



Article

Some new species and new records of corticioid fungi (Basidiomycota) from the Brazilian Amazon

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Abstract

As a result of the revision of some herbarium specimens deposited in INPA (Manaus, Brazil) and new collections from the Brazilian Amazon, we report on 35 noteworthy species that are new records to the Brazilian Amazon. *Dendrothele nakasoneae*, *D. ornata*, *Gloeodontia halocystidiata*, *Gloiothele incrustata*, *G. larssonii*, and *Peniophora wallacei* are described as new. Comments and illustrations are given for most of the species.

Key words: Brazil, Corticiaceae, South America, tropical rainforest

Introduction

The Amazon Rainforest comprises the largest and supposedly most species-rich area of tropical rainforest in the world. Ecosystem diversity is high and very variable depending on the area, and biological communities have a high complexity. But not only poorly or unexplored areas of old forest are interesting environments, also well preserved urbanized areas retain a very high biological diversity. Around 60% of the Amazonian forests are located in the Brazilian territory. These forests are seriously threatened by deforestation and basic inventories of biodiversity are urgently needed.

The Amazonian forests have never been extensively surveyed with a focus on corticioid basidiomycetes. During recent years, however, many papers by Kurt Hjortstam and collaborators paid attention to the diversity of corticioid species from tropical and subtropical areas, especially Colombia and Venezuela, and many new genera and species were described (see Hjortstam & Ryvarden 2007a). Gomes-Silva & Gibertoni (2009) based on literature survey, reported twenty-six corticioid species (excluding polyporoid and hymenochaetoid fungi) from the Brazilian Amazon. In April 2012, the senior author was invited to the “Instituto Nacional de Pesquisas da Amazônia” (INPA, Manaus, Brazil) to examine some collections of corticioid fungi from the Amazonas and Roraima states of Brazil. Most of the collections were made with no indication of host or substrate preference, in part due to the difficulties to identify plants in tropical forests, so ecological information is limited. Also, there are no molecular data from the specimens. In the present contribution we report on some new species and new records of corticioid fungi from the Brazilian Amazon.

Material & Methods

Macro- and microscopic examinations

For light microscopy studies, samples were mounted in 3% potassium hydroxide (KOH), Melzer's reagent (IKI), and 0.1% Cotton Blue (CB) in 60% lactic acid to determine cyanophily. Line drawings were made with a camera lucida attachment. All the specimens are deposited in INPA (SPG indicates collection numbers by Sergio P. Gorjón; LPM by M.A. de Jesus and collaborators).

Taxonomy

Boidinia peroxydata (Rick) Hjortstam & Ryvar den

The species is characterized by simple-septate hyphae, suburniform basidia, and globose, echinulate, amyloid basidiospores about 4–5 µm in diam (3.8–4.8 × 2.9–3.3 in the neotype of the species according to Wu 1998). It is known from South Brazil (Rick 1934), Ecuador, Venezuela (Hjortstam & Ryvar den 2007a), and Argentina (Greslebin & Rajchenberg 2003) in South America.

Specimen examined:—BRAZIL, Amazonas, Presidente Figueredo, Uatumã Biological Reserve, 26 May 2009, on fallen trunk, leg. M.A. Jesus, LPM 6918.

Byssomerulius corium (Fr.) Parmasto

This is the first report of this cosmopolitan species from the Brazilian Amazon.

Specimens examined:—BRAZIL, Amazonas, Presidente Figueredo, Uatumã Biological Reserve, 28 May 2009, on fallen trunk, leg. M.A. Jesus, LPM 7239; Roraima, Viruá National Park, 15 Nov 2009, on dead branches, leg. M.A. Jesus, LPM 7003.

Ceraceopsis verruculosa Hjortstam & Ryvar den

Basidiome resupinate, membranous, cream to pale brown, detachable, margin indeterminate. Hyphal system monomitic to pseudodimitic with simple-septate hyphae. Subhymenial hyphae thin-walled, hyaline, 3–5 µm in diam., subicular hyphae straight, thick-walled, yellowish in KOH, Melzer's reagent, and CB, 2–3 µm in diam. Hymenium a palisade of basidia, cystidiols, and hyphidia. Cystidiols clavate or with a median constriction, 20–30 × 5–10 µm, some with an apical papillae. Hyphidia not or with few sparse ramifications. Basidia clavate, 25–30 × 5–8 µm, with four sterigmata but difficult to discern because basidia collapse after discharging basidiospores, simple-septate at the base. Basidiospores ellipsoid to broadly ellipsoid, 6–8(–9) × 4–5.5 µm, rough, slightly thick-walled, with a prominent conical apiculus, IKI–, variably cyanophilous (Fig. 1).

The specimen agrees with *C. verruculosa* in its membranous basidiome, simple-septate hyphae, and rough cyanophilous basidiospores but differs in the presence of cystidioles and hyphidia that were not mentioned in the original description (Hjortstam & Ryvar den 2007b). The species was known from the type locality in the Venezuelan Amazon.

Specimen examined:—BRAZIL, Amazonas, Manaus, Adolpho Ducke Forest Reserve, 27 Jan 2008, on decayed wood, leg. M.A. Jesus, LPM 3697.

Crustodontia chrysocreas (Berk. & M.A. Curtis) Hjortstam & Ryvar den

≡ *Phlebia chrysocreas* (Berk. & M.A. Curtis) Burds.

This is widespread, pantropical species and has been reported from Ecuador (Hjortstam & Ryvar den 2008), Uruguay (Martínez & Nakasone 2011), and Chile (Gorjón & Hallenberg 2012).

Specimens examined:—BRAZIL, Amazonas, Manaus, INPA Campus, Bosque da Ciência, 02 Apr 2012, on decayed wood, leg. S.P. Gorjón, SPG 3452; Amazonas, Manaus, Adolpho Ducke Forest Reserve, 24 Jan 2006, on dead trunk, leg. M.A. Jesus, LPM 3775, 3211, 3823.

