

Research note

Five Aphyllorphorean Fungi (Basidiomycota) New to Taiwan

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【 Summary 】

Five aphyllorphorean fungi (Basidiomycota) new to Taiwan are described and illustrated. These are *Cryptoporus volvatus*, *Gloeostereum incarnatum*, *Polyporoletus sublividus*, *Polyporus admirabilis*, and *Polyporus alveolaris*. The genera *Cryptoporus*, *Gloeostereum*, and *Polyporoletus* are new to the fungiflora of Taiwan. *Polyporoletus sublividus* is a terrestrial fungus, while the others are wood-inhabiting fungi.

Key words: Aphyllorphorales, Taiwan.

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研究簡報

五種台灣新紀錄之無褶菌類

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摘 要

本文報導五種台灣新紀錄之無褶菌類：*Cryptoporus volvatus*, *Gloeostereum incarnatum*, *Polyporoletus sublividus*, *Polyporus admirabilis*和*P. alveolaris*，其中*Cryptoporus*, *Gloeostereum*和*Polyporoletus*等三屬為台灣新紀錄菌屬。*Polyporoletus sublividus*為土棲性真菌，另外四種為木棲性真菌。文內提供每種之形態描述和顯微特徵之描圖。

關鍵詞：無褶菌、台灣。

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During the survey on the aphyllorphorean fungi in Taiwan, four interesting wood-inhabiting fungi and one rare terrestrial fungus in woods were newly found to occur in Taiwan. In this report, they are described and illustrated.

Descriptions of basidiocarp characters were based on fresh and dried specimens. Free-hand sections of basidiocarps were mounted in two reagents for microscopic studies. KOH (3%) was used for observations and measurements of microscopic characters, and to ensure rehydration. Melzer's reagent (IKI) was used to detect amyloidity and dextrinoidity. The methods used for examining the of basidiocarps were described in a previous paper (Chang 1993). Species identification was based on Gilbertson and Ryvarden (1986~1987), Imai (1933), Imazeki and Hongo (1989), and Nunez and Ryvarden (1995, 2001).

Taxonomy

Cryptoporus volvatus (Peck.) Shear, Bull. Torrey Bot. Club 29: 450, 1902. (Fig. 1).

Basidiomata annual, sessile, unguulate, solitary, up to $2 \times 4 \times 3$ cm, soft when fresh, light and corky when dry, upper surface cream-colored to yellowish or tan, azonate, glabrous, often covered with a shiny, laccate layer, smooth or rugose, margin concolorous, continuous with a volva-like structure which completely encloses the pore surface except for a small hole at the base; pore surface pale to dark chocolate brown, pores circular, 4-6 per mm, with entire dissepiments, tubes pinkish-buff, up to 5 mm long; context ivory-white, soft-corky, up to 5 mm thick. Hyphal system trimitic, generative hyphae thin-walled, hyaline, with clamps and occasional branching, mostly 3-7 μ m wide but inflated portions at branches up to 15 μ m wide; skeletal hyphae thick-walled, hyaline, occa-

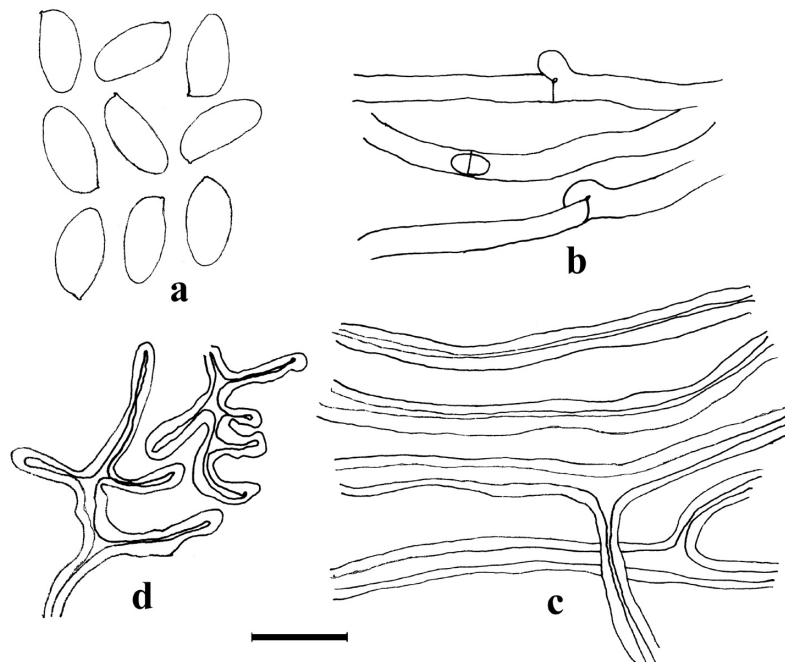


Fig. 1. *Cryptoporus volvatus*. a, Basidiospores; b, generative hyphae; c, skeletal hyphae; d, binding hyphae. Bar = 10 μ m.

