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Type studies of the polypores described by E.J.H. Corner from Asia and West Pacific Areas. VI. Species described in *Tyromyces* (3), *Cristelloporia*, *Grifola*, *Hapalopilus*, *Heterobasidion*, *Ischnoderma*, *Loweporus*, and *Stecchericum*

Received: July 25, 2003 / Accepted: September 5, 2003

Abstract Identifications were made by type examinations for 27 species of polypores described by Corner. *Roseofavolus* gen. nov. is proposed, typified by *Grifola eos*. The following new combinations are proposed: *Amylocystis unicolor*, *Antrodiella xanthochroa*, *Cristelloporia pahan-gensis*, *C. rutilantiformis*, *Roseofavolus eos*, *Tyromyces armeniacus*, *T. olivascens*, and *Wrightoporia solomonensis*. *Hapalopilus rubescens* is accepted in the original genus. The following species were already combined with the proper genus: *Stecchericum gyroporum* and *S. trametoides*. The following species are synonyms: *Tyromyces sublamellatus*, a synonym of *Abortiporus roseus*; *T. subradiatus*, a synonym of *Daedaleopsis conchiformis*; *T. subroseiporus*, a synonym of *Fomitopsis scorteus*; *T. subtrimiticus*, a synonym of *Fomitopsis spraguei*; *T. sulphureiceps*, a synonym of *Antrodiella flava*; and *Loweporus corticicola*, a synonym of *C. rutilantiformis*. The following species are dubious because of their poor or sterile conditions: *Cristelloporia trimitica*, *Loweporus castaneus*, *Tyromyces subrubescens*, and *T. tristaniae*. No authentic specimens were traced for *Ischnoderma brunneipurpureum*, *I. friabile*, *I. solomonense*, *Loweporus ochraceicinctus*, *L. pileoliferus*, *Stecchericum trimiticum*, and *Tyromyces xanthophaes*. Descriptions and line drawings are given for little-known species.

Key words E.J.H. Corner · Polypores · Southeast Asia · Type specimens

Introduction

This is the sixth part of the type studies of polypores described by Corner (1989, 1992). In this study, I examined type materials of 27 species described in the genera

Cristelloporia I. Johans. & Ryvar-den, *Grifola* Gray, *Hapalopilus* P. Karst., *Heterobasidion* Bref., *Ischnoderma* P. Karst., *Loweporus* J.E. Wright, and *Tyromyces* P. Karst. Their identities are shown, and descriptions and line drawings are given for little-known species.

Materials and methods

Type specimens of the polypores described by Corner (1989, 1992) were examined macro- and microscopically. The colors of basidiocarps are given according to Kornerup and Wanscher (1981). Information from living and dried specimens collected in Pasoh Forest Reserve, a lowland rain forest of West Malaysia, is also incorporated for some species. Descriptions on fresh specimens given by Corner (1989, 1992) are also referred, occasionally. Herbaria where specimens are deposited are abbreviated according to Holmgren et al. (1990).

Identification and descriptions

Tyromyces sublamellatus Corner, Beih. Nova Hedwigia 96:199 (1989).

Holotype: Malaysia, Negri Sembilan, Gunong Angsi, alt. 800m, June 29, 1930, leg. E.J.H. Corner (E).

I leave this as a sessile and whitish form of *Abortiporus roseus* (D.A. Reid) Masuka & Ryvar-den [Mycotaxon 44:246 (1992)] with subglobose basidiospores, gloeocystidia, and dimitic hyphal system. For a description of typical *A. roseus*, see Ryvar-den and Johansen (1980) as *Heteroporus roseus* D.A. Reid. A condensed description of the holotype is as follows: basidiocarps sessile, pileus flabelliform, upper surface white, almost glabrous; pores angular near the margin, sinuous to daedaleoid near the center, 3–4/mm in poroid parts; hyphal system dimitic; gloeocystidia 18–25 × 6–9 μm; basidiospores subglobose, IKI–, 4.5–6 × 3.5–4.5 μm; chlamyospores not seen.

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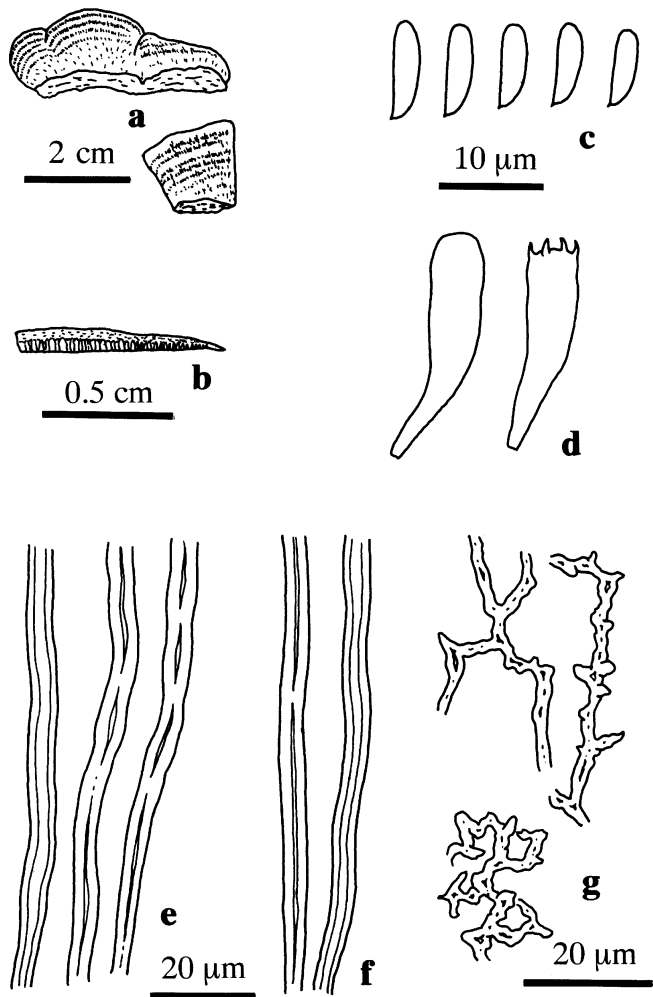


Fig. 1. Structures of *Daedaleopsis conchiformis* from basidiocarps (holotype of *Tyromyces subradiatus*). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidium and unripe basidium (left). **e** Skeletal hyphae from trama. **f** Skeletal hyphae from context. **g** Binding hyphae from context

Tyromyces subradiatus Corner, Beih. Nova Hedwigia 96:199 (1989). Fig. 1

Holotype: Malaysia, Pahang, Tembeling, June 4, 1931, leg. E.J.H. Corner (E).

The holotype represents *Daedaleopsis conchiformis* Imazeki, Bull. Tokyo Sci. Mus. 6:77 (1943) (holotype, US0321332, BPI!). Detailed description of the holotype was provided because of the limited information on *D. conchiformis*.

Basidiocarps effused-reflexed, pileus semicircular to elongated. Pileus surface glabrous, smooth, zonate, light orange (5A4–5B5; cream white, pallid ochraceous with age according to the original description), with brown zones (6C6–7, 6D6–7), sulcate. Pileus margin thin and acute, entire or eroded. Pore surface grayish-orange (5B4–5), pores angular to radially elongated, partly almost irpicoid, 2–3/mm, dissepiments thin and eroded. Context leathery, flexible, grayish-orange, up to 0.8 mm thick, without a crust. Tubes concolorous with the context, up to 0.5 mm deep.

Hyphal system trimitic. Contextual generative hyphae not seen; skeletal hyphae colorless, IKI–, thick-walled (up to 2 µm thick), 2–5 µm wide; binding hyphae scattered, conspicuously branched, up to 3 µm wide. Tramal hyphae similar to contextual hyphae. Cystidia not seen. Basidium, only one seen, approximately 25 µm long and 5 µm wide. Basidiospores cylindrical, colorless, IKI–, 9–11 × 2.5–3.5 µm.

Remarks: *Daedaleopsis conchiformis* has hitherto been reported from Japan, China (Hattori and Zang 1995), Micronesia (Imazeki 1941), and New Guinea (Imazeki 1952). In Japan, this species is distributed in cool temperate areas and is not seen in warm temperate to subtropical areas. This suggests that two geographically isolated populations are distributed in the northeastern Asia and the tropical areas of Asia-West Pacific. Further studies are needed to reveal whether they belong to a single species or represent two distinct species. For a description of the holotype of *D. conchiformis* described from Japan, see Hattori and Ryvardeen (1994).

