

FULL PAPER

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Type studies of the polypores described by E.J.H. Corner from Asia and West Pacific Areas. VII. Species described in *Trametes* (1)

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Abstract Identifications of 30 species of polypores described by Corner were made by type examinations. The following new combinations are proposed: *Antrodiella depauperata*, *Daedalea dochmia*, *D. fulvirubida*, *D. lusor*, *D. pseudodochmia*, *Fomitella fumosipora*, *F. rhodophaea*, *Microporus internuntius*, and *Trichaptum brastagii*. The following names are accepted in the original genus: *Trametes arcana*, *T. barbulata*, *T. daedaleoides*, and *T. jejuna*. The following species are taxonomic synonyms of already-described species: *Trametes atriceps*, a synonym of *Trametes menziesii*; *T. badiuscula*, a synonym of *Abundisporus roseoalbus*; *T. biogilvoides*, a synonym of *Corioloopsis glabro-rigens*; *T. elevata*, a synonym of *Daedalea dochmia*; *T. flammula*, a synonym of *C. glabro-rigens*; *T. fulvidochmia*, a synonym of *D. dochmia*; *T. linguiformis*, a synonym of *Trichaptum suberosum*; and *T. luridochracea*, a synonym of *Lenzites acutus*. *Trametes benetosta* is a synonym of *Fomitella rhodophaea* or its allied species. The following species are dubious because of the poor or sterile conditions of their type specimens: *Trametes allantospora*, *T. cristobalensis*, *T. farinolens*, *T. febris*, *T. fuligineicana*, and *T. granulifera*. No authentic specimens were traced for *T. argenteiceps*, *T. benevestita*, *T. castaneifumosa*, *T. decorticans*, and *T. flavidinigra*. Descriptions and line drawings are given for poorly known species.

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

Introduction

This is the seventh part of the type studies of polypores described by Corner (1989). In this study, I examined type

materials of 30 species described in the genus *Trametes* Fr. Their identities are shown, and descriptions and line drawings are given for little-known species.

Materials and methods

Type specimens of the species described by Corner (1989) 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 rainforest of West Malaysia, is also incorporated for some species. Descriptions on fresh specimens given by Corner (1989) are also referred to occasionally. Herbaria where specimens are deposited are abbreviated according to Holmgren et al. (1990).

Identification and descriptions

Trametes allantospora Corner, Beih. Nova Hedwigia 97:68 (1989).

Holotype: New Guinea, Okapa, alt. 2000m, Oct. 11, 1960, leg. E.J.H. Corner (E).

Basidiospores were not seen from the holotype. Quanten (1997) suggested that *T. allantospora* may be a synonym of *Trichaptum biforme* (Fr. in Kl.) Ryvarden, but it is a member of *Antrodiella* Ryvarden & I. Johans. because of its context becoming horny when dried, lack of encrusted hyphae, lack of distinct cystidia, and ditrimitic hyphal system. This species may be characterized by the thin, flabelliform, and whitish basidiocarps within the genus *Antrodiella*. For the time being, I leave this as *Antrodiella* sp. because basidiospore characteristics are unknown.

Trametes arcana Corner, Beih. Nova Hedwigia 97:68 (1989). Fig. 1

Holotype: Malaysia, Borneo, Mt. Kinabalu, Ulu Mesilau alt. 2200m, Mar. 20, 1964, leg. E.J.H. Corner (E).

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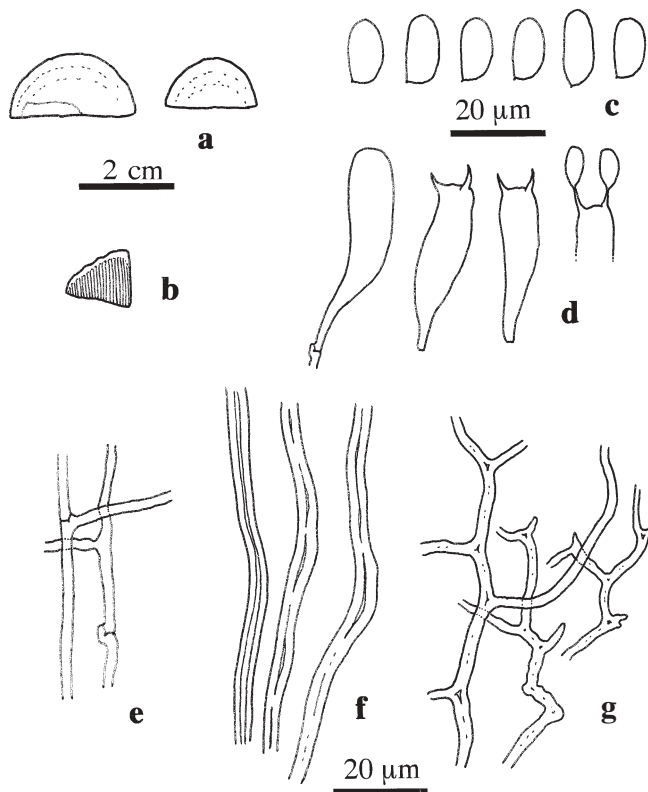


Fig. 1. Structures of *Trametes arcana* from basidiocarps (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia, tip of basidium bearing basidiospores (right). **e** Generative hyphae from trama. **f** Skeletal hyphae from context. **g** Binding hyphae from context

Accepted as *T. arcana*.

Basidiocarps sessile, pileus convex to unguulate, semicircular. Pileus surface glabrous, subsulcate, radially wrinkled, inconspicuously rough with irregular warts, white. Pileus margin thin and acute. Pore surface white, pores angular to round, 1–2/mm, dissepiments entire. Context fibrous-corky, white, up to 3 mm thick, without a crust. Tubes corky, white, up to 13 mm deep.

Hyphal system trimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 2–4 µm wide; tramal skeletal hyphae colorless, IKI–, unbranched, sinuous to almost straight, 2.5–5 µm wide; tramal binding hyphae colorless, IKI–, well differentiated from skeletal hyphae, up to 3.5 µm wide. Contextual generative hyphae sparse, otherwise similar to tramal hyphae. Cystidia not seen. Basidia clavate, 2-sterigmate, with a basal clamp, 30–45 × 7–11 µm, mostly collapsed after spore discharge. Basidiospores ellipsoid to short cylindrical, colorless, IKI– (to faintly dextrinoid), thin walled, 12–16 × 6–7.5 µm.

Remarks: Macroscopically, it resembles *Perenniporia ochroleuca* (Berk.) Ryvar den, but is easily discriminated by the large pores. Large ellipsoid basidiospores and 2-sterigmate basidia are unusual for *Trametes*, but currently I leave it in the original genus because of the pale-colored context, poroid hymenophore, typically trimitic hyphal system, lack of cystidia, and lack of distinct iodine reaction in

basidiospores, which are important characters for *Trametes* (Ryvarden 1991).

Trametes argenteiceps Corner, Beih. Nova Hedwigia 97:69 (1989).

Holotype or other authentic specimen were not traced in E.

