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Three new corticioid species (Basidiomycota) from the Caucasus region

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Abstract

Athelidium caucasicum from the Russian Caucasus, *Peniophora metuloidea* from NW Iran, and *Phlebia parva* from Georgia and Azerbaijan are described as new to science.

Introduction

The Caucasus region is an area of about 500,000 km² between the Black Sea and the Caspian Sea, regarded as the meeting point of Europe and Asia. It encompasses the total area of Armenia, Azerbaijan, Georgia, as well as the southernmost European Russia, NE Turkey, and northern Iran. The region has been recognized as a high-priority area for biodiversity conservation owing to its high level of species richness and presence of the two Pleistocene refugia with many relic species (Mittermeier et al. 1999).

The first checklist of corticioid and poroid basidiomycetes of the Caucasus region was published in 2009 (Ghobad-Nejjhad et al. 2009). The list has recently been revised and made available online for continuous updates (Ghobad-Nejjhad 2011a). During her PhD studies on wood-inhabiting basidiomycetes of the Caucasus region (Ghobad-Nejjhad 2011b), the first author had a chance to study part of the valuable collections mainly made by Erast Parmasto from different countries in the Caucasus region (except for Iran and Turkey), deposited at TAAM herbarium. Two of the three species described below, viz. *Athelidium*

caucasicum and *Phlebia parva*, are based on TAAM material. The third species, *Peniophora metuloidea*, was collected by the first author in Arasbaran forests, NW Iran.

Materials and methods

Specimens were studied from the herbaria H, MSK, TAAM (acronyms from Index Herbariorum, <http://sweetgum.nybg.org/ih>), and the Ghobad-Nejhad ref. coll. Squash mounts were prepared in 5% potassium hydroxide (KOH), cotton blue in lactic acid (CB), and Melzer's reagent (IKI). At least 30 spores were measured per collection. In the descriptions, Q is the variation in length to width ratios (L/W).

Athelidium caucasicum Yurchenko sp. nov.

Fig. 1

Holotype: Russia, Karachaevo-Cherkessiya, Arkhyz, Kizgytsh, Teberda Nature Reserve, 43.5° N, 41.2° E, alt. 1550 m, *Acer* forest, on dead twig of *Salix* sp., 24.IX.1968, coll. E. Parmasto (TAAM 53235; isotype in MSK). Mycobank: MB 564333.

Etymology: '*caucasicum*' referring to the type locality in the Caucasus region.

Diagnosis: The species is distinguished from *Athelidium aurantiacum* (M.P. Christ.) Oberw. by clamped septa, predominantly 2-sterigmate basidia, narrower (up to 5 µm) and slightly encrusted hyphae.

Basidiocarp annual, effused, adnate, loose-subceraceous, about 50 µm thick. Hymenial surface apricot orange, even, minutely porulose under a lens. Margin more or less diffuse.

Hyphal system monomitic, hyphae clamped at all septa, colorless, thin-walled. Hyphae and hymenial elements scarcely encrusted, incrustations mostly disappearing in KOH. Subiculum thin, subicular hyphae scarce, moderately branched, (2-)2.5-4 µm wide, little delimited from subhymenial ones. Subhymenial hyphae rather richly branched, (2.5-)3-4(-5) µm wide.

Cystidia and other sterile elements lacking.

Basidia subcylindrical or subclavate, (11-)15-20(-23) × 4-6(-7.5) µm, with (1-)2-3(-4) sterigmata measuring 3-5 × 0.8-1.3 µm.

Basidiospores broadly fusoid to subcylindrical, adaxially straight or slightly concave, smooth, thin-walled, colorless, (7-)8.5-10.5 × (2.2-)2.8-3.8(-4) µm, $L_{\text{mean}} = 9.1$ µm, $W_{\text{mean}} = 3.2$ µm, $Q = 2.2-3.6$, often glued together in pairs, IKI-, CB+, with rather large, blunt apiculus.

Remarks: *Athelidium* Oberw. is a small athelioid genus characterized by yellow to orange, adnate fruiting body, clampless hyphae, constricted basidia and nearly fusiform basidiospores (Jülich 1972, Eriksson & Ryvarden 1973, Bernicchia & Gorjón 2010). *Athelidium caucasicum* differs from *A.*

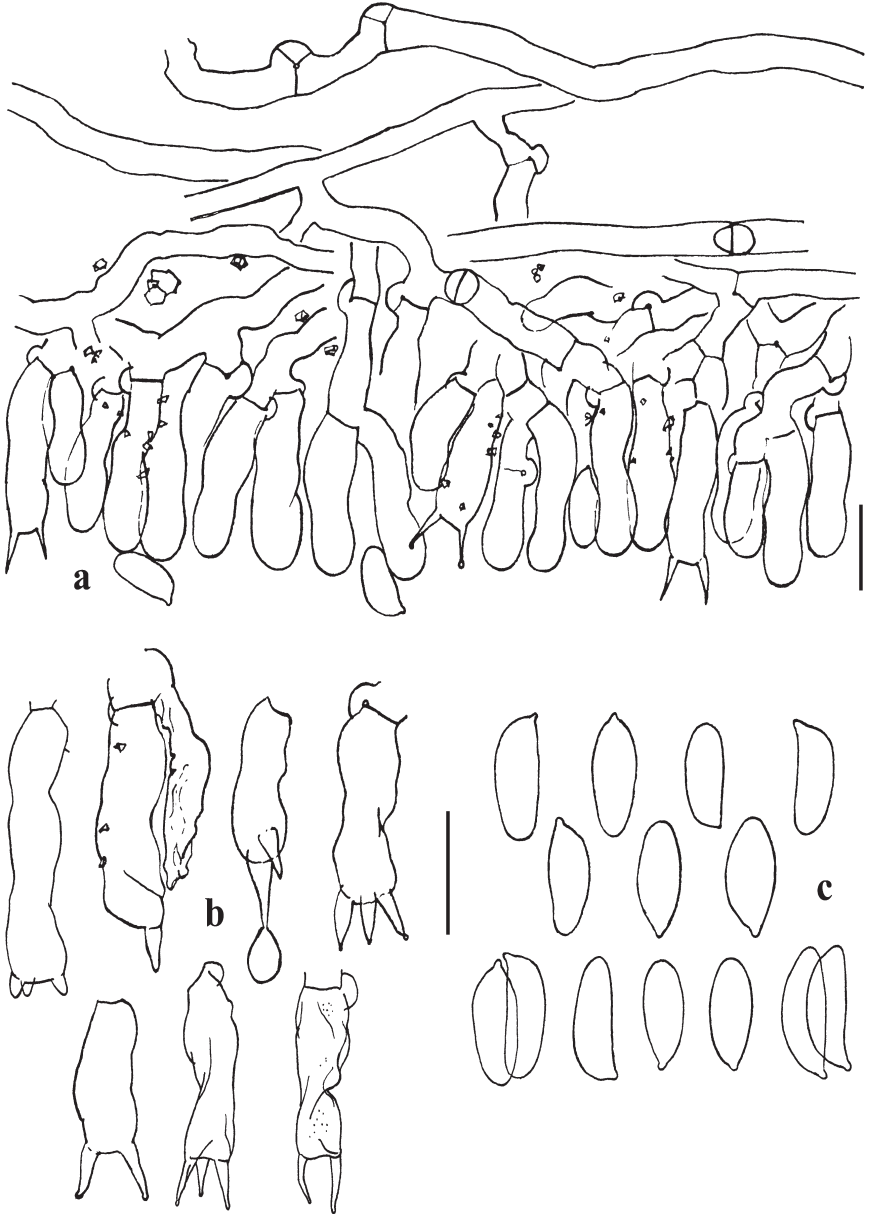


Fig. 1. *Athelidium caucasicum* sp. nov. (holotype). a) Vertical section through basidiocarp. b) Basidia. c) Basidiospores. Scale bars = 10 μ m.

aurantiacum by the presence of clamps, predominantly 2-sterigmate basidia, somewhat narrower subicular hyphae, and the presence of scarce crystalline material on hyphae. *Athelidium phycophilum* (Jülich) Zmitr. & Spirin has whitish basidiocarp, clavate basidia, and pyriform spores (Jülich 1972, as *Athelia phycophila* Jülich). The new taxon fits well in the genus except for having clamps at all septa. Nevertheless, there are several corticioid genera consisting of species with clamps and species with totally clampless septa, e.g. *Athelia* Pers., *Botryobasidium* Donk, *Byssocorticium* Bondartsev & Singer, *Clavulicium* Boidin, *Dendrothele* Höhn. & Litsch., *Galzinia* Bourdot, *Kneiffiella* P. Karst., *Paullicorticium* J. Erikss., *Peniophora* Cooke, *Radulodon* Ryvar den, *Scytinostroma* Donk, *Sistotrema* Fr., and *Steccherinum* Gray. Among athelioid fungi, *Athelopsis* Oberw. ex Parmasto sensu Eriksson & Ryvar den (1973) also has yellowish basidiocarp, but the stalked basidia characteristic for this genus are lacking in *A. caucasicum* described here.

Peniophora metuloidea Ghobad-Nejhad & Yurchenko sp. nov. Fig. 2

Holotype: Iran, East Azerbaijan Prov., Jolfa, 100 km E of Jolfa, Missan, open woodland with *Acer monspessulanum*, *Paliurus spina-christi*, *Quercus macranthera*, *Juniperus communis*, *Astragalus* spp., 38°51'07"N, 46°26'21"E, alt. 1372 m, on fallen rotten corticated branch of *Quercus macranthera*, part of the fruiting body overgrown by *Phanerochaete tuberculata* (P. Karst.) Parmasto, 29.IX.2006, coll. Ghobad-Nejhad 314 and Sohrabi (IRAN; isotypes in Ghobad-Nejhad ref. collection and MSK). Mycobank: MB 564338.

Paratype: Iran, in the same locality as the holotype, on fallen branch of *Quercus macranthera*, 29.IX.2006, coll. Ghobad-Nejhad 367 and Sohrabi (Ghobad-Nejhad ref. collection).

Etymology: ‘*metuloidea*’ referring to the conspicuous and abundant metuloid cystidia (lamprocystidia).

Diagnosis: The species is distinguished from *P. limitata* (Chaillet ex Fr.) Cooke by light brown hymenophore with olivaceous, pinkish to cream tint, and larger lamprocystidia, deeper ones with dome-shaped wall thickenings inside.

Basidiocarp annual, resupinate, adnate, confluent, ceraceous, ca. 150–250 µm thick; hymenial surface light brown with olivaceous, pinkish to cream tint, smooth to irregularly tuberculate, becoming cracked; margin determinate, minutely fimbriate under 16× lens when young, darkened in some parts.

Hyphal system monomitic, hyphae with clamps. Subiculum 35–135 µm thick, consisting of densely agglutinated, thick-walled, yellow to dark brown hyphae. Subhymenium composed of vertically arranged hyphae 2.5–4(–5) µm wide, thin to thick-walled, gelatinized in brownish yellow matrix, not changed in KOH.

