

# New records of *Hyphodontia sphaerospora* in Taiwan and Vietnam

Eugene Yurchenko and Sheng-Hua Wu\*

Department of Botany, National Museum of Natural Science, Taichung, Taiwan 404, R.O.C.

(Accepted: December 20, 2011)

## ABSTRACT

A corticioid basidiomycete *Hyphodontia sphaerospora* was known from Japan and South America. This species was found in this study as also distributed in Taiwan and Vietnam. Description and illustrations based on the studied collections are provided. The morphological distinction of *H. sphaerospora* from the most resembled species, *H. arguta*, is discussed.

**Keywords:** Basidiomycota, corticioid fungi, *Hyphodontia arguta*, *H. sphaerospora*, taxonomy.

## Introduction

*Hyphodontia sphaerospora* was firstly reported from the type locality in Ehime Prefecture, Shikoku Island, South Japan (Maekawa, 1993); then it was recorded from northeast Ecuador, and from Venezuela (Hjortstam and Ryvarde, 2002; Hjortstam *et al.*, 2005). Micromorphology of this species was only illustrated in the protologue (Maekawa, 1993). *Hyphodontia sphaerospora* was described for the first time by Maekawa (1993) as *Grandinia arguta* (Fr.) Jülich var. *sphaerospora* N. Maek. According to the protologue and other taxonomic reports (Hjortstam and Ryvarde, 2002; Hjortstam *et al.*, 2005), it differs from *G. arguta* var. *arguta* by having globose and slightly thick-walled spores up to 4.5 µm diam. Moreover, according to fig. 2 and fig. 3 in Maekawa

(1993), *G. arguta* var. *sphaerospora* differs from var. *arguta* in different morphology of capitate cystidia, which are narrower, cylindrical, and more or less flexuous in the former. In addition, lagenocystidia of var. *sphaerospora* are often lateral, while those in var. *arguta* are terminal.

After studying *Hyphodontia* spp. deposited in herbarium of National Museum of Natural Science, Taiwan, R.O.C. (TNM), we found that *H. sphaerospora* is also distributed to Taiwan and Vietnam. Description of the species based on two studied specimens is provided in this paper. Morphological descriptions were based on dry basidiomata. Microscopic measurements were carried out on the material mounted in 3% KOH water solution. The sporal wall amyloid or dextrinoid reaction was checked in Melzer's solution (Mz's), and cyanophily was examined

---

\* Corresponding author, email: shwu@mail.nmns.edu.tw

by using Cotton blue-lactophenol solution. Images of hymenial surface were captured by digital camera Nikon Coolpix P6000 via an ocular of Zeiss Stemi SV11 stereomicroscope.

## Taxonomy

*Hyphodontia sphaerospora* (N. Maek.) Hjortstam (Figs. 1, 2, 4A, & 4B)

Basidioma totally effused, soft-membranaceous. Hymenial surface odontoid. Aculei dark cream, conical-subcylindrical, usually blunt, wart-shaped in young basidiomata, 4–8 per mm, up to 0.35–0.5 mm high, 0.05–0.15(–0.2) mm wide at base, mostly solitary, under lens with fine bristles due to projecting lagenocystidia or almost smooth. The part between aculei paler in color, 0.03–0.1 mm thick, finely porulose-reticulate, slightly cracking. Margin paler, fairly abrupt or diffuse.