Trametes atriceps Corner, Beih. Nova Hedwigia 97:70 (1989).

Holotype: Solomon Is., San Cristobal, Warahito, Aug. 3, 1965, leg. E.J.H. Corner (E).

I consider the holotype a dark-colored form of *Trametes menziesii* (Berk.) Ryvar den [Norw. J. Bot. 19:236 (1972)] because of the dimidiate to flabelliform pileus with a tapering base, grayish pileus surface, and similar hyphal characters (see following).

Corner (1989) emphasized that *T. atriceps* is distinct from *T. menziesii* by having smaller basidiospores and characteristic binding hyphae, but I could not detect basidiospores from the holotype of *T. atriceps*. The holotype of *Polyporus menziesii* Berk. (K!) has larger pores [(1–)2–3/mm] and paler pileus surface than that of *T. atriceps*. These two type specimens share similar skeletal hyphae, which become yellowish in KOH solution, and both have abundant binding hyphae with conspicuous side branches.

Because *T. menziesii* is a variable species that might accommodate different biological species, a condensed description of the holotype is given below for further studies: pileus dimidiate to flabelliform, multisulcate, gray, with scattered nodulae near the base, margin entire; context leathery, white, becoming darker when touched with KOH solution, up to 2 mm thick; pores round to angular, 5–6/mm, dissepiments entire, basidiospores not seen. For a description and taxonomic synonyms of *T. menziesii*, see Ryvar den and Johansen (1980).

Trametes badiuscula Corner, Beih. Nova Hedwigia 97:74 (1989).

Holotype: Indonesia, Sumatra, Brastagi, alt. 1800 m, Sept. 14, 1931, leg. E.J.H. Corner (E).

The holotype represents *Abundisporus roseoalbus* (Jungh.) Ryvar den [Belg. J. Bot. 131:154 (1998)] with convex to triquetrous basidiocarps, ellipsoid and yellowish basidiospores, and dextrinoid hyphae. For a description of *A. roseoalbus*, see Ryvar den and Johansen (1980) as *Loweoporus roseoalbus* (Jungh.) Ryvar den.

Trametes barbulate Corner, Beih. Nova Hedwigia 97:75 (1989). Fig. 2

Holotype: Malaysia, Borneo, Liwagu R., June 1, 1961, leg. E.J.H. Corner (E).

Accepted as *T. barbulate*.

Basidiocarps sessile to effused-reflexed, pileus applanate to convex, semicircular to elongated. Pileus surface tomentose, faintly sulcate, pale orange (5A3-4; white according to the original description). Pileus margin obtuse to acute, entire. Pore surface whitish, pores hexagonal, 0.8–1.5 mm wide, dissepiments partly eroded. Context duplex with

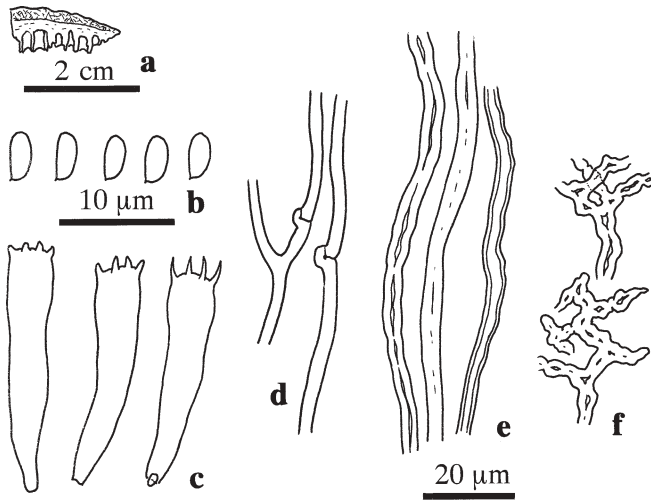


Fig. 2. Structures of *Trametes barbulate* from basidiocarps (holotype). **a** Vertical section view of basidiocarp. **b** Basidiospores. **c** Basidia. **d** Generative hyphae from trama. **e** Skeletal hyphae from context. **f** Binding hyphae from context

upper spongy layer up to 1 mm thick and lower leathery layer up to 2 mm thick separated by a thin dark-colored line, whitish, light in weight. Tubes leathery, whitish, up to 4 mm deep.

Hyphal system trimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 1.5–2.5 µm wide; tramal skeletal hyphae colorless, IKI– to dextrinoid, unbranched, sinuous to almost straight, 3–5 µm wide, swelled in KOH solution; tramal binding hyphae colorless, well-differentiated from skeletal hyphae, up to 4.5 µm wide. Contextual generative hyphae 2–3.5 µm wide, contextual skeletal hyphae 3–6 µm wide, otherwise similar to tramal hyphae. Cystidia not seen. Basidia cylindrical to clavate, 4-sterigmate, with a basal clamp, 18–25 × 3.5–4.5 µm. Basidiospores ellipsoid to oblong ellipsoid, colorless, IKI–, thin walled, 3.5–4.5 × 2–2.5 µm.

Remarks: It is unclear if the dextrinoid reaction in the hyphae is also observed in fresh condition. This species is similar to *T. pocas* (Berk.) Ryvarden by the whitish and tomentose pileus, large pores, and ellipsoid basidiospores. However, *T. pocas* has smaller pores (1–2/mm) and thinner pileus (about 1 mm thick) (Ryvarden and Johansen 1980; Ryvarden 1984).

Trametes benetosta Corner, Beih. Nova Hedwigia 97:75 (1989).

Holotype: Solomon Is., Guadalcanal, Gallego, alt. 650 m, July 7, 1965, leg. E.J.H. Corner (E).

Holotype is sterile. This specimen represents *Fomitella rhodophaea* (Lév.) T. Hatt., comb. nov. [basionym: *Polyporus rhodophaeus* Lév., Ann. Sci. Nat. Ser. 3(2):190 (1844)] or its allied species with brownish pileus, light brown and corky context with a thin crust, regular pores, and typically trimitic hyphal system. For the generic concept of *Fomitella* Murrill, see remarks under *T. fumosipora* Corner.

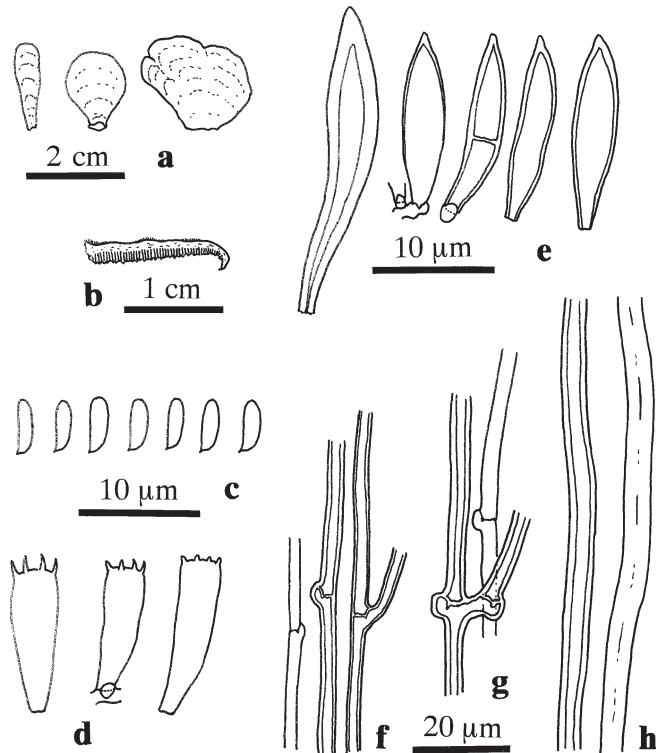


Fig. 3. Structures of *Trichaptum brastagii* from basidiocarps (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia. **e** Hymenial cystidia. **f** Generative hyphae from trama. **g** Generative hyphae from context. **h** Skeletal hyphae from context

Trametes benevestita Corner, Beih. Nova Hedwigia 97:77 (1989).

