Some species of coelomycetes from soil in Taiwan

Chang, Jong-How and Yei-Zeng Wang*

National Museum of Natural Science, 1, Kuan-Chien Rd. Taichung 404, Taiwan

(Accepted: December 31, 2007)

ABSTRACT

Five species of coelomycetes found in soils are described and illustrated in this report. Among them, Bartalinia pistacina, Diplodia mutila, Harknessia shearii, and Pestalotiopsis nattrassii are new records to Taiwan. Chaetomella raphigera is redescribed.

Keywords: Coelomycete, soil fungi, Taiwan.

Introduction

During the survey of fungal biodiversity in soil of Taiwan, some coelomycetous fungi were collected and identified. Among them, five species are described and illustrated in this paper. Bartalinia pistacina, Diplodia mutila, Harknessia shearii, and Pestalotiopsis nattrassii are new records, while Chaetomella raphigera is redescribed with the addition of culture characteristics.

Materials and Methods

Soil samples were collected from roadside in the country and in forest, and brought to laboratory in plastic bags. Two to three milligrams of soil particles were placed on malt extract agar (MEA, containing 2% malt extract, and 2% agar). The plates were left on a bench at room temperature, incubated for ca. 2–3 weeks, and then observed for pycnidia under a dissecting microscope. All specimens were examined in a fresh condition. Microscopic structures were studied under a phase-contrast light microscope with differential interference contrast lens, and measurements were made on distilled-water mounts. Individual conidia were initially isolated and inoculated on MEA plates containing 30 µg/mL of streptomycin sulfate and 100 unites/mL of penicillin at room temperature. Pure strains were transferred to new MEA plates and stored at low temperature. The reference cultures are maintained in the culture collection, and specimens are deposited at the herbarium of National Museum of Natural Science (TNM), Taichung.

Taxonomies

Bartalinia pistacina (J.L. Maas) Nag Raj, Coelomycetous anamorphs with appendage-bearing Conidia (Ontario): 141. 1993. (Figs. 1A, 1B, 5A, & 5E)

Conidiomata pycnidial, abundant, separate, usually immersed, unilocular, ostiolate, dark brown to black, globose, 105–200 µm in diam., thick-walled, composed of pale brown, thin-walled *textura angularis*. Conidiophores arising all around the cavity of the conidioma, reduced to conidiogenous cells. Conidiogenous cells holoblastic, discrete, determinate, simple, straight, smooth, hyaline, bottle-shaped, 2–5 × 2–3 µm, formed from the inner cells of the pycnidial wall. Conidia hyaline when young, pale brown, 4-septate at maturity, cylindric-fusiform, straight to curved, 17.5–20 × 4–5 µm; apical conical cell, hyaline, crested with three divergent, 5–12.5 × 1–1.5 µm setula; base cell, colorless to pale brown, conic truncate, with a filiform, straight or slightly bent, 5–7.5 µm long setula.

Colonies on MEA medium spreading rapidly. Mycelium white to pale yellow; yellowish on reverse, mainly submerged, margin smooth, reaching 5.0–5.4 cm in diam. in 5 days at room temperature. Aerial hyphae appressed and colonies smooth except for a mealy appearance from numerous small tufts of hyphae. Conidiomata gradually appearing, immersed or superficial on the tufts of hyphae, numerous, clustered.


This species is recognized by the size of conidia and their appendages, and the basal cell

---

![Fig. 1. A & B. Bartalinia pistacina. A. Conidia. B. Conidiogenous cells and developing conidia. C-G. Diplodia mutila. C-D. Conidiogenous cells and developing conidia. E. A conidium. F. A pycnidium. G. A part of pycnidial cell. Bar = 4 µm for A, & E; 2 µm for B; 6 µm for C, D, & G; 40 µm for F.](image-url)
usually is pigmented. This species is very close to *Bartalinia robillardoides*. The conidia of *B. robillardoides* in Matsushima’s description (1987) are 24–28 µm long, while those of our specimens are shorter.

