

Type studies of the polypores described by E. J. H. Corner from Asia and West Pacific Areas III*. Species described in *Trichaptum*, *Albatrellus*, *Boletopsis*, *Diacanthodes*, *Elmerina*, *Fomitopsis* and *Gloeoporus*

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Twenty-seven species of polypores described by Corner were identified by type examinations. *Corneroporus* gen. nov. is proposed, typified by *Boletopsis subcitrina*. The following new combinations are proposed: *Corioloopsis lacunosa*, *Corneroporus subcitrinus*, *Heterobasidion arbitrarium*, *Rigidoporus dimiticus*, *Skeletocutis basifusca*, *Tyromyces dolosus*, *T. friabilis*, *T. hispidus*, *T. subochraceus*. The following names are accepted in the original genera: *Trichaptum agglutinatum*, *T. suberosum*, and *Gloeoporus sulphureus*. *Gloeoporus carri* was already combined with the proper genus. The following species are synonyms: *Trichaptum ceracecutis*, *T. favoloides*, *Diacanthodes griseus*, *Elmerina unguiformis*, *Gloeoporus nigrescens*, *G. papuanus*, *G. pendens*, *G. umbrinus*, and *G. vitellinus*. *Gloeoporus cremeoalbus* belongs to a difficult complex and an allied species is cited. The following species are dubious because of their poor or sterile conditions: *Trichaptum jackiae* and *Fomitopsis euosma*. No authentic specimens were traced for *Albatrellus borneensis* and *Gloeoporus similis*. Descriptions and line drawings are given for the accepted species.

Key Words—E. J. H. Corner; polypores; Southeast Asia; type specimens.

This is the third part of the type studies of polypores described by Corner. Here, I examined the type materials described in the genera *Trichaptum* Murrill, *Albatrellus* S. F. Gray, *Boletopsis* Fayod, *Diacanthodes* Singer, *Elmerina* Bres., *Fomitopsis* P. Karst. and *Gloeoporus* Mont. by Corner (1987, 1989, 1992). Their identities are shown and descriptions and line drawings are given for the accepted species.

Materials and Methods

Type specimens of the species described by Corner (1987, 1989, 1992) were examined macro- and microscopically. Descriptions and line drawings based on the holotypes are given for the accepted species. The colors of basidiocarps are given according to Kornerup and Wanscher (1981). Information from living and dried specimens collected in Pasoh Forest Reserve, West Malaysia is also incorporated for some species. Descriptions of fresh specimens given by Corner (1989) are also referred to occasionally. Herbaria where specimens are deposited are abbreviated according to Holmgren et al. (1990).

Identities and Descriptions

Trichaptum agglutinatum Corner, Beih. Nova Hedwig. 86: 204 (1987). Fig. 1

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, Mesilau, alt. 3000 m, 27 June 1961, leg. E. J. H. Corner (E).

Accepted as *T. agglutinatum*.

Basidiocarps effused-reflexed, pileus applanate, semicircular to elongated. Pileus surface glabrous, irregularly rough, almost black (white when fresh in the original description). Pileus margin obtuse and entire, partly wavy. Pore surface pale orange (5 A 3), pores angular to round, 13–16 mm. Context agglutinated and horny, rigid, almost black, without a crust. Tubes horny, pale orange to almost black near the context, up to 4 mm deep.

Trama hyphae agglutinated and difficult to see, dimitic: generative hyphae with clamp connections; skeletal hyphae hyaline, thick-walled, occasionally encrusted at the tip, occasionally project into the hymenium. Hymenial cystidia abundant, ventricose, thick-walled, apically encrusted, 12–25 × 6–10 μm. Basidia 4-sterigmate, 7–12 × 3–4 μm. Basidiospores ellipsoid, hyaline, thin-walled, IKI-, 2–2.8 × 1.2–1.8 μm.

Remarks: Corner (1987) suggested that the 'extra hymenial setae' of this species are not encrusted, but skeletal hyphae in the trama are occasionally encrusted with fine crystals. Macroscopically, this species is simi-

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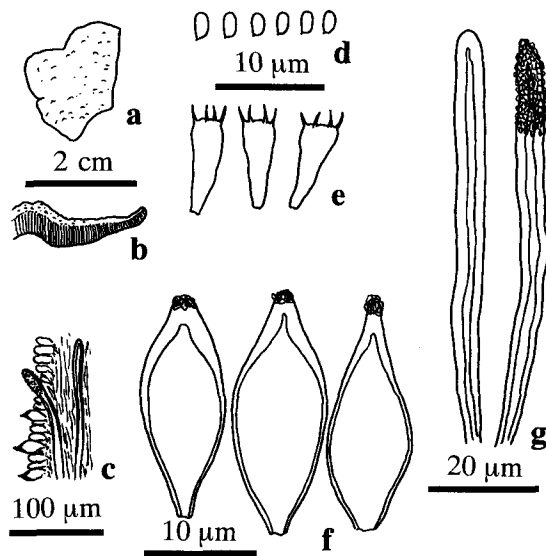


Fig. 1. Structures of *Trichaptum agglutinatum* from basidiocarps (from holotype). a, Basidiocarp; b, Vertical section of basidiocarp; c, Hymenium and trama; d, Basidiospores; e, Basidia; f, Hymenial cystidia; g, Skeletal hyphae with apical encrustation.

lar to some *Antrodiella* spp. with dense and agglutinated context, but thick-walled hymenial cystidia are unknown in this genus. I do not know its real taxonomic position, but for the time being, I prefer to keep this in *Trichaptum*. This species is characterized by the combination of ventricose hymenial cystidia, occurrence of clamp connections, and agglutinated basidiocarps.

Trichaptum basifuscum Corner, Beih. Nova Hedwig. **86**: 208 (1987). Fig. 2

Holotype: MALAYSIA, Trengganu, Kemaman, Bukit Kajang, 28 June 1932, leg. E. J. H. Corner (E).