Lamprocystidia abundant, almost ovoid to fusoid, often abruptly narrowed

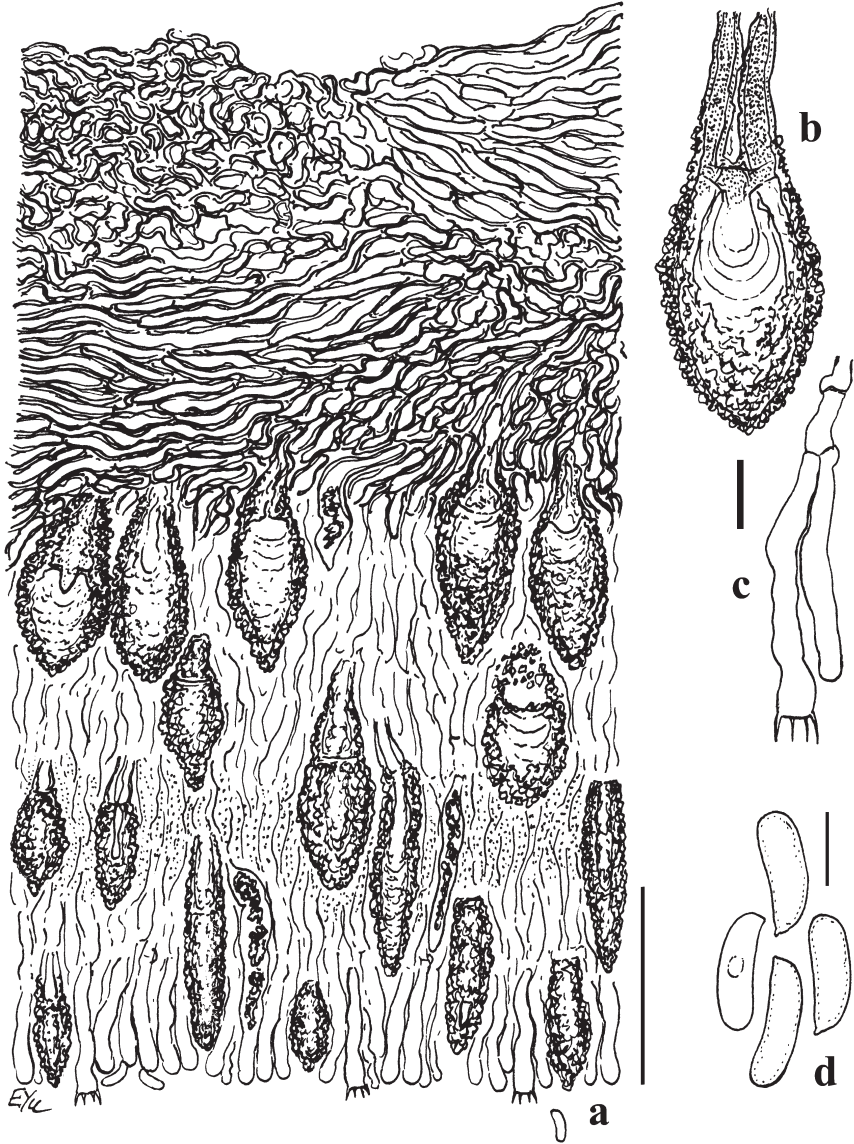


Fig. 2. *Peniophora metuloidea* (holotype). a) Vertical section through basidiocarp. b) Lamprocystidium. c) Basidium and basidiole. d) Basidiospores. Scale bars: a = 50 μ m, b and c = 10 μ m, d = 5 μ m.

near apex, apex sometimes blunt, basally with thick brown walls, developing from subicular hyphae and in subhymenium and approaching hymenium, mostly enclosed, $40\text{--}60(-75) \times (10\text{--})15\text{--}20(-24) \mu\text{m}$, crystallized part $(20\text{--})40\text{--}50 \mu\text{m}$ long. **Gloeocystidia** inconspicuous, lacking or very few, cylindrical to fusoid, $40\text{--}55 \times (4\text{--})6\text{--}8 \mu\text{m}$, thin-walled, with no schizopapilla.

Dendrohyphidia lacking.

Basidia subcylindrical to narrowly clavate, $28\text{--}43 \times 4.2\text{--}5.3 \mu\text{m}$, with a basal clamp, 4-sterigmate, walls thickened in mature basidia.

Basidiospores subcylindrical-suballantoid, $7\text{--}10(-11) \times 2.3\text{--}3.5 \mu\text{m}$, $L_{\text{mean}} = 8.5 \mu\text{m}$, $W_{\text{mean}} = 2.9 \mu\text{m}$, $Q = 2.3\text{--}3.8$ (60 spores from 2 samples), with a small apiculus, contents hyaline or faintly yellowish, walls smooth, thin to distinct, CB+, IKI-.

Additional material examined: Numerous samples of *Peniophora limitata* from various parts of Europe and some from Iran were studied. For a list of samples see Yurchenko (2010) and Ghobad-Nejhad & Hallenberg (2012).

Remarks: The key of Andreasen & Hallenberg (2009) will indicate this species to be close to *Peniophora limitata*. *Peniophora metuloidea* resembles *P. limitata* by its pigmented basal layer, shape and size of basidiospores, slightly dark margin, and the presence of lamprocystidia, but it differs from *P. limitata* by the color of hymenium (bluish-grey to brown with silver hue in the latter) and by in average larger lamprocystidia often abruptly narrowed near apex (normally conical in *P. limitata*). Basal lamprocystidia in *P. metuloidea* often reach $18\text{--}24 \mu\text{m}$ in width and have dome-shaped thickenings of walls, so that they almost lack a lumen. Besides, subhymenium in *P. metuloidea* is less pigmented than in *P. limitata*.

Phlebia parva Ghobad-Nejhad sp. nov.

Fig. 3

Holotype: Azerbaijan, Lenkoran, *Parrotia persica* forest, alt. 0–30 m.b.s.l., on *Alnus barbata*, 15.X.1962, coll. E. Parmasto (TAAM 15882). Mycobank: MB 564339.

Etymology: ‘*parva*’ referring to the small basidiospores.

Paratype: Georgia, Adjara, Khulo, Bacho, alt. 1700 m, on *Abies nordmanniana*, 3.X.1963, coll. E. Parmasto (TAAM 16022).

Diagnosis: The species is distinguished by its resupinate, grayish to ochraceous brown basidiocarp with reddish tint, monomitic hyphal system with hard consistency, densely intricate and gelatinized hyphae with clamps, short fusoid cystidia and small suballantoid basidiospores.

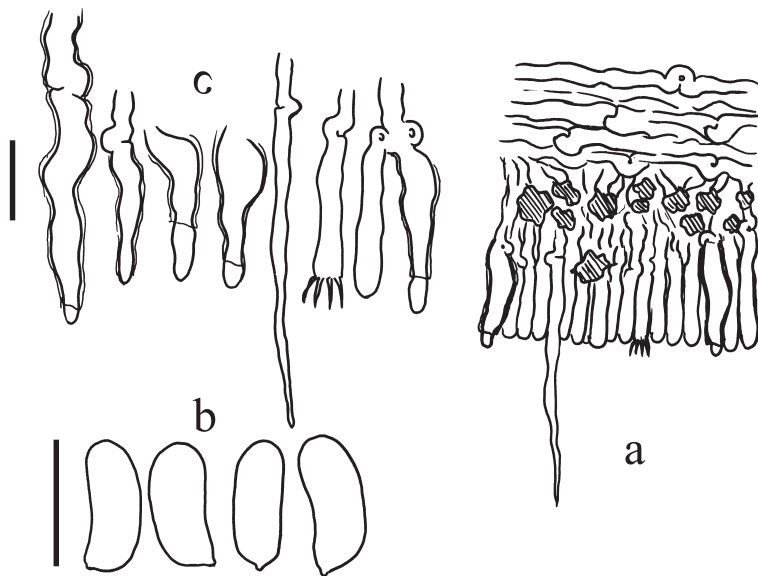


Fig. 3. *Phlebia parva* sp. nov. (holotype). a) Schematic sketch of a vertical section through basidiocarp. b) Basidiospores. c) Hymenial elements. Scale bars: b = 5 μ m, c = 10 μ m.

Basidiocarp annual, resupinate, closely adnate, ceraceous to crustaceous, confluent, 0.2–0.3 mm thick, hymenium surface with a pruina, grayish to ochraceous brown with reddish tint, irregularly tuberculate with smooth areas between tubercles, sparsely asperulate with minute teeth, margin finely fimbriate or indeterminate.

Hyphal system monomitic, all hyphae clamped, CB–, IKI–. Subhymenial (tramal) consistency very hard, hyphae gelatinized, crystallized with yellowish matter, densely intricate, individual hyphae very difficult to separate apart, 2.5–4 μ m wide, uneven, thin- to moderately thick-walled. Crystal lumps usually developing in subhymenium and eventually reaching the hymenium surface, yellowish, small or aggregated into large amorphous bodies, sometimes arranged as a horizontal layer in subhymenium. Subiculum 60–70(–100) μ m thick, composed of gelatinized, more or less horizontally arranged hyphae. Subicular hyphae hyaline, smooth, clamped, some clamps swollen, 5–8 μ m wide, walls thickened.

Basidia small, narrowly cylindrical, 20–25 × 3–3.5 μm, forming dense hymenial layer, with a basal clamp, thin-walled, bearing 4 thin sterigmata.

Cystidia of two types: 1) short fusoid, blunt, sinuous, (17–)20–30 × 3–4(–6.2) μm, mostly hymenial but also in subhymenium, enclosed, thin-walled, encrusted with resinous matter, contents hyaline, 2) narrow subulate, filiform, thin-walled, 27–40(–50) × 3–3.5 μm, projecting up to 20 μm above basidia.

Basidiospores small, suballantoid, 4–5(–5.3) × 1.5–2.1 μm, $L_{\text{mean}} = 4.5$ μm, $W_{\text{mean}} = 1.9$ μm, $Q = 1.9$ –3.1 (60 spores from 2 samples), thin-walled, smooth, CB[–], IKI[–], contents hyaline, without oil-drops.

Additional material examined: *Phlebia serialis* (Fr.) Donk. Finland, Tavastia australis, Pirkkala, Hyrsinki, on ?*Picea*, 26.VIII.2004, Unto 3497 (H).

Phlebia subochracea (Bres.) J. Erikss. & Ryvarden. Finland, Satakunta, Pori, Kankaanpään lehtokorpi, NWW Kaskisto, on ?, 16.IX.1995, Vauras 10766F (H).

Phlebia subserialis (Bourdot & Galzin) Donk. Finland, Uusimaa, Tammisaari, Snappertuna, innerside of *Betula* bark, 8.IV.2000, Kotiranta 16737 & Saarenoksa (H).

Remarks: *Phlebia subochracea* also has more or less tuberculate basidiocarp and subulate cystidia as in *Ph. parva*, but the former has thinner and softer fruiting body with lighter colouration, and much larger and ellipsoid spores. Besides, *Phlebia parva* has denser tissue with indistinct individual hyphae, while in *Ph. subochracea* the tissue is more open with easily visible hyphae.

Microscopically, *Ph. parva* may resemble *Ph. subserialis* (Bourdot & Galzin) Donk, which however has longer spores, produces yellowish-ochre exudate in KOH, and lacks fusoid cystidia. Compared to *Ph. parva*, it has thinner, chiefly smooth basidiocarp with isabelline tint.

Encrusted fusoid cystidia and suballantoid spores in *Ph. parva* reminds of *Ph. serialis* (Fr.) Donk. However, the latter species has softer fruiting body which is much easier to dissect and squash, longer spores, no crystal lumps on hyphae, no subulate cystidia, and encrustations on its hyphae are reddish.

Acknowledgments

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Literature cited

- Andreasen M, Hallenberg N (2009) A taxonomic survey of the Peniophoraceae. *Synopsis Fungorum* 26: 56–119.
- Bernicchia A, Gorjón SP (2010) *Fungi Europaei* 12—Corticiaceae s.l. Edizioni Candusso, Italy. 1008 pp.
- Eriksson J, Ryvarden L (1973) *The Corticiaceae of North Europe*. Vol. 2: *Aleurodiscus – Confertobasidium*. Oslo: Fungiflora. Pp. 60–286.
- Ghobad-Nejhad M (2011a) Updated checklist of corticioid and poroid basidiomycetes of the Caucasus region. *Mycotaxon* 117: 508 (abstract) + 70 pp. <http://www.myco-lich.com/mycology-of-iran/basidiomycota/caucasus-region/checklists>
- Ghobad-Nejhad M (2011b) Wood-inhabiting basidiomycetes in the Caucasus region - systematics and biogeography. *Publications in Botany from the University of Helsinki*. No 40. 30 pp. Yliopistopaino. URL: <http://urn.fi/URN:ISBN:978-952-10-6816-4>
- Ghobad-Nejhad M, Hallenberg N (2012) Checklist of Iranian non-gilled/non-gasteroid hymenomycetes (Agaricomycotina). *Mycotaxon* 119: 494 (abstract) + 41 pp. Available at <http://www.myco-lich.com/mycology-of-iran/basidiomycota/checklists/National-checklist> .
- Ghobad-Nejhad M, Hallenberg N, Parmasto E, Kotiranta H (2009) A first annotated checklist of corticioid and polypore basidiomycetes of the Caucasus region. *Mycologia Balcanica* 6: 123–168.
- Jülich W (1972) *Monographie der Athelieae (Corticiaceae, Basidiomycetes)*. Willdenowia. Beihefte 7: 1–283.
- Mittermeier RA, Myers N, Mittermeier CG (eds) (1999) *Hotspots, Earth's biologically richest and most endangered terrestrial ecoregions*. CEMEX and Conservation International, Mexico City.
- Yurchenko E (2010) *The genus Peniophora (Basidiomycota) of central and eastern Europe, morphology, taxonomy, ecology, distribution*. Belorusskaya nauka, Minsk. 339 pp.

Aleurodiscus indicus (Agaricomycetes) sp. nov. from India

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Abstract

Aleurodiscus indicus Ryvardeen, S.K. Sanyal, & Dhingra sp. nov. is described.

