Mycoscience (2002) 43:307–315

FULL PAPER

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

Received: December 25, 2001 / Accepted: April 26, 2002

Abstract Identifications of 30 species of polypores described by Corner were made by type examinations. The following new combinations are proposed: *Antrodiella brunneimontana*, *A. diffluens*, *A. flavitubus*, *Ceriporiopsis aurantitingens*, *C. cremeicarnea*, *Dichomitus affixus*, *Oligoporus bambusicola*, *O. cretaceitextus*, and *Skeletocutis falsipileata*. The following names are accepted in the original genus: *Tyromyces corniculatus*, *T. corticola*, *T. hispidulinanus*, *T. inodermatus*, *T. interponens*, and *T. languidus*. *Tyromyces aurantilaetus* was already combined with the proper genus. The following species are treated as synonyms: *Tyromyces amyloideus*, a synonym of *Oligoporus caesius*; *T. citrinicarneus*, a synonym of *Rigidoporus dextrinoideus*; *T. coeruleivirens*, a synonym of *O. caesius*; *T. fagraeae*, a synonym of *T. corticola*; *T. flavidicera*, a synonym of *R. dextrinoideus*; and *T. inconsideratus*, a synonym of *Tinctoporellus epimiltinus*. *Tyromyces dianthicolor* and *T. favulus* belong to difficult complexes, and allied species are cited for each species. The following species are dubious because of their poor or sterile condition: *Tyromyces albovinaceus*, *T. carbonicola*, *T. dacrydii*, and *T. descendens*. No authentic specimens were traced for *T. cinnamomeiporus* and *T. citriniporus*. Descriptions and line drawings are given for the accepted species.

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

Introduction

This is the fourth part of the type studies of polypores described by Corner. Here, I have examined 30 species of the type materials described in the genus *Tyromyces* P. Karst. by Corner (1989, 1992). Their identities are shown, and descriptions and line drawings are given for the accepted species.

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Materials and methods

Type specimens of the species described by Corner (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, a lowland rain forest of West Malaysia, and in Japan 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).

Identities and descriptions

Tyromyces affixus Corner, Beih. Nova Hedwigia 96:157, 1989. Fig. 1

Holotype: New Guinea, Edie Creek, alt. 1700 m, 13 Sept. 1960, leg. E.J.H. Corner (E).

Accepted as ***Dichomitus affixus*** (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps fully resupinate. Pore surface pale orange (5A3-4), pores angular, 5–6/mm, dissepiments entire. Context up to 0.2 mm thick, whitish (5A2-3). Tubes concolorous with context, up to 0.2 mm deep.

Trama hyphae dimitic: generative hyphae colorless, IKI-, with clamp connections, 1.5–3 μm wide; arboriform skeletal hyphae abundant, colorless, IKI–, up to 2 μm wide. Hyphal pegs not seen (minute and sparse in the original description). Dendrohyphidia scattered. Hymenial cystidia not seen. Basidia not seen (20–25 × 8–9 μm, 4-

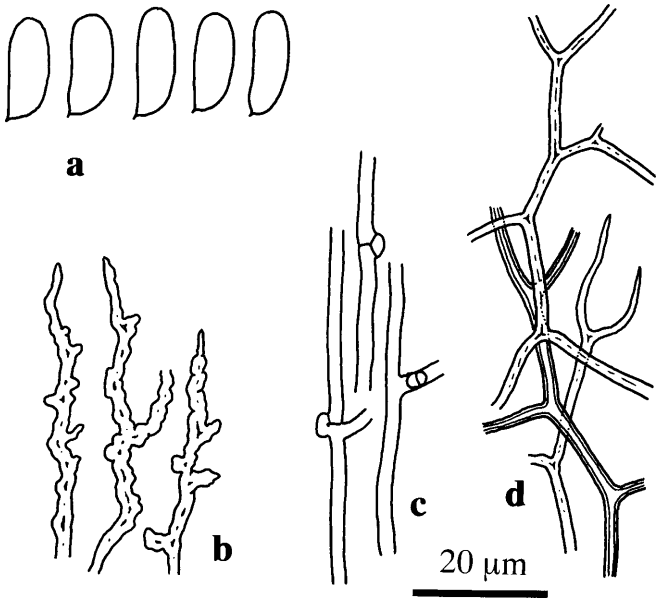

Fig. 1. *Dichomitus affixus* (holotype). **a** Basidiospores. **b** Hymenial dendrohyphidia. **c** Generative hyphae from trama. **d** Arboriform skeletal hyphae from trama

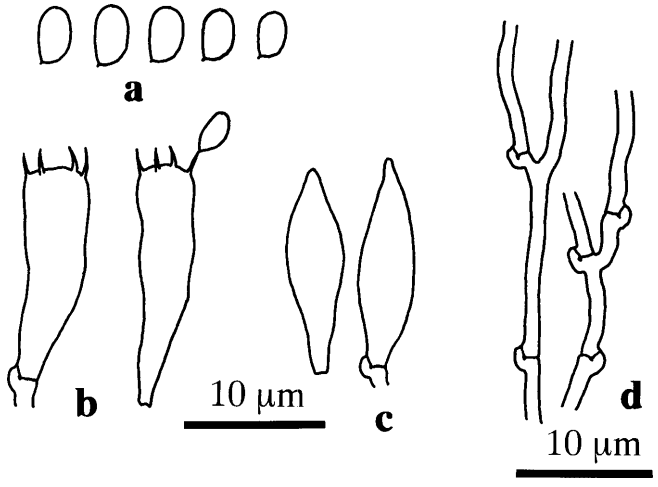

Fig. 2. *Ceriporiopsis aurantitingens* (TFM-F-15923). **a** Basidiospores. **b** Basidia. **c** Hymenial cystidioles. **d** Generative hyphae from trama

spored in the original description). Basidiospores short cylindrical, colorless, IKI–, 7.5–10 × 3–4.5 μm.

Remarks: This is a member of *Dichomitus* Reid with cylindrical basidiospores and arboriform skeletal hyphae. This species is characterized by short cylindrical basidiospores less than 10 μm long, lack of conspicuous hyphal pegs, and lack of dextrinoidity within the genus. *Dichomitus leucoplacus* (Berk.) Ryvarden is similar but has longer basidiospores (10–14 × 4–5.5 μm) and wider skeletal hyphae (up to 5 μm wide) (Masuka and Ryvarden 1999). *Dichomitus papuanus* Quanten is also similar, but lacks clamp connections (Quanten 1996).

Tyromyces albovinaceus Corner, Beih. Nova Hedwigia 96:159, 1989.