Accepted as ***Skeletocutis basifusca*** (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps effused-reflexed to sessile, pileus applanate, flabelliform. Pileus surface glabrous, multisulcate, reddish brown (7–8 D 7–8) with light brown (6 D 8) zones. Pileus margin obtuse and entire, partly wavy. Pore surface pale orange (5 A 2–3), partly darker (5 A–B 4–5), pores round to angular, 8–10 mm, dissepiments entire. Context woody-corky, pale orange (5 A 2–3), up to 1.5 mm thick, with a thin crust. Tubes corky, pale orange, up to 4 mm deep.

Trama hyphae dimitic: generative hyphae hyaline, with clamp connections, 1.5–2.5 μm wide; skeletal hyphae hyaline, IKI-, occasionally branched, almost solid, 2–3 μm wide; heavily encrusted hyphae abundantly seen near the pore surface. Context hyphae dimitic: generative hyphae 2–3.5 μm wide; skeletal hyphae similar to trama hyphae. Cystidia not seen (ventricoso-cuspidate, 9–12 \times 3–3.5 μm , in the original description). Basidiospores not seen (2–2.5 \times 1.3–1.5 μm , hyaline, IKI-, in the original description).

Remarks: This species may pass for *Flaviporus brownii* (Pers.) Donk because of the similar basidiocarps

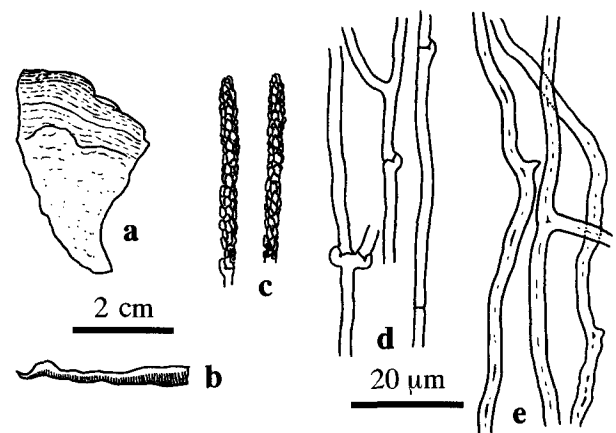


Fig. 2. Structures of *Skeletocutis basifusca* from basidiocarps (from holotype). a, Basidiocarp; b, Vertical section of basidiocarp; c, Encrusted hyphae from trama; d, Generative hyphae from context; e, Skeletal hyphae from context.

with a thin crust, dimitic hyphal system with abundant encrusted hyphae, etc. However, it lacks strikingly yellow coloration in the tubes and encrusted cystidial hyphae in the trama that are seen in *F. brownii*. Corner (1987) suggested the presence of thin-walled evanescent cystidia without encrustation, but I could not find the hymenial cystidia. Cystidia seen in *Trichaptum* spp. are usually thick-walled, often encrusted, and not evanescent. The 'cystidia' described by Corner are more similar to the cystidioles frequently seen in *Skeletocutis* spp. Because of the encrusted hyphae and dimitic hyphal system, this species is better placed in *Skeletocutis* Kotl. & Pouzar. Among *Skeletocutis* spp., it resembles *S. sensitiva* (Lloyd) Ryvarden in its woody-corky context and multilayered tubes. However, *S. sensitiva* is usually almost resupinate or pileate with irregular pileus and has tubes changing into red when touched with KOH (Lloyd, 1917).

Trichaptum ceraceicutis Corner, Beih. Nova Hedwig. **86**: 215 (1987).

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, alt. 1600 m, 26 Jan. 1964, leg. E. J. H. Corner (E).

This specimen is a large form of *Antrodiella liebmannii* (Fr.) Ryvarden. For a description of the typical form, see Ryvarden and Johansen (1980).

Trichaptum favoloides Corner, Beih. Nova Hedwig. **86**: 222 (1987).

Holotype: NEW GUINEA, Guadalcanal, Nuhu, 5 Nov. 1965, leg. E. J. H. Corner (E).

I consider this specimen to be a form of *Elmerina hexagonoides* (A. David & Jaquenoud) Núñez, although its pileus surface is less tomentose and darker than the typical form seen in Malaysia. For a description of the typical form, see David and Jaquenoud (1976) as *Aporpium hexagonoides* A. David & Jaquenoud.

Trichaptum jackiae Corner, Beih. Nova Hedwig. **86**: 223 (1987).

Holotype: SINGAPORE, Mandai Road, 1933, leg. E. J. H. Corner (E).

I could not find basidiospores from the holotype, and most of the cystidia are collapsed. This specimen may be a *Trichaptum* sp., but I prefer to treat it as a dubious species.

Trichaptum lacunosum Corner, Beih. Nova Hedwig. **86**: 225 (1987). Fig. 3

Holotype: MALAYSIA, Johore, 31 Dec. 1934, leg. E. J. H. Corner (E).

Accepted as *Corioloopsis lacunosa* (Corner) Hattori comb. nov. (Basionym indicated above.) Because the holotype is sterile, descriptions of basidia and basidiospores are based on the specimen below: TFM-F-17754 (TFM), Malaysia, N. Sembilan, Pasoh For. Res., 14 Mar. 1997, leg. T. Hattori.

Basidiocarps sessile to effused-reflexed, pileus appanate to convex, semicircular. Pileus surface strigose with branched fibrils, fibrils up to 3 mm long, light brown (6 C-D 5-6) to brown (6 E 7). Pileus margin obtuse and entire. Pore surface light brown, pores irregular, daedaleoid to partly almost lamellate, often radially elongated, up to 3 mm. Context fibrous-leathery, grayish orange (5 B 4-5), up to 1 mm thick, without a crust. Tubes leathery, grayish orange, up to 10 mm deep.

Trama hyphae trimitic: generative hyphae hyaline, with clamp connections, 2-3 μm wide; skeletal hyphae yellowish brown, IKI-, almost solid, 2-3.5 μm wide; binding hyphae with sword-like pointed tips as in *Lenzites betulinus* (L.: Fr.) Fr., up to 3 μm wide, frequently project into hymenium. Context hyphae trimitic: skeletal hyphae 2.5-4.5 μm wide; binding hyphae not pointed, up to 3 μm wide. Hymenial cystidia not seen. Basidia 4-sterigmate, 10-15 \times 3-3.5 μm . Basidiospores cylindrical, hyaline, thin-walled, IKI-, 4.5-6 \times 1.5-2 μm .

