

研究報告

臺灣的新紀錄種植物-翅莖半邊蓮 (桔梗科：山梗菜屬 卵葉半邊蓮組)

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【摘要】本文描述臺灣一新紀錄種植物-翅莖半邊蓮，本種之外觀形態與克氏半邊蓮相似，兩者皆屬於卵葉半邊蓮組，但本種的莖具三翅、腋生的花序以及花萼裂片長約花冠合生部分之1/2至2/3等可與後者區分。翅莖半邊蓮廣泛分布於東非至新幾內亞，及喜馬拉雅地區至中國東南部。在臺灣，本種僅見於花蓮及台東之低海拔地區，喜生於潮濕遮陰之生育地。

【關鍵詞】桔梗科、翅莖半邊蓮、植物分類、臺灣。

Research paper

Lobelia heyneana (Campanulaceae: *Lobelia* sect. *Stenotium*), a newly record species of eastern Taiwan

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【Abstract】A newly recorded species *Lobelia heyneana* Schult. of Taiwan was described in this article. This species is similar to *L. cliffortiana* L., but could be separated by its 3-winged stem, axillary inflorescence, and length of calyx ca. 1/2~2/3 to the fused part of corolla. This species is widely distributed in tropical Asia and Africa. In Taiwan, this species is only found in low altitude of Hualien and Taitung county, often growing on the moist habitat.

【Key words】Campanulaceae; *Lobelia heyneana*; plant taxonomy; Taiwan.

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Introduction

The genus *Lobelia* L. is a cosmopolitan genus which comprising 414~423 species, most members distributed in tropical and subtropical areas, especially abundant in Africa and South America (Hong & Lammers 2011; Lammers 2011). This genus is characterized by its herbal to shrub habitat, unilabiate or bilabiate corolla, connate stamens, and capsule to berry fruits (Lammers 2007; Hong & Lammers 2011). The intrageneric classification of *Lobelia* had been revised by Lammers (2011). He treated 18 sections, each had complete species list and description, four of them were found in Taiwan. This system was followed by many studies (Kokubugata et al. 2012; Chen et al. 2016; Gutiérrez-Sánchez et al. 2018; Li et al. 2018).

In Taiwan, five native species were recorded in Flora of Taiwan second edition (Lammers 1998). A newly naturalized species from Central America-*L. cliffortiana* L. was reported from central Taiwan (Hsu et al. 2011). Recently, an unknown species was encountered during a field work in eastern Taiwan. This species was characterized by its tiny and bilabiate flowers, winged stems, and capsules. Such characters, however, indicated this plant could be a *Lobelia* species never been recorded in Taiwan. Therefore, related references and herbarium sheets were reviewed and examined for identification the name of this *Lobelia* sp. Finally, I confirmed this unknown plant was *L. heyneana* Schult., a widespread species in tropical Asia and Africa, and was also a newly recorded species of flora of Taiwan.

Materials and methods

Study materials were gathered from living plants and herbarium sheets. Following herbarium or their website were examined: TAI, TAIF, HAST, PPI. Photo of the type specimen

of *L. heyneana* Schult. deposited in herbarium of the Botanic Garden and Botanical Museum Berlin-Dahlem (B) was also examined. Voucher specimens were deposit in the Herbarium of Taiwan Forestry Research Institute (TAIF). The herbarium acronyms were following Index Herbariorum of New York Botanical Garden (Thiers, continuously updated). The classification of geographical climatic regions and altitudinal vegetation zones on the distribution map were followed the studies of Su (1984, 1985).