Holotype: Solomon Is., Kolonbangara, alt. 700 m, 5 Sept. 1965, leg. E.J.H. Corner (E).

Sporelike structures are abundantly seen, but they are varied in size and shape, and the hymenium is not developed. They may represent conidia of a contaminant. Here, I leave it as a *Tyromyces* sp.

Tyromyces amyloideus Corner, Beih. Nova Hedwigia 96:160, 1989.

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mekado Valley, alt. 3400 m, 25 Mar. 1965, leg. E.J.H. Corner (E).

I leave it as a form of *Oligoporus caesius* (Schrad.: Fr.) Gilb. & Ryvarden *sensu lato* because of the allantoid and weakly amyloid basidiospores, monomitic hyphal system, and olivaceous tubes. A condensed description of the holotype is as follows: basidiocarps sessile; pileus surface ochraceous, rough with fine mycelial tufts, partly strigose; context white, corky-horny; tubes olivaceous, pores 4–5/mm, deeply split, taste mild; and basidiospores allantoid, 3–4.2 × 0.8–1 μm, weakly amyloid.

Tyromyces aurantilaetus Corner, Beih. Nova Hedwigia 96:161, 1989.

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mesilau, alt. 1700 m, 8 Mar. 1964, leg. E.J.H. Corner (E).

Accepted as *Antrodiella aurantilaeta* (Corner) T. Hatt. & Ryvarden. For a description, see Hattori and Ryvarden (1993).

Tyromyces aurantitingens Corner, Nova Hedwigia 55:139, 1992. Fig. 2

Holotype: Malaysia, Pahang, 29 May 1941, leg. E.J.H. Corner (E).

Accepted as ***Ceriporiopsis aurantitingens*** (Corner) T. Hatt., comb. nov. (basionym indicated above). Because the holotype is badly contaminated and other authentic specimens were not traced, the microscopic description is made based on the following specimen: TFM-F-15923, Japan, Bonin Is., Hahajima I., 26 Nov. 1990, leg. T. Hattori (TFM).

Basidiocarps fully resupinate. Pore surface pale orange to grayish-orange (5A-B3-4), pores angular, (4–)6–8/mm, dissepiments entire. Context up to 0.2 mm thick, brownish-orange (6C4). Tubes concolorous with context, up to 4/mm.

Trama hyphae monomitic: generative hyphae colorless, IKI-, with clamp connections, 1.5–3.5 μm wide. Hymenial cystidioles fusoid, 13–18 × 4–5 μm. Basidia 4-sterigmate, 12–18 × 4.5–5 μm. Basidiospores ellipsoid, colorless, IKI–, 3.5–5 × 2–3 μm.

Remarks: This species is not rare in subtropical areas of Japan, and a white rot is always attached to it. I put this species in *Ceriporiopsis* Domański because of the resupinate basidiocarps, purely monomitic hyphal system, and presence of clamp connections. This species is characterized by reddened substrata among this genus. Similar discoloration is also seen in some other tropical Asian polypores. However, it is discriminated from *Tinctoporellus epimiltinus* (Berk. & Broome) Ryvarden by the monomitic hyphal system and pale-colored pores, from *Porogramme*

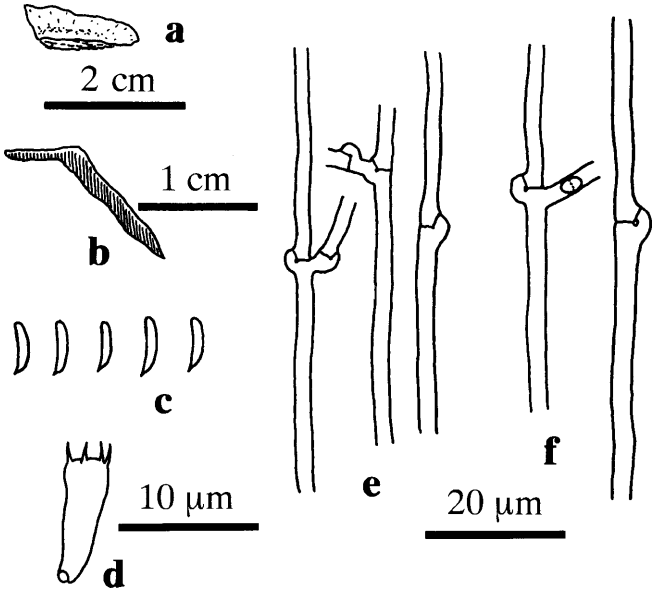

Fig. 3. *Oligoporus bambusicola* (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidium. **e** Generative hyphae from trama. **f** Generative hyphae from context

albocincta (Cooke and Massee) Lowe by pale-colored and larger pores, and from *Rigidoporus adnatus* Corner by presence of clamp connections (Ryvarden and Johansen 1980; Hattori 2001).

Tyromyces bambusicola Corner, Beih. Nova Hedwigia 96:161, 1989. Fig. 3

Holotype: Solomon Is., Guadalcanal, Popomanasiu, alt. 1800 m, 25 Oct. 1965, leg. E.J.H. Corner (E).

Accepted as ***Oligoporus bambusicola*** (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps effused-reflexed, pileus applanate, elongated. Pileus surface matted, subzonate, white. Pileus margin thin and entire. Pore surface whitish (5A2-3), partly darkened into brown (7D-E7-8), pores angular, 4–6/mm, dissepiments thin and entire. Context white, up to 0.5 mm thick, without a crust. Tubes brittle, whitish, agglutinated and brown near the context, up to 5 mm deep. Taste bitter.

Trama hyphae monomitic: generative hyphae colorless, IKI–, thin-walled, with clamp connections, 1.5–3 μm wide. Context hyphae monomitic: generative hyphae 2.5–4.5 μm wide, otherwise similar to trama hyphae. Hymenial cystidia not seen. Basidia 4-sterigmate, clavate, approximately 10 × 3.5 μm (only one seen). Basidiospores allantoid, colorless, thin-walled, IKI–, 3.5–4.5 × 0.8–1.2 μm.

Remarks: Type of rot is unknown, but I put it in *Oligoporus* Bref. because of its bitter taste and the purely monomitic hyphal system, which are more frequently seen in *Oligoporus* than in *Tyromyces*. Among the species in these two genera with thin pileate basidiocarps and allantoid basidiospores, this species is characterized by the narrow pileus, bitter taste, complete lack of blue, green, and yellow coloration, and narrow and thin-walled context hyphae. *Tyromyces gratus* (Berk.) Ryvarden described from Nepal is similar, but has more distinctly pileate basidiocarps and longer basidiospores (4.5–5 × 1–1.2 μm; Ryvarden 1977). *Oligoporus perdelicatus* (Murrill) Gilb. & Ryvarden known from North America has distinctly thick-walled generative hyphae and lacks the bitter taste (Gilbertson and Ryvarden 1987; Lowe 1975). *Tyromyces caesioflavus* (Pat.) Ryvarden from "Pallatanga, Equateur." is also similar, but has smaller pores (7–9/mm; Ryvarden 1983). Further studies are needed for species delimitations of this complex.