Remarks: This species is common in Pasoh. Corner (1987) took the pointed tips of binding hyphae to be cystidia. I put this species in *Corioloopsis* Murrill because of its lack of cystidia and its trimitic hyphal system with dis-

tinctly colored skeletal hyphae. This species is characterized by the branched and stiff fibrils on the pileus surface, irregular hymenophore and pointed hyphal tips in the trama in *Corioloopsis*.

Trichaptum suberosum Corner, Beih. Nova Hedwig. **86**: 230 (1987). Fig. 4

Holotype: MALAYSIA, Selangor, Ulu Gombak, 15 Dec. 1965, leg. E. J. H. Corner (E).

Accepted as *T. suberosum*.

Basidiocarps sessile to substipitate, pileus appanate, semicircular to flabelliform. Pileus surface glabrous, mostly smooth, partly warted, white (5 A 1-2), partly zonate with orange brown zones. Pileus margin thin and acute, eroded, partly wavy. Pore surface white, pores angular to irregular, (1-)3-5 mm, dissepiments thin, eroded. Context corky, white, up to 0.5 mm thick, without a crust. Tubes corky, white, up to 2.5 mm deep.

Trama hyphae dimitic: generative hyphae hyaline, with clamp connections, 1.5-3.5 μm wide; skeletal hyphae hyaline, IKI-, thick-walled, 2.5-5 μm wide, unbranched to occasionally branched. Context hyphae dimitic: as in trama hyphae. Hymenial cystidia ventricose, thick-walled near the apex, not encrusted, 15-25 \times 4-6 μm . Basidia 4-sterigmate, 8-12 \times 3.5-4.2 μm . Basidiospores short ellipsoid, hyaline, thin-walled, IKI-, 2-2.5 \times 1.5-2 μm .

Remarks: Macroscopically, this specimen resembles *Trametes conchifer* (Schwein.: Fr.) Pilát with small and white basidiocarps, but it is a member of *Trichaptum* with distinct hymenial cystidia.

Albatrellus borneensis Corner, Beih. Nova Hedwig. **96**: 16 (1989).

Holotype not traced in E.

Boletopsis subcitrina Corner, Beih. Nova Hedwig. **96**: 17 (1989). Fig. 5

Holotype: MALAYSIA, Trengganu, Kemaman, Banum

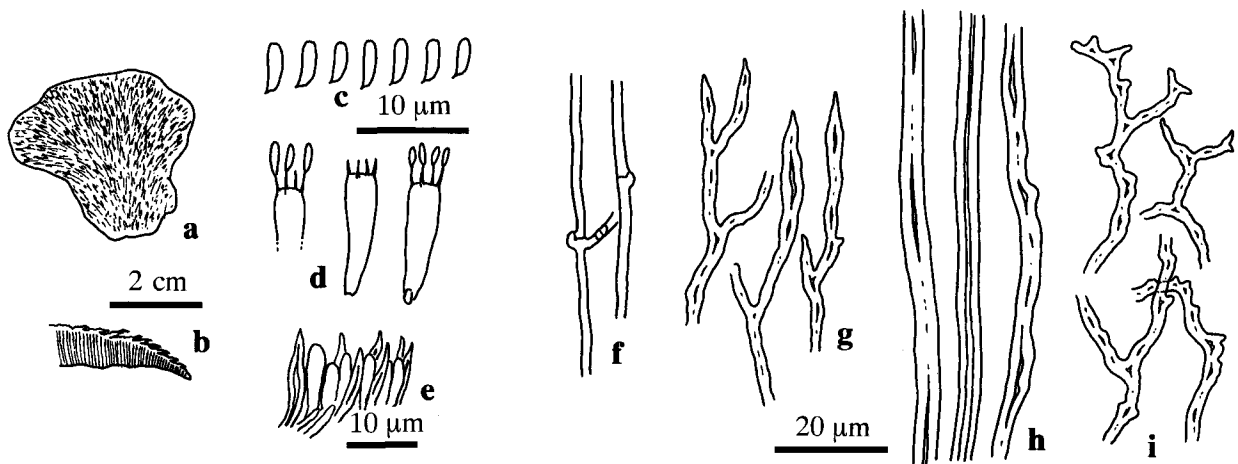


Fig. 3. Structures of *Corioloopsis lacunosa* from basidiocarps (a, b, f, g, h, i: from holotype; c, d, e: from TFM-F-17754). a, Basidiocarp; b, Vertical section of basidiocarp; c, Basidiospores; d, Basidia; e, Hymenium; f, Generative hyphae from trama; g, Binding hyphae from trama; h, Skeletal hyphae from context; i, Binding hyphae from context.

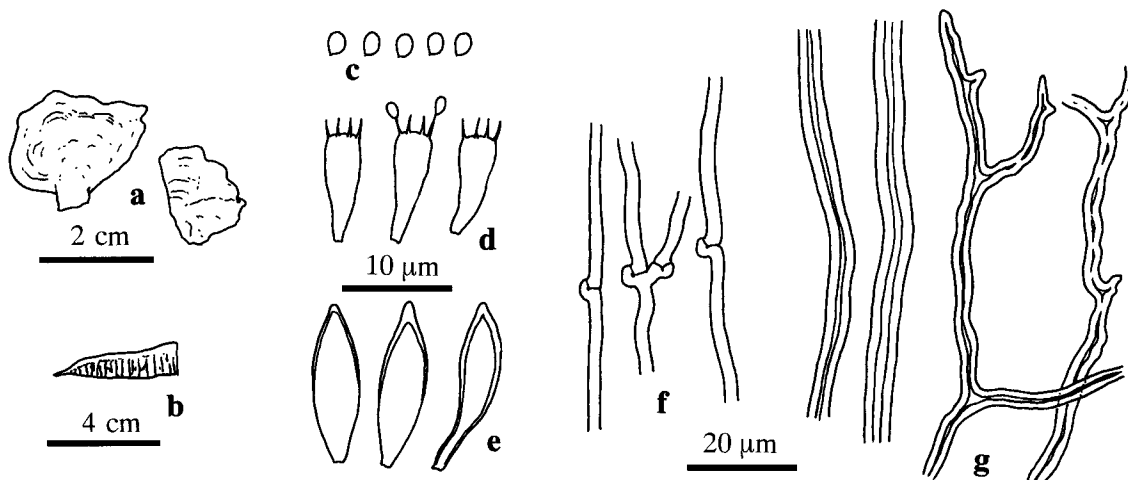


Fig. 4. Structures of *Trichaptum suberosum* from basidiocarps (from holotype). a, Basidiocarps; b, Vertical section of basidiocarp; c, Basidiospores; d, Basidia; e, Hymenial cystidia; f, Generative hyphae from context; g, Skeletal hyphae from context.

river, 22 June 1932, leg. E. J. H. Corner (E).

