Research note

Lathraea purpurea (Scrophulariaceae): A New Generic Record in Taiwan

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【Summary】

Lathraea purpurea Cummins (Scrophulariaceae), a holoparasitic plant originally described from Sikkim, was recently found at high elevations of central Taiwan. It also represents a new generic record to the flora of Taiwan. We provide a description, illustration, and color photos of *L. purpurea* and report *Yushania niitakayamensis* as its host in Taiwan.

Key words: New generic record, *Lathraea purpurea*, Scrophulariaceae, Taiwan, taxonomy.

Chung SW, Hsu TC, Jung MJ, Hsiao SC, Fang WU. 2010. *Lathraea purpurea* (Scrophulariaceae): a new generic record in Taiwan. Taiwan J For Sci 25(3):265-9.

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Received June 2009, Accepted March 2010. 2009年6月送審 2010年3月通過。

研究簡報

紫花齒鱗草(玄參科)：台灣新紀錄屬

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摘 要

原紀錄於錫金地區之寄生植物紫花齒鱗草(*Lathraea purpurea* Cummins，玄參科)為近期於台灣中部高海拔山區尋獲之新紀錄植物；齒鱗草屬亦為台灣的新紀錄屬。本文提供紫花齒鱗草的形態描述、線繪圖及照片，並報導玉山箭竹為其寄主。

關鍵詞：新紀錄屬、紫花齒鱗草、玄參科、台灣、分類學。

鐘詩文、許天銓、鍾明哲、蕭淑娟、方偉宇。2010。紫花齒鱗草(玄參科)：台灣新紀錄屬。台灣林業科學25(3):265-9。

Lathraea is a small genus of about 7 holoparasitic species native to Eurasia (Fischer 2004) but not previously recorded in Taiwan (Boufford et al. 2003). It was placed within Orobanchaceae (Zhang and Tzvelev 1998) but is now included in Scrophulariaceae in the latest systematic treatment (Fischer 2004). In summer 2007, we discovered an unknown *Lathraea* species with attractive purplish-white flowers in high-elevation mountains of central Taiwan. Our preliminary study revealed that this unknown *Lathraea* species was closest to *L. purpurea*, a rather rare species described from Sikkim (Rae 2001). After an examination of the type specimen photo offered by the Kew herbarium, we confirmed that our unknown *Lathraea* species is approximately identical to *L. purpurea*, which we describe and illustrate here. Our discovery represents a new generic record to the flora of Taiwan and another example of the Himalaya-Taiwan disjunct distribution (Wu and Wu 1998, Yukawa et al. 2003, Chung and Hsu 2008).

Lathraea purpurea Cummins (1895) 137; Rae (2001) 1331. – Type: SIKKIM. Singalelah Range, July 1896, *King's collector s.n.* (lectotype K photo!, here designated; isotype E).....紫花齒鱗草Figs. 1, 2.

Perennial holoparasitic herb, white tinged with purple. Stems whitish, subterranean, terete, sparsely covered with scale-like leaves, glabrous except for pubescent upper stem and inflorescence. Leaves reduced to achlorophyllous scales, opposite, suborbicular, margin entire, densely silky villous adaxially, ca. 2.5 by 3 mm. Inflorescence a short corymb with 2~6 flowers, axis subterranean and only flowers exposed above ground; bracts attached on inflorescence axis, similar to leaves. Flowers erect; pedicels sparsely pubescent, 7~10 mm long. Calyx tubular, unlobed, apex truncate, slightly undulate, white with purplish veins, pubescent on outer surface, inner glabrous, 5~8 mm long. Corolla bilabiate, white tinged with purple especially on veins, pubescent outside, 2~2.5 cm long; upper lip galeate, 1.2~1.5 cm long; lower lip shorter than upper lip, 10~13 mm long, 3-lobed, lobes oblong, 3~4 mm long. Stamens 4, didynamous; filaments curved, sparsely pubescent, 1.3~1.8 cm long; anther versatile, longitudinally dehiscent. Pistal 2.2~2.6 cm long; ovary globose,