Tyromyces subroseiporus Corner, Beih. Nova Hedwigia 96:200 (1989).

Holotype: New Guinea, Aiyura, alt. 2000 m, Nov. 23, 1960, leg. E.J.H. Corner (E).

The holotype represents *Fomitopsis scorteus* (Corner) T. Hatt. [Mycoscience 44:275 (2003)] with whitish and applanate pileus, more or less irregular hymenophore, dimittic hyphal system, and cylindrical and bent basidiospores. For a description of *F. scorteus*, see Hattori (2003). A condensed description of the holotype is as follows: basidiocarps sessile; pileus applanate, upper surface rough with small warts; pores angular to sinuous, 2–3/mm; basidiospores cylindrical, 5.5–7.5 × 2–3 µm.

Tyromyces subrubescens Corner, Beih. Nova Hedwigia 96:201 (1989).

Holotype: Malaysia, Borneo, Mt. Kinabalu, Kundasang, alt. 1200 m, Aug. 7, 1960, leg. E.J.H. Corner (E).

The holotype represents a *Gloeoporus* sp. with resinous tubes and monomittic hyphal system. This is characterized by tiny pores (10–12/mm) and generative hyphae with simple septa, but I prefer to leave this as *Gloeoporus* sp. because the holotype is sterile.

Tyromyces subtrimiticus Corner, Beih. Nova Hedwigia 96:201 (1989).

Holotype: Malaysia, Borneo, Mt. Kinabalu, alt. 1200–2700 m, Mar. 20, 1964, leg. E.J.H. Corner (E).

The holotype represents *Fomitopsis spraguei* (Berk. & M.A. Curtis) Gilb. & Ryvardeen [Mycotaxon 22:364 (1985)] with whitish basidiocarps, dimittic hyphal system, and subglobose basidiospores. For a description of *F. spraguei*, see Gilbertson and Ryvardeen (1986). Greenish coloration suggested in the original description is also observed in Japanese collections.

Tyromyces sulphureiceps Corner, Beih. Nova Hedwigia 96:204 (1989).

Holotype: Malaysia, Borneo, Mt. Kinabalu, alt. 1700 m, Feb. 23, 1964, leg. E.J.H. Corner (E).

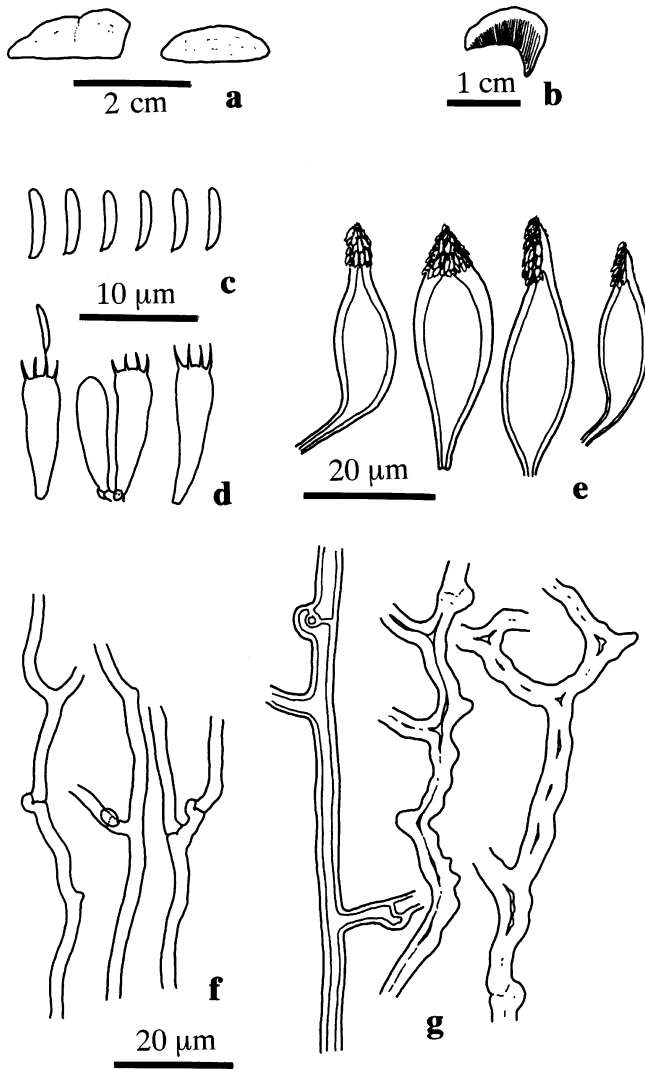


Fig. 2. Structures of *Amylocystis unicolor* from basidiocarps (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia. **e** Hymenial cystidia. **f** Generative hyphae from trama. **g** Generative hyphae from context

The holotype represents *Antrodiella flava* (Corner) T. Hatt. [Mycoscience 42:20 (2001)] with yellowish pileus when dried, gloeocystidia, and small ellipsoid basidiospores. For a description, see Hattori (2001).

Tyromyces tristaniae Corner, Beih. Nova Hedwigia 96:204 (1989).

Holotype: Malaysia, Borneo, Mt. Kinabalu, alt. 1800m, Aug. 20, 1961, leg. E.J.H. Corner (E).

The holotype is sterile and in poor condition.

Tyromyces unicolor Corner, Beih. Nova Hedwigia 96:205 (1989). Fig. 2

Holotype: Malaysia, Borneo, Mt. Kinabalu, alt. 1300m, Sept. 3, 1961, leg. E.J.H. Corner (E).

Accepted as *Amylocystis unicolor* (Corner) T. Hatt., comb. nov. (basonym indicated above).

Basidiocarps sessile, pileus convex, semicircular to elongated. Pileus surface velutinous, azonate, whitish (4A2–3), pileus margin obtuse, entire. Pore surface whitish, pores angular, 6–7/mm, dissepiments thin and entire. Context loose near the surface and corky near the base but not distinctly duplex, white, up to 2mm thick, without a crust, taste bitter. Tubes brittle when dried, pale orange (5A3–4), up to 2mm deep.

Hyphal system monomitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 1.8–3µm wide. Contextual generative hyphae 2.5–10µm wide, colorless, IKI–, thick-walled to almost solid, some hyphae sinuous and conspicuously branched. Hymenial cystidia abundant, ventricose, encrusted with crystals at the apex, thick-walled (up to 4µm thick), hyaline, amyloid, 25–45 × 6–15µm. Basidia clavate to short cylindrical, 4-sterigmate, 8–15 × 3–3.5µm. Basidiospores allantoid, colorless, IKI–, 4–5 × 0.8–1µm.

Remarks: This is a member of *Amylocystis* Bondartsev & Singer with distinctly amyloid hymenial cystidia and monomitic hyphal system with clamp connections. *Amylocystis lapponica* (Romell) Singer has larger basidiocarps with strong rufescence and larger basidiospores (8–11 × 2.5–3.5µm; Gilbertson and Ryvar den 1986). *Postia amylocystis* Y.C. Dai & Renvall (= *Auriporia pileata* Parmasto *vide* Núñez and Ryvar den 2001) is similar by the more or less amyloid cystidia and allantoid basidiospores, but has yellowish pore surface, larger pores (4–5/mm), weakly amyloid cystidia, and narrower (2.8–4.4µm wide) and less branched hyphae in the context (Dai and Renvall 1994).

Tyromyces xanthochrous Corner, Beih. Nova Hedwigia 96:206 (1989). Fig. 3

Holotype: Malaysia, Pahang, Cameron Highland, alt. 1500m, Nov. 13, 1930, leg. E.J.H. Corner (E).

Accepted as *Antrodiella xanthochroa* (Corner) T. Hatt., comb. nov. (basonym indicated above).

Basidiocarps sessile, pileus triquetrous to subungulate, semicircular to flabelliform. Pileus surface matted, radially fibrous, rough with irregular projections near the base, zonate, grayish-brown (6E4–5), darker near the base. Pileus margin obtuse, eroded. Pore surface yellowish-white, pores angular, 5–6/mm, dissepiments thin, eroded. Context horny-corky when dried, pale orange (5A2–3, 6A2–3) to brown (6F4–5), up to 8mm thick, without a crust. Tubes pale orange, up to 3mm deep.

