

# Resupinate polypores (Basidiomycotina) newly recorded from Taiwan

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**Abstract.** Eight resupinate polypores are reported from Taiwan for the first time, viz. *Antrodia xantha*, *Megasporoporia setulosa*, *Oxyporus cervinogilvus*, *Pachykytospora papyracea*, *Perenniporia medullapanis*, *P. tephropora*, *Phellinus ferreus* and *Wrightoporia avellanea*. Descriptions and microscopic line drawings are provided for the eight species. Sexuality, cultural characters, and nuclear behaviors are described for *Megasporoporia setulosa* and *Pachykytospora papyracea*.

**Keywords:** Cultural studies; Polypores; Taiwan.

## Introduction

In sharing the feature of a poroid hymenial surface, polypores represent a heterogeneous assemblage in the basidiomycetes. The poroid configuration increases the hymenial surface for the production of basidia and basidiospores. The poroid hymenial surface has evolved in many orders among basidiomycetes, so this feature in itself can not be considered highly valuable for systematics. Surveys of the polypores in Taiwan are meager, with only a minor portion reported. The first reports of the Aphyllophorales of Taiwan are found in the 11 volumes of the "Descriptive Catalogue of Formosan Fungi" by Sawada (1919–1959). Subsequently, the main contributions on this group include Chen (1976a; 1976b), Chang (1992a; 1992b; 1993; 1994a; 1994b), and Wu (1995). Most polypores are members of the Polyporaceae Corda s.l. of the heterogeneous Aphyllophorales Rea, and the poroid genera of the Hymenochaetaceae Donk, which belongs to the homogeneous Hymenochaetales Oberw. This study reports seven species of Polyporaceae s.l. and one species of poroid Hymenochaetaceae not previously recorded in Taiwan. All eight polypores are wood-decaying basidiomycetes. Sexuality, cultural characters, and nuclear behaviors are described for two species. The specimens and fungal cultures examined are deposited at NMNS (National Museum of Natural Science, Taiwan).

## Materials and Methods

Description of macroscopic characters were based on dried specimens. Free-hand, thin sections of fruiting bodies were mounted in four media for microscopic studies. KOH (5%) was used for observations and measurements of microscopic characters and to ensure rehydration. Melzer's reagent (IKI) was employed to detect amyloidity and dextrinoidity. Cotton blue (CB) was used as a mounting medium to determine cyanophily. Sulphoaldehyde (SA) was used to detect the reaction of gloeocystidia, a

bluish black color change indicating a positive reaction. The use of these media was previously described by Wu (1990).

The methodology of cultural description and use of cultural codes are based on those used by Nobles (1965) with amendments by Boidin and Lanquetin (1983). Minor modifications have been proposed by other mycologists (e.g., Boidin, 1966; Lanquetin, 1973; Burdsall et al., 1978; Boidin et al., 1980; Burdsall and Nakasone, 1981; Hassan Kasim and David, 1983; Chamuris, 1986). The Nobles' cultural code modified by these mycologists was comprehensively summarized by Nakasone (1990), and is adopted herein. Following Nakasone (1990) mycelia were grown on 1.5% MEA instead of 1.25% MEA. In this study, plates were inverted to avoid accumulation of water produced by the mycelia. Inverted plates permit formation of a hymenium oriented as in nature. Nuclear stainings of mycelia were made with Giemsa (Boidin, 1958). DAPI (4'-6'-diamidino-2-phenylindole) at a concentration of 0.25 µg/ml was used as a fluorescent stain for nuclei of basidiospores. Terminology for nuclear behavior follows Boidin and Lanquetin (1984). The methods of cultural study and determination of sexuality have been detailed by Wu (1996).

