

Helicoon doliiformis sp. nov. and two similar helicosporous hyphomycetes from Taiwan

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Abstract. Three species of helicosporous (aeroaquatic) hyphomycetes, including a new species *Helicoon doliiformis*, are described. *Helicosporium panacheum* is new for Taiwan, and a second record of *Xenosporium berkeleyi* is given.

Keywords: *Helicoon doliiformis*; Taiwan.

Introduction

In this paper we report three species of helicosporous hyphomycetes from Taiwan including a new interesting mitosporic fungus of the genus *Helicoon*. They were observed growing on decayed twigs collected from streams during our survey of freshwater Ascomycetes.

Helicoon doliiformis H.S. Chang, sp. nov. (Figure 1A-D)

Conidiophora semimacronematosa, mononematosa, cylindrica, erecta, recta, non ramosa, non septa, non verrucosa, 8-14 μm longa, 4-6 μm lata. Cellulae conidiogenae monoblasticae, in conidiophoris incorporatae, terminales, determinatae. Conidia solitaria, sicca, acrogena, flavidobrunnea vel atrobrunnea, helicoidea, 42-74 μm longa, 34-70 μm lata. Filamentum 9.5-16.0 μm latum, confertim septa, ellipsoideum vel doliiforme, 4-7 spiris sinistrorsum e centro visis arcte torsivum.

Holotypus: on submerged twig in a small stream, Wulai, Taipei, Taiwan, December 29, 1997, H.S. Chang, IBAS-WL1229-97A1.

Conidiophores micronematous to semimacronematous, mononematous, cylindrical, erect, straight, arising as short branches more or less at right angles to the surface hyphae, unbranched, non-septate, smooth, 8-14 μm long, 4-6 μm wide. Conidiogenous cells monoblastic, integrated, terminal, determinate. Conidia solitary, dry, acrogenous, yellowish to dark brown, helicoid, filament 9.5-16 μm wide, smooth, closely septate, 6-7 septa per coil, no constricted at septa, tightly coiled, 4-7 times in a counter-clockwise direction to form a broadly ellipsoidal or doliiform body, 42-74 μm long, 34-70 μm wide.

Helicoon doliiformis is erected as a new species mainly on the thickness of the conidial filament, ranging from 10 to 17 μm , and 13-15 μm in most cases. It is far thicker than those of known species (Goos et al., 1986; Matsushima, 1993; Van der Aa and Samson, 1994; Goh and Hyde, 1996; Voglmayr, 1997; Abdullah et al., 1998). *Helicoon macrosporum* had been the species with the

thickest conidial filament of 8.5-11 μm . Conidiophores are micronematous to semi-macronematous, up to 14 μm , but usually less than that. The conidium coils in a counter-clockwise direction as was reported for *H. gigantisporum* (Goh and Hyde, 1996). Though conidia coiled only 5-7 times, they reached a height of 70 μm due to the great thickness of their conidial filament.

Another isolate of the genus *Helicoon*, designated as HTP1101-BB1 (*Helicoon* sp.), was also obtained from an unidentified decayed twig collected in a stream at Puli, Nantou County. Morphologically, this isolate is very similar to *H. doliiformis*, but it possesses a thicker conidial filament. The morphological characters of this isolate are as follows:

Helicoon sp. (Figure 1E-F)

Conidiophores semimacronematous, mononematous, cylindrical, erect, straight, short, arising at right angles to the hyphae, light yellowish brown, unbranched, non-septate, smooth, 12-18 μm long, 6.0 μm wide. Conidiogenous cells monoblastic, integrated, terminal, determinate. Conidia solitary, dry, acrogenous, reddish brown when mature but light yellowish brown when still young, helicoid, filament smooth, 9-14 μm thick, tightly coiled 8-9 times in a counter-clockwise direction to form a broadly ellipsoidal or doliiform conidium, 80-86 μm long, 58-70 μm wide. Tentatively, we place this isolate in *Helicoon doliiformis* though its conidia are mostly larger than in this species.

Helicosporium panacheum R.T. Moore, 1954. Mycologia 46:92. (Figure 2A-E)

Conidiophores macronematous, mononematous, usually unbranched, straight or flexuous, short, light brown, 1-2 septate, 8-38 μm long, 5-6 μm wide. Conidiogenous cells commonly polybastic, terminated by tooth-like projections. Conidia hyaline, white in mass, 24-30 μm in diam. Conidial filament tightly coiled 2.0-2.5 times, multiseptate, 3-7 μm wide.

