NOTE

Galium paradoxum Maxim. (Rubiaceae), a Newly Recorded Plant in Taiwan

Tsung-Hsin Hsieh[1*] and Po-Yi Chiang[1]

1. Department of Biological Science and Technology, National University of Tainan, 33, Sec. 2, Su-Lin St. Tainan 700, Taiwan.
** Corresponding author. Tel: 886-6-2133111 ext.795; Email: thhsieh@mail.nutn.edu.tw*

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ABSTRACT: *Galium*, comprising about 300 or 400 species in the world, is a large genus of the family Rubiaceae. Ten taxa were recorded in the 2nd edition of Flora of Taiwan. In the course of our botanical inventory, *Galium paradoxum* Maxim., heretofore unknown in Taiwan, was collected from southern part of the island. This species can be characterized by its opposite leaves on lower parts and 4- (or 5)-verticillate leaves (2 larger, others often reduced into stipule-like) on upper parts of stem, distinct 3-10 mm long petiole and ovate to widely ovate leaves. In this report we provide a description, line drawings, and colored photographs taken from the wild to aid in identification.

KEY WORDS: New record, *Galium paradoxum*, Rubiaceae, Taiwan, Taxonomy.

INTRODUCTION

The genus *Galium* (Rubiaceae) consists of about 300 (Chen, 1999) or 400 species (Yang and Li, 1998a) in the world. This genus is characterized by its herbs and 4-8-verticillate leaves and has 10 (Yang and Li, 1998a; 1998b) to 13 (Chen, 1999) taxa, depending on species concepts in Taiwan.

Recently, In the course of our botanical inventory, we found *Galium paradoxum* Maxim. from Mt. Kuanshanlingshan, Kaohsiung County, southern Taiwan. This small herb can be characterized by its 2 opposite leaves on lower parts and 4- (or 5)-verticillate leaves (2 larger, others often reduced into stipule-like) on upper parts of stem, distinct 3-10 mm long petiole and wide ovate leaves (5-20 mm wide) (Fig. 1). On the other hand, the others species have 4-8- verticillate leaves throughout the plant, sessile or shortly petiole (0-1 mm long) and narrow leaves (1-4 mm wide) in Taiwan. This species widely distributed in Asia including E. Siberia, Korea, Japan, China, Nepal, Sikkim and India (Chen, 1999; Yamazaki, 1993), but it was rare and was restricted distribution at high elevations in the *Tsuga formosana* Hayata dominated forest in southern Taiwan.

In this study we provide a taxonomic description, line drawings, and colored photographs taken from the wild to aid in identification.

TAXONOMIC TREATMENT

Galium paradoxum Maxim., Bull. Acad. Sci. St.-Pet. 19:281. 1874; Yamazaki, Fl. Jap. 3(a): 236, 1993; Chen, Fl. Reip. Popul. Sin. 71(2): 239. 1999.

林豬殃殃 Figs. 1 & 2

Perennial herbs, 4-25 cm tall. Rhizomes slender, stoloniferous. Stems erect or ascending, quadrangular, glabrous. Leaves membranaceous, 2-opposite at lower nodes; 4- (or 5) -verticillate at upper nodes, 2 larger, others often reduced into stipule-like; petiole 3-10 mm long, longer at lower part, gradually shorter upwards, glabrous or sparsely pilose; blade ovate to wide ovate, 10-30 mm long, 5-20 mm cm wide, apex acute, base cuneate to rounded, short attenuate into petiole, entire, sparsely pubescent on both surface, pubescent on margin, pinnately nerved, with a prominent midrib and 2 pairs of lateral nerves. Cymes terminal and in axils of upper leaves, usually trichotomous branched, 2-4 cm long, branches often furcate, few-flowered, each branch with 2 or 3 flowers, peduncle glabrous. Flowers small; bracts linear, 1-2 mm long; pedicel 1-2 mm long at flowering, elongated to 3-9 mm long at fruiting, glabrous; calyx ellipsoid, *ca.* 1 mm long, with dense spreading long hooked pilose hairs; corolla rotate, white, *ca.* 2.5-3 mm in diameter, 4- (or 5) -lobed; lobes ovate, acute, *ca.* 1.5 mm long; stamens 4, alternated to the lobes, filaments short; style short, *ca.* 0.7 mm long, stigma bifid, ovary 2-celled, with dense spreading long hooked pilose hairs. Fruits dry, with 1 or 2 schizocarps. ; schizocarps globose, *ca.* 1.5-2 mm long, with dense spreading long hooked pilose hairs.