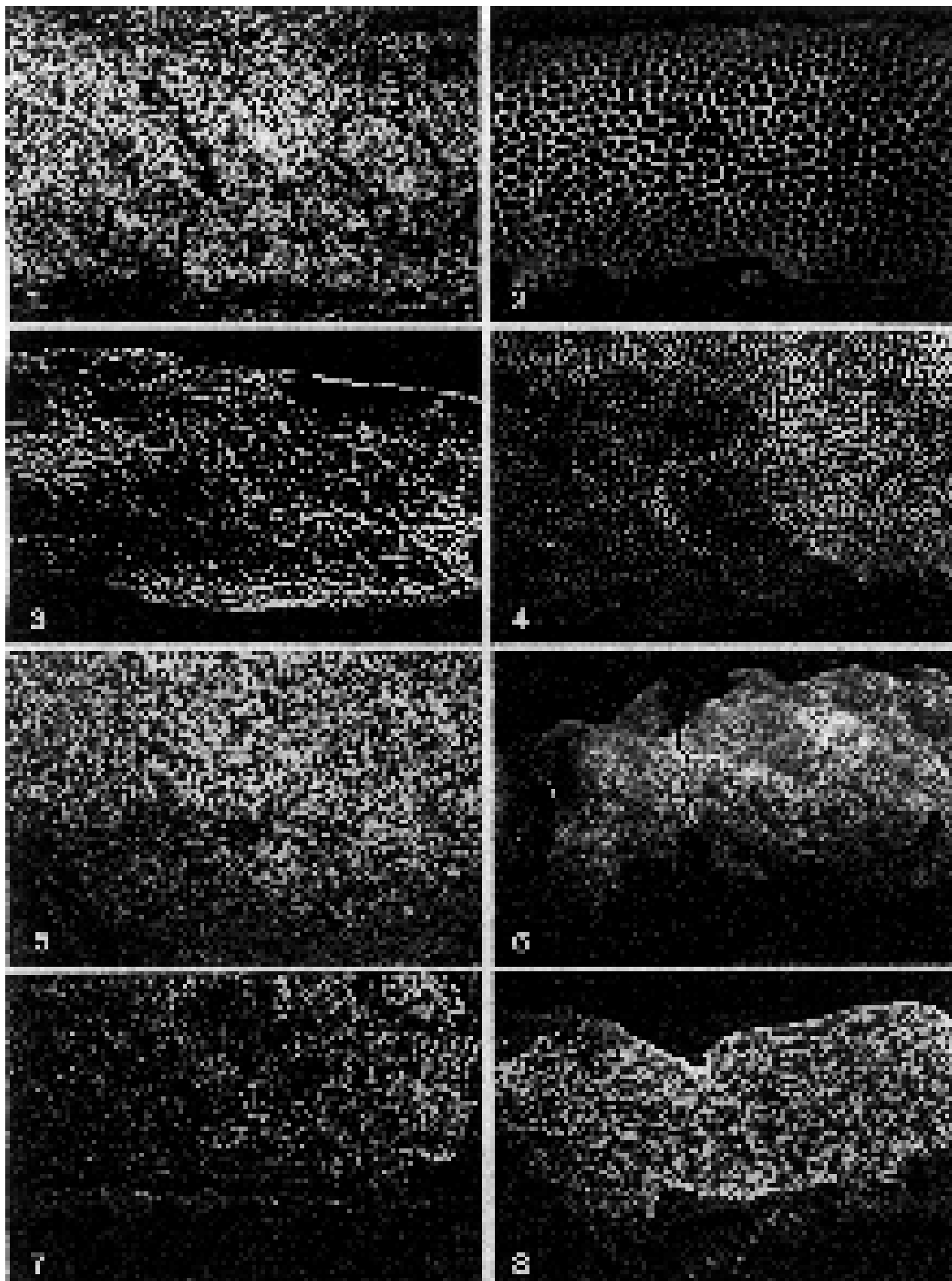
## Taxonomy

**Antrodia xantha** (Fr.) Ryvarden, Norw. J. Bot. 20: 8. 1973. Figures 1, 9A–E

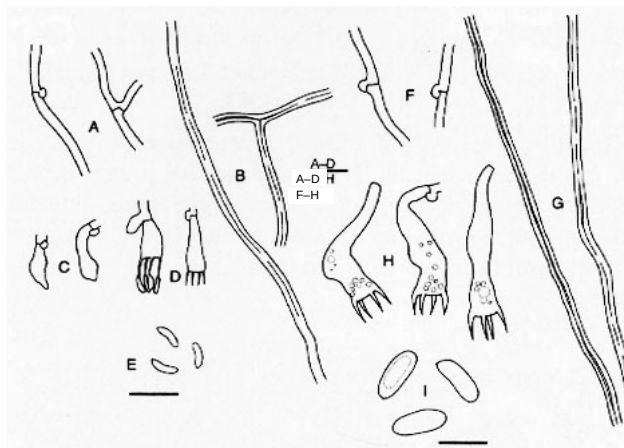
*Polyporus xanthus* Fr., Syst. Mycol. 1: 379. 1821.

Basidioma resupinate, effuse, fairly separable, bitter in taste. Context up to ca. 400 µm thick in section. Hymenial surface pale cream to pale straw-colored, poroid, cracked; margin thinning, white, slightly byssoid. Pores angular, 5–7 per mm; tubes up to 1.5 mm deep.

Hyphal system dimitic; generative hyphae nodose-septate. Context fairly homogeneous, with somewhat loose texture. Contextual generative hyphae colorless, 1.5–3 µm



**Figures 1–8.** Basidiomata, showing the pore surfaces. **1.** *Antrodia xantha* (Wu 9309-7);  $\times 5.64$ . **2.** *Megasporoporia setulosa* (Wu 9312-54);  $\times 5.64$ . **3.** *Oxyporus cervinogilvus* (TF 0095);  $\times 2.04$ . **4.** *Pachykytospora papyracea* (Chen 265);  $\times 5.64$ . **5.** *Perenniporia medullapanis* (Wu 9411-5);  $\times 5.64$ . **6.** *Perenniporia tephropora* (Chen 252); 1.88. **7.** *Phellinus ferreus* (Wu 9509-41);  $\times 5.64$ . **8.** *Wrightoporia avellanea* (Wu 9310-17);  $\times 1.88$ .