Introduction

Among many corticoid specimens collected recently, one of us (G.D.) came across *Aleurodiscus* specimens who could not be matched with any species described in the Synopsis of the genus by Nunez & Ryvardeen (1997). Thus it was concluded that it represented a new species and is described below.

Aleurodiscus indicus Ryvardeen, S.K. Sanyal, & Dhingra sp. nov.

Holotype: India, Uttarakhand: Uttarakashi, Chaurangi Khal, on decaying wood of *Rhododendron arboreum*, 29 September 2011, Dhingra 4413 in PUN, isotype in O.

Mycobank no. 802-480

Etymology: The epithet refers to the country of collection

Basidiocarp resupinate, adnate, effused, up to 1 mm thick in section; hymenial surface smooth to somewhat tuberculate, grayish orange to brownish orange when fresh, somewhat fading on drying; margins thinning, paler concolorous, to indeterminate.

Hyphal system monomitic; generative hyphae up to 6 μ m wide, branched, septate, without clamps; basal zone of brownish, horizontal, loosely arranged hyphae; followed by a zone of somewhat thick-walled more or less horizontal

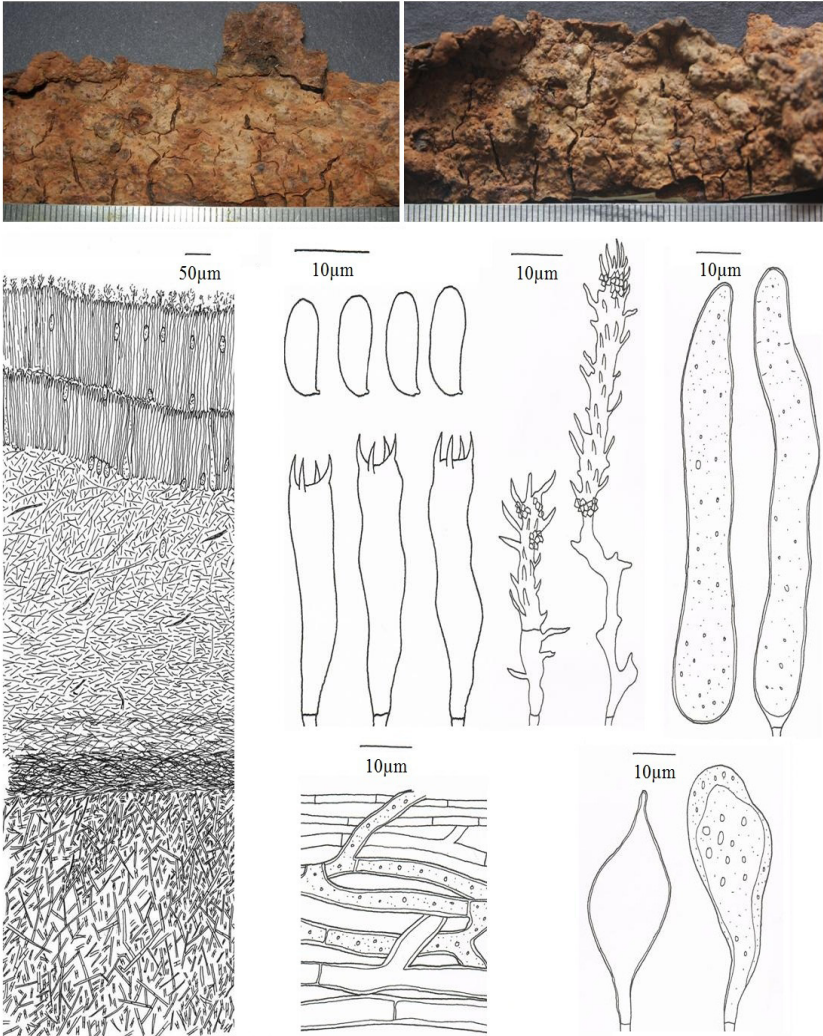


Fig. 1 *Aleurodiscus indicus*. On top: Basidiocarps, left: Section through the basidiocarp, centre: basidiospores, acanthocystidia, gloeocystidia, and section through the subhymenium. From the holotype.

hyphae with oily contents which gradually become thin-walled and vertical; subhymenial hyphae vertical, thin-walled, compactly arranged.

Acanthophyses common in hymenium, branches irregular with blunt endings.

Gloeocystidia 51.0–110.0 × 11.0–20.0 μm, abundant, bladder shaped to almost tubular, thin- to somewhat thick-walled, without basal clamp, positive to sulphovanilline.

Basidia 28.0–31.0 × 6.0–6.5 μm, clavate, tetrasterigmatic with a basal simple septum; sterigmata up to 4.0 μm long; basidioles rich in oily contents.

Basidiospores 12.0–14.0 × 4.5–5.0 μm, narrowly ellipsoid to sub-cylindrical, smooth, thin-walled, amyloid, acyanophilous.

Substratum. Known only from dead branches of *Rhododendron arboreum*.

Distribution: Known only from the type locality.

Remarks. Microscopically *A. indicus* comes close to *A. bergrenii* (Cooke) G. Cunn. known only from New Zealand, but this species has strongly pulvinate basidiocarps (remining one of those of *Xylobolus frustulatus* (Pers.) P. Karst.) besides having shorter spores, i.e. 9–12 μm long.

Literature cited

- GINNS J., BANDONI R. J. 1991. *Aleurodiscus gigasporus* sp. nov. from China and *A. subglobosporus* sp. nov. from Japan. *Mycologia*, 83: 548–552.
- ERIKSSON J., RYVARDEN L. 1973. The *Corticaceae* of North Europe—II. *Fungiflora*, Oslo. 62–261 pp.
- HALLENBERG N., PARMASTO E. 1998. Phylogenetic studies in species of *Corticaceae* growing on branches. *Mycologia* 90: 640–654.
- RATTAN S.S. 1977. The resupinate *Aphyllophorales* of the North Western Himalayas. *Bibliotheca Mycologica* 60: 1–427.
- NÚÑEZ M., RYVARDEN L. 1997. The genus *Aleurodiscus* (*Basidiomycotina*). *Synopsis Fungorum* 12: 1–164.
- THIND K. S., RATTAN S. S. The *Thelephoraceae* of India-X. 1973. *Mycologia*: 1250–1258.
- WU S-H., HIBBETT D. S., BINDER M. 2001. Phylogenetic analyses of *Aleurodiscus* s.l. and allied genera. *Mycologia* 93: 720–731.

A note of the genus *Xylobolus* P. Karst.

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Abstract

Descriptions and a key to accepted species in *Xylobolus* is provided.

Introduction

The genus *Xylobolus* P. Karst. was described for a small number of species previously placed in *Stereum* characterized by numerous achantocystidia, small, ellipsoid and amyloid spores, a dense consistency and a distinct pocket rot. Over time 15 species has been described in or transferred to *Xylobolus* and many of them have seemingly a doubtful position in the genus. Thus, to obtain a stricter concept of the genus, a key and descriptions to accepted species are provided as well as a nomenclator showing the disposition of all names in the genus.

Xylobolus P. Karst.,

Medd. Soc. Fauna Fl. Fenn. 6:11, 1881.

Basidiocarps perennial, resupinate to pileate, hard and stiff, upper surface deep brown to black, glabrous to tomentose or hirsute, hymenium smooth to undulant, beige to pale brown, hyphal system dimitic, generative hyphae with simple septa, skeletal hyphae thick-walled to solid with vertically arranged, skeletocystidia and achantocystidia present, basidia clavate, tetrasterigmatic, sometimes with small protuberances in the upper part (acanthobasidia), basidiospores ellipsoid smooth and amyloid, causes a white pocket rot.

Type species: *Thelephora frustulata* Pers.:Fr.

Remarks. The genus is related to *Stereum* but separated from it by the ellipsoid spores, numerous achantocystidia and lack of the cystidia like smooth conducting hyphae that penetrate all *Stereum* species. Further all *Xylobolus* species has a distinct pocket rot which is unknown in *Stereum*. All species in the genus has more or less the same microscopical characters except *X. gongyloides* which has longer spores than the other species in the genus. The species are in general separated on basis on colour and macroscopical characters which are strongly influenced by environmental conditions. In large collections, like that

of the Kew herbarium, there are transitions between the flabellate up to 15 cm wide specimens and the knoblike to nodulose ones, as in the type of *X. annosus* (Berk. & Br.) Boidin and it is impossible to draw a satisfactory line between the different forms. Sequencing of representative specimens will show whether we are confronted with a group of species which all are very strongly related to each other or just a single very variable species. Fig. 1 shows the general structure for all the species in the genus.

Key to species

- 1. Basidiocarps pulvinate to resupinate2
- 1. Basidiocarps distinctly pileate3

- 2. Basidiocarps resupinate usually deeply cracked, basidiocarps up to 5.5 µm long, acanthobasidia absent or very rare, cosmopolitan species almost exclusively on *Quercus* **X. frustulatus**
- 2. Basidiocarps resupinate to knoblike, basidiospores 5-7 µm long, acanthobasidia common, South American species on different hardwoods **X. gongyloides**

- 3. Pileus hirsute and brown, temperate species..... **X. subpileatus**
- 3. Pileus becoming black and glabrous or almost so, mostly of tropical distribution4

- 3. Hymenial surface first bluish, then ochraceous to grey, pileus rarely above 1 cm wide West Himalayan species **X. ahmadii**
- 3. Hymenial surface ochraceous becoming pale brown, pileus 2-10 cm wide, pantropical species **X. princeps**

Xylobolus ahmadii (Boidin) Boidin,

Revue Mycol., Paris 23: 341, 1958. - *Stereum ahmadii* Boidin, Biologia, Lahore 2: 217, 1956. Isotype in K!

Basidiocarp perennial, pileate, individual pilei up to 1 cm wide and long, in the type fused to more elongated compound basidiocarps, in parts imbricate, pileus black, glabrous, sulcate in narrow zones, margin sharp and wavy, hymenial surface smooth to slightly tuberculate, first distinct dark blue becoming grey with black spots and patches, in section distinctly stratified with very narrow distinct zones in variable whitish cream, ochraceous to pale brown, in the isotype counted up to 17 zones, in older parts darker than in younger ones, woody hard.

Hyphal system monomitic, hyphae 3.5-5 µm wide and with clamps, short celled, hyaline to yellowish brown (in older layers more strongly pigmented), sparsely

branched, vertically arranged with transitions to achantocystidia; other hyphae (tramal hyphae) 3-5 μm wide, few in number or not always found, most easily observed in very thin sections, also vertically arranged, thin to moderately thick-walled, with transitions to skeletocystidia

Cystidia present, of two kinds;

Skeletocystidia, 18-25 x 4-6 μm , thin to moderately thick-walled, barely or not projects above the basidia and the achantocystidia.

Acanthocystidia 25-30 μm x 4-5 μm , abundant, especially so in sterile specimens.

Basidia not seen.

Basidiospores 4.5-5(-5.5) x 3-3.2(-3.5) μm , shortly ellipsoid, thin-walled or occasionally slightly thick-walled, smooth, amyloid.

Substrate. Seemingly from the specimens examined, on decorticated very hard hardwood, both of deciduous trees such as *Quercus incana* and conifers such as *Cedrus deodara*.

Distribution. Restricted to Himalayas in Western Pakistan.

Remarks. The blue hymenial surface when fresh and actively growing is a distinct characters separating form all other species in the genus. Old specimens are rather similar to species of *X. princeps* of the type frequently named *X. annosus*.

Xylobolus frustulatus (Pers.:Fr.) Boidin,

Fig. 1

Rev. Mycol. (Paris) 23:341, 1958. - *Thelephora frustulata* Pers.:Fr., Syst. Mycol. 1:445, 1821. - *Thelephora frustulata* Pers., Syn. meth. Fung. p. 577, 1801.

Basidiocarp perennial, usually resupinate, rarely with a narrow black, zonate and glabrous pileus, woody textured, normally 1-2 mm thick, but in old specimens may be considerably thicker, in section distinctly stratified into several layers, soon cracked into small, angular polygons. Hymenium smooth, young layers pale ochraceous, older ones dull to deep brown.

Hyphal system monomitic, hyphae 3.5-5 μm wide and with clamps, short celled, hyaline to yellowish brown (in older layers more strongly pigmented), sparsely branched, vertically arranged with transitions to acanthocystidia; other hyphae (tramal hyphae) 3-5 μm wide, few in number or not always found, most easily observed in very thin sections, also vertically arranged, thin to moderately thick-walled, with transitions to skeletocystidia.

Cystidia present, of two kinds;

Skeletocystidia, 18-25 x 4-6 μm , thin to moderately thick-walled, barely or not projects above the basidia and the acanthocystidia.