Accepted as *Cornerporus subcitrinus* (Corner) Hattori. Because the holotype is badly contaminated, microscopical descriptions are based on the specimen below: TFM-F-17393 (TFM), Malaysia, N. Sembilan, Pasoh For. Res., 29 July 1995, leg. T. Hattori. Information from other collections from Pasoh is also incorporated.

Basidiocarps laterally to centrally stipitate, terrestrial, annual. Pileus single or occasionally imbricated with some pilei, surface floccose to tomentose, partly sulcate, azonate, light yellow to light orange (4–5 A–B 4–5; pale yellow to light yellow when fresh). Pileus margin thin, inrolled, eroded. Pore surface grayish orange (5 B 3–4; almost white when fresh), pores angular to daedaleoid, (1–)2–3 mm. Context duplex with upper tomentum and lower zone: upper tomentum pale yellow to light yellow (4–5 A 3–4), fragile; lower zone corky, pale orange to grayish orange (5 A–B 3–4; almost white when fresh), without a crust. Tubes fragile, up to 3 mm deep.

Trama hyphae monomitic: generative hyphae thin-walled, hyaline, IKI-, with clamp connections, 1.5–3 μm

wide. Context hyphae monomitic, similar to trama hyphae. Hymenial cystidia not seen. Basidia 4-sterigmate, clavate, 10–13 × 4.5–5 μm. Basidiospores subangular, echinulate, hyaline, IKI-, 3.5–4.5 × 2.5–3.2 μm.

Remarks: This species may be taken for an *Albatrelus* sp. in the field because of its stipitate and terrestrial basidiocarps with fleshy and whitish context when fresh, but it is distinguishable by its ornamented basidiospores. It is discriminated from *Boletopsis* spp. by its echinulate and hyaline basidiospores: these are angular-nodulose and usually colored in mass in *Boletopsis* spp.

Cornerporus Hattori, gen. nov.

Basidiocarpium stipitatum, terrestre, annum. Pileus singularis vel imbricatus. Hymenophorum tubulare. Contextus carnosus-floccosus, cremeo-albus, tactu haud decolorans; crusta nulla. Systema hypharum monomiticum; hyphae generativae fibulatae, hyalinae, haud dextrinoideae. Cystidia nulla. Sporae echinulae, hyalinae, haud dextrinoideae.

Typus generis: *Boletopsis subcitrina* Corner.

Basidiocarps stipitate, terrestrial, annual. Pileus single or imbricated. Hymenophore tubular. Context fleshy-floccose, cream white, not discoloring when touched, without a crust. Hyphal system monomitic; generative hyphae with clamp connections, hyaline, non-dextrinoid. Cystidia none. Basidiospores echinulate, hyaline, non-dextrinoid.

Etymology: Corner=name of a mycologist, porus =pores.

Cornerporus subcitrinus (Corner) Hattori comb. nov. (Basionym: *Boletopsis subcitrina* Corner, Beih. Nova Hedwig. 96: 17, 1989.)

Remarks: Corner described the type species in *Boletopsis* Fayod because of the stipitate and fleshy basidiocarps, and ornamented basidiospores. However, basidiospores of *Boletopsis* spp. are angular-nodulose and usually colored in mass (Ryvarden, 1991), while they are echinulate and hyaline in *C. subcitrinus*. Additionally, basidiocarps of *Boletopsis* spp. show nigrescence, while *C. subcitrinus* completely lacks dark coloration

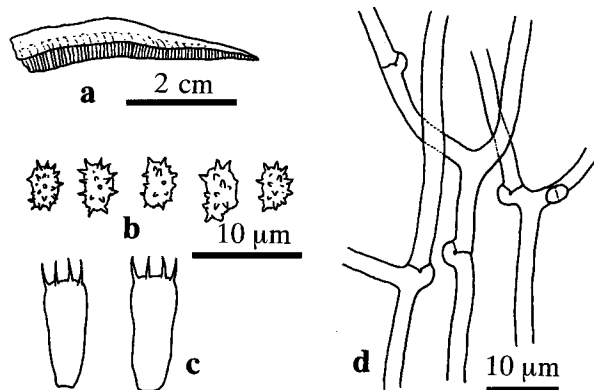


Fig. 5. Structures of *Cornerporus subcitrinus* from basidiocarps (a: from holotype; b, c, d: from TFM-F-17393). a, Vertical section of basidiocarp; b, Basidiospores; c, Basidia; d, Generative hyphae from context.

when touched and greenish coloration by KOH. Context hyphae of *C. subcitrinus* are not swollen as in *Boletopsis* spp.

The relationship between *Boletopsis* and *Corneroporus* is similar to that of *Sarcodon* P. Karst. and *Bankera* Coker & Beers. *Corneroporus* should be placed in Bankeraceae defined by Donk (1964).

Diacanthodes griseus Corner, Beih. Nova Hedwig. **96**: 25 (1989). var. *griseus*.

Holotype: MALAYSIA, Pahang, Tembeling, 10 Nov. 1930, leg. E. J. H. Corner (E).

I prefer to regard this species as a grayish form of *Diacanthodes novoguineensis* (Henn.) O. Fidalgo. For a description of *D. novoguineensis*, see Gilbertson and Ryvarden (1986).

Elmerina unguiformis Corner, Beih. Nova Hedwig. **96**: 30 (1989).

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, alt. 1700 m, 22 Aug. 1961, leg. E. J. H. Corner (E).