**Figure 9.** *Antrodia xantha* (Wu 9309-7: A–E) and *Megasporoporia setulosa* (Wu 9312-54: F–I). Contextual generative hyphae (A, F); contextual skeletal hyphae (B, G); cystidioles (C); basidia (D, H); basidiospores (E, I) (scale bar = 10  $\mu$ m).

diam, thin-walled; skeletal hyphae dominant in context, rarely branched, colorless, 2–3.5  $\mu$ m diam. Trama with dense texture. Subhymenium not thickening. Cystidioles present, apically pointed, 10–14  $\times$  3–4  $\mu$ m, thin-walled. Basidia clavate, 10–15  $\times$  4–5  $\mu$ m, 4-sterigmate. Basidiospores allantoid, colorless, smooth, thin-walled, 4.3–5.3  $\times$  1.2–1.5  $\mu$ m, IKI-, CB-.

**Specimens examined.** **TAIWAN.** NANTOU HSIEN: Yuanfeng, 24°07' N, 121°13' E, 2,800 m alt., on fallen trunk, leg. S.H. Wu, 20 Sep 1993, Wu 9309-7 (NMNS F1257); Yushan National Park, Nanshilintao, 23°22' N, 120°58' E, 1,950 m alt., on branch of *Chamaecyparis formosensis*, leg. S.H. Wu & S.Z. Chen, 13 Oct 1993, Wu 9310-43 (NMNS F1354).

**Distribution.** Pantemperate.

***Megasporoporia setulosa*** (Henn.) Rajchenb., Mycotaxon 16: 180. 1982. Figures 2, 9F–I, 15

*Poria setulosa* Henn., Engl. Bot. Jahrb. 28: 321. 1901.

Basidioma resupinate, effuse, adnate. Context up to ca. 700  $\mu$ m thick in section. Hymenial surface cream, turning cork-colored when old, poroid, not cracked; margin rather determinate, paler, forming an immature zone. Pores angular or circular, 1–2 per mm; tubes up to 600  $\mu$ m deep, with numerous pegs.

Hyphal system dimitic; generative hyphae nodose-septate. Context fairly homogeneous, with dense texture and numerous crystals. Contextual generative hyphae colorless, 1.5–3  $\mu$ m diam, thin-walled; skeletal hyphae dominant in context, rarely branched, colorless or yellowish, 2–4  $\mu$ m diam, sometimes almost solid,  $\pm$  dextrinoid. Trama with dense texture. Subhymenium not thickening. Cystidia lacking. Basidia utriform, with a stalked base, 30–40  $\times$  7–8.5  $\mu$ m, 4-sterigmate. Basidiospores cylindrical, colorless, smooth, thin-walled, 10–12 (–14)  $\times$  4–5.5  $\mu$ m, IKI-, CB-.

**Specimens examined.** **TAIWAN.** NANTOU HSIEN: Lienhuachih, 23°56' N, 120°53' E, 720 m alt., on branch of angiosperm, leg. S.Z. Chen, 17 Oct 1994, Chen 246 (NMNS F2768). KAOHSIUNG HSIEN: Liukuei, Shanping, 22°59' N, 120°40' E, 750 m alt., on branch of angiosperm, leg. S.H. Wu & S.Z. Chen, 22 Dec 1993, Wu 9312-54 (NMNS F1559); Sanming, 23°11' N, 120°39' E, 580 m alt., on branch of angiosperm, leg. S.H. Wu & S.Z. Chen, 23 Dec 1993, Wu 9312-84 (NMNS F1583). PINGTUNG HSIEN: Kenting National Park, Chufengshan, 22°02' N, 120°52' E, 100 m alt., on branch of angiosperm, leg. S.H. Wu, 31 Aug 1994 (NMNS F2462).

**Distribution.** Pantropical and subtropical.

**Cultural description** (secondary mycelium of Wu 9312-54). 1 wk growth: Colony radius 15–20 mm. Advancing zone fairly even. Mats white. Aerial mycelium almost absent. 2 wk growth: Colony radius 43–53 mm. Advancing zone fairly even. Mats white. Aerial mycelium downy, pellicular towards growth margins. Advancing hyphae nodose-septate, colorless, 2–4  $\mu$ m diam, thin-walled. 3 wk growth: Colony radius 70–80 mm. 4 wk growth: Plates covered. 6 wk growth: Mats white or slightly yellow. Aerial mycelium  $\pm$  crustose. Hyphal system dimitic. Aerial generative hyphae colorless, 1–2  $\mu$ m diam, thin-walled. Aerial skeletal hyphae colorless or slightly yellow, 1.5–2.5  $\mu$ m diam, thick-walled, dextrinoid. Submerged generative hyphae colorless, moderately ramified, 1.5–5 (–7.5)  $\mu$ m diam, thin-walled, occasionally irregularly swollen, rarely with thick-walled cystidium-like structures. No distinct odor. Not fruiting.

