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Supplements to the Pteridophyte in Taiwan (III): A Newly Recorded Species *Dryopteris championii* (Benth.) C. Chr. ex Ching (Dryopteridaceae)

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ABSTRACT: *Dryopteris championii* (Benth.) C. Chr. ex Ching is newly recorded to Taiwan. This species is rare and known only from three locations in Taiwan. Taxonomic description, illustration and distribution information are provided here.

KEY WORDS: Dryopteridaceae, *Dryopteris*, *Dryopteris championii*, New record, Pteridophyta, Taiwan.

INTRODUCTION

Dryopteris is a highly diversified genus containing about 225 species with the distribution concentrated on the north-temperate to warm-temperate parts of Central, S. E., and E. Asia (Kramer, 1990). The genus is well-known for its complexity in classification and in identification. The occurrence of the genus of hybridization and polyploidization (Montgomery, 1982; Lellinger, 1985) which blurs the boundaries between species. In Taiwan, it is a large genus including 28-40 species (Shieh et al., 1994; Kuo 1999; Buofford et al., 2003; Lu and Yang, 2005). Most of them look so alike as to be frequently misidentified or neglected. *Dryopteris championii* (Benth.) C. Chr. ex Ching, a newly recorded species from Taiwan, is one of these examples. During the botanical exploration, we successively found three populations of this species in northern Taiwan. It usually grows at the edge of secondary forests with some concealment. In the present work, taxonomic description, distribution information, line drawing, spore SEM plates, and habit photographs are provided for this newly recorded species.

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TAXONOMIC TREATMENT

Dryopteris championii (Benth.) C. Chr. ex Ching, Sinensia 3 (12): 327. 1931; Kurata & Nakaike, Illus. Pterid. Jap. 4: 316. 1985; Iwatsuki, Ferns & Fern Allies Jap. 194. *pl.* 121. *f.* 1 & 2. 1992; Nakaike, New Fl. Jap. Pterid., Rev. & Enlar. 402. *pl.* 402a & b. 1992; Iwatsuki, Fl. Jap. 1: 158. 1995; Lu, Fl. Reip. Pop. Sin. 5 (1): 201. *pl.* 34. *f.* 5 & 6. 2000. 闊鱗鱗毛蕨 Figs. 1 & 2

Aspidium championii Benth., Fl. Hongk. 456. 1861.
Dryopteris pseudoerythrosora Kodama in Matsumura, Icon. Pl. Koisik. 1(6): 165. t. 83. 1913.

Evergreen fern; rhizome stout, suberect. Fronds tufted, 35-85 cm long. Stipes 12-30 cm long, pale green, almost covered with pale-brown, lanceolate scales, most of scales bend inwards or toward base; scales lanceolate, entire, pale brown, 10-12 mm long and 1.5-2 mm broad at base of stipe, decreasing in size upwards. Lamina ovate, bipinnate to tripinnatifid, 20-55 cm long, 15-35 cm broad, apex pinnatifid; basal pinnae subopposite, equal to or more or less shorter than the next one; scales on rachis dense, similar to those on stipes but smaller. Pinna falcate, apex pointing upward, the biggest one 10-20 cm long, 2.5-5.5 cm broad; costa grooved, blackish purple, sporadically covered with linear scales and multicellular hairs on the adaxial side, pale green, covered with linear to lanceolate and bullate scales and multicellular hairs on the abaxial surface. Pinnule sessile, oblong to lanceolate, the biggest one 10-32 mm long, 6-12 mm broad, margin loosely crenate to