Acanthocystidia 25-30 μm x 4-5 μm , abundant, especially so in sterile specimens.

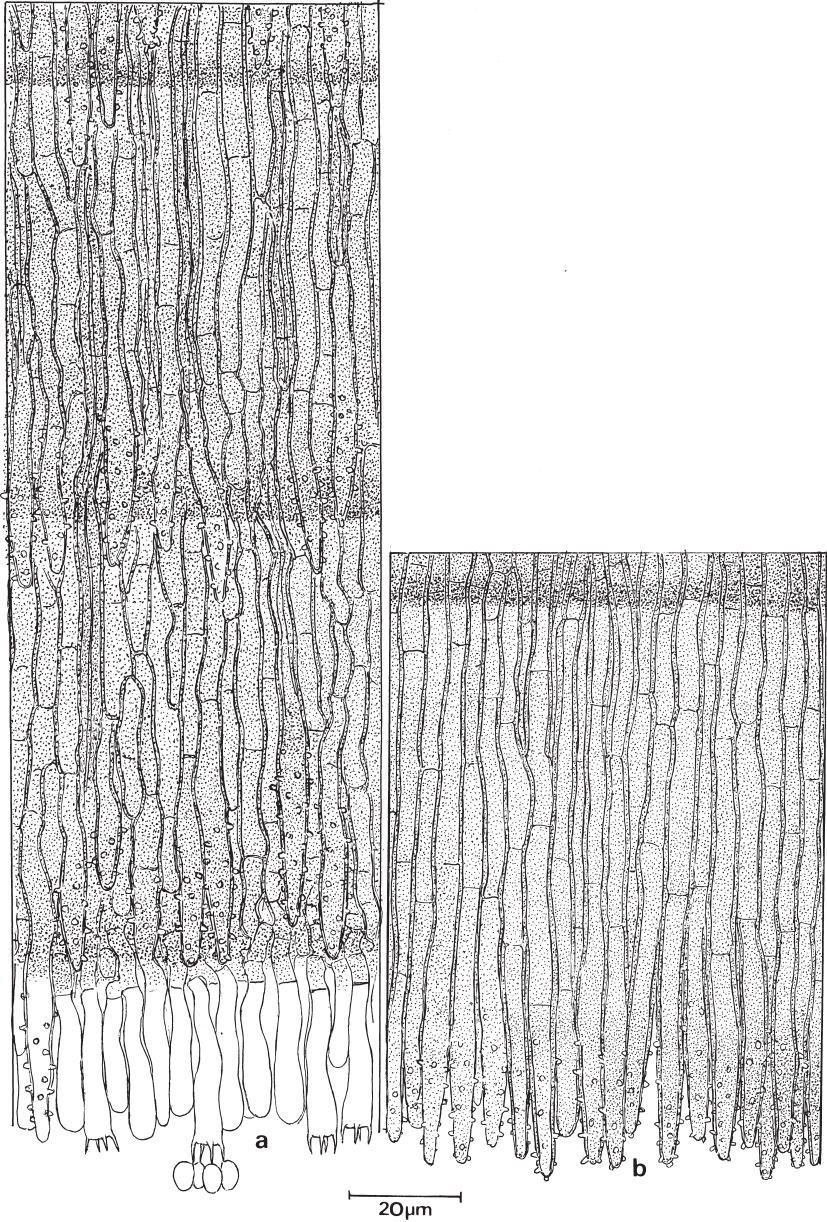


Fig. 1. *Xylobolus frustulatus*, section through the basidiocarp, showing a fertile and a sterile hymenium. Del. John Eriksson.

Basidia 25-30 x 4-5 μm , elongate clavate, smooth or with a few basal protuberances (acanthobasidia), tetrasterigmatic.

Basidiospores 4.5-5(-5.5) x 3-3.2(-3.5) μm , shortly ellipsoid, thin-walled or occasionally slightly thick-walled, smooth, amyloid.

Substrate. Most commonly on hard, decorticate wood, usually fallen branches or trunks of *Quercus*, but also known on other types of hard woods.

Distribution. Follows *Quercus* throughout its range but is rather rare, especially in the north.

Remarks. Easily recognizable in the field due to the strongly cracked often polygonal basidiocarps.

Xylobolus gongyloides Popoff & J.E. Wright,
Mycotaxon 51:321, 1994.

Basidiocarp perennial, resupinate to irregularly pulvinate, 3-4 mm thick, usually deeply cracked when dry, first wartlike, then confluent to more compound basidiocarps and then becoming nodulose with pileus black to dark brown, zonate, hymenial surface smooth to tuberculate, greyish cream to greyish blue when wet, in section with numerous very narrow zones.

Hyphal system monomitic, hyphae 3.5-5 μm wide, short-celled, simple septate, vertically arranged and with transitions to acanthocystidia.

Cystidia present, of two kinds;

Skeletocystidia 30-60 x 4-8 μm , thin to moderately thick-walled, embedded or barely projecting above the basidia and acanthocystidia.

Acanthocystidia 17-30 μm long and 4-6 μm wide, variable in shape, abundant, especially so in sterile specimens.

Basidia 25-30 x 5-6.5 μm , elongated clavate, tetrasterigmatic and usually as acanthobasidia with numerous protuberances in the upper part.

Basidiospores 5.3-7.3 x 3.5-4.8 μm , ellipsoid to ovoid, thin-walled or occasionally slightly thick-walled, smooth, amyloid.

Substrate. On decorticate logs of hard woods.

Distribution. Known only from Paraguay and Northern Argentina.

Remarks. The species comes close to *X. frustulatus* but separated by longer spores and a more distinctly pileate shape when fully developed.

Xylobolus princeps (Jungb.) Boidin,

Revue Mycol., Paris **23**: 341, 1958. - *Thelephora princeps* Jungb., Praem. Fl. Crypt. Javae (Batavia) p. 38, 1838. Holotype L!, isotypes in PC and K!.

Basidiocarp perennial, effused-reflexed, nodulose, triquetrous to fan shaped or semicircular, in larger specimens often lobed and incised, up to 10 cm wide and 7 cm wide, 4 mm thick, dense and hard when dry, pileus smooth to sulcate

in concentric zones, black and glabrous or with some apparently ephemeral narrow and thin velvety zones, hymenial surface smooth to tuberculate, cream coloured to ochraceous or pale brown with age, in section evenly brown, but with numerous very narrow zones.

Hyphal system monomitic, hyphae 3.5-5 µm wide, short-celled, lacking clamp connections, vertically arranged and with transitions to acanthocystidia.

Cystidia present, of two kinds;

Skeletocystidia 20-50 x 4-8 µm, thin to moderately thick-walled, embedded or barely projecting above the basidia and acanthocystidia.

Acanthocystidia, 25-30 µm long and 4-5 µm wide, abundant, especially so in sterile specimens.

Basidia 25-30 x 4-5 µm, elongated clavate and tetrasterigmatic, usually smooth but occasionally with some scattered protuberances in the upper part.

Basidiospores 4.5-5.0(-5.5) x 2.5-3.0(3.2) µm, shortly ellipsoid, thin-walled or occasionally slightly thick-walled, smooth, amyloid.

Substrate. On decorticate logs of hard woods of many kinds.

Distribution. Pantropical, the type came from Java, but specimens have been examined from Taiwan, Kenya, Uganda, Brazil and Costa Rica.

Remarks. The species is recognized by the often wide black pileus, more or less glabrous. Specimens with a almost a triquetrous basidiocarps with pilei rarely above 2 cm wide, has previously been called *X. annosus*, based on specimens from Sri Lanka. However, as seen in the Kew herbarium, there are transitions from effused reflexed and nodulose specimens to these being distinctly spatulate or fan shaped. Thus, a wide species concept is accepted here.

Xylobolus subpileatus (Berk. & M. A. Curtis.) Boidin,

Rev. Mycol. 23:341, 1958. - *Stereum subpileatum* Berk. & W. A. Curtis, Hooker J. Botany 1:238, 1849. K!

Basidiocarp perennial, effused-reflexed to distinctly pileate and dimidiate to slightly pendant and often attached by a central point, to 7.0 cm wide and long, coriaceous when fresh, dense and hard when dry, pileus velvety to tomentose or even hispid in various shades of brown, sometimes with violet tints, often furrowed and sulcate, becoming glabrous in zones when older, exposing a black cuticle, hymenium initially smooth then slightly tuberculate, sometimes concentrically ridged, grey to orange becoming light brown with age, fertile parts often stratified, context pale ochraceous, with a black cuticle below the pileus tomentum

Hyphal system monomitic, hyphae 3.5-5 µm wide, short-celled, lacking clamp connections, vertically arranged and with transitions to acanthocystidia.

Cystidia present, of two kinds;

Skeletocystidia 20-50 x 4-8 μm , thin to moderately thick-walled, embedded or barely projecting above the basidia and acanthocystidia.

Acanthocystidia, 25-30 μm long and 4-5 μm wide, abundant, especially so in sterile specimens.

Basidia 25-30 x 4-5 μm , elongated clavate and tetrasterigmatic.

Basidiospores 4.5-5.0(-5.5) x 2.5-3.0(3.2) μm , shortly ellipsoid, thin-walled or occasionally slightly thick-walled, smooth, amyloid.

Substrate. Usually on decorticate wood of *Quercus* spp., but also known other hardwoods.

Distribution. Seemingly follows the oak almost throughout the range of the genus, except in northern Europe.

Remarks. Recognized by the pileate basidiocarps with an upper brown, often zoned tomentum. Microscopically, the numerous acanthocystidia will immediately separate it from similarly coloured species of *Stereum*.

Nomenclator

The accepted species are written in boldface

Xylobolus ahmadii (Boidin) Boidin 1958.

Xylobolus annosus (Berk. & Broome) Boidin 1958.

= *Xylobolus princeps* (Jungh.) Boidin.

Xylobolus apricans (Bourdot) Sheng H. Wu, Boidin & C.Y. Chien

= *Aleurodiscus apricans* Bourdot.

Xylobolus areolatus (Chaillet ex Fr.) P. Karst.

= *Amylostereum areolatum* (Pers.) Boidin.

Xylobolus frustulatus (Pers.) Boidin.

Xylobolus frustulosus (Fr.) P. Karst.

= *Xylobolus frustulatus* (Pers) P. Karst.

Xylobolus gongyloides Popoff & J.E. Wright.

Xylobolus hiugensis (Imazeki) Imazeki & Hongo.

= *Xylobolus princeps* (Jungh.) Boidin.

Xylobolus illudens (Berk.) Boidin.

= *Stereum illudens* Berk.

Xylobolus princeps (Jungh.) Boidin 1958.

Xylobolus repandus (Fr.) P. Karst.

= *Stereum repandum* (Fr.) Fr. 1838, type is not found and it is a species of unknown disposition.

Xylobolus spectabilis (Klotzsch) Boidin.

= *Stereum versicolor* (Sw.) Fr. complex.

Xylobolus subpileatus (Berk. & M.A. Curtis) Boidin.

Xylobolus thoenii (Boidin, Lanq. & Gilles) Tura, Zmitr., Wasser & Spirin
= *Aleurodiscus thoenii* (Boidin, Lanq. & Gilles) Núñez & Ryvarden
Xylobolus tumulosus P. Karst.
= *Peniophora cinerea* (Pers.) Cooke.

References

Imazeki, R. 1939: Observations on Japanese Fungi III, J. Jap. Bot. 15:578-588.
Popoff, O. & Wright, J. E. 1994: Two new corticioid fungi (Aphylophorales) from NE Argentina and Paraguay, Mycotaxon 61:317-324.

A note on *Stereopsis* P. Karst. in the Neotropics

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Abstract. *Stereopsis albida* Ryvarden is described based on a Costa Rican collection.

Introduction

During field work in Costa Rica a small, white and fan shaped species were discovered on open ground on a slope close to a stream. Microscopical work revealed it to be monomitic with simple septate generative hyphae, no cystidia and spores without reaction in Melzer's reagent. These are characters defining the genus *Stereopsis* (Reid 1965, Ryvarden 2010). A search for a suitable name among those given in Ryvarden (201) and Reid (1965) gave no answer to its identity and it is herewith described as a new species.

Stereopsis albida Ryvarden nov. sp.