**Oxidase reactions.** TAA: +++, 0; tr. GAA: +++, 0; 0. TYA: -, 38; 79.

**Species code.** 2a, 3c, 8d, 13, 26, 32, 36, 38, 44, 54, 60, 61.

**Sexuality.** Tetrapolar ( $A_1B_1$ : 1, 2, 3, 4, 7;  $A_1B_2$ : 6;  $A_2B_1$ : 5;  $A_2B_2$ : 8, 9).

**Cytology.** Spores uninucleate, monosporous mycelium uninucleate, secondary mycelium dikaryotic.

**Nuclear behavior.** Normal.

**Remarks.** *Megasporoporia* Ryvarden & Wright is characterized by resupinate basidiomata, dextrinoid skeletal hyphae and large basidiospores. Corner (1989) regarded *Megasporoporia* as inseparable from the genus *Trametes* Fr., and did not consider the above features useful for separating these two genera. However, in this study I found that the basidia of *M. setulosa*, type species of the genus, are utriform in shape. The utriform basidial shape is rare in polypores, and is taxonomically important. Utriform basidia differ from the clavate basidia of *Trametes* species. Rajchenberg (1983) reported the cultural description of *M. setulosa*, but sexuality and nuclear behavior have not been previously described for *Megasporoporia* species.

**Oxyporus cervinogilvus** (Jungh.) Ryvarden, Norw. J. Bot. 20: 3. 1973. Figures 3, 10A–D

*Polyporus cervinogilvus* Jungh., Verh. Batav. Genootsch. Kunst. Wetensch. 17: 45. 1838.

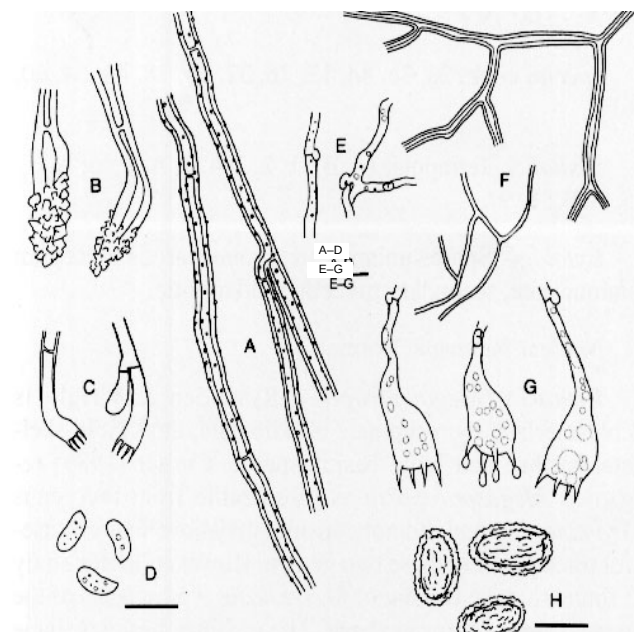
Basidioma resupinate, effuse with reflexed margin to weakly pileate, separable, context up to ca. 500  $\mu\text{m}$  thick in section. Hymenial surface brownish yellow, poroid; margin abrupt, usually paler. Pores angular, 1–2 per mm; tubes up to ca. 2 mm deep. Abhymenial surface of pileus villose, clay yellow.

Hyphal system monomitic; hyphae simple-septate. Context with fairly loose texture; hyphae fairly rigid, colorless or yellowish to slightly brownish yellow, covered with numerous minute crystals, 3–6  $\mu\text{m}$  diam, with 0.8–1.5  $\mu\text{m}$  thick walls. Trama with moderately dense texture. Subhymenium not thickening. Cystidia numerous, ventricose or fusoid, colorless or yellowish, apically encrusted, 20–40  $\times$  7–11  $\mu\text{m}$ , with 1–2  $\mu\text{m}$  thick walls. Basidia subclavate, 15–22  $\times$  4.5–5  $\mu\text{m}$ , 4-sterigmate. Basidiospores ellipsoid or narrowly ellipsoid, adaxially slightly concave, colorless, smooth, thin-walled, usually guttulate, 6.5–8.5  $\times$  3–3.8  $\mu\text{m}$ , IKI-, CB-.

*Specimen examined.* TAIWAN. PENGHU: Wuni, on branch of angiosperm, leg. W.N. Chou, 9 Sep 1993, TF 0095 (NMNS F3859).

*Distribution.* According to Ryvarden and Johansen (1980), this species is widely distributed in tropical and subtropical Asia, as well as in East Africa.

*Remarks.* In the genus *Oxyporus*, this species is characterized by large pores, as well as the yellowish contextual hyphae.

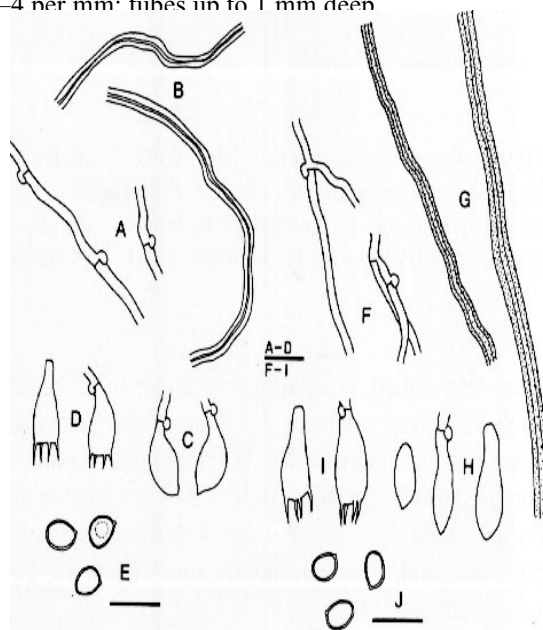


**Figure 10.** *Oxyporus cervinogilvus* (TF 0095: A–D) and *Pachykytospora papyracea* (Chen 265: E–H). Contextual generative hyphae (A, E); Contextual branched skeletal hyphae (F); cystidia (B); basidia (C, G); basidiospores (D, H) (scale bar = 10  $\mu\text{m}$ ).