Holotype or other authentic specimen were not traced in E.

Trametes biogilvoides Corner, Beih. Nova Hedwigia 97:81 (1989).

Holotype: Malaysia, Borneo, Mt. Kinabalu, alt. 1300 m, Aug. 31, 1961, leg. E.J.H. Corner (E).

This represents *Corioloopsis glabro-rigens* (Lloyd) Núñez & Ryvarden [Synopsis Fungorum 14:256 (2001); basionym *Polystictus glabro-rigens* Lloyd, holotype BPI!].

Remarks: Núñez and Ryvarden (2001) emphasized that *C. glabro-rigens* has a pinkish pore surface, but it is not a stable character for this species. This species is most similar to *C. sanguinaria* (Klotzsch) Teng by sharing similar sessile to effused basidiocarps, golden to orange-brown pileus when fresh, and skeletal hyphae with wide lumen occasionally with secondary septa. *Corioloopsis glabro-rigens* is distinct from *C. sanguinaria* by complete lack of reddish crust, more or less rough pileus with irregular warts, radial ridges or pointed projections, and somewhat shorter basidiospores (usually 4.5–6.5 µm long) according to my observation. Both the species are variable in morphology. Further studies are needed to reveal if they are distinct species.

Trametes brastagii Corner, Beih. Nova Hedwigia 97:83 (1989). Fig. 3

Holotype: Indonesia, Sumatra, Brastagi, alt. 1800m, Sept. 14, 1931, leg. E.J.H. Corner (E).

Accepted as *Trichaptum brastagii* (Corner) T. Hatt., comb. nov. (basonym indicated above).

Basidiocarps sessile on resupinate foot, pileus applanate, flabelliform to spatulate. Pileus surface velutinous near the base, almost glabrous near the margin, zonate, partly subshiny to silky, pale orange (5A3-4). Pileus margin thin and acute, entire to eroded, inrolled. Pore surface grayish-orange (6B4-5), pores angular near the margin, otherwise angular to almost irpicoid, 4-5/mm, dissepiments deeply split. Context leathery, flexible, without a crust, whitish, up to 1 mm thick. Tubes leathery, whitish, up to 2 mm deep.

Hyphal system dimitic. Tramal generative hyphae colorless, IKI-, with clamp connections, thin- to slightly thick walled, 2-3.5 µm wide; tramal skeletal hyphae colorless, IKI-, unbranched, almost straight and parallel, thick walled to almost solid, 3-4.5 µm wide. Contextual generative hyphae 2-5 µm wide, contextual skeletal hyphae 3-6 µm wide, otherwise similar to tramal hyphae. Cystidia abundant in the trama, fusoid, thick walled near the apex, colorless, IKI-, with a basal clamp. Basidia clavate, 4-sterigmate, with a basal clamp, 10-15 × 3.5-4 µm. Basidiospores short cylindrical, colorless, IKI-, thin-walled, 3.5-5 × 2-2.5 µm.

Remarks: This species is similar to *T. biforme* (Fr.) Ryvar den, but the latter has cylindrical basidiospores measuring 6-8 µm long (Gilbertson and Ryvar den 1987). Corner (1987) reported "*T. biforme*" with basidiospores measuring 4-5 µm long that are similar to *T. brastagii*. The Southeast Asian population with shorter basidiospores is better treated as a distinct species from *T. biforme*, the name *T. brastagii* having been adopted.

Trametes castaneifumosa Corner, Beih. Nova Hedwigia 97:90 (1989).

Holotype or other authentic specimens were not traced in E.

Trametes cristobalensis Corner, Beih. Nova Hedwigia 97:93 (1989).

Holotype: Solomon Is., San Cristobal, Warahito R., July 24, 1965, leg. E.J.H. Corner (E).

Holotype is sterile. This is a member of *Antrodiella* with horny context when dried, lack of encrusted hyphae and ditrimitic hyphal system. At present, I leave this as *Antrodiella* sp. because basidiospore characteristics are unknown.

Trametes daedaleoides Corner, Beih. Nova Hedwigia 97:93 (1989). Fig. 4

Holotype: Malaysia, Pahang, Kuala Tekai, June 7, 1931, leg. E.J.H. Corner (E).

Accepted as *T. daedaleoides*. Because the holotype is sterile, microscopic descriptions are based on the specimen below: Malaysia, N. Sembilan, Pasoh Forest Reserve, Mar. 14, 1997, leg. T. Hattori (F-17763, TFM).

Basidiocarps sessile, pileus applanate, semicircular to elongated, single to fusing laterally or imbricate. Pileus surface almost glabrous, weakly sulcate, partly with warts,

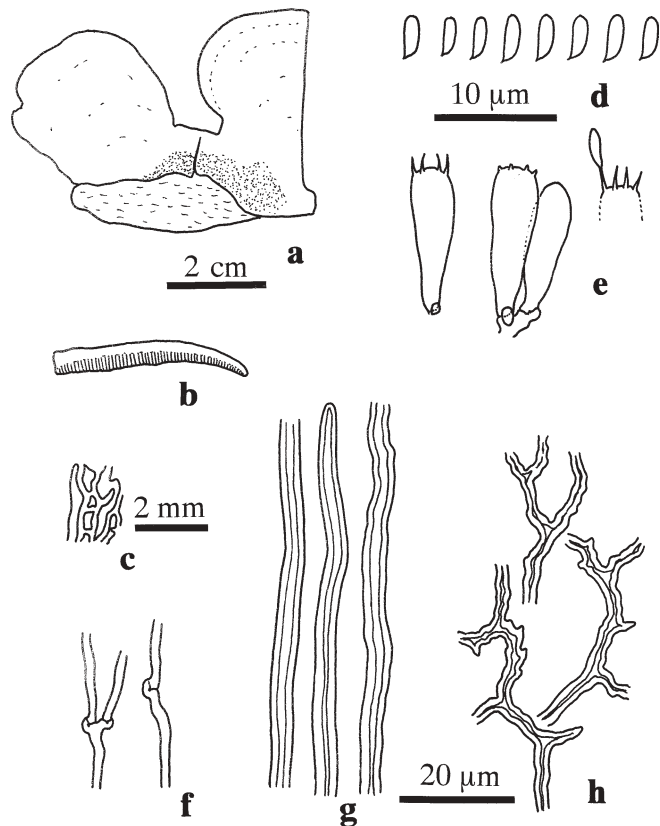


Fig. 4. Structures of *Trametes daedaleoides* from basidiocarps (a, b, c: holotype; d, e, f, g, h: F-17763, TFM). a Upper view of basidiocarp. b Vertical section view of basidiocarp. c Pore surface. d Basidiospores. e Basidia, tip of basidium bearing basidiospore (right). f Generative hyphae from trama. g Skeletal hyphae from context. h Binding hyphae from context