Results

Key to species of *Lobelia* of Taiwan

1. Stem prostrate.....2
1. Stem erect.....3
2. Leaf ovate; fruit capsule.....*L. zeylanica*
2. Leaf orbicular; fruit berry.....*L. nummularia*
3. Corolla longer than 1 cm.....4
3. Corolla shorter than 1 cm.....5
4. Stem robust; leaf 6-23 cm long; inflorescence raceme.....*L. seguinii*
4. Stem delicate; leaf 1-3.5 cm long; inflorescence solitary.....*L. chinensis*
5. Pedicels commonly ebracteolate; seeds elliptic-globose.....6
5. Pedicels commonly bibracteolate; seeds trigonous.....*L. alsinoides* subsp. *hancei*
6. Stems tetragone; inflorescence a terminal raceme; length of calyx lobes equal to the fused part of corolla.....*L. cliffortiana*
6. Stems 3-winged; inflorescence an axillary flower; length of calyx lobes ca. 1/2-2/3 to the fused part of corolla.....*L. heyneana*

Description of *Lobelia heyneana*

Lobelia heyneana Schult., Systema Vegetabilium 5: 50. 1819. TYPE: *Heyne s.n.*, B00154255 (B, photo!). 翅莖半邊蓮 (Figure 1)

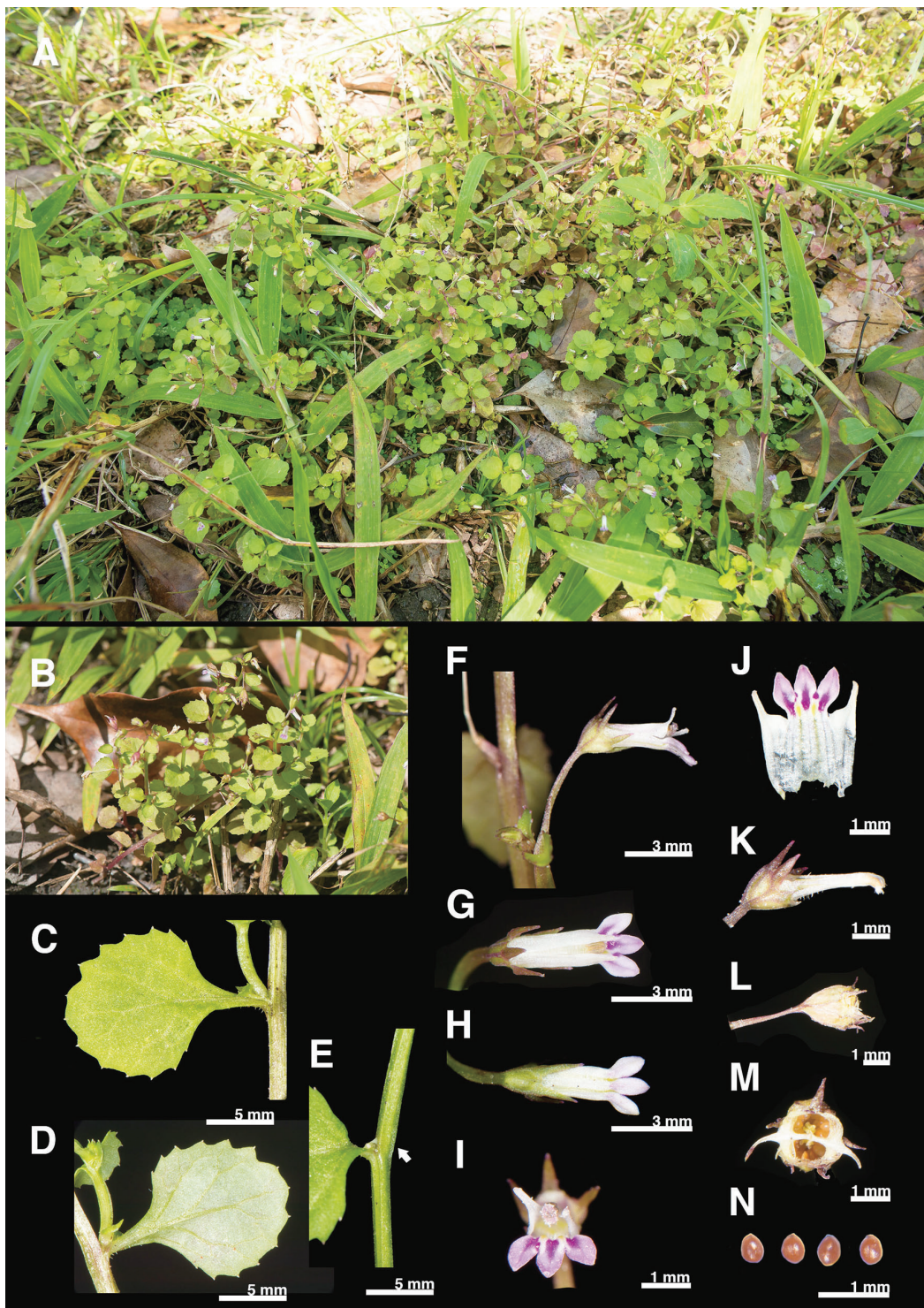


Figure 1. *Lobelia heyneana* Schult. A: habitat; B: habit; C: leaf adaxial surface; D: leaf abaxial surface; E: wing of stem F: inflorescence; G-I: flower (dorsal, ventral, and front view); J: corolla; K: stamen and pistil; L, M: fruit (side and front view); N: seeds.

L. decurrens Roth, Nov. Spec. 145. 1821. *nom. inval.* (non Cav., *Icones et Descriptiones Plantarum* 6: 13, t. 521. 1801.)

Annual herbs. Stem erect, 8~30 cm tall, glabrous, 3-winged. Leaves simple, alternate, very widely ovate to round, lower ones 1~1.2 cm long, 0.8~1.2 cm wide, upper ones gradually narrower and smaller, bract-like, chartaceous to membranaceous, base truncate to acute, apex acute to truncate, margin dentate, pinnate-netted veins, adaxial and abaxial surface glabrous to sparsely puberulent, petiole 1~3 mm, winged, glabrous or sparsely puberulent. Inflorescences solitary, axillary, bract leaf-like, peduncle ca. 3 mm long, glabrous. Flowers zygomorphic, hypanthium campanulate, ca. 1 mm long, ca. 2 mm in diam., calyx 