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HABITAT: Bark of fallen dead logs or erect stumps.

CASUARINACEAE. *Casuarina* sp.: New South Wales, Middle Harbor, Sydney. MIMOSACEAE. *Acacia* sp.: Queensland, Bribie Island, Moreton Bay. MYRTACEAE. *Leptospermum* sp.: Queensland, Bundaberg. *Tristania conferta*: New South Wales, Sydney. UNKNOWN HOSTS. Queensland, Kalbar; Bundaberg. New South Wales, Milson Island, Hawkesbury River; Lismore; Kew; Taree; Terrigal.

IN KEW HERBARIUM: "N.S.W., Richmond River", type collection, "Q., Imbil State Forest, J.B.C., 14", "N.S.W., Lismore, J.B.C., 30", and "N.S.W., Hawkesbury River, J.B.C., 29" filed under the cover of *Polyporus lividus*; "N.S.W., Clarence River, Wilcox" under *Poria livida*; "N.S.W., Clarence River," filed as *Polyporus luridus*; "N.S.W., Clarence River, Thornetton" labelled by Cooke *Polyporus obliqua*.

As all collections examined are resupinate the species is obviously a *Fuscoporia*. Context hyphae are encrusted with granules of mucilage, which give to context and pores their characteristic colour. Spores are unusual, being oval or subglobose, often angular or irregular, small, with relatively thick walls staining with aniline blue.

Lowe (1957, p. 41) referred to the species (as *Fomes*), as synonyms, *Fomitiporia cubensis* Murr. from West Indies, *Fomes olivaceus* Lloyd and *F. longinquus* Lloyd from Japan. Judging from his description of spores and generative hyphae they do not appear to be the same.

10. *Fuscoporia umbrinella* (Bresadola) comb. nov.

Poria umbrinella Bres., *Hedwigia* 35 : 282, 1896. *Fomitiporella umbrinella* (Bres.) Murr., *N. Am. Flora* 9 : 13, 1907. *Fomitiporella floridana* Murr., *N. Am. Flora* 9 : 14, 1907.

Hymenophore perennial, multistratose, woody, adherent, effused forming linear areas 14–28 × 5–16 cm, 5–20 mm thick. Hymenial surface bay or ferruginous, plane or slightly convex, slightly glancing, not creviced; margin cliff-like, receding, vaguely zoned, black with a hard and shining cortex to 1 mm thick, adherent. Pores in numerous layers, round, often oblique, 6–8 per mm, 75–100 μ diameter, 0.5–2 mm deep in each layer, frequently white stuffed; dissepiments 75–250 μ thick, equal, even. Context ferruginous, 0.1–0.5 mm thick, of intertwined hyphae; skeletal hyphae 3–4 μ diameter, walls 0.5 μ thick, yellow brown, aseptate, sparsely branched; generative hyphae to 2.5 μ diameter, walls 0.2 μ thick, hyaline, branched, septate. Hymenial layer to 10 μ deep, a dense palisade of basidia and paraphyses. Setae absent. Basidia oblong, 6–8 × 4–5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses oblong or obovate, 5–6 × 3.5–4 μ . Spores subglobose, globose, or oval, abundant, 4–5 × 3.5–4 μ , walls smooth, yellow brown, 0.1 μ thick.

TYPE LOCALITY: Santa Catharina, Brazil.

DISTRIBUTION: North and South America, New Zealand.

HABITAT: Bark of fallen trunks.

FAGACEAE. *Nothofagus fusca*: Nelson, Reefton, 700 m.

Specific features are the large, effused, adherent, multistratose hymenophore, absence of setae, irregular often thick dissepiments, and small coloured spores.

Lowe (1958, p. 109) listed as additional synonyms *Fuscoporella coruscans* Murr., *Fomitiporella langloisiana* Murr., and *Fuscoporella mexicana* Murr.

26. PHELLINUS Quelet,

Enchiridion Fungorum, p. 172, 1886.

Ochroporus Schroet., in *Krypt.-Fl. Schles.* 3 : 483, 1888. *Scindalma* Hill ex O. Kuntze. *Rev. Gen. Pl.* 3 : 517, 1898. *Pyropoly-porus* Murr., *Bull. Torrey bot. Club* 30 : 109, 1903. *Globifomes* Murr., *Bull. Torrey bot. Club* 31 : 424, 1904. *Nigrofomes* Murr., *Bull. Torrey bot. Club* 31 : 425, 1904. *Porodaedalea* Murr., *Bull. Torrey bot. Club* 32 : 367, 1905. *Fulvifomes* Murr., *Northern Polypores*, p. 49, 1914. *Oxyuris* Lloyd, *Mycol. Writ.* 4 (Fomes), p. 261, 1915. *nomen nudum*. *Daedaloides* Laz., *Rev. Acad. Madr.* 14 : 675, 1916. *Pseudofomes* Laz., *Rev. Acad. Madr.* 14 : 582, 1916. *Boudiera* Laz., *Rev. Acad. Madr.* 14 : 835, 1916, non Cke. 1887. *Cryptoderma* Imaz., *Bull. Tokyo Sci. Mus.* 6 : 106, 1943.

Hymenophore perennial, solitary or imbricate, attached by a broad lateral base. Pilei applanate, unguulate, conchate, or effused-reflexed, cortex present or absent. Pores round or angular, in two or

many strata. Context of intertwined or parallel hyphae compactly arranged; hyphal system dimitic; skeletal hyphae sparsely branched, usually long, with or without septa, sometimes pseudoseptate, walls coloured some shade of brown, in some species associated with setal hyphae; generative hyphae freely branched and septate, without clamp connections, walls thin, usually hyaline. Basidia and paraphyses forming a dense palisade, usually soon collapsing, in many species with subulate or ventricose setae, sometimes hamate, with coloured usually thickened walls. Basidia bearing 2-4 spores on brief sterigmata. Spores variously shaped, walls smooth, hyaline or coloured brown, amyloid.

TYPE SPECIES: *Polyporus rubiporus* Quel. (= *P. torulosus* Pers.).

DISTRIBUTION: Cosmopolitan.

As the accepted type for *Fomes* is *Polyporus fomentarius* (L.) Fr. (Donk, 1960, p. 215), a species with a trimitic hyphal system and clamp connections on the generative hyphae, it has been necessary to find a generic name for species in which the hyphal system is dimitic, skeletal hyphae possess walls coloured brown, darkening in aqueous solutions of potassium hydroxide, and generative hyphae are without clamp connections. The earliest valid name is *Phellinus*, with, as type, *Polyporus rubiporus* Quel. (Donk, 1960, p. 253). Thus defined, the genus contains about 120 valid species, this number probably being in excess of those species which will finally be recognised.

Herein species have been arranged into sections with setal hyphae, setae, coloured or hyaline spore walls, and presence or absence of a cortex.

Three species display setal hyphae in the context or dissepiments: they are narrow in *Phellinus lamaensis*, and stout in *P. pachyphloeus* and *P. noxius*. In the last, setae are rare. Additional to those, 11 other species bear abundant setae. The setae are ventricose or subulate, although in *P. setulosus* and *P. zealandicus* some or all may be hamate. In *P. robustus* they are rare in most European collections, and abundant or scanty in collections from this region. There is no apparent explanation for this erratic distribution. They are scanty in *P. melanoporus*, but found in thin sections, being obscured by the dark context colour. Setae are associated with a honeycomb basidial type. If setae are not found in a preliminary examination of specimens exhibiting a setose state, further search of sections taken from different parts of the fructification will usually detect a few. Of the setal bearing species two possess spores with coloured walls (*P. melanoporus* and *P. nilgheriensis*). Spores are globose in five species of this section, cylindrical in *P. tawhai*, and elliptical in the others.

In the region there are 11 species without setae. Of these, spore walls are coloured in nine. In this section there is one anomalous species, *P. albomarginatus*, with allantoid hyaline spores and orange-rufous context.

I have not segregated the non-setose species under a separate genus, mainly because of the difficulty experienced in finding setae in certain collections of *P. melanoporus* and *P. robustus*.

A well developed cortex is present in 19 species, and in thickness it may range from 0.2 mm to 2 mm. In tomentose species it lies between the abhymenial hairs and the context and appears black under a hand lens.

Pores of most species are arranged in several strata. Sometimes strata may be vaguely defined, then the peripheral layers indicate that species are perennial. In a few widespread species only one or two layers may develop in specimens collected in temperate regions, whereas they display several layers in tropical collections (*P. bicolor*, *P. gilvus*, *P. scruposus*).

Spores with coloured walls are usually plentiful and are readily found in sections. In species with hyaline spore walls, spores are often scanty and confined to peripheral pores of specimens actively growing at the time of collection. In a few species they have not been found, despite examination of many sections.

KEY TO SPECIES

1. Setal hyphae present in context and dissepiments; spore walls hyaline.
 2. Setal hyphae narrow, to $4.5\ \mu$ diameter; context hyphae to $4.5\ \mu$ diameter, aseptate; setae abundant 1. *P. lamaensis* (Murr.) Heim.
 2. Setal hyphae to $14\ \mu$ diameter.
 3. Setae abundant; context hyphae septate, to $3.5\ \mu$ diameter .. 2. *P. pachyphloeus* Pat.
 3. Setae scanty; context hyphae septate, $6-8\ \mu$ diameter .. 3. *P. noxius* (Corner) G. H. Cunn.
1. Setal hyphae absent.
 2. Setae present in walls of dissepiments.
 3. Setae uncinatae, some or all with hooked apices; spores subglobose or globose, with hyaline walls.
 4. Cortex present; pilei commonly ungulate 4. *P. setulosus* (Lloyd) Imaz.
 4. Cortex absent; pilei commonly applanate 5. *P. zealandicus* (Cke.) G. H. Cunn.
 3. Setae subulate or ventricose with erect acuminate apices.
 4. Spore walls coloured brown, or at least tinted yellow.
 5. Pores $10-12$ per mm; context and pore surface chocolate or black; skeletal hyphae septate 6. *P. melanoporus* (Mont.) G. H. Cunn.
 5. Pores $8-10$ per mm; context and pore surface chestnut or umber; skeletal hyphae aseptate 7. *P. nilgheriensis* (Mont.) G. H. Cunn.
 4. Spore walls hyaline.
 5. Pilei with a cortex.
 6. Pores $5-7$ per mm.
 7. Spores globose or subglobose.
 8. Pileus surface hirsute; spores $4-5.5\ \mu$ diameter; pilei small 8. *P. conchatus* (Pers. ex Fr.) Quel.
 8. Pileus surface glabrous, hard and indurated; spores $5.5-7\ \mu$ diameter, pilei large 9. *P. robustus* (Karst.) Bourd. & Galz.
 7. Spores cylindrical with rounded ends, $5-6 \times 1.5-2\ \mu$; pileus surface glabrous and black 10. *P. tawhai*, G. H. Cunn.
 6. Pores $9-11$ per mm; spores not seen; plant a *P. senex* with a cortex 11. *P. rhabarbarinus* (Berk.) G. H. Cunn.
 5. Pilei without a cortex, surface hirsute or tomentose.
 6. Pores $7-9$ (some $9-11$) per mm; spores globose, $4-5.5\ \mu$ diameter 12. *P. senex* (Nees & Mont.) Imaz.
 6. Pores $5-7$ per mm; spores elliptical, $4-6 \times 2.5-3\ \mu$.
 7. Pileus surface strongly strigose; context cinnamon; skeletal hyphae to $5\ \mu$ diameter 13. *P. scruposus* (Fr.) G. H. Cunn.
 7. Pileus surface hirsute or glabrous; context chestnut; skeletal hyphae to $8\ \mu$ diameter 14. *P. gilvus* (Schw. ex Fr.) Pat.
 2. Setae absent from walls of dissepiments.
 3. Spore walls coloured brown, or at least tinted, abundant.
 4. Pores $1-3$ per mm; spores elliptical or obovate, $5-6.5 \times 3.5-4.5\ \mu$; pilei without a cortex 15. *P. rimosus* (Berk.) Pilat.
 4. Pores $4-6$ per mm; pilei with a cortex.
 5. Spores oval or subglobose.
 6. Context ferruginous or umber; pileus surface glabrous.
 - [7. Pileus radiately striate, skeletal hyphae to $6\ \mu$ diameter 16. *P. badius* (Berk.) G. H. Cunn.
 7. Pileus concentrically ridged, skeletal hyphae to $3\ \mu$ diameter] 17. *P. inermis* (Ellis & Everh.) G. H. Cunn.
 6. Context rhubarb or fulvous, pileus surface tomentose .. 18. *P. lloydii* (Cleb.) G. H. Cunn.
 4. Pores $7-10$ per mm; pileus with a cortex.
 5. Spores subglobose, $4-4.5 \times 3.5-4\ \mu$; context rhubarb or fulvous 19. *P. spadiceus* (Berk.) G. H. Cunn.
 5. Spores elliptical, minute, scarcely exceeding $3\ \mu$ in length.
 6. Context chocolate; pilei glabrous. 20. *P. caliginosus* (Berk.) G. H. Cunn.
 6. Context chestnut; pilei hirsute 21. *P. pectinatus* (Kl.) Quel.
 5. Spores oblong, $3.5-5 \times 2-3\ \mu$; context fawn or chestnut; pileus surface glabrous 22. *P. endapalus* (Berk.) G. H. Cunn.
 4. Pores $10-12$ per mm; pileus with a cortex; spores subglobose, $2.5-3 \times 2-2.5\ \mu$; context chestnut or umber 23. *P. caryophylli* (Racib.) G. H. Cunn.
 3. Spore walls hyaline.
 4. Context orange-rufous; cortex present; pores $7-9$ per mm; spores allantoid, $3-3.5 \times 0.5-1\ \mu$ 24. *P. albomarginatus* (Zipp. ex Lev.) G. H. Cunn.
 4. Context fulvous; cortex absent; pores $8-10$ per mm; spores elliptical, $4-4.5 \times 1.5-2.5\ \mu$ 25. *P. bicolor* (Jungh.) G. H. Cunn.

1. *Phellinus lamaensis* (Murrill) Heim,

Fig. 50

Annales de cryptogamie exotique 7 : 21, 1934.

Pyropolyporus lamaensis Murr., Bull. Torrey bot. Club 34 : 479, 1907. *Pyropolyporus williamsii* Murr., Bull. Torrey bot. Club 34 : 479, 1907. *Fomes lamaensis* (Murr.) sacc. & Trott., Syll. Fung. 21 : 287, 1912. *Fomes williamsii* (Murr.) Bres., Ann. mycol. 14 : 225, 1916. *Cryptoderma lamaensis* (Murr.) Imaz., Bull. Tokyo Sci. Mus. 6 : 107, 1943.

Hymenophore perennial, solitary or imbricate, woody, attached by a broad lateral base. Pilei applanate or effused-reflexed, 5–20 cm wide, 4–7 cm radius, to 3 cm thick; pileus surface bay becoming umber, when old often black, concentrically sulcate and ridged, at first tomentose, soon glabrous; cortex to 1 mm thick, of densely intertwined cemented hyphae and setal hyphae, deep chestnut in section; margin acute or bluntly rounded, concolorous or lighter, lobed or entire; hymenial surface ferruginous to umber, plane or reflecting surface markings, even. Pores ferruginous, 5–10 mm long in each layer, often separated by a thin seam of context tissue, 5–7 per mm, 80–130 μ diameter; dissepiments 70–160 μ thick, tapering slightly, apices velutinate. Context chestnut to cinnamon, to 12 mm thick, zoned with growth layers, and black parallel lines of intertwined hyphae; skeletal hyphae to 4.5 μ diameter, aseptate, sparsely branched, walls 0.5–1 μ thick, yellow brown; setal hyphae abundant, to 4.5 μ diameter, with thick chestnut walls; generative hyphae to 3 μ diameter, branched, septate, walls 0.2 μ thick, tinted. Hymenial layer to 15 μ deep, a dense palisade of setae, basidia and paraphyses. Setae ventricose, 18–40 \times 6–8 μ , walls 2–3 μ thick, chestnut. Basidia subclavate, 12–18 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 2 μ long. Paraphyses subclavate, 8–14 \times 3.5–4 μ . Spores elliptical or obovate, apiculate, 3.5–4 \times 2.5–3 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: Luzon, Philippine Islands.