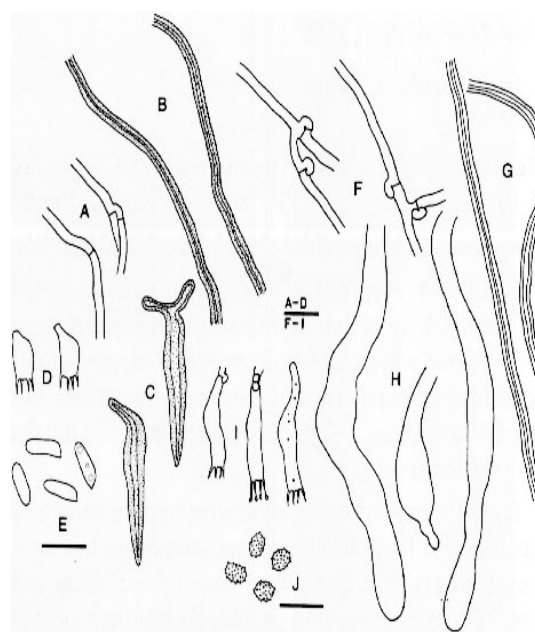
**Pachykytospora papyracea** (Schw.) Ryvarden, Norw. J. Bot. 19: 233. 1972. Figures 4, 10E–H, 13, 14, 16

*Boletus papyraceus* Schw., Natu. Ges. Leipzig Schrift. 1: 99. 1822.

Basidioma resupinate, effuse, adnate. Context up to ca. 400  $\mu\text{m}$  thick in section. Hymenial surface cream or sordid yellow, poroid, rarely cracked; margin rather determinate, whitish, forming an immature zone. Pores  $\pm$  angular, 3–4 per mm; tubes up to 1 mm deep.

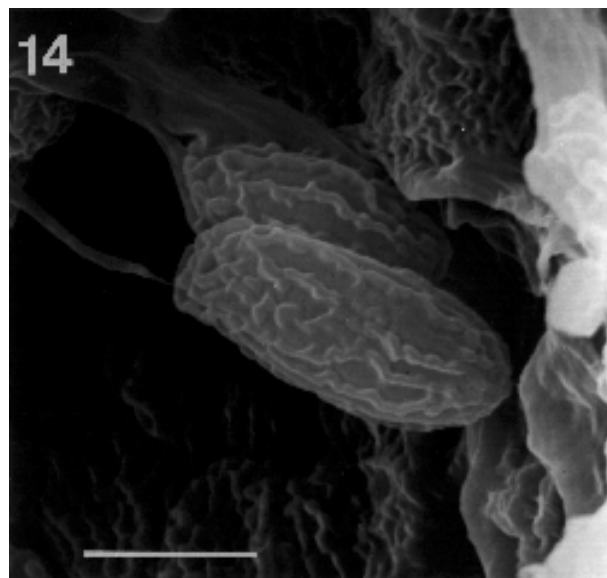
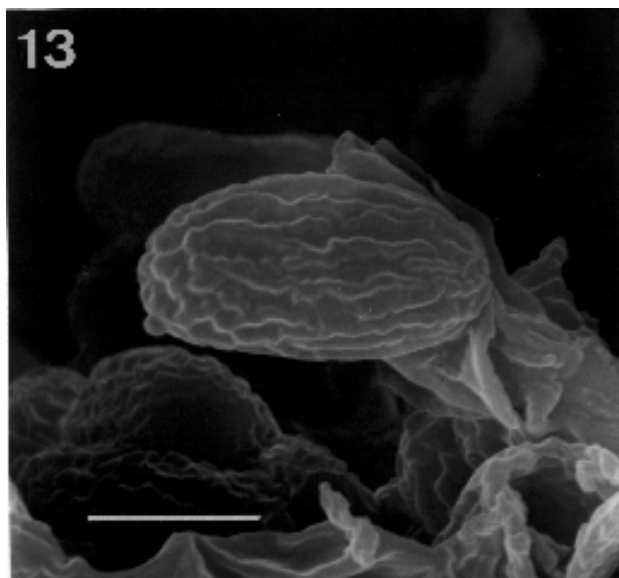


**Figure 11.** *Perenniporia medullapanis* (Wu 9411-5: A–E) and *P. tephropora* (Chen 252: F–I). Contextual generative hyphae (A, F); contextual skeletal hyphae (B, G); cystidioles (C, H); basidia (D, I); basidiospores (E, J) (scale bar = 10  $\mu\text{m}$ ).

