

# Type studies of the polypores described by E. J. H. Corner from Asia and the West Pacific I.

## Species described in *Polyporus*, *Buglossoporus*, *Meripilus*, *Daedalea*, and *Flabellophora*

Tsutomu Hattori

Forestry and Forest Products Research Institute, Tsukuba, Ibaraki 305–8687, Japan

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Identifications of 28 polypore species described by Corner were made by type examinations. The following new combinations are proposed: *Antrodiella aurantiaca*; *A. heritierae*; *Grifola kinabaluensis*; *Perenniporia marmorata*; *Piptoporus malesianus*. The following species are accepted in the original genera: *Polyporus aurantibrunneus*; *P. pervadens*; *Meripilus applanatus*; *Flabellophora intertexta*; *F. velutinoso*. The following species are synonyms: *Buglossoporus matangensis*; *B. rufescens*; *Meripilus villosulus*; *Flabellophora inconspicua*; *F. nana*; *F. squamosa*. The following species belong to difficult species complexes, and allied species are cited: *Polyporus trametoides*; *Flabellophora latiporus*. The following species are dubious because of their poor or sterile conditions: *Buglossoporus flavus*; *Flabellophora brevipes*; *F. deceptiva*; *F. flaviporus*; *F. obtorta*; *F. subsimplex*. No authentic specimens were traced for the following 4 species: *Buglossoporus brunneiflavus*; *B. magnus*; *Meripilus maculatus*; *Daedalea langkawiensis*. Descriptions and line drawings are given for some of the accepted species. The taxonomic positions of *Polyporus obovatus* and its allied species, and the genus *Flabellophora* are discussed.

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

E. J. H. Corner was one of the most active mycologists in the 20th century. He stayed in Singapore from 1929 to 1945, and collected a large number of macrofungi, mainly in lowland areas of Peninsular Malaysia (Corner, 1993). After the Second World War, he also made expeditions to Mt. Kinabalu in Borneo, Papua New Guinea, Solomon Islands, South America, etc., becoming probably one of the most experienced tropical mycologists, especially in Southeast Asia.

His interests embraced various groups of macrofungi like cantharelloid fungi, clavarioid fungi, *Thelephora* Ehrh. ex Willd, Boletaceae, *Amanita* Pers., *Trogia* Fr. and other agaric fungi, but he also worked intensively on description of polypores during the last decade of his research life. In total, he described 303 new polypores (including 20 species from South America) and 118 new varieties, mainly from Southeast Asia and the West Pacific (Corner, 1983; 1984; 1987; 1989a; 1989b; 1991; 1992).

His descriptions are usually very detailed, but his concepts of many species are not easy to grasp because he did not provide drawings of most of his new species, and his generic concepts are often ambiguous and quite different from those of other modern mycologists, such as Ryvarden (1991). Here, I examined the type materials described by Corner (1984) and those described in *Flabellophora* G. Cunn. by Corner (1987). Their identities are shown and descriptions and line drawings are given mainly for the accepted species.

### Materials and Methods

In an effort to clear up Corner's polypores, which are today housed in the Herbarium of the Royal Botanic Garden Edinburgh (E), the type specimens of his species in *Polyporus* Fr., *Buglossoporus* Kotl. & Pouzar, *Meripilus* P. Karst., *Daedalea* Pers., and *Flabellophora* were examined macro- and microscopically. For the accepted species, descriptions and line drawings based on the holotypes are given. 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. Herbaria where specimens are deposited are abbreviated according to Holmgren et al. (1990).

### Identities and descriptions

*Polyporus aurantibrunneus* Corner, Beih. Nova Hedwig. 78: 54 (1984). Fig. 1

Holotype: SINGAPORE, Botanic Garden, 20 Mar. 1943, leg. E. J. H. Corner (E).

Accepted as *P. aurantibrunneus*.

Basidiocarps laterally stipitate, pileus applanate, flabelliform. Pileus surface pubescent in zones, radially striate to wrinkled, zonate with reddish brown (8 D–E 6–7) zones and dark brown (8 E–F 7–8) zones. Pileus mar-

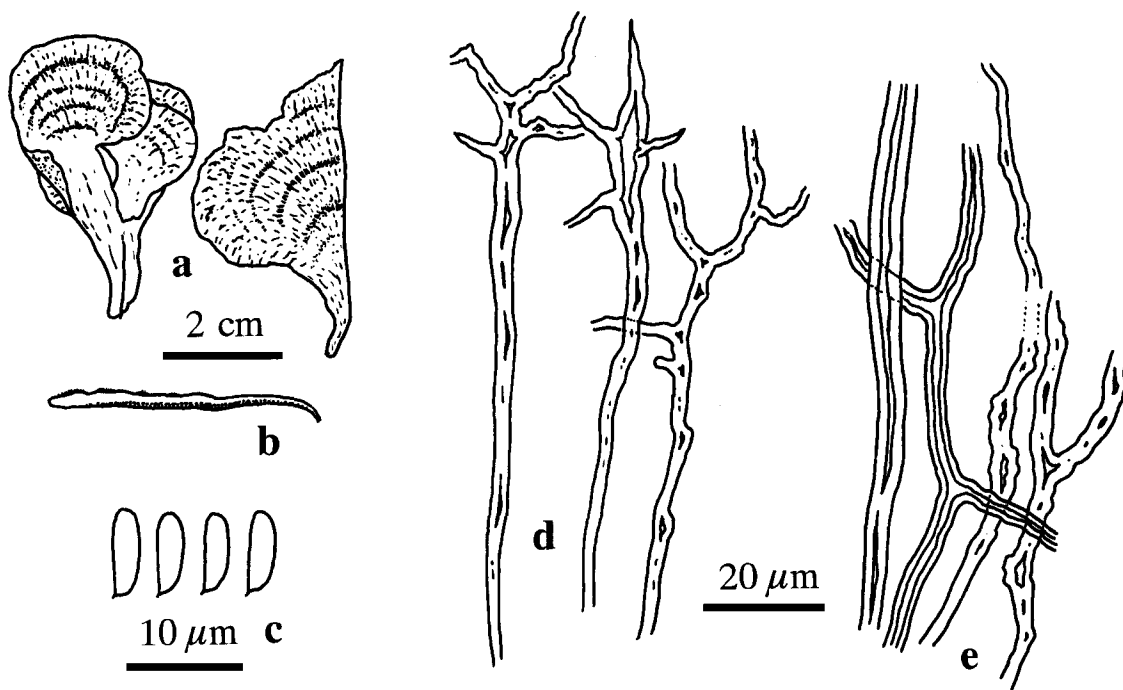


Fig. 1. Structures of *Polyporus aurantibrunneus* from basidiocarps (from holotype).

a. Basidiocarps. b. Vertical section view of basidiocarp. c. Basidiospores. d. Binding hyphae from trama. e. Binding hyphae from context.

gin thin and acute, incurved. Pore surface orange white (5 A 2–3), pores angular to slightly elongated radially, 5–6/mm. Stem reddish brown to dark brown, more densely velutinous than pileus. Context leathery, orange white (5 A 2–3), with a thin crust.

