. furcata is characterized by sparsely branched, orange basidiocarps and 1–3-septate spores; hyphae are clampless. It is distributed in Europe and Asia (McNabb 1965a, Reid 1974) and evidently prefers gymnosperm hosts. Its presence on St. Helena may be a result of the human-induced introduction.

Dacryopinax spathularia (Schwein.) Martin,

Specimens: LR 49584, 49430, 49456.

D. spathularia is considered as a widely distributed species with spathulate basidiocarps, clampless hyphae and 2-celled mature spores (McNabb 1965b). However, it is possible that it represents a species complex; McNabb (1965b) and Lowy (1971) listed many species names currently regarded as synonyms of *D. spathularia*.

Dendrogloeon Spirin & Miettinen, gen. nov.

Ab genero simile Basidiodendron basidia magniori et ovoidei differt. Index Fung. No 551113.

Basidiocarps corticioid, arid. Hyphal structure monomitic. Hymenium consists of gloeocystidia, dendrohyphidia and ovoid, four-celled basidia. Basidiospores broadly ellipsoid to subglobose, thin-walled, repetitive. On hardwood; presumably causes a white rot.

Type species: *Dendrogloeon helenae* Spirin, Ryvarden & Miettinen.

The genus is described to encompass the single species, *Dendrogloeon helenae* (see description and discussion below).

Dendrogloeon helenae Spirin, Ryvarden & Miettinen, sp. nova – Fig. 1

Effusus, corticioideus. Systema hypharum monomiticum; hyphae fibulatae.

Dendrohyphidia and gloeocystidia adsunt. Basidia ovoideae, 18–27 × 10–13 μm.

Basidiosporae lato ellipsoideae vel subgloboasae, 8–10.5 × 6.5–8.5 μm. Index Fung. No 551114.

Holotype. St. Helena. Plantation House, on hardwood, 5.II.2014 Ryvarden 49580 (K, isotype H).

Basidiocarps resupinate, grayish white, tough ceraceous, 0.03–0.05 mm thick, margin indistinct. Hymenial surface smooth, margin not differentiated. Hyphal structure monomitic, hyphae clamped. Subicular hyphae very densely arranged and partly glued together, slightly thick-walled, faintly cyanophilous, 3–4 μm in diam. Tramal / subhymenial hyphae densely arranged, thin-walled, 2–3 μm in diam. Gloeocystidia abundant, narrowly clavate, 22–28 × 5–8 μm (n = 10/1), with brownish, strongly cyanophilous content. Dendrohyphidia abundant, richly dichotomously branched, 1–2.5 μm in diam., embedded or slightly projecting, in some parts apically encrusted by rosette-like or stellate crystals. Basidia obovate, four-celled, (18.3–) 18.4–26.2 (–26.9) × (9.7–) 9.8–12.7 (–13.0) μm, slightly thick-walled (wall 0.3–0.5 μm thick), guttulate, with rather thick and straight, mostly blunt sterigmata up to 11 × 5 μm. Basidiospores broadly ellipsoid to subglobose, thin-walled, (8.1–) 8.3–10.3 (–10.4) × (6.2–) 6.5–8.3 (–9.2) μm, L = 9.23, W = 7.53, Q' = (1.1–) 1.2–1.4 (–1.5), Q = 1.23 (n = 20/1), with large central oil drop, inamyloid, acyanophilous.

D. helenae is so far known only from the type locality. Both nLSU and ITS sequences of this species give no close matches in GenBank. *D. helenae* is undoubtedly a member of the *Auriculariales* but it is very distant from other genera possessing similar morphological characters. The presence of gloeocystidia and almost subglobose spores brings *Basidiodendron* to mind, but species of the latter genus have thin-walled, shorter, broadly urniform or subglobose basidia, which collapse and form involucre-like structures in older basidiocarps (Luck-Allen 1963, Wells & Raitviir 1975). The sole representative of *Bourdodia*, *B. galzinii*, has stalked (petiolate) basidia and a well-developed epihymenial layer consisting of densely arranged hyphidia (Wells & Raitviir 1975, Weiss & Oberwinkler 2001). No gloeocystidiate species are known in *Exidiopsis*; however, the latter genus is highly artificial in morphological terms and certainly polyphyletic.