DISTRIBUTION: Philippine Islands, East Indies, New Guinea, Fiji, Australia.

HABITAT: Bark or decorticated wood of erect trunks.

MORACEAE. *Ficus* sp.: Queensland, Stony Creek, via Cairns. UNKNOWN HOSTS. Fiji, Suva; Colo-i-Suva. Queensland, Intake, via Cairns.

IN KEW HERBARIUM: Under *Fomes senex* is one collection from the region ex "New Guinea, Strickland River, Bauerlen".

Phellinus lamaensis, *P. noxius* and *P. pachyphloeus* are linked by the conspicuous setal hyphae present in context and dissepiments. In the first these are so strongly developed in the dissepiments as to form a horny tissue difficult to section. [This species may be separated from the related *P. pachyphloeus* by the presence in the hymenial layer of small ventricose setae as well as the projecting ends of setal hyphae. The setal hyphae do not exceed 4.5 μ diameter and context hyphae are aseptate.] Specimens listed are smaller than those described by Corner (1932c, p. 333); he recorded some pilei reaching a width of 43 cm and a radius of 28.5 cm.

2. *Phellinus pachyphloeus* Patouillard,

Essai Taxonomique sur les Familles et les Genres des Hymenomycetes, p. 97, 1900.

Polyporus pachyphloeus Pat., J. Bot., Paris 3 : 257, 1889. *Fomes pachyphloeus* (Pat.) Bres., Bull. Soc. mycol. Fr. 6 : 41, 1890. *Elfvigia elmeri* Murr., Bull. Torrey bot. Club 34 : 476, 1907. *Cryptoderma pachyphloeum* (Pat.) Imaz., Bull. Govt For. Exp. St., Tokyo 57 : 101, 1952.

Hymenophore perennial, solitary, firm and woody, attached by a broad lateral base. Pilei ungulate, sometimes applanate, occasionally resupinate, 6–15 cm wide, 5–11 cm radius, 1–3 cm thick; pileus surface bay, cinnamon, or umber, concentrically sulcate and ridged, sometimes with concentric bands of brown of different shades, glabrous, dull, sometimes rimose when old; cortex to 2 mm thick, rigid, black, shining, of intertwined cemented coloured hyphae with many erect embedded setal hyphae; margin acute, even, finely tomentose, ferruginous; hymenial surface slightly concave, cinnamon becoming umber, with a narrow pubescent cinnamon border 1–2 mm wide. Pores stratose, 3–5 mm deep in each layer, ferruginous, 5–6 per mm, 100–150 μ diameter; dissepiments 50–150 μ thick, equal, or with apices expanded partly occluding pores. Context cinnamon or ferruginous, to 15 mm thick, zoned, of intertwined hyphae; skeletal hyphae to 3.5 μ diameter, moderately branched, septate, walls to 1 μ thick, pallid chestnut; generative hyphae to 3 μ thick, branched, septate, walls tinted, 0.2 μ thick. Setal hyphae 10–14 μ diameter, with thick walls coloured chestnut, abundant. Hymenial layer to 18 μ deep, a dense palisade of setae, setal hyphae, basidia and paraphyses. Setae ventricose, 22–32 \times 6–8 μ , walls pallid chestnut. Setal hyphae projecting obliquely,

10–14 μ diameter, lumina capillary, chestnut. Basidia subclavate, 8–14 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 6–10 \times 3.5–4 μ . Spores subglobose or elliptical, 5–6 \times 4–5 μ , walls smooth, hyaline, some tinted in old specimens, 0.1 μ thick.

TYPE LOCALITY: Fiji.

DISTRIBUTION: Fiji, East and West Indies, Central and South America, Africa, New Guinea, Samoa, Australia, New Zealand.

HABITAT: Bark and decorticated wood of fallen logs and branches, associated with a white rot. ESCALLONIACEAE. *Quintinia serrata*: Westland, Pukekura. FAGACEAE. *Nothofagus cliffortioides*: Otago, Lake Manapouri, 130 m. MYRTACEAE. *Leptospermum ericoides*: Auckland, Little Barrier Island; Huia, coast. *Metrosideros perforata*: Otago, Ryans Creek, Stewart Island. *Metrosideros robusta*: Auckland, Ngaiotonga Ranges, 250 m; Moumoukai Valley, Hunua Ranges, 300 m. *Metrosideros umbellata*: Otago, Catlins, 100 m. PODOCARPACEAE. *Podocarpus dacrydioides*: Auckland, Mangatawhiri Stream, Hunua Ranges, 300 m; Moumoukai Valley, Hunua Ranges, 250 m. UNKNOWN HOSTS. Auckland, Waipoua Kauri Forest, 120 m. New South Wales, Bolar Creek, National Park; Near Sydney. Western Australia, no locality. Samoa, Savaii, Upolu, New Guinea, Lae.

IN KEW HERBARIUM: ex "Vic., Melbourne, F. Reader, 8" filed under *Fomes obliquus*, and "Q., Trinity Bay, Sayer", under *Fomes rufus*.

From the related *Phellinus lamaensis* and *P. noxius* the species may be separated by the stout setal hyphae with thick chestnut walls, present in the context and projecting obliquely into the pore cavities. Abundant setae are often formed in groups. The context is narrow; context hyphae and pores are umber in colour. Many of the collections listed are resupinate. In two, spores are elliptical, 4–6 \times 3–4 μ , with definite brown walls; in other collections they are elliptical with many subglobose, and walls are hyaline. Plants may grow to a large size since according to Humphrey and Leus (1932, p. 539) one specimen from Philippine Islands was 65 cm broad, with a radius 37.5 cm. The cortex is formed mainly from a palisade of setal hyphae some of which project and give the surface a velutinate appearance. Ends of dissepiments are similarly furnished.

3. *Phellinus noxius* (Corner) Comb. nov.

Fig. 51

Hymenochaete noxia Berk. in herb., Cke., Grevillea 8: 149, 1880, nomen nudum. *Poria setuloso-crocea* Clel. & Rodw., Pap. roy. Soc. Tasm. 1928, p. 34, 1928. *Poria luteo-fulvus* Clel. & Rodw., Pap. roy. Soc. Tasm. 1928, p. 42, 1928. *Fomes noxius* Corner, Gdns' Bull. 5: 342, 1932.

Hymenophore perennial, hard and woody, solitary sometimes imbricate, commonly resupinate, attached by a broad base. Pilei applanate or effused-reflexed, 11–15 cm wide, 5–13 cm radius, to 2 cm thick; pileus surface bay then umber, soon black when old, radiately and concentrically sulcate, sometimes zoned with bands of different colour, at first tomentose, becoming glabrous; cortex to 1 mm thick, of densely intertwined cemented skeletal and setal hyphae, chestnut in section; margin acute or bluntly rounded, at first pallid, becoming concolorous, even; hymenial surface umber, equal. Pores ferruginous or umber, stratose, 2–5 mm long in each layer with intertwined hyphae between, 6–8 per mm, 70–120 μ diameter; dissepiments 60–110 μ thick, slightly tapering or equal, apices velutinate. Context at first fulvous, becoming ferruginous, 5–10 mm thick, of closely intertwined hyphae; skeletal hyphae to 6 μ diameter (to 8 μ in resupinate forms), septate, branched, walls 0.5–1.5 μ thick, at first yellow-brown, chestnut when old; setal hyphae to 10 μ diameter, walls 1–3 μ thick, chestnut; generative hyphae to 3 μ diameter, branched, septate, walls 0.2 μ thick, hyaline or tinted. Hymenial layer to 18 μ deep, a dense palisade of setae, projecting hyphal setae, basidia and paraphyses. Setae rare, not more than 5 seen in one section, ventricose, 16–24 \times 6–8 μ , walls 1–2 μ thick, chestnut. Setal hyphae projecting at an acute angle, to 14 μ diameter, walls chestnut, lumina capillary. Basidia subclavate, 12–16 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 2 μ long. Paraphyses subclavate, 8–14 \times 3.5–4 μ . Spores elliptical or obovate, apiculate, 4–4.5 \times 3–3.5 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: Singapore Botanic Gardens.

DISTRIBUTION: Philippine Islands, East and West Indies, Ceylon, Fiji, New Guinea, Australia, Samoa.

HABITAT: Bark or decorticated wood of erect stems and trunks.

ANACARDIACEAE. *Blepharocarya involucrigera*: Queensland, Danbulla. *Schinus molle*: South Australia, Adelaide (type of *Poria setuloso-crocea*). ARALIACEAE. *Hedera australiana*: Queensland, Danbulla. ARAUCARIACEAE. *Araucaria cunninghamii*: Queensland, Barron River; Cairns. BOMBACACEAE. *Ceiba pentandra*: Samoa, Upolu. CASUARINACEAE.

Casuarina torulosa: Queensland, Barron River. MIMOSACEAE. *Acacia aulacocarpa*: Queensland, Stratford. RUTACEAE. *Flindersia brayleyana*: Queensland, Atherton Tableland. STERCULIACEAE. *Theobroma cacao*: Samoa, Savaii-Upolu; Lotofaga, Upolu; Lapi, Upolu. UNKNOWN HOSTS. Queensland, Danbulla. New South Wales, Bradleys Head, Sydney (type of *Poria luteo-fulvus*).

IN KEW HERBARIUM: One collection from the region, ex "Q., Daintree River" filed under *Fomes obliquus*.

Collections are often resupinate, the fungus producing irregular fructifications to 30 cm in length, usually sterile and with occasional setal hyphae in the periphery. This form was originally named *Hymenochaete noxia*, the 'type' in Kew herbarium being from "Samoa, T. Powell, Jan. 1875". No formal description was published. Other resupinate collections have been described as *Poria luteo-fulvus* and *P. setulosus-crocea* as I have ascertained by examination of part of the type collections. As specimens of these are fragmentary, and show little resemblance to pileate specimens, I have retained the specific name applied by Corner, since this was based on adequate type material and has become well established in literature. Pileate specimens resemble those of *Phellinus lamaensis* from which they may be separated by the setal hyphae of a greater diameter, projecting into pore cavities. Septate skeletal hyphae of larger diameter are also present and setae are scanty (described as wanting by Corner). Dissepiments, like those of *P. lamaensis*, are formed mainly from setal hyphae and consequently difficult to section.

According to Corner (1932c, p. 343) the species is the cause of the brown rot of rubber.

4. *Phellinus setulosus* (Lloyd) Imazeki,

Fig. 52, Plate V c

Bulletin of the Tokyo Science Museum 6 : 104, 1943.

Fomes setulosus Lloyd, Syn. Gen. Fomes, p. 243, 1915. *Fomes uncatus* G. H. Cunn., N.Z.D.S.I.R. Pl. Dis. Div. Bull. 79 : 3, 1948.

Hymenophore perennial, solitary, firm and woody, attached by a broad lateral base. Pilei commonly unguulate, seldom effused-reflexed, 12–23 cm wide, 6–12 cm radius, 3–8 cm thick; pileus surface ferruginous becoming umber or black near the base, concentrically sulcate and ridged, tomentose then glabrous; cortex to 0.5 mm thick, black, brittle, of intertwined hyphae cemented into a membrane which tends to flake away save peripherally; margin obtuse, even, tomentose; hymenial surface plane or slightly convex, at first ferruginous, then umber, even, with a fulvous tomentose sterile border 1–3 mm wide. Pores stratose, each layer 2–5 mm deep, ferruginous, round, 5–7 per mm, 100–150 μ diameter; dissepiments 75–100 μ thick, equal, apices finely velutinate. Context ferruginous, soon umber, 1–5 mm thick, of parallel hyphae radiately arranged; skeletal hyphae to 4 μ diameter, aseptate, sparsely branched, lumina 1 μ , walls chestnut; generative hyphae to 2.5 μ diameter, branched, septate, walls 0.2 μ thick, hyaline. Hymenial layer to 18 μ deep, a close palisade of setae, basidia and paraphyses. Setae mostly hamate, a few subulate, 16–35 \times 8–12 μ , walls chestnut, to 2 μ thick. Basidia clavate, 8–12 \times 5–7 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 6–10 \times 4–4.5 μ . Spores globose, subglobose, or broadly obovate, 5–6.5 \times 4.5–5 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: Ceylon.

DISTRIBUTION: Ceylon, Malaya, Australia, New Guinea, New Zealand.

HABITAT: Bark of standing dead trees, associated with a brown pocket rot.

CUNONIACEAE. *Weinmannia racemosa*: Otago, Horse Shoe Bay, Stewart Island. FAGACEAE. *Nothofagus fusca*: Wellington, Days Bay, 100 m. *Nothofagus menziesii*: Otago, Woodlaw State Forest. MELIACEAE. *Dysoxylum spectabile*: Auckland, Riverhead, 120 m; Orewa; Mountain Road, Henderson, 250 m; Waikowhai Park, 200 m. MONIMIACEAE. *Laurelia novae-zelandiae*: Otago, Woodlaw State Forest. MYRTACEAE. *Eucalyptus baxteri*: Victoria, Glenelg River. *Eucalyptus regnans*: Victoria, Toolangi. *Metrosideros excelsa*: Auckland, Kawau Island. *Metrosideros robusta*: Auckland, Riverhead; Spragues Hill, Henderson; Walkers Bush. Wellington, Wiltons Bush, 110 m. UNKNOWN HOSTS. Auckland, Little Huia, 130 m. New Guinea, Lae. Queensland, Bunya Mountains (Lloyd as *Fomes calkinsii*). South Australia, Kuitpo (Lloyd 861 as *F. yucatensis*).

IN KEW HERBARIUM: "Vic., D.F.P., 2013 on *Eucalyptus regnans*" and "W. Aus., D.F.P. 1015 on *E. marginata*" both labelled *Fomes hamatus*.

Close to *Phellinus zealandicus* but typical specimens differ in the presence of a black cortex and darker colour of hymenial surface; the broad setae are mostly hamate, and spores are slightly larger

than in *P. zealandicus*. Hymenophore is usually ungulate or irregularly applanate with thick and narrow pilei.

Recently I examined the paratype specimen of *Fomes setulosus* in Kew herbarium, and one from Hakgala, Ceylon, contributed by T. Petch, together with a third from Malaya. All possess hamate setae and a cortex, and spores similar to those of *Phellinus zealandicus*. What hitherto has been regarded as '*Fomes*' *setulosus* in Australasia, based on collections so named by C. G. Lloyd, are specimens of *Phellinus robustus*, commonly with more abundant setae than the European specimens, but otherwise identical. *Fomes uncatus* is an ungulate form of *P. setulosus* with slightly smaller spores. We are indebted to J. L. Lowe (1957, p. 60) who was the first to point out that the type of '*Fomes*' *setulosus* from Ceylon possessed hamate setae.

5. *Phellinus zealandicus* (Cooke) comb. nov.

Fig. 53

Polyporus zealandicus Cke., Grevillea 8 : 55, 1879, non Cke. 1888. *Polyporus victoriae* Berk. ex Cke., Grevillea 10 : 103, 1882. *Fomes zealandicus* Cke., Grevillea 14 : 18, 1885. *Poria victoriae* (Berk.) Cke., Grevillea 14 : 111, 1886. *Pyropolyporus robinsoniae* Murr., N. Am. Flora 9 : 108, 1908. *Poria uncinata* Weir ex Clel. & Rodw., Pap. roy. Soc. Tasm. 1928, p. 39, 1928. *Fomes senex* var. *hamatus* Corner, Trans. Brit. mycol. Soc. 17 : 75, 1932. *Fomes hamatus* (Corner) Imaz., J. Jap. Bot. 16 : 586, 1940. *Fuscoporia uncinata* (Weir) G. H. Cunn., N.Z.D.S.I.R. Pl. Dis. Div. Bull. 73 : 3, 1948.