Hyphal system monomitic, hyphae clamped at all primary septa. Subicular hyphae and hyphae of aculeal trama loosely arranged, moderately branched, straight to slightly flexuous, colorless, thin- to thick-walled, (1.5–)2.7–4(–5.2)  $\mu\text{m}$  diam, occasionally with adventitious septa. Subhymenium loose, indistinctly delimited from subiculum; subhymenial hyphae moderately branched, colorless, but yellowish in mass, thin-walled, constricted in branch sites up to 1.2–1.4  $\mu\text{m}$ , swollen between branch sites up to 3.3–3.7  $\mu\text{m}$ . Lagenocystidia numerous, with pale yellowish incrustation, occasionally with lateral protuberances, 16.5–28(–30)  $\mu\text{m}$  long, 3.5–4.2(–5.2)  $\mu\text{m}$  wide in basal part, the upper subulate part about 0.6  $\mu\text{m}$  wide without incrustation. Capitulate and subcylindrical cystidia or hyphal ends variably abundant, aggregated mostly at aculeal apices, but also occurring be-

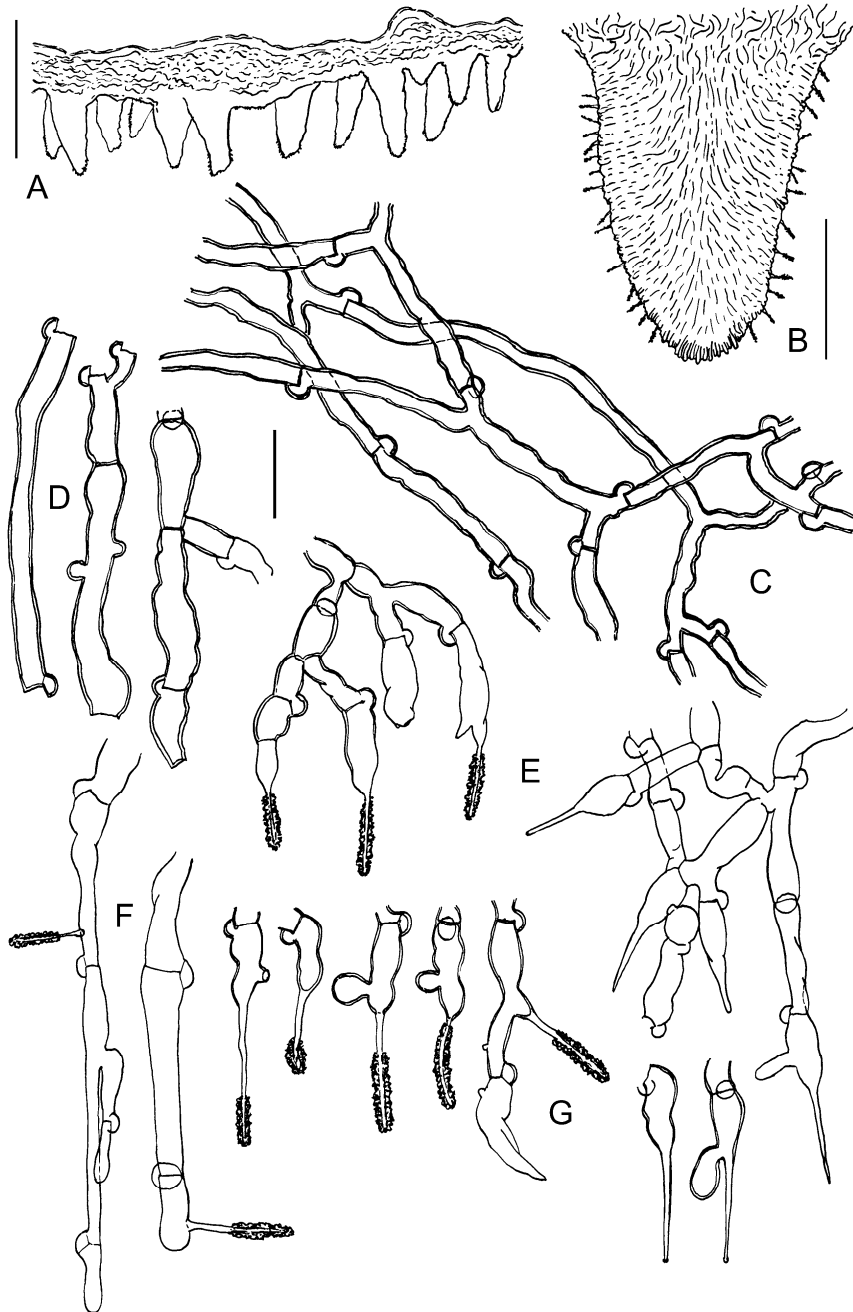
tween aculei, (13–)17–25(–40)  $\times$  3–4.5  $\mu\text{m}$ , with or without intercalary swellings, straight or flexuous, some with adventitious septa; capitulate hyphal ends with strongly cyanophilous contents. Basidia subcylindrical, 11–14  $\times$  3.8–4  $\mu\text{m}$ , colorless, thin-walled, 4-sterigmate. Basidiospores globose to broadly ellipsoid, (3.1–)3.3–4(–4.5)  $\times$  (2.8–)3–3.7(–4.1)  $\mu\text{m}$ , colorless, with ca. 0.3  $\mu\text{m}$  thick walls, Mz's-negative, slightly cyanophilous, with very small or indiscernible apiculus.