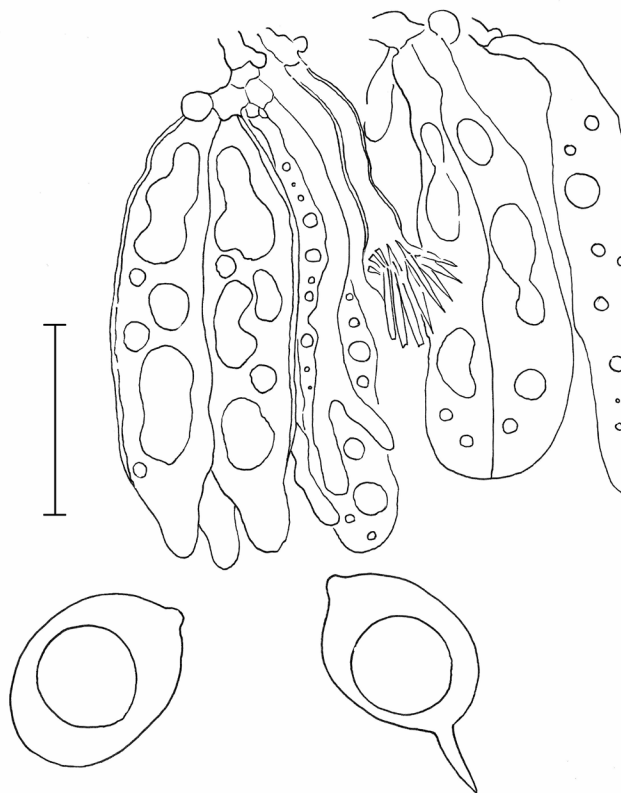


Fig. 1. *Dendrogloeon helenae* (from the holotype): hymenial cells and basidiospores. Scale bar = 10 μm .

Heterochaete inconspicua P. Roberts coll.

Specimens: LR 49514, 49583

Resupinate, grayish, semitranslucent, ceraceous, up to 0.05 mm thick, margin indistinct. Hymenial surface covered by dense, irregularly arranged hyphal pegs ("spines") up to $70 \times 60 \mu\text{m}$, 8–9 per mm. Hyphal structure monomitic, hyphae clamped, 2.5–3.5 μm in diam., thin- or slightly thick-walled, very densely arranged and abundantly encrusted (mineralized) in hyphal pegs. Cystidia rare, thin- or slightly thick-walled, clavate, up to $30 \times 7 \mu\text{m}$. Hyphidia present, richly branched, not encrusted, 1–2 μm in diam., embedded or slightly projecting. Basidia globose to obovate, four-celled, $11\text{--}13.5 \times 9\text{--}11 \mu\text{m}$ ($n = 10/1$), guttulate, with straight sterigmata up to $10 \times 2 \mu\text{m}$. Basidiospores thick cylindrical, germinating, $(8.8\text{--}) 9.5\text{--}12.4$ (-12.9) \times $(4.2\text{--}) 4.3\text{--}5.3$ (-5.7) μm , $L = 10.99$, $W = 4.75$, $Q' = (2.0\text{--}) 2.1\text{--}2.6$ (-2.7), $Q = 2.32$ ($n = 20/1$), with oily content, evenly curved (ventral side concave).

H. inconspicua was described from the British Virgin Islands based on a single collection (Roberts 2008). Two of our collections correspond with the original description in all essential details although their spores are slightly longer and wider ($9\text{--}11 \times 3.5\text{--}4 \mu\text{m}$ in the type, Roberts 2008). Further studies are needed for clarifying their conspecificity with *H. inconspicua* sensu typi.

Heterochaete shearii (Burt) Burt,
Specimens: LR 49412, 49469.