Trama hyphae dimitic: generative hyphae not seen, binding hyphae hyaline, branched with a long stalk, thick walled to solid, IKI-, up to 5(–7)  $\mu\text{m}$  wide. Context hyphae dimitic: binding hyphae thick-walled to solid, closely interwoven, IKI-, up to 7  $\mu\text{m}$  wide. Basidiospores cylindrical, hyaline, thin-walled, IKI-, 5–7  $\times$  2.5–3.5  $\mu\text{m}$ .

Remarks: This species is a member of the group *Melanopus* (Núñez & Ryvardeen, 1995) with a distinctly dark stipe and may pass as only a form of *P. dictyopus* Mont. *Polyporus aurantibrunneus* has a villose and multizonate pileus and a reddish brown and villose stipe, while the holotype of *P. dictyopus* (PC!) has an almost glabrous and azonate pileus and a black and less villose short stipe. At first sight, *P. aurantibrunneus* species is very similar to *Microporus affinis* (Blume et Nees : Fr.) Kuntze.

***Polyporus pervadens*** Corner Beih. Nova Hedwig. 78: 91 (1984). Fig. 2

Holotype: MALAYSIA, Penang, 14 Mar. 1972.

Accepted as *P. pervadens*.

Basidiocarps pendent, pileus convex to triquetrous. Pileus surface papery velutinous, dark brown (7 E–F 7–8) near the attached base, paler (5 B 3–4) near the margin. Pore surface light orange (5 A 3–4), pores angular, 0.5–1/mm. Context fibrous spongy, light

orange (5 A 3–4), with a thin agglutinated crust near the base.

Trama hyphae dimitic: generative hyphae thin-walled, with clamp connections, 2–3.5  $\mu\text{m}$  wide; binding hyphae hyaline, IKI-, up to 5  $\mu\text{m}$  wide. Context hyphae similar to the trama hyphae: generative hyphae 2–5  $\mu\text{m}$  wide; binding hyphae up to 4.5  $\mu\text{m}$  wide. Basidiospores not seen.

Remarks: This species is characterized by almost sessile and pendent basidiocarps, thin and leathery context, large pores up to 2.5 mm wide, and black rhizomorph as seen in *Armillaria* spp. These characters suggest a *Pseudofavolus* sp., but *Polyporus pervadens* is separated from *Pseudofavolus* Pat. because of the long tubes and small basidiospores given in the original description (Corner, 1984).

***Polyporus trametoides*** Corner, Beih. Nova Hedwig. 78: 92 (1984).

Holotype, not traced in E. The following specimen, the only traced specimen cited in the original description, was selected as lectotype: MALAYSIA, Johore, Mawai-Jemaluang Road, 1 Sep. 1940, leg. E. J. H. Corner (E). This is a member of *P. dictyopus* Mont. complex

Remarks: This is a common species in the lowland rainforest of Pasoh, Malaysia. Corner (1984) emphasized the occurrence of watery spots and dark colored tubes, but the watery spots are not always seen in Pasoh specimens, and the tubes of the lectotype are not smoky colored. On the other hand, tubes and pore surface are also often darker than the context in typical *P. dictyopus*.

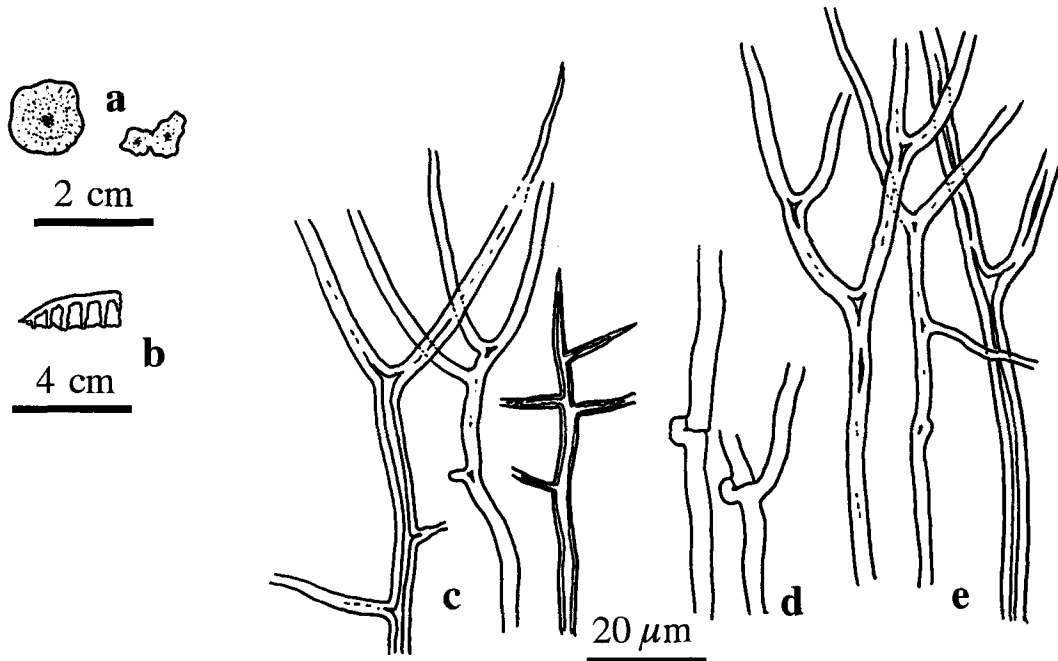


Fig. 2. Structures of *Polyporus pervadens* from basidiocarps (from holotype).

a. Basidiocarps. b. Vertical section view of basidiocarp. c. Binding hyphae from trama. d. Generative hyphae from context. e. Binding hyphae from context.

Based on the lectotype and fresh specimens from Pasoh, the species is characterized as follows: pileus at first pale grayish brown to pale ochraceous, later becoming brown, often zonate and sulcate, often with watery spots, glabrous. Stipe always short and lateral, con-

colorous with pileus surface and later becoming dark brown to almost black. Pore surface pallid to umber, angular, 3–5/mm. Context corky, up to 8 mm thick, without a distinct crust. Generative hyphae with clamp connections; binding hyphae from context narrow, up to