Tyromyces brunneimontanus Corner, Beih. Nova Hedwigia 96:162, 1989.

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mesilau, alt. 1700 m, 9 Apr. 1964, leg. E.J.H. Corner (E).

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

This is a prior name for *Antrodiella ussurii* Y.C. Dai & Niemelä with brownish and sulcate pileus, tiny pores (7–10/mm), dimitic hyphal system with clamp connections, and short-cylindrical and small basidiospores (2.5–3.2 × 1.3–1.8 μm). For a description, see Dai and Niemelä (1996; as *A. ussurii*).

Tyromyces carbonicola Corner, Nova Hedwigia 55:139, 1992.

Holotype: Malaysia, Johore, Mawai-Jemaluang Road, 5 May 1940, leg. E.J.H. Corner (E).

Basidiospores are not found from the holotype. This is probably a member of Corticiaceae *sensu lato* with an odontioid hymenophore instead of the poroid one in some basidiocarps.

Tyromyces cinnamomeiporus Corner, Beih. Nova Hedwigia 96:163, 1989.

The holotype was not traced in E.

Tyromyces citrinicarneus Corner, Nova Hedwigia 55:140, 1992.

Holotype: Malaysia, Johore, Sedili River, 13 May 1934, leg. E.J.H. Corner (E).

This is a form of *Rigidoporus dextrinoideus* I. Johans. & Ryvarden. Basidiospores are smaller (2.5–3 × 1.5–1.8 μm) than those given by Ryvarden and Johansen (1980), but otherwise similar with waxy and resupinate basidiocarps, dextrinoid hyphae without clamp connections, and cystidioles with granular excretion.

Tyromyces citriniporus Corner, Nova Hedwigia 55:141, 1992.

The holotype was not traced in E.

Tyromyces coeruleivirens Corner, Beih. Nova Hedwigia 96:163, 1989.

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mesilau, alt. 1800 m, 29 Apr. 1964, leg. E.J.H. Corner (E).

I leave it as a form of *Oligoporus caesius sensu lato* because of the greenish pileus, monomitic hyphal system, and allantoid basidiospores. A condensed description of the holotype is as follows: basidiocarps sessile; pileus surface

greenish-white, subvillose; context white, corky-chalky; tubes almost white, pores angular, 7–9/mm, dissepiments entire to partly split; taste mild; and basidiospores allantoid, 4–5 × 0.8–1 μm, IKI–.

Tyromyces corniculatus Corner, Beih. Nova Hedwigia 96:165, 1989.

Holotype: Solomon Is., Guadalcanal, Popomanasiu, alt. 1500 m, 21 Oct. 1965, leg. E.J.H. Corner (E).

Accepted as *T. corniculatus*.

Basidiocarps sessile, pileus convex to ungulate. Pileus surface strigose with branched fibrils, fibrils up to 5 mm long, azonate, grayish-orange (5B4-5; white when fresh according to the original description). Pileus margin obtuse and entire. Pores round to angular, 5–7/mm, dissepiments entire. Context fibrous-corky, pale orange (5A3-4), without a crust. Tubes subhorny, up to 2 mm deep.

Trama hyphae dimitic: generative hyphae colorless, with clamp connections, 1.5–3 μm wide, easily collapsed; skeletal hyphae colorless, IKI–, almost solid, 3–6 μm wide; crystals abundantly seen in the trama. Context hyphae similar to trama hyphae. Hymenial cystidia not seen. Basidia not seen. Allantoid sporelike structures are floating, but I am not sure if they really are basidiospores because the hymenium is not developed in the holotype.

Remarks: The type of rot is unknown, but I tentatively leave it in *Tyromyces*. It is very peculiar with the strigose pileus surface with branched fibrils. *Tyromyces sublacunosus* (Corner) T. Hatt. described from Solomon Is. also has similar fibrils on pileus, but is distinct by the monomitic hyphal system and abundant gloeoplerous hyphae in the trama (Hattori 2001). For line drawings, see Corner (1989).

Tyromyces corticola Corner, Beih. Nova Hedwigia 96:166, 1989. Fig. 4

Holotype: Malaysia, Sarawak, Semenggoh Forest, Jan. 1959, leg. E.J.H. Corner (E).

Accepted as *T. corticola*. Because of the encrusted hyphae, small basidia, and fusoid cystidioles, it might be considered as a *Skeletocutis* Kotl. & Pouzar, but I leave it in *Tyromyces* because of the monomitic hyphal system. Information from the holotype of *T. fagraeae* Corner, which is a synonym of *T. corticola*, is also incorporated.

Basidiocarps sessile to effused-reflexed, pileus thin and applanate to triquetrous, semicircular to elongated. Pileus surface subtomentose, multisulcate, white near the margin, grayish near the base. Pileus margin thin and acute, entire. Pore surface whitish, pores angular, partly irregular, 8–10/mm (10–11/mm in *T. fagraeae*), dissepiments thin and entire. Context fibrous, white, up to 1.5 mm thick, without a crust. Tubes fibrous, white, stratified in *T. fagraeae*, up to 1.5 mm deep in each layer.

Trama hyphae monomitic: generative hyphae colorless, IKI–, with clamp connections, 1.5–3 μm wide, some hyphae encrusted with crystals. Fusoid cystidioles abundant in the hymenium, 8–12 × 3–4.5 μm. Basidia 4-sterigmate, 7–12 × 3.5–4.5 μm. Basidiospores subglobose, colorless, IKI–, 2–2.8 × 1.8–2.5 μm.

