

New Materials of the Hymenophyllaceae from Hainan Island, China

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During a recent trip to Hainan Island of China, we collected some filmy ferns from Diaoluo Mountain in the southeastern of the island. *Trichomanes subclathratum* turns out to be a new record to the Hainan fern flora, and also represent new record to China, and *Mecodium riukiense*, so far has been unaware to Chinese pteridologists is also recorded here.

Kew words: Hainan, Hymenophyllaceae, *Mecodium riukiense*, *Trichomanes subclathratum*, unrecorded species.

During a recent trip to Hainan Island of China, we collected some filmy ferns (Hymenophyllaceae) from Diaoluo Mountain in the southeastern of the island. Those are *Callistopteris apiifolia* (C. Presl) Copel. (Sun et al. 5198), *Mecodium exsertum* (Wall. ex Hook.) Copel. (Sun et al. 5040), *M. riukiense* (H. Christ) Copel. (Sun et al. 5201A, Zhang et Liu 3529A), *Selenodesmium obscurum* (Blume) Copel. (Sun et al. 5195A, Zhang et Liu 3527), *S. siamense* (H. Christ) Ching & Chu H. Wang (Sun et al. 5195B, 5201B), and

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Trichomanes subclathratum (K. Iwats.) C.V. Morton (*Sun et al.* 5201C, 5214, 5218; *Zhang et Liu* 3529B). Specimens are preserved in the Herbarium of Chonbuk National University (JNU) and Chinese National Herbarium of Beijing (PE).

Of the above filmy ferns, *Trichomanes subclathratum* turns out to be a new record to the Hainan fern flora, and also represent new record to China, and *Mecodium riukiense* has so far not been recognized by Chinese pteridologists from China, although its occurrence in Hainan was recorded by Iwatsuki (1985, 1995). *Callistopteris apiifolia* is a tropical species widely distributed in tropical islands of Southeast Asia, east to Fiji, north to Yakushima of Japan (Iwatsuki, 1995), also in Taiwan (Ching et al., 1959) and Hainan (Xing et al., 1989). It is rediscovered here in Diaoluo Mountain.

Hainan Island is a tropical island. The annual average temperature ranges from 22 to 26°C, and the annual precipitation ranges from 1,500 to 2,600 mm. The fern flora of Hainan is very rich, especially with tropical species. About 438 species of ferns have been known from Hainan (Zhang, 2003). Hymenophyllaceae is one of the richest families in Hainan, with about 25 species in 10 genera (Dong, 2004), which represents about one third species and over half of those genera of Chinese Hymenophyllaceae (Ching et al., 1959, 1964), following the classification systems of Copeland (1947) and Ching (1978). Diaoluo Mountain located in the southeastern where the rainfall is very high in contrast to the inland and western part of the island. The filmy ferns are very rich in Diaoluo Mountain, 18 of the 25 species and all of the 10 genera of Hainan are found in this mountain (Dong et al., 2003), and some of them are restricted in this mountain in Hainan, such as the following two additional species.

Mecodium riukiense (H. Christ) Copel. in Philipp. J. Sci. 67: 21. 1938.

Hymenophyllum riukiense H. Christ in Ann. Cons. Jard. Bot. Genève 4: 208. 1900; K. Iwats. in J. Fac. Sci. Univ. Tokyo, III. 13: 518. 1985; et Fl. Jap. 1: 43. 1995.

Distribution: China (Hainan), Northeast Thailand, South Japan and the Ryukyu.

Ecology: On moist mossy rocks in the floor of open valley or along stream in dense evergreen forests.

琉球蕨 (新擬) Liu qiu lu jue

Mecodium riukiense is different from other species of the genus in Hainan by its small size, crisped wings along stipe and rachis, and the involucre lips toothed at margin.

Iwatsuki (1985, 1995) was the first to mention the distribution of this species to Hainan in the genus *Hymenophyllum* s. s. The delimitation of filmy fern genera is the most disputed in fern systems, from two genera of Christensen (1906) and Morton (1968)

to 34 genera of Copeland (1947), while Iwatsuki (1984, 1990) proposed a new intrafamilial system with two subfamilies, Hymenophylloideae with seven genera and the monotypic Cardiomanioidae. The phylogenetic study of Pryer *et al.* (2001) by using chloroplast *rbcL* gene convincingly reveals two monophyletic groups that correspond to the two genera, *Hymenophyllum s.l.* and *Trichomanes s.l.* of Morton's classification (1968) based principally on the sorus shape of sorus, whether being cup shaped or bivalved. They also suggest that some groups, such as *Mecodium* representing a subclade in the *Hymenophyllum* clade, which might be confirmed to be monophyletic with more studies. Plants of *Mecodium* and *Hymenophyllum* can be readily distinguished by the easily observable character of leaf margin, the former with entire margin, and the later with toothed margin.

Specimens examined: China, Hainan: Lingshui, Diaoluo Mountain, *Sun B.Y. et al. 5201A* (JNU, PE), *Zhang X.C. & B.D. Liu 3529A* (PE).

Trichomanes subclathratum (K. Iwats.) C.V. Morton in Contr. U. S. Nat. Herb. 38: 182. 1968.

Vandenboschia subclathrata K. Iwats. in Acta Phytotax. Geobot. 17: 70. 1958.

Lacosteopsis subclathrata (K. Iwats.) Nakaike, Enum. Pterid. Jap. Fil. 25. 1975; Sa. Kurata & Nakaike, Icon. Pterid. Jap. 5: 72. 1987.

Crepidomanes subclathratum (K. Iwats.) K. Iwats. in J. Fac. Sci. Univ. Tokyo sect. 3, 13: 528. 1985; Fl. Jap. 1: 46. 1995.

Distribution: China (Hainan), Ryukyu (Okinawa and Iriomote).

Ecology: on moist mossy rocks in the floor of open valley or along stream in dense evergreen forests.

琉球瓶蕨 (新擬) Liu qiu ping jue

Trichomanes subclathratum differs from the co occurring species in Hainan, *T. naseanum* H. Christ and *T. birmanicum* Bedd. in its small size (3–10 cm long), less divided lamina (bi- to tripinnatifid), and involucre with broader, truncate lips.

This is first record of this species in China. It was believed to be endemic to the Ryukyu Islands (Iwatsuki, 1995) before our discovery. In Diaoluo Mountain it grows very well with rather big size of populations. It is also noticed that the filmy ferns are always growing on mossy rocks, in the floor of open valley, or by stream, different species of different genera or of the same genus intermingled together. Probably they are facultative rheophytes, flooded during the rain season. In Diaoluo Mountain, some small *Grammitis*

species are also mixed with filmy ferns.

Specimens examined: China, Hainan: Lingshui, Diaoluo Mountain, *Sun B.Y. et al. 5201C, 5214, 5218* (JNU, PE), *Zhang X.C. et B.D. Liu 3529B* (PE).

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중국 하이난섬(海南島)의 미기록 Hymenophyllaceae

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최근 중국 하이난섬을 방문하여 양치식물상을 조사한 결과, 중국의 하이난섬의 남동쪽에 위치하는 디아오류오산에서 채집한 처녀이끼과 두 종 중 한 종인 *Trichomanes subclathratum*은 하이난섬 미기록으로 밝혀졌으며, 다른 한 종인 *Mecodium riukuense*은 중국 미기록을 밝혀져서 여기에 보고한다.

주요어: *Mecodium riukuense*, *Trichomanes subclathratum*, 미기록종, 처녀이끼과, 하이난섬

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