NOTE

Two Newly Discovered Plants in Taiwan

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(Manuscript received 5 March 2009; accepted 24 July 2009)

ABSTRACT: Two herbs are newly discovered in Taiwan. *Limnophila fragrans* (G. Forst.) Seem. (Scrophulariaceae), native in SE Asia, is recognized from southern lowlands. *Anagallis minima* (L.) E. H. L. Krause (Primulaceae), native in N America and Europe, was found from northern mountainous region at low altitudes. In this study, descriptions, line drawings, color photos and a distribution map of the two species are provided.

KEY WORDS: *Anagallis minima*, *Limnophila fragrans*, Primulaceae, Scrophulariaceae, Taiwan.

INTRODUCTION

Our recent field investigations have revealed fruitful results concerning the biodiversity of vascular plants in Taiwan. Several new species (Chung and Hsu, 2006b; Hsieh et al., 2007; Hsu and Chung, 2008a, 2008b), new records (Chung and Hsu, 2006a, 2008; Hsu and Chung, 2007, 2009; Chung and Lu, 2007), neglected species (Chung et al., 2008) and naturalized plants (Chung et al., 2007; Jung et al., 2008, 2009) were recognized and reported from various localities. In this article we continue our previous works and report two herbaceous plants, named *Limnophila fragrans* (G. Forst.) Seem. (Scrophulariaceae) and *Anagallis minima* (L.) E. H. L. Krause (Primulaceae), in Taiwan for the first time. Morphological descriptions, line drawings, color photos, and a distribution map of the two species are provided. *L. fragrans* is a native species in SE Asia. The new record in Taiwan completed the distributing gap between the Ryukyus and the Philippines. *A. minima*, a tiny herb native in North America and Europe, may be accidentally introduced and naturalized in Taiwan. The wild population found in Taipei County is possibly the first record about its occurrence in Asia.

TAXONOMIC TREATMENTS

1. ***Limnophila fragrans*** (G. Forst.) Seem., Fl. Vit. 180. 1865; Philcox, Kew Bull. 24: 139. 1970; Walker, Fl. Okinawa S. Ryukyu I. 927. 1976; Wannan & Waterhouse, Australia J. Bot. 33: 376. 1985; Yamazaki, Fl. Japan 3a: 332. 1993.

無柄田香草 Figs. 1, 3 & 5

Ruellia fragrans G. Forst., Fl. Ins. Austr. Prodr. 44. 1786.

Annual or perennial, terrestrial or amphibious herbs. Stem erect or decumbent, up to 50 cm long, glabrous to minutely glandular. Aerial and submerged leaves opposite, sessile, ovate-elliptic to ovate-oblong, to 3 cm long, 1 cm wide, crenate to crenate-dentate, glabrous, pinnately nerved, apex obtuse. Flowers sessile, axillary, solitary or occasionally in terminal or lateral leafy racemes, bi-bracteolate. Bracteoles 1.5-3 mm long, linear-lanceolate, glabrous, appressed. Calyx 3-5 mm long, glabrous, not striate in fruit; lobes 2.5-3 mm long, narrowly lanceolate. Corolla 6-10 mm long, white throughout or sometimes tinged with pale purple; glabrous outside, villous inside. Stamens 4, posterior filaments 1.5-2 mm long, anterior ones 3-4 mm long, glabrous or slightly villous at base. Capsule 4-5 mm long, compressed ovoid-ellipsoid. Seeds dark brown, 0.3-0.45 mm long.

Specimens examined: TAIWAN. Chiayi City: Tuanchu Neighborhood, 6 Oct 2005, *T.-C. Hsu 536* (TAIF); 21 Nov 2008, *T.-C. Hsu 1988* (TAIF). Tainan Co.: Guantian Township, Guantian, 22 Feb 2009, *T.-C. Hsu 2184* (TAIF); Sinhua Town, Shinhua, 22 Aug 2008, *T.-C. Hsu 1603* (TAIF); Guanmiao Township, Guanmiao, 10 Nov 2008, *J.-J. Lin 1, 2, 3* (TAIF); 22 Nov 2008, *T.-C. Hsu 1995* (TAIF). PALAU. Babeldaob, 14 Sep 1937, *T. Hosokawa 9264* (TAI). INDONESIA. Sulawesi (cultivated in Taiwan), 29 Sep 2002, *C.-C. Lin 526* (TAIF).

