NOTE

Materials to the Bryophyte Flora of Taiwan (II) – *Fossombronia caledonica* Steph. (Fossombroniaceae), a New Record

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ABSTRACT: A new record liverwort, *Fossombronia caledonica* Steph. from Yangmei, Taoyuan County, was described. This species inhabits open vegetable or paddy field sympatric with *F. japonica* Schiffne. Descriptions and SEM photos of both species are given to aid in identification. Keys for distinguishing three recorded species in Taiwan are also provided.

KEY WORDS: *Fossombronia caledonica*, *Fossombronia japonica*, Fossombroniaceae, liverwort, new record species, Taiwan.

INTRODUCTION

Fossombronia Raddi is a leafy liverwort in outer appearance but its sexual organs are scattered along the main axis of gametophytes, a characteristic of thalloid liverwort (Schuster, 1984). These combined characters make *Fossombronia* easily recognized. *Austrofossombronia* Schuster, *Fossombronia*, *Petalophyllum* Lehm., and *Sewardiella* Kashyap. comprise the family Fossombroniaceae that is allied to the Allisoniaceae, both being placed in the Fossombroniales and subclass Metzgeriidae. (Crandall-Stotler and Stotler, 2000). Seven species, namely, *F. alsakana* Steere & Inoue, *F. caledonica* Stephne, *F. himalayensis* Kashyap, *F. japonica* Schiffn., *F. macrocalyx* Steph., *F. mylioides* Inoue, and *F. pusilla* (L.) Nees, were recognized in East Asia and Oceania (Krayesky et al., 2005). Two species, *F. japonica* and *F. pusilla* were reported in Taiwan. Taxonomically, *F. japonica* contains a synonym of *F. australi-nipponica* Horikawa and a misapplied name of *F. cristula* from Taiwan (Krayesky et al., 2005; Kuo and Chiang, 1988; Lin, 2000). The taxonomy of this genus heavily relies on differentiation of spore wall ornamentation due to plasticity of gametophyte morphology (Scott and Pike, 1984, 1987, 1988; Krayesky et al., 2005). Recently, we carried out a survey of liverwort flora at Yangmei, Taoyuan County, and found two sympatric *Fossombronia* species with different spore wall ornamentation. One was determined as *F. japonica* and the other was determined to be a new record species, *F. caledonica*. Here we provide descriptions of both species and photos of SEM to assist identification of these two species. Keys for distinguishing Taiwan's species were also synthesized from literature.

MATERIALS AND METHODS

Specimens were collected from the field and air dried. They are deposited in the specimen room of the Department of Applied Science, National Hsinchu University (tentative acronym, NHCUE).

Preparation of SEM photos: Fresh materials were collected and fixed with 70% alcohol, and then dehydrated in alcohol series, dried in a critical point dryer, coated with gold and were examined with Hitachi S-3000N, installed at the Department of Applied Science, National Hsinchu University of Education.

TAXONOMIC TREATMENTS

There are three species of *Fossombronia* reported in Taiwan. Keys for distinguishing these three species are as below.

1. Spore walls alveolate in distal view; elators 1-spirally banded ……..…… ……..…….. 1. *F. japonica*
1. Spore walls lamellate or baculate in distal view; elators 1- or 2-4-spirally banded ……..……. 2
2. Spore walls lamellate in distal view; elators 2-4-spirally banded ...…… ……..……. *F. pusilla*
2. Spore walls baculate in distal view; elators 1 or 2-spirally banded ……..……. 2. *F. caledonica*

1. ***Fossombronia japonica*** Schiffn. in Osterr. Bot. Zeitschr. 49: 389, 1898; Krayesky et al in J. Hattori Bot. Lab. 98: 20, figs. 7-8, 2005. Fig. 1

Fossombronia australi-nipponica Horikawa in J. Sc. Hiroshima Univ. ser. B, Div. 2, 2: 138. fig. 8, 1934.
Fossombronia cristula auct. non Aust.: Inoue in J. Hattori Bot. Lab. 37: 293; Lai & Wang-Yang in Taiwania 21: 168, 1976.

Plants green, grown in mats on soil, sparingly branched, creeping, 8-10 mm long. Leaves imbricate,

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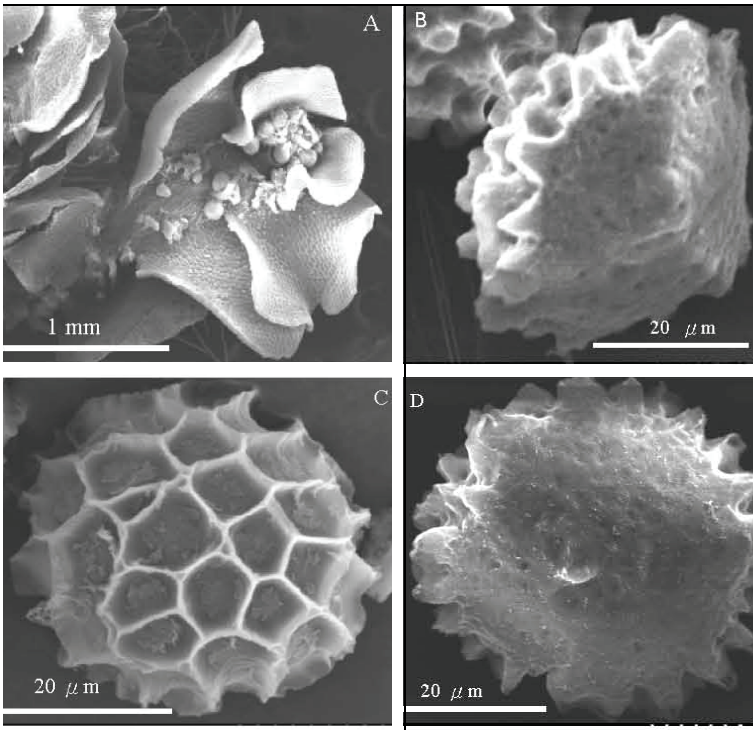


Fig. 1: *Fossombronia japonica* Schiffn. A: Habit. B: Equatorial view of the spore. C: Distal surface of the spore. D: Proximal surface of the spore.