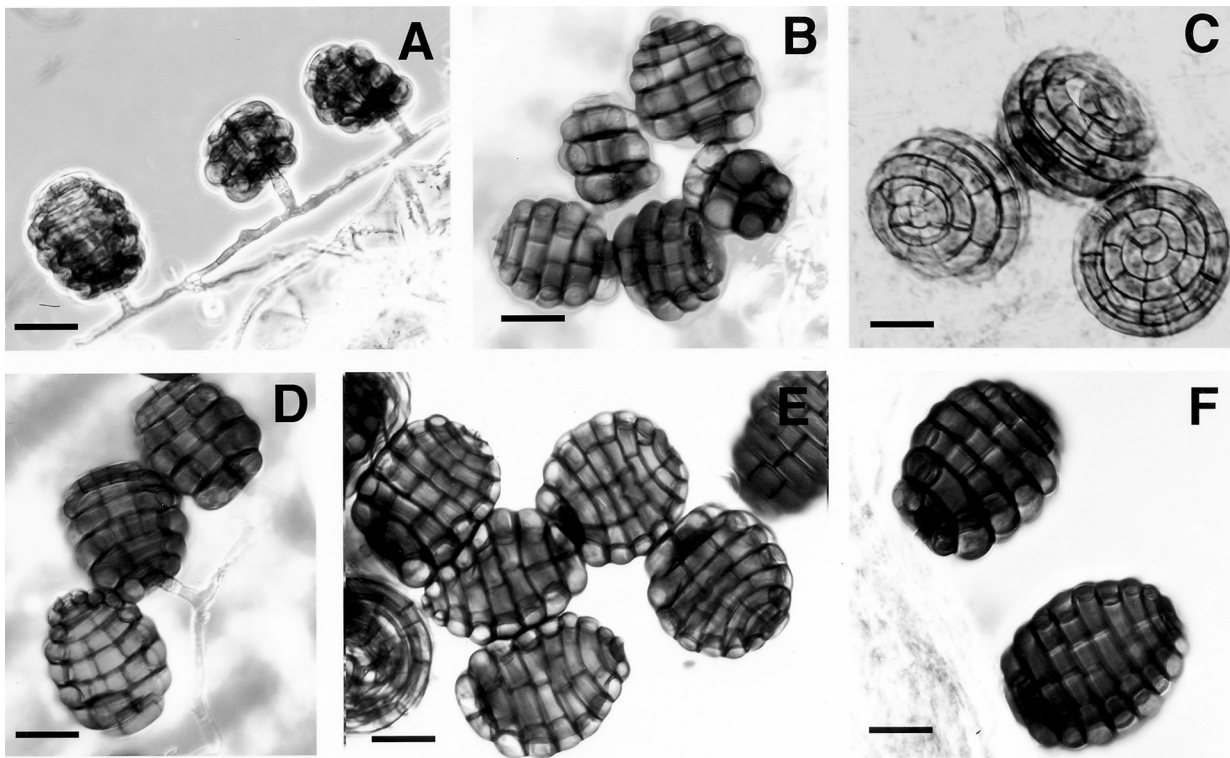


Figure 1. *Helicoon doliiformis* and *Helicoon* sp. A-D, Conidia and conidiophores of *Helicoon doliiformis*; E-F, Conidia of *Helicoon* sp. (HTP1101-BBL) (Scale bar=20 μ m).

