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Three Brown Rot Polypores New to Taiwan and Their Cultural Studies

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ABSTRACT: Three species of brown rot polypores (Basidiomycota) are described and illustrated as new records for Taiwan. They are *Daedalea quercina* Fr., *Oligoporus sericeomollis* (Romell) Pouzar, and *O. undosus* (Peck.) G. L. Gilb. & Ryvarden. Cultural characteristics are also described for these three species.

KEY WORDS: Aphyllophorales, Polypores, Taiwan.

INTRODUCTION

Wood-inhabiting Basidiomycota can be grouped into two categories, white rot and brown rot fungi, according to the way in which they decay wood. White rot fungi have cellulase and lignase enzyme systems that enable them to degrade all components of wood cell walls. However, brown rot fungi selectively degrade cellulose and hemicellulose from wood. The number of brown rot fungi is remarkably small compared with white rot fungi. Gilbertson (1981) has estimated that in North America approximately 6% of the wood-rotting Basidiomycota give a brown rot.

Daedalea Fr. and *Oligoporus* Bref. were common brown-rot fungi observed in Taiwan (Chang, 1999). Four species of *Daedalea* and six species of *Oligoporus* were recorded in Taiwan (Chang, 1999). In the present paper, the author describes one species of *Daedalea* and two species of *Oligoporus* new to Taiwan.

MATERIALS AND METHODS

Descriptions of basidiocarp characters were based on fresh and dried specimens. Free-hand thin 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 examination of basidiocarps have been described in a previous paper (Chang, 1993). Identification was based on Gilbertson and Ryvarden (1986).

The methods of Stalpers (1978) were used to study characteristics of these fungi in pure culture. These fungi were isolated from fruiting bodies examined in the study. Cultures were grown at 25℃ on 2% malt extract agar (MEA) and potato dextrose agar (PDA). Culture response to temperature was determined by measuring the linear growth of colonies on agar plate incubated at temperatures of 10, 15, 20, 25, 30 and 35℃ for 7 days, respectively. For cultural studies petri dishes (85 mm internal diameter, containing 20-25 mL agar) were

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inoculated with a piece of mycelium at the center, kept at 25℃ and macroscopically examined after 2-week and 6-week incubation. Separate slides were prepared from various parts of the colony and mounted in lactophenol for light microscopic observation. The culture code of these fungi followed Stalpers (1978). The methods of cultural study have been detailed by Chang *et al.* (1996).

TAXONOMY AND CULTURAL DESCRIPTIONS

Daedalea quercina Fr., Syst. Mycol. 1: 333, 1821 Fig. 1

Basidiocarps annual to perennial, single to imbricate, broadly sessile to dimitiate, up to 10 cm wide and 4 cm thick, corky to woody, upper surface uneven, tuberculate, smooth to finely velutinate, ochraceous to gray brown, the base more rough or scrupose than the margin which is smooth, margin sharp; pore surface light ochraceous, with daedaleoid to labyrinthine lamellae, lamellae 1-3 mm thick, up to 3 cm long; context up to 1 cm thick, ochraceous to gray brown. Hyphal system trimitic; generative hyphae with clamps, thin-walled, hyaline, up to 4 μm in diameter; binding hyphae tortuous, branched, thick-walled, yellowish brown; skeletal hyphae dominating in the fruiting body, thick-walled, light brown, up to 6 μm in diameter. Basidia not observed. Basidiospores cylindrical, hyaline, smooth, IKI^-, 5-6 × 2.5-3.5 μm.

Specimen examined: TAIWAN. Taitung County: Chulu, 1,800m alt., on fallen hardwood trunk, leg. T. T. Chang, July 2001, TFRI-993.

Distribution: Cosmopolitan species.

Remarks: The fungus is recognized by its even dark color and irregular daedaleoid hymenophore.