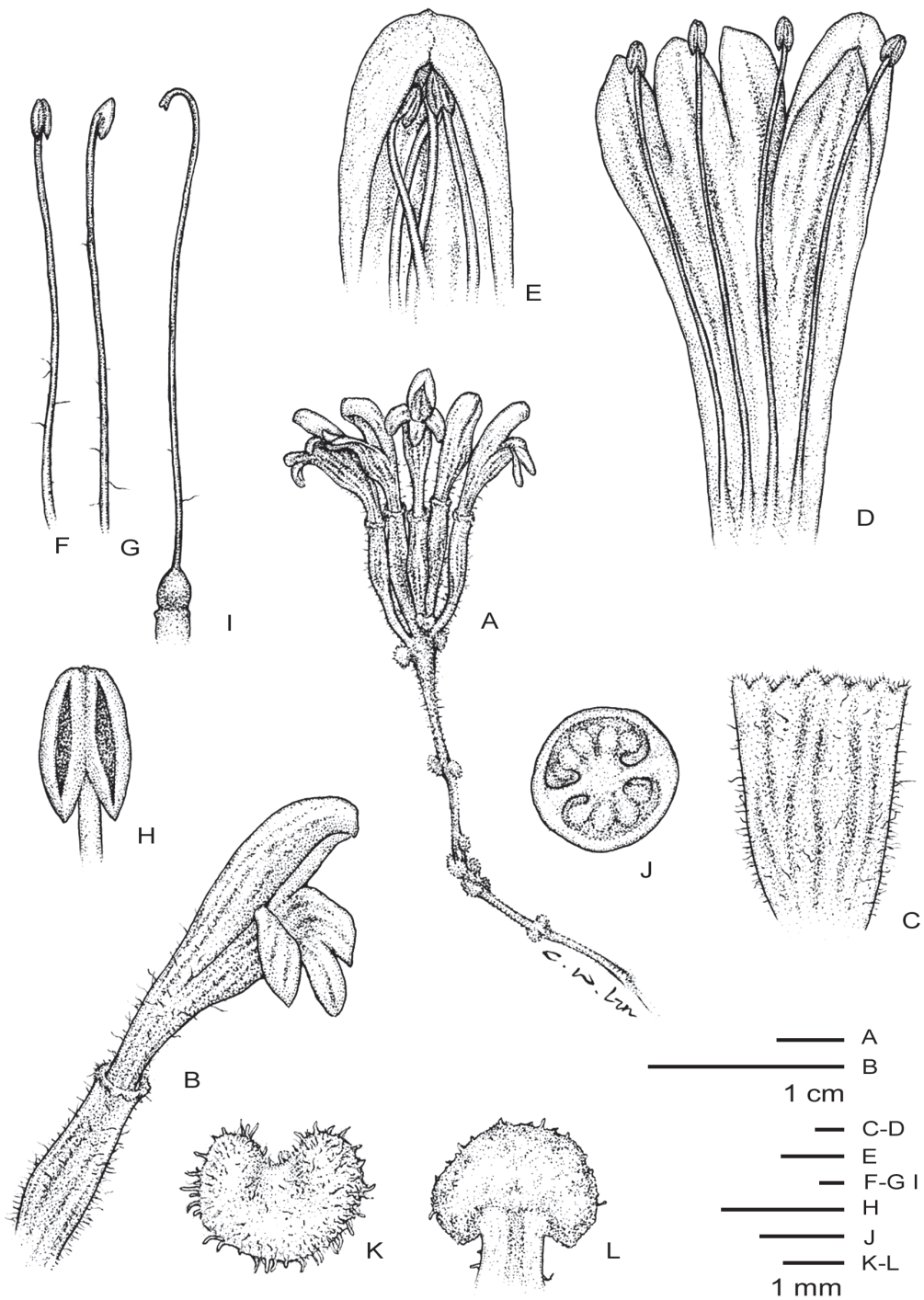

Fig. 1. ***Lathraea purpurea*** **Cummins. (A) Habit; (B) flower; (C) expanded calyx tube; (D) expanded corolla tube; (E) galeate upper-lip of the corolla, embracing the stamens; (F and G) stamens; (H) dehiscenced anther; (I) pistil; (J) ovary, cross section; (K) leaf, adaxial view; (L) leaf, abaxial view.**

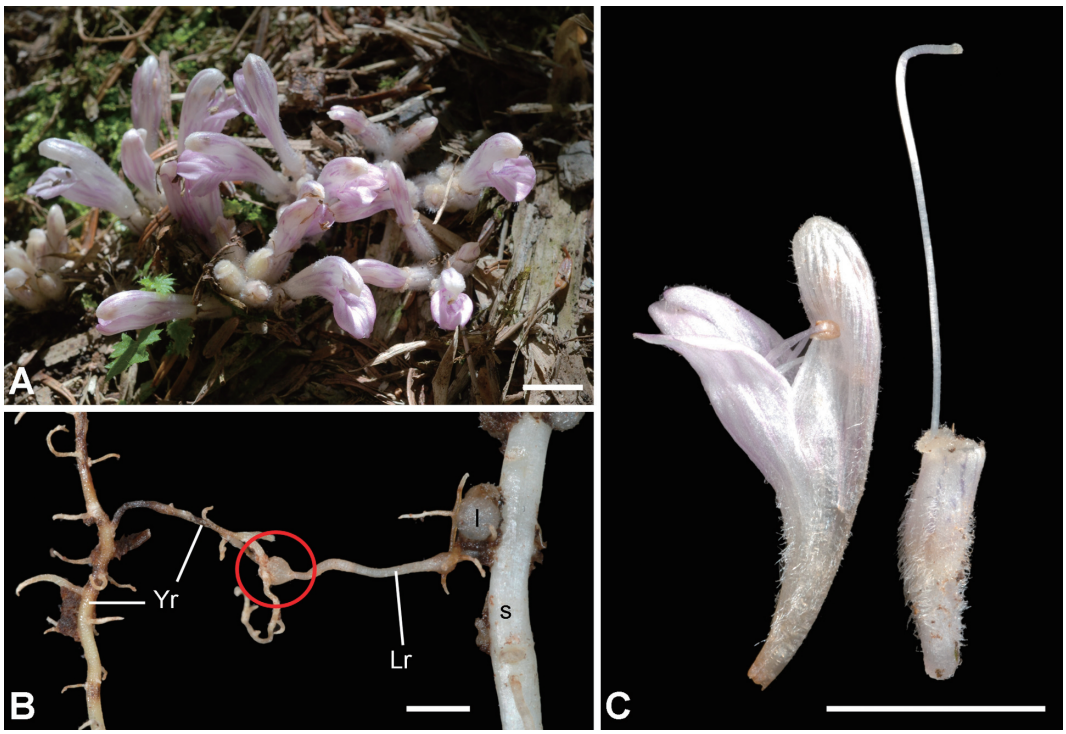

Fig. 2. *Lathraea purpurea* Cummins. (A) Habits *in situ*; (B) root association with its host *Yushania niitakayamensis*. Note the enlarged root tip of *L. purpurea* at the attachment (red circled area). Lr, l, and s, root, leaf, and stem of *L. purpurea*; Yr, roots of *Y. niitakayamensis*. (C) Corolla tube with anthers (left) and calyx tube with style and a part of pedicel (right). (A and C, bar = 1 cm; B, bar = 1 mm.)

2-locular, axile placentation.

Distribution: the Himalayas (Sikkim) and Taiwan.