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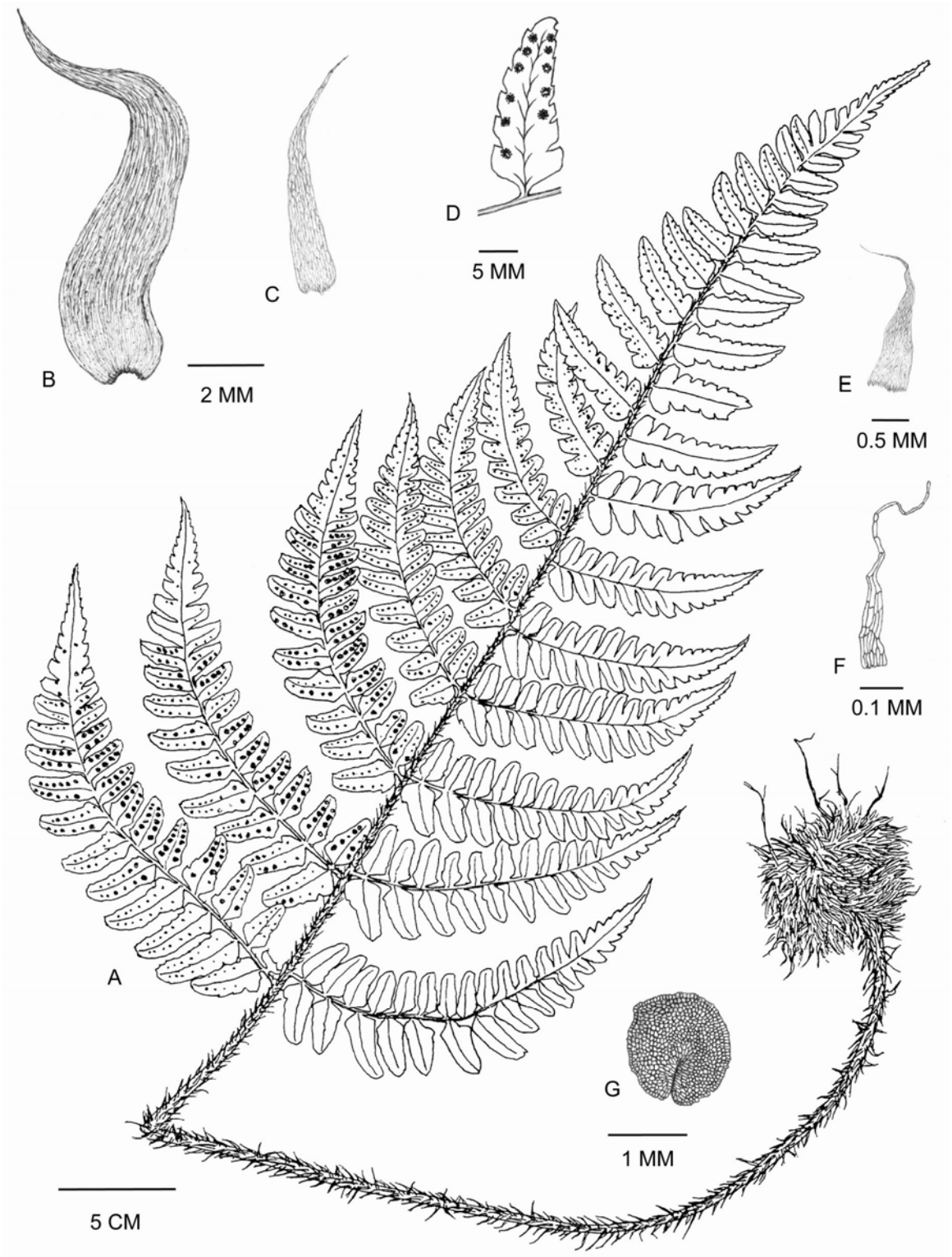


Fig. 1. Illustration of *Dryopteris championii* (Benth.) C. Chr. ex Ching. A: Fertile frond. B & C: Scales on the stipe base. D: Fertile pinnule. E & F: Scales on abaxial surface of costa. G: Indusium.