Hymenophore perennial, solitary or frequently imbricate, firm and woody, attached by a broad base. Pilei commonly applanate, sometimes effused-reflexed, occasionally resupinate, 5–25 cm wide, 4–11 cm radius, 12–25 mm thick; pileus surface chestnut, becoming umber, concentrically sulcate and ridged, at first tomentose with bands of hairs arranged concentrically, finally glabrous or almost so, save near the periphery; without a cortex; margin bluntly acute, bay or chestnut, tomentose, even or sparsely lobed; hymenial surface fulvous or chestnut, slightly glancing, with a lighter sterile border 1–4 mm wide. Pores stratose, 1–5 mm deep in each layer, ferruginous, 6–7 per mm, 80–150 μ diameter; dissepiments 50–120 μ thick, equal, finely velutinate. Context to 5 mm thick, fulvous or chestnut, seldom darker, of mainly radiate hyphae; skeletal hyphae to 4 μ diameter, pseudoseptate, sparsely branched, walls to 1 μ thick, chestnut; generative hyphae to 3.5 μ diameter, branched, septate, walls 0.2 μ thick, hyaline. Hymenial layer to 18 μ deep, a dense palisade of setae, basidia and paraphyses. Setae subulate or ventricose, some with hamate apices, 20–36 \times 6–8 μ , walls chestnut, to 2 μ thick. Basidia clavate, 8–12 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subulate or oblong, 6–10 \times 3.5–4 μ . Spores obovate, subglobose, or globose, 4.5–5.5 \times 3–3.5 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: Coromandel, Auckland.

DISTRIBUTION: New Zealand, Australia, Tasmania, New Guinea, North, Central and South America, Africa, East Indies.

HABITAT: Bark or decorticated wood of dead standing and fallen trunks, associated with a white pocket rot.

CUNONIACEAE. *Weinmannia racemosa*. Auckland, Te Moeau, Coromandel Peninsula, 700 m. Taranaki, Mt. Egmont, 770–850 m. LAURACEAE. *Beilschmiedia tarairi*: Auckland, Ngunguru, Whangarei. *Beilschmiedia tawa*: Auckland, Lake Okataina, 500 m; Lake Waikaremoana, 450 m. MELIACEAE. *Dysoxylum spectabile*: Auckland, Riverhead; Taupiri Mt., 300 m. PODOCARPACEAE. *Podocarpus dacrydioides*: Auckland, Smiths Bush, Takapuna. UNKNOWN HOSTS. Auckland, Woods Bay, Titirangi. Westland Hot Springs Track, Waiho, 200 m. Queensland, Bunya Mountains (Lloyd 622 as *Fomes torulosus*); Eugilla Range. New South Wales, The Oaks (Lloyd 53 as *Fomes squarrosus*). Victoria, Beech Forest, Belgrave. South Australia, National Park; Dorrigo (Lloyd 446 as *Fomes yucatensis*). Western Australia, Narrogin. Tasmania, Mt. Wellington; National Park.

IN KEW HERBARIUM: "Vic., Dr Mueller", type of *Polyporus victoriae*; "Vic., Mt Napier, Johnson", filed under *Poria corium*; "N.Z., Coromandel, 309, 310", type of *Polyporus zealandicus*; "N.Z., Berggren" and "Sunday Island, Kermadec Islands, W. R. B. Oliver", under *Fomes zealandicus*; "Q., Bunya Mountains, J.B.C.", under *Fomes torulosus*; and "Vic., D.F.P., 2494", under *Fomes hamatus*.

From *Phellinus setulosus*, which also possesses hamate setae, the species may be separated by the absence of a cortex, usually velutinate pileus surface, and the lighter colour of hymenial surface and context. Most plants are applanate. Some setae are hooked at their apices, with tips bent at right angles, but many are erect with acuminate apices.

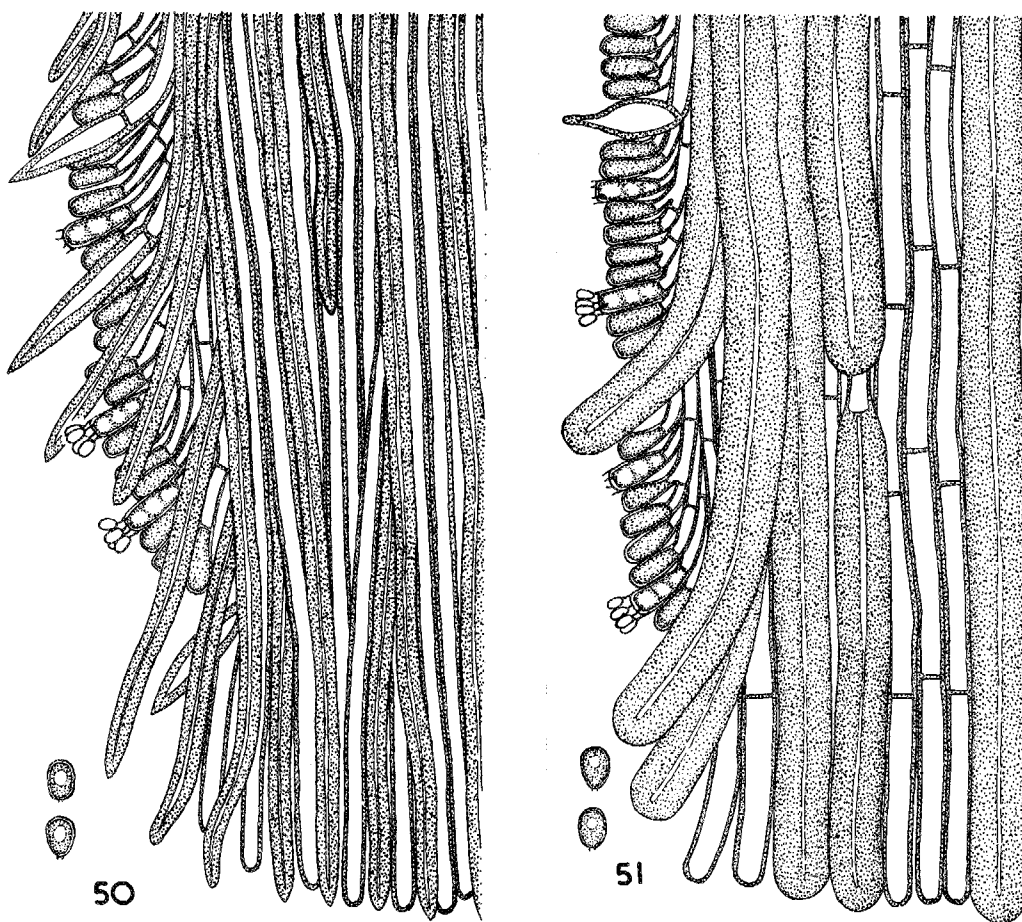


FIG. 50. *Phellinus lamaensis* $\times 600$, spores $\times 1200$. Section through a dissepiment showing abundant setal hyphae of narrow diameter, aseptate skeletal hyphae, septate generative hyphae, setae, hymenial layer, and spores.

FIG. 51. *Phellinus noxious* $\times 600$, spores $\times 1200$. Section through a dissepiment showing stout abundant setal hyphae, septate skeletal and generative hyphae, hymenial layer, one seta, and spores.

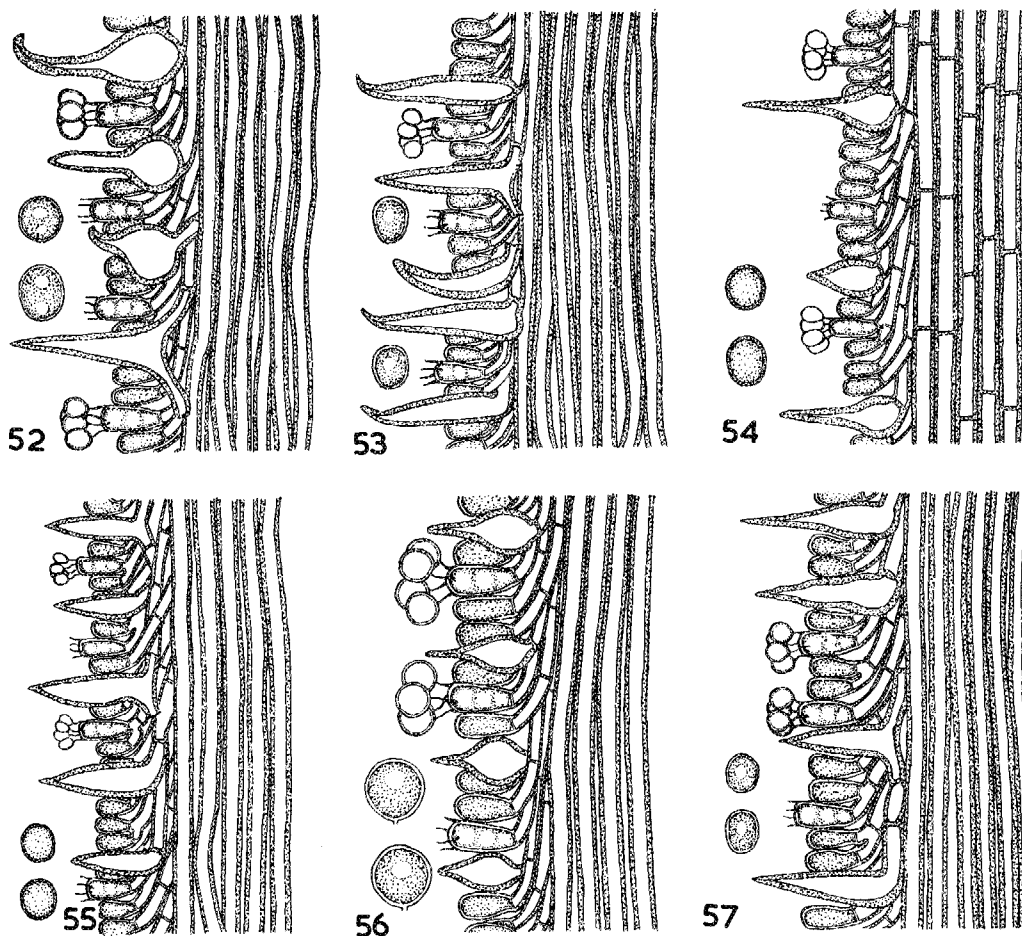
The type of *Polyporus victoriae* was, on examination, found to be a resupinate form of the species, as was the type of *Poria uncinata* ex "N.S.W., Milsom Island, Hawkesbury River, J.B.C." The New Zealand record of the latter (Cunningham 1948a, p. 3) was based on a resupinate specimen of *Phellinus zealandicus*.

6. *Phellinus melanoporus* (Montagne) comb. nov.

Fig. 54

Polyporus melanoporus Mont., in Sagra Pl. Cell. Cuba p. 422, 1842. *Polyporus cornubovis* Cke., Grevillea 13 : 2, 1884. *Fomes cornubovis* Cke., Grevillea 13 : 119, 1885. *Fomes melanoporus* (Mont.) Cke., Grevillea 14 : 20, 1885. *Nigrofomes melanoporus* (Mont.) Murr., Bull. Torrey bot. Club 31 : 425, 1904.

Hymenophore perennial, solitary, firm and woody, attached by a lateral base. Pilei applanate or effused-reflexed, sometimes ungulate, 6–18 cm wide, 5–11 cm radius, to 5 cm thick; pileus surface black, radiate-striate peripherally, basally tuberculate, glabrous; cortex to 1 mm thick, black, shining, of skeletal hyphae cemented into a compact palisade; margin bluntly rounded, radiate-striate, or even; hymenial surface chocolate or fuscous, often violaceous or olivaceous, sometimes black, plane, with a rounded sterile border 2–3 mm wide, tomentose. Pores stratose, 1–2 mm deep in each layer, chocolate, fuscous, or black, round, 10–12 per mm, 75–100 μ diameter; dissepiments



- FIG. 52. *Phellinus setulosus* $\times 600$, spores $\times 1200$. Section through part of a dissepiment showing two hooked and two acuminate setae, hymenial layer, and subglobose and oval spores.
- FIG. 53. *Phellinus zealandicus* $\times 600$, spores $\times 1200$. Section through part of a dissepiment showing most of the setae with slightly hooked apices, hymenial layer, and subglobose or broadly obovate spores.
- FIG. 54. *Phellinus melanoporus* $\times 600$, spores $\times 1200$. Section through a dissepiment showing ventricose setae, hymenial layer, compact arrangement of hyphae and oval to subglobose spores with coloured walls.
Setae are rare, the three shown were found in one large section of approximately 1×0.5 mm and figured together to illustrate the various shapes seen.
- FIG. 55. *Phellinus nilgheriensis* $\times 600$, spores $\times 1200$. Section through part of a dissepiment showing acuminate small setae, hymenial layer, and subglobose spores with tinted walls.
- FIG. 56. *Phellinus robustus* $\times 600$, spores $\times 1200$. Section through part of a dissepiment showing ventricose broad setae, hymenial layer, and large subglobose apiculate spores.
- FIG. 57. *Phellinus senex* $\times 600$, spores $\times 1200$. Section through part of a dissepiment showing moderately large subulate setae, hymenial layer, and globose or subglobose spores.

25–100 μ thick, commonly about 75 μ , equal, apices delicately velutinate. Context to 1 cm thick, chocolate, obscurely zoned, of intertwined hyphae; skeletal hyphae to 4 μ diameter, sparsely branched, freely septate, walls to 1 μ thick, fuscous; generative hyphae to 3 μ diameter, branched, septate, walls 0.1 μ thick, hyaline. Hymenial layer to 15 μ deep, a dense palisade of setae, basidia and paraphyses. Setae scanty, or rare, ventricose, 18–40 \times 5–10 μ , walls fuscous, to 3 μ thick. Basidia clavate, some oblong, 8–10 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 2 μ long. Paraphyses oblong, 6–8 \times 3–3.5 μ . Spores subglobose, globose, or a few obovate or oval, 3.5–5 \times 3.5–4 μ , walls smooth, pallid fuscous, 0.1 μ thick.

TYPE LOCALITY: Cuba.

DISTRIBUTION: North and Central America, East and West Indies, Fiji, New Guinea, Australia, New Zealand.

HABITAT: Bark or decorticated wood of dead often erect branches and trunks, associated with a white pocket rot.

LAURACEAE. *Beilschmiedia tarairi*: Auckland, Waipoua Kauri Forest. UNKNOWN HOSTS. New Guinea, Lac. Queensland, Danbulla. Fiji, Colo-i-Suva.

Specific features are the almost black colour of the pileus surface, context and pores, rare bulbous setae, minute pores, septate skeletal hyphae, and fuscous walls of the small subglobose spores. The hymenophore is firm, heavy, hard and horny because of the compact arrangement of the hyphae which are usually embedded in mucilage. Setae are rare in sections from three to five having been seen. In Fig. 54, three are illustrated to show the forms in which they appear. These were found in one section approximately 1×0.5 mm.

7. *Phellinus nilgheriensis* (Montagne) comb. nov.

Fig. 55

Polyporus nilgheriensis Mont., Ann. Sci. nat., II, 18 : 12, 1842. *Polyporus extensus* Lev., Ann. Sci. nat., III, 5 : 129, 1846. *Polystictus nilgheriensis* (Mont.) Fr., Nova Acta, III, 1 : 78, 1851. *Fomes extensus* (Lev.) Cke., Grevillea 14 : 18, 1885. *Fomes nilgheriensis* (Mont.) Bres.?

Hymenophore biennial or perennial, solitary, coriaceous, attached by a narrow lateral base. Pilei conchate or applanate, 1–7 cm wide, 1–6 cm radius, 3–7 mm thick; pileus surface chestnut to umber, at first finely tomentose, often drying glabrous, or becoming so when old, strongly closely concentrically sulcate, often radiately sulcate; margin acute, bay or chestnut, not or seldom lobed; hymenial surface dark ferruginous to umber, often showing two or three receding pore layers, with a broad bay or ferruginous border 1–3 mm wide. Pores chestnut or ferruginous, 8–10 per mm, to 2 mm long in each layer, 80–95 μ diameter, dissepiments 50–85 μ thick, tapering to the velutinate apices. Context 2–3 mm thick, of parallel hyphae radiately arranged, fulvous or chestnut, becoming umber with age, cortex a narrow black seam 100–300 μ thick lying beneath abhymenial hairs, in young specimens reduced to a tenuous layer visible only in sections under a microscope; skeletal hyphae 3.5–4 μ diameter, sparsely branched, aseptate, walls to 1.5 μ thick, brown; generative hyphae 2–2.5 μ diameter, branched and septate. Hymenial layer to 20 μ deep, a loose palisade of setae, basidia and paraphyses. Setae usually ventricose, sometimes bent or angled, 16–28 \times 4–8 μ , walls to 2 μ thick, chestnut. Basidia subclavate or subglobose, 6–10 \times 4–5 μ , bearing 4 spores; Sterigmata erect, to 3 μ long. Paraphyses subclavate or subglobose, 4–6 \times 3.5–4 μ . Spores subglobose, 3.5–4 \times 3–3.5 μ , walls smooth, tinted yellow, many hyaline, 0.1 μ thick.