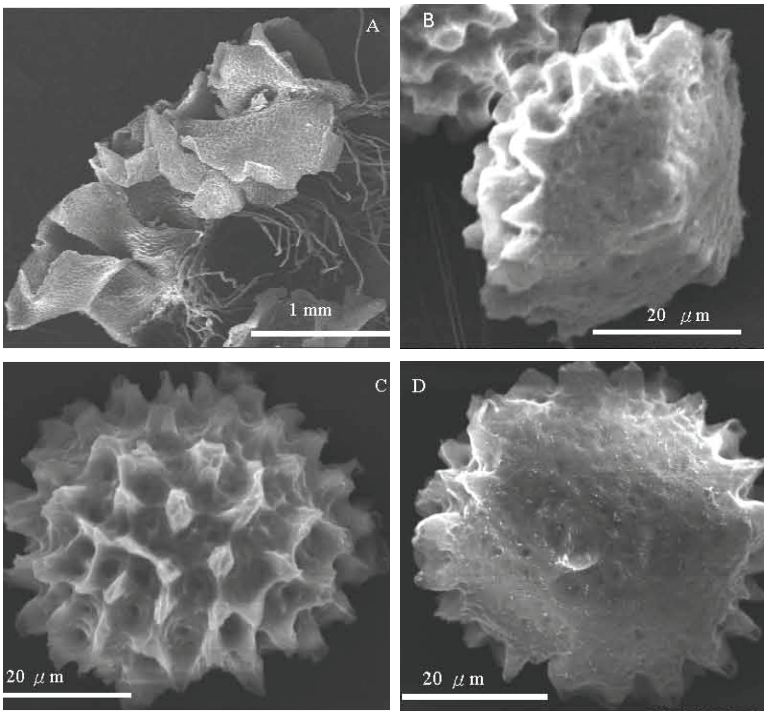


Fig. 2: *Fossombronia caledonica* Steph. A: Habit. B: Equatorial view of the spore. C: Distal surface of the spore. D: Proximal surface of the spore.

suberect to patent, entire except few 1-celled hairs protruding from epidermis, wavy, about 1.0 x 1.0-1.2 mm long, inserted near the dorsal stem midline, sometimes opposite leaves overlapping in outer appearance. Stem about 0.2 mm wide, rhizoids spreading along ventral surface of the stem, purplish red. Monoicous, male and female gametangia intermixed, along the upper portion of dorsal surface of the stem. Spores circular, 40-45 μm in diameter from polar view; fan shaped, about 36 μm long, 44 μm wide from equatorial view, the proximal surface cristate, without tri-radiate ridge; the distal surface alveolate, with 4-5 areolae across the diameter, margin of areola about 2 μm high. Elators one-spirally banded.

Specimens examined: Taoyuan: Yangmei, Y. J. Wu *164*. (NHCUE).

Habitat: Open loamy soil on a vegetable field.

Altitude: 200 m.

2. ***Fossombronia caledonica*** Steph., Species hepaticarum 6: 71. 1917; Krayesky et al. J. Hattori Bot. Lab. 98: 1-45. Fig. 2

Plants yellowish green, grown in mats, on soil, stems green, sparingly branched, creeping, 4-7 mm long. Leaves imbricate, patent to suberect, entire except few 1-celled hairs protruding from epidermis, usually emarginate, about 1.0 x 1.1 mm long, width usually broader than length, inserted not to the stem midline. Stem 0.2-0.3 mm wide, rhizoids spreading along the ventral surface of the stem, purplish red. Monoicous, male and female gametangia intermixed, along the upper portion of dorsal surface of the stem. Spores circular, about 45-50 μm in diameter from polar view; fan shaped, about 29-38 μm long, 50-54 μm wide from equatorial view, the proximal surface slightly trihedral, shallowly reticulate to nearly smooth; the distal surface with many rounded to truncate baculi of about 7 μm high, which connecting to their neighbors in different degree and forming lamellae or not; 19-30 baculi near the equatorial margin, different size of pores occurring among baculi. Elators 1 or 2-spirally banded, short, stout.

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Specimens examined: Taoyuan: Yangmei, Y. J. Wu *103, 165, 166* (NHCUE); S. H. Lin *9711102* (TUNG).

Habitat: Open loamy soil on a vegetable or paddy field.

Altitude: 200 m.

Our material is slightly different from those described from the literature (Krayesky et al., 2005) in having more connection among neighboring baculi and more smooth in the proximal surface in spore ornamentation.

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臺灣苔蘚植物誌資料 (二)－新喀島小葉蘚 (小葉蘚科)

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摘要：本文主要描述新紀錄種新喀島小葉蘚 (*Fossombronia caledonica* Steph.)。本種發現於桃園縣楊梅鎮，生長於菜園或水田邊，並與日本小葉蘚 (*F. japonica* Schiffn.) 共域生長。本文對這兩種作分類描述，並附有掃描式電子顯微相片作為鑑定之參考。本文同時提供檢索表區別三種報導存在於臺灣之小葉蘚種類。

關鍵詞：新喀島小葉蘚、日本小葉蘚、小葉蘚科、蘚類、新紀錄種、臺灣。

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