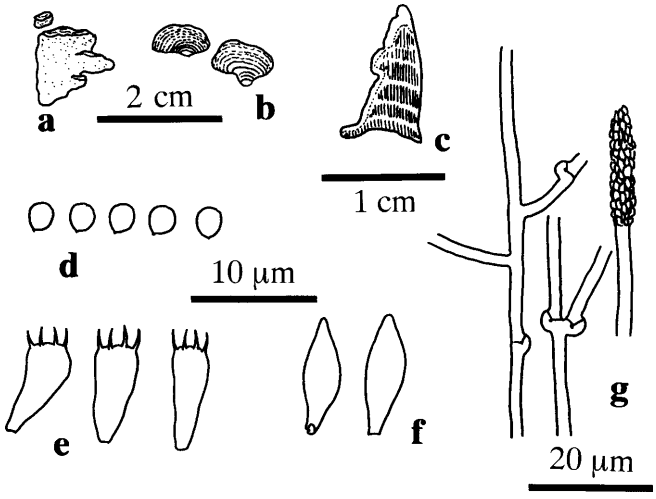

Fig. 4. *Tyromyces corticola* from basidiocarps (**a**,**d**,**e**,**f**,**g** holotype of *T. corticola*; **b**,**c** holotype of *T. fagraeae*). **a** Basidiocarps. **b** Upper view of basidiocarps (stratified form). **c** Vertical section view of basidiocarp (stratified form). **d** Basidiospores. **e** Basidia. **f** Hymenial cystidioles. **g** Generative hyphae from trama

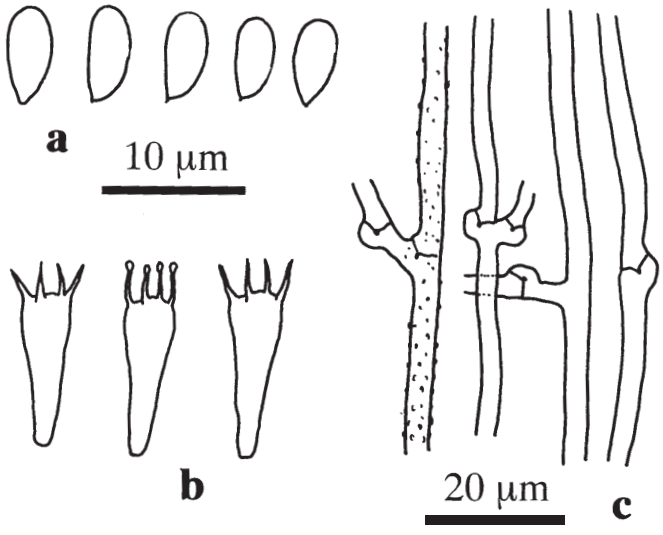

Fig. 5. *Ceriporiopsis cremeicarnea* (holotype). **a** Basidiospores. **b** Basidia. **c** Generative hyphae from trama

Remarks: This species is also seen in Pasoh, Malaysia. Macroscopically, it is characterized by the small and white basidiocarps restricted on barks of living trees.

Tyromyces cremeicarneus Corner, Nova Hedwigia 55:141, 1992. Fig. 5

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mahmud River, alt. 1300 m, 10 Aug. 1961, leg. E.J.H. Corner (E).

Accepted as ***Ceriporiopsis cremeicarnea*** (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps resupinate. Pore surface light orange (5A4-5; white then pale cream to dull pinkish in places when fresh according to the original description), pores angular, daedaleoid to irpicoid, 1–2/mm, dissepiments eroded. Sub-

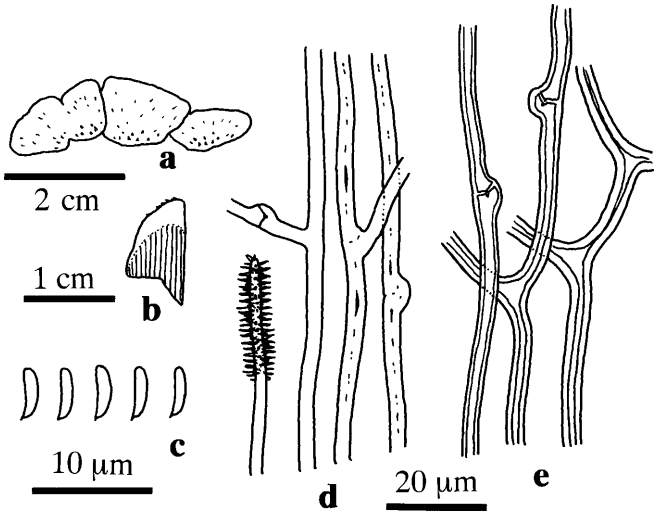

Fig. 6. *Oligoporus cretaceitextus* (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Generative hyphae from trama, some apically incrusted with needle-like crystals. **e** Generative hyphae from context

iculum membranous, whitish (3-4A1-2). Tubes waxy-pelliculose, up to 1.5 mm deep according to the original description. Margin cottony, whitish.

Trama hyphae monomitic: generative hyphae colorless, IKI–, with clamp connections, partly covered with fine crystals, 2–3.5 μm wide. Hymenial cystidia not seen. Basidia 4-sterigmate, 10–15 × 3–4 μm. Basidiospores ellipsoid, colorless, IKI–, 5.5–7.5 × 3–4 μm.

Remarks: I do not know its proper taxonomic position, but I placed it in *Ceriporiopsis* because of its resupinate basidiocarp and monomitic hyphal system with clamp connections, here. This species is similar to *Byssoporia terrestris* (DC.: Fr.) M.J. Larsen & Zak in its yellowish resupinate basidiocarps occasionally on fallen leaves. However, basidiospores are subglobose and generative hyphae from trama are simple septate in *B. terrestris* (Gilbertson and Ryvarden 1986).

Tyromyces cretaceitextus Corner, Beih. Nova Hedwigia 96:166, 1989. Fig. 6

Holotype: Malaysia, Borneo, Mt. Kinabalu, Kundasang, alt. 1500 m, 9 Sept. 1961, leg. E.J.H. Corner (E).

Accepted as ***Oligoporus cretaceitextus*** (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps sessile, pileus convex to ungulate, semicircular. Pileus surface rough with stiff mycelial tufts, mycelial tufts appressed near the margin, azonate, almost white. Pileus margin obtuse and entire. Pore surface almost white, pores angular to sinuous, (0.5–)1–2/mm, dissepiments entire. Context chalky-corky, white, up to 5 mm thick, without a crust. Tubes brittle, up to 10 mm deep. Taste bitter.

Trama hyphae monomitic: generative hyphae colorless, IKI–, with clamp connections, 2.5–4.5 μm wide, partly covered with needle-like crystals. Context hyphae monomitic: generative hyphae colorless, IKI–, thick-walled, 2.5–6 μm wide. Hymenial cystidia not seen. Basidia not seen. Basidiospores allantoid, colorless, IKI–, 4–5 × 1–1.3 μm.

Remarks: I placed this species in *Oligoporus* because a fragment of wood attached to the holotype is brown-rotted. This species is characterized by the large pores and chalky context. The only species with similarly large pores among known *Oligoporus* spp. are *O. amarus* (Hedgc.) Gilb. & Ryvarden and *O. undosus* (Peck) Gilb. & Ryvarden. The former has larger basidiocarps (up to 18 × 13 × 25 cm) with gloeoplerous hyphae, and the latter has thinner pileus, nonchalky context, and lacks bitter taste (Gilbertson and Ryvarden 1987).