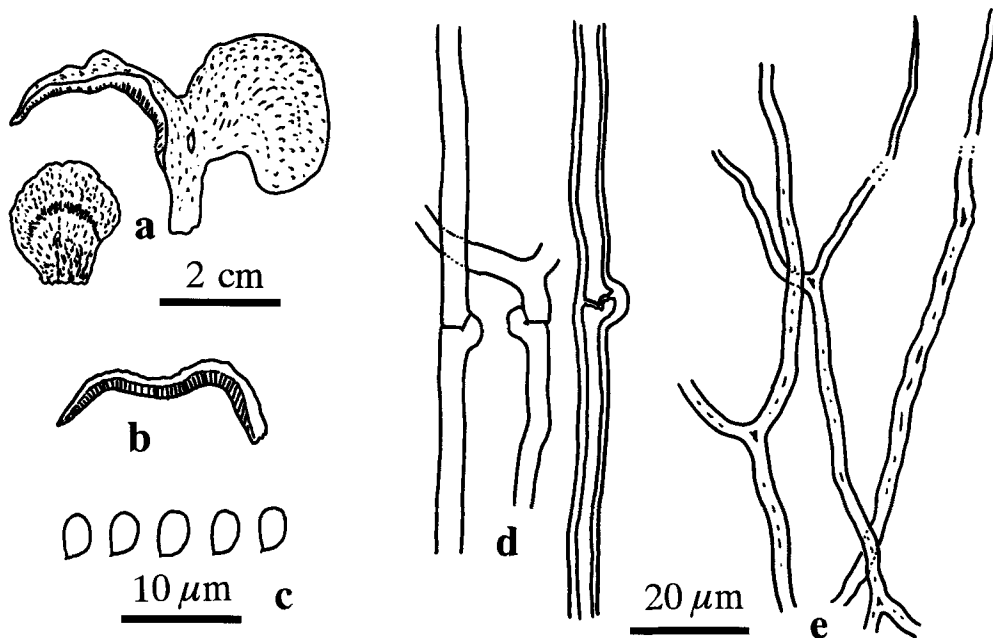


Fig. 3. Structures of *Antrodiella heritierae* from basidiocarps (from holotype).

a. Basidiocarps. b. Vertical section view of basidiocarp. c. Basidiospores. d. Generative hyphae from context. e. Skeletal hyphae from context.

3.5  $\mu\text{m}$  wide.

The species concept of *P. dictyopus* given by Núñez and Ryvarden (1995) is quite wide, and an earlier name for *P. trametoides* may be buried among their list of synonyms.

***Buglossoporus brunneiflavus*** Corner, Beih. Nova Hedwig. 78: 154 (1984).

No specimen traced in E.

***Buglossoporus flavus*** Corner, Beih. Nova Hedwig. 78: 156 (1984).

Holotype: SINGAPORE, Reservoir Jungle, 14 Oct. 1939, leg. E. J. H. Corner (E).

This is probably a *Tyromyces* sp., but is badly moldy and impossible to identify. Fragile chalky context and dimidiate to flabelliform basidiocarps may characterize it.

***Buglossoporus heritierae*** Corner, Beih. Nova Hedwig. 78: 160 (1984). Fig. 3

Holotype: SINGAPORE, Reservoir Jungle, Aug. 1940, leg. E. J. H. Corner (E).

Accepted as *Antrodiella heritierae* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps substipitate to sessile, applanate. Pileus surface velutinous, zonate with almost black zones and brown (6 D–E 8) zones, rough with radial ridges. Pileus margin thin and acute, eroded. Pore surface yellowish white (4–5 A 2–3), pores angular, partly elongated radially, 3–6/mm. Context corky-horny, grayish orange

(5 B 3–4), with a thin crust. Tubes up to 4 mm deep, yellowish white (4–5 A 2–3), fragile.

Trama hyphae dimitic: generative hyphae thin-walled, with clamp connections, 1.5–2.5  $\mu\text{m}$  wide; skeletal hyphae hyaline, slightly thick-walled, IKI-, up to 3  $\mu\text{m}$  wide. Context hyphae dimitic: generative hyphae thin- to thick-walled, with clamp connections; skeletal hyphae occasionally branched, almost solid, IKI-, 2.5–6  $\mu\text{m}$  wide. Basidiospores ellipsoid, hyaline, thin- to slightly thick-walled, IKI-, 3.2–4.5  $\times$  2.2–2.8  $\mu\text{m}$ .

Remarks: Corner (1984) overlooked the occurrence of skeletal hyphae in the trama, and put this species in *Buglossoporus* with monomitic trama hyphae. The slightly thick-walled and ellipsoid basidiospores are similar to those of some *Perenniporia* spp., but they lack dextrinoid reaction. For the time being, *Antrodiella* Ryvarden & I. Johans. is the best genus for this species because of its horny context, dimitic hyphal system and small basidiospores. Among species of the genus *Antrodiella*, it is characterized by substipitate basidiocarps, a distinct crust, and ellipsoid basidiospores.

***Buglossoporus magnus*** Corner, Beih. Nova Hedwig. 78: 163 (1984).

No specimen traced in E.

***Buglossoporus malesianus*** Corner, Beih. Nova Hedwig. 78: 165 (1984). Fig. 4

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, Mesilau, alt. 1500 m, 11 Mar. 1964, leg. E. J. H. Corner

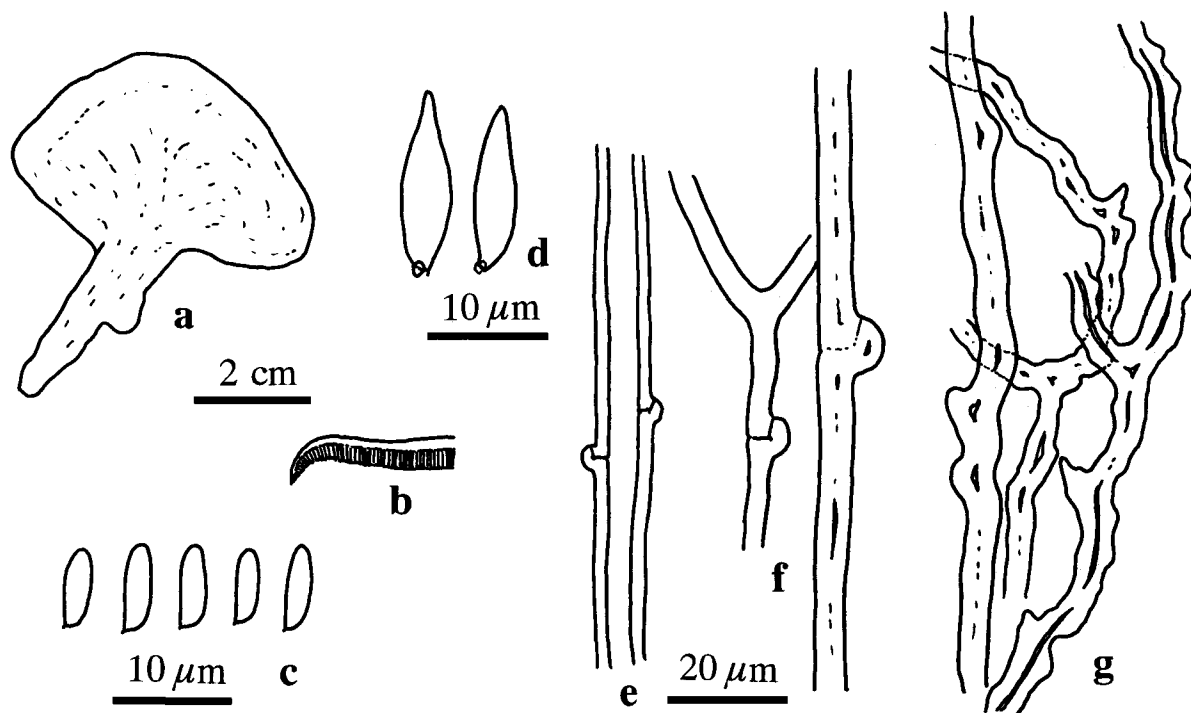


Fig. 4. Structures of *Piptoporus malesianus* from basidiocarps (from holotype).

a. Basidiocarp. b. Vertical section view of basidiocarp. c. Basidiospores. d. Cystidioles. e. Generative hyphae from trama. f. Generative hyphae from context. g. Skeletal hyphae from context.