gray-orange (6B-C4; pinkish-tan when fresh), with dark brown crust near the base. Pileus margin obtuse, entire. Pore surface pale orange (6A2-3), pores irregular, elongated or daedaleoid, round near the margin, poroid part 2-3/mm, dissepiments almost entire. Context corky, gray-orange (6C4-5), up to 3 mm thick, with or without a crust near the base. Tubes pale orange, up to 3 mm deep.

Hyphal system trimitic. Tramal generative hyphae colorless, IKI-, with clamp connections, 1-2.5 µm wide; tramal skeletal hyphae colorless to pale yellow, IKI-, sinuous, 2-3.5 µm wide; tramal binding hyphae up to 3 µm wide. Contextual generative hyphae sparse, colorless, with clamp connections, 2-3 µm wide; contextual skeletal hyphae colorless to pale yellow, unbranched, IKI-, thick walled, 2.5-4.5 µm wide; contextual binding hyphae conspicuously branched, well differentiated from skeletal hyphae, up to 3.5 µm wide. Context near the pileus surface composed of interwoven and somewhat agglutinated hyphae. Cystidia not seen. Basidia clavate, 4-sterigmate, 10-15 × 3-3.5 µm, with a basal clamp. Basidiospores short cylindrical, colorless, IKI-, 3-4 × 1-1.5 µm.

Remarks: This species is similar to *Trametes elegans* (Spreng. : Fr.) Fr., but distinct by the context with an orange or pinkish tint in fresh condition (white in *T. elegans*) and smaller basidiospores [5-7 µm long in *T. elegans* according

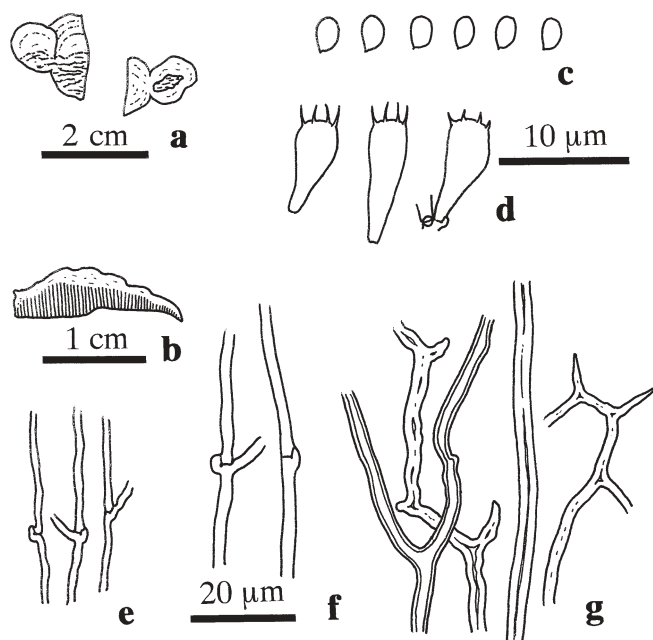


Fig. 5. Structures of *Antrodiella depauperata* from basidiocarps (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia. **e** Generative hyphae from trama. **f** Generative hyphae from context. **g** Skeletal-binding hyphae from context

to Gilbertson and Ryvarden (1987)]. *Trametes daedaleoides* is a common species in lowland Malaysia, and a prior name might be buried among those treated as synonyms of *T. elegans*.

Trametes decorticans Corner, Beih. Nova Hedwigia 97:94 (1989).

Holotype or other authentic specimens were not traced in E.

Trametes depauperata Corner, Beih. Nova Hedwigia 97:95 (1989). Fig. 5

Holotype: Solomon Is., Guadalcanal, Popmanasiu, alt. 1800m, Oct. 1965, leg. E.J.H. Corner (E).

Accepted as *Antrodiella depauperata* (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps sessile, pileus applanate, semicircular to elongated, single to fusing laterally or imbricate. Pileus surface almost glabrous, weakly sulcate, partly with warts, gray-orange (6B-C4; pinkish-tan when fresh according to the original description), with a dark brown crust near the base. Pileus margin obtuse, entire. Pore surface pale orange (6A2-3), pores irregular, elongated or daedaleoid, round near the margin, poroid part 2–3/mm, dissepiments almost entire. Context corky, gray orange (6C4-5), up to 3mm thick, with or without a crust near the base. Tubes pale orange, up to 3mm deep.

Hyphal system ditrimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, 1–2µm wide; tramal skeletal-binding hyphae colorless, IKI–, almost straight to sinuous, unbranched to occasionally branched, 2–4µm wide. Contextual generative hyphae 2–4.5µm wide, contex-

tual skeletal-binding hyphae 2.5–5µm wide, otherwise similar to tramal hyphae. Cystidia not seen. Basidia clavate, 4-sterigmate, 9–10 × 3–4µm, with a basal clamp. Basidiospores ellipsoid, colorless, IKI–, 2.5–3 × 1.8–2.2µm.

Remarks: This species may be confused with *A. semisupina* (Berk. & M.A. Curtis) Ryvarden by sharing similar spores and hyphal characters, but is distinct from the latter by the nonhorny context and tubes when dried.

Trametes elevata Corner, Beih. Nova Hedwigia 97:98 (1989).

Holotype: Malaysia, Pahang, Sungai Cheka, June 14, 1931, leg. E.J.H. Corner (E).

The holotype is sterile. Type of rot is unknown but it probably represents *Daedalea dochmia* (Berk. & Broome) T. Hatt., comb. nov. [basionym: *Polyporus dochmius* Berk. & Broome, J. Linn. Soc. 14:50 (1873)] because of the perennial basidiocarps, sulcate and brownish pileus, corky and pale brown context with a crust, and regular pores measuring 4–6/mm. For a description of *D. dochmia*, see Carranza-Morse and Gilbertson (1986) as *Fomitopsis dochmia* (Berk. & Broome) Ryvarden.