TYPE LOCALITY: Nilgiri Hills, India.

DISTRIBUTION: West Indies, South and Central America, India, New Guinea, Samoa, Australia.

HABITAT: Solitary on bark or more usually decorticated dead wood, associated with a white rot. ANACARDIACEAE. *Mangifera indica*: Queensland, Stony Creek, near Cairns. UNKNOWN HOSTS. New Guinea, Strickland River (ex Nat. herb. Vic. labelled by Cooke *Polystictus haskarlui*); no locality, W.E.D.M. Armit, No. 52 (ex herb. Vic. labelled *Polyporus isidioides*). Samoa, Mafa Pass, W. Samoa. Queensland, Redlands; Mt. Nebo; Intake near Cairns.

Separated from related species with setae and coloured spore walls by the tomentose, closely concentrically sulcate surface of the pileus, coloured cortex and small spores. The surface is at first tomentose, but as plants age hairs may disappear or become imbricated upon the pileus surface. The context may be conspicuous and readily seen as a black seam beneath the abhymenial hairs, or tenuous when it may be detected in sections examined under a microscope. Spores are subglobose, of the dimensions given, and in mature plants spore walls are tinted yellow, but often hyaline in young plants. Judging from specimens examined *Polyporus extensus* Lev. is based on the species, agreeing closely with a co-type specimen of '*P.* nilgheriensis' in Kew herbarium ex herb. C. Montagne from India.

8. *Phellinus conchatus* (Persoon ex Fries) Quelet,

Enchiridion fungorum, p. 173, 1886.

(*Boletus conchatus* Pers. Obs. Mycol. 1 : 24, 1796). *Polyporus conchatus* Pers. ex Fr., Syst. Mycol. 1 : 376, 1821. *Fomes conchatus* (Pers. ex Fr.) Gill., Champ. France, p. 685, 1878. *Xanthochrous conchatus* (Pers.) Pat., Essai Tax. Hymen., p. 101, 1900. *Pyropolyporus conchatus* (Pers.) Murr., Bull. Torrey bot. Club 30 : 117, 1903. *Fomes densus* Lloyd, Syn. Gen. Fomes, p. 245, 1915.

Hymenophore perennial, corky-woody, imbricate, attached by a broad lateral base. Pilei ungulate or effused-reflexed, 5–30 mm wide, 8–16 mm radius, 5–15 mm thick; pileus surface bay or chestnut, becoming umber, darker basally, concentrically sulcate, tomentose or strigose with glabrous bands between, undulate; cortex to 100 μ thick, chestnut in section, of densely compacted partly cemented hyphae from which arise the abhymenial hairs; margin bluntly acute, lighter in colour, entire or crenate; hymenial surface bay or chestnut, glancing, even, concolorous, with a narrow sterile border 1 mm wide. Pores in several strata each 1–5 mm deep, sometimes with a delicate layer of context hyphae between, ferruginous, 5–6 per mm, 50–150 μ diameter; dissepiments 100–200 μ thick, equal, apices finely velutinate. Context pallid chestnut, to 0.5 mm thick, of densely intertwined hyphae; skeletal hyphae to 4 μ diameter, aseptate, sparsely branched, walls to 1 μ thick, chestnut; generative hyphae to 2.5 μ diameter, branched, septate, walls 0.2 μ thick, hyaline. Hymenial layer to 16 μ deep, a dense palisade of setae, basidia and paraphyses, soon collapsing. Setae scanty, subulate or ventricose, 16–28 \times 5–8 μ , walls chestnut, 0.5–1 μ thick. Basidia subclavate, 10–14 \times 7–8 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, or many oblong, 8–12 \times 5–6 μ . Spores globose or subglobose, 4.5–5.5 μ diameter, walls smooth, hyaline, 0.2 μ thick.

TYPE LOCALITY: Europe.

DISTRIBUTION: Europe, North America, Australia, New Zealand.

HABITAT: Bark of dead branches.

PODOCARPACEAE. *Phyllocladus alpinus*: Canterbury, Governors Bush, Mt. Cook, 850 m. UNKNOWN HOST: New South Wales, Kendall.

IN KEW HERBARIUM: Two collections from the region are filed under *Fomes conchatus* ex "Q., Endeavour River" and "Christmas Island".

Diagnostic features are the thin context, hirsute zoned surface of pilei with a delicate cortex beneath the abhymenial hairs, rather scanty setae of moderate length, and globose hyaline spores. The description has been drawn from small specimens which, despite the coniferous host, agree in essentials with authentic collections from Europe examined in Kew herbarium. In general appearance pilei resemble small forms of *Phellinus zealandicus*, and spores are similar. The species differs in the presence of a delicate cortex and subulate setae.

9. *Phellinus robustus* (P. Karsten) Bourdot & Galzin

Fig. 56

Bulletin Trimestriel de la Societe Mycologique de France 41 : 188, 1925.

Fomes robustus Karst., Bidr. Finl. Nat. Folk 48 : 467, 1889. *Polyporus hartigii* Allesch. & Schnab., Fung. Bav. Exsicc. Cent. I, p. 48, 1890. *Pyropolyporus calkinsii* Murr., Bull. Torrey bot. Club, 30 : 113, 1903. *Pyropolyporus bakeri* Murr., N. Am. Flora 9 : 104, 1908. *Fomes squarrosus* Lloyd, Letter 53 : 10, 1914. *Fomes robinsoniae* Lloyd, Syn. gen. Fomes, p. 234, 1915. *Polyporus multisetosus* Lloyd, Mycol. Notes 63 : 976, 1920.

Hymenophore perennial, solitary, firm and woody, attached by a broad lateral base. Pilei ungulate, applanate, occasionally subglobose, seldom effused-reflexed, occasionally resupinate, 5–30 cm wide, 3–20 cm radius, 3–15 cm thick; pileus surface at first fulvous, soon umber or black when old, concentrically coarsely sulcate and ridged, frequently vertically or concentrically creviced when old, occasionally rimose; cortex 0.5–3 mm thick, hard, black, shining in section, of intertwined mainly erect hyphae densely compacted and cemented; margin obtuse, rounded, entire, bay or ferruginous; hymenial surface bay, ferruginous, or umber, plane, often creviced when old, with a sterile border 2–5 mm wide. Pores strigose, each layer 2–4 mm deep, often with seams of context hyphae between, ferruginous, round, 5–7 per mm, 75–125 μ diameter; dissepiments 100–150 μ thick, equal, apices velutinate. Context rhubarb or cinnamon, when old umber, of mainly parallel hyphae radiately

arranged; skeletal hyphae to $5\ \mu$ diameter, aseptate, sparsely branched, walls to $1\ \mu$ thick, pallid chestnut; generative hyphae to $3\ \mu$ diameter, branched, septate, walls $0.1\ \mu$ thick, hyaline. Hymenial layer to $20\ \mu$ deep, a dense palisade of setae, basidia and paraphyses. Setae abundant or scanty, but always present, ventricose, with inflated bases and acute apices, $16\text{--}24 \times 6\text{--}12\ \mu$, walls to $1\ \mu$ thick, chestnut. Basidia subclavate, $8\text{--}14 \times 4.5\text{--}5\ \mu$, bearing 4 spores; sterigmata erect, to $3\ \mu$ long. Paraphyses subclavate or oblong, $6\text{--}12 \times 4.4\text{--}5\ \mu$. Spores globose or subglobose, a few broadly apiculate obovate, $5.5\text{--}7 \times 5\text{--}6\ \mu$, walls smooth, hyaline, $0.5\ \mu$ thick.

TYPE LOCALITY: Runsala, Finland.

DISTRIBUTION: Probably cosmopolitan.

HABITAT: Bark or decorticated wood of dead standing or fallen trunks, associated with a white pocket rot.

ARALIACEAE. *Meryta sinclairii*: Auckland, South-west King Island. ARAUCARIACEAE. *Araucaria* sp.: Queensland, University Grounds, Brisbane. BURSERACEAE. *Canarium* sp.: Queensland, Kirrima. CASUARINACEAE. *Casuarina torulosa*: Queensland, Imbil State Forest. COMPOSITAE. *Cassinia leptophylla*: Wellington, Weraroa, sandhills. CUNONIACEAE. *Weinmannia racemosa*: Taranaki, Mt. Egmont, 750 m. FAGACEAE. *Nothofagus cliffortioides*: Westland, Four Mile River. Otago, Waiau River, Lake Manapouri. *Nothofagus fusca*: Auckland, Mamaku Forest, 600 m. Wellington, York Bay, 120 m; Days Bay, 80 m. Nelson, Golden Downs; Staircase Creek, Reefton, 700 m. *Nothofagus menziesii*: Auckland, Mamaku Forest, 600 m. Otago, Woodlaw State Forest. *Nothofagus truncata*: Auckland, Little Barrier Island. LAURACEAE. *Beilschmiedia tawa*: Auckland, Mangatawhiri Valley, Hunua Ranges, 300 m. MELIACEAE. *Dysoxylum spectabile*: Auckland, Little Barrier Island; Waitakere Ranges, 300 m. MIMOSACEAE. *Acacia aneura*: South Australia, Ooldea; Everard Ranges. *Acacia aulacocarpa*: Queensland, Yorkeys Knob, Cairns; Kamerunga; Gympie. *Acacia kempeana*: Central Australia, Alice Springs. MYRSINACEAE. *Myrsine australis*: Auckland, Waiwera, 50 m. MYRTACEAE. *Angophora lanceolata*: New South Wales, Hawkesbury River. *Eucalyptus alba*: Northern Territory, Groote Eylandt, Arnhem Land. *Eucalyptus redunca*: Western Australia, no locality. *Eucalyptus viminalis*: South Australia, National Park; Rocky River, Kangaroo Island. *Eucalyptus* spp.: Northern Territory, 75 miles west of Powells Creek. Victoria, Christmas Hills. *Leptospermum ericoides*: Auckland, Great King Island; Swanson; Hobsonville; Hunua Falls. *Leptospermum scoparium*: Auckland, Moturoa Island; Waipoua Kauri Forest; Manaia, Whangarei Heads; Swanson; Karekare, Waitakere Ranges, 250 m. Wellington, Days Bay. Otago, Town Belt, Dunedin. PAPILIONACEAE. *Erythrophloeum labouchei*: Northern Territory, Groote Eylandt, Arnhem Land. PROTEACEAE. *Banksia* sp.: Queensland, Noosa Heads. ROSACEAE. *Prunus armeniaca*: South Australia, Nuriootpa. RUBIACEAE. *Coprosma australis*: Auckland, Otari, Hunua Ranges, 300 m. *Coprosma macrocarpa*: Auckland, South-west King Island. *Coprosma rhamnoides*: Auckland, Manaia, Whangarei Heads, 70 m. *Coprosma robusta*: Auckland, Purewa Bush, 30 m. UNKNOWN HOSTS. Northern Territory, Yirrkala Aboriginal Reserve. Queensland, Kalbar; Bunya Mountains (Lloyd as *Fomes calkinsii*). New South Wales, Katoomba; Terrigal; Cremorne (Lloyd 448 as *Fomes densus*); Lisarow (Lloyd 204 as *Fomes yucatensis*); National Park; Killcare; Lindfield. Victoria, Flinders Island, Bass Strait (Lloyd 50 as *F. lineato-scaber*). South Australia, Norwood; National Park; Beaumont; Claremont; Mt. Lofty. Tasmania, Irvine River, Western Australia, Narrogin; Mosman Bay, Swan River.

IN KEW HERBARIUM: Under *Fomes robustus* are "Stradbroke Island, C. E. Hubbard", "Australia", "N.S.W., Moruya, Cheesman" and "N.Z., Levin, G. H. C. -H. McDonald"; under *Fomes setulosus* are "Q., Dunk Island, 36", "N.S.W., Nowra, F. A. Rodway, 14717"; under *F. fomentarius* are "N.Z., Colenso", "Twofold Bay, Tyrone", "Port Jackson, Haviland", "Vic., Melbourne, LeFevre, 203", "Van Ds. Land, Gunn" and "New Guinea, Strickland River, Bauerlen 58"; under *F. igniarius* are "Q., Port Denison, Shann", "Q., Moreton Bay, Bailey", "N.S.W., Illawarra, Kirton" and "Vic. Melbourne, G. LeFevre", under *F. rimosus* is "Q., Daintree River"; and under *Polyporus multisetosus* is the isotype ex "Vic., Ararat, E. J. Semmens, 5".

Probably this is the most abundant species in Australasia. Specimens vary appreciably in surface features, colour of hymenial surface and context, development of the cortex, and abundance of setae. Although always present, setae may be rare, scanty, or abundant. They are strongly ventricose with inflated bases, acuminate apices and relatively thin walls. There is little correlation between abundance or scantiness of setae in different specimens. In plants from certain hosts they are usually scanty, notably so from *Leptospermum scoparium* and species of *Coprosma*, possibly because plants on these hosts are small and ungulate. Pilei are commonly ungulate, less frequently applanate, sometimes resupinate. In one specimen from *Beilschmiedia tawa* the pileus measured $30 \times 20 \times 15$ cm. A cortex is always present in well developed plants, but in old or immature plants may be wanting, in the former flaking away and in the latter scantily developed. It is not possible to separate any of these many forms upon measurable and constant features, since so many intermediates occur in the abundant collections at hand. Additional to the synonyms listed, Lowe (1957, p. 54) gave from North America *Pyropolyporus crustosus* Murr., *Pyropolyporus haematocyli* Murr., *Pyropolyporus texanus* Murr., and *Pyropolyporus abramsianus* Murr.

10. **Phellinus tawhai** comb. nov.

Fuscoporia tawhai G. H. Cunn., N.Z.D.S.I.R. Pl. Dis. Div. Bull. 73 : 8, 1948.

Hymenophore perennial, imbricate, woody, attached by a broad lateral base. Pilei effused-reflexed, narrow margins of broadly resupinate areas, 3–8 cm wide, 0.5–2 cm radius, 5–25 mm thick, commonly resupinate when to 1 m long by 5 cm wide, 1–7 mm thick, with scattered outlying islands; pileus surface umber to black, glabrous, concentrically sulcate and ridged, irregularly radiately ridged, creviced when old; margin bluntly acute, bay, lobed; when resupinate lifting, irregularly lobed, ferruginous, greyish when old; cortex to 150 μ thick, black, of densely intertwined cemented hyphae; hymenial surface interrupted by numerous pilei, nodose or undulate, at first smoky grey or greyish-brown, becoming ferruginous or umber, deeply creviced when old. Pores in 3–4 obscure layers, each 1–2 mm deep, ferruginous, round, 5–7 per mm, 75–150 μ diameter; dissepiments 50–400 μ thick, equal, finely velutinate with hairs encrusted with fine crystals. Context to 2 mm thick, chestnut or ferruginous, of densely intertwined hyphae embedding numerous crystals; skeletal hyphae to 3.5 μ diameter, aseptate, sparsely branched, undulate, walls to 1 μ thick, yellow-brown; generative hyphae to 3 μ diameter, branched, septate, walls 0.2 μ thick, hyaline or tinted. Hymenial layer to 20 μ deep, a dense palisade of setae, basidia and paraphyses. Setae subulate, a few ventricose, 30–40 \times 6–8 μ , most 30–32 μ long, walls chestnut. Basidia obclavate, 8–12 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, some oblong, 6–11 \times 3.5–4 μ . Spores cylindrical with rounded ends, 5–6 \times 1.5–2 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: Mt. Tongariro, Wellington.

DISTRIBUTION: New Zealand.

HABITAT: Bark of attached dead branches, or erect dead saplings and trunks, associated with a white rot.