**Specimens examined.** *Hyphodontia sphaerospora*. Taiwan. Nantou County, Sunlinksea, 120°47' E, 23°38' N, alt. 1,700 m, on dead corticated twig of *Cryptomeria japonica* D. Don, 1 cm in diam, coll. S.H. Wu, 1.VII.1992, *Wu 9207-21* (TNM F24830). Vietnam. Ha Tay Province, Ba Vi National Park, 105°22' E, 21°04' N, alt. 1,200 m, on dead corticated angiosperm trunk, coll. S.H. Wu and S.Z. Chen, 3.VII.1998, *Wu 9807-53* (TNM F9041).

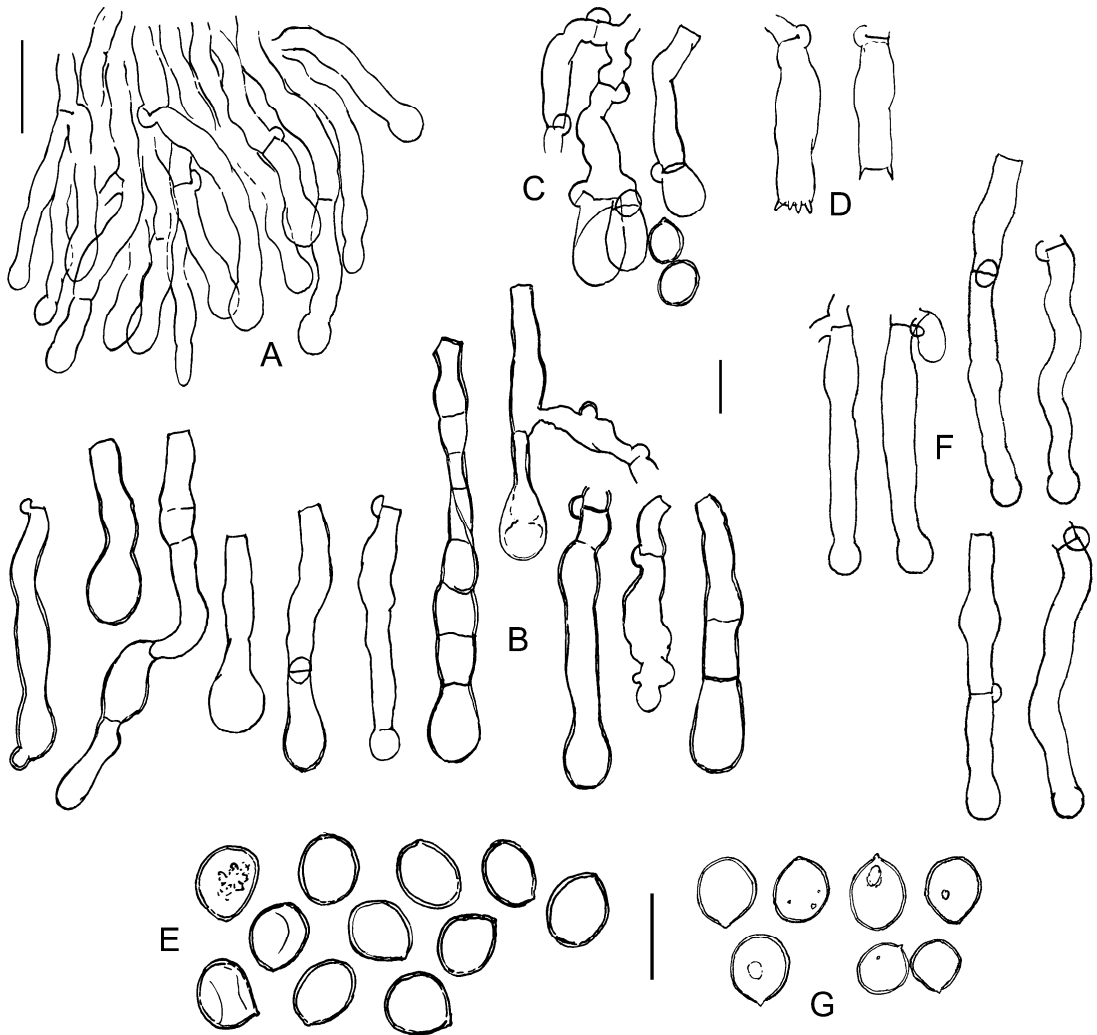
*Hyphodontia arguta*. Taiwan. Nantou County, Hsitou, alt. 1,200 m, on branch of *Cryptomeria japonica*, coll. S.H. Wu, 10.X.1991, *Wu 911010-4* (TNM F24822); Sunlinksea, alt. 1,700 m, on branch of *C. japonica*, coll. S.H. Wu, 1.VII.1992, *Wu 9207-17* (TNM F24829), *Wu 9207-32* (TNM F24831), *Wu 9207-40* (TNM F24724), coll. S.H. Wu, 19.IX.1992, *Wu 9209-58* (TNM F24833), *Wu 9209-82* (TNM F24835), *Wu 9209-85* (TNM F24837); Tungpu, alt. 1,300 m, on branch of angiosperm, coll. S.H. Wu, 8.X.1992, *Wu 9210-99* (TNM F24841). Taipei, Yangminshan National Park, alt. 350 m, on dead branch of angiosperm, coll. S.H. Wu and S.Z. Chen, 20.II.2001, *Wu 0102-12* (TNM F12781). China. Yunnan, Yiliang County, Shiaotsapa, Houho, on rotten trunk of angiosperm, coll. S.H. Wu and J.Y. Tseng,