Distribution: The Ryukyus, Philippine, New Guinea, N Australia, Micronesia and Polynesia; Taiwan, in southern lowlands.

Ecology: Occurring on damps, ditches and rice fields. Accompanied with other wetland plants such as *Lindernia anagallis* (Brum. f.) Pennell, *Ludwigia octovalvis* (Jacq.) P. H. Raven, *Fimbristylis dichotoma* (L.) Vahl and *Fuirena ciliaris* (L.) Roxb. Flowering and fruiting from July to December.

Note: Classified within sect. *Integrifolieae* Boerl. (Philcox, 1970; Yamazaki, 1993), *Limnophila fragrans* could be easily distinguished from *L. rugosa* (Roth) Merr., the only member of this section previously recorded in

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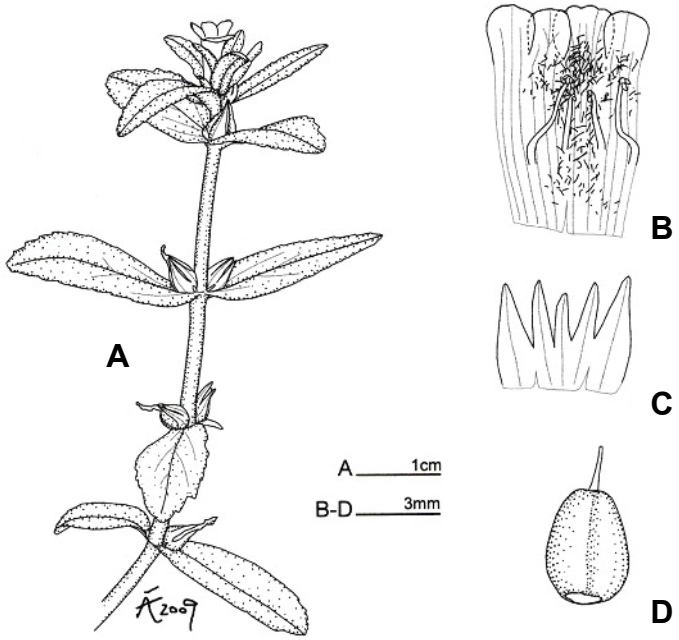


Fig. 1. ***Limnophila fragrans*** **(G. Forst.) Seem. A: Habit. B: Corolla, villous with stamens, expanded adaxial view. C: Calyx, expanded. D: Capsule.**

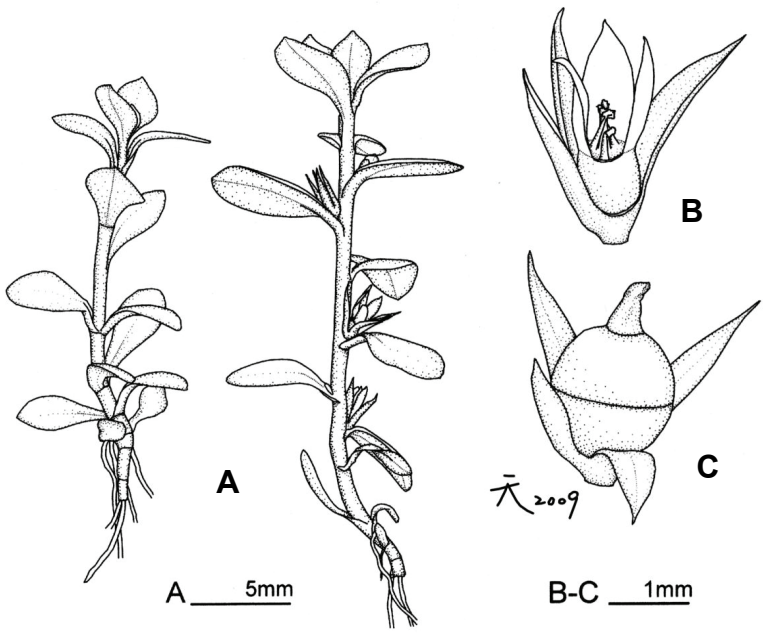


Fig. 2. ***Anagallis minima*** **(L.) E. H. L. Krause. A: Habit. B: Flower, one sepal and one petal lobe removed. C: Capsule.**

Taiwan, by much smaller, sessile leaves and different flower colors. In habit *L. fragrans* is much similar to another Taiwanese species *L. aromaticoides* Y. P. Yang & S. H. Yen (in sect. *Striatae* Philcox), but the later is clearly separated from the former by the larger, pedunculate flowers and the striation inside the mature calyx.