Resupinate, light brownish-gray, arid, up to 0.2 mm thick, margin abrupt. Hymenial surface covered by dense, irregularly arranged hyphal pegs ("spines") $90\text{--}120 \times 30\text{--}50 \mu\text{m}$, 6–7 per mm. Hyphal structure monomitic, hyphae clamped, 2–3.5 μm in diam., thick-walled and brownish in subiculum, thin- or only slightly thick-walled and hyaline in trama and subhymenium, densely arranged and glued by brownish substance in hyphal pegs. Crystals occasionally present on hyphal pegs. Cystidia abundant, thin- or slightly thick-walled, clavate, $26\text{--}46 \times 6.7\text{--}8.4 \mu\text{m}$. Hyphidia present, sparsely to richly dichotomously branched, 1.5–3 μm in diam., embedded or slightly projecting. Basidia subglobose to broadly ovoid, constantly two-celled, $10\text{--}16 \times 9\text{--}11 \mu\text{m}$ ($n = 10/1$), guttulate, with long, straight sterigmata up to $30 \times 2\text{--}3.5 \mu\text{m}$; a few basidia stalked-clavate, up to 30 μm long from the basal clamp. Basidiospores thick cylindrical, germinating, $(11.8\text{--}) 12.2\text{--}16.1$ (-16.2) \times $(5.0\text{--}) 5.3\text{--}6.5$ (-6.6) μm , $L = 14.40$, $W = 5.91$, $Q' = (2.0\text{--}) 2.1\text{--}2.7$ (-2.8), $Q = 2.44$ ($n = 30/1$), with oily content, ventral side concave or rarely almost flat.

H. shearii is recognizable due to arid (non-gelatinized) brownish basidiocarps and two-celled basidia. Our specimens fit well with its descriptions given by Bodman (1952), Lowy (1971) and Roberts (2001). *H. shearii* is a tropical species; it was earlier reported from both North and South America, the Pacific (Bodman 1952, Lowy 1971, Roberts 2003, 2006, 2008), Africa (Cameroon – Roberts 2001) and Azores (Roberts & Spooner 2004).

Saccoblastia media Spirin, Ryvarden & Miettinen, sp. nova – Fig. 2

S. sphaerosporae similis, sed cystidiis hyphoideis obtusis vel acutatis et sporis ellipsoideis $8.2\text{--}11 \times 6.3\text{--}8.2 \mu\text{m}$. Index Fung., No 551115.

Holotype. St. Helena. Scotland Research Station, on hardwood, 3.II.2014 Ryvarden 49436 (K, isotype H).

Basidiocarps resupinate, cream-colored, hypochnoid, covering several cm, up to 0.3 mm thick, margin pruinose. Hymenial surface smooth. Hyphal structure monomitic, hyphae clamped. Subicular hyphae loosely arranged, slightly thick-walled (wall up to 1 μm), faintly cyanophilous, $(5.8\text{--}) 6.8\text{--}8.7$ (-9.0) μm in diam. ($n = 10/1$). Tramal / subhymenial hyphae thin-walled, easily collapsing, 4–7 μm in diam. Cystidia long, hyphoid with obtuse or sharpened apex, $52\text{--}113 \times 6.3\text{--}7.9 \mu\text{m}$ ($n = 10/1$), slightly thick-walled (wall up to 0.5 μm thick). Basidia with oil droplets; probasidia bladder-shaped, $16\text{--}23 \times 7.2\text{--}10.7 \mu\text{m}$ ($n = 10/1$), metabasidia narrowly cylindrical, 4-celled, $41\text{--}76 \times 5.3\text{--}7.0 \mu\text{m}$ ($n = 10/1$), with short and rather sharp sterigmata $4.5\text{--}6 \times 1.5\text{--}2 \mu\text{m}$; sterigmata of the last cell almost apical. Basidiospores ellipsoid to broadly ellipsoid, some clearly tapering to the apiculus,