(E).

Accepted as *Piptoporus malesianus* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps substipitate, flabelliform, applanate. Pileus surface velutinous, azonate, dark brown (7–8 E–F 7–8). Pileus margin subacute, incurved. Pore surface light brown (6 C–D 5–6), pores angular, 3–4/mm, dissepiments thin and eroded. Context corky, light orange (5 A 5–6) to yellowish brown (6 D 5–6), without a crust. Tubes up to 5 mm deep, subgelatinous to resinous, almost black.

Trama hyphae monomitic: generative hyphae thin-walled, parallel, gelatinized, with clamp connections, 1.5–3  $\mu\text{m}$  wide. Context hyphae dimitic: generative hyphae thin- to thick-walled or almost solid, with clamp connections, 3–10  $\mu\text{m}$  wide; skeletal hyphae occasionally branched, almost solid, IKI-, 3–10  $\mu\text{m}$  wide. Cystidioles fusoid, scattered. Basidiospores cylindrical, fusiform, tapering to the apex, hyaline, thin-walled, IKI-, 5.5–7.0  $\times$  2.5–3.2  $\mu\text{m}$  (6.5–9  $\times$  2.7–4  $\mu\text{m}$  in the original description).

Remarks: This fungus is allied to *Piptoporus quercinus* (Schrad.) Pilát, a rare north temperate species restricted to deciduous *Quercus* spp., and characterized by the smaller pores and rufescence. *Piptoporus malesianus* may only be a form of *P. quercinus*, but for the time being I keep it separate because of their geographic isolation. *Buglossoporus* was established by Kotlaba and Pouzar (1966), typified by *Polyporus quercinus* Schrad. However, many modern mycologists take it as a synonym of *Piptoporus* P. Karst. because it differs from *Piptoporus* only in its monomitic trama, which is not enough to establish a new genus (Ryvarden, 1991).

*Buglossoporus marmoratus* Corner, Beih. Nova Hedwig. 78: 168 (1984). Fig. 5

Holotype: SINGAPORE, Reservoir Jungle, 3 Nov. 1929, leg. E. J. H. Corner (E).

Accepted as *Perenniporia marmorata* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps sessile, imbricate in the holotype, applanate in other specimens. Pileus surface almost glabrous, rough with irregular warts, brownish orange (5–6 C 4–5). Pore surface yellowish white (4 A 2), pores round, 4–5/mm, dissepiments thick and entire. Context stony rigid, light brown (5–6 D–E 4–5), with blackish spots.

Trama hyphae di-trimitic: generative hyphae thin-walled, with clamp connections, 2–3.5  $\mu\text{m}$  wide; skeletal-binding hyphae hyaline, slightly thick-walled, frequently branched, IKI- to dextrinoid in mass, up to 4  $\mu\text{m}$  wide. Context hyphae agglutinated. Basidiospores short ellipsoid, hyaline, slightly thick-walled, dextrinoid, 8.5–10  $\times$  6–8  $\mu\text{m}$ .

Remarks: This species is characterized by a watery patched and cheesy context when fresh, and large dextrinoid basidiospores. *Perenniporia minutissima* (Yasuda) Hattori et Ryvarden also has a similar context and large basidiospores (Hattori and Ryvarden, 1994) but differs in the truncate apex of the basidiospores. *Perenniporia marmorata* may be also allied with *Microporellus* Murrill because of its short ellipsoid and dextrinoid basidiospores, but I put this in *Perenniporia* Murrill because of its sessile basidiocarps, frequently branched skeletal-binding hyphae and affinity to *P. minutissima*.

*Buglossoporus matangensis* Corner, Beih. Nova Hedwig. 78: 172 (1984).

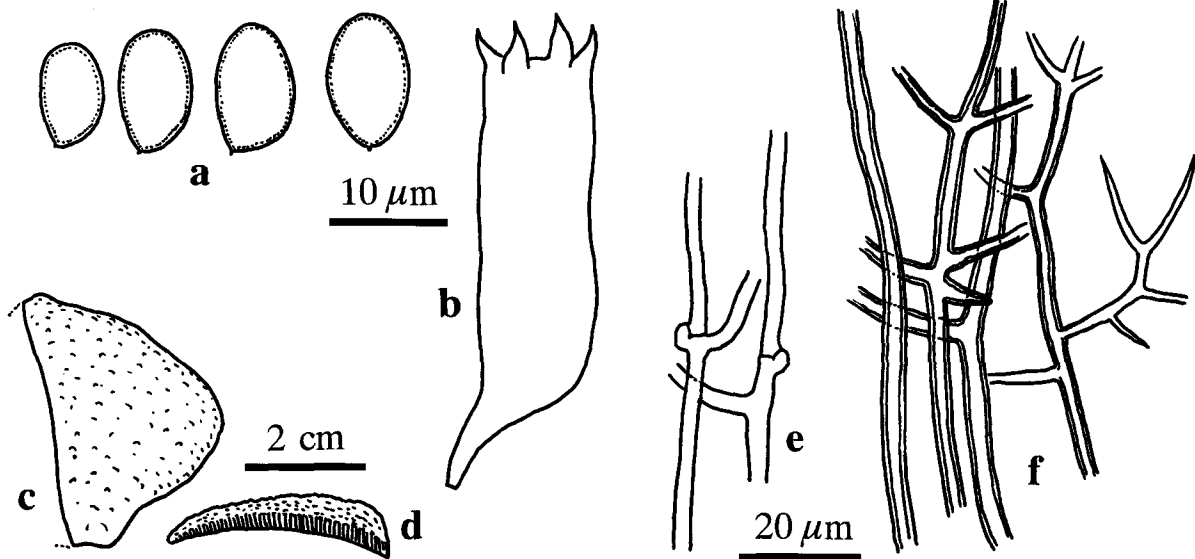


Fig. 5. Structures of *Perenniporia marmorata* from basidiocarps (a, b, e, f: from holotype, c, d: from the specimen collected in Bukit Timah, 19 Apr. 1941).

a. Basidiospores. b. Basidium. c. Basidiocarp. d. Vertical section view of basidiocarp. e. Generative hyphae from trama. f. Skeletal-binding hyphae from trama.