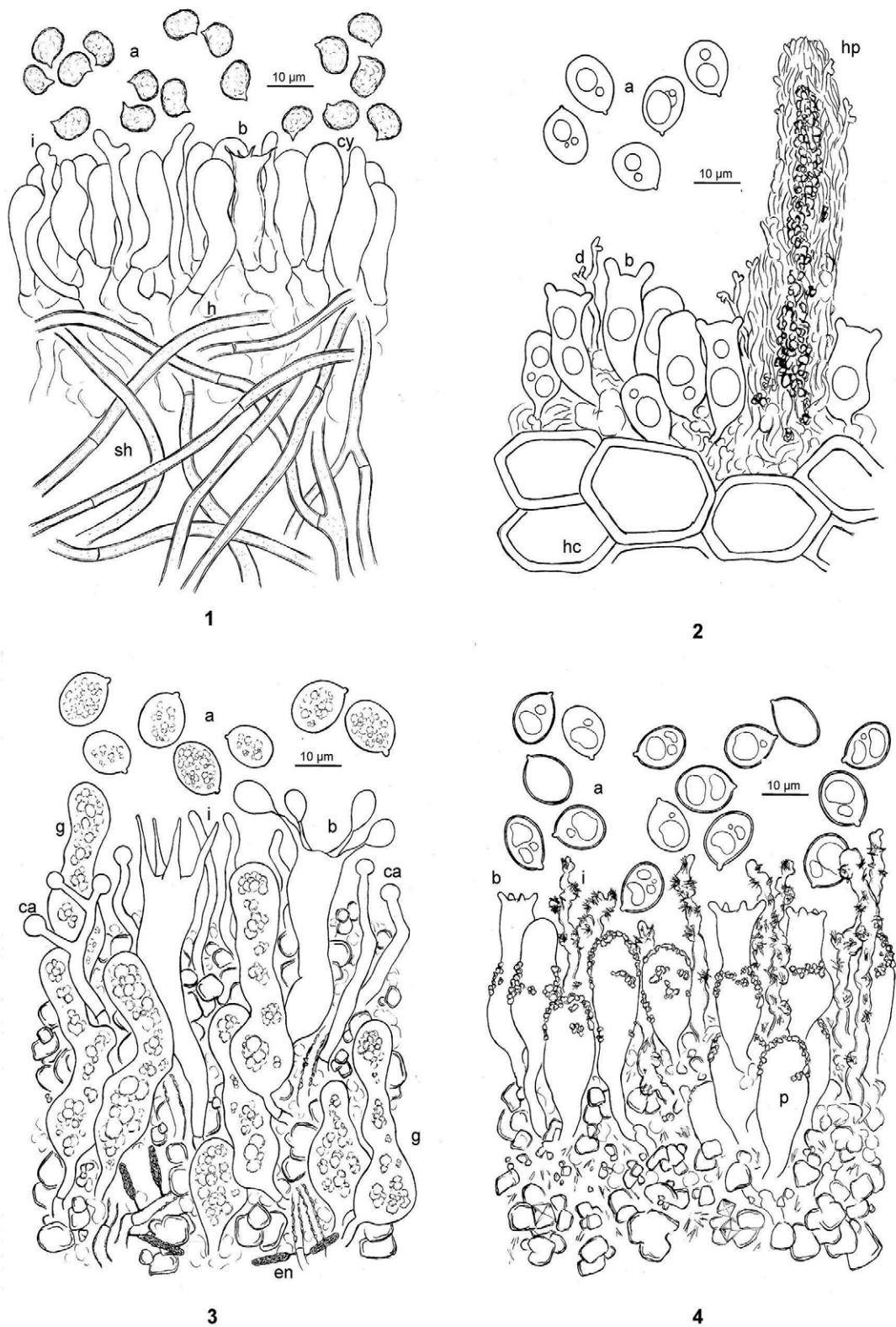


FIGURE 1–4. 1. *Ceraceopsis verruculosa*. 2. *Dendrothele andina*. 3. *Dendrothele nakasoneae*. 4. *Dendrothele ornata*. a. Basidiospores. b. Basidia. ca. Capitulate hyphidia. d. dendrohyphidia. en. needle-like encrusted projections. g. Gloeocystidia. h. Hyphae (generative). hc. Host cells. hp. Hyphal pegs. i. Hyphidia. p. Probasidia. sh. Subicular hyphae.

This species is characterized by an odontoid hymenophore, clavate to cylindrical cystidia, presence of dendrohyphidia, and ellipsoid to cylindrical basidiospores, tapering toward the apiculus. The Amazon specimen agrees with the description by Hjortstam (1987). Previously only known from the type locality in Tanzania.

Specimen examined:—BRAZIL, Amazonas, Roraima, Alto Alegre - Amajari, Maracá Ecological Station, 27 Sep 2008, on trunk of living tree, leg. M.A. Jesus, LPM 4514.

Dendrodontia bicolor (P.H.B. Talbot) Hjortstam & Ryvardeen

The species is known in South America from Argentina and South Brazil (Hjortstam & Ryvardeen 2007a).

Specimen examined:—BRAZIL, Amazonas, Manaus, IFAM Campus (Instituto Federal de Educação, Ciência e Tecnologia do Amazonas), 4 Jan 2011, on fallen trunk, leg. M.A. Jesus, LPM 7414.

Dendrothele andina (Pat.) Nakasone

Basidiome resupinate, hymenophore smooth, white to pale cream, with sterile hyphal pegs about 80–100 µm long and 12–30 µm in diam., margin abrupt. Hyphal system monomitic, hyphae with clamps. Dendrohyphidia present among basidia and forming the hyphal pegs. Cystidia absent. Basidia at first globose, then suburniform, 15–25 × 7–9 µm, with two stout sterigmata, basally clamped. Basidiospores ellipsoid, 10–13 × 8–9 µm, smooth, with thin or distinct walls but not thick-walled, IKI-, with some guttules (Fig. 2).

The species was previously known only from the type locality in Ecuador (Nakasone 2006). It is characterized by the presence of hyphal pegs, hyphae with clamps, and bisterigmate basidia.

Specimen examined:—BRAZIL, Amazonas, Manaus, IFAM Campus (Instituto Federal de Educação, Ciência e Tecnologia do Amazonas), 5 May 2012, on bark of living hardwood, leg. S.P. Gorjón, SPG 3483.

Dendrothele incrustans (P.A. Lemke) P.A. Lemke

The species is widespread in North America and it was previously known in South America from Argentina (Greslebin & Rajchenberg 1998).

Specimens examined:—BRAZIL, Amazonas, Manaus city (in several streets), 4 Apr 2012, on bark of living tree, leg. S.P. Gorjón, SPG 3456, SPG 3478. Manaus, Campus do IFAM (Instituto Federal de Educação, Ciência e Tecnologia do Amazonas), 5 May 2012, on bark of living hardwood, leg. S.P. Gorjón, SPG 3484, 3490.

Dendrothele nakasoneae Gorjón *sp. nov.*

Species ab aliis congeneribus affinis sed saepe differt parva et incrustata propagatio hypharum et hyphidiis capitatis exiguis.

Etymology:—Named to honor Dr. Karen K. Nakasone (USA), in recognition of her contributions to the taxonomy of corticioid fungi.

Type:—BRAZIL. Manaus, Praça de São Sebastião (in front of Teatro Amazonas), on bark of living *Licania tomentosa* (Benth.) Fritsch (Chrysobalanaceae), 17 Apr 2012, leg S.P. Gorjón, SPG 3473 (holotypus).

MycoBank: MB 800943

Basidiome resupinate, white to pale cream, hymenial surface smooth, margin abrupt. Hyphal system monomitic, hyphae simple-septate, about 2–3 µm in diam, usually encrusted, hyphae often laterally with a small needle-like encrusted projection. Hymenium composed of basidia, gloeocystidia, protruding capitate

hyphidia, and unbranched hyphidia. Capitulate hyphidia variable in length, often arising in two or three from the same hyphal segment, capitulate apex about 3–3.5 µm in diam. Other hyphidia abundant in the hymenial layer, about 2 µm in diam., sinuous, unbranched. Gloeocystidia ovoid to irregularly tubular or with protuberances, with abundant oily contents, yellowish in Melzer's reagent. Basidia tubular to clavate, 50–60 × 9–12 µm, with four sterigmata, collapsing after discharging the basidiospores. Basidiospores ellipsoid to ovoid, 10–12 × 8–10 µm, smooth, thin-walled, with abundant oily contents, IKI-, acyanophilous. (Figs. 3, 17).

The species is characterized by the simple-septate, usually encrusted hyphae some of them with small needle-like encrusted projections, small hyphidia with capitulate apex, gloeocystidia, and ellipsoid to ovoid basidiospores. It is a common species on bark of living *L. tomentosa*, a species from northeast Brazil, but frequently cultivated in gardens and streets of Manaus. *Dendrothele capitulata* Boidin & Lanquetin, described from Guadeloupe in the Lesser Antilles, has simple-septate hyphae and larger, capitulate cystidia but differing in larger subglobose basidiospores (Boidin *et al.* 1996).

Additional specimens examined:—BRAZIL, Amazonas, Manaus city, Praça de São Sebastião (in front of Teatro Amazonas), on bark of living *L. tomentosa*, 17 Apr 2012, leg. S.P. Gorjón, SPG 3457, 3472, 3474; Manaus city, Av. Fernao Dias, on bark of living *L. tomentosa*, 17 Apr 2012, leg. S.P. Gorjón, SPG 3476; Manaus city, Av. Paraíba, on bark of living *L. tomentosa*, 15 Apr 2012, leg. M.A. Jesus, LPM 7445; Manaus, INPA Campus, Bosque da Ciência, on bark of living *L. tomentosa*, 5 Apr 2012, leg. S.P. Gorjón, SPG 3458.

Dendrothele ornata* Gorjón *sp. nov.

Species ab aliis congeneribus affinis sed differt basidiis ornatis et hyphidia cum lobis rotundatis et crystallis filiformibus conglomeratis.

Etymology:—*ornatus* (Latin), referring to the crystal ornamentations on basidia and hyphidia.

Type:—BRAZIL. Manaus: INPA Campus, Bosque da Ciência, 2 Apr 2012, on bark of living *Clitoria racemosa* Benth. (Fabaceae), leg. S.P. Gorjón, SPG 3454 (holotypus).