Cultural descriptions: Growth rate of the fungus 20-45 mm in 14 days. The ratio of growth rate on MEA and PDA is 1.25. Critical temp. for growth: min. 10℃, opt. 20-25℃. Outline of colony even. Hyphae of the advancing zone appeared raised. Colony white to cream. Aerial mycelia floccose, cottony, woolly to felty. Generative hyphae with clamps. Skeletal and binding hyphae, and chlamydospores present.

Culture code: (7), (8), (9), 12, 19, 21, 22, 25, 30, 31, 39, 42, (44), (45), 46, (48), 49, 52, 53, 54, 83, 85, 89.

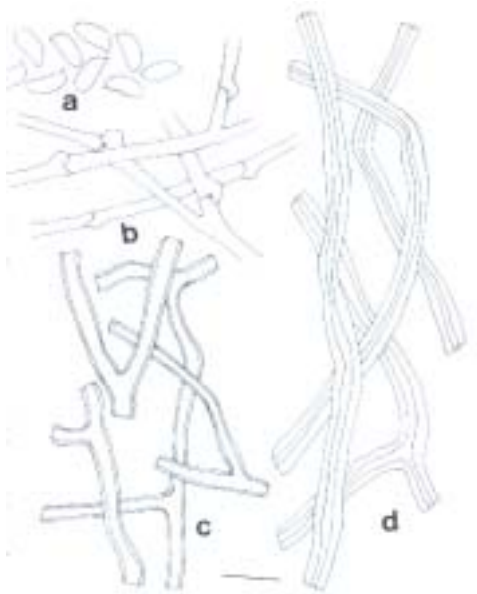

Fig. 1. *Daedalea guercina.* a. Basidiospores. b. Generative hyphae. c. Binding hyphae. d. Skeletal hyphae. Bar = 10 μm.

Oligoporus sericeomollis (Romell) Pouzar, Ceska Mykol. 38: 203, 1984. Fig. 2

Basidiocarps annual, resupinate, readily separable, soft when fresh, corky when dry; pore surface white to cream, pores circular to angular, 4-6 per mm; context whitish, less than 1 mm thick; tuber layer concolorous with pore surface, up to 2 mm thick. Hyphal system monomitic; generative hyphae clamped, hyaline, thin- to thick-walled, 2-4 μm in diameter. Cystidia occasional to abundant, ventricose, thick-walled, hyaline, with apically incrusted, 14-24 × 4-7

μm. Basidia clavate, 4-sterigmate, 15-20 × 4.5-6 μm, with a basal clamp. Basidiospores oblong to cylindric-ellipsoid, hyaline, smooth, IKI⁻, 4-5 × 2-2.5 μm.

Specimen examined: TAIWAN, Taichung county: Hsueshankeng, 1,950 m alt., on fallen trunk of *Cinnamomum kanehirai* Hay., leg. T. T. Chang, June 2001, TFRI-968.

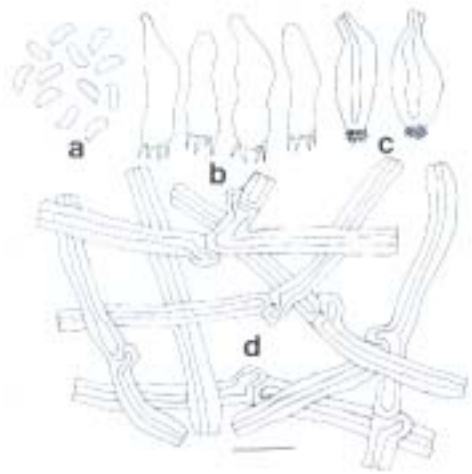

Fig. 2. *Oligoporus sericeomollis.* a. Basidiospores. b. Basidia. c. Cystidia. d. Generative hyphae. Bar = 10 μm.

Distribution: In conifer forests of Northern Hemisphere, eg. America, Europe and Asia.

Remarks: The extremely bitter taste and incrusted cystia characterize this species (Gilbertson & Ryvarden, 1986). However, the fruiting body collected from Taiwan does not have bitter taste. The fungus usually grows on conifers, but it was collected from *Cinnamomum kanehirai* in Taiwan.