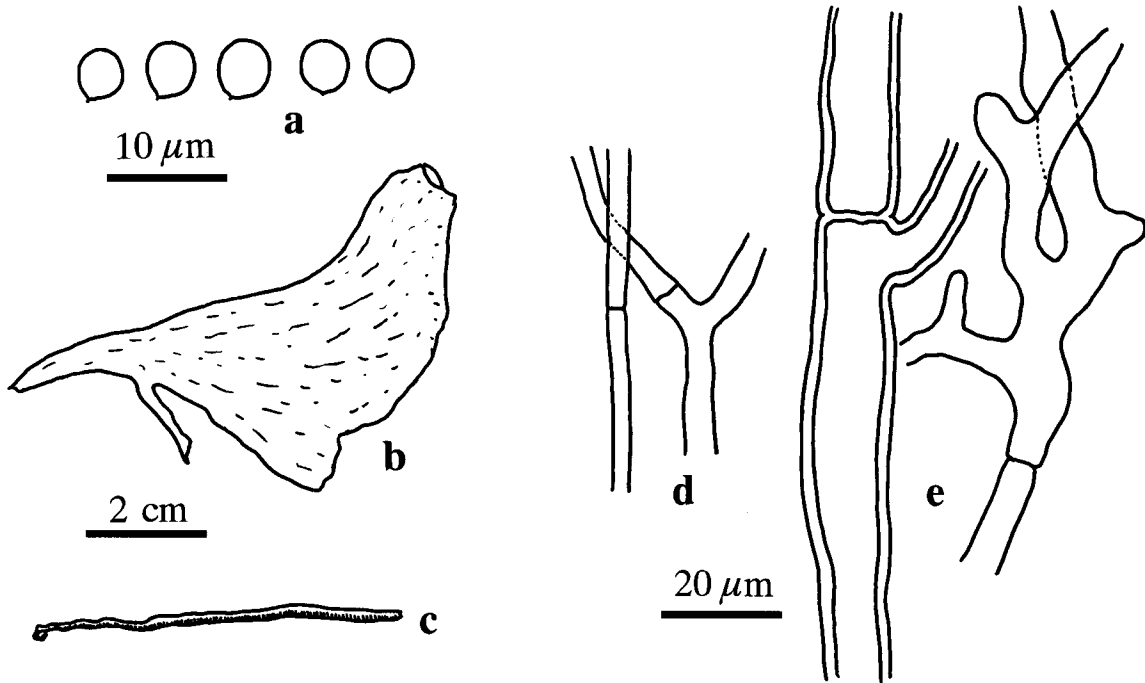


Fig. 6. Structures of *Meripilus applanatus* from basidiocarps (from holotype).

a. Basidiospores. b. Basidiocarp. c. Vertical section view of basidiocarp. d. Generative hyphae from trama. e. Generative hyphae from trama.

Holotype: MALAYSIA, Sarawak, Gunong Matang, alt. 300 m, 20 Aug. 1972, leg. E. J. H. Corner (E).

This is only a small-pored (5–6/mm) form of *Piptoporus malesianus*. Other morphological characters are almost identical with the holotype of *P. malesianus*.

*Buglossoporus rufescens* Corner, Beih. Nova Hedwig. 78: 178 (1984).

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, 19 Apr. 1964, leg. E. J. H. Corner (E).

Spores are sparse in the type material. This is only a young specimen of *Piptoporus malesianus*.

*Meripilus applanatus* Corner, Beih. Nova Hedwig. 78: 197 (1984). Fig. 6

Holotype: SOLOMON IS., Kolombangara, alt. 600–700 m, 5 Sep. 1965, leg. E. J. H. Corner (E).

Accepted as *M. applanatus*.

Basidiocarps laterally stipitate, flabelliform, applanate. Pileus surface almost glabrous to matt, irregularly wrinkled, almost black, margin thin and acute, easily broken. Pore surface mostly blackish, pores angular, 14–16/mm, dissepiments thin and entire. Context horny-leathery, almost blackish. Tubes almost black, fragile.

Trama hyphae monomitic: generative hyphae thin-walled, without clamp connections, 2.5–5(–8)  $\mu\text{m}$  wide, partly agglutinated. Context hyphae monomitic; without clamp connections, thin- to thick-walled, 3–25  $\mu\text{m}$  wide. Basidiospores almost globose, hyaline, thin-walled, IKI-, 3.5–4.5  $\times$  3–4  $\mu\text{m}$ .

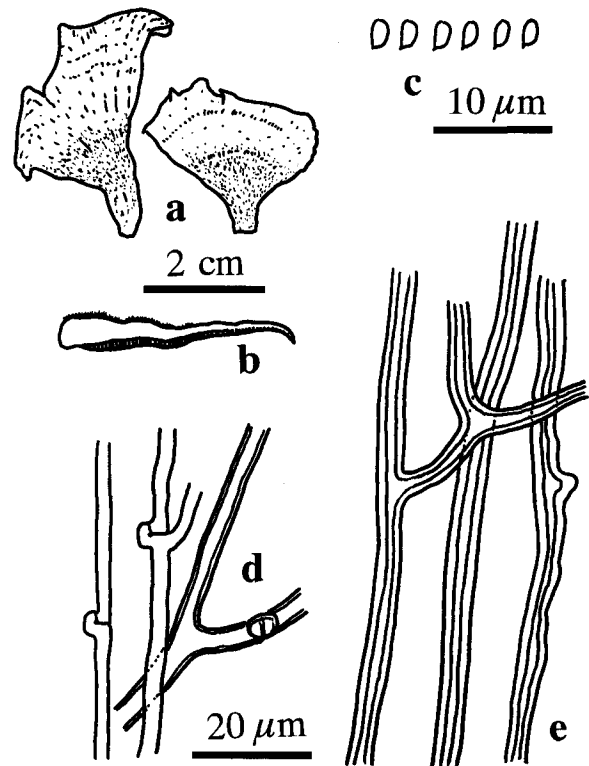


Fig. 7. Structures of *Antrodiella aurantiaca* from basidiocarps (from holotype).

a. Basidiocarps. b. Vertical section view of basidiocarp. c. Basidiospores. d. Generative hyphae from trama. e. Skeletal hyphae from trama.

Remarks: This species is allied to *M. giganteus* (Pers.: Fr.) P. Karst. but distinguished by its smaller and almost globose basidiospores, small pores invisible to the naked eye, and usually smaller and thinner basidiocarps. Basidiospores of *M. applanatus* are also smaller and more globose than *M. sumstinei* (Murrill) M. Larsen et Lombard and *M. lentifrons* (Murrill) M. Larsen et Lombard (Larsen and Lombard, 1988). *Meripilus giganteus* is usually found on *Fagus* L. in Japan (Imazeki and Hongo, 1989) and never found in subtropical and tropical areas in East Asia.

***Meripilus maculatus*** Corner, Beih. Nova Hedwig. 78: 202 (1984).

No specimen traced in E.

***Meripilus villosulus*** Corner, Beih. Nova Hedwig. 78: 203 (1984).

Holotype: MALAYSIA, Johore, Kota Tinggi, 23 Mar. 1940, leg. E. J. H. Corner (E).

Remarks: This is only a multipileate form of *M. applanatus*.

***Daedalea langkawiensis*** Corner, Beih. Nova Hedwig. 86: 11 (1987).

No specimen traced in E.

***Flabellophora aurantiaca*** Corner, Beih. Nova Hedwig. 86: 23 (1987). Fig. 7

Holotype: SOLOMON IS., South Malaita, 27 Nov. 1965, leg. E. J. H. Corner (E).