Hyphal system dimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 2–4µm wide; tramal skeletal hyphae colorless, IKI–, 3–5.5µm wide, swelled in KOH solution. Contextual hyphae similar to tramal hyphae. Cystidia not seen. Basidia not seen (4-sterigmate according to the original description). Basidiospores ellipsoid, colorless, IKI–, 2.8–3.5 × 1.5–2µm.

Remarks: This is a member of *Antrodiella* Ryvar den & I. Johans. because of the fleshy context becoming dense after dried, the dimitic hyphal system, and the small basidiospores. Microscopically, this species is similar to *A. semisupina* (Berk. & M.A. Curtis) Ryvar den, but distinct by the distinctly zonate pileus and brownish context.

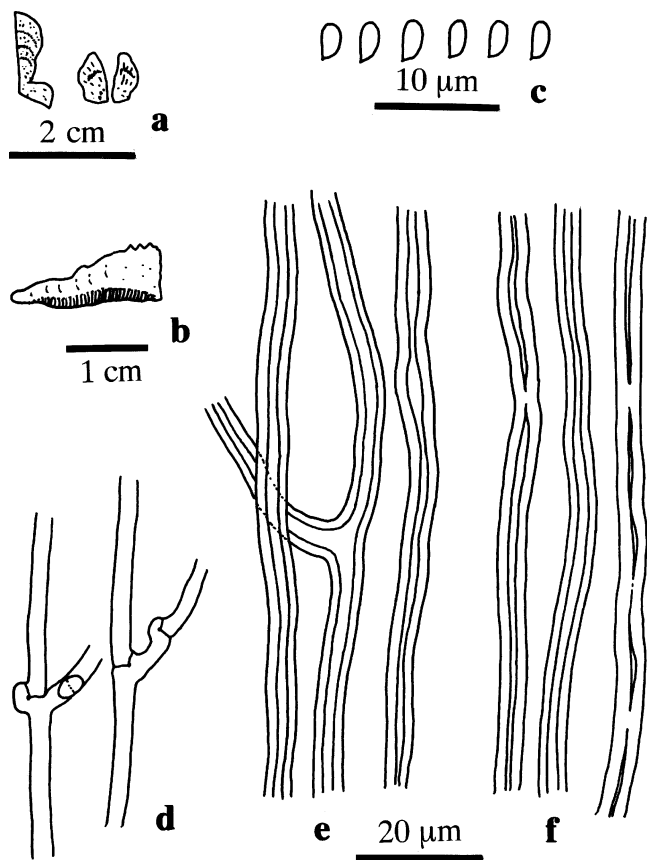


Fig. 3. Structures of *Antrodiella xanthochroa* from basidiocarps (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Generative hyphae from context. **e** Skeletal hyphae from trama. **f** Skeletal hyphae from context

Antrodiella fragrans (A. David & Tortiĉ) A. David & Tortiĉ also has similar basidiospores and brownish basidiocarps, but is distinct by encrusted hyphae in the dissepiments, occurrence of binding hyphae in the trama, and strong smell of coumarin when fresh.

Tyromyces xanthophaes Corner, Nova Hedwigia 55:150 (1992).

Holotype was not traced in E. This was not validly published because the herbarium in which the type is conserved was not cited in the original description (see ICBN Saint Louis Code, Art. 37.6).

Cristelloporia trimitica Corner, Nova Hedwigia 55:120 (1992).

Holotype: Papua, Kanosia, Feb. 8, 1935, leg. E.J.H. Corner (E).

The echinulate spores described in the original description are those of a contaminant. The holotype is a *Trametes* sp. with trimitic hyphal system and cylindrical basidiospores, and possibly represents a specimen that is produced on the underside of the substratum. A condensed description of the holotype is as follows: basidiocarps resupinate; pore surface pale orange, partly brownish, pores angular, 5–6/mm; context corky, white, up to 1 mm thick,

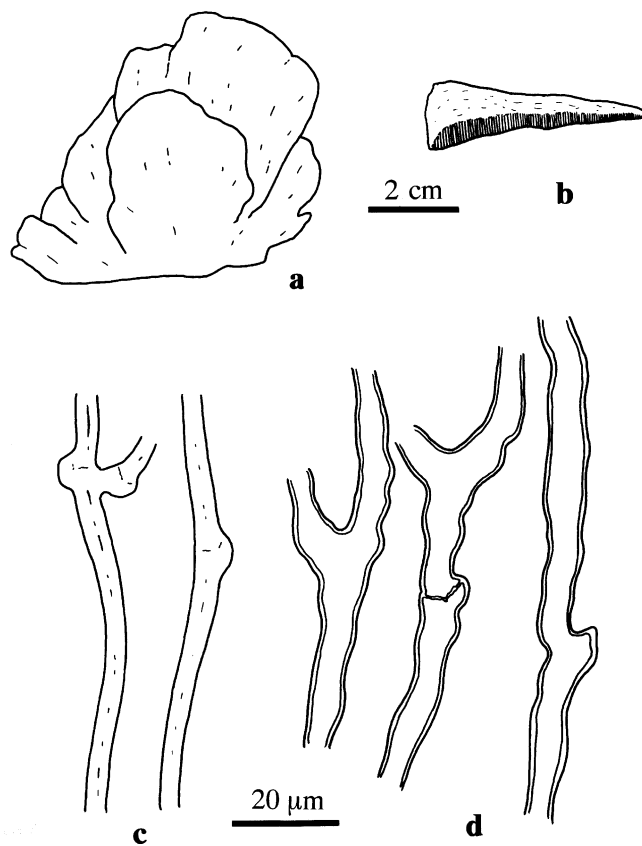


Fig. 4. Structures of *Tyromyces armeniicus* from basidiocarps (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Generative hyphae from trama. **d** Generative hyphae from context

without a crust; tubes up to 3 mm deep; hyphal system trimitic, generative hyphae with clamp connections, skeletal hyphae IKI–; basidiospores cylindrical, IKI–, 5.5–7 × 2–2.5 µm.

Grifola armeniaca Corner, Beih. Nova Hedwigia 96:64 (1989).

Fig. 4

Holotype: Malaysia, Johore, Gunong Panti, Sept. 26, 1966, leg. E.J.H. Corner (E).

Accepted as *Tyromyces armeniicus* (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps substipitate, imbricated or single. Pileus applanate to convex, flabelliform to semicircular. Pileus surface almost glabrous to radially wrinkled, azonate, pale orange to grayish-orange (5A3–4, 5B3–4; pale pink to lurid pink or pinkish-orange, pale apricot-pink or sublateritious, readily fading to buff-white, paler to the acute, often undulate, pale apricot-yellow margin according to the original description). Pileus margin entire, occasionally wavy. Pore surface pale orange (5A1–2), pores angular, 2–4/mm, dissepiments thin and eroded. Context fibrous-spongy, brittle, light in weight, pale orange to grayish (pale to bright pink, deep apricot-pink, or sublateritious according to the original description), up to 20 mm thick, without a crust. Tubes spongy, concolorous with the context, up to 5 mm deep.

Hyphal system monomitic. Tramal generative hyphae colorless, IKI–, with clamp connections, thin- to thick-walled (up to 2µm thick), easily broken when squashed in Melzer's reagent, 1.5–5µm wide, swollen in KOH solution. Contextual generative hyphae colorless, IKI–, clamp connections sparse, thin- to thick-walled, 3–12µm wide, dissolved in KOH solution. Cystidia not seen. Basidia not seen. Basidiospores not seen (ellipsoid, colorless, IKI–, 4–6 × 2.5–3µm according to the original description).

Remarks: Macroscopically, this species is similar to *Laetiporus sulphureus* (Bull. : Fr.) Murrill and *Piptoporus soloniensis* (Dubois: Fr.) Pilát by the orange to pinkish basidiocarps fading whitish or grayish, but distinct by the monomitic hyphal system with clamp connections. Type of rot is unknown, but I treat this as a member of *Tyromyces* P. Karst. because of the pale-colored context, monomitic hyphal system with clamp connections, and lack of iodine reaction. *Tyromyces incarnatus* Imazeki also has a reddish pileus, but is distinct by the single and smaller pilei, short cylindrical basidiospores, and narrower contextual hyphae that are not dissolved in KOH solution (Hattori and Ryvarden 1994).