Mycobank: MB 800944

Basidiome resupinate, whitish, hymenial surface smooth, margin abrupt. Hyphal system monomitic, hyphae with clamps. Hyphidia filiform or tortuous, variable in length, about 2–3 µm in diam., with round irregular protuberances, densely encrusted with short acicular crystals. Cystidia absent. Basidia at first ovoid, with the apical part characteristically encrusted, then becoming suburniform and distinctly stalked, 30–40 µm long, basal part ca. 9–10 µm, apical part 7–8 µm, with 4 sterigmata, encrustations remains in the middle part, with a basal clamp, cyanophilous. Basidiospores ellipsoid, 9–12 × 7–10 µm, smooth, thick-walled, IKI-, and acyanophilous (Figs. 4, 18).

The species is characterized above all by the young basidia apically encrusted with crystals that remain in the middle part of the mature basidium and by the encrusted hyphidia with protuberances. Although a variable encrustation is present to some degree in hyphidia and dendrohyphae in other *Dendrothele* species, the mentioned features are unique in the genus.

Additional specimen examined:—BRAZIL. Manaus: INPA Campus, Bosque da Ciência, 2 Apr 2012, on bark of living *C. racemosa*, leg. S.P. Gorjón, SPG 3455.

***Dentipellis* cf. *leptodon* (Mont.) Maas Geest.**

The specimen is characterized by an odontoid hymenophore, clamped hyphae, and presence of abundant gloeocystidia with variable apices. Because basidiospores were not observed, a firm determination is not possible. In South America the species is known from Chile and Brazil (Hjortstam & Ryvarde 2007a).

Specimens examined:—BRAZIL, Amazonas, Manaus, Adolpho Ducke Forest Reserve, 28 Jan 2008, on palm, leg. M.A. Jesus, LPM 3709.

Basidiome resupinate, effused, hymenial surface smooth with numerous sterile hyphal pegs, white to cream. Hyphal pegs composed of skeletal hyphae with many crystals. Generative hyphae with clamps, thin-walled, 2–3 µm in diam., skeletal hyphae thick-walled, about 2–4 µm in diam. Hyphidia and dendrohyphidia present in hymenium. Cystidia absent. Basidia short cylindrical, 25–30 × 8–10 µm, with four sterigmata, and a basal clamp. Basidiospores citriform, biapiculate, distal apiculus refractive in KOH, smooth, thin-walled, (11–)14–19 × 5.5–7 µm, IKI–, CB– (Fig. 5).

The species agrees with *E. citriformis* in distinguishing characters of the species as the presence of skeletal hyphae in the hyphal pegs and context, dendrohyphidia, and in the citriform, acyanophilous basidiospores. The Amazonian specimen has slightly narrower basidiospores than described in the original description (7–9 µm wide) of *E. citriformis* from the Ivory Coast and Gabon (Boidin & Lanquetin 1983). *Epithele interrupta* Bres. and *E. nikau* G. Cunn. are morphologically closely related species but differ in having fusiform, non-biapiculate basidiospores (Boidin & Gilles 2000).

Specimen examined:—BRAZIL, Roraima, Viruá National Park, 17 Nov 2009, on dead branches, leg. M.A. Jesus, LPM 6972.

Epithele interrupta Bres.

The specimen is in accordance with *Epithele interrupta* Bres. by the presence of skeletal hyphae and fusiform, rough basidiospores. When observed in KOH, basidiospores appear thick-walled and smooth, but the rough spore surface can be better observed in Melzer's reagent. *Epithele interrupta* was originally described from Congo (Mayidi) and according to Hjortstam & Ryvar den (2005, 2007a) the species is not with certainty known from South America.

Specimens examined:—BRAZIL, Roraima, Viruá National Park, 16 Nov 2009, on dead stem of a monocotyledon plant, leg. M.A. Jesus, LPM 6990, 6991.

Fibrodontia brevidens (Pat.) Hjortstam & Ryvar den

This species is characterized by small crowded aculei, encrusted skeletal-like hyphae, and broadly ellipsoid basidiospores. It has a pantropical distribution and is known from Brazil, Colombia, Ecuador, Uruguay (Martínez & Nakasone 2011), and Venezuela in South America.

Specimens examined:—BRAZIL, Amazonas, Manaus, INPA Campus, Bosque da Ciência, 16 Jun 2007, on dead wood, leg. M.A. Jesus, LPM 3376.

Gloeodontia halocystidiata Gorjón *sp. nov.*

Species ab aliis congeneribus affinis sed differt frequentia halocystidiorum.

Etymology:—*halus* (Latin), referring to the halo present in the apex of some cystidial elements.

Type:—BRAZIL, Roraima: Alto Alegre - Amajari, Maracá Ecological Station, 26 Sep 2008, on dead trunks, leg. M.A. Jesus, LPM 4631 (holotypus).

MycoBank: MB 800945

Basidiome resupinate, effused, hymenophore creamish brown, odontoid with conical to flattened aculei, margin not differentiate. Hyphal system dimitic, generative hyphae with clamps, 2–3 µm in diam., skeletal hyphae thick-walled, 2–4 µm in diam., smooth or encrusted, hyaline or yellowish brown. Gloeocystidia long tubular, walls slightly thickened towards the base, variable in length up to 100–120 µm, 5–8 µm in diam., apex obtuse or with a schizopapilla, with oily contents in KOH, yellowish in Melzer's reagent. Skeletocystidia

arising from skeletal hyphae, variably encrusted with hyaline crystals, usually $30\text{--}40 \times 6\text{--}8 \mu\text{m}$. Halocystidia with a resinous brown globule about $8\text{--}12 \mu\text{m}$ in diam. Core of aculei mainly composed of skeletal hyphae and halocystidia while the hymenium on aculei is formed as a palisade of gloecystidia and basidia. Skeletocystidia occurs primarily at the base of the aculei or the hymenium between the aculei. Basidia clavate, $10\text{--}15 \times 3\text{--}4 \mu\text{m}$, with four sterigmata, and a basal clamp. Basidiospores ovoid to ellipsoid, $3.5\text{--}4 \times 2\text{--}2.5 \mu\text{m}$, thin-walled, seemingly smooth or slightly rugose, ornamentations difficult to observe, amyloid (Figs. 6, 7, 19).

The species is characterized by an odontoid hymenophore, dimitic hyphal system, presence of gloecystidia and encrusted skeletocystidia, and above all by the presence of halocystidia capped with a globule of brown resinous matter. Halocystidia are easily distinguishable elements in the core of the aculei. *Gloeodontia* Boidin seems to be the appropriate genus considering macro- and micromorphology, even though halocystidia were not described in the genus. Presence of halocystidia can be regarded as a variation at the species level as it occurs in some species of other corticioid genera like *Peniophorella* P. Karst., *Resinicium* Parmasto or *Hyphodontia sensu lato* J. Erikss.

Additional specimens examined:—BRAZIL, Roraima: Alto Alegre - Amajari, Maracá Ecological Station, 26 Sep 2008, on dead trunks, leg. M.A. Jesus, LPM 4539, 4541, 4542, 4553, 4575, 4577, 4630, 4632, 4633.

***Gloiothele incrustata* Gorjón sp. nov.**

Species Gloiothele lactescens affinis sed differt frequentia hyphidiis incrustatis.

Etymology:—*incrustatus* (Latin), referring to the encrusted hyphal ends.

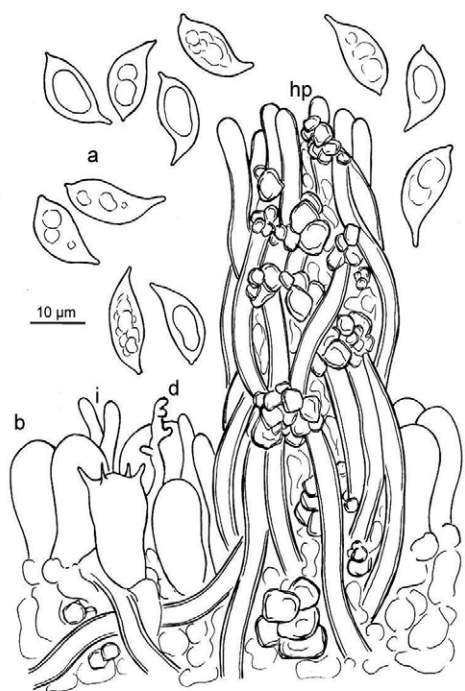
Type:—BRAZIL. Manaus: INPA Campus, Bosque da Ciência, 2 Apr 2012, on dead trunk (angiosperm), leg. S.P. Gorjón, SPG 3459 (holotypus).