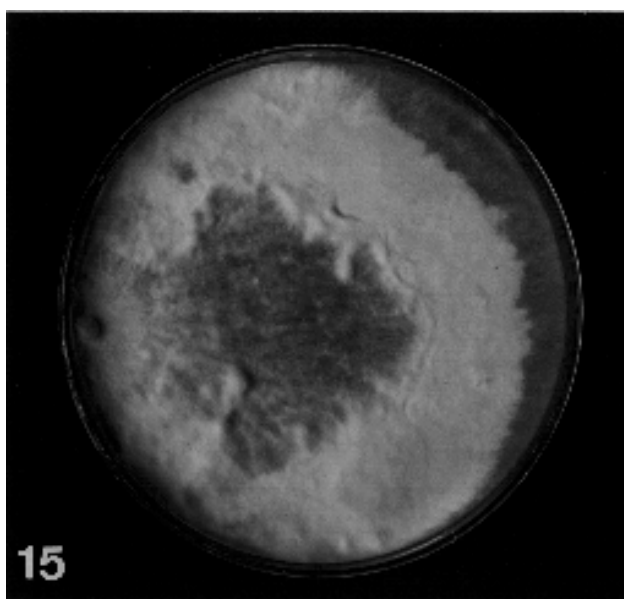


**Figure 12.** *Phellinus ferreus* (Wu 9509-41: A–E) and *Wrightoporia avellanea* (Wu 9310-17: F–J). Contextual generative hyphae (A, F); contextual skeletal hyphae (B, G); setae (C); gloeocystidia (H); basidia (D, I); basidiospores (E, J) (scale bar = 10  $\mu\text{m}$ ).

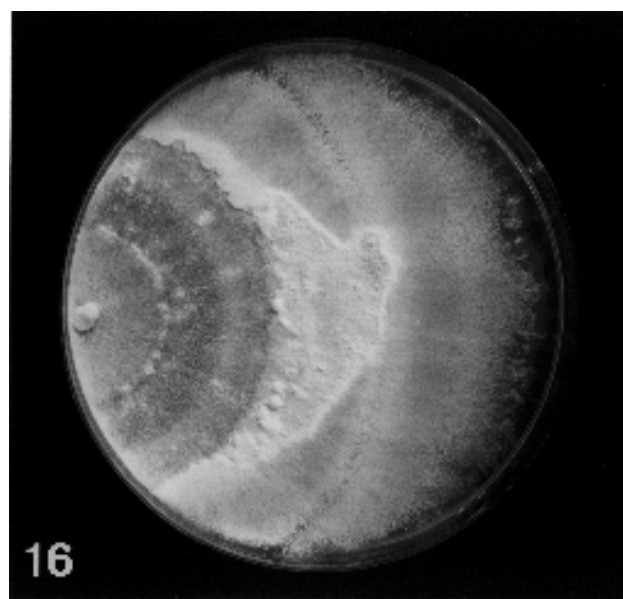




**Figures 13–14.** *Pachykytospora papyracea* (Chen 265). Basidiospores, showing surface ornamentation (scale bar = 5  $\mu$ m, SEM).



**Figure 15.** *Megasporoporia setulosa* (Wu 9312-54). Culture after 6 wk of growth on 1.5% MEA at 25 C.



**Figure 16.** *Pachykytospora papyracea* (Chen 265). Culture after 6 wk of growth on 1.5% MEA at 25 C.

Hyphal system dimitic; generative hyphae nodose-septate. Context fairly homogeneous, with moderately dense texture. Contextual generative hyphae colorless, 1–3  $\mu$ m diam, thin-walled, usually guttulate; skeletal hyphae fairly dominant in context, regularly branched, colorless or slightly yellow, 1.5–3  $\mu$ m diam, with a distinct lumen, the terminal skeletal hyphae may be as narrow as 0.5–1  $\mu$ m diam,  $\pm$  dextrinoid. Trama with fairly dense texture. Subhymenium not thickening. Cystidia lacking. Basidia clavate, with a stalked base, 22–40  $\times$  9–11  $\mu$ m, 4-sterigmate. Basidiospores cylindrical-ellipsoid, colorless, ornamented with aculei which tend to be in rows,  $\pm$  thick-walled, 11–15 (–17)  $\times$  7.5–9  $\mu$ m (aculei included), IKI-, CB-.

*Specimens examined.* **TAIWAN.** ILAN HSIEN: Fushan Botanical Garden, 24°47' N, 121°33' E, 600 m alt., on branch of angiosperm, leg. S.Z. Chen, 9 Mar 1994, *Chen 168* (NMNS F1952). PINGTUNG HSIEN: Payuchiputao, 22°44' N, 120°53' E, 2,000 m alt., on branch of angiosperm, leg. S.Z. Chen, 18 Jan 1995, *Chen 265* (NMNS F2968).

*Distribution.* Widely distributed in subtropical to temperate areas, but not found in Europe.