Holotype: Costa Rica, Punta Arenas, Valle Coto Brus, Sabalito, Amistad Hacienda, 1300 m.a. s. l., 5. November 2004, on soil, L. Ryvarden 46892, in INBio, isotype in O. Mycobank: 802473

Basidiocarps 0.5-1 cm high, 0.2-2 cm wide and up to 200 μ m thick, soft when fresh, very fragile as dry, solitary, spatulate or reniform, pileus white, becoming pale cream coloured when dry, dull, glabrous, bit in parts with a thin cover of appressed hyphal tufts or fibrils, azonate; hymenial surface whitish, sterile base or rudimentary stipe up to 5 mm long.

Hyphal system monomitic, generative hyphae, 3 - 5 μ m in diam., thin walled and with simple septa.

Cystidia not seen.

Basidia cylindrical or clavate, 20-35 x 3-5 μ m with 4 sterigmata.

Basidiospores 4-5 μ m in diameter, subglobose, thin-walled, hyaline,

Substrata. On soil.

Distribution. Known only from the type locality in Costa Rica (see above).

Remarks. The small white basidiocarps occurring in large numbers and the subglobose spores make it distinct in the genus. The spores are different from those of *S. burtianum*, being the only other simple septate species in America.

Key to species of *Stereopsis* in America

1. Gloeocystidia present in hymenium **S. radicans**
1. Gloeocystidia absent 2

2. Generative hyphae with simple septate 3
2. Generative hyphae with clamps 4

3. Basidiocarps ochraceous brown, basidiocarps ellipsoid, 3.5-5 x 2.5-3 μm **S. burtianum**
3. Basidiocarps white, basidiospores subglobose 4-5 μm in diameter **S. alba**

4. Basidiocarp black to dark brown, South American tropical species.. **S. nigripes**
4. Basidiocarps differently coloured, widespread species 5

5. Boreal species, on coniferous wood or in coniferous forests, basidiospores longer than 6.5 μm **S. humphreyi**
5. Tropical to warm temperate species in broad leaved forest, basidiospores shorter than 6.6 μm **S. hiscens**

References.

- Reid, D. A. 1965: A monograph of the stipitate stereoid fungi. Beiheft Nova Hedwigia 18:1-382.
- Ryvarden, L. 2010: Stereoid fungi of America. Synopsis Fung. 28:1-232.

Studies in Neotropical polypores 31

The genus *Oxyporus* in South and Central America and new records of further fungi from Panama

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Abstract

Oxyporus acystidiatus is described and a key to all known neotropical species in the genus is provided. Additionally eight fungi are reported for the first time for Panama.

Introduction

Oxyporus is a genus of polypores with a monomitic hyphal system with simple septate generative hyphae (Ryvarden 1991). Smooth, thin-walled spores without reaction in Melzer's reagent and presence of cystidia, in most cases apically encrusted. It includes both pileate and resupinate species and is a cosmopolitan genus (Gilbertson & Ryvarden 1985, Ryvarden & Gilbertson 1994). During an expedition to the island Coiba in Panama a white species of *Oxyporus* was collected. However, even after repeated examination we could not detect any cystidia. A search through a key to all neotropical species of *Oxyporus* (provided below) gave no answer to its identity and we describe it as a new species. There are many genera that include both cystidiate and acystidiate species, examples are *Rigidoporus* and *Oligoporus* (Ryvarden & Gilbertson 1994). Thus describing an acystidiate species in *Oxyporus* is not a general break with the principles commonly accepted for generic delimitation among poroid fungi.

During the expedition to Coiba and other field trips in the Chiriquí Province, Panama eight further fungi were collected and are newly reported for the country.

Materials and Methods

Together with other fungi a species of *Oxyporus* was collected and air-dried during an expedition to Coiba for the research project *Search for Bioactive Molecules in Tropical Fungi* (COL 10-060). During various expeditions between 2010 and 2012 further fungi were collected in the Chiriquí province. Fungal material was observed with a Leitz stereomicroscope and a Leitz microscope. The systematic position and authors of names of fungi and plants follow *Index Fungorum* and *Tropicos* (websites consulted 16 November 2012). Dried herbarium specimens were deposited in the Botanische Staatssammlung München (M), Germany, in the Herbario Nacional de la Universidad de Panamá (PMA), the herbarium of the Universidad Autónoma de Chiriquí (UCH), Panama, and in the Botanical Museum (O), Oslo, Norway.

Taxonomy

Oxyporus acystidiatus T.A. Hofm. & Ryvar den, sp. nov.

Holotype: Panama, Veraguas province, Coiba, Santa Cruz, trail to ANAM station, on dead wood of *Cecropia insignis* Liebm. (Cecropiaceae), dead leaves and soil, 07°37'6"N, 81°44'54"W, 19 March 2011, leg. T. A. Hofmann et al. LC 89 (UCH), isotype in O & PMA. Mycobank: 802485.

Basidiocarps annual, effused reflexed and imbricate, individual pilei 3 cm long and projecting up to 1 cm from the substrate and to 1 cm thick at the base, soft and fragile, upper surface adpressed velutinate, in parts finely radially striate, white, azonate margin on effused parts white, up to 4 mm wide; pore surface white, pores circular to angular, 5-7 per mm on horizontal parts of the basidiocarps, 2-4 per mm on sloping parts and there irregular with dentate dissepiments and smaller pores within larger ones; tube layer concolorous with pore surface up to 2 mm deep, context white, cottony and dense, up to 6 mm thick at base, effused sterile part between the individual pilei white, glabrous and papery smooth, no distinct taste in dry condition.

Hyphal system monomitic; generative hyphae thin-walled, smooth, simple septate and 2-5 μm wide.

Cystidia or other sterile elements not seen.

Basidia 15-18 x 5-7 μm , clavate, 4-sterigmate, simple septate at the base.

Basidiospores (4.5-) 5-6 x 4.5-5 μm globose to subglobose, thin walled, hyaline, smooth and without reaction in Melzer's reagent.

Substrata. The type was collected on a dead log of *Cecropia insignis* but also spread over the adjacent leaves and soil.

Distribution. Known only from the type locality in Panama, but will certainly shown to have a wider distribution when more collecting is preformed in Central

America, where still vast tropical forests remain more or less unexplored by mycologists.

Remarks. The dense imbricate white basidiocarps, lack of cystidia and the globose to subglobose spores characterize this species. The recently described *O. mollis* (Gibertoni et al. 2012) is a similar white pileate species, but it has smooth ventricose cystidia in the hymenium besides that the spores are smaller with 3.5-4.5 x 3.0-4.5 µm.

Key to neotropical species of *Oxyporus*

The references either after the name or in the parenthesis indicate where a description of the species can be found.

- | | |
|---------------------------------------------------------------------------|---|
| 1. Basidiocarps pileate | 2 |
| 1. Basidiocarps resupinate | 5 |
| 2. Basidiocarps annual, thin, pliable, tubes not stratified..... | 3 |
| 2. Basidiocarps perennial, dense and with stratified tubes | 4 |
| 3. Ventricose cystidia present, spores 3.5-4.5 x 3.0-4.5 µm | |
| <i>O. mollis</i> (Gibertoni et al. 2012) | |
| 3. Cystidia absent, spores 5-6 x 4.5-5 µm | |
| <i>O. acystidiatus</i> T.A. Hofm. & Ryvardeen | |
| 4. Basidiocarps cinnamon | |
| <i>O. cinnamomeus</i> Núñez & Ryvardeen (Núñez & Ryvardeen 1999) | |
| 4. Basidiocarps whitish, at least on pore surface and in context | |
| <i>O. populinus</i> (Schumach.) Donk (Ryvardeen & Gilbertson 1994) | |
| 5. Cystidia heavily encrusted | 6 |
| 5. Cystidia with a small crown of crystals | 9 |
| 6. Pores dentate and deeply split, 1-3 per mm | 7 |
| 6. Pores entire and angular, 5-6 per mm | 8 |
| 7. Basidiomes white to ochraceous | |
| <i>O. pellicula</i> (Jungh.) Ryvardeen (Ryvardeen & (Johansen 1980) | |
| 7. Basidiomes olivaceous brown to deep ochraceous..... | |
| <i>O. brunneus</i> Iturr. & Ryvardeen (Ryvardeen & Iturriaga 2010) | |

8. Basidiocarps cinnamon, basidiospores cylindrical to oblong ellipsoid, 4-5 x 1.5-2 (2.) μm *O. neotropicus* Ryvarden (Ryvarden 2004).
8. Basidiocarps ochraceous, basidiospores globose, 5-6 μm wide
..... *O. andinus* Iturr. & Ryvarden (Ryvarden & Iturriaga 2010).
9. Spores globose, pores 7-9 per mm
..... *O. fragilis* Læssøe & Ryvarden (Læssøe & Ryvarden 2010).
9. Spores ellipsoid, pores 1-6 per mm 10
10. Spores 5-7 μm long, pores usually 1-3 per mm *O. latemarginatus*
(Durieu & Mont.) Donk (Ryvarden & Gilbertson 1994).
10. Spores 3-4.5 μm long 11
11. pores round 4-6 per mm
..... *O. obducens* (Pers.) Donk (Ryvarden & Gilbertson 1994).
11. Pores angular, 2-3 per mm
..... *O. hexaporooides* Ryvarden & Iturr. (Ryvarden & Iturriaga 2011)

New records:

ASCOMYCOTA

Cladosporium oxysporum Berk. & M.A. Curtis, Davidiellaceae, Capnodiales
Specimen examined: Panama, Veraguas province, Coiba, Los Monos trail, on living leaves of *Lonchocarpus heptaphyllus* (Poir.) DC. (Fabaceae), 17 March 2011, leg. T. A. Hofmann et al. LC 64 (PMA, UCH), det. T. A. Hofmann.

BASIDIOMYCOTA

Alpova austroalnicola L.S. Domínguez, Paxillaceae, Boletales
Specimens examined: Panama, Chiriquí province, Parque Internacional de Amistad (PILA), La Cascada trail, on soil, close to *Alnus* sp. (Betulaceae), alt. ca. 2450 m a. s. l., 16 December 2010, leg. T. A. Hofmann et al. LC 09 (PMA, UCH), same locality and substrate, ca. 08°53'8"N, 82°37'09"W, ca. 2320 m, 29 July 2012, leg. M. Piepenbring et al. MP 5131 (PMA, UCH), det. M. Piepenbring & T. A. Hofmann.

Anthracophyllum lateritium (Berk. & M.A. Curtis) Singer, Marasmiaceae, Agaricales

Specimen examined: Panama, Veraguas province, Coiba, Cerro de la Equis, on dead wood (twig), 07°36'29"N, 81°43'60"W, 18 March 2011, leg. T. A. Hofmann et al. LC 70 (PMA, UCH), det. T. A. Hofmann.

Cyclomyces tabacinus (Mont.) Pat., Hymenochaetaceae, Hymenochaetales
Specimens examined: Panama, Veraguas Province, PANAMA, VERAGUAS PROVINCE, Coiba, Cerro de la Equis, on living leaves of *Miconia argentea* (Sw.) DC. (Melastomataceae), 07°36'44"N, 81°43'52"W, 18 March 2011, leg. T. A. Hofmann et al. LC 80 (M-0141277, PMA, UCH); Coiba, Santa Cruz, trail to ANAM station, on dead wood, 07°37'5"N, 81°45'13"W, 19 March 2011, leg. T. A. Hofmann et al. LC 94 (M-0141270, PMA, UCH), det. L. Ryvarden.

Phylloporia psila (Lloyd) Ryvarden, Hymenochaetaceae, Hymenochaetales
Specimen examined: Panama, Veraguas province, Coiba, Cerro de la Equis, on dead wood, 07°37'2"N, 81°45'17"W, 18 March 2011, leg. T. A. Hofmann et al. LC 73 (M-0141283, PMA, UCH), det. L. Ryvarden.

Phylloporus centroamericanus Singer & L.D. Gómez, Boletaceae, Boletales
Specimen examined: Panama, Chiriquí province, PANAMA, CHIRIQUÍ PROVINCE, Parque Internacional La Amistad (PILA), Retoño trail, on soil, ca. 2400 m a. s. l., 9 September 2011, leg. S. Castillo et al. LC 118 (PMA, UCH), det. T. A. Hofmann & M. Cedeño.

Stereum versicolor (Sw.) Fr., Stereaceae, Russulales
Specimen examined: Panama, Veraguas province, Coiba, Santa Cruz, trail to ANAM station, on dead wood (twig), 07°37'1"N, 81°45'20"W, 19 March 2011, leg. T. A. Hofmann et al. LC 93 (M-0141288, PMA, UCH), det. T. A. Hofmann & L. Ryvarden.