MycoBank: MB 800946

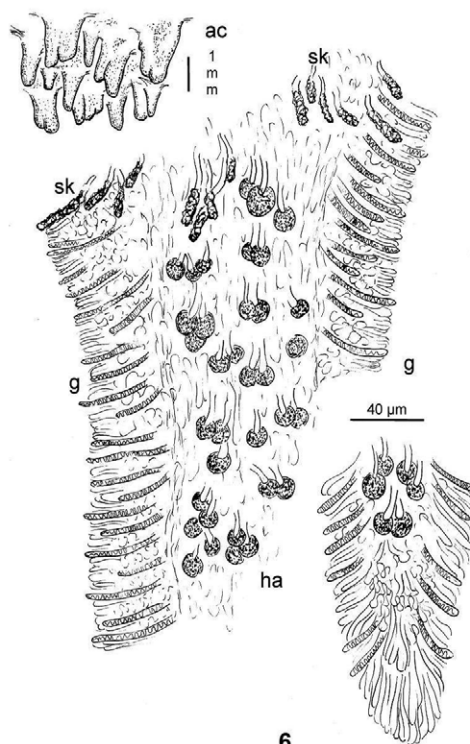
Basidiome resupinate, whitish to greyish, hymenial surface smooth, margin fibrillose. Hyphal system monomitic, hyphae simple septate, $2\text{--}3 \mu\text{m}$ in diam., thin-walled or with thickened walls, not encrusted. Hymenium a dense palisade dominated by gloecystidia, encrusted hyphal ends, and basidia. Gloecystidia irregularly cylindrical or fusiform with a widened basal part, stalked, simple-septate at the base, thin-walled, variable in size, $50\text{--}100 \times 8\text{--}12 \mu\text{m}$, with oily contents in KOH, yellowish in Melzer's reagent, sulfobenzaldehyde reaction not tested, usually enclosed or rarely projecting above the hymenial layer up to $40 \mu\text{m}$, originating in the hymenium or in the subhymenium. Encrusted hyphal ends abundant, thin-walled or with distinct walls, encrusted apical part ca. $15\text{--}25 \mu\text{m}$ long and $5\text{--}6 \mu\text{m}$ in diam. Basidia cylindrical to clavate, $35\text{--}40 \times 5\text{--}6 \mu\text{m}$, thin-walled, with four sterigmata, with minute oily guttules, simple-septate at the base, usually enclosed in the hymenial layer and scattered among the gloecystidia. Basidiospores ellipsoid, $5.5\text{--}7\text{--}(9) \times 4.5\text{--}5\text{--}(5.5) \mu\text{m}$, smooth, thin-walled or slightly thick-walled, with oleose contents, faintly amyloid or inamyloid (Figs. 8, 20).

This species is characterized by a smooth hymenophore, simple-septate hyphae, gloecystidia, abundant encrusted hyphal ends, and smooth, faintly amyloid basidiospores. It is similar to *Gloiothele lactescens* (Berk.) Hjortstam, differing in producing encrusted hyphal ends. *Gloiothele lamellosa* (Henn.) Bres. also has encrusted elements, but differing in their thickened walls and above all in the odontoid to lamellate hymenial surface. Hjortstam *et al.* (2005) reported two specimens of *Gloiothele* cf. *lactescens* from Venezuela. We have examined one of them (T. Iturriaga 206) with short encrusted hyphal ends, and it is in accordance with the specimens from Brazil. Hjortstam *et al.* (2005) keyed *Gloiothele humilis* (Boidin) Boidin, Lanq. & Gilles, with encrusted hyphal ends, but this is presumably a mistake and we suppose they wanted to key out the mentioned specimen (T. Iturriaga 206). In the original description of *G. humilis* encrusted elements are not mentioned (Boidin 1966), neither are they observed in other African specimens (Boidin *et al.* 1997, Roberts 2000).

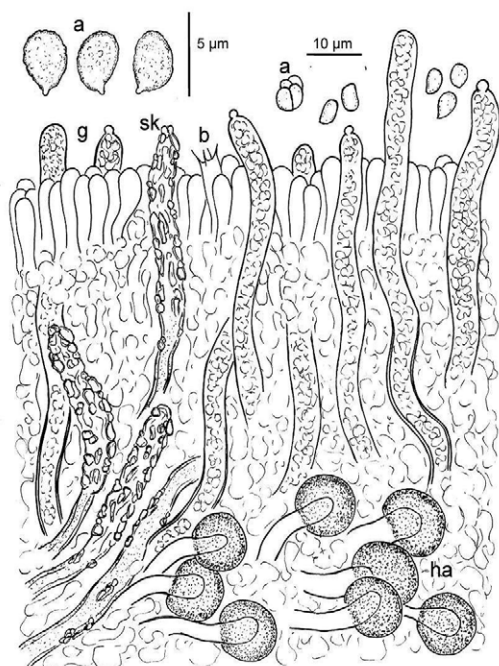
Additional specimens examined:—BRAZIL, Amazonas, Presidente Figueredo, Uatumã Biological Reserve, 26 May 2009, on dead trunk, leg. M.A. Jesus, LPM 6007. VENEZUELA, Aragua, Henri Pitier National Park, Rancho Grande Biological Station, 22 Feb 2000, leg. L. Ryvar den, T. Iturriaga, L. Harris, Páez, I., coll. T. Iturriaga 206 (in O).



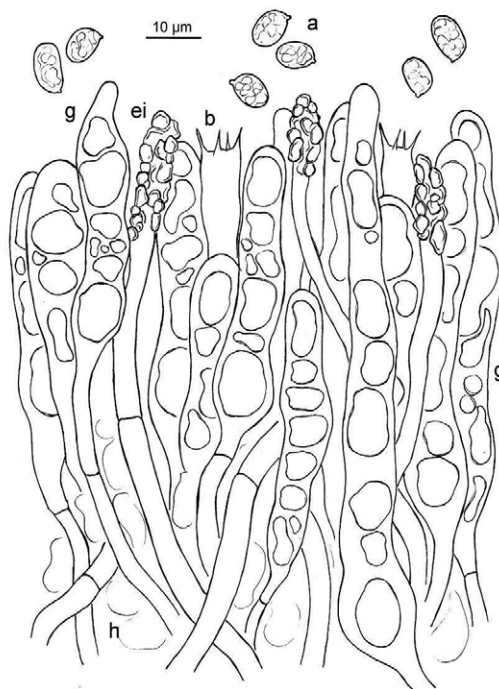
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FIGURE 5–8. 5. *Epithele* aff. *citrispora*. 6. *Gloeodontia halocystidiata* (hymenophore and aculei section). 7. *G. halocystidiata* (hymenium). 8. *Gloiothele incrustata*. a. Basidiospores. ac. Aculei. b. Basidia. d. dendrohyphidia. ei. Encrusted hyphidia. g. Gloeocystidia. h. hyphae. ha. Halocystidia. hp. Hyphal pegs. i. Hyphidia. sk. Encrusted skeletocystidia.