This is a small specimen of *Elmerina holophaea* (Pat.) Parmasto. For a description of *E. holophaea*, see Reid (1992).

Fomitopsis arbitraria Corner, Beih. Nova Hedwig. **96**: 37 (1989). Fig. 6

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, Mesilau, alt. 1800 m, 7 Feb. 1964, leg. E. J. H. Corner (E).

Accepted as *Heterobasidion arbitrarium* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps sessile to effused-reflexed, pileus applanate to subungulate, semicircular. Pileus surface matt, azonate, almost smooth, light orange (5 A–B 4). Pileus margin round and entire. Pore surface light orange (5 A–B 4), pores round to angular, 3–4 mm. Context woody-corky, light orange (5 A 4), up to 26 mm thick, without a crust. Tubes concolorous with the context, up to 2 mm deep.

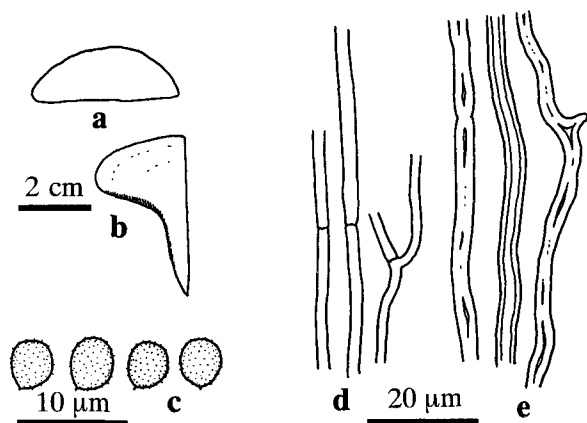


Fig. 6. Structures of *Heterobasidion arbitrarium* from basidiocarps (from holotype). a, Basidiocarp; b, Vertical section of basidiocarp; c, Basidiospores; d, Generative hyphae from trama; e, Skeletal hyphae from trama.

Trama hyphae dimittic: generative hyphae without clamp connections, thin-walled, hyaline, 2–3.5 µm wide; skeletal hyphae thick-walled to almost solid, hyaline, dextrinoid, 2–5 µm wide. Context hyphae dimittic: similar to trama hyphae. Hymenial cystidia not seen. Basidiospores subglobose, minutely echinulate to almost smooth, hyaline, IKI-, 4.5–5.5 × 4–5 µm.

Remarks: This species is apparently a member of *Heterobasidion* Bref., because of its dimittic hyphal system with simple-septate generative hyphae and dextrinoid skeletal hyphae, and its minutely echinulate basidiospores. Some biological species are included within *H. annosum* (Fr.) Bref. *sensu lato* though there are few morphological differences (Michelson and Korhonen, 1998). This suggests that speciation within this genus is more advanced than the morphological differentiation, and *H. arbitrarium* is suggested to be a distinct species with enough morphological differences.

This species is characterized by the thick context without a crust and thereby easily discriminated from the other species in *Heterobasidion* i.e., *H. annosum*, *H. insulare* (Murrill) Ryvarden, and *H. araucariae* P. K. Buchanan. Other species listed by Stalpers (1996) in *Heterobasidion* should be excluded from this genus because of their different hyphal characters.

Fomitopsis euosma Corner, Beih. Nova Hedwig. **96**: 37 (1989).

Holotype: MALAYSIA, Pahang, Fraser's Hill, alt. 1300 m, 28 Nov. 1930, leg. E. J. H. Corner (E).

Basidiocarps are old, soily and sterile. This may be a *Daedalea* sp., but I prefer to treat it as a dubious species.

Gloeoporus carrii Corner, Beih. Nova Hedwig. **96**: 46 (1989), 'carrii'.

Holotype: PAPUA NEW GUINEA, Veiya, 11 Feb. 1935, leg. C. E. Carr (E).

Accepted as *Tyromyces carrii* (Corner) Quanten. For a description, see Quanten (1997). This species is similar to *Tyromyces fissilis* (Berk. & M. A. Curtis) Donk in its massive basidiocarps, which become dark and resinous upon shrinking. However, basidiospores are smaller than those of *T. fissilis*, and no chlamyospores are seen in the context in *T. carrii*.

Gloeoporus cremeo-albus Corner, Beih. Nova Hedwig. **96**: 46 (1989).

Holotype: JAPAN, Nara, Mt. Kasuga (incorrectly indicated in the original description), 10 Sep. 1996, leg. E. J. H. Corner (E).

I prefer to treat this specimen as *Skeletocutis cf. amorphia* (Fr.) Kotl. & Pouzar. A condensed description of the holotype is as follows: basidiocarps effused-reflexed; pileus surface tomentose; pores 6–8 mm, grayish orange (5 B 4); context thin, duplex with upper tomentum and a cartilaginous lower zone. Hyphal system dimittic, generative hyphae with clamp connections, some hyphae encrusted with crystals; cystidioles scattered; basidiospores allantoid, 3–4.2 × 0.8–1 µm.

Gloeoporus dimiticus Corner, Beih. Nova Hedwig. **96**: 50 (1989). Fig. 7

Holotype: MALAYSIA, Perlis, Bukit Lagi. 16 Nov. 1929, leg. E. J. H. Corner (E).

Accepted as *Rigidoporus dimiticus* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps effused-reflexed, pileus flabelliform to elongated, applanate. Pileus surface glabrous, subzonate, light orange (5 A–B 4; white in the original description). Pileus margin thin and acute, entire. Pore surface brownish orange (6 C 5), pores round, 10–12 mm. Context corky, up to 13 mm thick, without a crust. Tubes corky-horny (gelatinous-firm when fresh in the original description), up to 1 mm deep.

Trama hyphae dimitic, partly agglutinated: generative hyphae without clamp connections, hyaline, IKI-, 2–4.5 μm wide; skeletal hyphae thick walled, hyaline, IKI-, 4–10 μm wide. Context hyphae similar to trama hyphae. Cystidial hyphae scattered in the trama, apically encrusted with crystals, up to 6 μm wide, occasionally project into hymenium. Hymenial cystidia not seen. Basidiospores subglobose, thin walled, hyaline, IKI-, 4–5 \times 3–4 μm .