Tyromyces dacrydii Corner, Beih. Nova Hedwigia 96:167, 1989.

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mesilau, alt. 1700 m, 11 Feb. 1964, leg. E.J.H. Corner (E).

The holotype may be conspecific with *Oxyporus lilaceus* Corner. Corner (1989) described that *T. dacrydii* has allantoid basidiospores and dimitic hyphal system without clamp connections. Allantoid basidiospores are unknown in *Oxyporus* Donk, and the dimitic hyphal system without clamp connections is unknown in *Tyromyces*. I hesitate to make the final conclusion because I find basidiospores from neither the holotype of *O. lilaceus* nor *T. dacrydii*.

Tyromyces descendens Corner, Beih. Nova Hedwigia 96:167, 1989.

Holotype: Malaysia, Johore, Gunong Panti, 28 Apr. 1941, leg. E.J.H. Corner (E).

I could not find the basidiospores seen in the original description. For the time being, I leave it as *Antrodiella* sp. because of the dimitic hyphal system in the trama (monomitic in the context) and tiny basidiospores given by the original description.

Tyromyces dianthicolor Corner, Beih. Nova Hedwigia 96:168,1989.

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mahmud River, alt. 1300 m, 10 Aug. 1961, leg. E.J.H. Corner (E).

For the time being, I leave it as *Trametes* cf. *rhodophaea* (Lév.) Corner with probably perennial basidiocarps with a distinct crust, trimitic hyphal system with clamp connections, nondextrinoid hyphae, and small ellipsoid basidiospores. If this is proved to be a brown-rotter, it should be placed in *Fomitopsis* P. Karst. A condensed description of the holotype is as follows: basidiocarps sessile; pileus surface light to dark brown, nonlaccate; context corky, white, with an agglutinated crust; pores pale orange, regular, 7–8/mm; basidiospores ellipsoid, 2.5–3.5 × 1.5–2 μm; and hyphal system trimitic, generative hyphae with clamp connections, skeletal hyphae colorless, IKI–.

Tyromyces diffluens Corner, Beih. Nova Hedwigia 96:169, 1989.

Holotype: Malaysia, Pahang, Tembeling, 18 Nov. 1930, leg. E.J.H. Corner (E). Fig. 7

Accepted as ***Antrodiella diffluens*** (Corner) T. Hatt., comb. nov. (basionym indicated above). Because the holo-

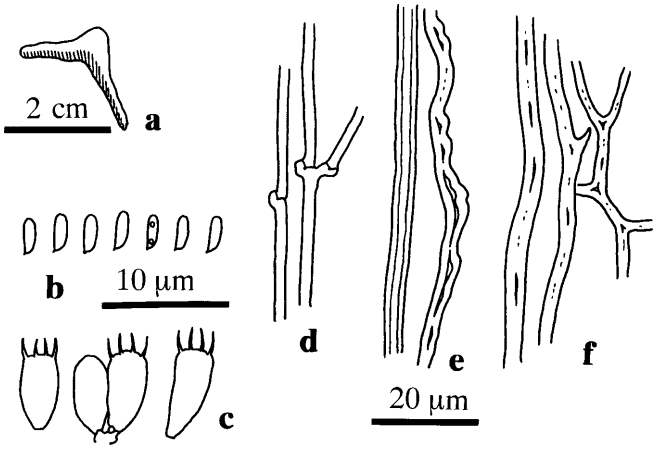

Fig. 7. *Antrodiella diffluens* (**a**,**d**,**e** holotype; **b**,**c**,**f** TFM-F-17731). **a** Vertical section view of basidiocarp. **b** Basidiospores. **c** Basidia. **d** Generative hyphae from trama. **e** Skeletal hyphae from trama. **f** Skeletal hyphae from context

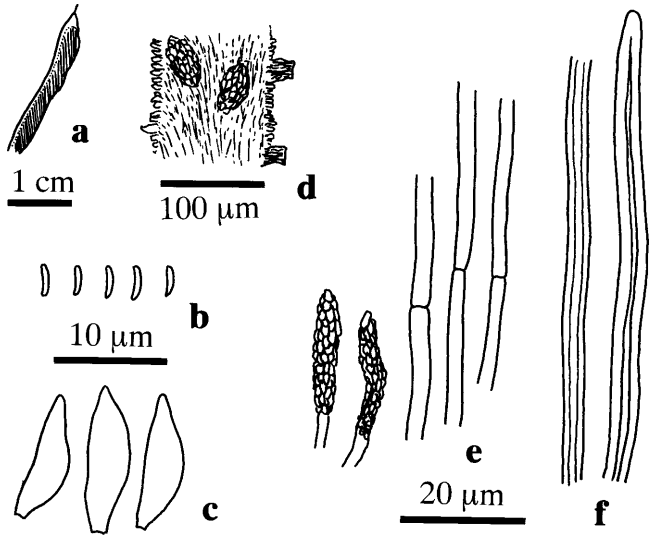

Fig. 8. *Skeletocutis falsipileata* (holotype). **a** Vertical section view of basidiocarp. **b** Basidiospores. **c** Hymenial cystidioles. **d** Hymenium and trama. **e** Generative hyphae from trama, some apically incrusted with crystals. **f** Skeletal hyphae from trama

type is sterile, microscopic characteristics were described based on the following specimen: TFM-F-17731, Malaysia, N. Sembilan, Pasoh, 2 Dec. 1996, leg. T. Hattori (TFM). Information from other specimens collected in Pasoh is also incorporated.

Basidiocarps sessile to effused-reflexed, pileus applanate, elongated. Pileus surface subtomentose, partly sulcate, cream white when fresh. Pileus margin entire. Pore surface whitish, pores round to angular, 4–6/mm, dissepiments entire. Context fibrous-chalky, white in fresh condition, light brown in the holotype, up to 3 mm thick, without a crust. Tubes fibrous-chalky, concolorous with the context, up to 2 mm deep.

Trama hyphae dimitic: generative hyphae colorless, with clamp connections, 1.5–3 μm wide; skeletal hyphae colorless, IKI–, unbranched to occasionally branched, fragile, 2–5.5 μm wide. Context hyphae as in trama hyphae. Hymenial cystidia not seen. Basidia 4-sterigmate, oblong-ellipsoid to clavate, 6–8 × 3–3.5 μm. Basidiospores short cylindrical, colorless, IKI–, 2.5–3.5 × 1–1.5 μm.