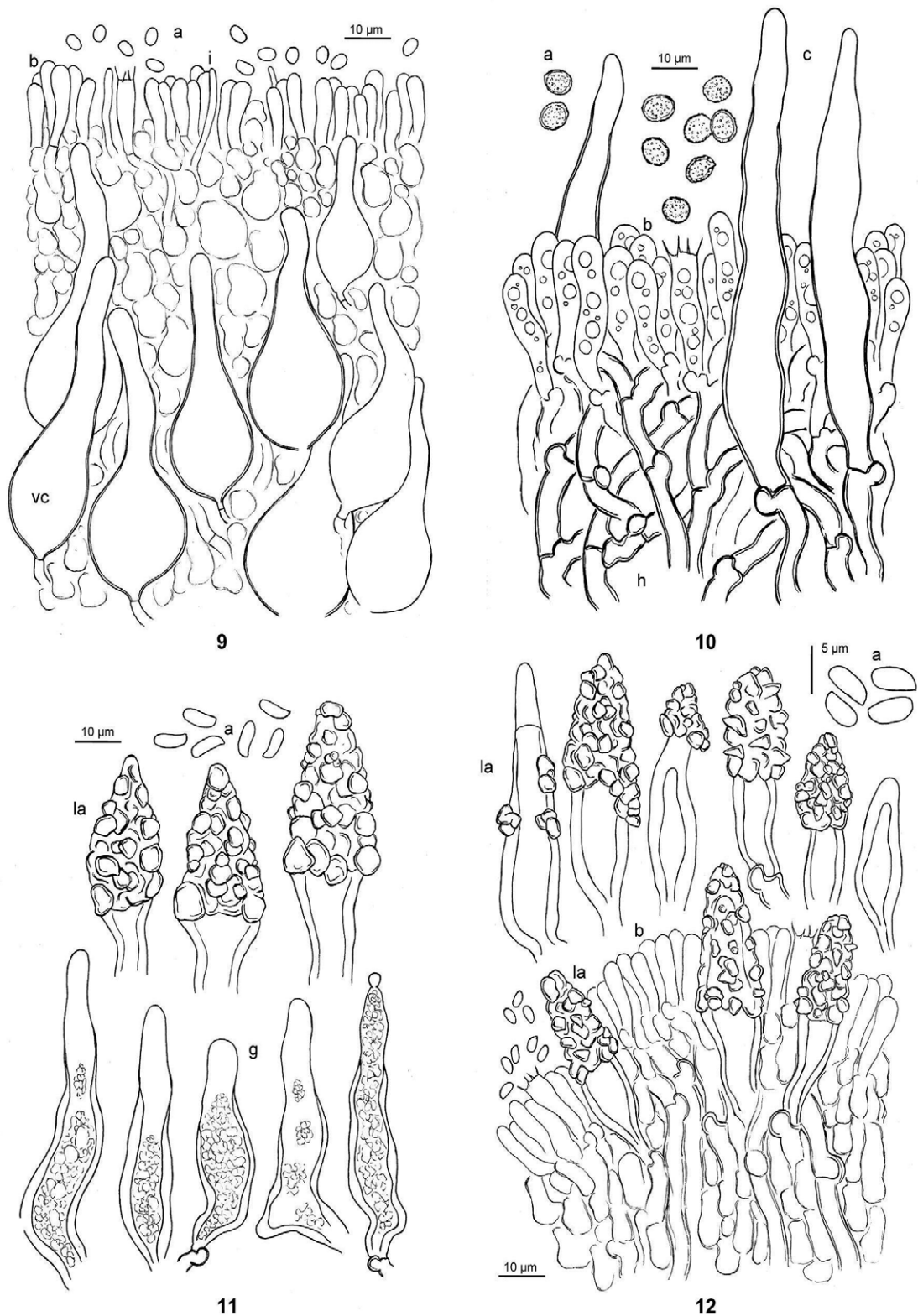


FIGURE 9–12. 9. *Gloiothele larssonii*. 10. *Hypochnicium* aff. *cremicolor*. 11. *Peniophora bonariensis*. 12. *Peniophora wallacei*. a. Basidiospores. b. Basidia. c. Cystidia. g. Gloeocystidia. h. hyphae. i. Hyphidia. la. Lamprocystidia. vc. Vesicular cystidia.

***Gloiothele lactescens* (Berk.) Hjortstam**

This species is characterized by simple-septate hyphae, gloeocystidia, and ellipsoid, weakly amyloid basidiospores.

Specimens examined:—BRAZIL, Amazonas, Manaus, Adolpho Ducke Forest Reserve, 25 Jan 2008, on dead trunk, leg. M.A. Jesus, LPM 3750; Amazonas, Manaus, IFAM Campus (Instituto Federal de Educação, Ciência e Tecnologia do Amazonas), 17 Mar 2010, on dead trunk, leg. M.A. Jesus, LPM 7417.

Gloiothele larssonii Gorjón *sp. nov.*

Species Gloiothele granulosa affinis sed differt basidiosporis minoribus et cystidiis vesiculosis.

Etymology:—Named to honor Dr. Karl-Henrik Larsson (Sweden), in recognition of his contributions to the taxonomy of corticioid fungi.

Type:—BRAZIL. Presidente Figueiredo: Uatumã Biological Reserve, 30 May 2009, on dead branches (angiosperm), leg. M.A. Jesus, LPM 6085 (holotypus).

MycoBank: MB 800947

Basidiome resupinate, effused, hymenial surface grandinioid to minutely tuberculate with small papillae, isabelline to cream, margin abrupt, brownish. Hyphal system monomitic, hyphae with simple-septa, agglutinated, difficult to observe. Hymenium a dense palisade of basidia and hyphidia. Subhymenium composed of vesicular cystidia at different levels and agglutinated hyphae. Hyphidia filiform, smooth, scattered among the basidia but not conspicuous. Cystidia vesicular, with a widened subglobose basal part up to 15–20 µm wide, then prolonged in a tubular apical part up to 60–80 µm long, walls slightly thickened, with no granular contents in KOH or Melzer's reagent, hyaline in KOH, yellowish in Melzer's reagent, sulfobenzaldehyde reaction not tested, with a simple basal septum. Basidiospores ellipsoid, 3–4.5 × 2.5–3.5 µm, thin or with slightly thickened walls, smooth, with a faint amyloid reaction (Figs. 9, 21).

This new species is characterized by a grandinioid to tuberculate hymenophore, vesicular cystidia, and small basidiospores. Among described species in *Gloiothele* Bres. and *Vesiculomyces* E. Hagstr. it has the smallest basidiospores. *Gloiothele granulosa* Hjortstam & Spooner also has a granular hymenophore and small basidiospores but it differs in the tubular, subulate gloeocystidia and somewhat larger basidiospores measuring 4–5 × 3.5–4.5 µm (Hjortstam *et al.* 1990). *Vesiculomyces citrinus* (Pers.) E. Hagstr. and *Gloiothele ventricosa* Ghobad-Nejhad has also cystidia with swollen basal part and homogeneous no granular contents, differing in the smooth hymenophore and larger, globose basidiospores.

Hjortstamia amethystea (Hjortstam & Ryvarden) Boidin & Gilles

This species is characterized by a lilaceous hymenial surface, hyphae with simple-septa, and brown metuloids encrusted with large hyaline crystals. It is so far known only from Brazil.

Specimens examined:—BRAZIL, Amazonas, Manaus, INPA Campus, Bosque da Ciência, 16 Jun 2007, on dead branches, leg. M.A. Jesus, LPM 3455; Manaus, IFAM Campus (Instituto Federal de Educação, Ciência e Tecnologia do Amazonas), on bark of living hardwood, 5 May 2012, leg. S.P. Gorjón, SPG 3491.

Hypochnicium aff. *cremicolor* (Bres.) H. Nilsson & Hallenb.

The studied specimen is characterized by the presence of one kind of thick-walled fusiform cystidia, thick-walled hyphae, and ornamented, broadly ellipsoid basidiospores measuring 5.5–6.5 × 4.5–5 µm (Fig. 10). Although thickened hyphae have been reported for *H. cremicolor* by Paulus *et al.* (2007) and Tellería *et al.* (2010), thick-walled cystidia is not typical for the species. Thick-walled hyphae are not described in *H. punctulatum* (Cooke) J. Erikss. nor *H. albostramineum* (Bres.) Hallenb. *Hypochnicium cremicolor* was previously reported from Uruguay (Martínez & Nakasone 2011) in South America. It is typically distributed in Europe (Bernicchia & Gorjón 2010) but it has also been reported from the Canary Islands (Tellería *et al.* 2010) and Korea (Jung 1996) *Hypochnicium cremicolor* is morphologically and phylogenetically closely related to *Hypochnicium cystidiatum* Boidin & Gilles and *H. aoterae* B.C. Paulus, H. Nilsson & Hallenb.,

which have two kinds of cystidia (Paulus *et al.* 2007). *Hypochnicium guineensis* Tellería, M. Dueñas, Melo & M.P. Martín has more globose basidiospores and encrusted, thick-walled cystidia (Tellería *et al.* 2010). *Hypochnicium patagonicum* Gorjón & Hallenb. has thick-walled cystidia often with secondary septa and larger basidiospores (Gorjón & Hallenberg 2012).

Specimen examined:—BRAZIL, Amazonas, Presidente Figueiredo, leg. M.A. Jesus, LPM 7385.