18.IX.1998, *Wu 9809-86* (TNM F9180). U.S.A. Ohio, Butler County, on *Quercus* sp., coll. H.H. Burdsall, Jr., 18.VII.1977 [ex Herb. Center of Forest Mycology Research, HHB 9393; TNM

F914 (duplicate)]. Sweden. Öland, Högstrum, on fallen *Quercus*, coll. Å. Strid, 7.X.1995 [ex Naturhistoriska Riksmuseet (S); TNM F4607 (duplicate)].



**Fig. 1.** *Hyphodontia sphaerospora* (TNM F9041). A. Basidioma section. B. Aculeus section. C. Subicular hyphae. D. Hyphae from aculeal trama. E. Subhymenial hyphae and lagenocystidia. F. Hyphal ends from the base of aculei, with lagenocystidia. G. Lagenocystidia. Scale bars for A = 0.5 mm, for B = 0.1 mm, for C–G = 10  $\mu$ m.



**Fig. 2.** *Hyphodontia sphaerospora* (TNM F9041). A. Capitulate cystidia and hyphal ends at aculeal apex. B (TNM F9041) & F (TNM F24830). Capitulate cystidia. C. Basidiolae and basidiospores. D. Basidia. E (TNM F9041) & G (TNM F24830). Basidiospores. Scale bars for A = 10 µm, for B–G = 5 µm.

