

## Two Species of *Elaphomyces* (Ascomycota, Elaphomycetaceae) in Taiwan

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(Received December 21, 2010; Accepted March 24, 2011)

**Abstract.** Morphological features of two *Elaphomyces* species, *E. granulatus* and *E. muricatus*, collected in Taiwan are described. They can be separated by the structure of the peridium and the size of the ascospores. *Elaphomyces mucriatus* is new to Taiwan.

**Key words:** Elaphomycetales, Eurotiales, Mycorrhizae, Taiwan.

*Elaphomyces granulatus* Fr., Syst. Mycol. 3: 58. 1829.

Figs. 1, 3, 5, 7.

Ascomata globose to ellipsoid, 1-2 cm in diam., yellow to ochreous-brown, covered with small warts, each wart 150-400  $\mu\text{m}$  high, 100-150  $\mu\text{m}$  wide. Peridium 600-1100  $\mu\text{m}$  thick, 2-layered in vertical section; outer layer yellowish-brown; inner layer homogenous, creamy-white, 400-800  $\mu\text{m}$  thick, composed of *textura intricata*, each constituent filamentous cell 4-7  $\mu\text{m}$  wide. Gleba dark-brown, divided into compartments by white bands of sterile tissue. Asci not seen. Ascospores globose, reddish-brown, 20-32  $\mu\text{m}$  in diam. including ornamentation, spinose, spines 2-2.5  $\mu\text{m}$  high, sometimes agglutinated into small patches.

Specimen examined: Nantou County, Yuanfeng (鳶峰), elev. 2750m, in soil; Coll. WN Chou; WAN 1348, Sept. 9, 2010 (TNM F24051).

This hypogeous species is the most common species of *Elaphomyces* occurring in the northern hemisphere (Kobayasi 1960, Zhang 1991). Hu (1993) reported a collection of this species from Yushan National Park, central Taiwan and used it to inoculate *Pinus taiwanensis* to obtain ectomycorrhizae without providing a description of the fungus. The ascospores of this Taiwanese

collection are slightly smaller than those described in the literature (Dennis 1981; Eckblad *et al.*, 2000).

*Elaphomyces muricatus* Fr., Syst. Mycol. 3: 59. 1829.

Figs. 2, 4, 6, 8.

Ascomata globose to ellipsoid, 1-1.5 cm in diam., yellowish-brown, covered with small pyramidal warts, each wart 200-500  $\mu\text{m}$  high, 200-300  $\mu\text{m}$  wide. Peridium 1.5-1.7 mm thick, 3-layered in vertical section; outer layer hard, yellowish-brown; inner layer heterogeneous, pale-brown, marbled, 600-800  $\mu\text{m}$  thick, composed of *textura intricata*, each constituent cell 4-7  $\mu\text{m}$  wide; middle layer lying between outer and inner layers, white, composed of hyphae. Gleba dark-brown, divided into compartments by white bands of sterile tissue. Asci not seen. Ascospores globose, yellowish-brown, 18-22  $\mu\text{m}$  in diam. including ornamentation, spinose, spines 2-3  $\mu\text{m}$  high, sometimes agglutinated into small patches.

Specimens examined: Ilan County, Fushan Botanical Garden(福山植物園). elev. 600m, in soil parasitized by *Cordyceps capitata*; Coll. C.C. Wen; WAN 391, Feb. 25, 1997 (TNM F5673). Taichung, Hoping Township, Malunshan (馬崙山), in soil under pine forest; Coll. WN Chou; WAN 1322, June 22, 2010 (TNM F24026).

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Fig. 1. Habitat of *Elaphomyces granulatulus*. Bar = 3.5 mm.  
Fig. 2. Habitat of *Elaphomyces muricatus*. Bar = 2.5 mm.  
Fig. 3. An ascoma of *Elaphomyces granulatulus* sliced in half. Bar = 2.5 mm.  
Fig. 4. An ascoma of *Elaphomyces muricatus* sliced in half. Bar = 2.5 mm.

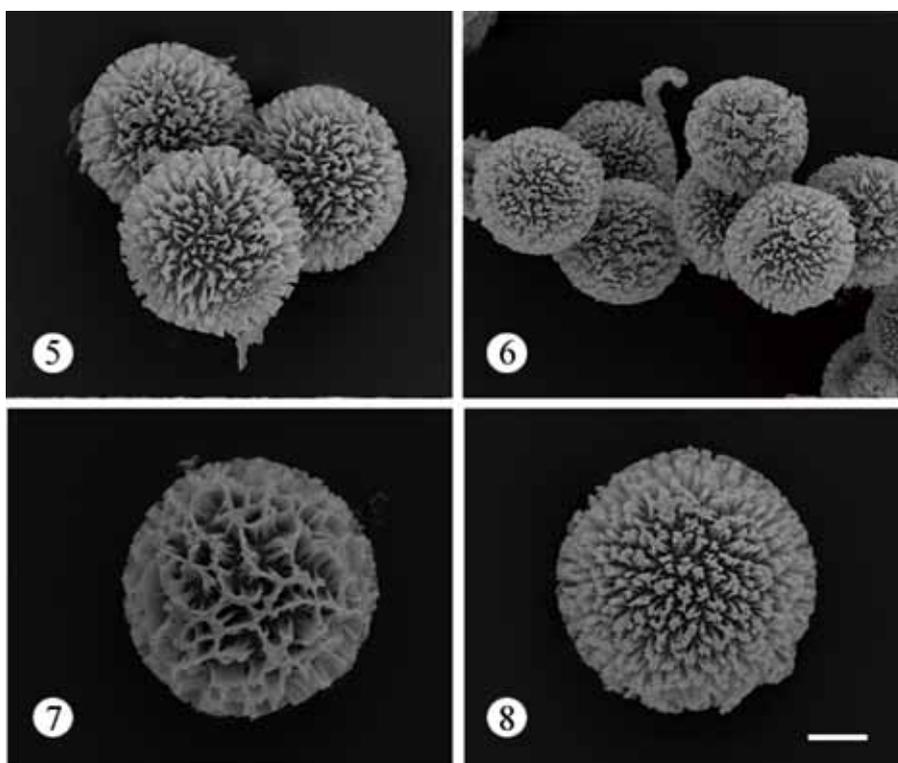


Fig. 5. Spores of *Elaphomyces granulatulus*. (by SEM) Bar = 10  $\mu$ m.  
Fig. 6. Spores of *Elaphomyces muricatus*. (by SEM) Bar = 10.5  $\mu$ m.  
Fig. 7. A spore of *Elaphomyces granulatulus*. (by SEM) Bar = 6  $\mu$ m.  
Fig. 8. A spore of *Elaphomyces muricatus*. (by SEM) Bar = 5  $\mu$ m.

*Elaphomyces muricatus* can be separated from *E. granulatus* by having a thicker peridium with a marbled inner layer, and smaller ascospores. However, Eckblad *et al.* (2000) reported that Nordic collections have larger ascospores, ranging 18-40  $\mu\text{m}$  in diameter.

#### ACKNOWLEDGEMENTS

Thanks are due to W. N. Chou and C. C. Wen for their assistance with collecting specimens studied in this paper.

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## 兩種台灣產大團囊菌

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本文描述臺灣的粗粒團囊菌(*Elaphomyces granulatus*)與粗棘團囊菌(*E. muricatus*)兩種大團囊菌，這兩種主要的區別是外皮構造與孢子的不同，其中粗棘團囊菌為台灣新紀錄。

關鍵詞：團囊菌目、散囊菌目、菌根、台灣。