Daedalea and *Fomitopsis* P. Karst. share distinctly pileate and often perennial basidiocarps, ditrimitic hyphal system, lack of an iodine reaction, and a brown rot. Gilbertson and Ryvarden (1986) accommodated various species in *Fomitopsis*, which makes the genus heterogeneous. *Daedalea dochmia* has a distinctly brownish context and lacks distinct cystidia (Carranza-Morse and Gilbertson 1986) as in *D. quercina* Fr., the type species of *Daedalea*. On the other hand, *Fomitopsis pinicola* (Swartz: Fr.) P. Karst., the type species of *Fomitopsis*, has cream context and long hyphoid cystidia (Gilbertson and Ryvarden 1986). I conclude that *Daedalea* is the proper genus to accommodate *P. dochmius* because color of the context and occurrence of distinct cystidia are considered to be distinct characters to define polypore genera (Ryvarden 1991). Infrequent occurrence of basidia in *D. dochmia* is also similar to other *Daedalea* spp.

Trametes farinolens Corner, Beih. Nova Hedwigia 97:98 (1989).

Holotype: Solomon Is., Guadalcanal, Gallego, alt. 800m, July 8, 1965, leg. E.J.H. Corner (E).

The holotype is sterile and in poor condition.

Trametes febris Corner, Beih. Nova Hedwigia 97:99 (1989).

Holotype: Malaysia, Johore, Sedili Kechil R., June 18, 1934, leg. E.J.H. Corner (E).

The holotype is sterile. This probably represents a *Flabellophora* sp. with stipitate and leathery basidiocarps, dimitic hyphal system, and lack of iodine reaction.

Trametes flammula Corner, Beih. Nova Hedwigia 97:101 (1989).

Holotype: Malaysia, Pahang, Cameron Highland, July 28, 1934, leg. E.J.H. Corner (E).

The holotype represents *Corioloopsis glabro-rigens* with rough pileus surface and context with an orange tint without

a crust. For characters of *C. glabro-rigens*, see remarks under *T. biogilvoides*.

Trametes flavidinigra Corner, Beih. Nova Hedwigia 97:102 (1989).

Holotype or other authentic specimens were not traced in E.

Trametes fulgineicana Corner, Beih. Nova Hedwigia 97:103 (1989).

Holotype: Malaysia, Negri Sembilan, Gunong Angsi, alt. 500 m, July 4, 1930, leg. E.J.H. Corner (E).

The holotype represents a young and sterile specimen of *Polyporus* sp. with laterally stipitate basidiocarps, arboriform skeletal hyphae, and lack of iodine reaction.

Trametes fulvidochmia Corner, Beih. Nova Hedwigia 97:104 (1989).

Holotype: Malaysia, Trengganu, Kemaman, June 24, 1932, leg. E.J.H. Corner (E).

Type of rot is unknown but it probably represents a dark-colored form of *Daedalea dochmia* because of the perennial basidiocarps, sulcate and brownish pileus, corky and pale brown context with a crust, and regular pores measuring 4–6/mm.

Trametes fulvirubida Corner, Beih. Nova Hedwigia 97:104 (1989). Fig. 6

Holotype: Malaysia, Johore, Gunong Panti, Jan. 31, 1930, leg. E.J.H. Corner (E).

Accepted as *Daedalea fulvirubida* (Corner) T. Hatt., comb. nov. (basonym indicated above). Information of collections from Pasoh (F-18260, 18301, 19024, 19037, 19355, 19386, TFM) is also incorporated in the description below.

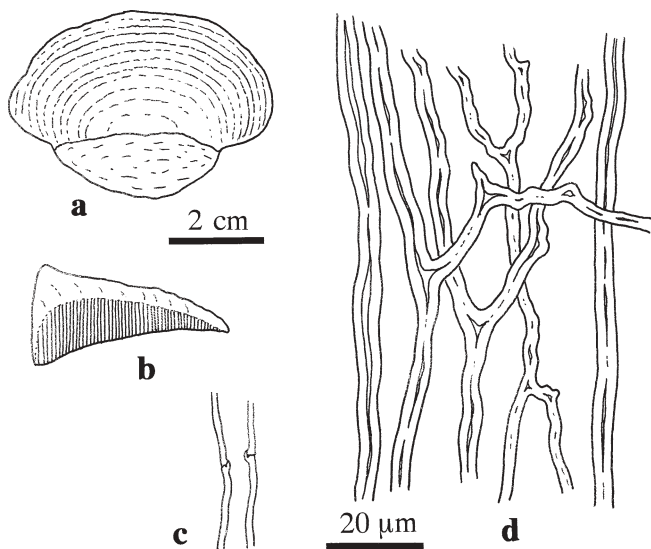


Fig. 6. Structures of *Daedalea fulvirubida* from basidiocarps (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Generative hyphae from trama. **d** Skeletal-binding hyphae from context

Basidiocarps annual, sessile, pileus convex to triquetrous or subungulate, semicircular, usually single. Pileus surface almost glabrous to matted, sulcate, light brown to brown (7D5-6, 7E5-6), margin paler. Pileus margin obtuse to sharp, entire. Pore surface light orange (6A3-4; whitish when fresh), pores angular to daedaleoid, mostly angular near the margin, (1–)2–3/mm, dissepiments entire. Context corky, light orange (6A3-4), without a crust. Tubes light orange, up to 10mm deep.

Hyphal system ditrimitic. Skeletal hyphae and binding hyphae not well differentiated. Tramal generative hyphae sparse, colorless, IKI–, with clamp connections, 1.5–2.5 μm wide; tramal skeletal-binding hyphae pale brown, IKI–, mostly sinuous, unbranched to occasionally branched, thick-walled to almost solid, 2–5 μm wide. Contextual hyphae similar to tramal hyphae. Cystidia not seen. Basidia not seen. Basidiospores not seen (ellipsoid, colorless, IKI–, 4.5–6.5 × 2–2.8 μm according to the original description).

Remarks: Corner described four varieties under this species, var. *fulvirubida*, *gyrosipora*, *micropora*, and *pallida*. However, holotype of var. *micropora* (E!) represents *Fomitopsis pseudopetchii* (Lloyd) Ryvardeen, and that of *pallida* (E!) does *Fomitella rhodophaea* or its allied species. This wide concept made its original description unacceptable.

Daedalea fulvirubida is a common species in Pasoh on various tree species causing a brown rot. Basidiocarps are always annual, convex to subungulate and usually less than 10cm long, contrasting with many *Daedalea* spp. that have perennial, larger or applanate basidiocarps.

Its pileal surface and contextual color are similar to those of *D. aurora*, but the present species is distinct by the larger pores and usually smaller and more convex to unguulate basidiocarps.

Daedalea pseudodochmia (Corner) T. Hatt., comb. nov. [basonym *Trametes pseudodochmia* Corner, Beih. Nova Hedwigia 97:138 (1989)] is a similar species. This species has been called as *Daedalea incana* (Lév.) Ryvardeen [Mycotaxon 20:148 (1984); basonym *Trametes incana*, holotype PC!], but this name is illegitimate with an earlier homonym *D. incana* (P. Karst.) Sacc. & D. Sacc. [Sylloge Fungorum 17:139 (1905)] Both *D. pseudodochmia* and *D. fulvirubida* have pores measuring 2–3/mm, but the former has annual to perennial basidiocarps, often rimose pileus, round and regular pores, and brownish context with or without a crust. For distinction from other *Daedalea* spp., see the key below for *Trametes lusor* Corner.