2. ***Anagallis minima*** (L.) E. H. L. Krause, in Sturm, Fl. Deutschl. ed. 2. 9: 251. 1901; Ferguson, Fl. Eur. 3: 28. 1968; Stace, New Fl. Brit. Is., 2nd ed. 301. 1997;Walsh, Fl. Victoria 3: 520. f. 106j-l. 2003.
小海綠 Figs. 2, 4 & 5

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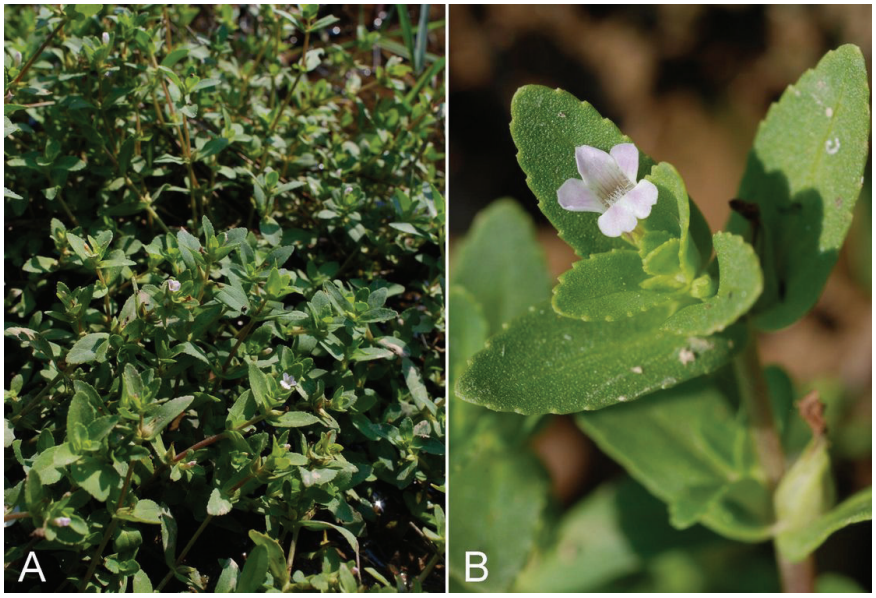


Fig. 3. *Limnophila fragrans* (G. Forst.) Seem. A: Habitat and habits. B: Flower (upper side) and Fruit (lower right side).

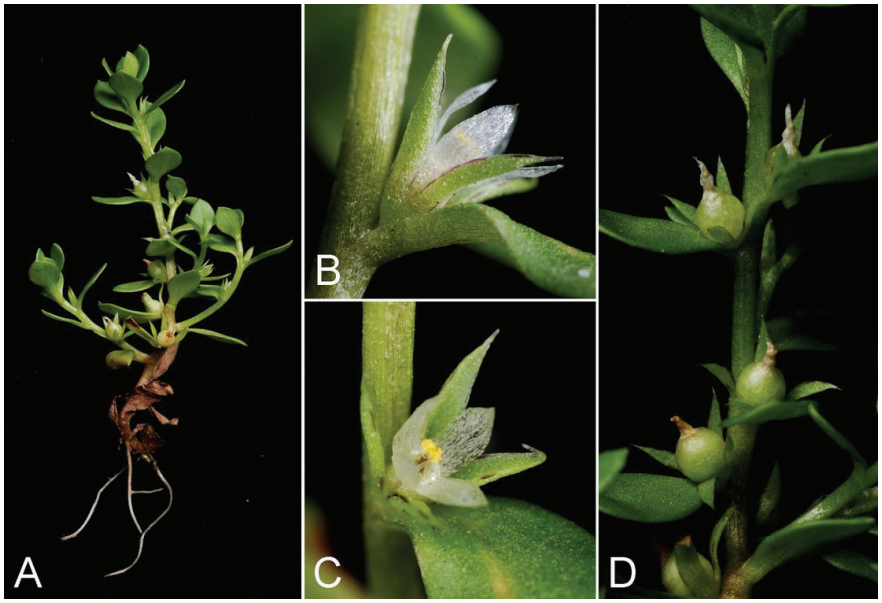


Fig. 4. *Anagallis minima* (L.) E. H. L. Krause. A: Habit. B: Flower (lateral view). C: Flower(face view), D: Fruits with persistent calyx.