Remarks: This species is remarkable in having whitish pileate basidiocarps, gelatinous-firm tubes, and the encrusted cystidial hyphae of *Rigidoporus* Murrill. *Rigidoporus lineatus* (Pers.) Ryvar den also has distinctly pileate basidiocarps and encrusted cystidial hyphae, but it also has reddish pileus and tubes and hymenial cystidia (Gilbertson and Ryvar den, 1987). *Rigidoporus incarnatus* Corner has a distinct crust and smaller basidiospores (Hattori, 2001).

Gloeoporus dolosus Corner, Beih. Nova Hedwig. **96**: 50 (1989). Fig. 8

Holotype: MALAYSIA, Pahang, Cameron Highland, alt. 1500 m, 4 Oct. 1966, leg. E. J. H. Corner (E).

Accepted as *Tyromyces dolosus* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps sessile to effused-reflexed or sub-

stipitate, occasionally pendent, pileus applanate, dimidiate to flabelliform or irregular. Pileus surface radially striate and almost black (appressedly fibrillose strigose and drab white when fresh in the original description). Pileus margin thin and acute, partly eroded. Pore surface light brown (6 D 4–5; drab white with a pinkish tinge when fresh), pores angular, (2–)3–5 mm. Context agglutinated and horny, almost black (cheesy brittle, watery, white when fresh), without a crust. Tubes agglutinated, up to 1 mm deep (up to 3 mm when fresh).

Trama hyphae agglutinated, monomitic: generative hyphae thick walled, with clamp connections, hyaline, IKI-, up to 4.5 μm wide; gloeoplerous hyphae scattered to abundant, hyaline, up to 9 μm wide. Oily drops abundantly seen in the trama. Context hyphae agglutinated and difficult to observe. Basidia 4-sterigmate, 8–12 \times 3.5–4.5 μm . Basidiospores ellipsoid, hyaline, IKI-, 3–4.5 \times 2–3 μm .

Remarks: Among polypores, *Gloeoporus* is characterized by the continuous layer of basidia over the pore-edges and a more or less reddish and dense hymenophore, contrasting with the much looser and white context (Ryvar den, 1991). However, the layer of basidia is not continuous over the pore-edges, and the hymenophore is almost homogeneous with context in this species. Because of the monomitic hyphal system with clamp connections, I put it in *Tyromyces* P. Karst., though the type of rot is unknown.

This species is characterized by the small and often pendent basidiocarps becoming dense and agglutinated when dried, scattered gloeoplerous hyphae and oily materials in the trama, and ellipsoid basidiospores. *Tyromyces albogilvus* (Berk. & M. A. Curtis) Murrill described from Cuba also has gloeoplerous hyphae and ellipsoid basidiospores, but is distinct in the soft fibrous context (Lowe, 1975).

Gloeoporus friabilis Corner, Beih. Nova Hedwig. **96**: 51 (1989). Fig. 9

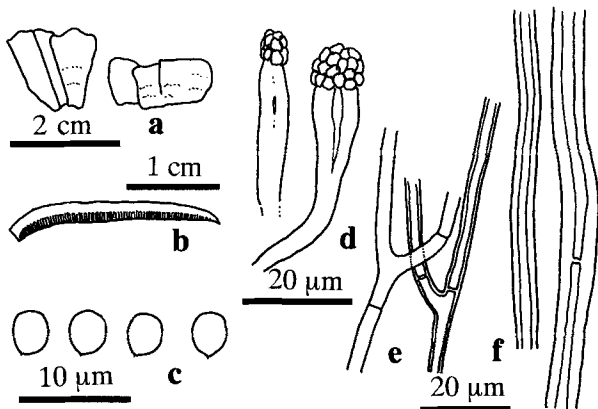


Fig. 7. Structures of *Rigidoporus dimiticus* from basidiocarps (from holotype). a, Basidiocarps; b, Vertical section of basidiocarp; c, Basidiospores; d, Cystidial hyphae in trama; e, Generative hyphae from context; f, Skeletal hyphae from context.

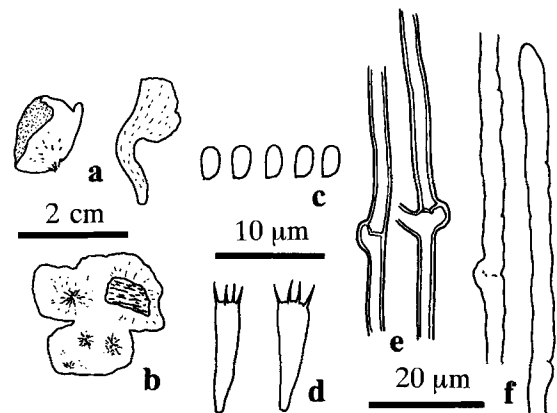


Fig. 8. Structures of *Tyromyces dolosus* from basidiocarps (a, c, d, e, f: from holotype of *Gloeoporus dolosus*; b, from holotype of *Gloeoporus pendens*). a, Basidiocarps; b, Upper side of basidiocarp produced on underside of substratum (pendent form); c, Basidiospores; d, Basidia; e, Generative hyphae from trama; f, Gloeoplerous hyphae from trama.

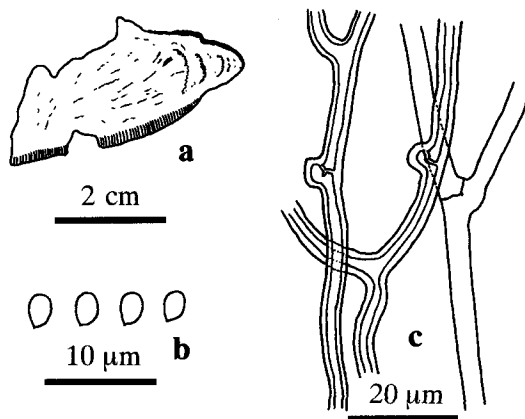


Fig. 9. Structures of *Tyromyces friabilis* from basidiocarps (from holotype). a, Vertical section of basidiocarp; b, Basidiospores; c, Generative hyphae from trama.

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, Mahmud Riv., alt. 1300 m, 6 Aug. 1961, leg. E. J. H. Corner (E).