Litschauerella clematitidis (Bourdot & Galzin) J. Erikss. & Ryvar den

The species was reported in South America from Colombia and Venezuela (Hjortstam & Ryvar den 2007a). In the Brazilian Amazon, it was collected from bark of living *Licania tomentosa*, sharing the habitat with *Dendrothele nakasoneae*.

Specimen examined:—BRAZIL, Amazonas, Manaus city, Plaza São Sebastião, 17 Apr 2012, bark of living *Licania tomentosa*, leg. S.P. Gorjón, SPG 3475.

Peniophora bonariensis C.E. Gómez

Basidiome resupinate, whitish, adnate, very thin, margin abrupt. Hyphal system monomitic, hyphae hyaline, with clamps. Hymenium a dense palisade of basidia, gloeocystidia, and lamprocystidia. Gloeocystidia abundant, tubular, often with a rooted base, few with an apical schizopapilla, 40–60 × 8–10 µm, distinctly thick-walled except at the apex, walls thickened up to 3 µm, with oleose contents. Lamprocystidia conical, mostly 25–35 × 10–15 µm, encrustation and basal part hyaline, less abundant than gloeocystidia. Basidia clavate, 25–30 × 6–8 µm, with four sterigmata, with a basal clamp. Basidiospores cylindrical to suballantoid, 6.5–8 × 2.5–3 µm, smooth, hyaline, IKI- (Fig. 11).

The species is characterized above all by the thick-walled gloeocystidia, often rooted at the base. The lamprocystidia, presence of clamps, and suballantoid basidiospores are also diagnostic. It is morphologically closely related to *Peniophora crassitunicata* Boidin, Lanq. & Gilles that differs in having much larger gloeocystidia and slightly smaller basidiospores. Martínez & Nakasone (2011) reported *Peniophora crassitunicata* from Uruguay. *Peniophora bonariensis* was recorded from northern Argentina (Gómez & Loewenbaum 1976) and Guadeloupe (Boidin *et al.* 1991).

Specimen examined:—BRAZIL, Amazonas, Manaus, INPA Campus, Bosque da Ciência, on dead trunk, 16 Jun 2007, leg. M.A. Jesus, LPM 3373

Peniophora wallacei Gorjón *sp. nov.*

Ab Peniophora pithya et P. exima affinis sed differt basidiosporis minoribus et egestate gloeocystidiis.

Etymology:—Named to honor the naturalist Alfred Russel Wallace (United Kingdom), in recognition of his contributions to the natural history and his extensive fieldwork in the Amazon River basin.

Type:—BRAZIL. Manaus: INPA Campus, Bosque da Ciência, on dead trunk (angiosperm), 18 Jun 2007, leg. M.A. Jesus, LPM 3411 (holotypus).

MycoBank: MB 800948

Basidiome resupinate, hymenial surface smooth, pale brown to buff, margin indeterminate. Hyphal system monomitic, hyphae thin to usually thick-walled, hyaline to yellowish, with clamps. Hymenium a palisade of basidia and lamprocystidia. Gloeocystidia absent. Lamprocystidia conical, hyaline to yellowish, distinctly thick-walled, walls up to 2–3 µm thick, encrusted with large irregular crystals, encrusted part up to 40 × 10–20 µm, with a basal clamp. Basidia cylindrical to clavate, 12–15 × 3–5 µm, hyaline, with four sterigmata, and a basal clamp. Basidiospores narrowly ellipsoid to cylindrical, (3.5–)4–5 × 2–2.5 µm, smooth, thin-walled, IKI- (Fig. 12, 22).

The species is characterized by a pale brown basidiome, hyphae with clamps, large encrusted cystidia, absence of gloeocystidia, and small basidiospores. It is morphologically related to *Peniophora exima* H.S. Jacks. and *Peniophora pithya* (Pers.) J. Erikss. in the *Peniophora molesta*-group (cf. Andreassen & Hallenberg 2009) but this species group differ in the presence of gloeocystidia and slightly larger basidiospores.

Peniophorella praetermissa s.l. (P. Karst.) K.H. Larss.

A cosmopolitan species in its broad sense. For further information regarding the *Peniophorella praetermissa* species complex see Hallenberg *et al.* (2007).

Specimens examined:—BRAZIL, Amazonas, Manaus, IFAM Campus (Instituto Federal de Educação, Ciência e Tecnologia do Amazonas), on bark of living hardwood, 5 May 2012, leg. S.P. Gorjón, SPG 3487.

Peniophorella pubera (Fr.) P. Karst.

A cosmopolitan species reported from the Brazilian Amazon for the first time.

Specimen examined:—BRAZIL, Amazonas, Manaus, Adolpho Ducke Forest Reserve, 29 Jan 2008, on dead wood, leg. M.A. Jesus, LPM 3386.

Phanerochaete australis Jülich

Basidiome resupinate, membranaceous, white to isabelline when young, or cream to pale brown when old, hymenial surface smooth or slightly tuberculate, margin abrupt. Hyphal system monomitic, all hyphae with simple-septa, subicular hyphae thick-walled, 4–7 µm in diam., not encrusted, subhymenial hyphae thin-walled, 2–3.5 µm in diam. Cystidia more or less fusiform, with a tapered or obtuse apex, not acute, 40–55 × 9–12 µm, distinctly thick-walled, walls thickened up to 3 µm, hyaline, usually smooth or encrusted only in the apical part. Basidia clavate, 20–25 × 3–4 µm, with four sterigmata, simple-septate at the base. Basidiospores narrowly ellipsoid, 4–5.5 × 2–2.5 µm, smooth, thin-walled, IKI- (Fig. 13).

The species is easily distinguished by the thick-walled cystidia with a variable encrusted apical part, small basidiospores, and simple-septate hyphae.

Specimens examined:—BRAZIL, Amazonas, Presidente Figueredo, Uatumã Biological Reserve, on fallen trunk, 29 May 2009, leg. M.A. Jesus, LPM 5892; Amazonas, Manaus, Adolpho Ducke Forest Reserve, 27 Jan 2008, on dead wood, leg. M.A. Jesus, LPM 3729; Manaus, INPA Campus, Bosque da Ciência, on decayed wood, 18 Jun 2007, leg. M.A. Jesus, LPM 342; Roraima, Alto Alegre - Amajari, Maracá Ecological Station, 27–30 Sep 2008, on dead trunks, leg. M.A. Jesus, LPM 4444, 4519, 4522.

Phanerochaete corymbata (G. Cunn.) Burds.

The species is distributed in Brazil (Hjorstam & Ryvarden 2007a) and Uruguay (Martínez & Nakasone 2011) in South America. There are records from USA (Burdsall 1985), Australia, and New Zealand (type locality) (Cunningham 1963).

Specimen examined:—BRAZIL, Amazonas, Amazonas, Adolpho Ducke Forest Reserve, 2 Feb 2006, on decayed wood, leg. M.A. Jesus, LPM 3334.

Phanerochaete fuscomarginata (Burt) Gilb.

The species is characterized by the presence of leptocystidia, ellipsoid basidiospores about 6–8 × 3.5–5 µm, and brown subicular hyphae with scattered single clamp-connections. Basidiospores are variable in size in the examined specimens, and usually vary from hyaline to pale brown. It has been reported from North America (Burdsall 1985) and Uruguay in South America (Gazzano 1994).

Specimens examined:—BRAZIL, Roraima, Alto Alegre - Amajari, Maracá Ecological Station, 14 Nov 2008, on dead trunks, leg. M.A. Jesus, LPM 4506; Roraima, Viruá National Park, 14 Nov 2009, on dead wood, leg. M.A. Jesus, LPM 7013.