Accepted as *Antrodiella aurantiaca* (Corner) Hattori comb. nov. (Basionym indicated above.)

Basidiocarps laterally stipitate to substipitate, flabelliform, applanate. Pileus surface velutinous, tomentose near the base, slightly sulcate, light orange (5 A 3-4) near the base, reddish orange (7 A-B 7-8) near the margin. Pores angular, 10-12/mm, dissepiments thin and entire. Context horny-corky, light orange (5-6 A 3-4). Tubes horny-corky, light brown (6 D 5-6) to almost black, fragile.

Trama hyphae probably dimitic, agglutinated. Context hyphae dimitic: generative hyphae with clamp connections, thin- to thick-walled, 2-5(-8)  $\mu\text{m}$  wide; skeletal hyphae hyaline, unbranched to occasionally branched, thick-walled, IKI-, 3-6  $\mu\text{m}$  wide. Basidiospores ellipsoid, hyaline, thin-walled, IKI-, 3-3.8  $\times$  1.5-2  $\mu\text{m}$ .

Remarks: This species is characterized by a flabelliform, velutinous and light orange pileus, watery, cartilaginous consistency when fresh, and a strong fruity smell. Originally described from Solomon Is., it has also been found in the lowland forest of Pasoh, Malaysia. It has a short lateral stipe, but nevertheless it is better placed in *Antrodiella* because of the watery cartilaginous context drying rigid. It always occurs on well-rotted wood. *Antrodiella murrillii* (Lloyd) Ryvarden, described from Belize, has similar laterally stipitate basidiocarps and oblong-ellipsoid basidiospores but is distinguished by the glabrous pileus (Ryvarden, 1990).

***Flabellophora brevipes*** Corner, Beih. Nova Hedwig. 86: 24 (1987).

Holotype: BRUNEI, Badas, 24 Feb. 1959, leg. E. J. H. Corner (E).

This is probably an *Antrodiella* sp. The holotype is flabelliform with a short to obscure lateral stipe. I am not convinced that the spore-like organisms visible under the microscope are really basidiospores from the type because the tubes are moldy.

***Flabellophora deceptiva*** Corner, Beih. Nova Hedwig. 86: 25 (1987).

Holotype: MALAYSIA, Johore, Jason Bay, 16 Apr. 1934, leg. E. J. H. Corner (E).

I leave it as *Flabellophora* cf. *licmophora* (Mass.) Corner. Corner (1987) stated that the basidiospores of *F. deceptiva* are ellipsoid, but no basidiospores or hymenophores were detected. Otherwise, it is identical with *F. licmophora*.

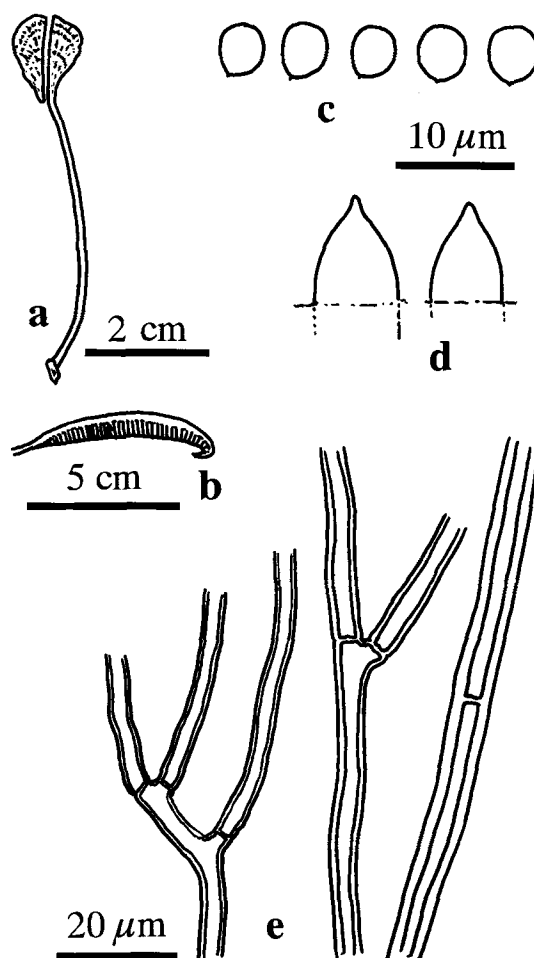


Fig. 8. Structures of *Rigidoporus incurvus* from basidiocarps (from holotype of *Flabellophora inconspicua*). a. Basidiocarp. b. Vertical section view of basidiocarp. c. Basidiospores. d. Apical part of cystidioles. e. Generative hyphae from context.

***Flabellophora flaviporus*** Corner, Beih. Nova Hedwig. 86: 26 (1987).

Holotype: MALAYSIA, Selangor, Kepong, Jan. 1959, leg. E. J. H. Corner (E).

The holotype is badly moldy. It is probably a *Tyromyces* sp. with monomitic and clamped hyphae in the context.

***Flabellophora inconspicua*** Corner, Beih. Nova Hedwig. 86: 27 (1987). Fig. 8

Holotype: MALAYSIA, Pahang, Tembeling, 9 Nov. 1930, leg. E. J. H. Corner (E).

Hyphal characters are very different from those given in the original description, and some confusion has probably occurred. The specimen indicated as the type represents *Rigidoporus incurvus* (Cooke) Ryvar den. As the description by Ryvar den (1988) based on a single specimen is the only modern description of this species, it is also described below based on Corner's specimen.

Basidiocarps laterally stipitate, spatulate, applanate. Pileus surface almost glabrous, subzonate, pale orange (6 A 3) near the margin, light brown (6 C 4–5) near the base. Pores angular, 9–11/mm, dissepiments thin and entire. Stipe cylindrical, smooth. Context corky-fibrous, pale orange (6 A 3). Tubes horny, rigid, brownish orange (6 C 4–5).

Trama hyphae highly agglutinated, pale reddish brown. Context hyphae monomitic: generative hyphae without clamp connections, thin- to thick-walled, 3–6  $\mu\text{m}$  wide, IKI-. Cystidioles fusiform, thin-walled, up to 10  $\mu\text{m}$  wide. Basidiospores globose, hyaline, thin walled, IKI-, 3.2–4.5  $\times$  3–4  $\mu\text{m}$ .

Remarks: At first sight, this is similar to *F. licmophora*, but it is distinguished by agglutinated tubes and monomitic hyphae without clamp connections in the context. For differences from other species of *Rigidoporus* Murrill, see Ryvar den (1988).

***Flabellophora intertexta*** Corner, Beih. Nova Hedwig. 86: 27 (1987). Fig. 9

Holotype: NEW BRITAIN, Kelavat, 14 Oct. 1960, leg. E. J. H. Corner (E).

It is not a typical member of *Flabellophora* because of its large cylindrical basidiospores. I am unable to find a proper taxonomic position, and leave it for the time being as *F. intertexta*.