Some of the *Trametes* spp. are macroscopically similar to *Daedalea* spp. However, *Daedalea* spp. lack typical binding hyphae (Rajchenberg 1986) and have sinuous “skeletal hyphae” with occasional to frequent branches. These hyphae are treated as skeletal-binding hyphae here. On the other hand, most of the *Trametes* spp. have well-differentiated skeletal and binding hyphae.

Trametes lactinea Berk. (holotype, K!) is a species most frequently confused with *Daedalea* spp. because outdated specimens of *T. lactinea* usually have colored context as in *Daedalea* spp. Several specimens in BPI, e.g., US0247024, US0247026, US0349902, and US0349903 labeled *T. incana*

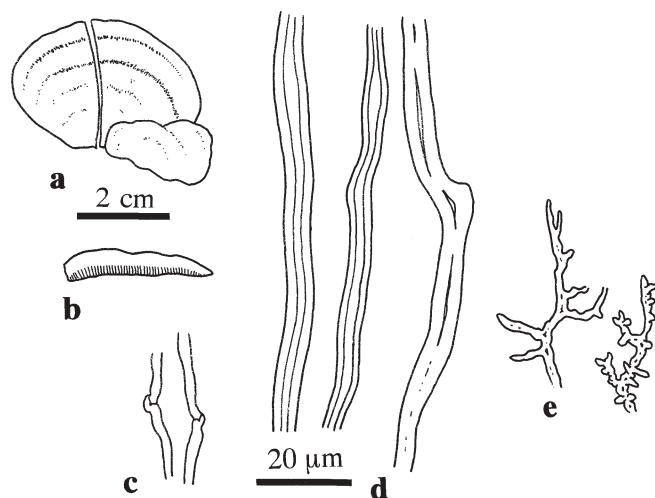


Fig. 7. Structures of *Fomitella fumosipora* from basidiocarps (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Generative hyphae from trama. **d** Skeletal hyphae from context. **e** Binding hyphae from context

Lév. [= *D. incana* (Lév.) Ryvardeen] represent *T. lactinea*. Ryvardeen (1985) put *Trametes subacuta* Murrill (holotype, NY!) and *T. williamsii* Murrill (holotype, NY!) into synonymy of *D. incana* (Lév.) Ryvardeen, but they also represent *T. lactinea*. However, this species is distinct from *Daedalea* spp. by the hyphal characteristics indicated above.

Trametes fumosipora Corner, Beih. Nova Hedwigia 97:106 (1989). Fig. 7

Holotype: Malaysia, Pahang, Fraser's Hill, alt. 1300m, May 16, 1930, leg. E.J.H. Corner (E).

Accepted as *Fomitella fumosipora* T. Hatt., comb. nov. (basonym indicated above). Information of collections from Pasoh (F-18242, 19405, 19471, TFM) is also incorporated in the description below.

Basidiocarps annual to perennial, sessile, pileus applanate, dimidiate, occasionally with a contracted base, single, laterally fused, or imbricate. Pileus surface glabrous to matted, sulcate, zonate with brown zones (7D5-6) and dark brown zones (7-8F8). Pileus margin obtuse, entire. Pore surface dark brown (9E3-4, 9F3-4), pores round, 7-9/mm, dissepiments entire. Context fibrous-corky to felty, grayish-red (8B3-4), darker near the tubes (8C4-5), up to 4mm thick, with a distinct crust. Tubes grayish-brown (9D3-4), corky, up to 2mm deep in the holotype.

Hyphal system trimitic. Tramal generative hyphae sparse, colorless, IKI-, with clamp connections, 1.5-3µm wide; tramal skeletal hyphae yellow to pale brown, IKI-, unbranched to rarely branched, thick walled to almost solid, 2.5-5µm wide; tramal binding hyphae yellow to pale brown, IKI-, conspicuously branched, almost solid, up to 3.5µm. Contextual skeletal hyphae 3-10µm wide, otherwise similar to tramal hyphae. Cystidia not seen. Basidia not seen. Basidiospores not seen.

Remarks: This is a common species in Malaysia, and an earlier name might be buried among those described from

Southeast Asia. *Fomitella rhodophaea* is similar, but *F. fumosipora* has smaller basidiocarps (usually less than 10cm long), and usually with dark-colored pileus and distinctly dark-colored tubes. In Southeast Asia, there are some species with perennial (to annual) basidiocarps, light brown colored context with a distinct agglutinated crust, distinctly trimitic hyphal system in the context, and associated with a white rot such as *F. rhodophaea* and *F. fumosipora*. These characters are shared with *Fomitella supina* (Swartz : Fr.) Murrill, the type species of *Fomitella*.

Fomitella has been treated as a monotypic genus (Gilbertson and Ryvardeen 1986). Here, I propose to emend the generic concept of *Fomitella* as follows: basidiocarps perennial or annual, sessile to effused-reflexed, pileus dimidiate to irregular, pileus surface glabrous to minutely tomentose, context firm-fibrous to corky, light orange to light brown, with a dark agglutinated crust; hyphal system trimitic, generative hyphae with clamp connections, skeletal and binding hyphae well differentiated, hyphae IKI-, cystidia lacking, basidiospores ellipsoid to cylindrical, colorless, IKI-, causing a white rot. The following species are hitherto accepted in the genus *Fomitella*: *F. supina*, *F. fumosipora*, and *F. rhodophaea*.

Trametes granulifera Corner, Beih. Nova Hedwigia 97:107 (1989).

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mahmud Valley, alt. 1400m, Aug. 3, 1961, leg. E.J.H. Corner (E).

The holotype is sterile. This is probably a young specimen of *Wrightoporia* sp. with yellowish basidiocarps, tough-spongy context, dimitic hyphal system, and weakly dextrinoid skeletal hyphae. For a key to the pileate *Wrightoporia* spp., see Hattori (2003).

Trametes internuntia Corner, Beih. Nova Hedwigia 97:109 (1989). Fig. 8

Holotype: Malaysia, Borneo, Mt. Kinabalu, alt. 3200m, July 15, 1961, leg. E.J.H. Corner (E).

Accepted as *Microporus internuntius* T. Hatt., comb. nov. (basonym indicated above).

Basidiocarps sessile to effused-reflexed, pileus applanate, dimidiate to flabelliform, single or imbricate. Pileus surface zonate with velutinous and light brown (5D5-6) zones and glabrous, subshiny, and reddish-brown (8C-D8) zones. Pileus margin thin and acute, almost entire, inrolled when dried. Pore surface light orange (5B5-6; pale cream white according to the original description), pores angular to round, 5-6/mm, dissepiments entire. Context leathery, flexible, whitish (5A2), with a thin reddish cutis, up to 3mm thick. Tubes whitish, up to 2mm deep.