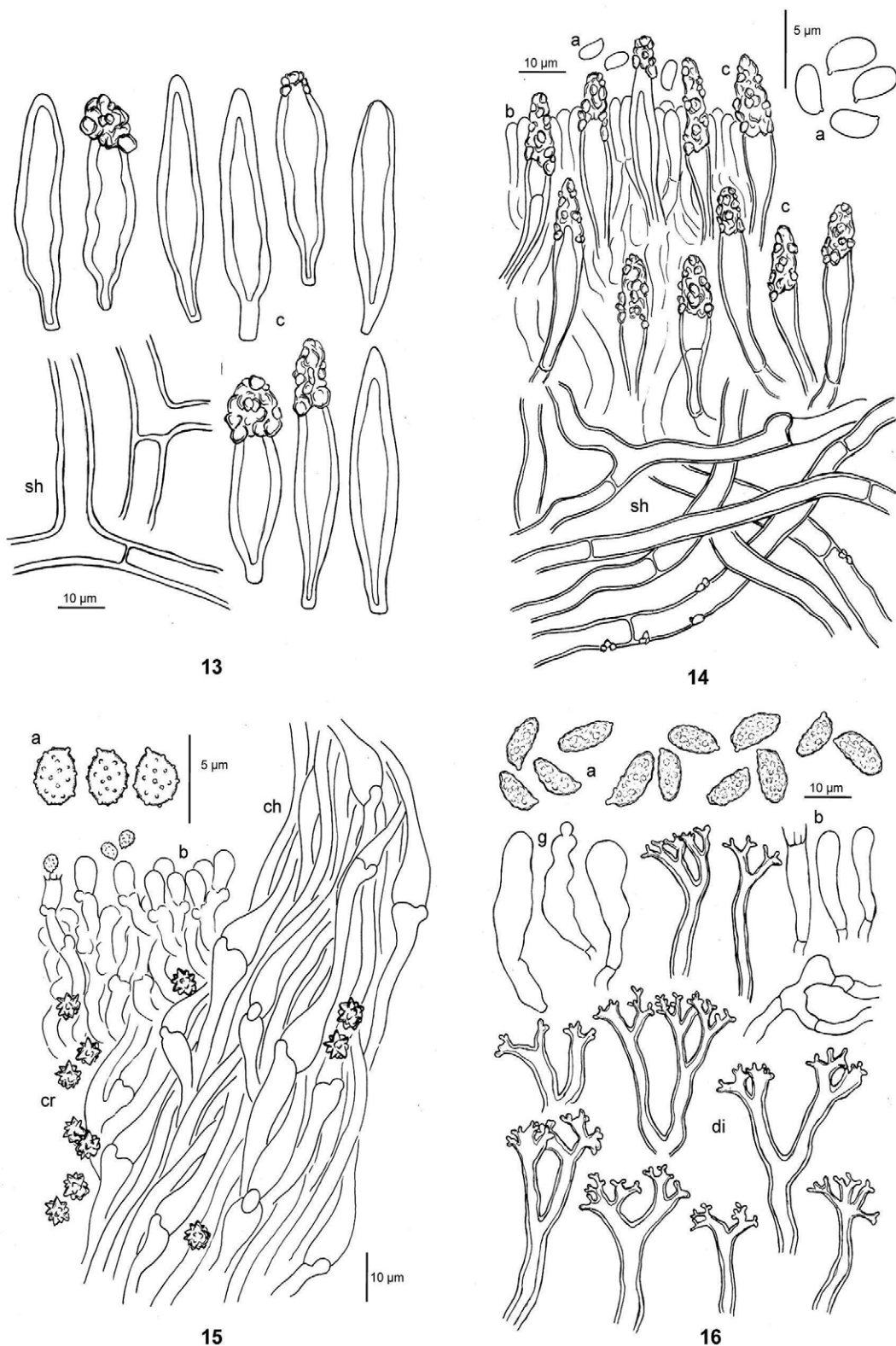


FIGURE 13–16. 13. *Phanerochaete australis*. 14. *Phanerochaete* sp. 15. *Trechispora* aff. *nivea*. 16. *Vararia* aff. *rugosispora*. a. Basidiospores. b. Basidia. c. Cystidia. ch. Hyphal cords. cr. Crystals. di. Dichohyphae. g. Gloeocystidia. h. hyphae. la. Lamprocystidia. sh. Subicular hyphae.

Phanerochaete sp.

The specimen is scanty but it seems morphologically related to *Phanerochaete exilis* (Burt) Burds. by the small, thick-walled cystidia (Fig. 14). However, it differs in smaller basidiospores ($3\text{--}4 \times 2\text{--}2.5 \mu\text{m}$), subicular hyphae with scattered clamp connections, and cream to pinkish hymenial surface. In *P. exilis* basidiospores are $5.5\text{--}6.5 \times 3\text{--}3.5 \mu\text{m}$ and the hymenial surface is yellowish grey.

Specimen examined:—BRAZIL, Roraima, Alto Alegre - Amajari, Maracá Ecological Station, 25 Sep 2008, on dead trunks, leg. M.A. Jesus, LPM 4620.

Pseudolagarbasidium venustum (Hjortstam & Ryvarde) Nakasone & D.L. Lindner

A species known from Brazil and Colombia. For a recent survey of the genus see Nakasone & Linder (2012).

Specimens examined:—BRAZIL, Roraima, Boa Vista, on dead *Acacia mangium* Willd. (Fabaceae), leg. M.A. Jesus, LPM 2670, 2698, 2768.

Scytinostroma phaeosarcum Boidin & Gilles

A pantropical species. See Boidin & Lanquetin (1987) for further details.

Specimen examined:—BRAZIL, Amazonas, Adolpho Ducke Forest Reserve, 24 Feb 2008, on dead standing trunk, leg. M.A. Jesus, LPM 3484.

Trechispora aff. *nivea* (Pers.) K.H. Larss.

Basidiome resupinate, hymenial surface smooth, porulose under the lens, whitish to grayish, hyphal cords present in the hymenophore, margin indeterminate. Hyphal system monomitic, hyphae with clamps, septa ampullate in the basal hyphae and hyphal cords, smooth or encrusted with rosette-like crystal druses. Hyphal cords composed of long-celled and clamped hyphae, encrusted with rosette crystals or smooth. Cystidia absent. Basidia short cylindrical, $8\text{--}10 \times 3\text{--}4 \mu\text{m}$, with 4 sterigmata, and a basal clamp. Basidiospores ellipsoid, $3\text{--}3.5 \times 2\text{--}2.5\text{--}(3) \mu\text{m}$, aculeate, IKI- (Fig. 15).

The specimen is characterized by the smooth hymenophore, small aculeate basidiospores, and presence of druse-like crystals. It seems micromorphologically closely related to *Trechispora nivea* (Pers.) K.H. Larss., the latter differing in the hydroid hymenophore.

Specimens examined:—BRAZIL, Amazonas, Manaus, INPA Campus, Bosque da Ciência, 2 Apr 2012, on bark of living spiny palm, leg. S.P. Gorjón, SPG 3453, 3467.

Vararia dussii Boidin & Lanq.

This species is characterized by clamped hyphae, inamyloid, ellipsoid to ovoid basidiospores about $4\text{--}6 \times 3\text{--}4 \mu\text{m}$, and presence of capillar dichophyses. A species reported from Argentina (Boidin & Gilles 1999), Brazil, and Venezuela (Hjortstam & Ryvarde 2007a).

Specimens examined:—BRAZIL, Amazonas, Manaus, INPA Campus, Bosque da Ciência, 14 Apr 2009, on dead wood, leg. M.A. Jesus, LPM 6716.

Vararia aff. *rugosispora* Boidin, Lanq. & Gilles

The species is characterized by a brownish basidiome, arboriform dichohyphae, simple-septate hyphae, and above all by rugose basidiospores (Fig. 16). Specimens from Amazon differs in somewhat narrower basidiospores ($10\text{--}12 \times 5\text{--}6 \mu\text{m}$) whereas in specimen from Gabon (the type locality) basidiospores are described as $(10\text{--})12\text{--}16\text{--}(18.7) \times (6\text{--})7\text{--}8.2 \mu\text{m}$ (Boidin *et al.* 1980). *Vararia rugosispora* was also previously recorded from Iguazu, Argentina by Hjortstam & Ryvarde (1986).

Specimens examined:—BRAZIL, Amazonas, Adolpho Ducke Forest Reserve, 4 Feb 2006, on dead trunk, leg. M.A. Jesus, LPM 3228. Amazonas, Presidente Figueredo, Uatumã Biological Reserve, 24–26 May 2009, on fallen trunk, leg. M.A. Jesus, LPM 7125, 6055. Roraima, Viruá National Park, 12 Nov 2009, on dead wood, leg. M.A. Jesus, LPM 7002.