Ustilago affinis Ellis & Everh., Ustilaginaceae, Ustilaginales
Specimen examined: Panama, Chiriquí province, PANAMA, CHIRIQUÍ PROVINCE, road to Boquete, close to the bakery La Alemana, on inflorescences of *Stenotaphrum secundatum* (Walther) Kuntze (Poaceae), 17 July 2012, leg. M. Piepenbring et al. MP 5112 (PMA, UCH), det. M. Piepenbring.

Acknowledgement

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References:

- Gibertoni, T., Martins-Junior, A., Ryvardeen, L. & Sotão, H. 2012. *Oxyporus mollis* sp. nov. (Agaricomycetes) from the Eastern Brazilian Amazonia. *Nova Hedwigia* 94: 175-179.
- Læssøe, T. & Ryvardeen, L. 2010. Studies in neotropical polypores 26. Some new and rarely recorded species from Ecuador. *Synopsis Fungorum* 27: 34-58.
- Núñez, M. & Ryvardeen, L. 1999. New and interesting species from Japan. *Fungal Diversity* 3: 107-122.
- Ryvardeen, L. 1991. Genera of polypores, nomenclature and taxonomy. *Synopsis Fungorum* 5: 1-363.
- Ryvardeen, L. 2004. Studies in neotropical polypores 20. Some polypores from the Amazonas region. *Synopsis Fungorum* 18: 62-67.
- Ryvardeen, L. 2007. Studies on neotropical Polypores 23. New and interesting wood-inhabiting fungi from Belize. *Synopsis Fungorum* 23: 32-50.
- Ryvardeen, L. & Gilbertson, R. L. 1994. European polypores, Part 2, *Synopsis Fungorum* 7:394-743.
- Ryvardeen, L. & Iturriaga, T. 2010. Studies in Neotropical polypores 29. Some new and interesting species from the Andes region in Venezuela. *Synopsis Fungorum* 27: 78-91.
- Ryvardeen, L. & Iturriaga, T. 2011. Studies in Neotropical polypores 30. New and interesting species from Gran Sabana in Venezuela. *Synopsis Fungorum* 29: 74-81.
- Ryvardeen, L. & Johansen, I. 1980. Preliminary Polypore Flora of East Africa. 455 pp (Oslo)

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Some new species from Costa Rica

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Abstract

Dichomitus costaricensis Ryvardeen, *Sarcoporia neotropica* Ryvardeen, *Trametes brunnea* Ryvardeen, *Trichaptum album* Ryvardeen and *Tyromyces albus* Ryvardeen are described and keys to all known Neotropical species in the respective genera, are provided.

Introduction

Among a large collection of polypores collected in Costa Rica a small number of specimens could not be identified by using the current keys which has been developed over the last 20 years or so. Thus, they are described as new species below.

Dichomitus costaricensis Ryvardeen, nova species

Holotype: Costa Rica, La Amistad Pacifico, Estacion Biologicas Las Tablas, Finca Cafrosa, entre senderos Higuero y Ripario, 1300 m, 29 September 2000, on dead hard wood log, L. Ryvardeen 42879, in INBio, isotype in O. Mycobank no 802474.

Basidiocarps annual, effused reflexed, pileus up to 1 cm long, 0.5 cm wide and 4 mm thick at base, effused resupinate lower part of the basidiocarps, up to 2 cm wide, upper surface brown in variable shades becoming black from the base, glabrous and sulcate in distinct zones, some of them black and very thin margin sharp, pore surface ochraceous to cork coloured, pores round, 6-8 per mm, split on the vertical parts of the basidiocarps, tubes concolorous with pore surface, up to 3 mm long, context ochraceous and up to 1 mm thick.

Hyphal system dimitic; generative hyphae with clamps, hyaline, thin walled, 2-4 μm in diam; skeletal hyphae 2-4 μm sparingly arboriform and easily broken in microscopical preparations, solid, hyaline and without reaction in Melzer's reagent

Cystidia and other sterile hymenial elements absent.

Basidia 15-20 x 6-7 μm , clavate, tetrasterigmatic and with a basal clamp.

Basidiospores 7-8 x 3-3.2 μm , cylindrical, hyaline, thin walled and without reaction in Melzer's reagent.

Substrata. On dead hard wood log.

Distribution. Known only from the type locality.

Remarks. Undoubtedly the species is similar to *D. pendulus* which however has longer spores and an orbicular to discoid basidiocarp reminding one of a large *Aleurodiscus* species.

Key to Neotropical species of *Dichomitus*

- 1. Skeletal hyphae non-dextrinoid2
- 1. Skeletal hyphae dextrinoid.....5

- 2. Spores shorter than 10 μm 3
- 2. Spores longer than 10 μm 4

- 3. Spores 8-10 x 3-3.2 μm **D. pendulus**
- 3. Spores 7-8 x 3-3.2 μm **D. costaricensis**

- 4. Basidiospores 20-27 x 7-10 μm **D. grandisporus**
- 4. Basidiospores 15-18 x 6 - 8 μm **D. anoectoporus**

- 5. Pores 1-3 mm wide with a variable number of hyphal pegs6
- 5. Pores 2-5 per mm, lacking hyphal pegs7

- 6. Basidiospores 11-17 x 3-4.5 μm , hyphal pegs numerous **D. setulosus**
- 6. Basidiospores 20-26 x 6-9 μm , hyphal pegs few **D. mexicana**

- 7. Basidiospores cylindrical, 8-10 x 2.5-3 μm **D. cylindrosporus**
- 7. Basidiospores ellipsoid to subcylindrical, longer than 10 μm 8

- 8. Pores 4-5 per mm, spores 10-12 x 4.5-5.5 μm **D. ecuadoriensis**
- 8. Pores 2-4 per mm, spores 12-16 x 5-7 μm9

- 9. Basidiocarps perennial, up to 1.3 cm thick, cork coloured..... **D. perennis**
- 9. Basidiocarps annual, up to 3 mm thick, white to pale straw coloured
..... **D. cavernulosus**

Sarcoporia P. Karst

This is a rather characteristic genus with whitish basidiocarps which change colour to wine red or brown when dried, a monomitic hyphal system and dextrinoid slightly thick-walled basidiospores. It gives a brown rot in the wood and the type species *S. polyspora* (Syn. *Parmastomyces kravtzevianus* Bondartsev & Parmasto, *P. mollissimus* (Maire) Pouzar, *Polyporus transmutans* Overh.) is widely distributed in the boreal-temperate conifer region. Thus it came as a surprise to find another species in the genus in tropical Costa Rica.

Sarcoporia neotropica Ryvar den nova species,

Holotype: Costa Rica, Punta Arenas, Valle Coto Brus, Sabalito, Amistad Hacienda, 1300 m.a. s. l., 5. November 2004, on hard wood log, L. Ryvar den 46855, in INBio, isotype in O. Mycobank no 802475.

Basidiocarps annual, pileate, broadly sessile, 3-5 cm wide and up to 1.5 cm thick in imbricate clusters, soft and fleshy, drying brittle and contracting; pileus white, smooth when fresh, bruising or drying reddish brown and wrinkled in irregular patches; in some places with a thin dark cuticle, pore surface white, also turning reddish brown on drying, the pores circular to angular with thin dissepiments, 3-4 per mm, tubes up to 1 cm deep, white when fresh drying deep reddish wine coloured and becoming agglutinated and fragile, context white when fresh drying whitish with a faint wine red hue, up to 5 mm thick, homogenous and fragile soft shattering easily when dry

Hyphal system monomitic; contextual hyphae thin- to thick-walled, frequently branched, with clamps, 3-5 μm in diam, in the trama mostly collapsed and difficult to separate, in the context scattered gloeocystidial hyphae present, up to 6 mm wide and with large clamps and a yellowish colour.

Cystidia and other sterile hymenial elements lacking.

Basidia 12-15 x 5-7 μm , clavate, tetrasterigmatic and with a basal clamp.

Basidiospores 4-5 x 2.8-3.3 μm , ellipsoid to short cylindrical, hyaline in KOH, smooth, thick walled and dextrinoid in Melzer's reagent.

Distribution. Known only from the type locality.

Remarks. The slightly thick walled dextrinoid basidiospores, the monomitic hyphal system and the colour and consistency change under drying clearly indicate that the species belongs in *Sarcoporia* (Syn. *Parmastomyces* Kotl. & Pouzar) where these characters characterize the type species, i.e. *S. polyspora* P. Karst. This is a brown rot species, almost exclusively known from coniferous wood. Even if the rot for the new species was not examined when it was collected, the characters mentioned above make the generic position clear.

In *S. neotropica* the spores are 4-5 μm long, which separates it from the type species where they are 5-6 μm long. The difference is easily observed when

the spores from the respective types are examined in the same microscopical preparation. The spores in *S. polypora* also have a much stronger dextrinoid reaction in Melzer's reagent than those of *S. neotropica*.

Trametes Fr.

The genus *Trametes* is a large and in parts complex genus of too frequently specimens are sterile and have to be discarded. However, in a collection made in Costa Rica there was a peculiar and fortunately fertile specimen which with its trimitic hyphal system clearly belonged in the genus. A search through my keys to all known *Trametes* species in Africa, America and Europe did not give a clue to its identity and it was concluded that it is a new species.

Trametes brunnea Ryvarden nova species

Holotype: Costa Rica, Punta Arenas, Valle Coto Brus, Sabalito, Amistad Hacienda, 1300 m.a. s. l., 5. November 2004, on hard wood log, L. Ryvarden 46913, in INBio, isotype in O. Mycobank no 802476.

Basidiocarps annual, effused-reflexed with elongated pilei along upper edge of basidiocarps, individual pilei up to 4 cm long, 1 cm wide, and 2 mm thick at base, upper surface dark brown, adpressed velutinate to slightly hirsute close to the base, azonate; pore surface pale ochraceous, pores round to slightly angular 6-7 per mm, tubes concolorous with pores surface up to 1 mm deep, context white, dense and 1 mm thick at the base, in context sharply limited toward the persistent 200 μ m thick brown tomentum, effused resupinate part of the basidiocarps up to 1 cm long down from the reflexed pileus part.

Hyphal system trimitic; generative hyphae thin-walled, with clamps, rarely branched, 2-4 μ m in diam; skeletal hyphae thick-walled to almost solid 3-6 μ m hyaline in context and trama, pale brown in the pileus tomentum, biding hyphae solid, sparingly branched, hyaline 2-3 μ m wide, seen only in the context.

Cystidia or other sterile hymenial elements lacking.

Basidia clavate, 4-sterigmate, 14-20 x 5-7 μ m, with a basal clamp.

Basidiospores cylindrical, hyaline, smooth, IKI-, 5-6 x 2.5 μ m.

Substrata. On dead unknown hard wood log.

Distribution. Known only from the type locality

Remarks. In the field the species was taken for a specimen of *Datronia stereoides* having the same type of effused reflexed small basidiocarps. However, this species has a dark brown context and longer spores (8-12 μ m long) than *T. brunnea* which has a white context and shorter spores, i.e. 5-6 μ m long.