**Chaetomella raphigera** Swift, Mycologia 22: 165. 1930. (Figs. 2, 5B, 5F, & 5G)

Conidiomata pycnidial, abundant, separate, superficial, produced from a short hyaline stalk, dark brown but yellowish or pale brown when young, subglobose to reniform, 200–330 × 150–165 µm, with a single raphe, longitudinal dehiscence; thick-walled, composed of pale brown, thin-walled *textura angularis*, and the inner layer of hyaline cells radially arranged, bearing conidiophores on the inner face except in the region of the raphe; setae evenly formed over the pycnidia, 1–4 septate, smooth, pale brown to brown, becoming lighter towards the apices, club-shaped, 55–100 × 4–5 µm, with straight, bent or hooked tips, slightly swollen at the apical cell, basal cell irregular. Conidiogenous cells enteroblastic, monophialidic, determinate, lateral and integrated, or terminal, smooth, hyaline, filiform, channel and collaret minute. Conidia borne as phialospores from the apices of main and lateral conidiogenous cells, 1-celled, aseptate, smooth, hyaline, cylindrical to slightly fusiform, 5–6 × 2–3 µm, often somewhat allantoid, occasionally guttulate.

Colonies on MEA medium spreading slowly. Mycelium white to pale yellow; yellowish on reverse, mainly submerged, margin smooth, reaching 1.0–1.4 cm in daim. in 5 days at room temperature. Hyphae hyaline, branched, septate, 2.5–5.0 µm wide. Aerial mycelium normally sparse. Conidiomata rapidly appearing, superficial in the agar, numerous, readily forming in concentric zones among pinkish cinnamon aerial hyphae, rapidly becoming black.


The species can be easily distinguished by small conidia and bent or hooked apex of setae (Sutton, 1980). Matsushima (1980) reported this species as a new record for Taiwan but with no description or illustration, hence we describe it here and add the cultural characteristics based on the specimens collected in Taiwan.

**Diplodia mutila** Fries in Montagne, Ann. Sci. nat., ser. 2, 1: 302. 1834. (Figs. 1C–G)


Conidiomata pycnidial, numerous, uniformly distributed, superficial, solitary, non-aggregated, dark brown to black, pycnidia with a conical papilla and a globose base, 325–420 × 150–250 µm, clothed in flexuous hyphae when young; wall of outer layer dark brown, *textura angularis* thick-walled, a middle layer of dark brown thin-walled cells, and an inner layer of thin-walled, hyaline cells. Conidiophores absent. Conidiogenous cells holoblastic, discrete, determinate, unbranched, smooth, hyaline, cy-
lindrical, 8–17 × 3–6 µm, forming a single apical conidium. Conidia 1-celled, aseptate, smooth, hyaline, thick-walled, oblong, 20–30 × 10–15 µm, both ends broadly rounded, rarely becoming brown and septate with age.


Fig. 2. Chaetomella raphigera. A. Conidia. B & F. Types of setae on pycnidium. C. A part of pycnidial cell. D & E. Pycnidia. G. Conidiophores and conidiogenous cells. H. A part of hyphae. Bar = 5 µm for A; 20 µm for B; 200 µm for D; 40 µm for E; 10 µm for C, F, G, & H.
Some species of coelomycetes

The specimens were isolated from soil and the conidiomata were formed within aerial mycelium on MEA. The globose conidiomata and indeterminate conidiogenous cells described by Alves et al. (2004) were not observed in these specimens, but the size of conidiogenous cells and conidia well fit the description for *Diplodia mutila*. Sutton (1980) described the conidia of *D. mutila*, were hyaline and aseptate at first, then later becoming brown and one median euseptate. According to Alves et al. (2004), the conidia of this species are rarely becoming pale brown and euseptate.

