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Two newly recorded hypogeous fungi in Taiwan—*Endogone flammicorona* and *Sclerogaster compactus*

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ABSTRACT

Two newly recorded species of hypogeous fungi, *Endogone flammicorona* (Zygomycota) and *Sclerogaster compactus* (Basidiomycota), were collected from plantation of *Picea morrisonicola* along Dasyueshan Trail in central Taiwan, at the altitude of 2500 m.

Key words: Basidiomycota, false truffles, pea truffles, *Picea morrisonicola*, Zygomycota

Introduction

Hypogeous fungi produce fruiting bodies among layers of leaf-litters underground and do not actively disperse spores, being spread passively by their animal vectors. They are classified in three phyla, with true truffles belonging to Ascomycota, false truffles to Basidiomycota, and pea truffles to Zygomycota. *Tuber* species in the Ascomycota are well-known as gourmet hypogeous fungi, while other hypogeous fungi remain unknown for their edibility. In Taiwan, four species of basidiomycete and zygomycete hypogeous truffles have been reported previously: *Rhizopogon rubescens* (Tul. & C. Tul.) Tul. & C. Tul., *Hymenogaster arenarius* Tul. & C. Tul., *Descomyces albellus* (Massee & Rodway) Bougher & Castellano, and *Gymnoglossum connectens* (Bucholtz) Zeller (Hu, 2002; Chou, 2011, 2016). In this study, we reported two newly recorded hypogeous fungi collected from plantation of *Picea morrisonicola* Hayata in Taiwan; *Endogone flammicorona* Trappe & Gerdem. is a

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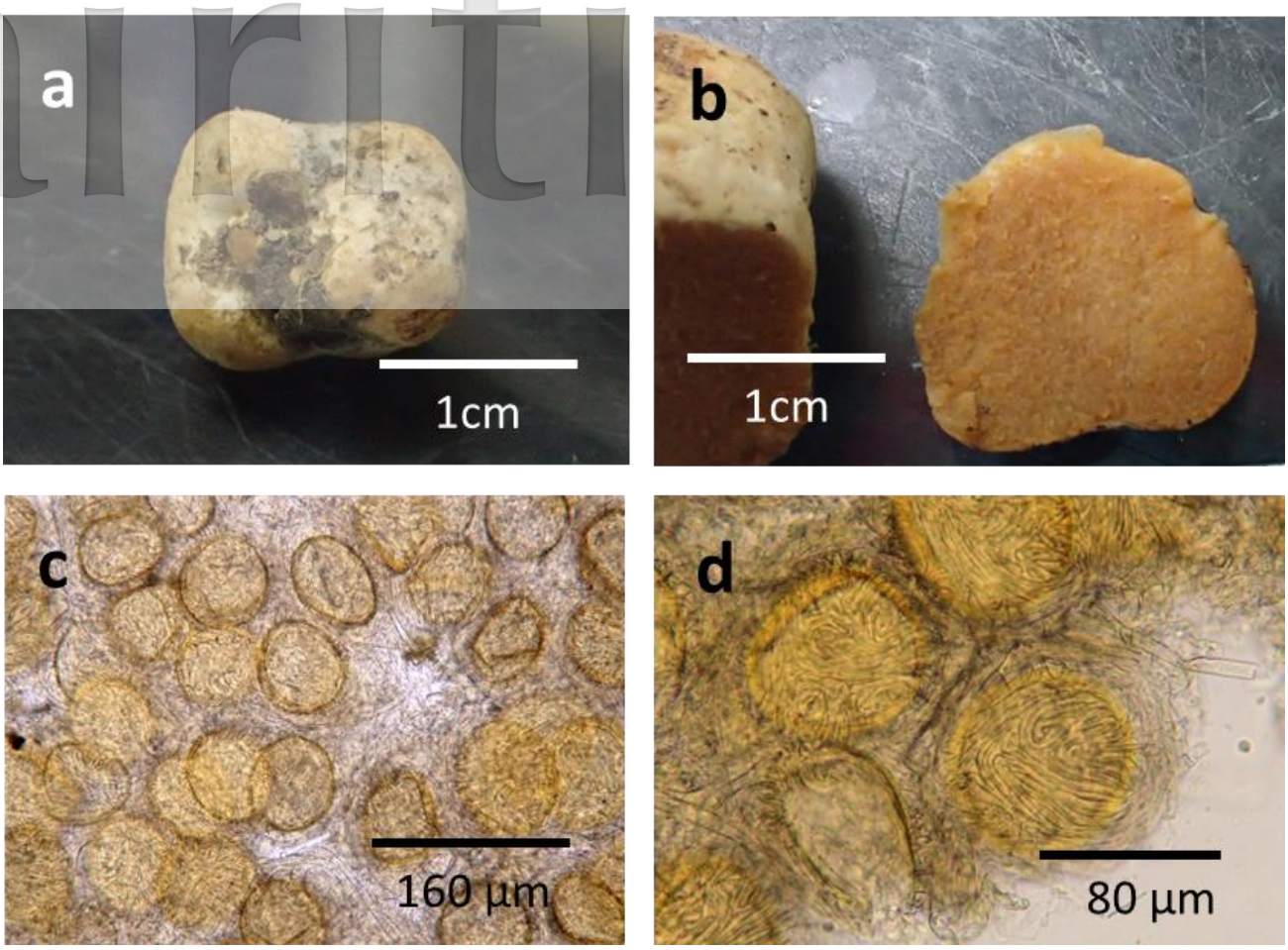