Remarks: I placed this species in *Antrodiella* because of the fibrous context that is often seen in this genus in addition to dimitic hyphal system and tiny basidiospores. *Antrodiella diffluens* is common on well-rotted trees in Pasoh. This species is characterized by the small sessile basidiocarps and white and fibrous context within the genus *Antrodiella* Ryvarden & I. Johans. *Antrodiella gypsea* (Yasuda) T. Hatt. & Ryvarden (holotype TNS!) also has similar characteristics as these, but has hymenial cystidia and tougher context (Hattori and Ryvarden 1994).

Tyromyces fagraeae Corner, Beih. Nova Hedwigia 96:170, 1989.

Holotype: Solomon Is., Guadalcanal, Nuhu, alt. 500 m, 16 Oct. 1965, leg. E.J.H. Corner (E).

It represents a stratified form of *T. corticola* with fibrous and whitish basidiocarps, monomitic hyphal system, hyphae encrusted with crystals, small and subglobose basidiospores, and habitat on bark of living trees.

Tyromyces falsipileatus Corner, Nova Hedwigia 55:142, 1992. Fig. 8

Holotype: Malaysia, Pahang, Tembeling, 7 Nov. 1930, leg. E.J.H. Corner (E).

Accepted as ***Skeletocutis falsipileata*** (Corner) T. Hatt., comb. nov. (basionym indicated above).

Basidiocarps almost resupinate. Pore surface brownish-orange (6C4-5; white when fresh according to the original description), pores angular, 10–12/mm. Context membranous when dried (cheesy-subligneous, pale wood color, up to 1 mm thick when fresh according to the original description). Tubes horny-corky and brownish-orange when dried (waxy and white when fresh), up to 4 mm deep.

Trama hyphae dimitic: generative hyphae fragile, colorless, without clamp connections, 2–3 μm wide; skeletal hyphae colorless, IKI–, 3–6 μm wide, some hyphae encrusted with crystals. Coarse granular crystals abundant in the trama. Cystidioles scattered in the hymenium, fusoid, 8–15 × 3–6 μm. Basidia not seen. Basidiospores (?) sparse, floating, allantoid, colorless, IKI–, 2.5–3.2 × 0.6–0.8 μm (2.5–3 × 1.3–1.5 μm according to the original description).

Remarks: I do not know its real taxonomic position, but I placed it in *Skeletocutis* here because of the dimitic hyphal system with encrusted hyphae, allantoid basidiospores, and scattered fusoid cystidioles that are seen in many species of *Skeletocutis*. This species is characterized by the almost resupinate basidiocarps with waxy tubes, dimitic hyphal system without clamp connections, encrusted hyphae, and small allantoid basidiospores.

Tyromyces favulus Corner, Beih. Nova Hedwigia 96:170, 1989.

Holotype: Malaysia, Pahang, Tembeling, 20 Nov. 1930, leg. E.J.H. Corner (E).

Sporelike structures (ellipsoid, measuring 3–3.8 × 2–2.5 μm) are present in the holotype, but they might be contaminants because similar structures are also present within the context and hymenium is not developed. Here, I leave this as *Trametes* cf. *pocas* (Berk.) Ryvarden because of the white basidiocarps with tomentose pileus, large pores, and trimitic hyphal system without dextrinoid reaction. A condensed description of the holotype is as follows: pileus semicircular, pileus surface sulcate with thicker tomentose zones; context white, duplex with upper tomentum and lower context, with a thin crust below the tomentum; and pores angular, 1–2/mm.

Tyromyces flavidicera Corner, Nova Hedwigia 55:143, 1992.

Holotype: Brunei, Ulu Belalong, 17 Feb. 1959, leg. E.J.H. Corner (E).

This is a small-spored form of *R. dextrinoideus*. See *T. citrinicarneus*.

Tyromyces flavitubus Corner, Nova Hedwigia 55:143, 1992. Fig. 9

Holotype: Solomon Is., Kolombangara, alt. 700 m, 6 Nov. 1965, leg. E.J.H. Corner (E).

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

Basidiocarps resupinate. Pore surface brown (6D-E5-6; bright yellow when fresh according to the original description), pores angular, dissepiments entire to partly eroded, 5–7/mm. Context pale orange (5A-B3), up to 0.5 mm thick. Tubes horny (waxy when fresh), dark brown (6F5-6), up to 2 mm deep.

Trama hyphae dimitic: generative hyphae colorless, with clamp connections, 2–3.5 μm wide; skeletal hyphae colorless, IKI–, mostly agglutinated, swollen at the tip, 2.5–5 (–8) μm wide, mycelial strands with dark resinous hyphae present in the trama. Context hyphae subdimitic: generative hyphae 2.5–5 μm wide; skeletal hyphae 3–5 μm wide. Hymenial cystidia not seen. Basidia not seen. Basidiospores ellipsoid, colorless, IKI–, 2.5–3 × 1.5–2 μm.

Remarks: I placed it in *Antrodiella* because of the waxy tubes that become horny after being dried, dimitic hyphal system with clamp connections, and tiny basidiospores. This description is almost identical with that of *Antrodiella straminea* (Bres.) Ryvarden & I. Johans. by Ryvarden and Johansen (1980), but the holotype of *Poria straminea* Bres. (BPI, US0242655!) represents a *Perenniporia* sp. as suggested by David and Rajchenberg (1985), Ryvarden (1988), and Decock (2001). David and Rajchenberg (1985) concluded that one specimen determined as *A. straminea* by Ryvarden stored in O is *Flaviporus subundatus* (Murrill) Ginns, but I prefer to keep *A. flavitubus* with a yellow pore surface distinct from *F. subundatus* with a pink pore surface. The specimens listed as *A. straminea* by Suhirman and Núñez (1998) may also represent this species. This species is characterized by the resupinate basidiocarps and bright yellow pores and may have nigrescence when touched or dried. *Antrodiella citrinella* Niemelä & Ryvarden also has resupinate basidiocarps and yellow pores, but has larger pores (3–4/mm), larger basidiospores (3–3.5 × 2.0–2.5 μm), and its occurrence is restricted to boreal conifer forests (Ryvarden and Gilbertson 1993).

Tyromyces hispidulinanus Corner, Beih. Nova Hedwigia 96:171, 1989. Fig. 10

Holotype: Malaysia, Pahang, Tembeling, 15 Nov. 1930, leg. E.J.H. Corner (E).

Accepted as *T. hispidulinanus*.