*Harknessia shearii* Petrak, Sydowia 7: 404. 1953. (Figs. 3 & 5H)

**Fig. 3.** *Harknessia shearii*. A. Conidia. B. Conidiogenous cells and developing conidia. C. A pycnidium. D. A part of pycnidial cell. E. A part of hyphae. Bar = 7 µm for A, D; 10 µm for B, E; 30 µm for C.
Conidiomata pycnidial, abundant, separate, immersed or superficial, unilocular, erumpent, ostiolate, pale olivaceous or pale brown, subglobose, 200–300 × 180–270 μm, finally punctate, with each exuded black conidial mass surrounded by a distinct creamy-white furfuraceous border; wall varying thickness and color, composed of thin-walled textura angularis, globose to polygonal cells 7.5–12.5 × 5–6(–7.5) μm, hyaline in inner layers, pale brown in some outer and upper parts. Conidiophores absent. Conidiogenous cells holoblastic, determinate, unbranched, smooth, hyaline, cylindrical, 7.5–17.5 × 2.0–3.5 μm, formed from the inner cells of stromatic wall, each forming a single apical conidium. Conidia acrogenous, solitary, aseptate, smooth, guttulate, longitudinally strait, pale brown to brown, gibbous, ellipsoid, (7–)10–12 × 4–6 μm, with part of conidiogenous cell persisting as a hyaline, rarely branched, cellular basal appendage, (5–)10.0–17.5 × 2.0–2.5 μm.

Colonies on MEA medium spreading rapidly. Mycelium white to pale yellow; yellowish on reverse, mainly submerged, margin smooth, reaching 7.8–8.2 cm in diam. in 5 days at room temperature. Hyphae hyaline, branched, septate, 1–4 μm wide. Aerial mycelium almost absent. Conidiomata rapidly appearing, immersed or superficial in the agar, numerous.

**Specimen examined.** Taipei: Danshui, Fisherman’s wharf, isolated from soil, *Jong S4*, Dec. 29, 2006 (TNM F20625).

Most collections of this genus were recorded on dead or living leaf, twigs and bark samples (Sutton, 1980; Furlanetto and Dianese, 1998), but this specimen was directly collected from soil substrate. It is new to Taiwan.

**Pestalotiopsis nattrassii** Steyaert, Trans. Br. Mycol. Soc. 36: 82. 1953. (Fig. 4)
≡ *Pestalotia nattrassii* (Steyaert) Guba, Monograph of *Monochaetia* and *Pestalotia*: 163. 1961.

![Fig. 4. Pestalotiopsis nattrassii. A. Conidia. B. Conidiogenous cells and developing conidia. C. A pycnidium. Bar = 8 μm for A; 12 μm for B; 100 μm for C.](image-url)
Some species of coelomycetes

Conidiomata pycnidial, separate or confluent, semi-immersed to superficial, unilocular, glabrous, olivaceous brown to black, globose, 375–425 µm in diam., thick-walled, composed of pale brown, thin-walled textura angularis. Conidiophores hyaline, unbranched, smooth, formed from the inner cells of the pycnidial wall, reduced to conidiogenous cells, sometimes septate. Conidiogenous cells holoblastic, annellidic, discrete, indeterminate, unbranched, smooth, hyaline, cylindrical, 14–15 × 1 µm. Conidia 4-septate, 18–22 × 5–7 µm; apical and basal cell hyaline, 3 median cell pale brown, smooth, short-cylindrical, 15–18 µm long, septa and periclinal walls darker than the rest of the cell area; apical appendages four branched, cellular, filiform, 31–38 µm long; basal appendage absent.

**Specimen examined.** Yilan: Sanshing, isolated from soil, Jong S22, Mar. 20, 2007 (TNM F20638).

Sutton (1969) assigned this fungus in *Monochaetia*. But Nag Raj’s studies (1993) agreed with Steyaert’s disposition of this fungus in *Pestalotiopsis*. Steyaert (1953) pointed out that the conidia lack a basal appendage, although the basal ends bear marginal frills and drawn out into a short, blunt process. The conidia are 24–33 × 8–9 µm according to Steyaert (1953), while those of the Taiwanese specimens are 18–22 × 5–7 µm.

**References**

Alves, A., A. Correia, J. Luque, and A. Phillips. 2004. *Botryosphaeria corticola*, sp. nov. on *Quercus* species, with notes and description


---

幾種臺灣產土生腔孢菌

張仲豪 王也珍

國立自然科學博物館，台中市館前路一號

摘 要

本文描述五種腔孢菌，其中 *Bartalinia pistacina*、*Diplodia mutila*、*Harknessia shearii* 及 *Pestalotiopsis nattrassii* 為臺灣新紀錄。

關鍵詞：土生真菌、腔孢菌類、臺灣。