Accepted as *Tyromyces friabilis* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps sessile. Pileus surface rough with spiny mycelial tufts when dried (matt to finely villousulose when fresh in the original description), almost black (pinkish buff to pale apricot pink when fresh). Pileus margin thick. Pore surface dark brown (pale to clear pink when fresh), pores angular round, 5–6 mm, dissepiments thin and entire. Context agglutinated and horny, (light) brown (6–7 C–D 6–8), (cheesy, pallid white to pale ochraceous, pinkish in places on bruising when fresh), without a crust, but partly secondary crustose when dried. Tubes horny, brittle, dark brown (pale pink when fresh), up to 5 mm deep.

Trama hyphae agglutinated and difficult to see (monomitic in the original description). Context hyphae also agglutinated, monomitic: generative hyphae thin- to thick-walled, with clamp connections, hyaline, IKI-, 2–6 μm wide. Cystidia not seen. Basidia not seen. Basidiospores ellipsoid, hyaline, IKI-, 2.8–3.5 \times 1.8–2.5 μm (3.5–4 \times 2.7–3 μm in the original description).

Remarks: I put this species in *Tyromyces* for the same reason as in the case of *T. dolosus*. This species may be allied to *T. fissilis*, because of its massive basidiocarps with weak rufescens becoming dark and resinous after dried, and ellipsoid basidiospores. I prefer to keep *T. friabilis* separate because of the smaller pores, smaller basidiospores and lack of chlamydospores in the context. It is distinguishable from *T. carrii*, by its pinkish coloration when fresh and smaller pores.

***Gloeoporus hispidus* Corner, Nova Hedwig. 96: 52 (1989).** Fig. 10

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, Mahmud riv., alt. 1300 m, 6 Aug. 1961, leg. E. J. H. Corner (E).

Accepted as *Tyromyces hispidus* (Corner) Hattori comb. nov. (Basionym indicated above.)

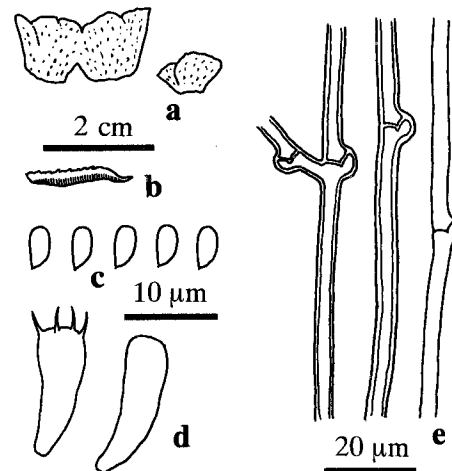


Fig. 10. Structures of *Tyromyces hispidus* from basidiocarps (from holotype). a, Basidiocarps; b, Vertical section of basidiocarp; c, Basidiospores; d, Basidia; e, Generative hyphae from context.

Basidiocarps effused-reflexed, pileus applanate, semicircular to elongated. Pileus surface hispid to rough with mycelial tufts, azonate, grayish orange (5 B 3–4). Pileus margin thin and acute, eroded. Pore surface light brown (6 D 5–6; white when fresh according to the original description), pores angular to irregular, 2–3 mm. Context fibrous-leathery, almost concolorous with pileus surface, without a crust, with a thin black line above the tubes. Tubes light brown, fragile (white and subgelatinous when fresh), up to 2 mm deep.

Trama hyphae monomitic: generative hyphae with clamp connections, thin- to thick-walled, hyaline, IKI-, 2.5–5 μm wide. Context hyphae similar to trama hyphae. Cystidia not seen. Basidia 4-sterigmate, 12–20 \times 4.5–5.5 μm . Basidiospores ellipsoid, hyaline, IKI-, 4.5–5.5 \times 2.5–3 μm .

Remarks: This species may be placed in *Bjerkandera* P. Karst. if taxonomic emphasis is put on the thin black line present between context and tubes. However, I put this in *Tyromyces*, because the pale brownish context and white tubes are contradictory to white context and fuscous tubes in *B.* spp. The black line is not noted in the original description, and it is unclear if it is also seen in fresh condition. This species is characterized by the light brownish context, hispid pileus surface, and more or less irregular pores among the genus *Tyromyces*.

***Gloeoporus nigrescens* Corner, Beih. Nova Hedwig. 96: 52 (1989). var. *nigrescens*.**

Holotype: MALAYSIA, Fraser's Hill, alt. 1300 m, 29 Nov. 1930, leg. E. J. H. Corner (E).

This specimen is a form of *Bjerkandera adusta* (Willd.: Fr.) P. Karst. Pileus surface is glabrous and subshiny, and the black line between tubes and context is more distinct than in the typical form of *B. adusta*, but otherwise *G. nigrescens* is similar to the latter.

***Gloeoporus papuanus* Corner, Beih. Nova Hedwig. 96:**

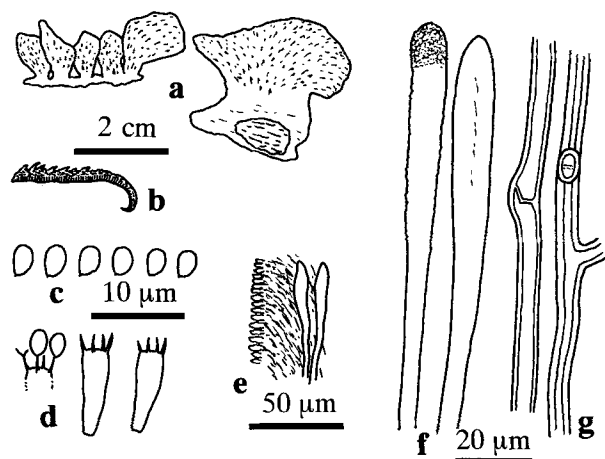


Fig. 11. Structures of *Tyromyces subochraceus* from basidiocarps (from holotype). a, Basidiocarps; b, Vertical section of basidiocarp; c, Basidiospores; d, Basidia; e, Hymenium and trama; f, Gloeoplerous cystidial hyphae from trama; g, Generative hyphae from context.

53 (1989).