**Distribution.** Japan, Taiwan, Vietnam, Ecuador, Venezuela (subtropical to warm-temperate areas of East Asia and northern South America).

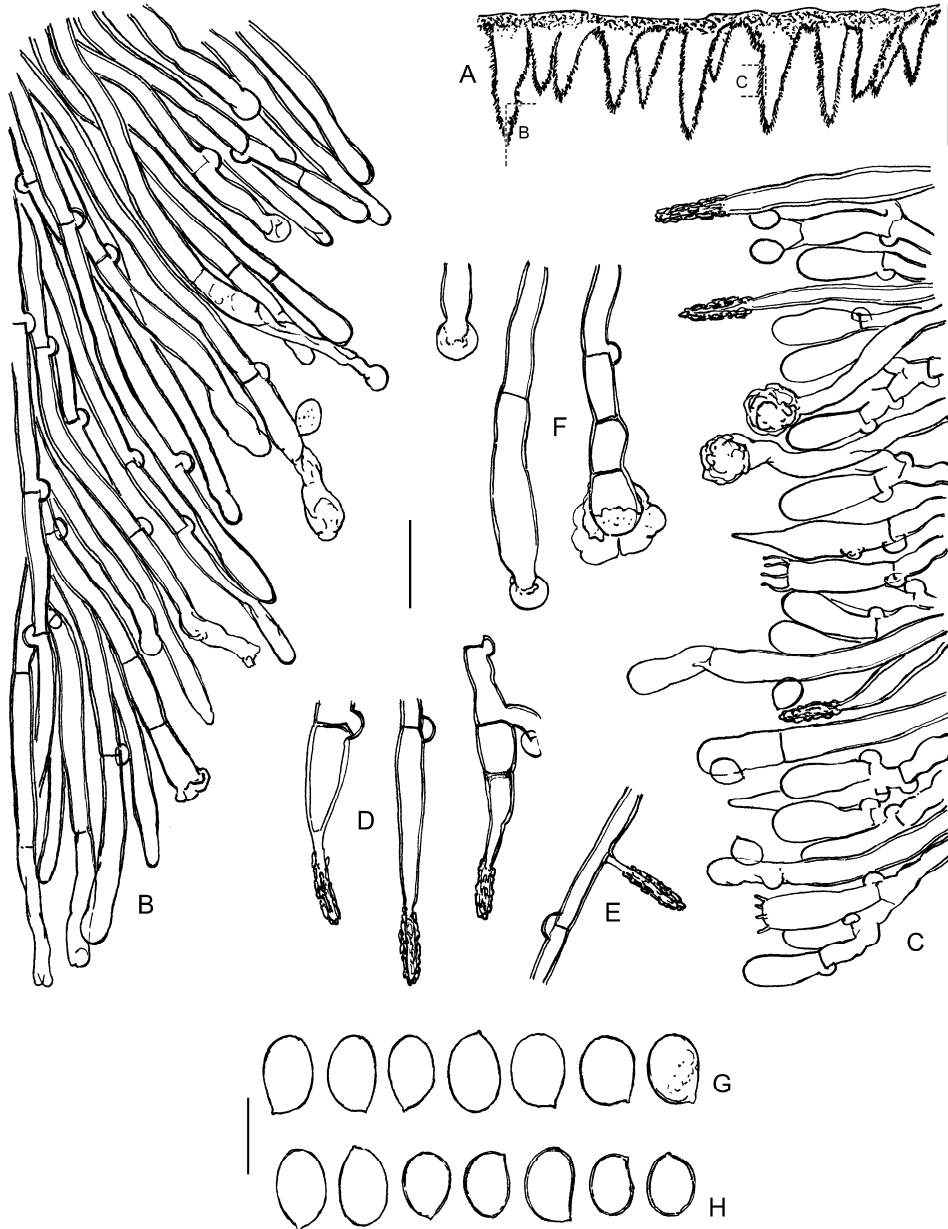
**Remarks.** In contrast with the description for *H. sphaerospora* (Maekawa, 1993; Hjortstam and Ryvarden, 2002), collections from Taiwan and Vietnam have denser and shorter aculei, and spores are from globose to broadly-ellipsoid. The Taiwanese collection is probably young, and has wart-like to short-conical aculei,

60–80 µm high and 45–90 µm wide at base. The specimen from Vietnam has conical-subcylindrical aculei, up to 0.5 mm high and up to 0.2 mm wide.