Specimen examined: TAIWAN. KAOHSIUNG COUNTY: Taoyuan Township, Mt. Kuanshanlingshan, 2,800 m, 9 Jul. 2009, *Hsieh and Chiang 3007* (TAI, NUTN).

Distribution: *Galium paradoxum* Maxim. is widely distributed in Asia including E. Siberia, Korea, Japan, China, Nepal, Sikkim and India (Yamazaki, 1993; Chen, 1999). In China, it is a widespread species distributed in Provs. Heilongjiang, Jilin, Liaoning, Hebei, Shaanxi,

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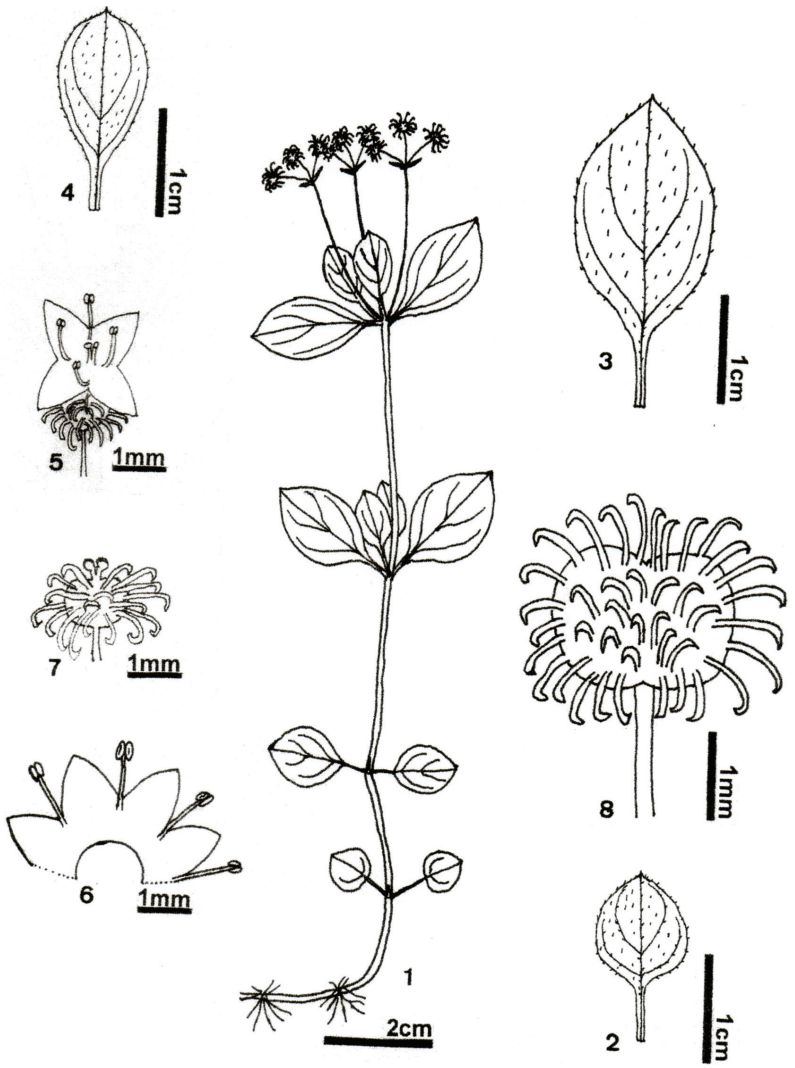


Fig. 1. *Galium paradoxum* Maxim. 1: Habit. 2: Lower leaf. 3: Upper larger leaf. 4: Upper smaller leaf. 5. Flower. 6. Dissected corolla and stamens. 7: Pistil. 8: Fruit.

Gansu, Qinghai, Anhui, Zhejinag, Henan, Hubei, Hunan, Guangxi, Sichuan, Guizhou, Yunnan, Xizhang. From the fact of such distributional pattern, the occurrence of this species in Taiwan seems to be natural, although Taiwan is a new locality of this species.

Habitat and Ecology: This species is found at *ca.* 2,800 m of high elevations in Mt. Kuanshanlingshan area, Yushan National Park. It is scattered in the understory layer of *Tsuga formosana* Hayata dominated forest and is associated with understory herbs such as *Impatiens uniflora* Hayata, *Ellisiophyllum pinnatum*(Wall. ex Benth.) Makino, *Lecanthus peduncularis* (Wall. ex Royle) Wedd., *Selaginella labordei* Hieron. ex Christ, *Urtica thunbergiana* Siebold & Zucc., *Myriactis humilis* Merr., *Epilobium amurense* Hausskn., *Chrysosplenium hebetatum* Ohwi, and *Theligonum formosanum* (Ohwi) Ohwi & T. S. Liu.