Fig. 1. *Endogone flammicorona*. a. Sporocarp. b. Yellowish-orange gleba. c. Zygospores surrounded by agglutinated hyphae. d. Fingerprint-like ornamentation on zygospores.

pea truffle and *Sclerogaster compactus* (Tul. & C. Tul.) Sacc. is a false truffle.

Taxonomy

Endogone flammicorona Trappe & Gerdem., Trans. Brit. Mycol. Soc. 59: 405 (1972) Fig. 1

Sporocarp hypogeous, irregularly subglobose, ca 1cm diam. Peridium smooth, thin, pale-brown. Gleba yellowish-orange, densely packed. Zygosporangia not observed. Zygospores subglobose or ovoid, yellowish-orange, 75–90 × 87.5–97.5 µm, surrounded by agglutinated and condensed hyphal layer 15–17.5 µm thick, ornamented with conspicuous looped and pseudohelical ridges.

Specimen examined: TAIWAN. Taichung County, Dasyueshan Trail, 2500 m elev., beneath piled leaves under plantation of *Picea morrisonicola*, 8 Aug 2016, *Lin, C.-L.*

Distribution: Italy, Taiwan, UK, and USA.

Remarks: *Endogone flammicorona* is similar to *E. lactiflua* Berk. & Br., from which it differs by the significant fingerprint-like spore ornamentation with the appearance of tongues of flame