5-lobed, narrowly triangular, ca. 1 mm long, 0.5 mm wide, glabrous, corolla bilabiate, ca. 5 mm long, 2 mm wide, sparsely puberulent inside, upper lobes white, linear, ca. 1 mm long, lower lobes reddish-purple with yellow spots, oval, ca. 1 mm long, ca. 0.7 mm wide. Stamens connate into tube at upper part, enveloping pistil, filaments free part flattened, ca. 1 mm long, white, glabrous; anthers ca. 1 mm long, brown, introrsely dehiscent. Ovary inferior, style filiform, straight, ca. 2 mm long, stigma punctate. Capsule 2-valved, ca. 3 mm long, 2 mm in diam. Seeds numerous, ca. 0.2~0.3 mm in diam., elliptic-globose, smooth.

Native to Bhutan, Cambodia, China, Indonesia, India, Laos, Myanmar, Nepal, New Guinea, the Philippines, Sri Lanka, Thailand, Vietnam, also reports from Africa. In Taiwan, this species only found in low altitude of eastern Taiwan (Figure 2).

Specimen examined: Hualien county, Kuangfu town, industrial road under Dafu bridge, 18 Feb. 2019, *C. T. Chao 4751* (TAIF); Taitung

county, Changpin township, Tafengfeng, 27 Mar. 2004, *C. F. Chen 1413* (PPI).

Discussion

Lobelia heyneana was similar to *L. cliffortiana*, both two species belonged to sect. *Stenotium*, which shared annual habit, erect stem, bilabiate corolla, and ventral side stamens bearded. *Lobelia heyneana* could be distinguished by its three-winged stem, solitary axillary inflorescence, reddish-purple corolla, and shorter pedicel.

Lobelia heyneana was widely distributed in the countries from eastern Africa to Indonesia, and Himalaya region, southern China, Taiwan, and the Philippines. In Taiwan, this species was only found in Hualien and Taitung county. This area was located in the East region and *Ficus-Machilus* zone of geographical climatic region and altitudinal vegetation zone of the studies of Su (1984, 1985). The climate was summer rain type, the moisture was higher than the western parts generally. The population of Taiwan was growing in moist habitat, Hong & Lammers (2011) also mentioned *L. heyneana* was found in moist place in China.