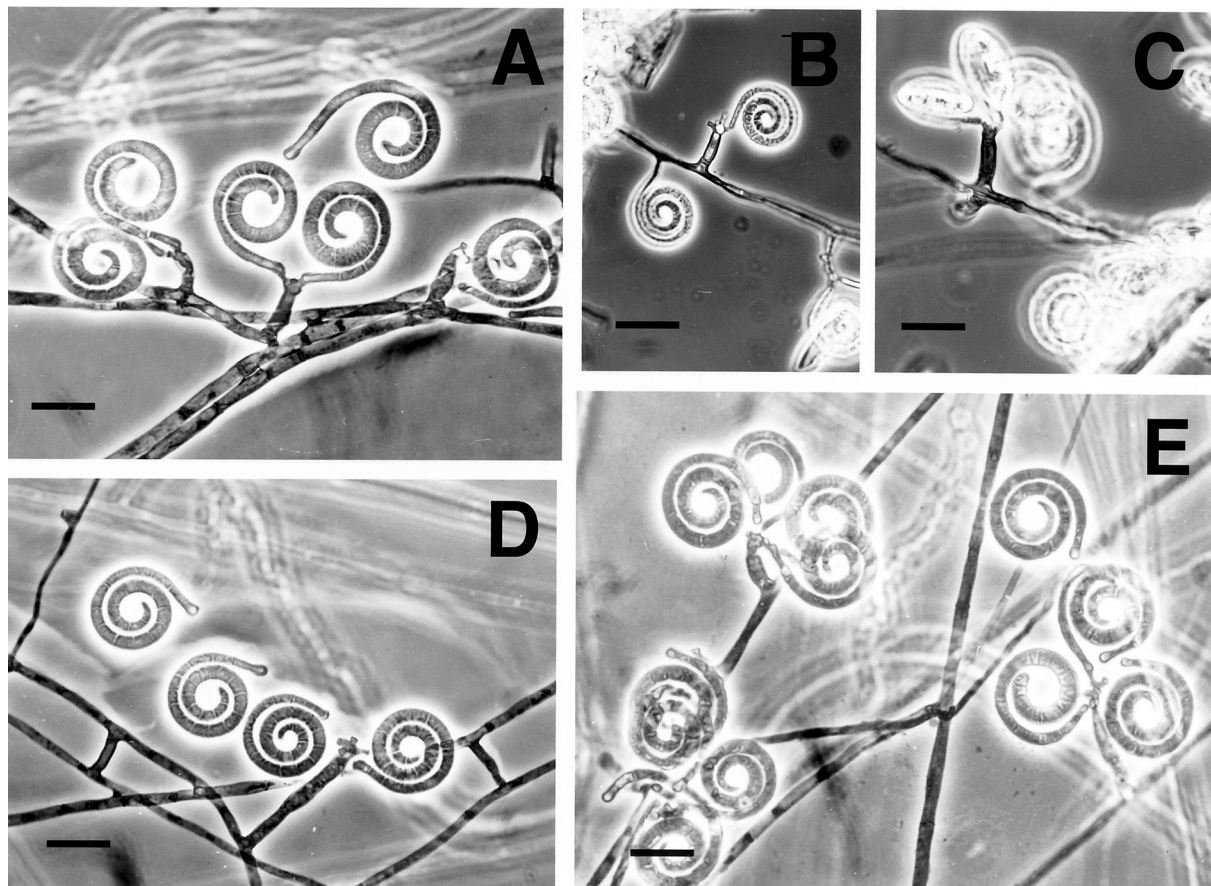


Figure 2. *Helicosporium panacheum*. A-E, Helicosporous conidia and conidiophores. (Scale bar=20 μ m).

The short conidiophores of this fungus are usually recorded as less than 70 μm high. However, some were occasionally longer than 100 μm in culture on an autoclaved corn leaf section on Sach's medium, though most of them were short and stout. Cultural conditions apparently affected the length of conidiophores. Nevertheless, short conidiophores with polyblastic conidia are the main character of this species of *Helicosporium*.

Habitat. On decayed twigs of unknown tree collected from streams at Wulai, Taipei County, Puli, Nantou County and Fusan, Yulan county. Apparently this fungus is widely distributed in Taiwan.

Xenosporium berkeleyi (Curtis) Pirozynski. Mycol. Papers 105: 27-29. 1966. (Figure 3A-B)

Helicoma berkeleyi Curtis, Amer. J. Sci. II 6: 352. 1848.

Helicosporium bereleyi (Curt.) Saccardo, Sylloge Fung. 4: 560. 1886.

Xenosporella berkeleyi (Curt.) Linder, Ann. Mo. Bot. Gard. 16: 318. 1929.

=*Helicoma binale* "Berkeley & Curtis" ex Berk. & Broome, J. Linn. Soc. Bot. 14: 100. 1873.

Helicosporium binale (Berk. & Curt.) Sacc., Sylloge Fung. 4: 560. 1886.

=*Helicosporium diplosporum* Ellis & Everhart, Proc. Acad. Nat. Sci. Philad. 1891: 93. 1891.

Helicomycetes diplosporus (Ell. & Ev.) Pound & Clements, Minn. Bot. Stud. 9: 658. 1896.

=*Helicoma bambusae* P. Hennings, Hedwigia 41: 310. 1902.

Conidiophores macronematous, mononematous, usually in groups, mostly unbranched, straight or flexuous, dark brown, thick-walled, septa distinct and smooth, 6-16.5 μm long, 1.25-1.50 μm wide. Conidiogenous cells monoblastic, integrated, terminal, percurrent, cylindrical. Conidia borne singly on broadly flattered tips of the conidiophores, at first hyaline, then dark yellow-brown, coiled. 5.0-6.5 μm diam., filament 1.25-1.50 μm wide, composed of two rows of distinctly thick-walled cell, coiled 2-2.5 times at maturity.