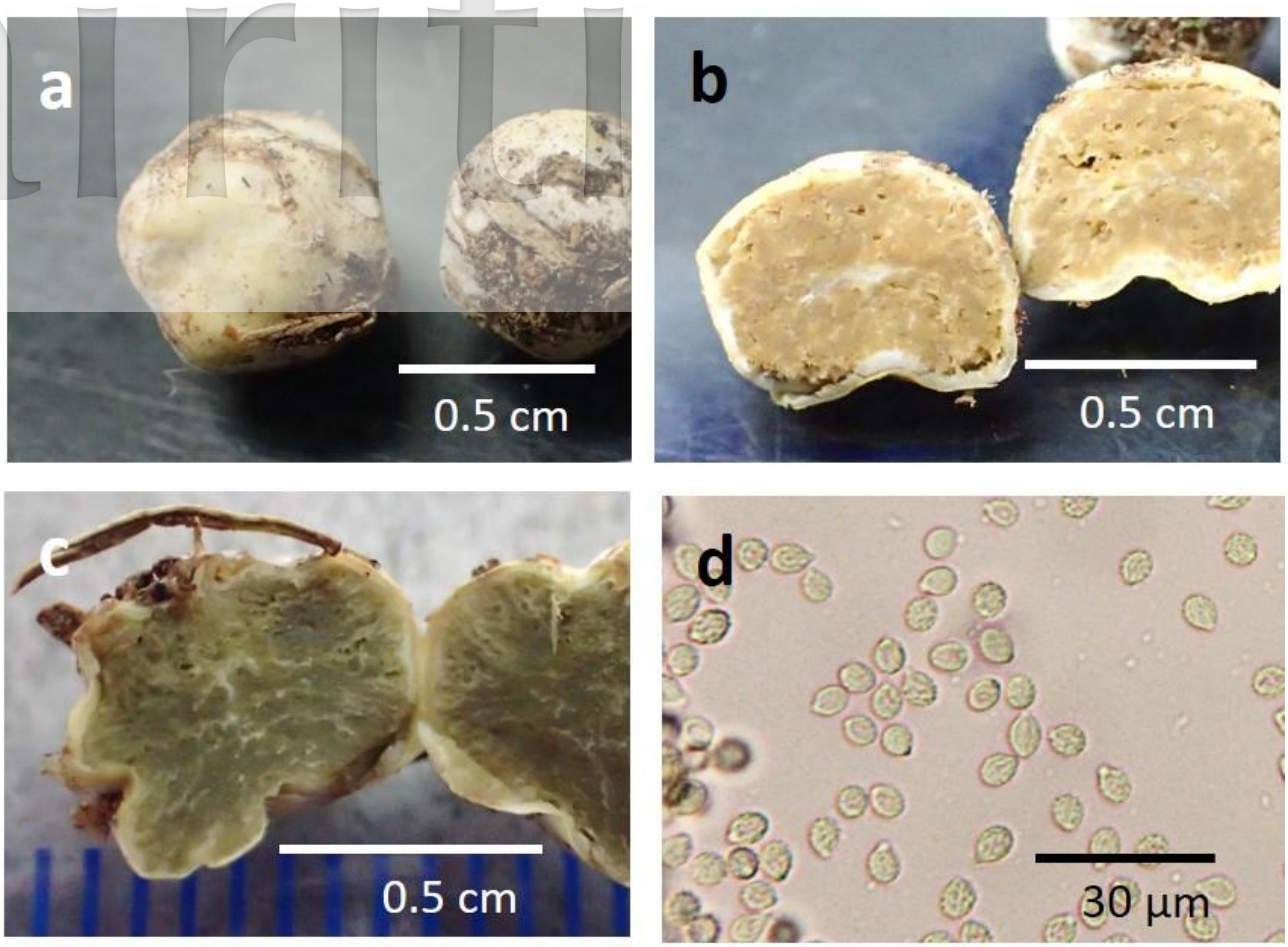

Fig.2. *Sclerogaster compactus*. a. Gastrocarp. b, c. Yellowish-brown to yellowish-green gleba with white veins. d. Tiny verrucous basidiospores.

(Trappe and Gerdemann, 1972). This species has been reported to form an ectomycorrhizal association with Pinaceae (Gerdemann and Trappe, 1974), and were found in humus associated with both coniferous and deciduous trees in the UK (Pegler et al., 1993).

Sclerogaster compactus (Tul. & C. Tul.) Sacc., Syll. Fung. 11: 170 (1895) Fig. 2

≡ *Octaviania compacta* Tul. & C. Tul., Giorn. Bot. Ital., Ann. 1, 2(1): 56 (1844)

Gastrocarp hypogeous, irregularly globose, small, less than 1 cm diam. Peridium smooth, white to milky yellow. Gleba dense, yellowish-brown to yellowish-green, with white veins. Basidia not observed. Basidiospores pale green to pale yellow, 7.5 × 5 µm, mostly ovoid, with thickened wall ornamented with tiny verrucae.

Specimen examined: TAIWAN. Taichung County, Dasyueshan Trail, 2500 m elev., beneath piled leaves under plantation of *Picea morrisonicola*, 8 Aug 2016, *Lin, C.-L.*

Distrubution: France, Germany, Italy, Taiwan, and UK.

Remarks: *Sclerogaster compactus* is distinct in having a small and compact gastrocarp and tiny verrucous basidiospores. It was found in leaf litter or decomposing organic layer, likely not forming a mycorrhizal association with plant roots.

References

Chou WN. 2011. *Hymenogaster arenarius* (Basidiomycota) newly recorded to Taiwan. Taiwan Journal of Biodiversity13(3): 265–268.

Chou WN. 2016. Two species of hypogeous gasteroid fungi (Basidiomycota) new to Taiwan. Taiwan Journal of Biodiversity 18(3): 169–172.

Gerdemann JW, Trappe JM. 1974. The Endogonaceae in the Pacific Northwest. Mycologia Memior 5: 1–76.

Hu HT. 2002. *Glomus spinosum* sp. nov. in the Glomaceae from Taiwan. Mycotaxon 83: 159–164.

Korf RP. 1972. Synoptic key to the genera of the Pezizales. Mycologia 64(5): 937–994.

Montecchi A, Sarasini M. 2000. Funghi ipogei d'Europa. Associazione Micologica Bresadola, Italy. 714 p.

Pegler DN, Spooner BM, Young TWK. 1993. British truffles: A revision of British hypogeous fungi. The Royal Botanic Gardens, Kew. 216 p.

Trappe JM, Gerdemann JW. 1972. *Endogone flammicorona* sp. nov., a distinctive segregate from *Endogone lactiflua*. Transactions of the British Mycological Society 59(3): 403–407.

兩種臺灣新記錄地下真菌—火冠豆松露與緻密硬皮腹菌

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摘　要

本文描述兩種臺灣新記錄地下真菌，分別為接合菌門的火冠豆松露（*Endogone flammicorona*）與擔子菌門的緻密硬皮腹菌（*Sclerogaster compactus*），皆採自臺灣中部大雪山林道、海拔 2500 m 的臺灣雲杉人工林。

關鍵詞：擔子菌、假松露、接合菌、豆松露、臺灣雲杉