sionally branching, 2.5-8 μm wide; binding hyphae thick-walled, much branched, 2-3 μm wide. Cystidioles fusoid, not projecting, thin-walled, 15-28 \times 5-10 μm , with a basal clamp. Basidia clavate, 15-28 \times 7-10 μm , with 4 sterigmata and a basal clamp, Basidiospores cylindrical, hyaline, smooth, IKI-, 8-11 \times 4-5 μm .

Specimens examined. TAIWAN. Nantou County: Aowanta, 1800 m alt., on dead wood of *Pinus taiwanensis*, leg. July 2003. T. T. Chang, TFRI 1107.

Distribution: Widely distributed in coniferous forest regions of North America, also known from East Asia.

Remarks. According to Wu and Zang (2000), *Cryptoporus sinensis* Sheng H. Wu & M. Zang strongly resembles *C. volvatus* except that basidiospores of *C. sinensis* (7.5-10 \times 4-5 μm) are shorter than those of *C. volvatus* [(9-) 10-12.5 (-13.5) \times (4.5-) 5-6 (-7) μm]. Although the basidiospore sizes of the Taiwan specimen are close to those of *C. sinensis*, the range of basidiospore sizes for both species overlap. Therefore, *C. volvatus* is still used for Taiwan collections. It has been reported that the basidiospore sizes of *Ganoderma tornatum* (Pers.) Bres. were affected by latitude, with the higher the temperature, the smaller the basidiospore size (Steyaert 1975). Because *Cryptoporus sinensis* was known only from central and southern provinces of China, its smaller basidiospores may be due to the warmer temperature. It is not justified to erect a new species based on a subtle difference of basidiospore size. Other evidences such as mating and molecular level studies should be conducted.

Gloeostereum incarnatum S. Ito & S. Imai, Transact. Sapporo Nat. Hist. Soc. 13, 9, 1933. (Fig. 2).

Basidiomata annual, subreniform, fan-

shaped, sessile, solitary to imbricate, up to 5 \times 10 \times 1.5 cm, gelatinous and soft when fresh, cartilaginous and hard when dry, upper surface white to pale ochraceous-salmon or buffy-pink, silkily villous. Hymenial surface glabrous, uneven appearing tubercular or rugulose, pinkish-buff, fawn to salmon. Context gelatinous, pinkish-buff. Hyphal system monomitic, generative hyphae thin-walled, hyaline, with clamps, 2.5-4 μm wide. Gloeocystidia cylindrical, cylindrol-clavate to sub-linear, 50-110 μm long, 5-10 μm wide, hyaline with granular contents. Basidia cylindro-clavate, 55-80 \times 5-10 μm , with 4 sterigmata and a basal clamp. Basidiospores ellipsoid, smooth, IKI-, 6-9 \times 2.5-3.5 μm .

Specimen examined. TAIWAN. Taichung County: Hsueshankeng, 1500 m alt., on decayed hardwood, leg. June 2001. W. N. Chou, CWN-5069.

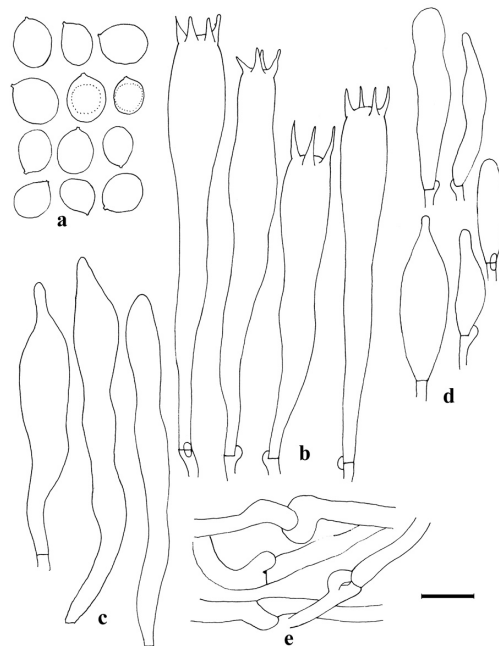


Fig. 2. *Gloeostereum incarnatum*. a, Basidiospores; b, basidia; c, gloeocystidia; d, immature basidia; e, generative hyphae. Bar = 10 μm .