Here I would like to discuss about the native or naturalized feature of Taiwanese *L. heyneana*. The natural distribution of this species was from southeast Asia to Africa, and often growing on the moist place, from sea level to ca. 2,000 m altitude (Hong & Lammers 2011). The populations of Taiwan were found in eastern part, ca. 150 m altitude and moist habitat, such condition was similar to the native one. Considering the distribution, habitat condition, together with the annual habit and tiny plant size, this species was easily neglected from field collection. However, the possibility of naturalization could not exclude from Taiwan populations, because the abundant

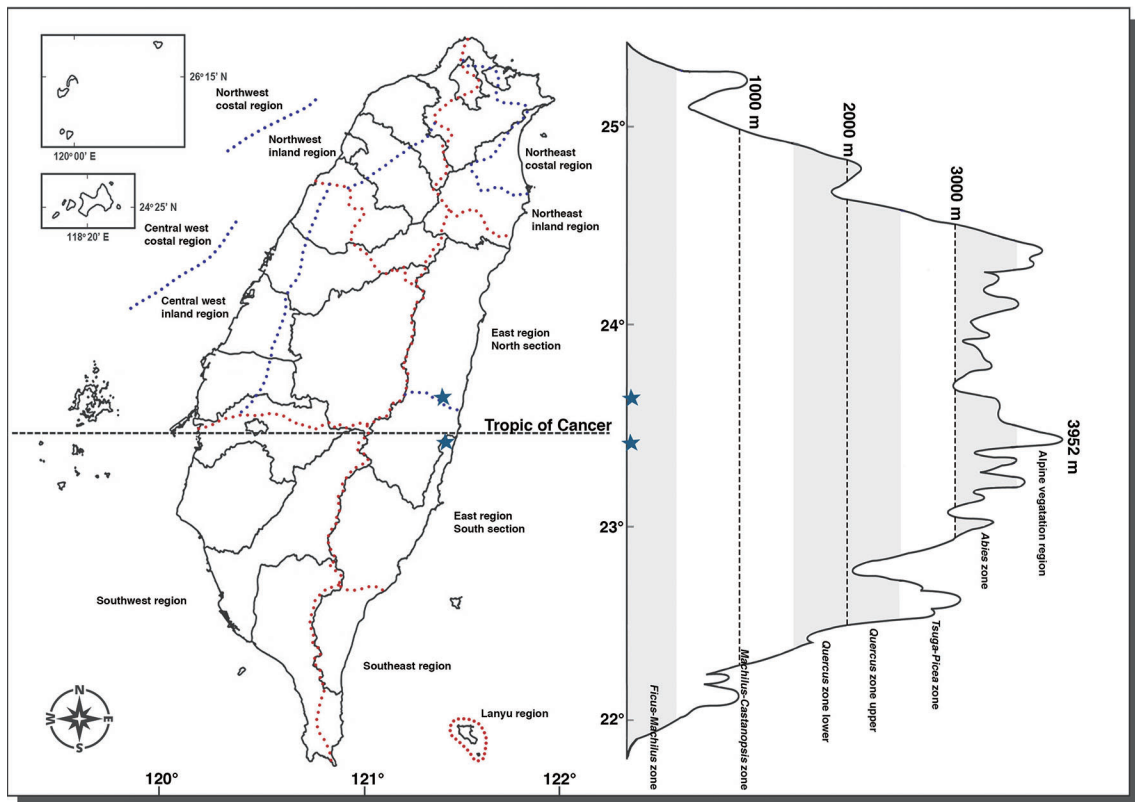


Figure 2. Distribution map of *Lobelia heyneana* Schult. in Taiwan.

and tiny seeds can be carried by human activity easily. Therefore, although I regarded this species as a native one based on the distribution and habitat evidences, further study is needed to confirm that *L. heyneana* is native or naturalized species to Taiwan .

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