Grifola eos Corner, Beih. Nova Hedwigia 96:65 (1989).

Fig. 5

Holotype: Singapore, Bukit Timah, Sept. 14, 1930, leg. E.J.H. Corner (E).

Accepted as *Roseofavolus eos* (Corner) T. Hatt. Because the holotype is badly contaminated, microscopic descriptions are based on the specimen below: TFM-F-17426 (TFM), Malaysia, N. Sembilan, Pasoh For. Res., Aug. 1, 1995, leg. T. Hattori. Macroscopic descriptions are of the specimen indicated above and other specimens from Malaysia in addition to the holotype.

Basidiocarps laterally stipitate to substipitate, pileus applanate, flabelliform. Pileus surface smooth, glabrous to pruinose, reddish-brown (7D4–5, 7E4–5, 8D4–5, 8E4–5) when dried (at first deep carmine-red more or less suffused umber, then clear rose-pink with innate fuscous streaks or scattered fuscous pruinae or spicules, often with faint slightly elongate reticulation according to the original description). Pileus margin thin and acute, often wavy and/or eroded. Stem lateral, up to 4cm long, concolorous with pileus. Pore surface rose-pink when fresh, angular, often radially elongated, 1–3/mm (occasionally up to 2mm wide), dissepiments thin, partly eroded. Context horny when dried, sappy to fleshy when fresh, brown (6D6, 6E6) in holotype (white to pale pink when fresh according to my observation), 5–11mm thick when fresh according to the original description, without a crust. Tubes brittle when dried, separable from the context, 7–11mm deep according to the original description.

Hyphal system monomitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 2–3.5µm wide. Contextual generative hyphae colorless, IKI–, with clamp connections, thin- to thick-walled, 3–15µm wide. Cystidia tubular to capitata, hyaline, IKI–, smooth, thin-walled, 30–45 × 5–7.5µm. Basidia cylindrical, 4-sterigmate, 20–28

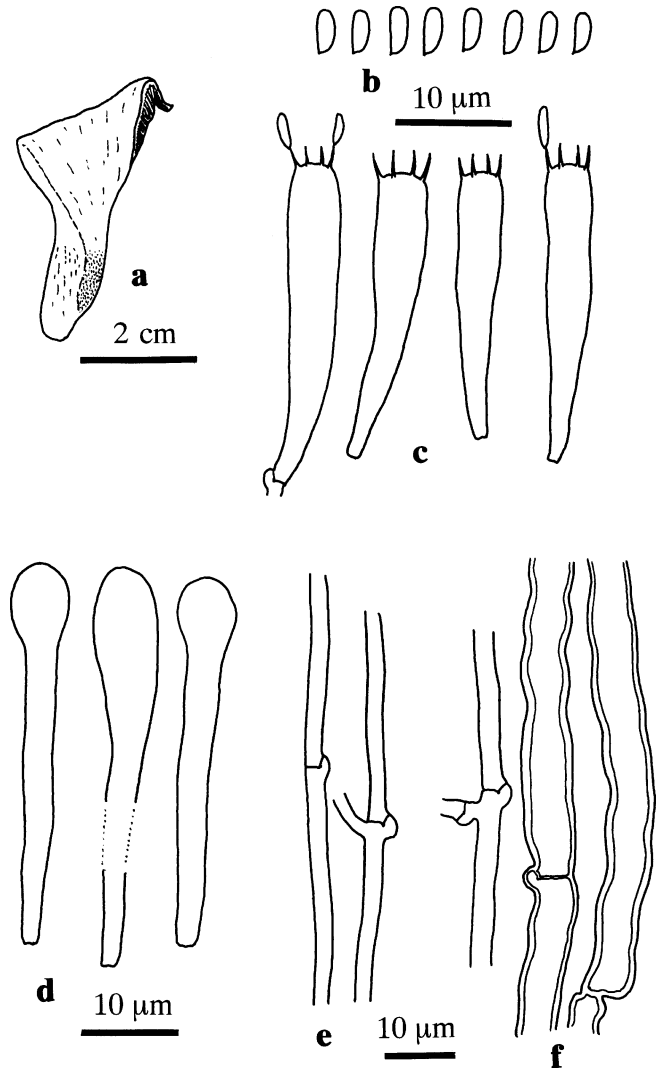


Fig. 5. Structures of *Roseofavolus eos* from basidiocarps (a holotype; b–f TFM-F-17426, TFM). a Upper view of basidiocarps. b Basidiospores. c Basidia. d Cystidia. e Generative hyphae from trama. f Generative hyphae from context

× 3.5–5µm. Basidiospores long-ellipsoid, colorless, IKI–, 3.2–4.5 × 1.8–2.5µm.

Remarks: The present species may be taken for a *Polyporus* sp. in the field because of its stipitate and fleshy basidiocarps with large pores, but it is distinguishable by its monomitic hyphal system. It can be easily determined in the field by its pink-colored basidiocarps and large pores.

This species is usually found on well-decomposed wood in Pasoh. It was never successfully isolated from tissue or from spore prints.

Roseofavolus T. Hatt., gen. nov.

Basidiocarpium a latere stipitatum, lignatile, annum. Pileus singularis vel imbricatus. Hymenophorum tubulare. Contextus carnosus, pallidus. Systema hypharum monomiticum; hyphae generativae fibulatae, hyalinae, haud dextrinoideae. Cystidia tubulosa vel capitata. Basidia cylindrica. Sporae laeves, hyalinae, haud dextrinoideae.

Typus generis: *Grifola eos* Corner.

Basidiocarps laterally stipitate, lignicolous, annual. Pileus single or imbricated. Hymenophore tubular. Context fleshy, pale-colored. Hyphal system monomitic, generative hyphae with clamp connections, hyaline, IKI-. Cystidia tubular to capitate. Basidia cylindrical. Basidiospores smooth, hyaline, IKI-. Type of rot unknown.

Etymology: Latin, *roseo-* = rose colored, *Favolus* = a generic name.

Roseofavolus eos (Corner) T. Hatt., comb. nov. (Basionym: *Grifola eos* Corner, Beih. Nova Hedwigia 96:65, 1989).

Remarks: This genus is a member of Polyporaceae sensu lato, although its phylogenic position is unclear. It is characterized by the stipitate basidiocarps on well-decomposed wood, tubes separable from the context, the fleshy and pale-colored context, the monomitic hyphal system, the tubular to capitate cystidia, the cylindrical basidia, and complete lack of dextrinoidity and amyloidity. Macroscopically, it is most similar to *Polyporus* Fr. but discriminated by the monomitic hyphal system. *Jahnporus* Nuss has a corky context, clavate basidia, large fusiform basidiospores, and lacks cystidia. *Tyromyces* P. Karst. usually lacks a distinct stipe and tubular to capitate cystidia and has clavate basidia.

Hapalopilus olivascens Corner, Beih. Nova Hedwigia 96:69 (1989). Fig. 6

Holotype: Malaysia, Borneo, Mt. Kinabalu, alt. 1700m, Jan. 31, 1964, leg. E.J.H. Corner (E).

Accepted as ***Tyromyces olivascens*** (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps sessile, pileus convex to applanate, semicircular. Pileus surface matted to velutinous, almost smooth, azonate, yellow to orange (4A6-7, 4B6-7), partly olive-brown (4D7-8, 4E7-8, 5D7-8, 5E7-8; brilliant orange to ferruginous-orange, rubiginous in age when fresh according to the original description). Pileus margin thick and obtuse, entire. Pore surface olive-brown (4D6-7, 4E6-7; pale yellowish-white to pale orange-yellow, turning dull rufescent on bruising when fresh according to the original description), pores angular, 3-4/mm, dissepiments entire. Context fibrous-corky, drying light in weight, yellow to olive (4A6-7, 4B6-7; orange-yellow, ferruginous-yellow in the older parts, dull rufous-vinescent on cutting when fresh according to the original description), without a crust, olive-brown by KOH solution. Tubes concolorous with the context, rigid when dried, up to 4 mm deep.

Hyphal system monomitic. Tramal generative hyphae colorless, IKI-, with clamp connections, 2-4.5µm wide. Contextual generative hyphae colorless, IKI-, with clamp connections, conspicuously inflated, 2-20µm wide, covered with resinous materials. Cystidia not seen. Basidia not seen. Basidiospores short ellipsoid, colorless, IKI-, 3.8-5 × 2.2-3µm.