Key to Neotropical *Trametes* species

1. Pores 1-3 per mm or larger, regular, lamellate, deadaleoid, semi-labyrinthine or lacerate to almost hydroid2
1. Pores 3-8 per mm, round to angular, more or less entire6
2. Upper surface more or less glabrous3
2. Upper surface hirsute to hispid4
3. Hymenophore often lamellate or pores sinuous to deadaleoid in parts, cystidia absent **T. elegans**
3. Pores angular 1-4 mm wide, finely encrusted cystidia present **T. cystidiata**
4. Basidiocarps thin and flexible, rarely above 3 mm thick **T. villosa**
4. Basidiocarps tough, hard and rigid, up to 15 mm thick6
5. Context duplex with a distinct black zone, at least close to the base; hymenophore split and almost hydroid, spores 4.5-5.5 μm long **T. maxima**
5. Basidiocarps up to 2 cm wide, often effused reflexed, homogenous to duplex, but lacking a black zone; hymenophore regular, to slightly deadaleoid, about 1 mm wide spores 7-9 μm long **T. corvine**
6. Pileus hirsute to tomentose; context duplex, often with a black line between tomentum and context, at least close to the base7
6. Pileus adpressed velutinate and dull to subshiny or soon becoming glabrous except for margin; context homogeneous although a cuticle may develop from the base with age10
7. Pileus multizonate, often in different colours as tomentose and glabrous zones are alternating; pore surface white becoming pale tan with age **T. versicolor**
7. Pileus azonate or with zones in different colours of white to ochraceous8
8. Basidiocarps up to 1 cm wide and long, pores tiny, regular, spores cylindrical 6-8 x 2.8-3.5 μm **T. minuta**
8. Basidiocarps usually larger, spores ellipsoid to short cylindrical, up to 6 μm long9

9. Pileus hirsute to tomentose, pores angular, often slightly elongated radially; spores ellipsoid, 5-6 x 3-4 μm	T. pavonia
9. Pileus finely adpressed velutinate, becoming almost glabrous with age, white, pale tan or pale cinnamon; pores round to regular; spores cylindrical 4.5-6 x 2-2.5 μm	T. membranacea
10. Pores 1-3 per mm	11
10. Pores 4-7 per mm	12
11. Spores 10-15 μm long, skeletal hyphae dextrinoid	T. frustrata
11. Spores 4-7 μm long, skeletal hyphae non dextrinoid	T. lactinea
12. Dark reddish, brown or blackish cuticle spreading from the base	13
12. No cuticle spreading from the base, upper surface white, ochraceous becoming unevenly pale brown with age	15
13. Upper surface becoming greyish and black from base	T. cingulata
13. Upper surface becoming tan, brown to reddish from base or in zones	14
14. Upper surface usually zonate with variable colours in brown shades, not pointed hyphal ends in the hymenium	T. ectypus
14. Upper surface azonate, becoming reddish from the base, sharply pointed hyphal ends in the hymenium	T. cubensis
15. Context pale pinkish to cafe au lait, red to brownish with KOH fading to dark spot	6
16. Context white to ochraceous or cork coloured	17
16. Basidiocarps flat and flexible, upper surface soft velvety to glabrous in zones spores 1.5-2 μm wide	T. modesta
16. Basidiocarps elongated semicircular, 5-20 mm thick, upper surface azonate and glabrous, spores 2.5-3 μm wide	T. roseola
17. Pores 6-7 per mm, upper surface dark brown and adpressed velutinate.....	T. brunnea
17 Pores 3-5 per mm, upper surface whitish to ochraceous, smooth to velutinate .	18
18. Pores 3-4 per mm, often slightly irregular, spores cylindrical	19
18. Pores 4-5 per mm, more or less round, spores subglobose to ellipsoid	20

19. Basidiocarps effused reflexed, pileus flexible and papery thin, spores 7-10 μm long **T. cotonea**
 19. Basidiocarps single, sessile to dimidiate, tough, up to 6 mm thick, spores 6-7 μm long **T. marianna**
20. Spores globose, 4.5-6 μm in diameter **T. globospora**
 20. Spores ellipsoid 3-6 μm long21
21. Pore surface even, whitish, spores 3-4 x 2.5-3 μm **T. ellipsospora**
 21. Pore surface uneven, irregular, yellowish spores 5-6 x 2.5-3 μm
 **T. ochroflava**

Trichaptum album Ryvarden nova species

Holotype: Costa Rica, Punta Arenas, Valle Coto Brus, Sabalito, Amistad Hacienda, 1300 m.a. s. l., 5. November 2004, on hard wood log, L. Ryvarden 46906, in INBio, isotype in O. Mycobank no 802477.

Basidiocarps annual, semicircular dimidiate to slightly sessile; pilei imbricate, up to 3 cm wide and 3 mm thick; pileus surface white, densely tomentose and soft to touch, slightly zonate; margin acute; hymenophore surface pale violaceous when fresh, paling to cork coloured, hymenophore hydroid, spines round to slightly flattened, up to 3 mm long and 200 μm in diameter, context duplex, lower part dense and pale ochraceous with a sharp limit, but no black zone, towards the white tomentum.

Hyphal system dimitic; generative hyphae thin-walled, with clamps, occasionally branched, 2.5-5 μm in diam; skeletal hyphae thick-walled, nonseptate, rarely branched, 3-6 μm in diam;

Cystidia clavate, abundant, slightly thick-walled, becoming more so towards the pointed apex, apically encrusted, but crystals fall easily off in microscopical preparations, 20-35 x 3-5 μm and projecting to 10 μm , with a basal clamp;

Basidia clavate, 4-sterigmate, 15-22 x 4-5.5 μm , with a basal clamp.

Basidiospores cylindrical, slightly curved, 5-6 x 1.5-2 μm .

Substrata. On dead hardwood log.

Distribution. Known only from the type locality.

Remarks. The species is undoubtedly related to *T. biforme* (Fr.) Ryvarden but is separated by the white, densely tomentose pileus and the hydroid hymenophore. *T. biforme* may also develop partly hydroid hymenophore, but then as a result of splitting pores which always will be present. In *T. alba* has a completely hydroid hymenophore.

Key to Neotropical species of *Trichaptum*

1. Upper surface glabrous to adpressed tomentose mixed with glabrous zones ...2
1. Upper surface strongly strigose to hispid..... 9

2. Pores large, 5-8 per cm, whole basidiocarp dense and deep purplish to almost black **T. sprucei**
2. Pores smaller, basidiocarps greyish, clay coloured to pale brown3

3. Hymenophore distinctly hydroid4
3. Hymenophore poroid5

4. Pileus brown, spores 6-7 μm long **T. griseofuscens**
4. Pileus white, spores 4-5 μm long **T. album**

5. Basidiocarps rarely above 3 mm thick, flexible, petaloid to fan shaped or effused reflexed often in clusters, pileus velutinate to hirsute6
5. Basidiocarps usually 1 to 10 cm thick, dense and hard, usually single, pileus glabrous7

6. Pore surface grey to black, pores entire, upper surface often grey to whitish **T. sector**
6. Pore surface pale violet when fresh fading to beige or pale brown, pores often lacerate with tendencies to becoming irpicoid, upper surface grey to deep beige, often in dense zones **T. biforme**

7. Pores irregular at least in parts, 1-2 per mm or longer, pore surface split by age, basidiocarp brown **T. variabilis**
7. Pores regular and round, pore surface even, basidiocarps greyish to clay coloured8

8. Pores 8-10 mm, hardly visible to the naked eye, basidiocarps often bluish grey, up to 2 cm thick generally small **T. durus**
8. Pores 3-4 per mm, basidiocarps greyish to clay coloured or brown, up to 14 cm thick in massive specimens **T. fumosoavellanea**

9. Pileus with a dense mat of dark brown to black strigose to hispid hairs, basidiocarps sessile **T. perrottetii**
9. Pileus with gray to pale brown hirsute hairs; basidiocarps resupinate, effused-reflexed or sessile10

10. Pores 1-2 per mm, spores cylindrical 5.5-8 x 2-2.5 μm **T. byssogenum**
 10. Pores 2-4 per mm, spores ellipsoid, 4.5-6 x 2.5-3 μm **T. strigosum**

Tyromyces albus Ryvarden nova species,

Holotype: Costa Rica, La Amistad Pacifico, Estacion Biologicas Las Tablas, Finca Cafrosa, sendero Progreso 1280 m, 29 September 2000, on dead hard wood log, L. Ryvarden 43002, in INBio, isotype in O. Mycobank no 802478.

Basidiocarps annual, pileate, applanate to slightly convex, fan shaped to spatulate, 4 cm wide and long and 3 mm thick at the contracted base, at the type locality in dense clusters, some sort of 40 specimens along the dead long which the were growing, pileus pure white, glabrous and smooth when fresh slight radially folded when dry, margin sharp and partly deflexed in dry specimens, pore surface white to pale cream, pores circular, 6-7 per mm, with thin dissepiments; tube layer concolorous with pore surface, up to 1 mm thick, context white and dense in dry condition, up to 1.5-2 mm thick at the base;

Hyphal system monomitic; generative hyphae with clamps, thin-walled, 2-4 μm in diam, , in the trama more or less parallel and more straight, in the context more or less parallel in radial direction and up to 7 μm in diam

Cystidia absent.

Basidia 14-20 x 4-5 μm , clavate, tetrasterigmatic with a basal clamp.

Basidiospores 3.5-4 x 2-2.3 μm , cylindrical, smooth, hyaline, thin walled and without reaction in Melzer's reagent.

Substrata. On dead hard wood log.

Distribution. Known only from the type locality.

Remarks. The species is undoubtedly related to *T. pseudolacteus* Murrill, but this species has larger spores (4-5 x 2.5-3.5 μm).

Key to Neotropical species of *Tyromyces*

1. Basidiocarps stipitate, semistipitate to pendant2
 1. Basidiocarp sessile-dimidiolate6
2. Pileus warm chocolate brown or cinnamon3
 2. Pileus differently coloured4
3. Basidiospores allantoid, pileus warm chocolate brown **T. polyporoides**
 3. Basidiospores broadly ellipsoid to subglobose, pileus cinnamon
 **T. cinnamomeus**

4. Basidiocarps distinctly reddish, basidiospores shorter than 8 μm in longest dimension	5
4. Basidiocarps differently coloured, basidiospores 8-10 μm long	T. aquosus
5. Basidiocarp pendant, basidiospores subglobose 4-5 x 3.5-4.5 μm ...	T. navarrii
5. Basidiocarp flabellate to semistipitate basidiospores oblong ellipsoid sp. 6-8 μm long	T. singeri
6. Spores allantoid to cylindrical	7
6. Spores globose to ellipsoid	14
7. Gloecystidia present	T. hypocitrinus
7. Gloecystidia absent	8
8. Context duplex, lower part cinnamon, upper part white	T. duplex
8. Context homogenous, white to ochraceous	9
9. Basidiospores 5-6 μm long, pores 3-4 per mm, bulbous cystidia present in the dissepiments	T. nodulosus
9. Basidiospores shorter than 5 μm , pores 4-9 per mm, cystidia absent in the dissepiments	10
10. Upper surface pale reddish to dark brown, pores 4-7 per mm	11
10. Upper surface whitish to pale yellow, pores 7-9 per mm	13
11. Upper surface strigose by bundles of stiff dark brown hairs ...	T. neostrigosus
11. Upper surface adpressed velutinate to glabrous.....	12
12. Upper surface pale reddish brown, basidiospores 4-4.5 x 1.5-2 μm wide	T. preguttulatus
12. Upper surface chocolate brown, basidiospores 3-4 x 1.2-1.5 μm	T. americanus
13. Upper surface pale yellow, glabrous, basidiocarps rarely more than 3 mm thick	T. caesioflavus
13. Upper surface white to cream, velvety to tomentose, basidiocarps 1-2 cm thick	T. leucomallus

14. Basidiocarps contracting strongly and become dense and resinous with drying15
14. Basidiocarps not contracting and becoming dense and resinous by drying...16
15. Upper surface hirsute to velvety, whitish to ochraceous grey, basidiospores 5-5.5 x 4-4.5 μm **T. subgiganteus**
15. Upper surface glabrous, dirty white to pink, basidiospores 3.5-4.5 x 2.5-3.2 μm **T. venustus**
15. Context duplex with or without a dark resinous zone separating upper and lower part16
15. Context more or less homogenous and without a dense dark line generative hyphae rarely above 5 μm wide17
16. A dark resinous zone separating upper and lower part, generative hyphae up to 10 μm wide in the context basidiospores ellipsoid **T. limitatus**
16. No dark line between upper loose part and lower denser part, hyphae up to 5 μm wide, basidiospores globose **T. semilimitatus**
17. Upper surface white to grey becoming beige to pale reddish brown, soon glabrous, strong odour of anise when fresh and becomes brown when bruised in fresh condition **T. atroalbus**
17. Upper surface white to cream or ochraceous, no distinct smell of aniseed when fresh and more or less unchanged when bruised in fresh condition.....18
18. Pileus glabrous, basidiospores globose 4-5 μm in diameter**T. oxyporoides**
18. Pileus velvety to tomentose or scrupose, basidiospores ellipsoid.....19
19. Upper surface white and silky velvety, pores angular 3-5 per mm, basidiospores 3.5-4.5 x 2.5-3.5 μm **T. xuchilensis**
19. Upper surface white to cream, tomentose to scrupose, becoming glabrous in parts, pores round to angular, 4-6 per mm, basidiospores 4-5 x 2.5-3.5 μm
..... **T. pseudolacteus**

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Cerrena gilbertsonii nov. sp.

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Abstract

Cerrena gilbertsonii Ryvarden is described based on specimens from Mexico and Martinique and a key to accepted species in the genus is provided.

Introduction

In 1987 the late Dr. R. L. Gilbertson from University of Arizona, United States gave me a collection from Mexico for which he could not find a proper name. It was a thin flexible pileate hydroid species with a brown zoned tomentum and in section with a dark line between the tomentum and the white context. We joked about calling it *Cerrenella*, i.e. a small *Cerrena*, because of the black line below the tomentum, a striking character in *Cerrena unicolor* (Bull.: Fr.) Murrill, the type species. Unfortunately *Cerrenella* Murrill was already published being a taxonomic synonym of *Hydnochaete* Bres.