CUNONIACEAE. *Weinmannia racemosa*: Auckland, Lake Waikaremoana, trig track, 750 m. FAGACEAE. *Nothofagus cliffortioides*: Wellington, Pangarara River, Mt. Tongariro, 1,300 m, type collection, P.D.D. herbarium, No. 5509; Oturere River, Mt. Tongariro, 1,100 m; Kaimanawa Ranges, 950 m. *Nothofagus fusca*: Hawke's Bay, Upper Mohaka River, 700 m. Westland, Orwell Creek, Ahaura; Totara Flat, Granville Forest. *Nothofagus menziesii*: Auckland, Lake Waikaremoana, 500 m. Nelson, Little Wanganui River, 270 m. *Nothofagus truncata*: Auckland, Little Barrier Island, 400 m; Mangatangi Valley, Hunua Ranges, 250 m; Kauaeranga Valley, Thames, 700 m.

IN Kew HERBARIUM: "N.Z., A. Menzies ex herb. Sowerby" filed under *Fomes salicinus*.

Resupinate specimens resemble *Fuscoporia ferrea* in microfeatures, differing in small pores, thicker dissepiments, colour of the hymenial surface, and marginal features. The perennial pileate condition is characteristic. Many collections have been made since the resupinate stage was described. Fructifications develop as large sheets upon erect dying or dead trunks, with numerous small pilei arising at intervals, appearing as small irregular hoof-shaped nodules in overlapping rows scarcely reaching 2 cm radius. Save some forms of *Phellinus gilvus* the species is not closely related to any other setal bearing *Phellinus* present in the region. It differs in the black cortex, thicker dissepiments, different colour of the hymenial surface and context, and cylindrical spores. The specific name is taken from the group Maori name given to most species of New Zealand beech.

11. **Phellinus rhabarbarinus** (Berkeley) comb. nov.

Polyporus rhabarbarinus Berk., Ann. nat. Hist. 3 : 388, 1839. *Fomes rhabarbarinus* (Berk.) Sacc., Syll. Fung. 6 : 164, 1888.

Hymenophore perennial, solitary, woody, attached by a broad lateral base. Pilei applanate, to 1 cm wide, 7 cm radius, 1.5 cm thick (in the type 12.5 \times 15 \times 2.5 cm); pileus surface date brown, glabrous, concentrically sulcate and ridged; cortex to 0.5 mm thick, black, of densely intertwined hyphae cemented; thick-walled; margin acute, concolorous, lobed; hymenial surface reddish-brown or umber, plane, fertile to the concolorous edge. Pores in 2–3 layers each 1–3 mm deep, umber, round, 9–11 per mm, 60–95 μ diameter; dissepiments 50–90 μ thick, equal or with apices expanded slightly, and velutinate. Context to 5 mm deep, chestnut to rhubarb, of closely compacted mainly parallel hyphae radiately arranged; skeletal hyphae to 4.5 μ diameter, sparingly septate, sparsely branched, walls chestnut, 1–1.5 μ thick; generative hyphae to 2.5 μ diameter, branched, septate, walls 0.2 μ thick, tinted. Setae ventricose, 14–22 \times 6–8 μ , walls dark chestnut, 2 μ thick. Hymenial layer and spores not seen.

TYPE LOCALITY: Unknown, "probably from Brazil" (Berkeley).

DISTRIBUTION: ? South America, New Guinea, Fiji.

HABITAT: Bark of dead standing trunks.

UNKNOWN HOSTS. New Guinea, Lae, Fiji, Vitilevu Island.

Briefly this species may be described as *P. senex* with a strongly developed cortex. Collections were compared with the type in Kew herbarium and found to match. All are sterile.

12. **Phellinus senex** (Nees & Montagne) Imazeki,

Fig. 57

Bulletin of the Government Forest Experiment Station, Tokyo 57 : 115, 1952.

Polyporus senex Nees & Mont., Ann. Sci. nat., II, 5 : 70, 1836. *Fomes senex* (Nees & Mont.) Cke., Grevillea 13 : 118, 1885. *Xanthochrous senex* (Nees & Mont.) Pat., Essai Tax. Hymen., p. 101, 1900. *Fomes hawaiiensis* Lloyd, Syn. Gen. Fomes, p. 260, 1915.

Hymenophore perennial, solitary or imbricate, firm and woody, attached by a broad lateral base. Pilei applanate or effused-reflexed, sometimes resupinate, 3–25 cm wide, 2–16 cm radius, 0.5–4 cm thick; pileus surface bay, chestnut, or umber towards the base, concentrically sulcate and ridged, tomentose becoming glabrous; without a cortex; margin bluntly rounded, fulvous or chestnut, even; hymenial surface chestnut, sometimes darkening with age, even, slightly glancing, with a sterile border 1–3 mm wide. Pores stratose, 2–4 mm deep in each layer, ferruginous, round, 7–9 per mm, 100–150 μ diameter; dissepiments 60–150 μ thick, equal, apices finely velutinate. Context chestnut, to 5 mm thick, of radiately arranged mainly parallel hyphae; skeletal hyphae to 4 μ diameter, sparsely branched, pseudoseptate, walls to 1 μ thick, yellow brown; generative hyphae to 3.5 μ diameter, branched, septate, walls 0.2 μ thick, hyaline or tinted. Hymenial layer to 20 μ deep, a close palisade of setae, basidia and paraphyses, soon collapsing. Setae subulate or ventricose, 24–32 \times 6–8 μ , apices long-acuminate, walls chestnut, to 2 μ thick. Basidia clavate, 8–12 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 6–10 \times 3.5–4 μ . Spores obovate, subglobose, or globose, 4–5.5 \times 3–3.5 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: Juan Fernández Islands.

DISTRIBUTION: Central and South America, East Indies, Philippine Islands, Australia, New Zealand.

HABITAT: Bark or decorticated wood of dead standing or fallen trunks, associated with a white pocket rot.

ESCALLONIACEAE. *Carpodetus serratus*: Auckland, Trounson Kauri Park, 170 m. LAURACEAE. *Beilschmiedia tarairi*: Auckland, Awhitu Peninsula, 120 m. MELIACEAE. *Melia dubia*: Queensland, Wongabel. MYRTACEAE. *Metrosideros excelsa*: Auckland, Bethells Beach. *Metrosideros robusta*: Auckland, Anawhata Road, Waitakere Ranges, 300 m; Cutty Grass Road, Waitakere Ranges, 300 m; Moumoukai Valley, Hunua Ranges, 250 m; Mt. Te Aroha, 400 m. Wellington, Weraroa 25 m; Lake Papaitonga, 20 m; Ngaio, 150 m. PODOCARPACEAE. *Dacrydium cupressinum*: Wellington, Lake Papaitonga, 20 m. Westland, Weheka, 200 m. UNKNOWN HOST. Queensland, Intake, via Cairns.

IN KEW HERBARIUM: "Q., Daintree River, T. Pentzke" filed under *Fomes ignarius*; "Q., Dunk Island, No. 8" as *Fomes senex*; and "New Guinea, Strickland River, Bauerlen 54" under *Fomes spadiceus*.

From *Phellinus zealandicus*, which it resembles closely, the species may be separated by the acuminate, not hooked, setae; and from *P. gilvus*, by the different shape and context colour and smaller pores. It produces a different type of decay. Specimens vary somewhat in size of pores, ranging from 7–9 to 9–11, shape of setae, most being ventricose, some subulate, and in surface markings. The Montagne type in Paris herbarium has pores of the smaller diameter, and agrees exactly with some of our collections. Although spores were not found in part of the type examined, they are abundant in some of the New Zealand collections.

13. **Phellinus scruposus** (Fries) comb. nov.

Polyporus scruposus Fr., Epicrisis, p. 473, 1838. *Polyporus breviporus* Cke., Grevillea 12 : 17, 1883. *Polyporus hookeri* Berk., ex Lloyd Syn. Sect. Apus Polyporus, p. 348, 1915. *Fomes scruposus* (Fr.) G. H. Cunn., N.Z.D.S.I.R. Pl. Dis. Div. Bull. 79 : 11, 1948.

Hymenophore annual or perennial, often imbricate, woody, attached by a lateral base. Pilei applanate, effused-reflexed, sometimes triquetous, occasionally resupinate, 3–14 cm wide, 2–8 cm radius, 0.5–2 cm thick; pileus surface fulvous, ferruginous, or chestnut, seldom concentrically zoned, scrupose with coarse erect tufts of cemented hyphae reaching a length of 4 mm; without

a cortex; margin bluntly rounded, fulvous or fawn, velutinate, even; hymenial surface bay, becoming chestnut or umber, fertile to the edge. Pores ferruginous, in 1-4 layers each 2-5 mm deep, round or angular, 6-7 per mm, 75-125 μ diameter; dissepiments 50-125 μ thick, equal, apices finely velutinate. Context fulvous or cinnamon, of radiately arranged parallel hyphae with the upper layers upturned into vertical tufts; skeletal hyphae to 5 μ diameter, sparsely branched, pseudoseptate, walls 1-2 μ thick, chestnut; generative hyphae to 3 μ diameter, branched, septate, walls 0.1 μ thick, hyaline or tinted. Hymenial layer to 20 μ deep, a dense palisade of setae, basidia and paraphyses, soon collapsing. Setae ventricose, 20-28 \times 6-8 μ , walls chestnut. Basidia subclavate, 10-14 \times 4-5 μ , bearing 4 spores; sterigmata erect, to 4 μ long. Paraphyses subclavate, many oblong, 8-12 \times 3.5-4 μ . Spores elliptical, 4-5 \times 2.5-3 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: North America.

DISTRIBUTION: North America, Africa, East and West Indies, Australia, Tasmania, New Zealand.

HABITAT: Bark or decorticated wood of standing or fallen trunks and branches, associated with a white rot.

CORYNOCARPACEAE. *Corynocarpus laevigatus*: Auckland, Karekare, Waitakere Ranges, 180 m; Spragues Hill, Henderson Valley, 200 m; Purewa Bush, 30 m. CUNONIACEAE. *Weinmannia racemosa*: Auckland, Mt. Te Aroha, 400 m. Taranaki, Mt. Egmont, 770 m. ELAEOCARPACEAE. *Aristotelia serrata*: Auckland, Cascade Kauri Park Waitakere Ranges, 250 m. FAGACEAE. *Nothofagus cliffortioides*: Wellington, Gollans Valley, 120 m. *Nothofagus fusca*: Westland, Hokitika. LAURACEAE. *Beilschmiedia tawa*: Auckland, Hunua Ranges, 300 m; Claudelands Reserve, Hamilton, 45 m. LILIACEAE. *Cordylone australis*: Auckland, South-west King Island. MELIACEAE. *Dysoxylum spectabile*: Auckland, Matapouri Bay, Whangarei; Waikowhai, 150 m; Mt. Te Aroha, 200 m. MONIMIACEAE. *Hedycarya arborea*: Auckland, Dome Valley, Warkworth, 60 m. MYRTACEAE. *Eucalyptus calophylla*: Western Australia, Mundaring Weir. *Eucalyptus globulus*: Auckland, Mt. Te Aroha, 300 m. OLEACEAE. *Gymnelaea lanceolata*: Auckland, Swanson, 80 m. ONAGRACEAE. *Fuchsia excorticata*: Auckland, Cascade Kauri Park, Waitakere Ranges, 250 m. PODOCARPACEAE. *Dacrydium cupressinum*: Wellington, Whakapapa Stream, Mt. Ruapehu, 1,100 m. *Podocarpus spicatus*: Wellington, Weraroa, 25 m. *Podocarpus totara*: Auckland, Kauaeranga Valley, Thames, 70 m. RUTACEAE. *Melicope ternata*: Auckland, South-West King Island. VERBENACEAE. *Vitex lucens*: Auckland, Whangapoua, Coromandel Peninsula. VIOLACEAE. *Melicytus ramiflorus*: Wellington, Weraroa, 25 m. UNKNOWN HOSTS. Western Australia, Pemberton; Claremont. New South Wales, Comboyne. Victoria, Creswick Plantation. Tasmania, Flinders Island, Bass Strait.

IN KEW HERBARIUM: Under *Polyporus scruposus* are "Q., Toowoomba, Hartmann", "Q., Endeavour River, Persieh", "N.S.W., National Park, Sydney, Cheesman", "N.S.W., Pennant Hills, Paramatta River", type of *P. isidioides*, "Vic., Port Albert", "N.Z., Bay of Islands"; under *Polystictus breviporus* is the type ex "Q., Endeavour River"; under *Fomes holosclereus* is "Q., Endeavour River, Persieh"; under *Fomes laurencii* is "Vic., Gippsland, Miss Campbell"; and under *Fomes fomentarius* is "W. Aus., King Georges Sound, Harris"; under *Fomes inflexibilis* "Q., Mount Williams, Belinger River, No. 28".

Separated from *Phellinus gilvus* by the different pileus surface context colour and colour of the hymenial surface, smaller pores, narrower skeletal hyphae and shorter, broader setae. The scrupose surface of typical specimens, which is so characteristic a feature, is produced from bundles of skeletal hyphae cemented into rigid, projecting aculeate tufts which may reach a length of 4 mm.

14. *Phellinus gilvus* (Schweinitz) Patouillard.

Essai Taxonomique sur les Familles et les Genres des Hymenomycetes, p. 97, 1900.

Boletus gilvus Schw., Syn. Fung. Carol. Super. II, p. 70, 1822. *Polyporus gilvus* (Schw.) Fr., Elench Fung. 1 : 104, 1828. *Polyporus rubiginosus* Berk., Ann. nat. Hist. 3 : 324, 1839. *Polyporus laurencii* Berk., Fl. Tasm. 2 : 254, 1860. *Hapalopilus gilvus* (Schw.) Murr., Bull. Torrey bot. Club 31 : 418, 1904. *Fomes gilvus* (Schw.) Lloyd, Letter 42 : 6, 1912. *Polyporus scabrosus* Berk., in herb. Kew, non Fr. 1838).

Hymenophore biennial or perennial, sometimes imbricate, coriaceous, attached by a broad lateral base. Pilei applanate, conchate or effused-reflexed, 3-11 cm wide, 1-5 cm radius, 0.5-2 cm thick; pileus surface fulvous, chestnut, or darker when old, often concentrically zoned with bands of brown hairs of different shades, either glabrous or more usually coarsely velutinate or strigose, radiate-striate; without a cortex; margin acute, even or crenate, sometimes lobed, plane or slightly inturned; hymenial surface ferruginous, uneven, slightly glancing, fertile to the edge. Pores sometimes in strata, frequently of one layer, 2-5 mm deep in each layer, ferruginous or cinnamon, 5-6 per mm, 75-150 μ diameter; dissepiments 50-150 μ thick, commonly 50-75 μ , equal, apices velutinate. Context fulvous or chestnut, 1-7 mm thick, commonly 2-3 mm, of mainly parallel hyphae radiately arranged; skeletal hyphae to 8 μ diameter, sparsely branched, sparsely pseudoseptate, walls pallid yellow brown, 0.5-1 μ thick, often collapsing; generative hyphae to 3 μ

diameter, septate, branched, walls $0.25\ \mu$ thick, hyaline. Hymenial layer to $20\ \mu$ deep, a dense palisade of setae, basidia and paraphyses, soon collapsing. Setae subulate, $20\text{--}42 \times 5\text{--}6\ \mu$, walls chestnut, $1\text{--}2\ \mu$ thick. Basidia subclavate, $8\text{--}12 \times 4\text{--}5\ \mu$, bearing 4 spores; sterigmata erect, to $3\ \mu$ long. Paraphyses subclavate, $6\text{--}10 \times 3.5\text{--}4\ \mu$. Spores elliptical or obovate, apiculate, $4\text{--}6 \times 2.5\text{--}3\ \mu$, walls smooth, hyaline, $0.1\ \mu$ thick.

TYPE LOCALITY: North Carolina.

DISTRIBUTION: Cosmopolitan.

HABITAT: Bark of fallen branches and trunks, associated with a white rot.