Remarks: I placed this species in *Tyromyces* P. Karst. because of the sappy and pale-colored context, lack of vinescence by KOH solution, the monomitic hyphal system with clamp connections, and complete lack of iodine reaction. This species is characterized by the yellowish pileus

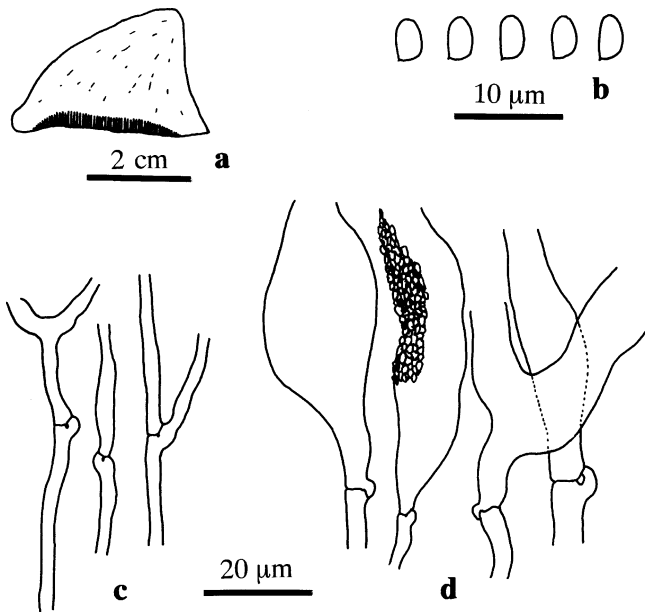


Fig. 6. Structures of *Tyromyces olivascens* from basidiocarps (holotype). a Vertical section view of basidiocarp. b Basidiospores. c Generative hyphae from trama. d Generative hyphae from context partly covered with resinous materials

with vinescence on cutting, the olive-brown coloration in KOH solution, and the conspicuously inflated hyphae in the context.

Hapalopilus rubescens Corner, Beih. Nova Hedwigia 96:70 (1989). Fig. 7

Holotype: Malaysia, Johore, Sept. 2, 1934, leg. E.J.H. Corner (E).

Accepted as *H. rubescens*.

Basidiocarps sessile, effused-reflexed to resupinate, pileus nodulose to convex, irregular to semicircular. Pileus surface matted to velutinous, partly irregularly rough, azonate, orange-brown (5B6-7, 5C6-7, 6B6-7, 6C6-7; bright cinnamon-fawn, lighter cinnamon-buff near the pale cartridge-buff margin according to the original description). Pileus margin thick and obtuse. Pore surface sordid-orange (6C5) to brown (7F5, pale cinnamon-ochraceous buff when fresh according to the original description), pores angular, 5-7/mm, dissepiments thin and mostly entire, waxy when fresh according to the original description. Context horny and rigid, orange-brown with dark zones when dried (rather spongy and tough but sappy and putrescent, lurid cinnamon-fawn, up to 30 mm thick when fresh according to the original description), without a crust. Tubes rigid, stratified, olive-brown to brown (5E4-5, 5F4-5, 7E4-5, 7F4-5) when dried, concolorous with the context when fresh, up to 10 mm deep. All parts turning dull rufous-pink on bruising, turning reddish-purple in dilute potash according to the original description.

Hyphal system monomitic. Tramal generative hyphae colorless, IKI-, with clamp connections, 2-4µm wide. Contextual generative hyphae colorless, IKI-, with clamp connections, thick-walled to almost solid (up to 2.5µm thick),

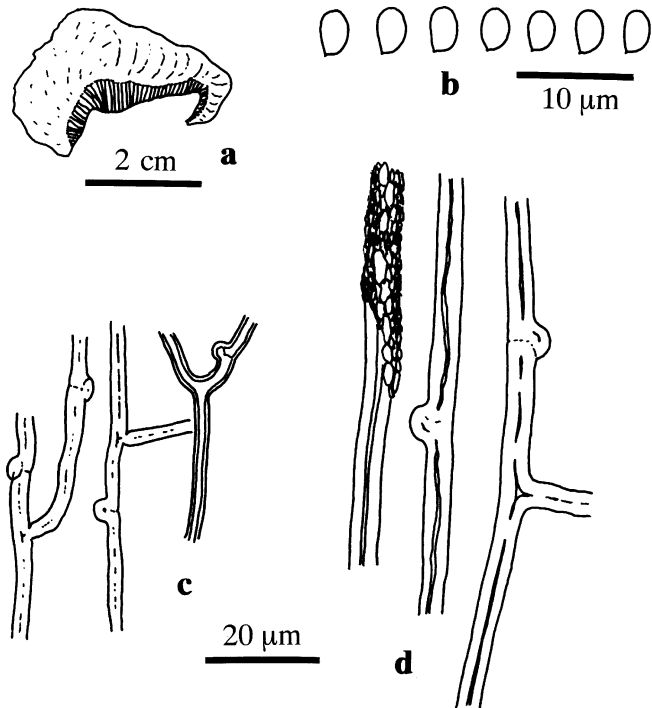


Fig. 7. Structures of *Hapalopilus rubescens* from basidiocarps (holotype). **a** Vertical section view of basidiocarp. **b** Basidiospores. **c** Generative hyphae from trama. **d** Generative hyphae from context, hypha covered with resinous materials (left)

encrusted with resinous materials, 2.5–6 µm wide. Cystidia not seen. Basidia not seen. Basidiospores short, ellipsoid, colorless, IKI–, 3.2–4 × 2–2.5 µm.

Remarks: This species is similar to *H. crocatus* (Pers. : Fr.) Donk and *Tyromyces pulcherrimus* (Rodway) G.H. Cunn. by the sappy context drying dense and rigid. However, *H. crocatus* has vividly orange basidiocarps without distinct rubescens on bruising and larger basidiospores (4–6 × 3–4 µm), according to my observations of Japanese specimens. *Tyromyces pulcherrimus* has crimson basidiocarps, larger pores (1–3/mm), and larger basidiospores (4.5–6 × 3.5–4.5 µm) according to Cunningham (1965).

Heterobasidion pahangense Corner, Beih. Nova Hedwigia 96:73 (1989). Fig. 8

Holotype: Malaysia, Pahang, Tembeling, Nov. 5, 1930, leg. E.J.H. Corner (E).

Accepted as ***Cristelloporia pahangensis*** (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps resupinate to effused-reflexed with narrow pilei, with white floccose rhizomorphs from the underside or the margin of effused parts. Pileus indistinct in dried specimens (up to 3 cm, smooth or somewhat uneven, innately cottony fibrillose, white then pale brown or pale rufous from the base, varying pale ochraceous to wholly pale brown, not or very faintly zoned according to the original description). Pore surface whitish (5A1–2), pores angular, 6–8/mm, dissepiments thin, entire to partly eroded. Context soft, fibrous, white, up to 0.5 mm thick, without a crust. Tubes soft, pale orange (5A2–3), up to 10 mm deep.

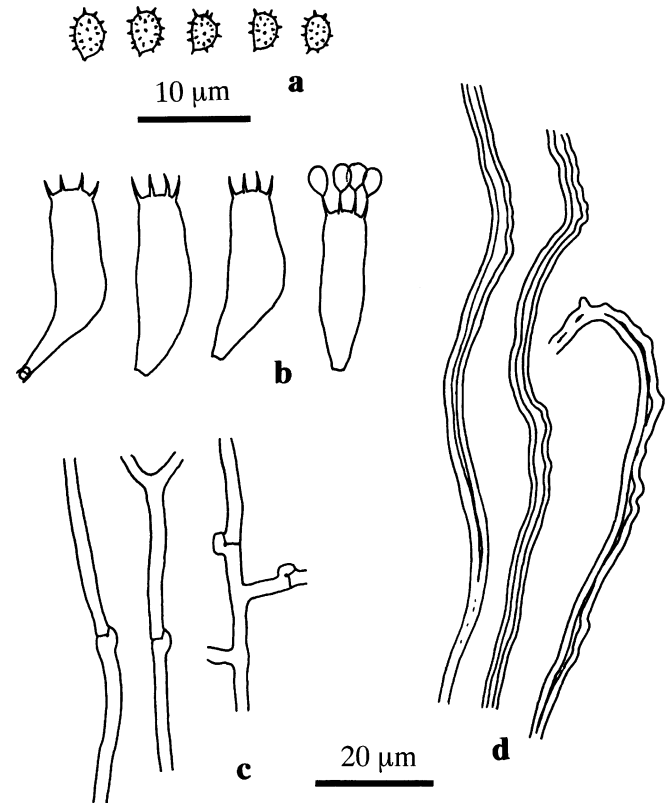


Fig. 8. Structures of *Cristelloporia pahangensis* from basidiocarps (holotype). **a** Basidiospores. **b** Basidia. **c** Generative hyphae from trama. **d** Skeletal hyphae from trama

Hyphal system dimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 1.5–2.5 µm wide; skeletal hyphae sinuous, unbranched, thick-walled (up to 1 µm thick), colorless, dextrinoid in mass, 2–3.5 µm wide. Cystidia not seen. Basidia clavate, 4-sterigmate, 14–20 × 4–5 µm. Basidiospores ellipsoid, echinate, colorless, IKI–, 3.2–4.2 × 2–2.5 µm.