Ecology: In Taiwan, under *Abies kawakamii* (Hayata) T. Ito forests with loose to dense ground vegetation of *Yushania niitakayamensis* (Hayata) Keng f., 3000~3100 m elev.; flowering observed from July to August. In Sikkim, under dense bamboo jungle of *Arundinaria aristata* Gamble, 3657~3962 m (12000~13000 ft) elev. (Cummins 1895).

Parasitism: We considered *Y. niitakayamensis* as the host of *L. purpurea* in Taiwan based on to the attachment found between their roots (Fig. 2B). In Sikkim, another bamboo, *A. aristata*, was predicted to be the host because it was the only vegetation besides *L. purpurea* in the habitat (Cummins 1895).

Taxonomic notes: Cummins (1895) recorded that the upper lip of *L. purpurea* is subacutely 1-toothed below the apex on both sides. However, we found no distinct "tooth" either on our fresh materials or from the high-resolution type photo offered by the Kew herbarium. Since other features fit smoothly, we still applied the name *L. purpurea* to the population we found in Taiwan and await further confirmation from the type locality.

In habit, *L. purpurea* is close to *L. clandestina* L. in that they both have almost subterranean corymbose inflorescences and relatively long corolla tubes. Even so, *L.*

purpurea can easily be distinguished from *L. clandestina* by the sparsely leafy stems, densely silky scale-like leaves which are adaxially villous, and unlobed calyx tube with a truncate and slightly undulate apex.

Other specimens examined: TAIWAN. Nantou Co.: Hohuanshan, 6 Aug 2007, *S. W. Chung 9097* (TAIF); Hsiaofengkou, 29 July 2007, *T. C. Hsu 899* (TAIF); same local, 17 Aug 2008, *C. M. Wang 12265* (TNM).

ACKNOWLEDGEMENTS

We especially thank Dr. T. Harris of the Herbarium, Royal Botanic Gardens, Kew for kindly providing the photo of *L. purpurea* specimens. We also thank Mr. S.-K. Yu, Dr. C.-M. Wang, and Mr. Y.-C. Chen for their assistance with field work.

LITERATURE CITED

Boufford DE, et al. 2003. A checklist of the vascular plants of Taiwan. In: Huang TC et al., editors. Flora of Taiwan, 2nd ed. Taipei, Taiwan: Department of Botany, National Taiwan Univ. 6:15-139.

Chung SW, Hsu TC. 2008. *Corybas himalaicus* (King & Pantl.) Schltr. (Orchidaceae): a newly recorded species in Taiwan. Taiwan J Forest Sci 23(1):99-103.

Cummins HA. 1895. Description of a new *Lathraea* from eastern Himalaya. J Asiat Soc Bengal Pt 2 Nat Hist 64:137-8.

Fischer E. 2004. Scrophulariaceae. In: Kubitzki K, Kadereit JW, editors. The families and genera of vascular plants. Berlin, Heidelberg, Germany: Springer-Verlag. 7:333-432.

Rae SJ. 2001. Orobanchaceae. In: Grierson AJC, Long DG, editors. Flora of Bhutan. Edingburgh, UK: Royal Botanic Garden, Edinburgh. 2(3):1330-4.

Wu ZY, Wu SK. 1998. A proposal for a new floristic kingdom (realm) - the E. Asiatic Kingdom, its delineation and characteristics. In: Zhang AL, Wu SK, editors. Floristic characteristics and diversity of East Asian plants. Beijing, China: China Higher Education Press. p 3-42.

Yukawa T, Chung SW, Luo YP, Peng CI, Momohara A, Setoguchi H. 2003. Reappraisal of *Kitigorchis*. Bot Bull Acad Sin 44:345-51.

Zhang ZY, Tzvelev NN. 1998. Orobanchaceae. In: Wu ZY, Raven PH, editors. Flora of China. Beijing, China: Sciense Press. 18:229-43.