ARALIACEAE. *Pseudopanax crassifolium*: Wellington, Erua State Forest, 450 m. COMPOSITAE. *Olearia ilicifolia*: Westland, Douglas Rock, Copland Valley, 1,200 m. CORIARIACEAE. *Coriaria arborea*: Auckland, Rangitoto Island, 160 m; Waionu Valley, Thames, 70 m. CUNONIACEAE. *Weinmannia racemosa*: Taranaki, Mt. Egmont, 710 m; Otago, Lake Wilkie, Catlins. LAURACEAE. *Beilschmiedia tawa*: Wellington, Weraroa, 25 m. MIMOSACEAE. *Acacia aulacocarpa*: Queensland, Ellis Beach. MYRTACEAE. *Eucalyptus* sp.: Victoria, Goongerah. *Melaleuca* sp.: Western Australia, Chittering Lakes. *Metrosideros excelsa*: Auckland, South-west King Island. PROTEACEAE. *Banksia* sp.: Western Australia, Cannington. RHIZOPHORACEAE. *Rhizophora mucronata*: Queensland, Barron River. SALICACEAE. *Salix babylonica*: Wellington, Lake Horowhenua, 25 m. UNKNOWN HOSTS. Northern Territory, Groote Eylandt, Arnhem Land. Queensland, Stradbroke Island (Lloyd 617 as *P. scruposus*); Eight Mile Plains. New South Wales, Hawkesbury River (Lloyd 144 as *P. radiatus*); The Spit, Sydney (Lloyd 176, 263 as *P. lichnoides*); South Australia, Encounter Bay. Victoria, Ararat. Western Australia, Pemberton. Tasmania, Flinders Island, Bass Strait.

IN KEW HERBARIUM: Collections from the region are filed under several covers. Under *Polyporus gilvus* are "Q., Daintree River, Pentzke", "Q., Port Denison, Shann", "Q., Blomfield River, Miss Bauer", "Q., Endeavour River", "S. Aus., Adelaide Nat. Park, Cheesman 55, 68" and "Vic., Melbourne, E. McLennan 8"; under *P. scruposus* are "Q., Enoggera, Bailey" and "N.S.W., Pennant Hills, Challenger Expedition"; under *Fomes conchatus* is "Vic., Melbourne, Le Fevre 206"; under *Fomes senex* is "Vic., Melbourne, Le Fevre 212"; under *Fomes laurencii* are "V.D.L., Laurence 15", "V.D.L., William Gourlie Jr." labelled *Polyporus rubiginosus* and "N.S.W., Clarence River"; under *Fomes carneus* is "N.S.W., Bot. Gardens, Sydney, A. Grant"; and under *Polyporus scabrosus* "ex N.Z."

Although some pilei appear to be thin and with only a single layer of pores other plants frequently exhibit two or three layers and are up to 2 cm thick. Specific features are the long narrow setae, elliptical hyaline spores, the fulvous colour of the context and pores 4–5 per mm. The surface is tomentose. The species is closely allied to *Phellinus scruposus*, differing in features set out under the latter.

15. *Phellinus rimosus* (Berkeley) Pilat,

Annales Mycologici 38 : 80, 1940.

Polyporus ignarius var. *scaber* Berk., Ann. nat. Hist. 3 : 324, 1839. *Polyporus rimosus* Berk., Lond. J. Bot. 4 : 54, 1845. *Fomes rimosus* (Berk.) Cke., Grevillea 14 : 18, 1885. *Xanthochrous rimosus* (Berk.) Pat., Essai Tax. Hymen., p. 101, 1900. *Fomes versicolor* Henn., Hedwigia 42 : 75, 1903. *Fomes scaber* (Berk.) Lloyd, Syn. Gen. Fomes, p. 249, 1915. *Fomes tepperii* Lloyd, Syn. Gen. Fomes, p. 256, 1915.

Hymenophore perennial, solitary, woody, attached by a broad lateral base. Pilei ungulate, 3–14 cm wide, 2–7 cm radius, 3–8 cm thick; pileus surface at first chestnut with fawn margins, glabrous and azonate, then grey or black, strongly concentrically sulcate, deeply radiately creviced, finally deeply rimose; without a cortex; margin abruptly rounded, even, lighter in colour; hymenial surface plane, ochre or bay, with a narrow sterile border 1–3 mm wide. Pores fulvous to ferruginous, multistratose, each layer 5–10 mm deep, 1–3 per mm, 100–500 μ diameter; dissepiments 100–300 μ thick, equal, apices finely velutinate. Context fulvous, with radiately arranged hyphae; skeletal hyphae to 8 μ diameter, freely septate, scantily branched, walls to $0.5\ \mu$ thick; generative hyphae to 3 μ diameter, branched, septate, walls $0.2\ \mu$ thick, hyaline or tinted. Hymenial layer to $20\ \mu$ deep, a scanty palisade of basidia and paraphyses. Basidia subclavate, $8\text{--}12 \times 3.5\text{--}4\ \mu$, bearing 4 spores; sterigmata erect, to $3\ \mu$ long. Paraphyses subclavate, many cylindrical, $6\text{--}10 \times 3.3\text{--}5\ \mu$. Spores elliptical, obovate, or some subglobose, $5\text{--}6.5 \times 3.5\text{--}4.5\ \mu$, walls smooth, tinted yellow, $0.2\ \mu$ thick.

TYPE LOCALITY: Tasmania (paratype).

DISTRIBUTION: Australia, Tasmania, Ceylon, India, Africa, Philippine Islands.

HABITAT: Bark or exposed wood of standing living or dead trunks.

CASUARINACEAE. *Casuarina stricta*: Victoria, Mt. Bepcha. *Casuarina* sp.: South Australia, Dilhera. MELIACEAE. *Carapa moluccensis*: Northern Territory, Yirrkala Aboriginal Reserve. MIMOSACEAE. *Acacia cheelii*: New South Wales,

Baan Baa (Lloyd as *Fomes tepperii*). *Acacia* sp.: Western Australia, York near Perth. MYRTACEAE. *Melaleuca halmaturorum*: South Australia, near Cape Spencer, York Peninsula. *Melaleuca pubescens*: South Australia, Halletts Cove. *Melaleuca* sp.: South Australia, Encounter Bay (Lloyd as *Fomes badius* and *F. ignarius*). Western Australia, Sixty miles south of Coolgardie. UNKNOWN HOSTS. Northern Territory, Groote Eylandt, Arnhem Land. South Australia, Naidia. New South Wales, Sydney.

IN KEW HERBARIUM: Collections from the region are the type of *Polyporus ignarius* var. *scaber* ex "Tasmania", "Q., Port Denison, Shann" and "W. Aus., King Georges Sound, Harris" filed under *Fomes fulvus*; "Islands of Torres Strait, Hartmann" under *Fomes rimosus*; "Vic., ex Lloyd" under *Fomes scaber*; "S. Aus., Norwood, J.G.O. Tepper 7315" type of *Fomes tepperii*; "N.S.W., Sydney, J.B.C. 29" as *F. tepperii* and "N.S.W., Narrabri, J.B.C. 36" as *F. tepperii* var. *casuarinae*.

From *Phellinus badius* the species is separated by the larger pores and the freely septate, wide context hyphae. A cortex is absent and the hymenial surface, margin and context are fulvous rather than umber. Plants are often rimose when old, this condition arising through context hyphae near the periphery growing radiately outwards and becoming cemented into compact areas which readily split into segments.

The species was described from a collection ex "Western Australia, Swan River, Drummond No. 144" which unfortunately is now missing from the Kew herbarium. Under this species cover in Kew there are three collections. One, ex "Van Diemens Land, Laurence", was labelled by Berkeley *Polyporus ignarius* var. *scaber* and published in 1839 under that name. On the sheet it had been noted by Bresadola and by Lloyd as 'type'. It is the type of *Fomes scaber* (Berk.) Lloyd. A second collection from Mauritius is of '*Fomes*' *badius*, and a third ex "Q., Daintree River, Pentzke" is of *Phellinus robustus*. I have regarded the Tasmanian specimen as the paratype since it came from Australasia and it agrees with collections listed above. Lloyd's name *Fomes scaber* was based on a varietal name only and cannot supercede the specific name used by Berkeley.

16. *Phellinus badius* (Berkeley) comb. nov.

Polyporus badius Berk., Ann. nat. Hist. 7: 453, 1841. *Fomes badius* (Berk.) Cke., Grevillea 14: 18, 1885. *Trametes badia* (Berk.) Pat., Essai Tax. Hymen., p. 93, 1900. *Polystictus badius* (Berk.) Lloyd, Mycol. Notes 65: 1038, 1921.

Hymenophore perennial, woody, solitary, attached by a broad lateral base. Pilei ungulate, sometimes applanate, 7–15 cm wide, 6–9 cm radius, 5–8 cm thick; pileus surface glabrous, at first ferruginous or bay, becoming almost black, concentrically sulcate, radiately striate, or not, then rimose at first near the base finally completely and deeply fissured; cortex in section black, about 0.5 mm thick, of densely cemented more or less radiately arranged hyphae; margin bluntly acute, pallid ferruginous save when old, equal; hymenial surface plane, ferruginous, with a sterile border 1–3 mm wide. Pores usually in many obscure layers each 3–15 mm deep, sometimes in one, ferruginous, 4–6 per mm, 150–200 μ diameter; dissepiments 120–200 μ thick, equal, apices finely velutinate. Context ferruginous or umber, to 15 mm thick composed of parallel hyphae radiately arranged; skeletal hyphae to 6 μ diameter, sparsely branched, septate, walls 0.5–1.5 μ thick, chestnut; generative hyphae to 3 μ diameter, septate, branched, walls 0.5 μ thick, tinted. Hymenial layer to 18 μ deep, a scanty palisade of basidia and paraphyses. Basidia subclavate, 10–14 \times 4–4.5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 8–12 \times 3.5–4 μ . Spores oval, subglobose, or some elliptical, 5–7 \times 4.5–5 μ , walls smooth, tinted pallid yellow-brown 0.5 μ thick.

TYPE LOCALITY: Labelled as Arctic America, but probably from the West Indies where the species is abundant.

DISTRIBUTION: Southern North America, Central America, West Indies, India, Africa, East Indies, Australia.

HABITAT: Bark of erect living or dead trunks.

BURSERACEAE. *Canarium australicum*: Northern Territory, Bickerton Island. CASUARINACEAE. *Casuarina stricta*: South Australia, Mt. Dutton, Eyres Peninsula. MELIACEAE. *Carapa moluccensis*: Northern Territory, Yirrkala Aboriginal Reserve. MIMOSACEAE. *Acacia aulacocarpa*: Queensland, Gympie. *Acacia dealbata*: Victoria, Lincoln Gully, Creswick. *Acacia* sp.: Queensland, Redbank Plains. MYRTACEAE. *Eucalyptus* sp.: Western Australia, Ivanhoe. UNKNOWN HOSTS. New Caledonia, Ouen Toro, 30 m, Northern Territory, Groote Eylandt, Arnhem Land. Queensland, Moreton Bay (misnamed *Polyporus patouillardii* by Lloyd). New South Wales, Landsdowne Forest; near Sydney. Victoria, Stanley Creek, Howe Ranges.

In superficial features this species is a difficult one to separate from *Phellinus rimosus* but the pores are small and context hyphae narrow. Typical specimens agree with the types in Kew herbarium and other authentic collections therein, but as in both species, pore size varies and pilei assume many forms and surface features, it is probable that they are merely forms of one species.

Lowe (1957, p. 28) gave as additional synonyms *Xanthochrous ignarioides* Pat., *Pyropolyporus underwoodii* Murr., *Fomes subendosheius* Bres., and *Pyropolyporus melleicinctus* Murr.

17. ***Phellinus inermis*** (Ellis & Everhart) comb. nov.

Poria inermis Ell. & Ev., Proc. Acad. nat. Sci. Phil., p. 322, 1894. *Fomitiporella inermis* (Ell. & Ev.) Murr., N. Am. Flora 9 : 13, 1907. *Fuscoporia inermis* (Ell. & Ev.) G. H. Cunn., N.Z.D.S.I.R. Pl. Dis. Div. Bull. 73 : 12, 1948. *Fomes inermis* (Ell. & Ev.) G. H. Cunn., N.Z.D.S.I.R. Pl. Dis. Div. Bull. 79 : 14, 1948.

Hymenophore perennial, firm and woody, often imbricate, attached by a broad lateral base. Pilei narrowly effused-reflexed when 1.5–8 cm wide, 0.5–1.5 cm radius, or usually resupinate when forming elliptical areas to 20 × 5 cm, 1–8 mm thick; pileus surface umber, soon black, concentrically ridged and sulcate, dull glabrous; cortex to 100 μ thick, black and shining, of densely intertwined cemented hyphae with walls thickened and deeply coloured; margin bluntly acute, even, entire, bay or cinnamon; hymenial surface ferruginous, umber, or chocolate, often creviced when old, with a cinnamon sterile border 1–2 mm wide. Pores obscurely stratoise, 1–3 mm long in each layer, cinnamon, slightly glancing, round 5–6 per mm, 100–150 μ diameter; dissepiments 50–150 μ thick, equal, apices finely velutinate. Context dark ferruginous, or umber, 0.2–1 mm thick, of intertwined hyphae; skeletal hyphae to 3 μ diameter, aseptate, sparsely branched, undulate near ends, walls yellow-brown, to 1 μ thick; generative hyphae to 2 μ diameter, branched, septate, walls 0.2 μ thick, hyaline or tinted yellow. Hymenial layer to 15 μ deep, a dense palisade of basidia and paraphyses, soon collapsing. Basidia subclavate, 8–10 × 4.5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 6–8 × 3.5–4 μ . Spores oblong with rounded ends, ovate, or a few subglobose, 4.5–6 × 4–4.5 μ , walls smooth, golden brown, 1 μ thick.

TYPE LOCALITY: New Jersey.

DISTRIBUTION: North America, New Zealand, Samoa.

HABITAT: Bark or decorticated wood of fallen branches, associated with a white rot.

CUNONIACEAE. *Weinmannia racemosa*: Taranaki, Dawson Falls, Mt. Egmont, 850 m. Wellington, Tararua Ranges, 600 m. Otago, Ulva Islet, Stewart Island. FAGACEAE. *Nothofagus fusca*: Westland, Orwell Creek, Ahaura, 120 m. LAURACEAE. *Beilschmiedia tawa*: Auckland, Mangatawhiri Ridge, Hunua Ranges, 300 m; Earthquake Flat, Rotorua, 600 m. MYRTACEAE. *Leptospermum ericoides*: Auckland, Great King Island. Wellington, Lake Papaitonga, 20 m. *Metrosideros excelsa*: Auckland, Coromandel Peninsula, coast. *Metrosideros robusta*: Wellington, Ruahine Ranges, 500 m. UNKNOWN HOSTS. Auckland, Te Whaiti, 300 m. Samoa, Pago Pago.

Three of the collections listed, all from *Weinmannia racemosa*, are pileate, pilei being represented by narrow reflexed margins on upper surfaces of broad resupinate areas growing vertically upon erect trunks. A few are unguulate-reflexed, and one is unguulate. The species is therefore a *Phellinus*, with as specific features broadly elliptical spores with thick brown walls, umber or cinnamon coloured context and hymenium, pores of medium size, narrow effused pilei with concentric ridges, and thin black cortex. Pores are usually in two or three, sometimes four strata. [*P. inermis* may be separated from *P. badius* by its thin context, narrow skeletal hyphae, and smaller thick walled spores.] Most plants are resupinate, and may be separated from species of *Fuscoporia* without setae by the coloured spores, save *Fuscoporia umbrinella*, which differs in being multistratose.

18. ***Phellinus lloydii*** (Cleland) comb. nov.

Fomes lloydii Clel., Toadst. and Mushr. of S. Aus., Part II, p. 200, 1935.