Remarks: Corner placed this species in *Heterobasidion* because of the asperulate basidiospores and dextrinoid hyphae, but occurrence of clamp connection in basidiocarps and distinctly echinate basidiospores are unknown in the genus. This species is a member of *Cristelloporia* I. Johans. & Ryvarden because of the dimitic hyphal system, the generative hyphae with clamp connections, and the ornamented basidiospores. *Cristelloporia dimitica* I. Johans. & Ryvarden is similar in fibrous resupinate basidiocarps and floccose rhizomorphs, but has larger pores (2–4/mm), larger basidiospores (4–5 × 3–3.5 µm), and lacks dextrinoid reaction in the skeletal hyphae (Johansen and Ryvarden 1979).

Ischnoderma brunneipurpureum Corner, Beih. Nova Hedwigia 96:79 (1989).

The holotype or other authentic specimen was not traced in E. This is a synonym of *Corioloopsis brunneoleuca* (Berk.) Ryvarden according to Quanten (1997).

Ischnoderma friabile Corner, Beih. Nova Hedwigia 96:81 (1989).

The holotype or other authentic specimen was not traced in E. Quanten (1997) accepted this species as *Skeletocutis friabilis* (Corner) Quanten (as "*friabile*"). For a description, see Quanten (1997).

Ischnoderma solomonense Corner, Beih. Nova Hedwigia 96:82 (1989).

The holotype or other authentic specimen was not traced in E.

Loweporus castaneus Corner, Beih. Nova Hedwigia 96:86 (1989).

Holotype: Brunei, Ulu Belalong, Feb. 14, 1959, leg. E.J.H. Corner (E).

The holotype is sterile. This is probably a related species to *Perenniporia fraxinea* (Bull. : Fr.) Ryvarden because of the perennial basidiocarps with a distinct crust and the skeletal hyphae with strongly dextrinoid reaction.

Loweporus corticicola Corner, Beih. Nova Hedwigia 96:88 (1989). Fig. 9

Holotype: Malaysia, Pahang, Mar. 1933, leg. E.J.H. Corner (E).

The holotype represents ***Cristelloporia rutilantiformis*** (Murrill) T. Hatt., comb. nov. (basionym: *Trametes rutilantiformis* Murrill, Bull. New York Bot. Gardn. 8:147, 1912; holotype, NY!). As the description by Ryvarden (1985) based on a single specimen is the only modern description of this species, a description based on the Corner's specimen is provided below.

Basidiocarps sessile to effused-reflexed, pileus ascending, semicircular to elongated. Pileus surface matted, sulcate, light brown (6D6, 6E6), azonate. Pileus margin obtuse, entire. Pore surface light orange (5A4, 5B4), pores round, 4–5/mm, dissepiments entire. Context corky-felted, light brown (6D6, 6E6), without a crust, light in weight. Tubes corky-felted, concolorous with the context, up to 15 mm deep.

Hyphal system dimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 1.5–3 µm wide; tramal skeletal hyphae arboriform, colorless to pale yellow, dextrinoid, 1.2–2.5 µm wide, swollen in KOH solution. Contextual hyphae similar to tramal hyphae. Cystidia not seen. Basidia not seen. Basidiospores ellipsoid, finely echinulate, colorless, IKI–, 3.5–4.5 × 2–3 µm.

Remarks: The holotype of *L. corticicola* has darker context compared with that of *T. rutilantiformis*, but otherwise similar. Ryvarden (1985) described *Murrilloporus* Ryvarden typified by *T. rutilantiformis* on the basis of the ellipsoid asperulate IKI-negative spores and the dextrinoid skeletal hyphae. However, the spore characteristics are common to *Cristelloporia*, and the dextrinoid reaction is also seen in *C. pahangensis*, which may be closely related to *C. dimiticus*, the type species of *Cristelloporia*. Therefore, I treat *Murrilloporus* as a taxonomic synonym of *Cristelloporia* here. Stalpers (1996) used *Heterobasidion* Bref. in a wide sense and placed some species with clamp

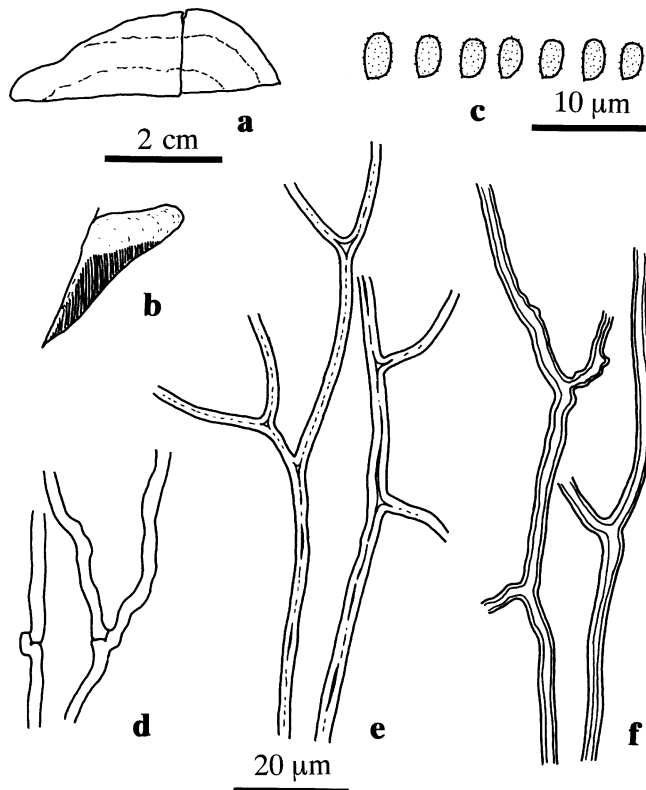


Fig. 9. Structures of *Cristelloporia rutilantiformis* from basidiocarps (holotype of *L. corticicola*). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Generative hyphae from trama. **e** Skeletal hyphae from trama. **f** Skeletal hyphae from context

connections such as *T. rutilantiformis* into this genus. On the other hand, some of the *Cristelloporia* spp. are similar to *Trechispora* P. Karst., sharing similar spore characteristics and fibrous resupinate basidiocarps, and perhaps these two genera are closely related. *Trechispora* spp. are phylogenetically separated from *Heterobasidion*, which is a member of Russuloid group (Larsson 2002). For the time being, I prefer to keep *Cristelloporia* separate from *Heterobasidion*.

Loweporus ochraceicinctus Corner, Beih. Nova Hedwigia 96:91 (1989).

The holotype or other authentic specimen was not traced in E.

Loweporus pileoliferus Corner, Beih. Nova Hedwigia 96:92 (1989).

The holotype or other authentic specimen was not traced in E.

Stecchericium gyroporum Corner, Beih. Nova Hedwigia 96:121 (1989). Fig. 10

Holotype: Brunei, Andulai Forest, Feb. 22, 1959, leg. E.J.H. Corner (E).

Accepted as *Wrightoporia gyropora* (Corner) Stalpers [Studies in Mycology 40:37 (1996)].