Holotype: PAPUA NEW GUINEA, Koitaki, alt. 500 m, 25 June 1935, leg. E. J. H. Corner (E).

As suggested by Quanten (1997), this specimen represents *Gloeoporus dichrous* (Fr.: Fr.) Bres.

Gloeoporus pendens Corner, Beih. Nova Hedwig. **96**: 54 (1989).

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, alt. 1700 m, 2 Feb. 1964, leg. E. J. H. Corner (E).

This specimen is a pendent form of *Tyromyces dolosus*.

Gloeoporus similis Corner, Beih. Nova Hedwig. **96**: 57 (1989).

Holotype: MALAYSIA, Johore, Jemaluang road, 5 May, 1940, leg. E. J. H. Corner (E).

No authentic specimens traced in E.

Gloeoporus subochraceus Corner, Nova Hedwig. **96**: 57 (1989). var. *subochraceus*. Fig. 11

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, alt. 1700 m, 28 Feb. 1964, leg. E. J. H. Corner (E).

Accepted as *Tyromyces subochraceus* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps sessile, pileus applanate, dimidiate to flabelliform, imbricate. Pileus surface rough, fibrillo-spiculose, with radial ridges near the margin, reddish brown (8 D-E 8) to almost black (wholly subochraceous when fresh). Pileus margin thin and acute, eroded, incurved. Pore surface brown (7 D-E 5-6), pores angular, 5-6 mm, dissepiments thin and entire. Context agglutinated and horny, rigid (watery, fibrous-brittle when fresh), almost black, without a crust. Tubes horny, fragile, up to 2 mm deep.

Trama hyphae agglutinated, monomitic: generative hyphae with clamp connections, thick walled, hyaline, IKI-, 2.5-7.5 µm wide. Context hyphae similar to trama

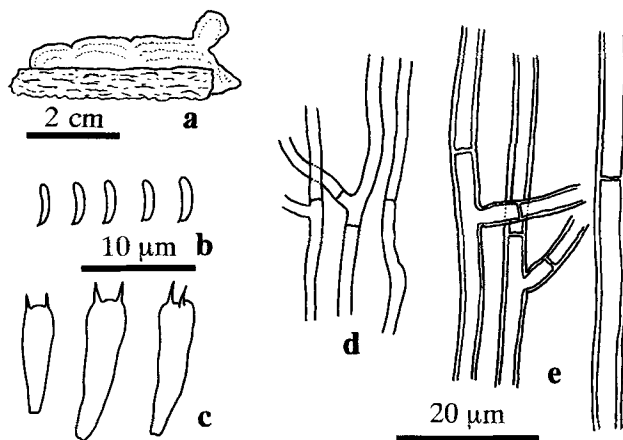


Fig. 12. Structures of *Gloeoporus sulphureus* from basidiocarps (a: from holotype; b, c, d, e: from TFM-F-17778). a, Basidiocarp; b, Basidiospores; c, Basidia; d, Generative hyphae from trama; e, Generative hyphae from context.

hyphae. Gloeoplerous cystidial hyphae abundantly seen in the trama, encrusted with a vitreous oleaginous exudate, up to 15 µm wide. Hymenial cystidia not seen. Basidia 4-sterigmate, 9-12 × 3.5-4 µm. Basidiospores ellipsoid, hyaline, IKI-, 3-3.8 × 2.5-3 µm.

Remarks: I put this species in *Tyromyces* for the same reason as the case of *T. dolosus*. This species is peculiar, with encrusted gloeoplerous cystidial hyphae abundantly seen in the trama. The drawing of cystidia of *G. pendens* given by Corner (1989) in Fig. 5 is probably that of *T. subochraceus*.

Gloeoporus sulphureus Corner, Beih. Nova Hedwig. **96**: 59 (1989). Fig. 12

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, alt. 1300 m, 14 June 1961, leg. E. J. H. Corner (E).

Accepted as *G. sulphureus*. This species is common in Pasoh, West Malaysia. Because basidiospores are sparse in the holotype, microscopical descriptions are based on the specimen below: TFM-F-17778 (TFM), Malaysia, N. Sembilan, Pasoh For. Res., 15 Mar. 1997, leg. T. Hattori. Information from other collections from Pasoh is also incorporated.

Basidiocarps effused-reflexed to sessile, pileus applanate, flabelliform or fused and elongated, often imbricated from resupinate foot. Pileus surface velutinous, sulcate to almost azonate, almost white when fresh, grayish orange (5 A-B 4) when dried. Pileus margin thin and acute, occasionally eroded. Pore surface pale yellow (3 A 2-3) when fresh, light orange (5 A 4) when dried, pores angular to round, 7-9 mm. Context white when fresh, pale orange (5 A 3) when dried, without a crust. Tubes gelatinous, pale yellow when fresh, becoming thin membranous after dried.

Trama hyphae monomitic: generative hyphae without clamp connections, thin-walled, hyaline, IKI-, 1-2 µm wide. Cystidia not seen. Basidia 2-sterigmate, 10-15 × 3-4 µm. Basidiospores allantoid, hyaline, IKI-, 3.5-4.5 × 0.8-1.2 µm.

Remarks: Most species of *Gloeoporus* have distinctly colored tubes, but this species has pale yellow tubes that do not contrast distinctly with the white context. Microscopically, hyphae without clamp connections and 2-sterigmate basidia are characteristic.

Gloeoporus umbrinus Corner, Beih. Nova Hedwig. **96**: 61 (1989).

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, Mah-mud riv., alt. 1400 m, 5 Aug. 1961, leg. E. J. H. Corner (E).

This is a young specimen of *Bjerkandera adusta* with dark colored tubes and a dark line between the tubes and the context.

Gloeoporus vitellinus Corner, Nova Hedwig. **55**: 122 (1992).

Holotype: SINGAPORE, Selitar, 21 Nov. 1943, leg. E. J. H. Corner (E).

This specimen represents *Gloeoporus chlorinus* (Pat.) Ginns with resupinate basidiocarps, large pores (2–3/mm) and cylindrical basidiospores ($4.5\text{--}5.5 \times 1.5\text{--}2 \mu\text{m}$). For a description, see Ginns (1976).

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