Hymenophore perennial, solitary, woody or corky, attached by a lateral base. Pilei applanate, 5–11 cm wide, 4–6 cm radius, to 2.5 cm thick; pileus surface fulvous, then chestnut or umber near the base, obscurely concentrically zoned, irregularly nodose, tomentose becoming glabrous with age; cortex to 200 μ thick, of densely intertwined cemented hyphae chestnut in section, black under a lens; margin bluntly rounded, fulvous, tomentose, even; hymenial surface bay then

ferruginous, even, with a sterile border 2–3 mm wide. Pores in several strata each to 6 mm deep, chestnut or umber, 4–5 per mm, 100–150 μ diameter; dissepiments 50–250 μ thick, equal, apices finely velutinate. Context 1–2 cm thick, rhubarb or fulvous, vaguely zoned, of mainly parallel hyphae radiately arranged; skeletal hyphae to 8 μ diameter, sparsely branched, freely septate, walls 0.5 μ thick, lemon yellow; generative hyphae to 3 μ diameter, branched, septate, walls 0.2 μ thick, hyaline. Hymenial layer to 15 μ deep, a close palisade of basidia and paraphyses, soon collapsing. Basidia clavate, 10–14 \times 4–5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 8–12 \times 3.5–4 μ . Spores globose or subglobose, a few obovate, 4.5–5.5 \times 4–4.5 μ , walls smooth, yellow brown, 0.1 μ thick.

TYPE LOCALITY: National Park, South Australia.

DISTRIBUTION: Australia, New Zealand.

HABITAT: Bark or decorticated wood, associated with a yellow pocket rot.

ARAUCARIACEAE. *Agathis palmerstonii*: Queensland, Kirrima. FAGACEAE. *Nothofagus fusca*: Wellington, Gollans Valley, 120 m. PODOCARPACEAE. *Podocarpus hallii*: Auckland, Te Whaiti, 500 m. *Podocarpus totara*: Auckland, Omahuta State Forest. RUTACEAE. *Flindersia pimenteliana*: Queensland, Atherton Tableland. UNKNOWN HOSTS. New South Wales, Dorrigo. South Australia, National Park, type collection, herb. Cleland.

Close to *Phellinus spadiceus*, the species differs in the larger pores and larger freely septate skeletal hyphae. Both possess the same type of spore. Typical specimens may be recognised by the abundant subglobose spores, with yellow-brown walls, bright rhubarb colour of the context hyphae, tomentose surface and absence of setae.

It is possible the species may have an earlier name in *Polyporus fastuosus* Lev.; but the type of the latter has not been seen so the matter cannot be finalised.

19. ***Phellinus spadiceus*** (Berkeley) comb. nov.

Polyporus spadiceus Berk., Ann. nat. Hist. 3 : 388, 1839. *Fomes spadiceus* (Berk.) Cke., Grevillea 14 : 20, 1885.

Hymenophore perennial, solitary, woody, laterally attached by a broad base. Pilei applanate, 12–18 cm wide, 10–20 cm radius, 1–2 cm thick; pileus surface dark brown, concentrically sulcate, glabrous; cortex to 150 μ thick, black, of compact, cemented, mainly intertwined hyphae with thick chestnut walls; margin bluntly acute, zoned, concolorous, lobed; hymenial surface ferruginous, even, with a narrow sterile border 1–2 mm wide. Pores multistratose, 1–3 mm deep in each layer, ferruginous, 9–10 per mm, 60–85 μ diameter; dissepiments 40–70 μ thick, equal or slightly inflated at apices, velutinate. Context rhubarb or fulvous, to 3 mm thick, of intertwined rather loosely arranged hyphae; skeletal hyphae to 5 μ diameter, sparsely branched, pseudoseptate, walls to 1 μ thick, yellow-brown; generative hyphae to 3 μ diameter, branched, septate, walls 0.2 μ thick, tinted yellow. Hymenial layer to 15 μ deep, a dense palisade of basidia and paraphyses, soon collapsing. Basidia subclavate, 8–12 \times 4–4.5 μ , bearing 4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 6–10 \times 3.5–4 μ . Spores subglobose, apiculate, 4–4.5 \times 3.5–4 μ , walls smooth, golden brown, 0.1 μ thick.

TYPE LOCALITY: India.

DISTRIBUTION: India, Central America, Australia, New Guinea.

HABITAT: Bark or decorticated wood of dead fallen branches and trunks.

DILLENIACEAE. *Dillenia quercifolia*: New Guinea, Papua, Oitandi. PROTEACEAE. *Embothrium wickhami*: Queensland, Wongabel. UNKNOWN HOSTS. New Guinea, Aroa River; Strickland River, W. Bauerlen, 57; Jimari, W. Fitzgerald, 34 (Collections in Nat. herb. Vic.); Papua, Oitandi. Queensland, Cascade Creek; Intake near Cairns. Victoria, Poweltown.

In KEW HERBARIUM: "Q., Dunk Island, 38" filed under *Fomes caryophylli*; "Torres Strait, Hartmann", "Tropical Queensland, Bailey" and "New Guinea, Strickland River, Bauerlen, 50" under *Fomes rimosus*; "New Guinea, Capt. Armit, 10" under *Fomes senex*.

Specimens from the region have been compared with the type from India and found to agree in all essential features. The large applanate pilei resemble those of *Phellinus senex*. Minute pores and small subglobose spores with yellow-brown walls, presence of a cortex, aseptate (or pseudoseptate) skeletal hyphae and absence of setae are the main specific characters.

20. *Phellinus caliginosus* (Berkeley) comb. nov.

Polyporus caliginosus Berk., J. Linn. Soc. 16 : 46, 1877. *Fomes caliginosus* (Berk.) Cke., Grevillea 14 : 20, 1885. *Pyropolyporus caliginosus* (Berk.) Murr., Bull. Torrey bot. Club 34 : 478, 1907. *Fomitopsis caliginosus* (Berk.) Imaz., Bull. Govt For. Exp. Stn, Tokyo 57 : 110, 1952.

Hymenophore annual or perennial, solitary, woody, attached by a broad or narrow lateral base. Pilei applanate or conchate, 7–14 cm wide, 4–9 cm radius, 5–25 mm thick; pileus surface dark umber, fuscous, dark chocolate, concentrically striate and/or sulcate, radiately rugulose, edges often complicate, sometimes with concentric colour zones; cortex to 100 μ thick, appearing black in section, of densely intertwined cemented hyphae; margin acute, inturned, entire or lobed, concolorous; hymenial surface slightly concave, deep chocolate, even, with a sterile border 1–2 mm wide. Pores in 1–4 strata, each layer 2–7 mm deep, chocolate, angular, or round, 8–9 per mm, 65–100 μ diameter; dissepiments 30–55 μ thick, equal, apices velutinate and often toothed. Context 1–2 mm thick, chocolate, of mainly parallel hyphae radiately arranged and usually embedded in mucilage and encrusted with mucilage granules; skeletal hyphae to 3.5 μ diameter, aseptate, sparsely branched save near tapering ends, walls 0.5 μ thick, fuscous, staining; generative hyphae to 2 μ diameter, freely branched, septate, walls 0.2 μ thick, hyaline or tinted. Hymenial layer to 12 μ deep, a loose palisade of basidia and paraphyses embedded in mucilage, soon collapsing. Basidia subclavate, 5–7 \times 4–4.5 μ , bearing 4 spores; sterigmata erect, to 2 μ long. Paraphyses subclavate, 4–6 \times 3–3.5 μ . Spores elliptical, 2.5–3 \times 1–1.5 μ , walls smooth, hyaline or tinted, 0.1 μ thick.

TYPE LOCALITY: Malamon Islands.

DISTRIBUTION: Philippine Islands, Ceylon, Africa, East Indies, Malaya, New Guinea, Australia, Samoa.

HABITAT: Bark of dead usually erect stems.

UNKNOWN HOSTS. New Guinea, Lae. Samoa, Mafa Pass. Queensland, Intake, via Cairns.

IN KEW HERBARIUM: Collections from the region under *Fomes caliginosus* are "Q., Endeavour River", "New Guinea, Armit" and "New Guinea, Raboul"; "Admiralty Islands," is under *Fomes exotephrus*.

Readily identified by the peculiar colour of hymenial surface and context, minute pores which are usually stratosed, minute spores, and prominent cortex. Sometimes a second black seam is present in the context. Context and dissepiment hyphae are embedded in mucilage so that plants, soft when fresh, become hard and woody when dry with inturned and complicate margins. Spores are minute, and walls are hyaline under the microscope but tinted yellow when old or from a spore print. The species resembles *Phellinus endapalus* in context structure and pore size, but differs in shape, slightly smaller spores and narrower dissepiments. Bresadola (1916, p. 223) referred the species to *Polyporus roseo-albus* Jungh.

21. *Phellinus pectinatus* (Klotzsch) Quelet,

Enchiridion Fungorum, p. 173, 1886.

Polyporus pectinatus Kl., Linnaea 8 : 485, 1833. *Polyporus pullus* Mont. & Berk.; Lond. J. Bot. 3 : 332, 1844. *Polyporus haskarlil* Lev., Ann. Sci. nat., III. 2 : 190, 1844. *Polyporus xerampelinus* Kalch. ex Thuem., Grevillea 4 : 72, 1875. *Fomes pectinatus* (Kl.) Gill., Champ. Fr. 1 : 686, 1878. *Polystictus substygicus* Berk. & Br. ex Cke., Nuovo G. bot. ital. 10 : 17, 1878. *Fomes pullus* (Mont. & Berk.) Cke., Grevillea 14 : 19, 1885. *Polystictus haskarlil* (Lev.) Cke., Grevillea 14 : 86, 1886. *Polystictus xerampelinus* (Kalch.) Cke., Grevillea 14 : 86, 1886. *Fomes substygicus* (Berk. & Br.) Sacc., Syll. Fung. 6 : 195, 1888. *Xanthochrous pectinatus* (Kl.) Pat., Essai Tax. Hymen., p. 101, 1900. *Pyropolyporus pectinatus* (Kl.) Murr., Bull. Torrey bot. Club 34 : 479, 1907. *Pyropolyporus subpectinatus* Murr., N. Am. Flora 9 : 109, 1908. *Polyporus substygicus* (Berk. & Br.) Lloyd, Syn. Sect. Apus Polyporus, p. 364, 1915. *Cryptoderma substygium* (Berk. & Br.) Imaz., Bull. Tokyo Sci. Mus. 6 : 107, 1943. *Coltricia haskarlil* (Lev.) G. H. Cunn., Proc. Linn. Soc. N.S.W. 75 : 228, 1950.

Hymenophore perennial, imbricate, coriaceous, attached by a lateral base. Pilei conchate, flabelliform, or unguulate, 1–3.5 cm wide, 0.7–3 cm radius, 2–3 mm thick, in unguulate specimens to 8 mm; pileus surface chestnut to cinnamon, concentrically sulcate and ridged with bands of hairs of different shades of brown, some with glabrous bands between, coarsely strigose near the base; cortex to 150 μ thick, a dense zone of intertwined cemented hyphae chestnut in section; margin inturned, bluntly rounded, bay, tomentose; hymenial surface bay, becoming chestnut, concave, fertile to the edge. Pores stratosed, to 2 mm deep in each layer, bay, 8–9 per mm, 75–100 μ diameter; dissepiments 50–100 μ thick, most 50–75 μ , equal, apices velutinate. Context to 5 mm thick, chestnut, of mainly parallel hyphae radiately arranged; skeletal hyphae to 6 μ diameter, sparsely branched, pseudoseptate, walls 1–2 μ thick, yellow-brown; generative hyphae to 2.5 μ diameter, branched,

septate, walls $0.2\ \mu$ thick, hyaline. Hymenial layer to $15\ \mu$ deep, a dense palisade of basidia and paraphyses, collapsing. Basidia clavate, $8-10 \times 3.5-4\ \mu$, bearing 4 spores; sterigmata erect, to $2\ \mu$ long. Paraphyses subclavate, many cylindrical, $6-8 \times 3-3.5\ \mu$. Spores broadly elliptical, a few subballantoid, $3.5-4 \times 2-2.5\ \mu$, walls smooth, tinted yellow, many hyaline, $0.1\ \mu$ thick.

TYPE LOCALITY: East Indies.

DISTRIBUTION: East and West Indies, North and Central America, Ceylon, Philippine Islands, Fiji, Cook Islands, Australia, New Zealand.

HABITAT: Bark of dead standing trunks and branches, and sometimes exposed roots, associated with a white rot.

MYRTACEAE. *Eucalyptus regnans*: Victoria, Wallaby Creek. *Leptospermum ericoides*: Auckland, Great King Island; Little Barrier Island; Moturoa Island; Cornwallis; Mt. Te Aroha, 250 m. *Leptospermum scoparium*: Auckland, Anawhata Road, Waitakere Ranges, 300 m; Waiaatarua, Waitakere Ranges, 300 m; Swanson, 180 m; Walkers Bush, 250 m; Silverdale, 30 m; Huia, 120 m; Camels Back, Coromandel Peninsula, 160 m. RUBIACEAE. *Coprosma robusta*: Auckland, Silverdale, 30 m. UNKNOWN HOSTS. Queensland, Kalbar. New South Wales, Sydney. Cook Islands, Rarotonga. Fiji, Suva.

IN KEW HERBARIUM: Collections from the region filed under *Fomes pectinatus* are "N.Z., Bay of Islands, 334" and "New Guinea, Armit, 18"; under *Fomes spadiceus* is "Q., Condamine River, Hartmann, 3" labelled by Bresadola *Polyporus nilgheriensis* and by Cooke referred to *Fomes substygius*; under *Fomes loricatus* is "New Guinea, Strickland River, Everells Exped." labelled *Fomes torulosus* and ? *F. loricatus*; under *Polystictus murinus* is "N.S.W., Brodgers Creek, W. Bauerlen"; under *Polystictus haskarlii* are "Q., Daintree River, Harris, "Upper Daintree River, Harris" and "New Guinea, Strickland River, Bauerlen, 35"; under *Polystictus xerampelinus* is the type ex "Q., Rockhampton".

Formerly (1948g, p. 13) I referred the species to *Fomes endozonus* (Fr.) G. H. Cunn. on a specimen so named by C. G. Lloyd, who later referred his species to *Polyporus endozonus* Fr. which he had previously described under *P. enzonus* Lloyd. Later, in Kew herbarium I found specimens from this region to agree with *Phellinus pectinatus*. It may be recognised by the densely tomentose, concentrically zoned pileus surface, presence of a cortex, small pores and minute spores with tinted walls. The species is close to *P. caryophylli* from which it differs in the larger pores, lighter colour of the context, hirsute pileus surface, and context hyphae of greater diameter.

Lowe (1957, p. 17) suggested as an additional synonym *Polyporus boninanus* Pat. I have added *P. haskarlii* after examination of authentic Leveille specimens in Kew herbarium; *P. xerampelinus* Kalch. after examination of an isotype specimen in that herbarium; and *Polystictus substygius* Berk. & Br. after examining the type from Ceylon.

22. *Phellinus endapalus* (Berkeley) comb. nov.

Polyporus endapalus Berk., J. Linn. Soc. 13: 163, 1872. *Fomes endapalus* (Berk.) Cke., Grevillea 14: 20, 1885. *Coriopsis copelandi* Murr., Bull. Torrey bot. Club 35: 392, 1908. *Polystictus copelandi* (Murr.) Sacc. & Trott., Syll. Fung. 21: 322, 1912. *Polyporus pubertatis* Lloyd, Syn. Sect. Apus Polyporus, p. 358, 1915. *Polyporus fuscodesdensis* Lloyd, Mycol. Notes 66: 1112, 1922. *Fomes awhitu* G. H. Cunn., N.Z.D.S.I.R., Pl. Dis. Divn. Bull. 79: 16, 1948.

Hymenophore perennial, imbricate, membranous, attached by a broad lateral base. Pilei narrowly applanate, effused-reflexed, often resupinate, 6-20 cm wide, 2-5 cm radius, 0.5-2 cm thick; pileus surface bay, umber, sometimes violaceous, almost black when old, even or obscurely concentrically zoned, finely pubescent or as often glabrous; cortex to $200\ \mu$ thick, a densely intertwined and cemented layer, frequently wanting in old specimens; margin bluntly rounded, even, entire, concolorous; hymenial surface fawn, bay, rose-pink, or violaceous when fresh, becoming tobacco brown when old, slightly glancing, with a sterile border of lighter colour 1-5 mm wide. Pores stratose, 1-5 mm deep in each layer, bay, chestnut, or violaceous in section, 7-9 per mm, $100-150\ \mu$ diameter; dissepiments $50-100\ \mu$ thick, commonly about $50\ \mu$, equal or slightly tapering, with apices finely velutinate. Context fawn, bay, or chestnut, 1-3 mm thick, of loosely intertwined hyphae; skeletal hyphae to $4.5\ \mu$ diameter, scantily branched, branches tapering and undulate near ends, aseptate, walls $1-1.5\ \mu$ thick, pallid fuscous, staining; generative hyphae to $2.5\ \mu$ diameter, septate, branched, walls $0.2\ \mu$ thick, hyaline. Hymenial layer to $15\ \mu$ deep, a dense palisade of basidia and paraphyses, soon collapsing. Basidia subclavate, $8-10 \times 3.5-4\ \mu$, bearing 4 spores; sterigmata erect, to $3\ \mu$ long. Paraphyses subclavate, $6-9 \times 3-3.5\ \mu$. Spores oblong with rounded ends, $3.5-5 \times 2-3\ \mu$, walls smooth, yellow brown, $0.1\ \mu$ thick.