Hyphal system trimitic. Tramal generative hyphae colorless, IKI-, with clamp connections, 1.5-2.5µm wide; tramal skeletal hyphae colorless, IKI- to dextrinoid in mass, unbranched, thick walled to almost solid, 2-4.5µm wide (swelled in KOH solution), tramal binding hyphae conspicuously branched, up to 3.5µm wide. Contextual skeletal hyphae 2.5-6µm wide, otherwise similar to tramal hyphae. Cystidia not seen. Basidia clavate, 4-sterigmate, with a basal

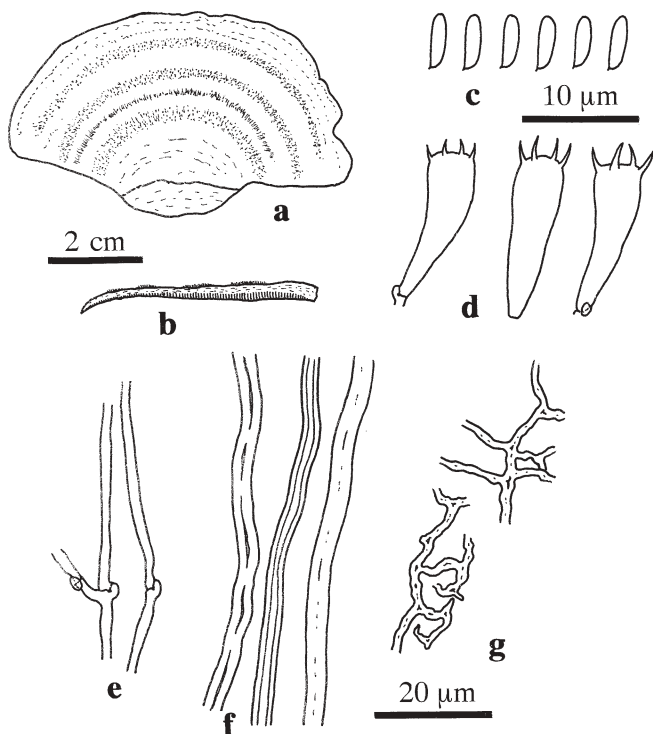


Fig. 8. Structures of *Microporus internuntius* from basidiocarps (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia. **e** Generative hyphae from trama. **f** Skeletal hyphae from context. **g** Binding hyphae from context

clamp, $10\text{--}18 \times 3.5\text{--}4.5\ \mu\text{m}$. Basidiospores short cylindrical, colorless, IKI–, $4\text{--}5 \times 1.5\text{--}2\ \mu\text{m}$.

Remarks: Corner (1989) suggested that its hyphal character is intermediate between arboriform skeletal and normally trimitic hyphal system, but it has a typically trimitic hyphal system as in other *Microporus* spp. Macroscopically, this species is very similar to *Microporus affinis* (Blume & Nees : Fr.) Kuntze, but the latter has shorter basidiospores ($3\text{--}4\ \mu\text{m}$ long) and smaller pores (usually $6\text{--}10\ \text{mm}$), according to my observations on Japanese and Malaysian specimens. *Microporus affinis* is widely distributed from tropical to warm temperate areas in Asia but is never seen in cool temperate areas. The high elevation of its localities suggests that *M. internuntius* is adapted to cool temperate climate. *Microporus vernicipes* (Berk.) Kuntze (basionym *Polyporus vernicipes* Berk., holotype K!), the only other species known in cool temperate areas in this genus, has a glabrous and azonate to subzonate pileus.

Trametes jejuna Corner, Beih. Nova Hedwigia 97:110 (1989). Fig. 9

Holotype: Malaysia, Pahang, Tembeling, Nov. 8, 1930, leg. E.J.H. Corner (E).

Accepted as *T. jejuna*.

Basidiocarps sessile, pileus applanate, flabelliform to semicircular. Pileus surface zonate with prominently tomentose zones and less tomentose zones, light brown (6C5-6, 6D5-6; white when fresh according to the original

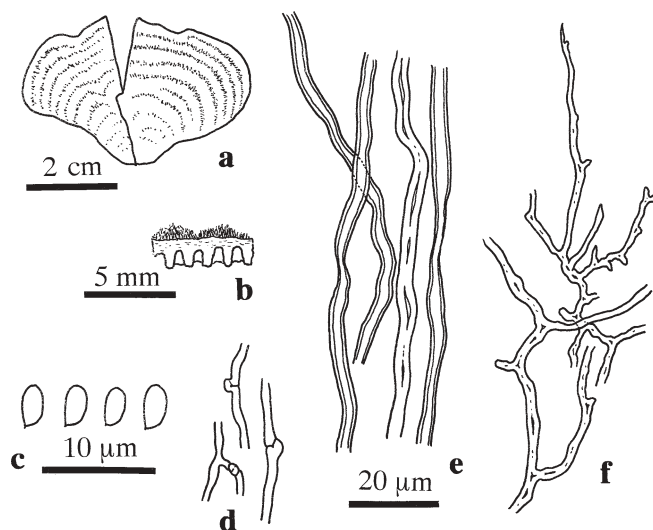


Fig. 9. Structures of *Trametes jejuna* from basidiocarps (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Generative hyphae from context. **e** Skeletal hyphae from context. **f** Binding hyphae from context

description). Pileus margin thin and acute, entire, inrolled or not. Pore surface light brown (probably white originally), pores angular, $(1\text{--})2\text{--}3\ \text{mm}$, dissepiments thin, partly eroded. Context soft leathery, light brown (probably white originally), up to $2\ \text{mm}$ thick, without a crust. Tubes concolorous with the context, up to $1\ \text{mm}$ deep.

Hyphal system trimitic. Tramal generative hyphae colorless, IKI–, with clamp connections, $1.5\text{--}2.5\ \mu\text{m}$ wide; tramal skeletal hyphae colorless, IKI– to dextrinoid in mass, mostly unbranched, thick walled to almost solid, $2\text{--}3.5\ \mu\text{m}$ wide, swelled in KOH solution; tramal binding hyphae colorless, IKI–, conspicuously branched, up to $2.5\ \mu\text{m}$ wide. Contextual skeletal hyphae partly flattened, $2\text{--}5\ \mu\text{m}$ wide, otherwise similar to tramal hyphae. Cystidia not seen. Basidia not seen. Basidiospores long ellipsoid, IKI–, $2.8\text{--}3.2 \times 1.8\text{--}2.0\ \mu\text{m}$.

Remarks: It is unclear if the dextrinoid reaction in the hyphae is also observed in fresh condition. This is an allied species with *T. pocas*, but distinct from the latter by the more flexible basidiocarps and shorter basidiospores [$4\text{--}5.5 \times 2.5\text{--}3\ \mu\text{m}$ in *T. pocas*, according to Ryvarden and Johansen (1980)]. *Trametes barbulata*, another allied species, has thicker context with a distinct cutis and larger pores.

Trametes linguiformis Corner, Beih. Nova Hedwigia 97:112 (1989).

Holotype: Malaysia, Pahang, Fraser's Hill, May 25, 1930, leg. E.J.H. Corner (E).