We were busy with writing up manual for the poroid fungi of North America and then for Europe, and the Mexican specimen ended up in my box marked "American new species?". Then, a few weeks ago, professor Karl-Henrik Larsson, Botanical Museum, here in Oslo, showed me a specimen sent to him by Dr. F. Dämmrich in Austria, collected at Martinique in the Caribbean by one of his friends. "Did I know it?" "Never seen it before." was my answer". However, a few hours later suddenly it dawned to me that it was the same as the Mexican collection, and indeed it was.

To settle its generic position, the collection from Martinique was sequenced and it came out 95 % identical with *Cerrena unicolor*, thus settling its generic position.

Cerrena gilbertsonii Ryvarden nova species

Holotype: Mexico, Sonora, Alamos area, Rio Cuchuajqui, El Guayabo Crossing, Leg. Thomas R. Vandevender no 94-144, 14 March 1994, on *Croton niveus* Jacq. Isotypes in NY, K and O. Mycobank no 802479.

Etymology: Named in honour to my good friend and co-author who brought the species to my attention and let me keep the type collection.

Basidiocarps annual, dimidiate up to 2 x 2 cm and about 2.5 mm thick, flexible, pileus dark brown, densely tomentose in numerous zones, in a few places exposing a back and glabrous cuticle, hymenophore densely hydroid pale grey with a silvery tone, individual teeth white, round to slightly flattened and in some incised in the apex, up to 1.2 mm long, context white, slightly fibrous in radial direction and about 250 µm thick and above which there is a about 50 µm thick black line and about which there is the brown tomentum 100-200 µm thick.

Hyphal system trimitic; generative hyphae thin-walled, with clamps, 2-4 µm in diam; skeletal hyphae thick-walled, nonseptate, 3-5 µm in diam; binding hyphae rare, thick-walled to solid sparingly branched, 2-4 µm in diam

Cystidia or other sterile hymenial elements not seen.

Basidia 15-18 x 4-5 µm, clavate, tetrasterigmatic and with a basal clamp.

Basidiospores 5-6 x 3-3.5 µm, cylindrical-ellipsoid, hyaline, smooth, negative in Melzer's reagent,

Substrata. As indicated for the holotype, no host indicated for he >Martinique collection.

Distribution. Known from the type locality in Sonora province in Mexico and Martinique.

Remarks. *Cerrena gilbertsonii* is cauterized by its densely hydroid hymenophore, thin flexible basidiocarp with a dense dark brown tomentum. *C. unicolor* is a much larger and more robust perennial species with a labyrinthine hymenophore with a smooth hymenophore or occasionally with slightly dentate dissepiments.

Key to accepted species

- 1. Pileus dark brown i dense zones, basidiocarp up to 3 m hick, hymenophore densely hydroid **C. gilbertsonii**
- 1. Pileus whitish grey, often with greenish colouration due to growth of algae, basidiocarp usually 1- to many cm thick, hymenophore labyrinthine.. **C. unicolor**

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A preliminary checklist from Galapagos Islands, Ecuador

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Abstract

Inonotus galapagosensis Ryvarden and *Trametes imbricata* Ryvarden are described as new and 31 poroid species and 29 corticioid species are reported from the Islands.

Introduction

In 2005 I was kindly invited by Dr. Frank Bungharz on behalf of the Darwin research Station to come to Galapagos, Ecuador, to collect polypores. Due to financial restraints, collecting was restricted to Santo Cruz, the largest and most forested of the islands in the archipelago. The following checklist is based on my own collections besides specimens in the herbarium at the research station.

Several persons have over time collected fungi on different Galapagos Islands and the results of these expeditions are excellently summarized in Reid, Pegler and Spooner (1981) including collections made by an English expedition in 1976 and deposited at the Kew Herbarium in London. Since then, according to my knowledge no major collecting of Basidiomycota has not been undertaken on the archipelago. My collections are split between the Oslo Herbarium (O) and Quito University herbarium (QCA) at Santa Cruz, Galapagos.

In the following list, those species reported by Reid et al. are indicated with (Reid), and the reader interested in details is referred to their publication. Species represented only in the herbarium of Darwin, are indicated with the acronym QCA, while my own records are without symbol.

Besides polypores I collected also a great number of corticioid specimens. They were in part determined by the late Kurt Hjortstam before he became ill and died. Thus, there remain a good number of undetermined

specimens in this group and the list given below must be looked upon as a very preliminary survey of species present from this group of fungi on the islands.

Discussion.

The Galapagos Islands are of volcanic origin, about three million years old. Thus all higher plants and fungi as well much have reached the islands by long distance dispersal. This could have occurred in three different ways, by driftwood, air or birds.

The Humboldt Current sweeping up along the western coast of South America is changing to a westerly course around equator and could in principle bring driftwood to the Galapagos. However, it is unlikely in my opinion that the spores would survive a prolonged submerging in warm salt water and from a barren beach be able to invade dead wood inland from the beach. Dispersal by air could be rather fast if the conditions are right, but we know that the ultra violet radiation besides desiccation will be a problem for thin-walled spores. However, a number of species in *Phellinus* among others has thick-walled basidiospores which may survive some 1000 km air transport.

Thus, it is more probably that birds over time have brought fungal spores with them to the islands, either among their feathers or at their feet. From the following list it is evident that all Aphylllophorales groups are present on the islands with the strange exception of *Stereum* s.s.tr. When sorting my collections the first day, I became aware of the lack of this genus and looked under the rest of my stay specifically for it, but in vain. A search in the QCA herbarium gave same result. *Stereum* is otherwise a genus which is richly present in most types of vegetation due to their dimitic basidiocarps and their ability to survive prolonged dry periods. Their absence on Galapagos is a mysterious to which I can offer no sensible explanation.

All species reported below have been recorded from America. This is as expected considering the short distance between the islands and the continent.

Preliminary checklist of Aphylllophorales

Hymenochaetaceae

- Aurificaria luteoumbrina* (Romell) Reid D
- Hymenochaete digitata* Burt,
- H. epichlora* (Berk. & M. A. Curtis) Cooke,
- H. luteo-badia* (Fr.) Höhnelt & Litsch.,
- H. pinnatifida* Burt,
- H. minuscula* G. H. Cunningh.,
- H. rheicolor* (Mont.) Lev.

Inonotus galapagosensis Ryvarden nov. sp.

Holotype: Ecuador, Galapagos Santa cruz, Camote, Finca Rene Vale, 12 October 2008, on rotten hard wood trunk. L. Ryvarden 47985 (O), isotype in Mycobank no.

Basidiocarps resupinate, annual, effused, adnate, hard and brittle, margin distinct, smooth, dark brown, 1-3 mm wide, pore surface yellowish brown, glancing in incident light when fresh, dull when dry, pores round to angular, 6-8 per mm, hardly visible to the naked eye; tube layer up to 3 mm thick, yellowish brown; context dense, brown and thin.

Hyphal system monomitic, generative hyphae hyaline to rusty brown, thin-walled to thick-walled, 2-4 μm in diameter, simple septate, moderately branched.

Basidia broadly clavate, 12-15 x 6-7.5 μm , 4 sterigmata.

Hymenial setae absent.

Basidiospores 4-5 x 3.5-4.5 μm , subglobose, smooth, IKI-, hyaline to very pale yellow.

Substrata. Dead hardwood.

Distribution. Known from Ecuador, Galapagos.

Remarks. The pale subglobose basidiospores and the small pores separate this species from *I. venezuelensis* Ryvarden, to which it no doubt is related. However, the latter species has 3-4 pores per mm and brown spores.

Phellinus apiahynus (Speg.) Rajchenb. & Wright.

P. contiguus (Fr.) Pat.

P. fastuosus (Lev.) Ryvarden Reid

P. gilvus (Schw.) Pat.

P. maxonii (Murrill) D. A. Reid.

P. melleoporus (Murrill) Ryvarden.

P. rhabarbarinus (Berk.) G. Cunungh.

P. rimosus (Berk) Pilat Reid.

P. shaferi (Murr.) Ryvarden.

Phylloporia spathulata (Hooker) Ryvarden Reid.

Polyporaceae

Antrodiella reflexa Nunez & Ryvarden.

Ceriporia reticulata (Fr.) Donk.

C. xylostromatioides (Berk.) Ryvarden.

Corioloropsis polyzona (Pers.) Ryvarden.

Ganoderma australe (Fr.) Pat.,

G. boudier Reid.

Lentinus berteri (Fr.) Fr.

L. swartzii Berk.

Mycobonia flava (Berk.) Pat.

Polyporus arcularius Fr.

P. ciliatus Fr. Reid.

P. tricholoma Mont.

Pycnoporus sanguineus (Fr.) Murrill.

Schizophora flavipora (Cooke) Ryvarden.

Trametes membranaceus (Fr.) Kreisel.

Trametes imbricata Ryvarden nova sp.

Holotype: Ecuador, Galapagos, Santa Cruz, around Los Gemelos, 11. October 2008, on rotten standing, hard wood trunk, L. Ryvarden 47924 (O) isotype in QCA, Mycobank 802501

Basidiocarps annual, imbricate in dense clusters, up to 40 to 60 basidiocarps in the clusters with partly a common effused base, 1.0 - 2 cm long and 1 cm wide at the margin and up to 2 mm thick at the base, individual basidiocarps fan-shaped, rarely effused-reflexed to sessile, commonly dimidiate to flabelliform with contracted base, flexible, upper surface glabrous, partly shiny, pale straw coloured to cream with a pink tinge when fresh, more clean cream to pale ochraceous when dry, azonate, margin thin, often incised to lobed and wavy when dry; pore surface cream to pale tan, pores irregularly dentate with pores of different height, angular, thin-walled 7-9 per mm; tubes concolorous with pore surface, up to 0.5 mm deep; context white to pale cream, dense, homogeneous 0.5 mm thick at the base.

Hyphal system trimitic; generative hyphae with clamps, 3-5 μm wide; skeletal hyphae abundant, thick-walled to almost solid, 5-8 μm wide; binding hyphae tortuous, strongly branched, solid to very thick-walled, 2-5 μm thick in the main stem.

Cystidia or other sterile hymenial elements lacking.

Basidia 10-14 x 3-4 μm clavate, 4-sterigmate, with a basal clamp.

Basidiospores 4-5 x 2-2.5 μm cylindrical to oblong ellipsoid, hyaline, IKI-.

Substrata. On dead hardwood tree.

Distribution. Known only from the type locality.

Remarks. The thin flabelliform small basidiocarps in dense clusters, reminding one of an *Antrodiella* on sight, the dentate irregular pores surface with tiny pores surface makes this a distinct species. The binding hyphae are prominent in the context and trama and leave no doubt that the species is better placed in *Trametes* rather than in *Antrodiella* where all species are dimitic without binding hyphae.

T. lactinea Berk.
T. pavonia (Hooker) Ryvarden.
T. supermodesta Ryv. & Iturriaga.
T. villosa (Fr.) Kreisel.
Tinctoporellus epimiltinus (Berk.) Ryvarden.

Corticiaceae

Asterostroma cervicolor (Berk. & M.A. Curtis) Masee.
Auriscalpium villipes (Lloyd) Snell & Dick.
Fibrodontia brevidens (Pat.) Hjorst. & Ryvarden.
Gloeodontia columbiensis Burdsall & Lombard.
Hyphoderma praetermissum (P. Karst.) Eriks. & Strid.
H. setigerum (Fr.) Donk.
Hyphodontia alutaria (Burt) Erikss.
H. arguta (Burt.) Erikss.
H. globospora Langer.
H. pallidula (Brrs.) Erikss.
H. tomentosa (Berk. & Curtis) Hjortst.
Litschauerella clematidis (Bourdot & Galzin) Erikss & Ryvarden.
Pellidiscus pallidus (Berk. & Broome) Donk.
Peniophora meridionalis Boidin.
Phanerochaete australis Jülich.
Phlebia chrysocreas (Berk. & M.A. Curtis) Burds.
P. trmellosa (Fr.) Nakasone.
Phlebiella ardoisaca (Bourd- & Galzin) K.-H.Larsson & Hjortstam.
P. nasti Boidin & Gilles.
Scytinostroma portentosum (Berk. & M.A. Curtis) Donk.
Subulicystidium longisporum (Pat.) Parmasto.
Trechispora clanculare (Parker. Rhodes) K-H. Larsson.
T. farinacea (Pers.:Fr.) Liberta.

Gastromycetes

Geaster schweinitzii (Berk & Curtis) Zeller.

References

Dennis, R. W. G. & Reid, D. A. 1981: An annotated list of the Fungi of the Galapagos Islands. Kew Bull. 35:847-892.