ACKNOWLEDGMENTS

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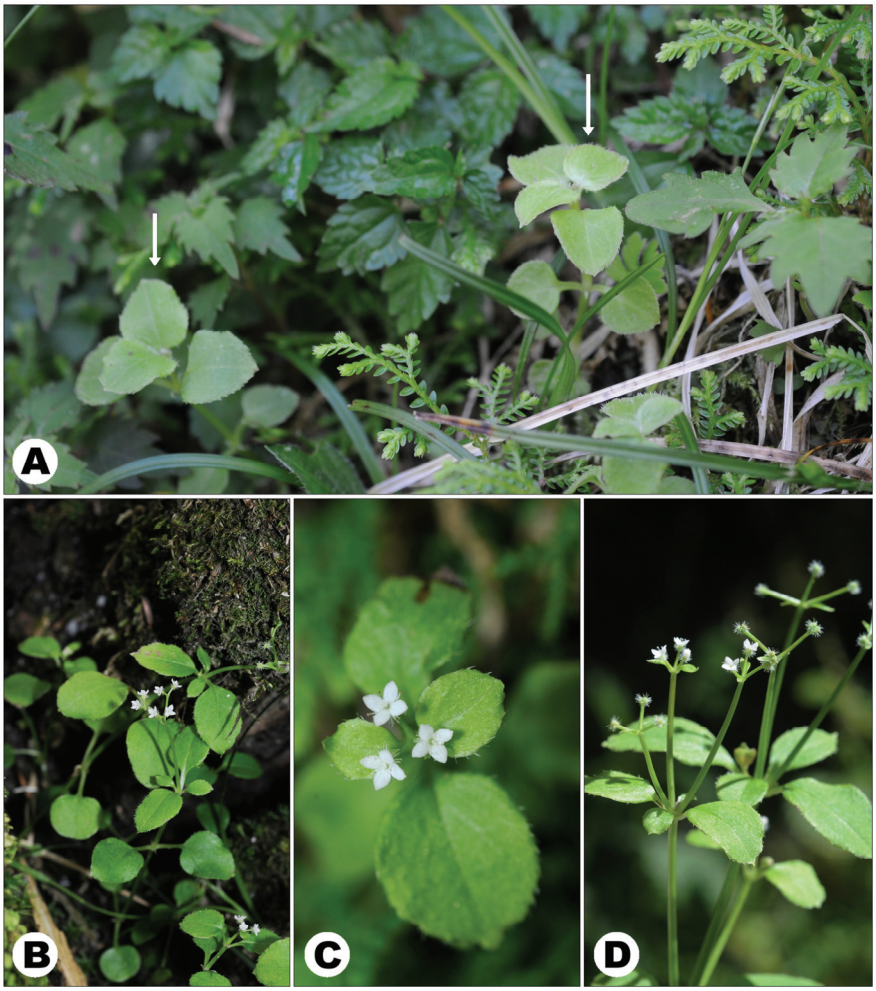


Fig. 2. ***Galium paradoxum*** **Maxim. A: Habitat, arrows indicating the plants of** ***Galium paradoxum*****. B: Habit, showing 2-opposite leaves on lower parts and 4-verticillate leaves on upper parts. C: Cyme inflorescences. D: Infructescence, showing trichotomous branched cymes and 4-verticillate leaves on upper parts.**

臺灣茜草科的新紀錄植物－林豬殃殃

謝宗欣[1*]、江柏毅[1]

1. 國立台南大學生物科技學系，700 台南市樹林街二段 33 號，臺灣。
* 通信作者。*Tel: 886-6-2133111 ext. 795; Email: thhsieh@mail.nutn.edu.tw*

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摘要：林豬殃殃屬為茜草科植物，臺灣植物誌第二版紀錄有 10 種，最近我們在南部關山嶺山植物調查時發現另一新紀錄植物－林豬殃殃，該植物的莖下部具對生葉，上部具 2 片較大 2 片較小的 4 枚輪生葉、葉柄明顯和葉身較寬等特徵而明顯不同於臺灣所產的該屬植物，本種廣泛分佈於亞洲，但在臺灣僅發現於關山嶺山鐵杉林海拔 2,800 公尺林緣處，數量十分稀少。本文章提供該種的形態描述、手繪圖與彩色圖片，並報告其分布及生態。

關鍵詞：新紀錄、林豬殃殃、茜草科、臺灣、分類。

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