*Cultural description* (secondary mycelium of *Chen 265*). 1 wk growth: Colony radius 12 mm. Advancing zone even. Mats white. Aerial mycelium slightly pellicular. 2 wk growth: Colony radius 30 mm. Advancing zone slightly

bayed. Mats white. Aerial mycelium farinaceous, zonate. Advancing hyphae colorless, nodose-septate, 2–5  $\mu\text{m}$  diam, thin-walled. 3 wk growth: Colony radius 47–50 mm. 4 wk growth: Colony radius 62–67 mm. 5 wk growth: Colony radius 75–83 mm. 6 wk growth: Plates covered. Mats whitish. Aerial mycelium  $\pm$  crustose, zonate. Hyphal system dimitic. Aerial generative hyphae colorless, moderately ramified, sometimes guttulate, 1–2.5  $\mu\text{m}$  diam, thin- or slightly thick-walled. Aerial fiber hyphae colorless, moderately ramified, 0.7–1.5  $\mu\text{m}$  diam, IKI-. Submerged generative hyphae colorless, moderately or sparsely ramified, usually guttulate, 1.5–5  $\mu\text{m}$  diam, thin-walled. Crystals present. No distinct odor. Not fruiting.

*Oxidase reactions.* TAA: +, 0; -, 0. GAA: +++, 0; 0. TYA: -, 0; tr.

*Species code.* 2a, 3c, 8, 32, 36, 38, 46, 54, 60, 61.

*Sexuality.* Tetrapolar ( $A_1B_1$ : 1;  $A_1B_2$ : 6, 7, 8;  $A_2B_1$ : 2;  $A_2B_2$ : 3, 5).

*Cytology.* Spores uninucleate, monosporous mycelium uninucleate, secondary mycelium dikaryotic.

*Nuclear behavior.* Normal.

*Remarks.* SEM observation of basidiospore surface is firstly presented for *Pachykytospora papyracea*. David (1972) reported sexuality of *P. tuberculosa* (Fr.) Kotl. & Pouzar as tetrapolar which conforms with the sexuality found here for *P. papyracea* that was obtained in this study.

***Perenniporia medullapanis*** (Jacq.:Fr.) Donk, Persoonia 5: 76. 1967. Figures 5, 11A–E

*Boletus medullapanis* Jacq., Miscel. Austr. 1: 141. 1778.

*Polyporus medullapanis* Jacq.:Fr., Syst. Mycol. 1: 380. 1821.

Basidioma resupinate, effuse, adnate. Context fairly thin, up to ca. 150  $\mu\text{m}$  thick in section. Hymenial surface cream-colored, poroid, rarely cracked; margin thinning or rather determinate, usually concolorous. Pores  $\pm$  angular or circular, 5–7 per mm; tubes up to ca. 1 mm deep.

Hyphal system trimitic; generative hyphae nodose-septate. Context fairly uniform, composed of medullary layer, with fairly loose texture. Contextual generative hyphae colorless, 1.5–2.5  $\mu\text{m}$  diam, thin-walled; skeletal hyphae dominant in context, colorless or yellowish, 2–3.5  $\mu\text{m}$  diam, usually with a distinct lumen, dextrinoid; binding hyphae fairly rare, colorless or yellowish, 1.5–2  $\mu\text{m}$  diam, dextrinoid. Trama with fairly dense texture. Subhymenium not thickening. Cystidioles present, fusoid, 12–18  $\times$  5–8  $\mu\text{m}$ , thin-walled. Basidia clavate, 14–20  $\times$  7–8  $\mu\text{m}$ , 4-sterigmate. Basidiospores ellipsoid-truncate, colorless, 4.5–6  $\times$  4–4.5  $\mu\text{m}$ , with ca. 0.4  $\mu\text{m}$  thick walls, dextrinoid.

*Specimen examined.* **TAIWAN.** TAIPEI HSIEN: Yangminshan, 25°09' N, 121°32' E, 600 m alt., on branch of angiosperm, leg. S.H. Wu, 15 Nov 1994, *Wu 9411-5* (NMNS F2748).

*Distribution.* Cosmopolitan.

***Perenniporia tephropora*** (Mont.) Ryvarden, Norw. J. Bot. 19: 233. 1972. Figures 6, 11F–I

*Polyporus tephroporus* Mont., Ann. Sci. Nat. Ser. 3 vol. 4: 358. 1845.

Basidioma resupinate, effuse, hard, adnate. Context dark brown, up to ca. 300  $\mu\text{m}$  thick in section. Hymenial surface pale gray or yellowish gray, poroid, not cracked; margin abrupt, usually brown. Pores  $\pm$  angular, 5–8 per mm; dissepiments fairly thick; tubes up to 2 mm deep.

Hyphal system trimitic; generative hyphae nodose-septate. Context fairly homogeneous, with fairly dense texture. Contextual generative hyphae colorless, 1.5–2.5  $\mu\text{m}$  diam, thin-walled; skeletal hyphae dominant in context, brownish, 2.5–5  $\mu\text{m}$  diam, with a distinct lumen, dextrinoid; binding hyphae fairly rare, yellowish, 1.5–2.5  $\mu\text{m}$  diam, dextrinoid. Trama with dense texture. Subhymenium not thickening. Cystidioles present, fusoid, 13–18  $\times$  5–7  $\mu\text{m}$ , thin-walled. Basidia clavate, 13–17  $\times$  6–8  $\mu\text{m}$ , 4-sterigmate. Basidiospores ellipsoid-truncate, colorless or slightly yellow, 4.5–5.7  $\times$  3.5–4.2  $\mu\text{m}$ , with ca. 0.4  $\mu\text{m}$  thick walls,  $\pm$  dextrinoid.

