

## Myxomycetes of Taiwan (XVII): Four New Records of *Cribraria*

Chin-Hui Liu<sup>(1,3)</sup>, Jong-How Chang<sup>(1)</sup>, Ya-Fen Chen<sup>(1)</sup> and Fu-Hung Yang<sup>(2)</sup>

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**ABSTRACT:** Two species and two varieties of the genus *Cribraria* are described and illustrated in this paper. Included are *Cribraria* cf. *laxa* Hagelst., *Cribraria microcarpa* (Schrad.) Pers. var. *pachydictyon* (Nann.-Bremek.) Y. Yamam., *Cribraria mirabilis* (Rostaf.) Masee, and *Cribraria vulgaris* Schrad. var. *oregana* (H. C. Gilbert) Nann.-Bremek. & Lado. They are all newly recorded in Taiwan and all their fruiting bodies are collected from fields.

**KEY WORDS:** *Cribraria*, Cribrariaceae, Myxomycetes, Taiwan, True slime molds.

### INTRODUCTION

Sixteen members of the genus *Cribraria* in Taiwan have been reported previously (Nakazawa, 1929; Wang et al., 1981; Liu, 1983; Chiang and Liu, 1991; Chen et al., 2005). Of them ten were recorded in a list by Nakazawa (1929). In this paper we report four new records of *Cribraria*. Included are two species and two varieties of different species. They were found from fields either on rotten logs or dead wood.

### TAXONOMIC TREATMENT

*Cribraria* cf. *laxa* Hagelst., Mycologia 21: 298. 1929. Figs. 1A-C

Fructification gregarious or scattered on rotten logs, sporangiate, 0.50-0.75 mm in total height. Sporangia stipitate, pale to ochraceous brown, globose, 0.4-0.5 mm in diameter. Basal cup strongly ribbed, occupying about one-fourth or less of the sporangium. Net arising from the ribs, wide meshed, nodes large, pulvinate, polygonaled, with slender connecting threads and few free ends. Stalk short, about 0.3 mm long, reddish brown to blackish brown, attenuate, furrowed. Spores clay-colored in mass, colorless by transmitted light, globose, 5-6  $\mu$ m in diameter, minutely warted. Plasmodium not observed.

Specimen examined: TAIWAN. Taipei Co.: Shih-ting, Wenshan Botanical Gardens of National Taiwan University, YangA5-18-2, May 15, 1999, on rotten logs.

Distribution: North America, Asia (Japan and Taiwan).

Our specimen is a minute form, but mostly close to *Cribraria laxa* in shape, color of sporangia, and spores. The distinctive characters of this species are the sporangia which are moderately large with short stalks and wide-meshed net.

*Cribraria microcarpa* (Schrad.) Pers. var. *pachydictyon* (Nann.-Bremek.) Y. Yamam., Myxomycetes Biota Japan 81. 1998.

Figs. 2A-C

*Cribraria pachydictyon* Nann.-Bremek. Proc. K. Ned. Akad. Wet. C. 69: 342. 1966.

Specimen examined: TAIWAN. Taipei: Wenshan District, Hsien-Chi-Yen, CHL B1849d, June 28, 1999, on dead wood.

Distribution: North America, Europe, Asia (Japan and Taiwan).

This specimen was described as *Cribraria* sp. (Chen et al., 2005) and said being very similar to *Cribraria microcarpa* and *Cribraria confusa* in bearing minute sporangia. It is distinguished by having thin and flat, rounded or elongated peridial nodes (about 8-10  $\mu$ m in diameter). The whole fruiting body is 0.4-0.8 mm in total height, with a longly stipitate sporangium nodding and rounded, 0.08-0.14 mm in diameter. The spores are pale salmon in mass, globose or subglobose, 6-7  $\mu$ m in diameter, minutely warted. The total height of fruiting body is recorded in the reference (Yamamoto, 1998) as 1.5-3.0 mm. Apparently our specimen is a minute form of *Cribraria microcarpa* var. *pachydictyon*.

*Cribraria mirabilis* (Rostaf.) Masee, Mon. 60. 1892. Figs. 1D-J & 3

*Heterodictyon mirabile* Rostaf., Mon. 231. 1875.