Centunculus minimus L., Sp. Pl. 116. 1753; Munz & Keck, Calif. Fl. 404. 1959; Britton & Brown, Ill. Fl. N. U. S. Canad. 2nd ed. 2: 717. f. 3301. 1970; Holmgren, Ill. Companion Gleason Cronquist Man. 203. f. 1998; Zuloaga & Morrone, Cat. Pl. Vas. Rep. Argentina 2: 960. 1999.

Annual herbs. Stem glabrous, suberect, solitary or branched, to 10 cm long. Leaves alternate, sometimes opposite at the basal 1-3 nodes, glabrous, subsessile, entire, elliptic to spatulate, 3-10 mm long, 2-4 mm wide. Flowers subsessile, axillary, solitary. Calyx lobes (3-)4-5, almost free, lanceolate, 1.5-2.5 mm long. Corolla whitish, petals (3-)4-5, all joined at base, lobes narrowly ovate, acute at apex, 1.2-1.5 mm long. Capsule globose, circumsciss, 1.5-2 mm across, with 5-15 seeds. Seeds ellipsoid, ca. 0.5 mm long, brownish.

Specimens examined: TAIWAN: Taipei Co.: Shrding Township, Erger, 25 Apr 2003, *T.-C. Hsu s.n.* (TAIF); 15 Mar 2008, *T.-C. Hsu 1264* (TAIF); 4 Apr 2008, *T.-C. Hsu 1320* (TAIF); 3 May 2008, *T.-C. Hsu 1364* (TAIF).

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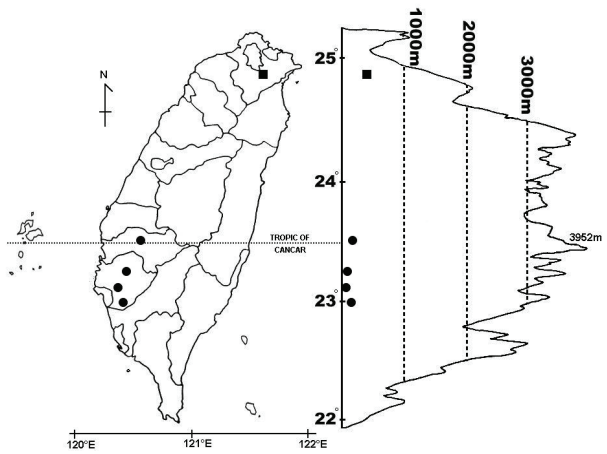


Fig. 5. Distribution of *Limnophila fragrans* (solid circle "●") and *Anagallis minima* (solid square "■") in Taiwan.

Distribution: Native to N America and Europe, introduced to S America (Walsh, 2003) and Australia (Zuloaga and Morrone, 1999); Taiwan, possibly introduced, in northern mountainous region at low altitudes.

Ecology: Occurred on wet places along roadsides. Accompanied with *Poa annua* L., *Gnaphalium spicatum* Lam., *Plantago major* L., and *Mazus pumilus* (Burm. f.) Steenis, etc. Flowering and fruiting from March to Jun.

Note: This species is the second member of *Anagallis* in Taiwan. The previously recorded *A. arvensis* L. is also a naturalized plant (Chen, 2008). *A. minima* differs from *A. arvensis* in having much smaller habits, usually alternate leaves, subsessile flowers, and much narrower corolla lobes with acute apex.

ACKNOWLEDGEMENTS

We thank Mr. Shou-Hsian Wu for his kindly assistance in field works and curators of TAI and TAIF for helping in specimen examination.

LITERATURE CITED

Chen, S.-H. 2008. Naturalized Plants of Eastern Taiwan. National Hualien University of Education. Hualien, Taiwan. p. 246.