Cultural descriptions: Growth rate of the fungus 20-35 mm in 14 days. The ratio of growth rate on MEA and PDA is 0.79. Critical temp. for growth: min. 10℃, opt. 20-25℃. Outline of colony even. Hyphae of the advancing zone appeared raised. Colony white to cream. Aerial mycelia floccose, cottony to woolly. Generative hyphae with clamps. Chlamydospores present.

Culture code: (8), (9), (11), 12, (14), 19, 21, 22, 30, 31, 39, 42, 44, 45, (48), 52, 53, 54, 83, 85, 89.

Oligoporus undosus (Peck) G. L. Gilb. & Ryvarden., Mycotaxon 22: 365, 1985. Fig. 3

Basidiocarps annual, effused-reflexed to resupinate; pilei usually narrow, elongate, margin undulate; upper surface white to pale buff, tomentose to glabrous, smooth to shallowly sulcate; pore surface cream, pores angular to irregular, 1-4 per mm; context whitish, soft when fresh, up to 5 mm thick; tube layer concolorous with the context, up to 1.5 mm thick. Hyphal system monomitic; clamped, hyaline, thin- to thick-walled, 2.5-7 μm in diameter. Basidia clavate, 4-sterigmate, 15-30 × 4.5-8 μm, with a basal clamp. Basidiospores allantoid, hyaline, smooth, IKI⁻, 4.5-6 × 1-1.5 μm.

Specimen examined: TAIWAN, Ilan county: Suyuanyakou, 1,650 m alt., on fallen trunk of *Pinus taiwanensis* Hay., leg. T. T. Chang, Nov. 1998, TFRI-878.

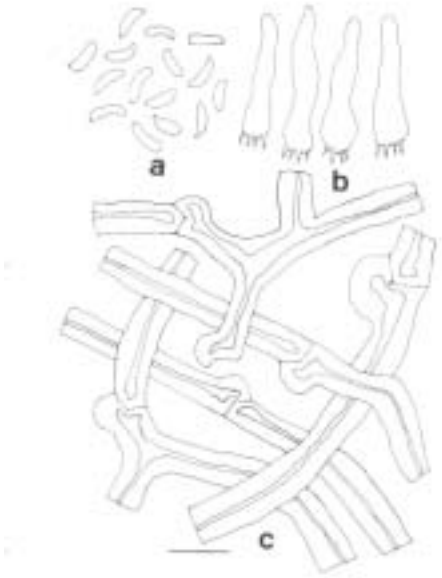

Fig. 3. *Oligoporus undosus.* a. Basidiospores. b. Basidia. c. Generative hyphae. Bar = 10 μm.

Distribution: In conifer forests of Northern Hemisphere, eg. America, Europe and Asia.

Remarks: The undulate margin and large pores characterize this species.

Cultural descriptions: Growth rate of the fungus 20-38 mm in 14 days. The ratio of growth rate on MEA and PDA is about 1. Critical temp. for growth: min. 10℃, opt. 20-25℃. Outline of colony even. Hyphae of the advancing zone appeared raised. Colony white to cream. Aerial mycelia floccose, cottony to woolly. Generative hyphae with clamps. Chlamydospores present.

Culture code: (8), (9), (11), 12, (14), 19, 21, 22, 30, 31, 39, 42, 44, 45, (48), 52, 53, 54, 83, 85, 90.

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三種台灣新紀錄褐腐多孔菌及其純培養研究

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摘　　要

本文報導在台灣首次發現的三種褐腐多孔菌新紀錄種，分別是 *Daedalea quercina* Fr., *Oligoporus sericeomollis* (Romell) Pouzar，和 *O. undosus* (Peck) G. L. Gilb. & Ryvarden。本文同時研究其純培養性質。

關鍵詞：無褶菌類、多孔菌、台灣。

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