Basidiocarps sessile, pileus applanate, semicircular. Pileus surface strigose to spiculose, rough with mycelial tufts or appressed hair, azonate, faintly sulcate, light brown (6D7-8; white according to the original description). Pileus margin thin and acute, entire. Pore surface light brown, pores angular to sinuose (1–)2–3/mm. Context duplex with

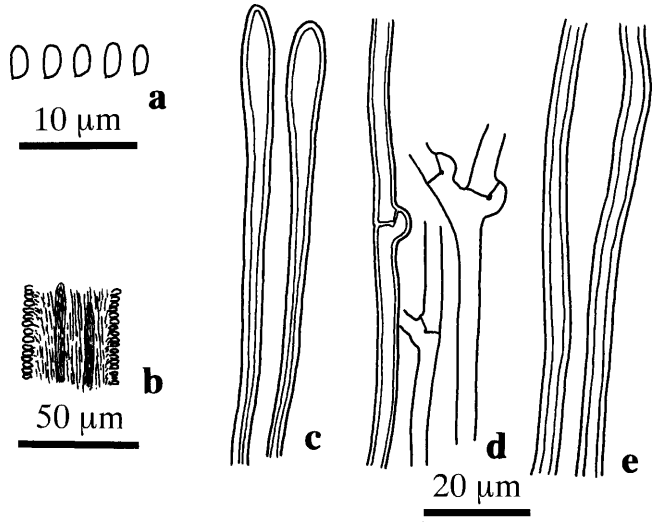

Fig. 9. *Antrodiella flavitubus* (holotype). **a** Basidiospores. **b** Hymenium and trama. **c** Hyphal tips of skeletal hyphae from trama. **d** Generative hyphae from context. **e** Skeletal hyphae from context

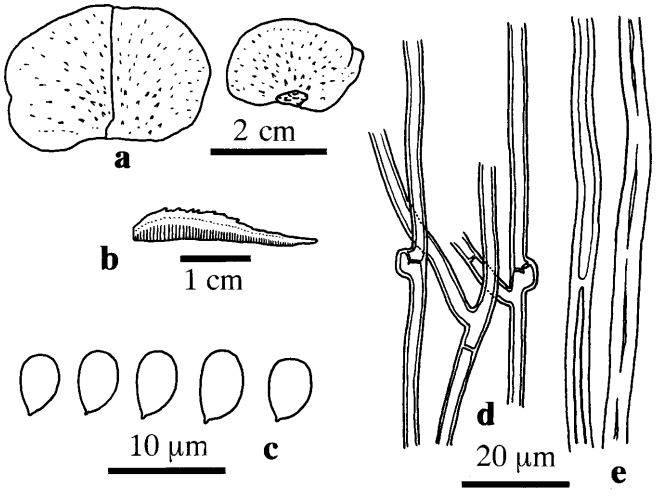

Fig. 10. *Tyromyces hispidulinanus* (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Generative hyphae from context. **e** Skeletal hyphae from context

lower corky layer (up to 1.5 mm thick) and upper fibrous layer (up to 2 mm thick), originally white, without a crust. Tubes brittle or not, up to 2.5 mm deep (up to 4 mm long, in 1–2 layers according to the original description).

Trama hyphae subdimitic: generative hyphae colorless, without clamp connections (?), 2–3 μm wide; skeletal hyphae colorless, IKI–, 2–5 μm wide. Context hyphae subdimitic: generative hyphae with or without clamp connections, 1.5–3 μm wide; skeletal hyphae colorless to pale yellow, IKI–, 2–5 μm wide, not well-differentiated from generative hyphae. Hymenial cystidia not seen. Basidia not seen. Basidiospores broadly ellipsoid, colorless, IKI–, 5–6.5 × 3–4.5 μm.

Remarks: I hesitate to put it in *Spongipellis* in spite of its duplex context and broadly ellipsoid basidiospores, because the spore wall is not thickened as in *Spongipellis* spp. I failed to check the cyanophily of basidiospores, which is another important character for this genus. I do not know its proper taxonomic position, but prefer to retain it in *Tyromyces*, here.

This species is characterized by rough pileus surface, sinuous and large pores, duplex context, and broadly ellipsoid basidiospores.

Tyromyces inconsideratus Corner, Nova Hedwigia 55:145, 1992.

Holotype: Malaysia, Johore, Mawai-Jemaluang Road, 30 Mar. 1941, leg. E.J.H. Corner (E).

This is a young and contaminated specimen of *Tinctoporellus epimiltinus* (Berk. & Broome) Ryvarden with grayish pores, reddened substrata, and dimitic hyphal system.

Tyromyces inodermatus Corner, Beih. Nova Hedwigia 96:172, 1989. Fig. 11

Holotype: Malaysia, Borneo, Mt. Kinabalu, Mesilau, alt. 1700 m, 17 Mar. 1964, leg. E.J.H. Corner (E).

Accepted as *T. inodermatus*.

Basidiocarps sessile, pileus applanate, flabelliform. Pileus surface velvety, partly sulcate, pale orange (4-5A2-3; originally white). Pileus margin thin, acute, and entire. Pore surface grayish-orange (5A-B4), pores angular, 6–8/mm. Context fibrous-floccose, whitish, up to 3 mm thick, without a crust. Tubes brittle, up to 3 mm deep.

Trama hyphae trimitic: generative hyphae colorless, IKI–, with clamp connections, occasionally branched, 1.5–3.5 μm wide. Context hyphae as in trama hyphae. Hymenial cystidia not seen. Basidia 4-sterigmate, clavate, 10–16 × 3.5–4.5 μm. Basidiospores ellipsoid, colorless, thin-walled, IKI–, 2.8–3.5 × 1.5–2 μm.

Remarks: This species is characterized by distinct pileus, small pores (more than 5/mm), and small ellipsoid (up to 5 μm long) basidiospores among *Tyromyces* spp. These features are similar to those of *Tyromyces fumidiceps* G.F. Atk., *T. galactinus* (Berk.) Lowe, *T. pseudolacteus* Murrill, and *T. catervatus* (Berk.) G.H. Cunn. However, *T. fumidiceps* has context hyphae with numerous side branches, *T. galactinus* (Berk.) Lowe and *T. pseudolacteus* Murrill have tomentose or strigose pileus and sappy and thicker context (Gilbertson and Ryvarden 1987), and *T. catervatus* (Berk.) G.H. Cunn. (holotype, K!) has small pendent basidiocarps and subglobose basidiospores.