FIGURE 17–22. Basidiomes of type specimens. 17. *Dendrothele nakasoneae*. 18. *Dendrothele ornata*. 19. *Gloeodontia halocystidiata*. 20. *Gloiothele incrustata*. 21. *Gloiothele larssonii*. 22. *Peniophora wallacei*. Bar 1 cm

An easily distinguishable species by the hyphae with clamp-connections and inamyloid, globose basidiospores about 6–9 µm in diam. It is reported from northern Argentina, Brazil, and Colombia (Hjortstam & Ryvarden 2007a).

Specimens examined:—BRAZIL, Amazonas, Manaus, INPA Campus, Bosque da Ciência, 2 Apr 2012, on bark of living palm, leg. S.P. Gorjón, SPG 3464. Roraima, Alto Alegre - Amajari, Maracá Ecological Station, 29 Sep 2008, on dead trunks, leg. M.A. Jesus, LPM 4511.

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References

- Andreasen, M. & Hallenberg, N. (2009) A taxonomic survey of the *Peniophoraceae*. *Synopsis Fungorum* 26: 56–119.
- Boidin, J. (1966) Basidiomycètes Corticiaceae de la République Centrafricaine. *Cahiers de la Maboké* 4: 5–17.
- Boidin, J. & Gilles, G. (1999) Contribution à la connaissance du genre *Vararia* (Basidiomycotina). *Bulletin de la Société Mycologique de France* 115: 115–139.
- Boidin, J. & Gilles, G. (2000) Basidiomycètes Aphyllophorales de l'île de La Réunion. XIX: Le genre *Epithele* (Pat.) Pat. 1900. *Bulletin Mensuel de la Société Linnéenne de Lyon* 69: 193–198.
- Boidin, J. & Lanquetin, P. (1983) Basidiomycètes Aphyllophorales epitheloides étalés. *Mycotaxon* 16: 461–499.
- Boidin, J. & Lanquetin, P. (1987) *Le genre Scytinostroma* Donk. *Bibliotheca Mycologica* 114:1–130.
- Boidin, J., Lanquetin, P. & Duhem, B. (1996) Contribution à la connaissance du genre *Dendrothele* (Basidiomycotina, Aphyllophorales). *Bulletin de la Société Mycologique de France* 112: 87–126.
- Boidin, J., Lanquetin, P. & Gilles, G. (1980) Application du concept biologique de l'espèce aux Basidiomycètes. Le genre *Vararia* section *Vararia* au Gabon. *Cyptogamie, Mycologie* 1: 265–384.
- Boidin, J., Lanquetin, P. & Gilles, G. (1991) Les *Peniophoraceae* de la zone intertropicale (Basidiomycetes, Aphyllophorales). *Bulletin de la Société Mycologique de France* 107:91–156.
- Boidin, J., Lanquetin, P. & Gilles, G. (1997) Le genre *Gloeocystidiellum* sensu lato (Basidiomycotina). *Bulletin de la Société Mycologique de France* 113: 1–80.
- Burdsall, H.H.Jr. (1985) A contribution to the taxonomy of the genus *Phanerochaete* (Corticiaceae, Aphyllophorales). *Mycologia Memoir* 10: 1–165.
- Cunningham, G.H. (1963). The Thelephoraceae of Australia & New Zealand. *New Zealand Department of Scientific and Industrial Research Bulletin* 145, 359 pp.
- Gazzano, S. (1994) Notas sobre Basidiomycetes xilofilos del Uruguay. VI. Nuevos registros. *Comunicaciones Botánicas del Museo de Historia Natural de Montevideo* 102: 1–10.
- Gomes-Silva, S.C. & Gibertoni, T.B. (2009) Checklist of the aphyllophoraceous fungi (Agaricomycetes) of the Brazilian Amazonia. *Mycotaxon* 108: 319–322 + checklist on-line at <http://www.mycotaxon.com/resources/checklists/gomesSilva-v108-checklist.pdf>
- Gómez, C.E. & Loewenbaum, M. (1976) El género *Peniophora* (Cooke) Donk (Basidiomycetes-Aphyllophorales) de los alrededores de Buenos Aires. *Dawiniana* 20: 189–209.
- Gorjón, S.P. & Hallenberg, N. (2012) Some new species and a first checklist of corticioid fungi (Basidiomycota) from Chile. *Mycological Progress* (in press) + checklist on-line at <http://corticioids.webs.com/checklists>
- Greslebin, A.G. & Rajchenberg, M. (1998) Corticioid Aphyllophorales (Basidiomycota) from the Patagonian Andes forests of Argentina 3. The genus *Dendrothele*. *Mycotaxon* 77: 469–486.
- Greslebin, A.G. & Rajchenberg, M. (2003) Diversity of Corticiaceae sens. lat. in Patagonia, Southern Argentina. *New Zealand Journal of Botany* 41: 437–446.

- Hallenberg, N., Nilsson, R.H., Antonelli, A., Wu, S.H., Maekawa, N. & Nordén B. (2007) The *Peniophorella praetermissa* species complex (Basidiomycota). *Mycological Research* 111: 1366–1376.
- Hjortstam, K. (1987) Studies in tropical Corticiaceae (Basidiomycetes) VII. Specimens from East Africa collected by L. Ryvar den. II. *Mycotaxon* 28: 19–37.
- Hjortstam, K. & Ryvar den, L. (1986) Some new and noteworthy fungi (Aphyllorphales, Basidiomycetes) from Iguazu, Argentina. *Mycotaxon* 25: 539–567.
- Hjortstam, K. & Ryvar den, L. (2005) Notes on the genus *Epithele* (Basidiomycotina, Aphyllorphales) from South America. *Synopsis Fungorum* 20: 23–32.
- Hjortstam, K. & Ryvar den, L. (2007a) Checklist of corticioid fungi (Basidiomycotina) from the tropics, subtropics, and the southern hemisphere. *Synopsis Fungorum* 22: 27–146.
- Hjortstam, K. & Ryvar den, L. (2007b) Studies in corticioid fungi from Venezuela III (Basidiomycotina, Aphyllorphales). *Synopsis Fungorum* 23: 56–107.
- Hjortstam, K. & Ryvar den, L. (2008) Some corticioid fungi (Basidiomycotina) from Ecuador. *Synopsis Fungorum* 25: 14–27.
- Hjortstam, K., Ryvar den, L. & Iturriaga, T. (2005) Studies in corticioid fungi from Venezuela II (Basidiomycotina, Aphyllorphales). *Synopsis Fungorum* 20: 42–78.
- Hjortstam, K., Spooner, B.M. & Oldridge, S.G. (1990) Some Aphyllorphales and Heterobasidiomycetes from Sabah, Malaysia. *Kew Bulletin* 45: 303–322.
- Jung, H.S. (1996) Taxonomic study on Korean Aphyllorphales (II) – on some unrecorded species – *The Korean Journal of Mycology* 24: 228–236.
- Martínez, S. & Nakasone, K.K. (2011) New records and checklist of corticioid Basidiomycota from Uruguay. *Mycotaxon* 114: 481–484.
- Nakasone, K.K. (2006) *Dendrothele griseocana* (Corticiaceae) and related taxa with hyphal pegs. *Nova Hedwigia* 83: 99–108.
- Nakasone, K.K. & Linder, D.L. (2012) Taxonomy of *Pseudolagarobasidium* (Polyporales, Basidiomycota). *Fungal Diversity* 55: 155–169.
- Paulus, B., Nilsson, H. & Hallenberg, N. (2007) Phylogenetic studies in *Hypochnicium* (Basidiomycota), with species emphasis on species from New Zealand. *New Zealand Journal of Botany* 45: 139–150.
- Rick, J.E. (1934) *Monographia Thelephoracearum resupinatarum Riograndensium*. *Brotéria Série Trimestral: Ciências Naturais* 3: 31–48.
- Roberts, P. (2000) Corticioid fungi from Korup National Park, Cameroon. *Kew Bulletin* 55: 803–842.
- Tellería, M.T., Dueñas, M., Melo, I., Hallenberg, N. & Martín, M.P. (2010) A re-evaluation of *Hypochnicium* (Polyporales) based on morphological and molecular characters. *Mycologia* 102: 1426–1436.
- Wu, S.H. & Buchanan, P. (1998) Species of *Boidinia* (Basidiomycotina) with simple-septate hyphae. *Mycotaxon* 67: 123–128.