TYPE LOCALITY: Tweed River, New South Wales.

DISTRIBUTION: Philippine Islands, Japan, Australia, Tasmania, New Zealand.

HABITAT: Bark or decorticated wood of fallen trunks, associated with a white rot.

ESCALLONIACEAE. *Carpodetus serratus*: Auckland, Ottau, Hunua Ranges, 300 m. LAURACEAE. *Beilschmiedia tarairi*: Auckland, Karekare, Waitakere Ranges, 200 m; Awhitu Peninsula, 120 m. *Beilschmiedia tawa*: Auckland, Moumoukai Valley, Hunua Ranges, 300 m; Whitianga-Coromandel Road, 100 m. MIMOSACEAE. *Acacia melanoxylon*: Victoria, Hardys Gully, Dandenong Ranges. MYRTACEAE. *Leptospermum ericoides*: Wellington, Lake Papaitonga, 20 m. PINACEAE. *Larix europaeus*: Otago, Dunedin, 30 m. PODOCARPACEAE. *Dacrydium cupressinum*: Wellington, Erua State Forest, 450 m. *Podocarpus dacrydioides*: Auckland, Papatoetoe Bush, 35 m. UNKNOWN HOSTS. Queensland, Danbulla. Victoria, Sherbrooke Forest. New South Wales, Mummulgum (Lloyd as *Polyporus pubertatis*).

IN KEW HERBARIUM: Collections from the region are the type collection ex "N.S.W., Tweed River, Dr. Guilfoyle", and the isotype of *Polyporus fuscodesdensis* ex "Tasmania, L. Rodway" and "Australia".

Specimens vary appreciably in size, shape, and colour. Most are effused-reflexed, many are resupinate. The hymenial surface of fresh plants may be rose-pink, some shade of brown, or violaceous. The species may be recognised, even if specimens are resupinate, by the minute pores, thin dissepiments, fuscous skeletal hyphae which, although coloured, stain readily with aniline blue, small oblong coloured spores and absence of setae. A cortex is present in well developed pileate specimens, but in immature or weathered plants may be wanting. [Bresadola (1916, p. 224) referred the species to *Polyporus roseo-albus* Jungh., and in Kew herbarium he has referred a collection of this species to *P. roseo-albus* Jungh.]

23. ***Phellinus caryophylli* (Raciborski) comb. nov.**

Trametes caryophylli Racib., Parasit. Algen u Pilze Javas 3 : 17, 1900. *Fomes caryophylli* (Racib.) Bres., Ann. mycol. 10 : 498, 1912.

Hymenophore perennial, solitary or imbricate, woody, attached by a lateral base. Pilei unguate or conchate, 1-6 cm wide, 1.5-5 cm radius, 2-8 mm thick; pileus surface dark umber to almost black, strongly concentrically multistriate and sulcate, with ridges 0.1-1.5 mm apart, zones showing various shades of brown or grey, at first densely velutinate with erect abhymenial hairs umber in colour, becoming glabrous or almost so; cortex to 0.5 mm thick, black in section of densely compacted and cemented mainly parallel hyphae with thick chestnut walls; margin acute, lighter in colour, plane, even or lobed; hymenial surface cinnamon or ferruginous, finally chocolate, even, with a sterile fulvous border 1-2 mm wide. Pores stratose, in 2-5 obscure layers each 1-2 mm deep, or in islands of tissue upon the earlier surface, ferruginous, 10-12 per mm, 40-80 μ diameter; dissepiments 35-60 μ thick, rarely to 80 μ , equal, or with apices slightly expanded, velutinate. Context chestnut or umber, to 1 mm thick, of mainly parallel hyphae radiately arranged; skeletal hyphae to 3 μ diameter, sparsely branched, aseptate, walls to 1 μ thick, reddish-brown; generative hyphae to 2 μ diameter, branched, septate, walls 0.2 μ thick, hyaline. Hymenial layer to 8 μ deep, a close palisade of basidia and paraphyses. Basidia subclavate, 4-6 \times 3-3.5 μ , bearing 2-4 spores; sterigmata erect, to 3 μ long. Paraphyses subclavate, 3-5 \times 2.5-3 μ . Spores subglobose, 2.5-3 \times 2-2.5 μ , walls smooth, tinted yellow, 0.1 μ thick.

TYPE LOCALITY: Buitenzorg, Java.

DISTRIBUTION: East Indies, Australia, New Guinea.

HABITAT: Bark or decorticated erect dead branches.

MYRTACEAE. *Rhodamnia spongiosa*: Queensland, Atherton Tableland. PROTEACEAE. *Cardwellia sublimis*: Queensland, Kirima. UNKNOWN HOSTS. Queensland, Johnstone River; Mt. Demi; Middle Creek, near Cairns.

IN KEW HERBARIUM: "Q., Bellenden Ker, Bailey", "Q., Toowoomba, Hartmann" and "Clarence River, Camara" filed under *Polystictus haskarlui*; and under *Fomes inflexibilis* is "New Guinea, Strickland River".

Resembling *Phellinus pectinatus* in the minute tinted spores, small pores, presence of a cortex, and absence of setae; the species differs in the closely and strongly concentrically multizoned pileus surface, dark umber fugacious tomentum, deep brown hymenial surface and context, minute pores, the latter 10-12 per mm, and thinner context hyphae of different colour. Specimens listed were

previously identified for Australian correspondents as *Fomes pectinatus*. Collections from the region have been compared with a Kew herbarium specimen ex "Buitenzorg, ex herb. Hoehnel" and labelled by Hoehnel as 'original'; it is evidently part of the type collection.

24. ***Phellinus albomarginatus*** (Zippelius ex Leveille) comb. nov.

Polyporus albomarginatus Zipp. ex Lev., Ann. Sci. Nat., III, 2 : 191, 1844. *Polyporus kermes* Berk. & Br., J. Linn. Soc. 14 : 49, 1873. *Polyporus laeticolor* Berk., J. Linn. Soc. 16 : 46, 1877. *Fomes pyrrhocreas* Cke., Grevillea 14 : 11, 1885. *Fomes albomarginatus* (Zipp. ex Lev.) Cke., Grevillea 14 : 19, 1885. *Fomes kermes* (Berk. & Br.) Cke., Grevillea 14 : 19, 1885. *Pyropolyporus albomarginatus* (Zipp ex Lev.) Murr., Bull. Torrey bot. Club 34 : 478, 1907. *Fomitopsis albomarginata* (Zipp. ex Lev.) Imaz., Bull. Govt. For. Exp. Stn, Tokyo 57 : 110, 1952.

Hymenophore perennial, solitary or imbricate, woody, attached by a broad lateral base. Pilei effused-reflexed, sometimes applanate, 5–16 cm wide, 3–6 cm radius, to 2 cm thick; pileus surface dingy grey, pallid brown, or fuscous, concentrically sulcate and ridged, sometimes irregularly radiately rugulose, glabrous but sometimes with irregular warts or tufts of scrupose hairs near the base; cortex to 150 μ thick, a densely intertwined layer of cemented hyphae reddish-brown in section, with beneath the cortex hyphae arranged vertically, loosely or in strands; margin bluntly rounded, concolorous, even or lobed; hymenial surface pallid cream becoming orange rufous, farinose, creviced when old. Pores in 2–5 strata each 2–5 mm deep, orange rufous, 7–9 sometimes 9–11 per mm, 50–100 μ diameter; dissepiments 40–90 μ thick, equal or slightly expanded at apices, velutinate. Context to 12 mm thick, of mainly parallel hyphae radiately arranged, orange rufous; skeletal hyphae to 6 μ diameter, aseptate, scantily branched, lumina to 1 μ wide, walls reddish-brown and encrusted with mucilage granules; generative hyphae to 2.5 μ diameter, branched, septate, walls 0.1 μ thick, hyaline. Hymenial layer to 10 μ deep, a scanty palisade of basidia and paraphyses embedded in mucilage. Basidia subclavate, 6–8 \times 3.5–4 μ , bearing 4 spores; sterigmata erect, to 2 μ long. Paraphyses subclavate, 4–8 \times 3–3.5 μ . Spores allantoid, some cylindrical, 3–3.5 \times 0.5–1 μ , walls smooth, hyaline, 0.1 μ thick.

TYPE LOCALITY: Java.

DISTRIBUTION: East and West Indies, Africa, Ceylon, Philippine Islands, New Guinea, Australia.

HABITAT: Bark or decorticated fallen branches and trunks.

UNKNOWN HOSTS. Queensland, Intake, via Cairns. New South Wales, Thornleigh.

Types of *Fomes pyrrhocreas* ex "New Guinea, Capt. Armit" and *Polyporus laeticolor* ex "Malamon Island, Challenger Expedition" were compared with authentic specimens of *Phellinus albomarginatus* and found to agree in essentials. *Polyporus kermes* of Ceylon also is based on the species. The species may be recognised by the rich orange-rufous colour of the context, presence of a cortex, minute pores, and allantoid spores. In colour and spore shape the species resembles *Polyporus merulinus* differing in the stratosed context, colour of skeletal hyphae deepening to cherry red or violet in aqueous solutions of potassium hydroxide, and absence of clamp connections. The species is anomalous in the genus because of its unusual colour and allantoid spores.

25. ***Phellinus bicolor*** (Junghuhn) comb. nov.

Polyporus bicolor Jungh., Prae. Fl. Crypt. Javae, ins. p. 54, 1838. *Trametes cognata* Berk., J. Linn. Soc. 16 : 43, 1877. *Fomes bicolor* (Jungh.) Cke., Grevillea 14 : 21, 1885. *Polyporus venezuelae* Berk. & Curt., Grevillea 15 : 20, 1886. *Polyporus subpruinatus* Bres., Ann. mycol. 10 : 495, 1912. *Polyporus zebra* Lloyd, Syn. Sect. Apus Polyporus, p. 339, 1915.

Hymenophore annual, or biennial, solitary or imbricate, coriaceous, laterally attached by a narrow base. Pilei conchate or flabelliform, 5–8 cm wide, 4–5.5 cm radius, 2–5 mm thick; pileus surface bay or chestnut, glabrous, radiately and concentrically sulcate, with a few basal lichenoid warts, sometimes with reddish blotches, or both may be absent; without a cortex; margin plane, acute, even or coarsely lobed, concolorous or darker; hymenial surface ferruginous or umber, exhibiting surface irregularities, fertile to the edge. Pores round, ferruginous or darker in section, 8–10 per mm, 60–95 μ diameter, to 2 mm deep; dissepiments 60–170 μ thick, tapering or equal, apices finely velutinate. Context rhubarb or ferruginous, of mainly parallel hyphae radiately arranged; skeletal hyphae to 7 μ diameter, walls 1–1.5 μ thick, brown, aseptate, scantily branched; generative hyphae to 3 μ diameter, branched, septate, walls yellow. Hymenial layer to 16 μ deep, a scanty

palisade of basidia and paraphyses. Basidia clavate, $8-10 \times 5-6 \mu$, bearing 4 spores; sterigmata erect, to 4μ long. Paraphyses clavate or subclavate, $6-8 \times 4.5-5 \mu$. Spores narrowly elliptical, apiculate, $4.5-5 \times 1.5-2 \mu$, walls smooth, hyaline, 0.1μ thick.

TYPE LOCALITY: Java.

DISTRIBUTION: East Indies, Ceylon, South America, New Guinea, Samoa, Fiji, Australia.

HABITAT: Bark or decorticated wood of fallen dead branches, associated with a white rot.

UNKNOWN HOSTS. Fiji, Waidina River, Viti Levu; Suva, New Guinea, Zampota, No. 15, W. Fitzgerald (ex Nat. Herb. Vic. labelled *Fomes carneo-fulvus*); Lae, Queensland, Mt. Nebo.

IN KEW HERBARIUM: "Q., Dunk Island, No. 1" filed under *Polyporus anebus*; "New Guinea, Strickland River, Bauerlen, 26, 37", "New Guinea, Jala River, Armit" and "New Guinea, St Georges River" under *Polystictus meleagris*; "New Guinea, Strickland River, Bauerlen" under *Polyporus atypus*; "Q., Brisbane, ex herb. Broome 172" under *Poria medulla-panis*; "Samoa, C. G. Lloyd" type of *Polyporus zebra*; "New Guinea, Papua, C. E. Carr" under *Polyporus bicolor*; and "Aru Islands" type of *Trametes cognata*.

Most specimens examined are annual, pores being in one layer; a few have two pore layers, and two have three. The species is therefore a *Phellinus* as it possesses other features of the genus. The surface varies appreciably in colour, degree of concentric zoning, presence or absence of lichenoid warts, and presence or absence of a reddish stain near the base. Most of these features have been used for identification of the species or of its several synonyms. All collections listed agree in micro-features, even to size and shape of the spores. *Polyporus zebra* and *P. subpruinatus* are based on specimens of the species, although both Lloyd and Bresadola described spores as being subglobose, mistaking mould spores for those of the species. In well developed plants the contrasting colours of the surface of pileus and hymenium are conspicuous, but in many collections they differ only slightly, or both may be some shade of ferruginous.

B. Subfamily FOMITOIDEAE: III Tribe FOMITEAE

Context hyphae with walls coloured some shade of brown, the colour deepening when hyphae are treated with aqueous solutions of potassium hydroxide. Hymenophore pileate, annual or perennial, when perennial with pores in strata; hyphal system trimitic with clamp connections on the generative hyphae; basidial type clavate.

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|--|-----------------------------------|
| 1. Pilei annual or biennial with one or two layers of pores. | |
| 2. Pores round, usually deep and well defined. | |
| 3. Metuloids absent from the context | 27. <i>Osmoporus</i> Sing. |
| 3. Metuloids present in the context and dissepiments | 28. <i>Metuloidea</i> G. H. Cunn. |
| 2. Pores labyrinthiform or daedaloid, or as linear cavities lying between lamellae | 29. <i>Gloeophyllum</i> Karst. |
| 2. Pores round or hexagonal, large, shallow and often toothed | 30. <i>Hexagona</i> Fr. |
| 1. Pilei perennial with several layers of pores in strata. | |
| 2. Spores walls ganodermous, coloured | 31. <i>Elfyngia</i> Karst. |
| 2. Spore walls smooth and hyaline | 32. <i>Fomes</i> Fr. |

27. OSMOPORUS Singer, Mycologia 36 : 67, 1944.

Ceratophora Humb. ex Cda., Ic. Fung. 5 : 25, 1842, *nomen monstrositatis* (Donk, 1960, p. 195). *Anisomyces* Pilat, Atl. Champ. Eur. 3 : 11, 1936, *non* Theiss. & Syd., 1914. *Pseudotrametes* Pinto Lopes, Mem. Soc. broteriana 8 : 160, 1952.

Hymenophore annual, some reviving a second season, solitary or imbricate, attached by a lateral base. Pilei appanate, conchate, or effused-reflexed, cortex present or absent. Pores round or slightly angular, seldom slightly daedaloid, sometimes in two obscure layers. Context of intertwined or parallel hyphae radiately arranged; hyphal system trimitic; skeletal hyphae unbranched, aseptate, walls coloured some shade of brown; binding hyphae aseptate, freely branched, of the bovista type, branches tapering and flexuous, walls brown; generative hyphae branched, septate, walls hyaline, with clamp connections. Basidia and paraphyses forming a dense palisade, usually soon collapsing. Basidia bearing 2-4 spores on brief sterigmata. Spores elliptical, walls smooth, hyaline save in one species where tinted when old, nonamyloid.