*Specimen examined.* **TAIWAN.** MIAOLI HSIEN: Tahu, Shuiliutung, 24°23' N, 120°51' E, on branch of angiosperm, leg. S.Z. Chen, 25 Oct 1994, *Chen 252* (NMNS F2770).

*Distribution.* Pantropical and subtropical.

*Remarks.* In the genus *Perenniporia*, this species is distinct by having resupinate fruiting body and grayish hymenial surface.

***Phellinus ferreus*** (Pers.) Bourd. & Galz., Soc. Mycol. France Bull. 41: 247. 1925. Figures 7, 12A–E

*Polyporus ferreus* Pers., Mycol. Europe 2: 89. 1825.

Basidioma resupinate, effuse,  $\pm$  adnate. Context up to ca. 200  $\mu\text{m}$  thick in section. Hymenial surface brown, poroid, sometimes cracked; margin rather determinate, paler, filamentose. Pores  $\pm$  angular, 6–8 per mm; tubes up to ca. 600  $\mu\text{m}$  deep.

Hyphal system dimitic; generative hyphae simple-septate. Context fairly homogeneous, with fairly dense texture. Contextual generative hyphae colorless, 2–3  $\mu\text{m}$  diam, thin-walled; skeletal hyphae dominant, brownish, 2–3.5  $\mu\text{m}$  diam. Trama with dense texture. Subhymenium not thickening. Cystidia lacking. Hymenial setae numerous, subulate or conical, brown, 25–40  $\times$  5–8  $\mu\text{m}$ , with 1–1.5  $\mu\text{m}$  thick walls. Basidia clavate, 10–15  $\times$  5–6  $\mu\text{m}$ , 4-sterigmate. Basidiospores cylindrical, colorless, smooth, thin-walled, 6.7–8.3  $\times$  2.2–2.8  $\mu\text{m}$ , IKI-, CB-.

*Specimen examined.* **TAIWAN.** NANTOU HSIEN: Tungpu, 23°33' N, 120°56' E, 1,600 m alt., on branch of angiosperm, 20 Sep 1995, *Wu 9509-41* (NMNS F3858).

*Distribution.* Cosmopolitan.

***Wrightoporia avellanea*** (Bres.) Pouzar, Česka Mykol. 20: 173. 1966. Figures 8, 12F–J

*Poria avellanea* Bres. in V. Höhnelt, K. Akad. Wiss. Math. Naturw. Klas. Denk. Schr. 83: 14. 1907.

Basidioma resupinate, effuse, consistency fairly soft, ± separable. Context up to ca. 400 µm thick in section. Hymenial surface woody yellow, poroid, not cracked; margin determinant, paler, filamentose. Pores ± angular, ca. 2 per mm; tubes slightly paler than the pore surface, up to 1.5 mm deep.

Hyphal system dimitic; generative hyphae nodose-septate. Context fairly homogeneous, with fairly loose texture. Contextual generative hyphae colorless, 1.8–2.8 µm diam, thin-walled; skeletal hyphae fairly dominant, yellowish or slightly brown, 2–4 µm diam, with a distinct lumen, slightly dextrinoid. Trama with fairly loose texture. Subhymenium not thickening. Gloeocystidia numerous, tubular, ± flexuous, sometimes with several constrictions towards apices, colorless, up to ca. 300 µm long, 4–10 µm diam, thin-walled, with fairly homogeneous contents, SA+. Basidia utriform, 22–28 × 4–5 µm, 4-sterigmate. Basidiospores broadly ellipsoid, colorless, minutely aculeate, thin-walled, 3.8–4.5 (–5) × 2.8–3.3 (–3.6) µm (aculei excluded), amyloid.

*Specimen examined.* **TAIWAN.** NANTOU HSIEN: Yushan National Park, Nanshilintao, 23°22' N, 120°58' E, 1,850 m alt., on branch of angiosperm, leg. S.H. Wu & S.Z. Chen, 13 Oct 1993, *Wu 9310-17* (NMNS F1339).

*Distribution.* According to Gilbertson and Ryvarden (1987), this species is widespread, but rare, in the tropics.

*Remarks.* The shape of basidia in members of *Wrightoporia* Pouzar has always been described as clavate (e.g., Gilbertson and Ryvarden, 1987). However, basidia of *W. avellanea* are here found to be utriform in shape. Careful study of basidial shape for other *Wrightoporia* species may aid delimitation of this genus.

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## 台灣新記錄扁平型多孔菌

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本文報導台灣新發現的扁平型多孔菌八種。這些種類是：*Antrodia xantha*、*Megasporoporia setulosa*、*Oxyporus cervinogilvus*、*Pachykytospora papyracea*、*Perenniporia medullapanis*、*P. tephropora*、*Phellinus ferreus* 以及 *Wrightoporia avellanea*。文內並提供每種之描述和顯微特徵之針筆描圖；此外並提供 *M. setulosa* 和 *P. papyracea* 的性別研究、培養描述以及細胞核行為研究。

**關鍵詞：**培養研究；多孔菌；台灣。