*Dictydium mirabile* (Rostaf.) Meylan, Bull. Soc. Vaud. Sci. Nat. 57: 305. 1931.

1. Institute of Plant Biology, National Taiwan University, 1, Roosevelt Rd., Sec. 4, Taipei 106, Taiwan.  
2. Institute of Life Sciences, National Defense Medical Center, National Defense University, 161, Sec. 6, Min-Chuan E. Rd., Taipei 114, Taiwan.  
3. Corresponding author. Email: huil4951@ntu.edu.tw

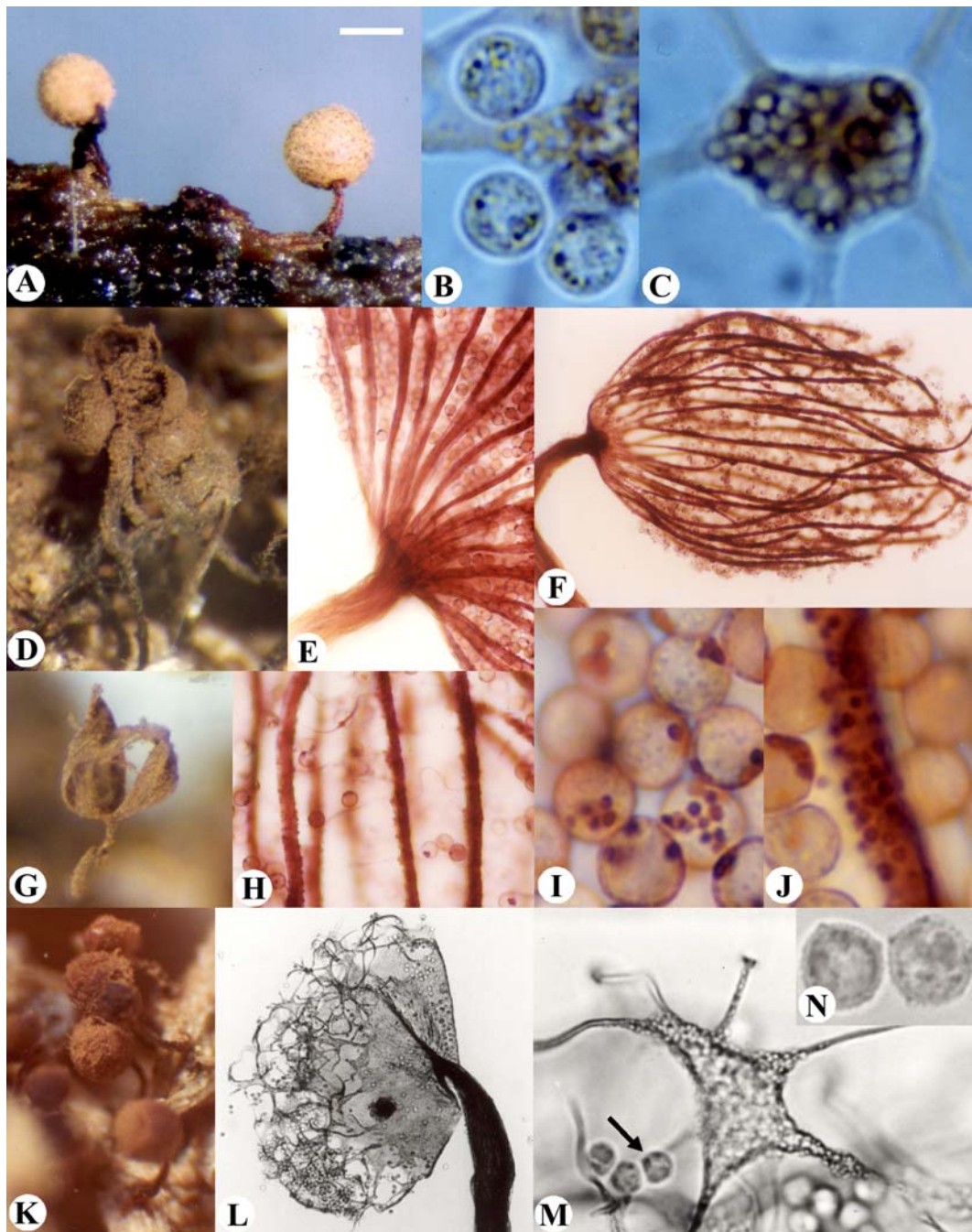


Fig. 1. A-C. *Cribraria cf. laxa*. A: Fruiting bodies. B: Spores. C: Peridial node. D-J. *Cribraria mirabilis*. D: Fruiting bodies. E: Calyculus and peridial net. F: One sporangium under transmitted light. G: Sporangium. H: Peridial net with dictydine granules and spores. I: Spores. J: Peridial rib with dictydine granules and spores. K-N. *Cribraria vulgaris* var. *oregana*. K: Fruiting bodies. L: One sporangium showing the peridial net. M: Peridial node and surface view of spores (arrow). N: Spores. Scale bars: A = 600  $\mu$ m, B-C, I-J, N = 7.5  $\mu$ m, D = 300  $\mu$ m, E, H = 50  $\mu$ m, F = 100  $\mu$ m, G = 200  $\mu$ m, K = 750  $\mu$ m, L = 150  $\mu$ m, M = 25  $\mu$ m.

Fructification densely gregarious to clustered, sporangiate, erect or inclined, 1.4-2.2 mm in total height. Sporangia stipitate, reddish brown to dark reddish brown, depressed globose, 0.37-0.47 mm in diameter. Peridial ribs reddish brown, covered with dictydine granules on the inner side, the outer

surface smooth, composed of 20-30 main branches radiating from the base of sporangia, some dichotomously branched upwards and anastomosed forming lax meshes on the upper part, with transverse connecting filaments between two neighboring ribs, sometimes with a silvery