In our isolate we did not observe the secondary conidia described by previous reports (Linder, 1929; Pirozynski, 1966; Goos, 1990).

Habitat. On decayed twig collected in a stream at Puli, Nantou County on Dec. 10, 1998; also recorded by Matsushima on *Phyllostachys makinoi* stems collected at Chungpu, Chiayi County on July 8, 1977.

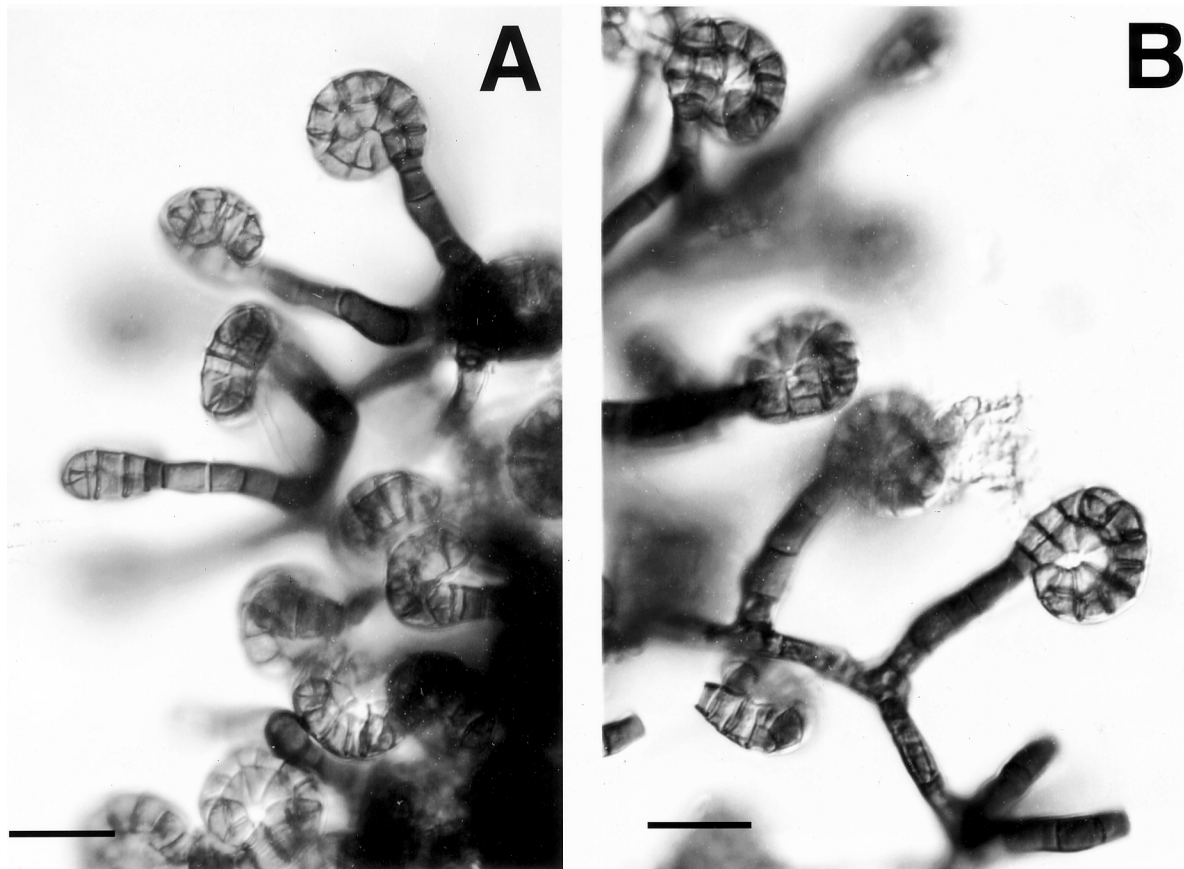


Figure 3. *Xenosporium berkeleyi*. A-B, Conidia and conidiophores. (Scale bar=20 μm).

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Helicoon doliiformis 一種台灣新螺旋孢絲胞菌及 兩種類似菌

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本報告記錄一新螺旋孢絲胞菌 *Helicoon doliiformis* 以及兩種類似菌 *Helicosporium panacheum* 和 *Xenosporium berkeleyi*。 *H. panacheum* 亦為台灣新紀錄菌。

關鍵詞：新螺旋孢絲胞菌；台灣。