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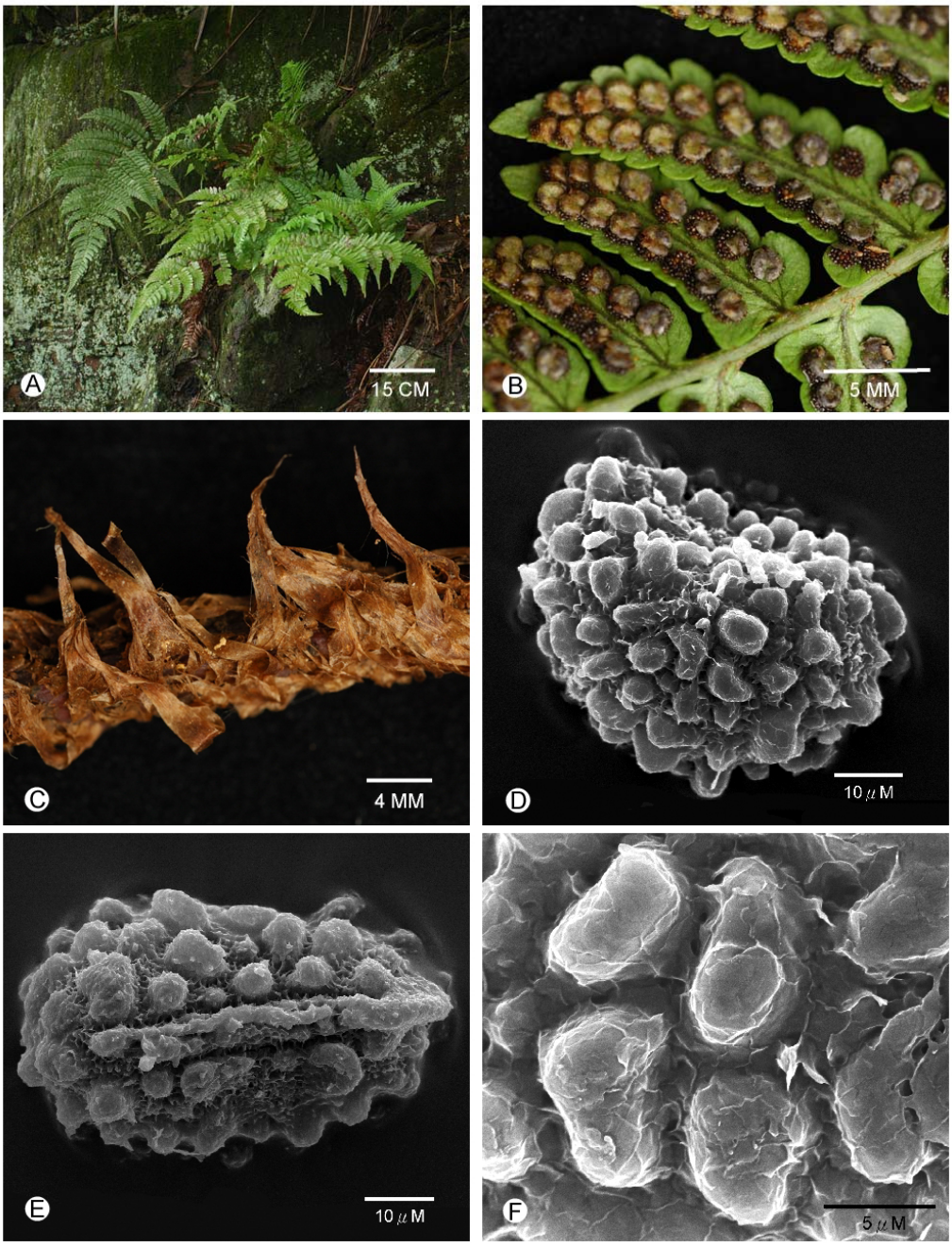


Fig. 2. *Dryopteris championii* (Benth.) C. Chr. ex Ching. A: Habit. B: Pinna and sori. C: Pale-brown scales on the stipe. D, E & F: SEM micrographs of spore. D: Lateral view. E: Proximal view and aperture. F: Surface structure of lateral view.

shallowly lobed, apex round or truncate, base auricled and truncate to shallowly cordate, glabrous on the adaxial surface, sporadically covered with multicellular hair on the abaxial surface; the basal pinnules of the basal pinnae usually the shortest; costule blackish purple, groove-like sunken on the adaxial side. Sori reniform, near to margin than to costule, in one or two rows on each side of costule; indusia round-reniform, sub-entire to entire; spore monolete, bean-shape, perispore rugulo-saccate. 32 spores/sporangium.