Distribution: Japan and Taiwan.

Remarks. Although the fungus has a gelatinous basidiocarp which resembles certain species of Tremellineae in its general appearance, the microscopic characters undoubtedly place it as a member of the Thelephoraceae. This is the first record of the species outside Japan (Imai 1933).

Polyporeletus sublividus Snell, Mycologia 28: 467, 1936. (Fig. 3).

Basidiomata annual, laterally to centrally stipitate; pileus solitary, circular to reniform, up to 15 cm wide and 2 cm thick; upper surface tomentose to fibrillose, becoming appressed in a reticulate pattern, dark purplish-gray, fading to cinnamon-buff, olivaceous-tawny, almost black after drying, azonate; pore surface purplish-gray to olivaceous after drying, pores circular to angular, 1-3 per mm, with

thick entire dissepiments that become thin and lacerate with age; tube layer decurrent to stipe, up to 0.8 cm thick, pinkish buff; context pinkish-buff to ochraceous salmon, soft and friable, up to 1.2 cm thick; stipe up to 10 cm long and 3.5 cm wide with a bulbous base up to 5 cm wide, reticulate pattern, tomentose to finely hispid, concolorous with upper surface of pileus. Hyphal system monomitic; contextual hyphae mostly thin-walled, with clamps and simple septa, and occasional branching, hyaline to pale gray, 5-10 μm wide, while some larger hyphae with unevenly thick-walled, up to 15 μm wide; tramal hyphae thin-walled, hyaline to pale gray, 2.5-5 μm wide, with clamps, gloeoplurous hyphae also present in trama; large globules of dark brown material exuding from all tissues. Basidia clavate, with 4 sterigmata, 30-45 \times 10-15 μm , with a basal clamp. Basidiospores subglobose to broadly ellipsoid, hyaline, appearing slightly rough, with a double wall separated by interwall pillars, IKI, 10-12 \times 8-10 μm , with a large spherical guttule, outer walls and pillars apparently sloughing off some spores which appear smooth and single-walled.

Specimens examined: TAIWAN. Taipei City: Yuanshan, on ground under *Machilus thunbergii* Sieb. et Zucc., leg. June 2003, T. T. Chang, TFRI 1101.

Distribution: Rarely distributed in the US from the Pacific Northwest and from the Great Smoky Mountains in Tennessee and North Carolina. This is the first record outside the US.

Remarks. *Polyporeletus sublividus* is a taxon morphologically similar to species of *Albatrellus* S. F. Gray except for its unique spores. The species could be a mycorrhizal fungus associated with roots of *Machilus thunbergii* in Taiwan. However, further study needs to be conducted.



Fig. 3. A basidiocarp of *Polyporeletus sublividus*.

Polyporus admirabilis Peck, Bull. Torrey Bot. Club 26: 69, 1899. (Fig. 4).

Basidiomata annual, single caespitose, laterally stipitate or substipitate, pileus applanate to dimidiate, 6-15 cm wide, up to 3 cm thick, white when fresh, becoming cream-colored to pale buff with age, glabrous and pelliculose, azonate or mottled with dark spots, margin concolorous; stipe lateral, with decurrent tubes, up to 7 cm long and 3 cm thick, pale buff to brown at base, glabrous to finely tomentose; pore surface white, drying cream-colored to pale buff, pores circular to angular, 4-5 per mm, with thin, entire to lacerate dissepiments, tubes concolorous with pores, 2-5 mm long; context concolorous with pores, firm-corky, up to 2.5 cm thick. Hyphal system

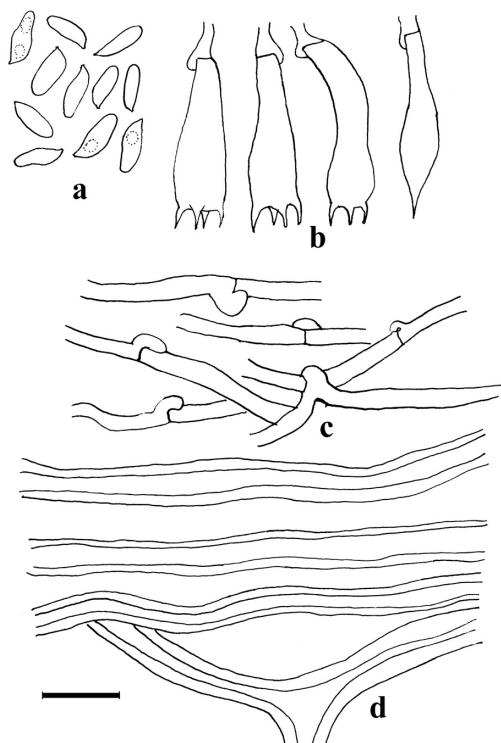


Fig. 4. *Polyporus admirabilis*. a, Basidiospores; b, basidia; c, generative hyphae; d, skeleto-binding hyphae. Bar = 10 μ m.