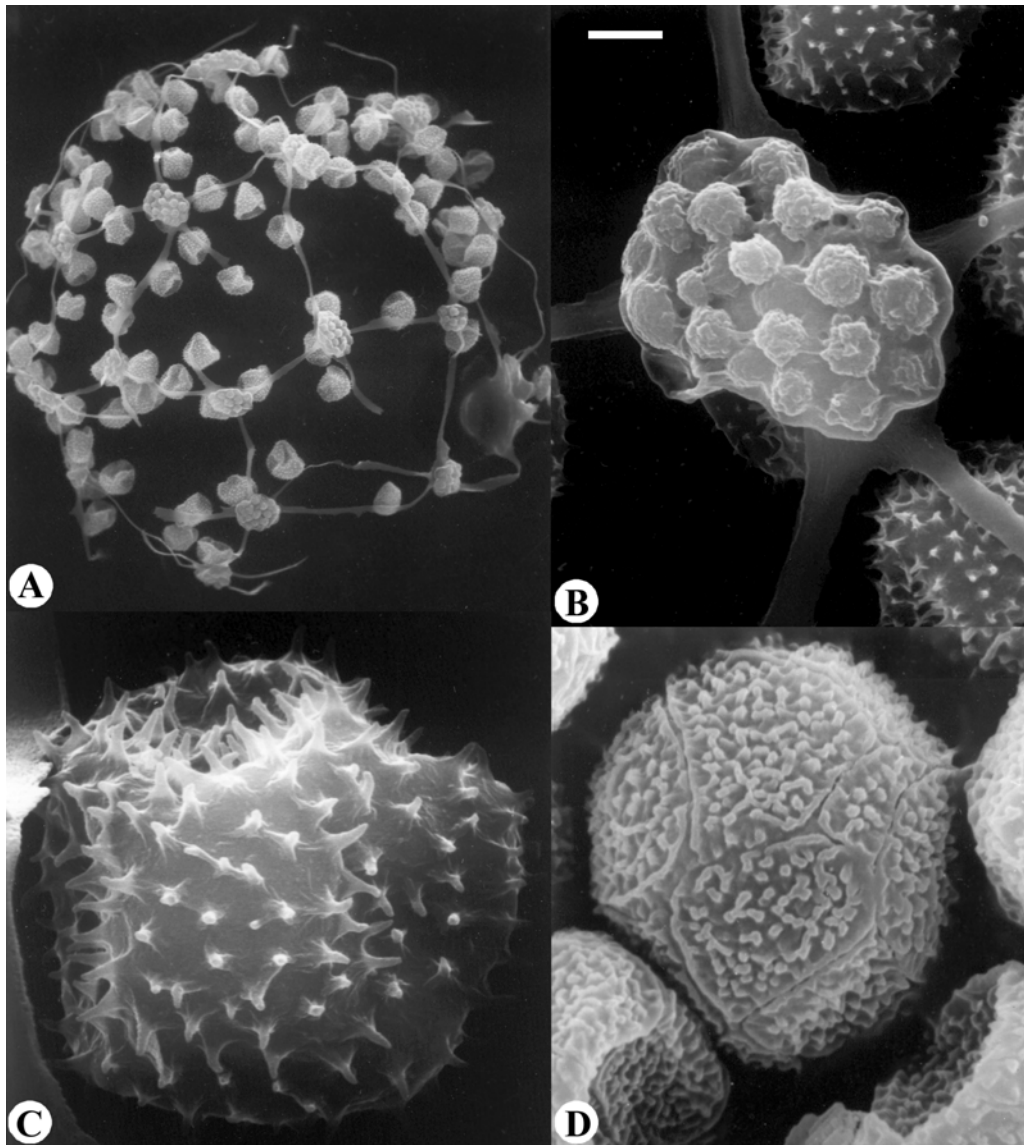


Fig. 2. A-C. SEM of *Cribraria microcarpa* var. *pachydictyon*. A: Peridial net and spores. B: Peridial node. C: Surface markings of spore. D: Spores surface markings of *Cribraria vulgaris* var. *oregana*, SEM. Scale bars: A = 25  $\mu\text{m}$ , B = 7.5  $\mu\text{m}$ , C = 1.5  $\mu\text{m}$ , D = 4  $\mu\text{m}$ .

membrane. Stalk attenuate, pale at the upper portion under transmitted light, longitudinally furrowed, filled with reddish brown dictydine granules. Hypothallus brownish, membranous. Spores reddish brown in mass, pale reddish under transmitted light, nearly smooth under high dry lens, with several clustered dictydine granules inside the wall of spores, banded reticulate under SEM, globose, 5-6  $\mu\text{m}$  in diameter. Plasmodium not observed.

Specimen examined: TAIWAN. Taipei: Mt. Samoa, CHL B1312, Oct. 11, 1997, on rotten logs.

Distribution: Mountains of central Europe, Sweden, California, Asia (Japan and Taiwan).

This species resembles *Cribraria cancellata* in color and shape of sporangia. However, spores of *C.*

*mirabilis* always contain clusters of dictydine granules, which is not found in *C. cancellata*. In addition, the number of ribs in this species is less than *C. cancellata* (ca. 40 to 50 in a sporangium) (Nannenga-Bremkamp, 1991; Yamamoto, 1998).

Our specimen is slightly different from the description for this species in references (Martin and Alexopoulos, 1969; Nannenga-Bremkamp, 1991; Yamamoto, 1998; Ing, 1999). (1) The sporangia is depressed globose, not prolate under stereomicroscope, however, when viewed under a mounted slide, the sporangia became elongated and appeared as prolate. (2) The diameter of sporangia is smaller (0.5-0.8 mm in reference).