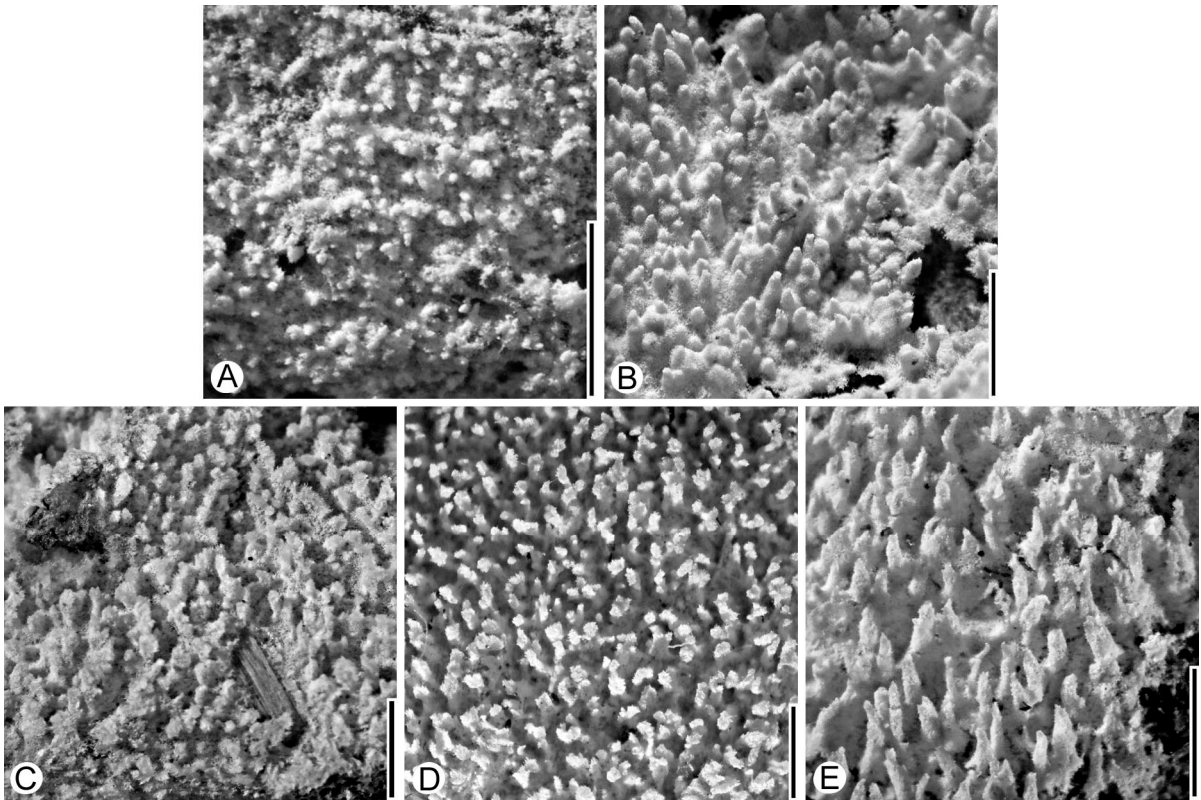
After studying specimens of *H. arguta* from Taiwan, China, Sweden, and U.S.A., we found that this species is distinctly separated from *H. sphaerospora*. In *H. arguta* there are numerous wide, moderately thick-walled hyphal ends, constituting aculei tips and resembling tubular cystidia or even skeletal hyphae, often yellow-