Chung, S.-W. and T.-C. Hsu. 2006a. *Gastrodia shimizuana*, a newly recorded of *Gastrodia* (Orchidaceae) in Taiwan. Taiwania **51**: 50-52.

Chung, S.-W. and T.-C. Hsu. 2006b. *Bulbophyllum kwanwuensis* (Orchidaceae), a new species in Taiwan. Taiwania **51**: 139-142.

Chung, S.-W., T.-C. Hsu and Y.-H. Chang. 2007. *Acmella uliginosa* (Swartz) Cassini (Asteraceae): A newly naturalized plant in Taiwan. Taiwania **53**: 276-279.

Chung, S.-W., T.-C. Hsu and T. Yukawa. 2006. *Saccolabiopsis taiwaniana* (Orchidaceae), a new species from Taiwan. Quart. J. Forest Res. **28**: 25-28.

Chung, S.-W. and T.-C. Hsu. 2008. *Corybas himalaicus* (King & Pantl.) Schltr. (Orchidaceae): A newly recorded species in Taiwan. Taiwan J. For. Sci. **23**: 99-103.

Chung, S.-W. and S.-Y. Lu. 2007. *Dendrobium okinawense* Hatusima & Ida (Orchidaceae): A newly recorded species in Taiwan. Taiwania **52**: 106-112.

Chung, S.-W., D. A. Madulid and T.-C. Hsu. 2008. *Portulaca psammotropha* Hance (Protulacaceae), a neglected species in the flora of Taiwan and the Philippines. Taiwania **53**: 90-95.

Hsieh, T.-Y., T.-C. Hsu, Y. Kono, S.-M. Ku and C.-I Peng. 2007. *Gentiana bambuseti* (Gentianaceae), a new species from Taiwan. Bot. Stud. (Taipei) **48**: 349-355.

Hsu, T.-C. and S.-W. Chung. 2007. *Didymoplexis micradenia*: A newly recorded orchid (Orchidaceae) in Taiwan. Taiwania **52**: 360-364.

Hsu, T.-C. and S.-W. Chung. 2008a. Two new *Bulbophyllum* (Orchidaceae) species in Taiwan: *B. brevipedunculatum* and *B. ciliisepalum*. Taiwania **53**: 23-29.

Hsu, T.-C. and S.-W. Chung. 2008b. *Oberonia segawae* (Orchidaceae): A new orchid species in Taiwan. Taiwania **53**: 165-169.

Hsu, T.-C. and S.-W. Chung. 2009. Supplements to the orchid flora of Taiwan (1). Taiwania **54**: 82-87.

Jung, M.-J., T.-C. Hsu and S.-W. Chung. 2008. Notes on two newly naturalized plants in Taiwan. Taiwania **53**: 230-235.

Jung, M.-J., T.-C. Hsu, S.-W. Chung and C.-I Peng. 2009. Three newly naturalized Asteraceae plants in Taiwan. Taiwania **54**: 76-81.

Philcox, D. 1970. A taxonomic revision of the genus *Limnophila* R. Br. (Scrophulariaceae). Kew Bulletin **24**: 101-170.

Walsh, N. G. 2003. Primulaceae. In: Walsh, N.G., T. J. Entwisle (eds.), Flora of Victoria **3**: 517-522. Inkata Press, Melborne, Australia.

Yamazaki, T. 1993. *Limnophila*. In: Iwatsuki, K. et al. (eds.), Flora of Japan **3a**: 331-333. Kodansha Ltd., Tokyo, Japan.

Zuloaga, F. O. and O. Morrone. 1999. Catálogo de las Plantas Vasculares de la República Argentina 2. Missouri Botanical Garden, St. Louis, USA.

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兩種臺灣新發現植物

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(收稿日期：2009 年 3 月 5 日；接受日期：2009 年 7 月 24 日)

摘要：本文報導兩種臺灣新發現草本植物。無柄田香草（*Limnophila fragrans* (G. Forst.) Seem.，玄參科）發現於南部低地，而小海綠（*Anagallis minima* (L.) E.H.L. Krause，報春花科）則發現於北部低海拔山區。本文提供兩種新紀錄植物之描述，線繪圖，照片及分布圖。

關鍵詞：小海綠、無柄田香草、報春花科、玄參科、臺灣。

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