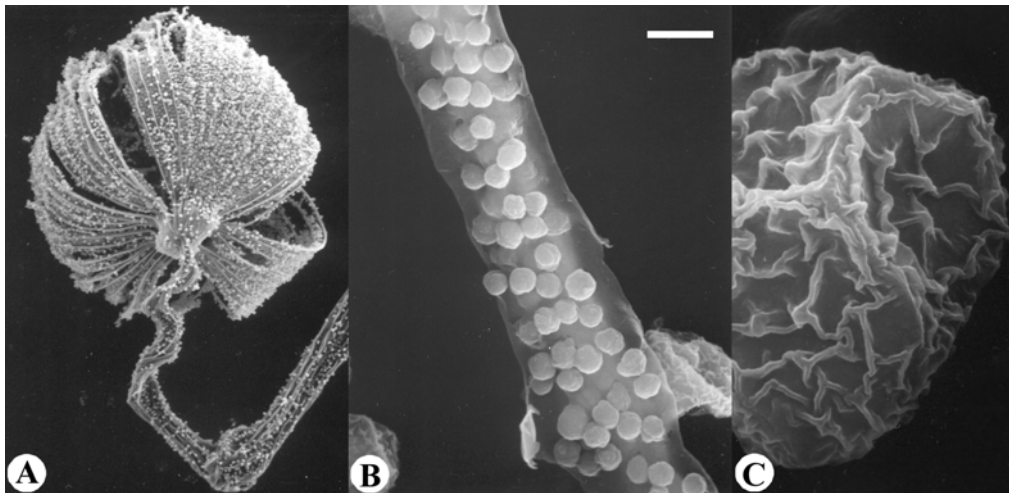


Fig. 3. SEM of *Cribraria mirabilis*. A: Sporangium. B: Peridial rib with dictydine granules. C: Surface markings of spore. Scale bars: A = 150  $\mu$ m, B = 5  $\mu$ m, C = 1  $\mu$ m.

*Cribraria vulgaris* Schrad. var. *oregana* (H. C. Gilbert) Nann.-Bremek. & Lado, Proc. Kon. Ned. Akad. Wet. C. 88: 224. 1985.

Figs. 1K-N & 2D

*Cribraria oregana* H. C. Gilbert, in Peck & H. C. Gilbert, Am. J. Bot. 19: 142. 1932.

Fructification gregarious or scattered, erect or inclined, 0.76-1.4 mm in total height. Sporangia stipitate, subglobose, 0.22-0.60 mm in diameter, orange-brown. Peridium persisting as a calyculus at the base covering one third or more of the sporangium, with ribs not prominent, the margin irregular or toothed, connected with the net above, net with meshes of variable size, nodes large and of variable shape, flat, with few or almost without free ends. Stalk dark brown, subulate, 0.64-0.84 mm long. Spores orange brown in mass, brownish yellow by transmitted light, globose or subglobose, angular with large reticulation, minutely warty, 6.2-9.0  $\mu$ m in diameter. Plasmodium not observed.

Specimen examined: TAIWAN. Taichung Co.: Wuling Farm, CHL B235, April 16, 1983, on dead wood.

Distribution: Europe, North America, Asia (China, Japan, Taiwan).

This variety differs from var. *vulgaris* in its color (Nannenga-Bremekamp, 1991). The distinct characters are the flat and large nodes which are almost without free ends, and the spores with large reticulation on the surface appeared somewhat angular in profile. Martin and Alexopoulos (1969) recognized it as a distinct species of *Cribraria* and stated that the spores are larger and darker in *C. oregana* than in *C. vulgaris* (5-6  $\mu$ m in diameter). Besides, the species *C. oregana* is consistently smaller than *C. vulgaris*.

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## 臺灣黏菌(十七)：四種篩黏菌屬的新紀錄

劉錦惠<sup>(1,3)</sup>、張仲豪<sup>(1)</sup>、陳雅芬<sup>(1)</sup>、楊馥鴻<sup>(2)</sup>

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### 摘 要

本篇報導篩黏菌屬的四種新紀錄，包括鬆篩黏菌 (*Cribraria cf. laxa* Hagelst.)、小篩黏菌大網變種(*Cribraria microcarpa* var. *pachydictyon* (Nann.-Bremek.) Y. Yamam.)、非凡篩黏菌 (*Cribraria mirabilis* (Rostaf.) Masee) 與橙篩黏菌俄勒岡變種 (*Cribraria vulgaris* var. *oregana* (H. C. Gilbert) Nann.-Bremek. & Lado)。所有子實體都自野外直接採得。

關鍵詞：篩黏菌屬、篩黏菌科、黏菌綱、臺灣、真黏菌。

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1. 國立臺灣大學植物科學研究所，106 台北市羅斯福路4段1號，臺灣。
  2. 國立國防大學生命科學研究所，114 台北市民權東路6段161號，臺灣。
  3. 通信作者。Email: huil4951@ntu.edu.tw