Distribution: Korea, Japan, central and southern China. During our survey, We only found three populations in northern Taiwan (Fig. 3). Very rare.

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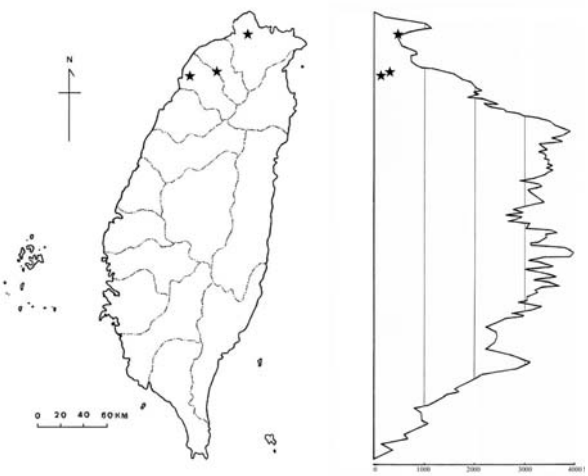


Fig. 3. Distribution of *Dryopteris championii* (Benth.) C. Chr. ex Ching in Taiwan.

Specimens examined: Taipei: Peitou District, Huti, near Mt. Shamaoshan, growing at the crevice of big rock under the forest, Jan. 22, 2001, *Lu, P.-F. 341* (TAIF). Taoyuan Co.: Lungtan, Shangkaoyuan, at the roadside near the secondary forest, Mar. 5, 2003, *Chang, H.-M. 6246* (TNU). Hsingchu Co.: Chupei, Mt. Niuhulian, near Tientetang Temple, under the secondary forest, May 22, 2000, *Chiang, H.-L. 1146* (TAIF).

Note: *Dryopteris championii* is common in Mainland China and Japan. Because of its wide variation in size and morphs, lots of names had been given. However, most of them were treated as synonyms (Lu 2000). We also found several local forms and unorderly variable characters when checked other specimens from mainland China and Japan. For example, scales on the abaxial surface of costa are plane-shaped base in some individuals but nearly bullate-shaped in others. *Dryopteris labordei* (Christ) C. Chr., with dark brown scales, submedial sori and pinna apex usually stretching outward, is the most resemblance in Taiwan. *Dryopteris championii* differs from it by the pale brown scales, supramedial sori and pinna apex pointing upward.

The number of spores per sporangium is likely associated with the frequency of apogamy (Manton, 1950; Knobloch 1969; Knobloch et al., 1973). In this study, 32 spores per sporangium were observed from two populations of this species. In the meanwhile, Japanese plants of the same species were reported as agamosporous triploid (Iwatsuki, 1995). Even if polyploid cytological types or species are common in *Dryopyeris* (Iwatsuki, 1995; Lellinger, 1985; Xiang et al., 2006) and most of them have 32 spores per sporangium. In the absence of cytological and breeding data, using spore counts to determine the reproductive type may be misleading (Chiou et al., 2006; Gastony and Windham, 1989; Walker, 1979). It needs other more experiments focusing on Taiwanese materials to confirm its reproductive mode.

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臺灣蕨類植物補遺（三）：新紀錄種闊鱗鱗毛蕨（鱗毛蕨科）

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摘　　要

本文新紀錄一種產於臺灣北部之鱗毛蕨屬(*Dryopteris*)植物－闊鱗鱗毛蕨 (*D. championii* (Benth.) C. Chr. ex Ching)。此物種在臺灣極稀有，目前僅發現三處生育地。本文提供其分類描述、圖片與分布資訊。

關鍵詞：鱗毛蕨科、鱗毛蕨屬、闊鱗鱗毛蕨、新紀錄、蕨類、臺灣。

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