Basidiocarps centrally to laterally stipitate, mesopodal to pleuropodal. Pileus surface velutinous, sulcate, light reddish brown (6 D–E 6). Pores round to angular, white, 4–5/mm, dissepiments moderately thick and entire. Context corky-leathery, orange white (5 A 2). Tubes corky, concolorous with context.

Trama hyphae dimitic: generative hyphae with clamp connections, hyaline, thin-walled, 1.5–2.5  $\mu\text{m}$  wide, sparse; skeletal hyphae thick-walled to almost solid, sinuous to almost straight hyaline, 2–3  $\mu\text{m}$  wide, IKI-. Context hyphae mostly similar to the trama hyphae, but skeletal hyphae mostly straight, 2.5–4  $\mu\text{m}$  wide. Basidiospores cylindrical, hyaline, thin-walled, IKI-, 9–11  $\times$  3.5–5  $\mu\text{m}$ .

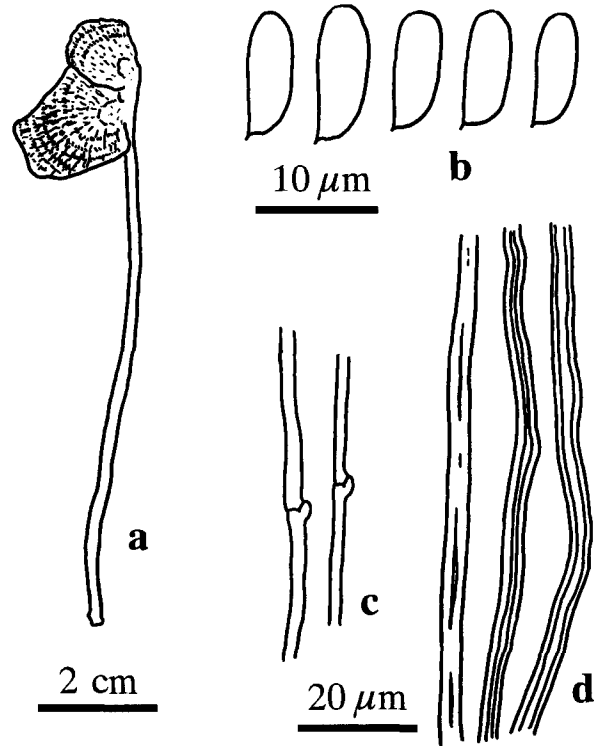


Fig. 9. Structures of *Flabellophora intertexta* from basidiocarps (from holotype).

a. Basidiocarp. b. Basidiospores. c. Generative hyphae from context. d. Skeletal hyphae from context.

Remarks: Macroscopically, it is similar to *Amauroderma* spp. but differs in the smooth and thin-walled basidiospores.

***Flabellophora kinabaluensis*** Corner, Beih. Nova Hedwig. 86: 28 (1987).

Holotype: MALAYSIA, Borneo, Mt. Kinabalu, Bemangan R, 3 Mar. 1964, leg. E. J. H. Corner (E).

Accepted as *Grifola kinabaluensis* (Corner) Hattori comb. nov. (Basionym indicated above.)

This species is placed temporarily in *Grifola* Gray, because of the merismatoid basidiocarps and dimitic hyphal system with clamp connections, as its real taxonomic position is unclear.

Basidiocarps merismatoid, pilei labelliform, imbricated. Pileus surface velutinous to glabrous, azonate, warted near the base, irregularly wrinkled near the margin, grayish orange (5 A–B 4–5) to dark brown (7–8 D–F 8). Pores angular, 3–4/mm, dissepiments thin, eroded. Context leathery to corky, somewhat horny, brittle near the margin, with agglutinated crust, orange white (5 A 2). Tubes brittle, concolorous with the context.

Trama hyphae dimitic: generative hyphae with clamp connections, thin-walled, hyaline, 2–5  $\mu\text{m}$  wide; skeletal hyphae thick-walled with a distinct lumen, hyaline, 1.5–3  $\mu\text{m}$  wide. Context hyphae subdimitic: generative hyphae with clamp connections, thin- to slightly thick-walled, 2.5–7  $\mu\text{m}$  wide; skeletal hyphae thick-walled with a distinct lumen, occasionally flattened, hyaline,



IKI-, 2–10  $\mu\text{m}$  wide, somewhat fragile in Melzer's reagent, swelled in 5% KOH solution. Basidiospores not seen.

Remarks: This species is characterized by its merismatoid basidiocarps with imbricated pilei. It is distinguished from *G. rosularis* (G. H. Cunn.) G. H. Cunn. and *G. campyla* (Berk.) G. H. Cunn. by its less tomentose pileus and dimitic hyphal system, and from *G. colensoi* (Berk.) G. H. Cunn. by its ellipsoid basidiospores (Cunningham, 1965). Corner (1987) gave line drawings of a basidiocarp and its microscopic structures.

*Flabellophora latiporus* Corner, Beih. Nova Hedwig. 86: 31 (1987).

Holotype: MALAYSIA, Pahang, Tembeling, 25 May 1931, leg. E. J. H. Corner (E).

This is a member of the complex around *Trametes hirsuta* (Wulf: Fr.) Pilát, but I leave it as a *Trametes* sp. here because speciation of this group in tropical Asia is still difficult to ascertain. The holotype is characterized by the substipitate basidiocarps, tomentose and sulcate pileus surface and lack of a distinct crust. Pores are 3–4/mm.

*Flabellophora nana* Corner, Beih. Nova Hedwig. 86: 35 (1987).

Holotype: MALAYSIA, Pahang, Fraser's Hill, alt. 1500 m, 15 May 1930, leg. E. J. H. Corner (E).

This is only a pale-colored form of *Flabellophora licmophora* (Mass.) Corner.

*Flabellophora obtorta* Corner, Beih. Nova Hedwig. 86: 40 (1987).

Holotype: MALAYSIA, Pahang, Fraser's Hill, alt.

1300 m, 26 Nov. 1930, leg. E. J. H. Corner (E).

The holotype is sterile and abnormal and is probably a *Flabellophora* sp.

*Flabellophora squamosa* Corner, Beih. Nova Hedwig. 86: 43 (1987).

Holotype: MALAYSIA, Selangor, Kuala Lumpur, 14 Apr. 1930, leg. A. Thomson (E).

The holotype represents a *Polyporus udus* Jungh. with laterally stipitate basidiocarps, smooth and papery pileus surface and a dimitic hyphal system with generative and binding hyphae.

*Flabellophora subsimplex* Corner, Beih. Nova Hedwig. 86: 45 (1987).

Holotype: MALAYSIA, Pahang, Tembeling, 3 Dec. 1930, leg. E. J. H. Corner (E).

Corner (1987) described its basidiospores as subglobose, but I could not find spores or hymenium from the type. For the time being, I leave it as *F. cf. intertexta* because other morphological characters are almost identical.

*Flabellophora velutinosa* Corner, Beih. Nova Hedwig. 86: 52 (1987). Fig. 10

Holotype: MALAYSIA, Johore, Sedili River, 22 June 1934, leg. E. J. H. Corner (E).

Accepted as *F. velutinosa*.