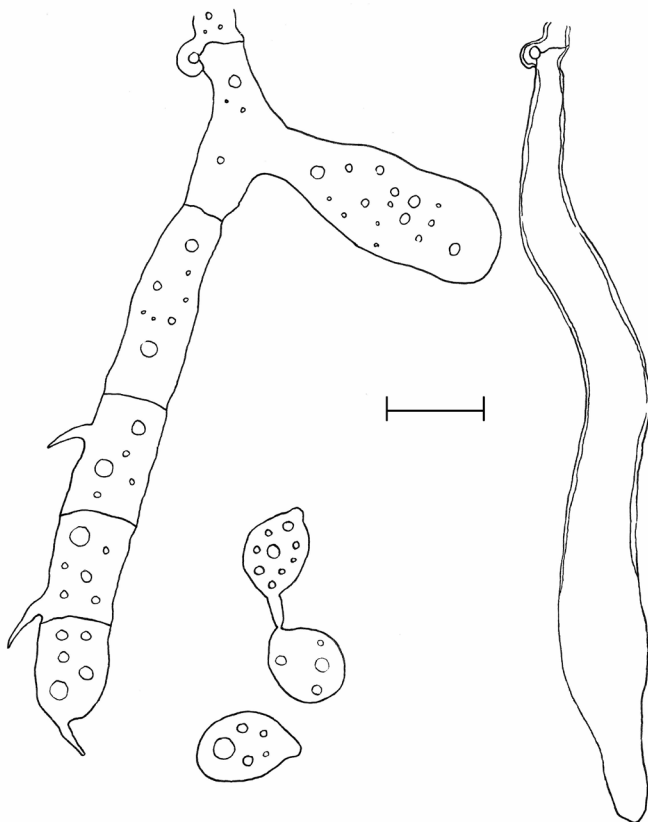


Fig. 2. *Saccoblastia media* (from the holotype): basidia, basidiospores, cystidia. Scale bar = 10 μm .

(8.1–) 8.2–11.0 (–11.1) \times (6.2–) 6.3–8.2 (–9.0) μm , $L = 9.66$, $W = 7.28$, $Q' = (1.2–) 1.3–1.5$ (–1.6), $Q = 1.33$ ($n = 30/1$), with oily content, apiculus thick and blunt, up to $1 \times 3 \mu\text{m}$. *S. media* is so far known from the type locality. Morphologically, the most similar species is the lectotype of *Saccoblastia*, *S. sphaerospora* A. Möller (selected by Kisimova-Horovitz et al. 2000). The latter species lacks cystidia and its spores are globose and smaller (6–8 μm in diam. – Lowy 1971). *Helicogloea variabilis* from Brazil (Wells 1990) and *H. globispora* from Taiwan (Wu & Chen 2000) have spores of the same size as *S. media* but they both are acystidiate species; moreover, *H. variabilis* possesses no clamps. Donk (1966) and Jülich (1976) considered *Saccoblastia* as a genus different from *Helicogloea* (the opposite view was presented by Baker 1936 and, partly, by Lowy 1971); however, the morphological differences are rather subtle (see Kirschner 2004 for further

comments). We address our new species to *Saccoblastia* based on such morphological characters as floccose basidiocarps and a presence of clamps. However, recent DNA-based studies of the *Atractiellomyces* (*Pucciniomycotina*) (Bauer et al. 2006, Aime et al. 2006) revealed that the generic division in this group is much more complicated and should be completely reconsidered.

Stypella glaira (Lloyd) Roberts coll.

Specimens: LR 49417, 49418, 49594.

Resupinate, semitranslucent, very thin (ca. 0.02 – 0.03 mm thick) and almost invisible by the naked eye. Hymenial surface smooth or covered by scattered tubercles or spines. Hyphal structure monomitic, hyphae clamped, 1.5–2 µm in diam., thin-walled. Cystidia absent. Hyphidia few, simple or scarcely branched, 1–1.5 µm in diam. Basidia pedunculate (myxarioid), 4-celled, basal part stalk-shaped, 3–8 µm long, apical part ovoid to subglobose, 8–11 × 7–9 µm (n = 10/1), guttulate, with short sterigmata up to 7 × 2.5 µm. Basidiospores broadly ellipsoid to subglobose, (5.1–) 5.2–7.1 (–7.2) × (4.1–) 4.2–5.5 (–5.8) µm, L = 5.97, W = 4.82, Q' = (1.1–) 1.2–1.4 (–1.5), Q = 1.24 (n = 30/1), with a large central oil drop, ventral side more or less distinctly convex.

The three specimens cited above possess identical morphological features which put them in the vicinity of *S. glaira* from the northern hemisphere. The latter species has a long list of synonyms and its spore variation is wide (Roberts 1998).

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