dimitic; generative hyphae with clamps, thin-walled, 2.5-4.5 μ m wide; skeleto-binding hyphae predominant, thick-walled, hyaline, 2-6 μ m wide, occasionally branching 2.5-7 μ m wide in context. Basidia clavate, 20-30 \times 5-8 μ m, with 4 sterigmata and a basal clamp. Basidiospores cylindrical, hyaline, smooth, IKI, 6-8.5 \times 3-3.5 μ m.

Specimens examined. TAIWAN. Nantou County: Lienhuachih, 500 m alt., on decayed hardwood, leg. Apr 2001, T. T. Chang, TFRI 955; Juiyen, 2200 m alt., on decayed hardwood, leg. Apr 2002, T. T. Chang, TFRI 1044.

Distribution: Widespread in the north-eastern US and in temperate zones in Far Eastern Russia, China, Japan, and Taiwan, in Europe only known from Norway.

Remarks. *Polyporus admirabilis* is a rare species in Taiwan. The white basidiomata and laterally stipitate and smaller basidiospores characterize the fungus.

Polyporus alveolaris (DC.: Fr.) Bondartsev & Singer, Anns. Mycol 39: 58, 1941. (Fig. 5).

Basidiomata annual, sessile to stipitate, circular to dimidiate, up to 8 cm wide and 6 mm thick; pileus pale reddish-yellow, fibrillose to squamose, becoming ivory to pale buff, azonate, becoming glabrous with age, margin concolorous; stipe central to lateral, buff, glabrous, up to 1.5 cm long and 5 mm thick; pore surface white to tan, pores diamond-shaped, radially elongated, 1-2 per mm tangentially, dissepiments lacerate with age, tubes up to 5 mm long; context pale tan to ivory, corky, up to 1 mm thick. Hyphal system dimitic; generative hyphae with clamps, hyaline and thin-walled, rarely branched, 2.5-4 μ m wide; skeleto-binding hyphae thick-walled, much branched, 3-7 μ m wide. Basidia clavate, 25-30 \times 6-9 μ m, with 4 sterigmata and a basal clamp. Basidiospores cylindrical, hyaline, smooth, IKI, 10-14 \times 3.5-5 μ m.

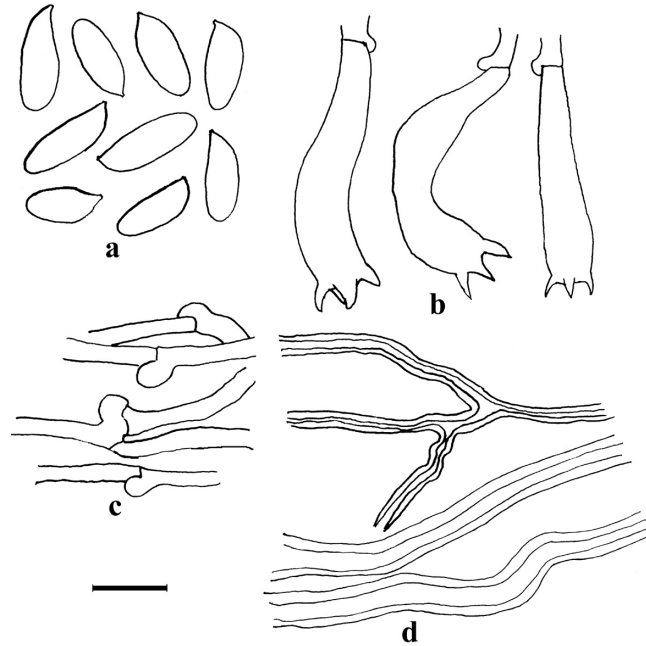


Fig. 5. *Polyporus alveolaris*. a, Basidiospores; b, basidia; c, generative hyphae; d, skeleto-binding hyphae. Bar = 10 μ m.

Specimens examined. TAIWAN. Nantou County: Juiyen, 2200 m alt., on decayed hardwood, leg. Mar 2003, T. T. Chang, TFRI 1084; Tainan County: Matou, plain, on decayed hardwood, leg. May 2004, T. T. Chang, TFRI 1147.

Distribution: Widely distributed in warm-temperate zones.

Remarks: The radially aligned, diamond-shaped pores and the laterally stipitate basidiocarps characterize this fungus.

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