Basidiocarps centrally to laterally stipitate. Pileus surface velutinous, closely zonate and sulcate, grayish orange (5–6 B 4–5). Pores angular, 9–11/mm, dissepiments thin and entire. Context corky to woody, orange white (5 A 2–3), with a thin crust below the tomentum. Tubes corky to horny, somewhat fragile. Stipe cylindrical

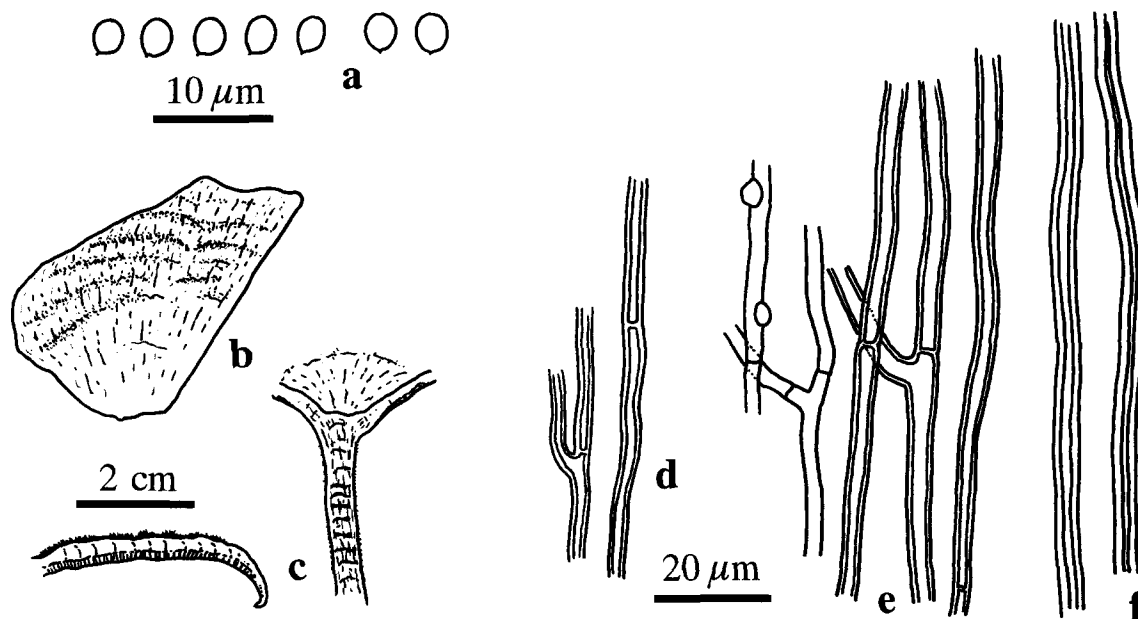


Fig. 10. Structures of *Flabellophora velutinosa* from basidiocarps (from holotype).

a. Basidiospores. b. Basidiocarp. c. Vertical section view of basidiocarps. d. Generative hyphae from trama. e. Generative hyphae from context. f. Skeletal hyphae from context.

cal, villose, brown (6 D–E 6–7), with a crust below the tomentum.

Trama hyphae somewhat agglutinated, monomitic: generative hyphae without clamp connections, thin- to slightly thick-walled, hyaline, 1.5–2.5  $\mu\text{m}$  wide. Context hyphae subdimitic: generative hyphae without clamp connections, thin- to thick-walled, 2.5–5  $\mu\text{m}$  wide; skeletal hyphae thick-walled, hyaline, IKI-, 4–5.5  $\mu\text{m}$  wide, indistinct from generative hyphae. Basidiospores subglobose, hyaline, thin-walled, IKI-, 2.5–3.5  $\times$  2–3  $\mu\text{m}$ . Remarks: At first sight, it may be taken as a weathered specimen of *Rigidoporus lineatus* (Pers.) Ryvarden. This species is characterized by the velutinous pileus and lack of clamp connections in the context hyphae. According to Corner (1987), clamp connections are seen in the stipe tissue, but I failed to confirm this observation. This species should be placed in *Rigidoporus* if clamp connections are absent from the stipe.

#### Taxonomic position of *Polyporus obovatus* and generic concept of *Flabellophora* G. H. Cunn.

*Polyporus obovatus* Jungh. (holotype L!) is a widespread species in tropical areas and common in tropical and subtropical areas of Asia. It was transferred to *Microporus* P. Beauv. by Imazeki (1943) then to *Polyporellus* P. Karst. by Imazeki (1952). Later, Ryvarden (1972) put this species into *Microporellus*, and this combination has been widely used (Ryvarden and Johansen, 1980; Gilbertson and Ryvarden, 1987).

*Polyporus licmophorus* Mass. (holotype K!; = *P. fumigatus* Bres., holotype BPI!) has been overlooked by many mycologists, but it differs from *P. obovatus* in having allantoid basidiospores. *Polyporus obovatus* and *P. licmophorus* are related, but their taxonomic position has not yet been well discussed. Their hyphal characters are different from those of the genera indicated above, being distinguished from *Microporus* and *Polyporellus* (= *Polyporus*) by different hyphal system, and from *Microporellus* by a lack of dextrinoid reaction.

The *Polyporus obovatus* group is characterized as follows: basidiocarps distinctly stipitate, context soft leathery becoming rigid when dried, hyphal system in the context and/or trama dimitic with clamp connections, IKI-, spores small and IKI-, causing white rot, mainly occurring in the later stage of decomposition. Except for the stipitate basidiocarps, these characters are common with *Antrodiella*, and the group might be related to some species of *Antrodiella*.

*Flabellophora* was established by Cunningham (1965) with *F. superposita* (Berk.) G. H. Cunn. as the only constituent. This species is distinguished by its imbricate pilei on a single stipe (Jülich, 1984), but otherwise similar to *P. obovatus* group with stipitate basidiocarps, leathery context, dimitic hyphal system, and small spores without dextrinoid reaction, though clamp connections are restricted to the stipe context. *Flabellophora superposita* may be an advanced stage of *P. obovatus* group. For the time being, I feel that *Flabellophora* is the best genus to include the members of *P.*

*obovatus* group.

*Lignosus* Torr. typified by *Polyporus sacer* Afz. ex Fr., has similar stipitate basidiocarps, small spores, and hyphae without dextrinoid reaction. However, most *Lignosus* spp. have a trimitic hyphal system, and their basidiocarps are usually (but not always) produced from a large sclerotium. *Lignosus* might be an earlier name for *Flabellophora*, but I prefer to leave them separate to avoid too many new combinations without a firm phylogenetic basis.

The generic concept of *Flabellophora* given by Corner (1987) is unclear, and I prefer the following definition: basidiocarps stipitate, pileus single or several pilei arise from a common stipe, usually thin and applanate, mostly up to 5 mm thick; context pale colored, leathery, often rigid when dried; hymenophore poroid. Hyphal system dimitic in context and /or trama; hyphae non-dextrinoid, with clamp connections at least on the contextual hyphae of the stipe; basidiospores usually small, short ellipsoid to allantoid (cylindrical in one species), non-dextrinoid.

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