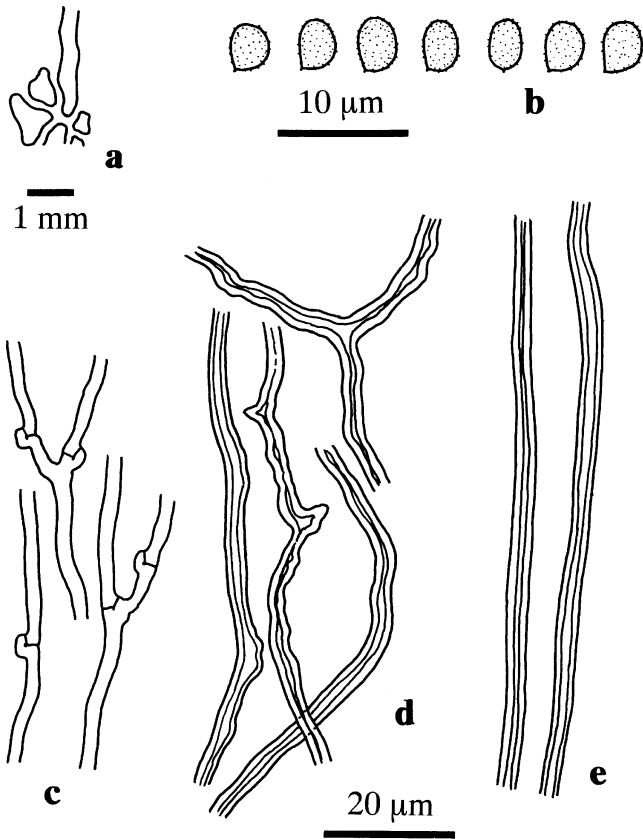


Fig. 10. Structures of *Wrightoporia gyropora* from basidiocarps (holotype). **a** Pore surface. **b** Basidiospores. **c** Generative hyphae from trama. **d** Skeletal hyphae from trama. **e** Skeletal hyphae from context

Basidiocarps resupinate. Pore surface pale orange to light orange (5A2–3, 5B2–3), pores angular, sinuous to daedaleoid, poroid part 1–2/mm, dissepiments entire. Context consists of fibrous mycelial strands, up to 2mm thick, without a crust. Tubes soft corky to fibrous, single or developed on old tubes, each layer up to 4mm deep.

Hyphal system dimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 1.5–2.5µm wide; tramal skeletal hyphae sinuous, occasionally branched, colorless, strongly dextrinoid, 2–3.5µm wide. Contextual skeletal hyphae almost straight and unbranched, otherwise similar to tramal hyphae. Cystidia not seen. Basidia not seen. Basidiospores short ellipsoid, finely echinulate, colorless, strongly amyloid, 3.5–4.5 × 2.5–3.2µm.

Remarks: This species is characterized by the resupinate basidiocarps and large irregular pores in *Wrightoporia* Pouzar. *Wrightoporia isabellina* (Corner) Stalpers is similar, but has smaller basidiospores (2.7–3.3 × 1.7–2µm) and encrusted cystidia (Corner 1989).

Stecchericium solomonense Corner, Beih. Nova Hedwigia 96:124 (1989). Fig. 11

Holotype: Solomon Is., Guadalcanal, Mt. Gallego, July 6, 1965, leg. E.J.H. Corner (E).

Accepted as *Wrightoporia solomonensis* (Corner) T. Hatt., comb. nov. (basonym indicated above.)

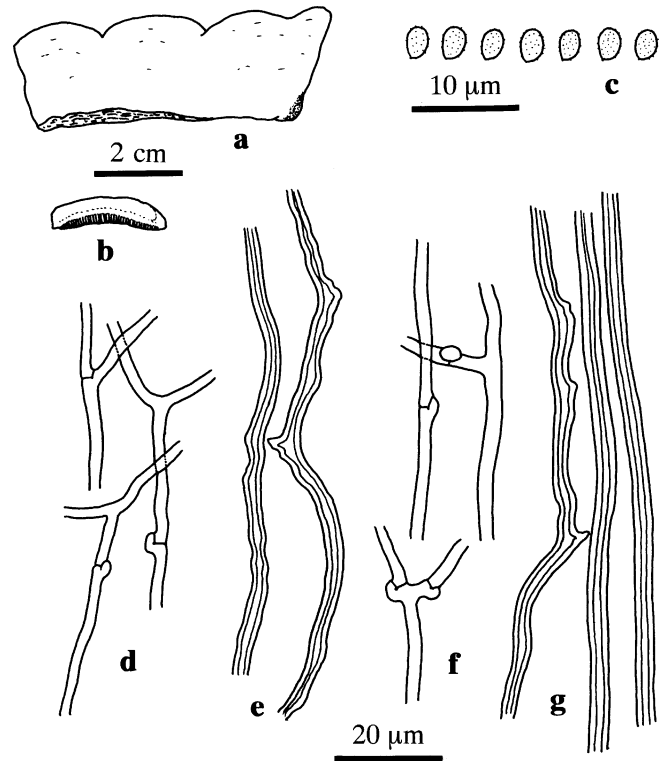


Fig. 11. Structures of *Wrightoporia solomonensis* from basidiocarps (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Generative hyphae from trama. **e** Skeletal hyphae from trama. **f** Generative hyphae from context. **g** Skeletal hyphae from context

Basidiocarps sessile, occasionally effused-reflexed, pileus applanate, semicircular to elongated. Pileus surface matted to subtomentose, azonate, light orange (5A4) to brownish-orange (5B5–6, 5C5–6), partly brown (6D7–8, 6E7–8), partly sulcate. Pileus margin obtuse, entire. Pore surface brownish-orange (5C5–6, 6C5–6), pores round, 9–10/mm, dissepiments entire. Context soft corky, brownish-orange (6C4, 6D4) near the pileus surface, pale orange (5A3–4) near the tubes, up to 6mm thick, without a crust. Tubes corky, concolorous with the context, occasionally two-layered, up to 2mm deep in each layer.

Hyphal system dimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 1.5–2.5µm wide; tramal skeletal hyphae colorless, IKI– to weakly dextrinoid, thick-walled (up to 1µm thick), sinuous, 2.5–4µm wide. Contextual hyphae almost similar, generative hyphae 1.5–3µm wide; skeletal hyphae straight to sinuous, 2.5–4.5µm wide. Hymenial cystidia not seen. Basidia not seen. Basidiospores short ellipsoid, finely echinulate, colorless, strongly amyloid, 2.8–3.5 × 2–2.8µm.

Stecchericium trametoides Corner, Beih. Nova Hedwigia 96:125 (1989). Fig. 12

Holotype: Malaysia, Johore, Sedili River, Mar. 22, 1940, leg. E.J.H. Corner (E).

Accepted as *Wrightoporia trametoides* (Corner) Stalpers [Studies in Mycology 40:37 (1996)].

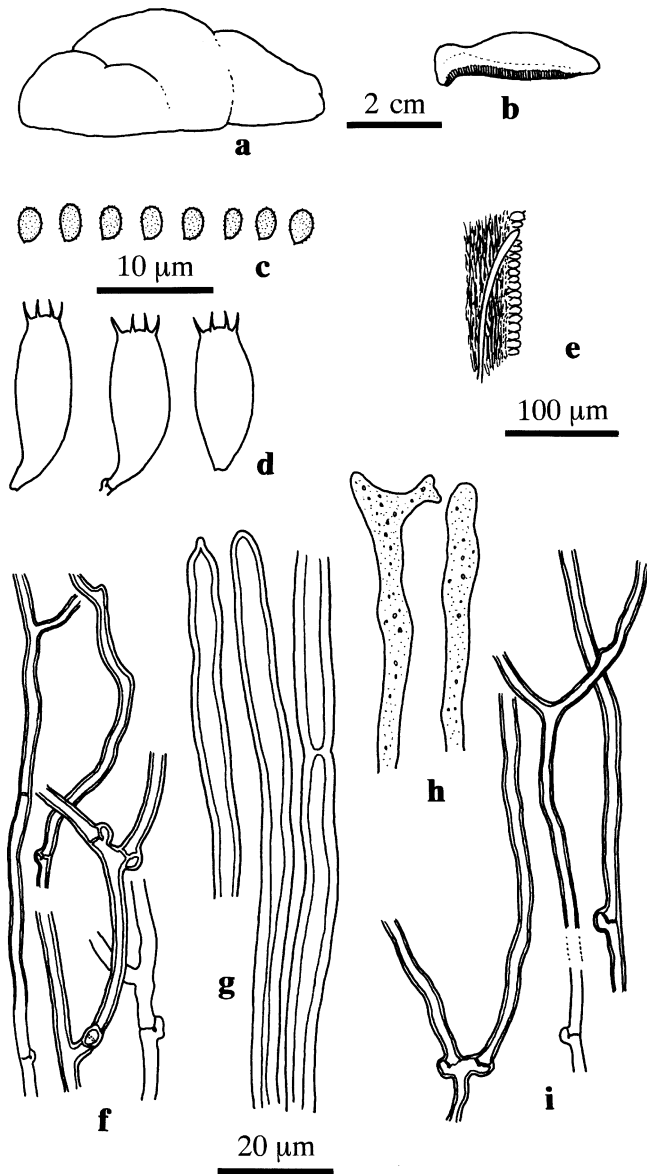


Fig. 12. Structures of *Wrighttoporia trametoides* from basidiocarp (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia. **e** Hymenium and trama. **f** Generative hyphae from trama. **g** Skeletal hyphae from trama. **h** Gloeoplerous hyphae from trama. **i** Generative hyphae from context