ish to reddish-yellow in mass (Fig. 3B) and rendering the upper part of aculeus fimbriate (Fig. 4D); hyphae in aculeal trama and subiculum are often thick-walled. In *H. sphaerospora* hyphal ends are fairly slender, thin-walled and colorless; hymenophoral aculei are generally

smooth; hyphae are narrower and thin-walled, which gives more soft consistency of the basidioma. Besides, lagenocystidia in *H. sphaerospora* are smaller, thin-walled, and more abundant, than in *H. arguta* (Figs. 3C, D). Both species have thin- to slightly thick-walled basidio-



**Fig. 3.** *Hyphodontia arguta* (TNM F24822). A. Basidioma section. B. Hyphal ends near aculeus tip. C. Hymenium. D. Lagenocystidia from hymenium. E. Lagenocystidium at vegetative hypha. F. Capitata cystidia with exudate. G (TNM F24833) & H (TNM F914). Basidiospores. Scale bars: for A = 0.5 mm, for B–F = 10  $\mu$ m, for G & H = 5  $\mu$ m.



**Fig. 4.** Hymenial surfaces. *Hyphodontia sphaerospora*. A. TNM F24830. B. TNM F9041. *Hyphodontia arguta*. C. TNM F24831 (irregularly odontoid). D. TNM F24822 (almost hydroid). E. TNM F24837 (almost hydroid). Scale bars = 1 mm

spores, but in *H. sphaerospora* they are smaller and often globose, whereas in *H. arguta* subglobose spores are seldom (Figs. 3G, H). Spores of Taiwanese material of *H. arguta* were measured as  $(4.2\text{--})4.8\text{--}5.3 \times (2.8\text{--})3.4\text{--}3.7 \mu\text{m}$ .

Significant morphological variation in hymenophore was found in examined collections of *H. arguta*, from warted to minutely hydroid, probably due to developmental stage of the basidiomata. However, *H. arguta* generally has thicker and longer aculei (Fig. 4).

### Acknowledgements

This study is supported by National Science Council of R.O.C. (Grant No. NSC 98-2621-B-178-002-MY3). The first author is financially

supported by the National Science Council of R.O.C. (Grant No. NSC 100-2811-B-178-001). The authors are grateful to Ms. S.Z. Chen (National Museum of Natural Science), for the help in managing herbarium specimens.

### References

- Hjortstam, K. and L. Ryvarden. 2002. Studies in tropical corticioid fungi (Basidiomycotina, Aphyllophorales): *Alutaceodontia*, *Botryodontia*, *Hyphodontia* s.s. and *Kneiffiella*. Synop. Fung. 15: 7–17.
- Hjortstam, K., L. Ryvarden, and T. Iturriaga. 2005. Studies in corticioid fungi from Venezuela II (Basidiomycotina, Aphyllophorales). Synop. Fung. 20: 42–78.

Maekawa, N. 1993. Three new corticiaceous fungi (Basidiomycotina, Aphyllophorales) from Japan. Proc. Japan Acad., Ser B 69(5): 119–122.

## 球孢絲齒菌 (*Hyphodontia sphaerospora*) 在臺灣及越南的新記錄

Eugene Yurchenko 吳聲華

國立自然科學博物館植物學組，臺中市 404

### 摘 要

球孢絲齒菌 (*Hyphodontia sphaerospora*) 是一種過去發現於日本及南美洲的殼菌類。本研究發現這種也產於臺灣及越南。本文並提供球孢絲齒菌的特徵描述及特徵圖。本文並討論球孢絲齒菌與一相似種，銳尖絲齒菌 (*H. arguta*) 的特徵差別。

**關鍵詞：**分類學、球孢絲齒菌 (*H. sphaerospora*)、殼菌、銳尖絲齒菌 (*Hyphodontia arguta*)、擔子菌門。