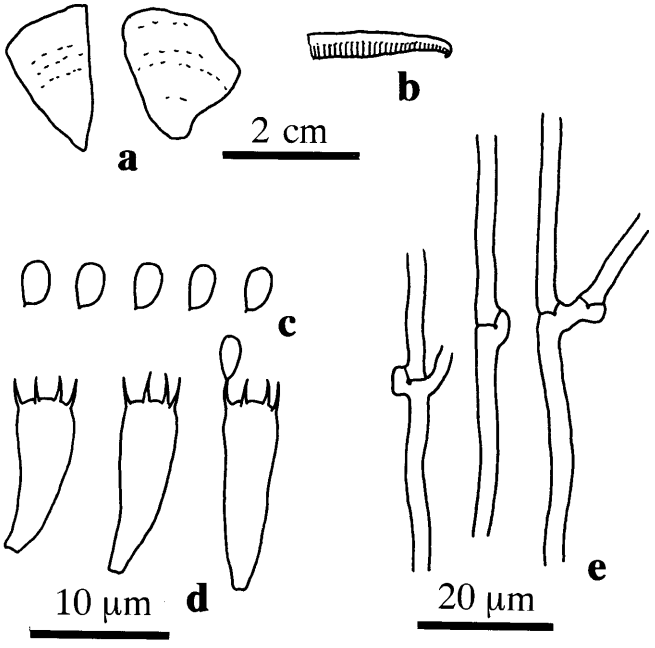

Fig. 11. *Tyromyces inodermatus* (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia. **e** Generative hyphae from context

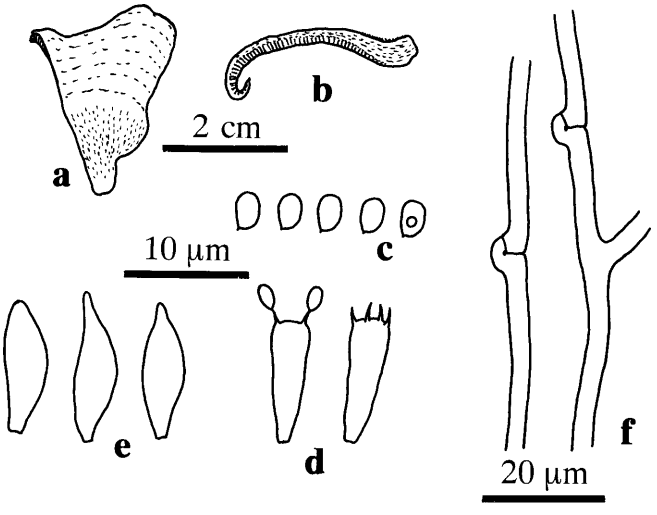

Fig. 12. *Tyromyces interponens* (holotype). **a** Upper view of basidiocarp. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Basidia. **e** Hymenial cystidioles. **f** Generative hyphae from context

Tyromyces interponens Corner, Beih. Nova Hedwigia 96:173, 1989. Fig. 12

Holotype: Solomon Is., Kolombangara, 24 Aug. 1965, leg. E.J.H. Corner (E).

Accepted as *T. interponens*.

Basidiocarps sessile, pileus applanate, flabelliform. Pileus surface villose near the base, almost glabrous near

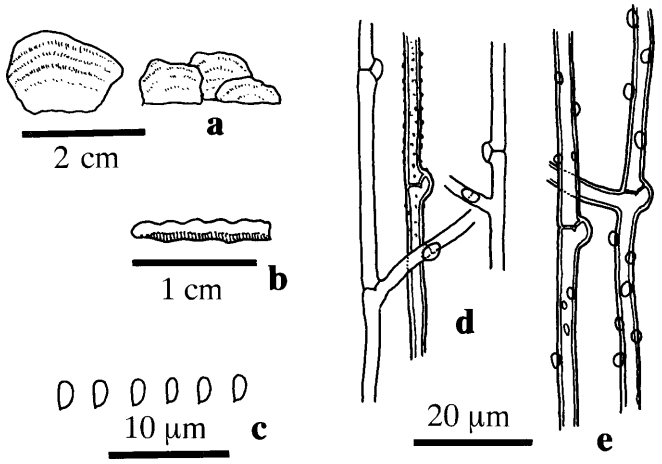

Fig. 13. *Tyromyces languidus* (holotype). **a** Upper view of basidiocarps. **b** Vertical section view of basidiocarp. **c** Basidiospores. **d** Generative hyphae from trama. **e** Generative hyphae from context

the margin, brownish-yellow (5B-C7; pallid ochraceous buff when fresh), zonate with reddish (7-8D-E7-8) and grayish (5E-F4-5) zones. Pileus margin thin and acute, incurled when dried. Pore surface brownish (6-7D7-8), pores angular to sinuous, 9–11/mm, dissepiments thin, entire. Context horny-corky (fibrous fissile and watery zoned when fresh), up to 4 mm thick (up to 9 mm when fresh), without a crust. Tubes horny, agglutinated, up to 1 mm deep.

Trama hyphae monomitic: generative hyphae colorless, IKI–, with clamp connections, rarely branched, 1.5–3 μm wide. Context hyphae monomitic: generative hyphae 2.5–4.5 μm wide. Hymenial cystidioles abundant, fusoid, 10–15 × 4–5.5 μm. Basidia (2-)4-sterigmate, clavate, 8–12 × 4–5 μm. Basidiospores ellipsoid, colorless, IKI–, 2.5–3.2 × 1.5–2 μm.

Remarks: Among the *Tyromyces* spp. with small ellipsoid basidiospores, this species is characterized by the ochraceous and watery basidiocarps that dry rigid, and the small pores.

Tyromyces languidus Corner, Beih. Nova Hedwigia 96:174, 1989. Fig. 13

Holotype: Malaysia, Sarawak, Kuching, 26 Sept. 1961, leg. E.J.H. Corner (E).

Accepted as *T. languidus*.

Basidiocarps sessile to effused-reflexed, pileus applanate, semicircular to elongated, imbricated. Pileus surface subtomentose, sulcate with thick tomentose zones, white. Pileus margin obtuse. Pore surface whitish, pores angular to sinuous, 10–14/mm, dissepiments thin and entire. Context fibrous-spongy, up to 1 mm thick, without a crust. Tubes fibrous, up to 0.5 mm deep.

Trama hyphae monomitic: generative hyphae colorless, IKI–, with clamp connections, occasionally branched, 2–5 μm wide. Context hyphae monomitic: generative hyphae colorless, IKI–, thin- to thick-walled (up to 1 μm thick), partly covered with resinous granules, 2.5–6 μm wide. Hymenial cystidia not seen. Basidia not seen. Basidiospores ellipsoid, colorless, IKI–, 1.8–2.5 × 1.2–1.6 μm.

Remarks: This species is common on well-rotted trees in Pasoh. It is characterized by the small and spongy basidiocarps, small ellipsoid basidiospores, and context hyphae covered with granules.

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. I also thank the curators of the following herbaria for loan of the specimens: BPI, K, TNS.

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