Basidiocarps sessile to effused-reflexed, pileus convex, semicircular. Pileus surface spongy-tomentose, azonate, grayish-orange (5A4–5, 5B4–5) to brownish-orange (5B6, 5C6). Pileus margin obtuse, entire. Pore surface light orange (5A4–5), pores angular, 4–5/mm, dissepiments thin and entire. Context spongy near the upper surface, soft corky near the tubes, brownish-orange (5C6–7), without a crust. Tubes soft corky, pale orange (5A3–4), up to 3 mm deep.

Hyphal system dimitic in the trama, monomitic in the context. Tramal generative hyphae colorless to yellow, IKI–, with clamp connections, 1.5–4 μm wide; skeletal hyphae colorless to yellow, IKI– to weakly dextrinoid, thick-walled (up to 2 μm wide), 2.5–7.5 μm wide. Gloeoplerous

hyphae scattered in the trama, up to 6 μm wide, with amyloid contents. Contextual generative hyphae 1.5–4 μm wide, colorless to yellow, IKI– to weakly dextrinoid. Cystidia not seen, but tips of skeletal hyphae curving into the hymenium may be taken for cystidia. Basidia oblong ellipsoid, 4-sterigmate, 13–18 × 5–6 μm. Basidiospores broadly ellipsoid, finely echinulate, colorless, strongly amyloid, 2.8–3.8 × 2–3 μm.

Remarks: This species is characterized by the dimitic hyphal system in the trama, monomitic hyphal system in the context, hyphae without or weak dextrinoid reaction, and presence of gloeoplerous hyphae in the trama.

A number of pileate species of *Wrighttoporia* has been reported mainly from paleotropical areas (Corner 1989; David and Rajchenberg 1985, 1987; Núñez and Ryvar den 1999; Ryvar den 1982, 1987; Gilbertson and Ryvar den 1987; Ryvar den and Johansen 1980). A key to the pileate species of *Wrighttoporia* in the world is provided below.

Key to the pileate species of *Wrighttoporia*

- 1 Hyphal system monomitic in the context. 2
- 1 Hyphal system dimitic in the context. 4
- 2 Hyphal system monomitic in the trama. Pileus dimidiate to broadly attached, yellow then fading to ochraceous, context whitish, fibrous, pores regular to partly split, 3–4/mm. Hyphal system monomitic, but some thick-walled hyphae may be taken for skeletal hyphae, gloeoplerous hyphae with amyloid contents scattered, cystidia none, basidiospores ellipsoid to subglobose, almost smooth to finely echinulate, 3–4 × 2–3 μm. Known from Africa. *W. flava* (Ryvar den) A. David & Rajchenb.
- 2 Hyphal system dimitic in the trama. 3
- 3 Pileus surface bright yellow to brownish, context yellow, soft and punky, homogeneous. Gloeoplerous hyphae IKI–. Pores regular to sinuous, or irpicoid, 5–6/mm (larger when fused). Cystidia none, basidiospores broadly ellipsoid, finely echinulate, 3–3.5 × 2–2.5 μm. Known from SE Asia. *W. ochrocrocea* (Henn. & E. Nyman) A. David & Rajchenb.
- 3 Pileus surface brownish, context brownish, spongy near the surface, corky near the tubes. Gloeoplerous hyphae amyloid. Pores regular, 4–5/mm. Cystidia none, basidiospores broadly ellipsoid, finely echinulate, 2.8–3.8 × 2–3 μm. Known from SE Asia (Malaysia). *W. trametoides* (Corner) Stalpers
- 4 Tramal skeletal hyphae IKI– or weakly dextrinoid. 5
- 4 Tramal skeletal hyphae distinctly dextrinoid. 6
- 5 Basidiocarps resupinate to effused-reflexed, pileus elongated, cinnamon to dark brown, context up to 1 mm thick, pores regular to sinuous, 1–3/mm. Cystidia none, gloeoplerous hyphae occasionally seen, basidiospores ellipsoid to subglobose, finely echinulate, 3.5–5 × 3–4 μm. Known from Africa. *W. pouzarii* A. David & Rajchenb.
- 5 Basidiocarps sessile, pileus semicircular, light orange to brownish, context soft corky, up to 6 mm thick, pores regular, 9–10/mm. Cystidia none, basidiospores short ellipsoid, finely echinulate, 2.8–3.5 × 2–2.8 μm. Known

- from Solomon Is.
 *W. solomonensis* (Corner) T. Hatt.
 6 Basidiocarps effused-reflexed. Contextual skeletal hyphae IKI–. 7
 6 Basidiocarps sessile or effused-reflexed. Contextual skeletal hyphae dextrinoid. 8
 7 Pileus surface chestnut, context duplex, pores irregular, 4–5/mm. Cystidia none, basidiospores ellipsoid, finely echinulate, 3–3.5 × 2 µm. Known from tropical America. *W. brunneo-ochracea* A. David & Rajchenb.
 7 Pileus surface light brown, context single, chestnut, pores regular, 8–9/mm. Cystidioles lageniform or mucronate, basidiospores ellipsoid, finely echinulate, 3–3.5 × 2–2.5 µm. Known from Africa.
 *W. gillesii* A. David & Rajchenb.
 8 Basidiocarps sessile, pileus surface beige to brownish. 9
 8 Basidiocarps effused-reflexed, pileus surface cream. 10
 9 Basidiocarps perennial, pileus surface beige, context corky, pores regular to irregular, 3–4/mm. Gloeocystidia and gloeoplerous hyphae present, basidiospores broadly ellipsoid, finely echinulate, 3.5–4 × 3 µm. Known from SE Asia (Singapore).
 *W. dimidiata* A. David & Rajchenb.
 9 Basidiocarps annual, pileus surface ochraceous, context tough, brownish, pores regular, 6–8/mm. Cystidia and gloeoplerous hyphae not seen, basidiospores ellipsoid, finely echinulate, 4 × 2.5 µm. Known from E Asia (a subtropical area of Japan).
 *W. japonica* Núñez & Ryvar den
 10 Context fibrous, pale cream, pores regular to sinuous, 4–5/mm. Gloeocystidia scattered, often difficult to find, basidiospores ellipsoid, finely echinate, 2.5–3.5 × 2–2.5 µm. Known from N America.
 *W. subrutilans* (Murrill) Ryvar den
 10 Context dense, pale ochraceous, pores regular, 3–4/mm. Cystidia none, basidiospores subglobose, finely echinate, 3–4 µm in diameter. Known from S America (Brazil).
 *W. cremea* Ryvar den

Stecchericum trimiticum Corner, Beih. Nova Hedwigia 96:126 (1989).

The holotype or other authentic specimen was not traced in E. According to the original description, this species has pileate basidiocarps, corky and pinkish context, tiny pores, strongly dextrinoid skeletal hyphae in the trama, almost IKI– skeletal hyphae in the context, and ellipsoid basidiospores. This name is possibly a prior name for *W. japonica* because they share the similar characteristics indicated above (Núñez and Ryvar den 1999).

Acknowledgments I wish to express my greatest thanks to Dr. R. Watling and the other staff of the Royal Botanic Garden Edinburgh for their kind hospitality during my stay in Edinburgh. The curators of BPI and NY are appreciated for the loan of the specimens.

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