The holotype is similar to *Trichaptum suberosum* Corner [Beih. Nova Hedwigia 86:230 (1987)] with the white and almost glabrous pileus surface, dimitic hyphal system, ventricose hymenial cystidia. Size of the basidiospores of *T. linguiformis* given by Corner (1989) is different ($4.5\text{--}5.5 \times 2.7\text{--}3\ \mu\text{m}$) from that of *T. suberosum* [$2\text{--}2.5 \times 1.5\text{--}2\ \mu\text{m}$ according to Hattori (2001)], but basidiospores were not seen from the holotype of *T. linguiformis*. I leave this name as a

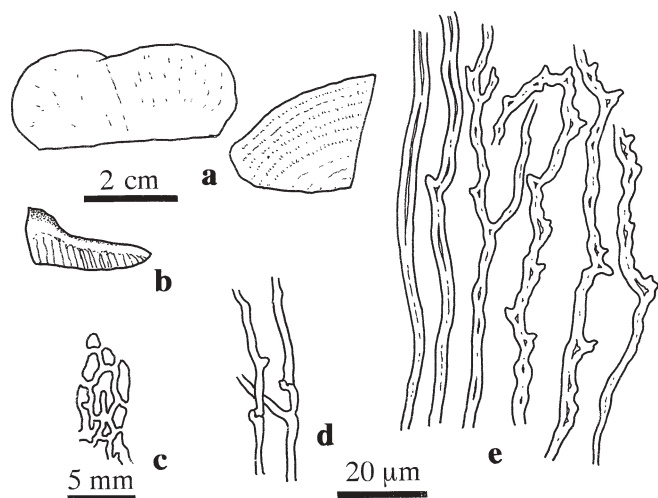


Fig. 10. Structures of *Daedalea lusor* from basidiocarps (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Pore surface. **d** Generative hyphae from trama. **e** Skeletal-binding hyphae from context

synonym of *T. suberosum* to avoid an excess of new combinations without confidence.

Trametes luridochracea Corner, Beih. Nova Hedwigia 97:113 (1989).

Holotype: Singapore, Selitar, Apr. 26, 1941, leg. E.J.H. Corner (E).

This is a poroid form of *Lenzites acutus* Berk. with matted to glabrous and ochraceous pileus surface, yellowish context, and large and partly irregular pores. This form is common in Penang and Perlis States of Malaysia. For a detailed description of *L. acutus*, see Ryvarden and Johansen (1980).

Trametes lusor Corner, Beih. Nova Hedwigia 97:114 (1989). Fig. 10

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

Accepted as *Daedalea lusor* (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps sessile, pileus semicircular or laterally fused, applanate to convex, single or imbricate. Pileus surface matted to almost glabrous, azonate to faintly zonate, sulcate or not, dark brown (7E7-8), paler (6D6-7) in young specimens. Pileus margin obtuse to acute, entire. Pore surface purplish-brown (10E6-7), pores angular near the margin, angular to daedaleoid near the base, 1(-2)/mm in poroid part, larger in daedaleoid part, dissepiments thin and eroded. Context corky, pinkish (7A3) near the tubes, brown (7D5-6) near the surface, up to 5 mm thick, without a crust. Tubes more or less horny, purplish-brown, up to 8 mm deep (purplish color and horny consistency of the tubes might be induced by contamination or inadequate desiccation).

Hyphal system ditrimitic. Tramal generative hyphae colorless, IKI-, with clamp connections, occasionally branched, 1.5-2.5 µm wide; skeletal-binding hyphae yellow to pale brown, IKI-, thick walled to almost solid, sinuous,

unbranched to occasionally branched, 2-5 µm wide. Contextual hyphae similar to tramal hyphae, but generative hyphae sparse. Hymenial cystidia not seen. Basidia not seen (11-14 × 3-4 µm according to the original description). Basidiospores not seen (ellipsoid, 3-3.5 × 2 µm according to the original description).

Remarks: Type of rot is unknown for the holotype, but I combined this with *Daedalea* because of the hyphal characteristics similar to other *Daedalea* spp.; see remarks below for *T. fulvirubida*.

A number of *Daedalea* spp. are distributed in the lowland rainforest of Malaysia. I provide here a key to the known species of Malaysian *Daedalea* spp. and two widespread components unknown from Malaysia.

A key to the species of *Daedalea* reported from lowland Peninsula Malaysia

1. Hymenophore poroid, pores smaller than 4/mm. 2
1. Hymenophore poroid to daedaleoid, pores larger than 4/mm in poroid part. 3
2. Pileus surface brownish to dark brown, often rimose, context light brown to pinkish-buff with a distinct crust, pores 4-6/mm, widespread in tropical areas. Restricted to Dipterocarpaceae trees in Malaysia.
. *D. dochmia* (Berk. & Broome) T. Hatt.
2. Pileus surface pinkish to cinnamon-brown when fresh, drying light brown, almost smooth, sulcate broadly, context light orange to pinkish-buff, without a crust or crust limited near the base, pores 8-10/mm, known from Malaysia. Restricted to Dipterocarpaceae trees.
. *D. aurora* (Ces.) Aoshima
3. Hymenophore mostly daedaleoid or poroid part mostly larger than 1 mm wide. 4
3. Hymenophore mostly poroid, poroid part smaller than 1 mm wide. 5
4. Pileus surface light orange, light brown to grayish, azonate, context light orange to buff, without a crust, hymenophore daedaleoid to almost lamellate, widespread in temperate areas. (Unknown from Malaysia.)
. *D. quercina* L.: Fr.
4. Pileus surface dark brown, azonate to sulcate, context pinkish-buff to light brown, darker near the pileus surface, without a crust, hymenophore poroid to daedaleoid, poroid part about 1/mm. (Known from Malaysia.)
. *D. lusor*
5. Pileus surface yellowish-brown to brown, distinctly sulcate or not. (Known from tropical areas.) 6
5. Pileus surface and pore surface pinkish-buff, although basal area of pileus surface may become darker in old specimens, nonsulcate or indistinctly sulcate, context pinkish-buff, without a crust, pores regular to partly irregular, 1-2/mm, distributed in temperate areas of E. Asia. (Unknown from Malaysia.)
. *D. dickinsii* Yasuda
6. Basidiocarps annual, pileus surface azonate to sulcate, dark brown, context pinkish-buff to light brown, pores round to irregular, 0.5-1(-2)/mm.
. *D. lusor*

6. Basidiocarps annual, pileus up to 10cm long, convex to triquetrous, pileus surface sulcate, never rimose, cinnamon to brown, context light orange, without a crust, pore surface whitish to light orange, pores angular to sinuous, (1–)2–3/mm. (Known from Malaysia.) On various host trees. *D. fulvirubida*
6. Basidiocarps perennial, pileus up to 20cm long, applanate, convex to unglulate, pileus surface sulcate or not, often rimose, yellowish-brown to brown, context brownish-orange to light brown, with or without a crust, pore surface light brown to yellowish-brown, pores round to angular, 2–3/mm. Probably widespread in tropical Asia. Host range unknown.
 *D. pseudodochmia* [= *D. incana* (Lév.) Ryvarden, non *D. incana* (P. Karst.) Sacc. & D. Sacc.]

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