Lysimachia rupestris F. H. Chen & C. M. Hu (Primulaceae): a new record for the flora of Vietnam and reconsideration of its taxonomical position

Yi-Hua TONG
Nian-He XIA
Key Laboratory of Plant Resources Conservation and Sustainable Utilization & Guangdong Provincial Key Laboratory of Digital Botanical Garden, South China Botanical Garden, Chinese Academy of Sciences (China)
yh-tong@scbg.ac.cn
nhxia@scbg.ac.cn (corresponding author)

Le Viet LAM
Department of Science and Technology for Economic and Technical Branches, Ministry of Science and Technology (Vietnam)
lamtrr@yahoo.com

ABSTRACT
Lysimachia rupestris F. H. Chen & C. M. Hu is reported for the first time in Vietnam, in Cat Ba National Park. The supplemental description of its floral characters is applied. It has glabrous yellow corollas divided near to base, and stamens with short filaments connate basally into a ring and basifixing anthers opening by apical pores. The systematic position of L. rupestris F. H. Chen & C. M. Hu and its closely related species is also discussed.

KEY WORDS
Primulaceae, Vietnam, supplemental description, new record.

RÉSUMÉ
Lysimachia rupestris F. H. Chen & C. M. Hu est signalé pour la première fois au Vietnam, dans le Parc national de Cat Ba. Une description plus détaillée de ses caractères floraux est effectuée : les corolles jaunes et glabres sont divisées près de leur base, tandis que les étamines présentent des files courts, connées à la base en un anneau, ainsi que des anères basifixes, déhiscentes par des pores apicaux. La position systématique de L. rupestris F. H. Chen & C. M. Hu et des espèces les plus affines est également discutée.

MOTS CLÉS
Primulaceae, Viêt-Nam, description supplémentaire, signalement nouveau.

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INTRODUCTION

Lysimachia L., with approximately 140-200 species worldwide, is the largest genus of the tribe Lysimachieae Reich., Myrsinoideae, Primulaceae (Stevens 2017). Recent phylogenetic studies reported that the traditional Lysimachia is paraphyletic and for monophyly, the other genera of the tribe Lysimachieae, such as Anagallis L., Asterolimon Hoffmanns. & Link, Glaux L., Pelletiera A. St.-Hil., Trientalis L., should be all merged into Lysimachia (Hao et al. 2004; Manns & Anderberg 2005, 2009; Anderberg et al. 2007), leaving Lysimachia s.l. as the sole genus in this tribe.

In Vietnam there occur 18 species of Lysimachia, including two recently published new species (Hu 1992; Hồ 1999; Phan & Hu 2011). During a plant survey of Cat Ba National Park in Quang Ninh Province, a specific Lysimachia with both flowers and fruits never recorded in Vietnam was found. It grows on the top of limestone hills and has several stolons arising from leaf rosette, and the apex of each stolon bears another leaf rosette, which can grow into a new individual. Despite of this, the stems, leaves and pedicels are all minutely glandular and the flower is solitary in the axil of rosette leaf. These quite distinct characteristics are also shared by L. rupestris F. H. Chen & C. M. Hu, which was known only from China until now (Hu & Kelso 1996). Lysimachia rupestris was published by Chen & Hu (1979) based on two collections from Southwest Guangxi, China, both of which are fruiting materials. After careful comparison of our specimens and the type specimens of L. rupestris, we drew the conclusion that they are conspecific. Thus, it represented a new record for the flora of Vietnam. Fortunately, several flowers on our specimens are appropriate for monophyly, the other genera of Myrsinoideae, Primulaceae (Stevens 2017). Recent phylogenetic research confirmed that section Rosulatae is more close to subgenus Idiophyton, rather than subgenus Lysimachia (Hao et al. 2004; Anderberg et al. 2007). Our supplement of the floral characters, especially the basifixed anthers opening by apical pores (Fig. 1F) of L. rupestris is another strong evidence to support that section Rosulatae should be transferred to subgenus Idiophyton. The third species with the spirally aggregated leaves forming nearly rosettes is the recently described L. verbascifolia (Phan & Hu 2011). This species also has basifixed anthers opening by apical pores, which shows its affinity of L. rupestris. However, the lack of stolons in L. verbascifolia adds confusion to the relationship between these species. Thus, there is still much work to do to figure out their systematic position.

Family PRIMULACEAE Batsch ex Borkh.
Genus Lysimachia L.

Lysimachia rupestris F. H. Chen & C. M. Hu
(Fig. 1)


SPECIMEN DATA. — Vietnam. Ha Long Bay, Quang Ninh, 20°48’5.56”N, 106°59’50.51”E, alt. 163 m, on rocks at the top of limestone hills, 29.IV.2015, Nian He Xia, Viet Lam Le & Duy Hung Vuong, s.n. (IBSC, two duplicates).

DESCRIPTION

Herbs perennial, 2-5 cm tall, glabrous throughout. Stems copiously minutely glandular; stolons 2- many, 6-17 cm long, arising from leaf rosette, leafy at apex. Leaves spirally arranged, ± forming a rosette; petiole 1-2 cm long, narrowly winged; leaf blade elliptic-oblanceolate, 3-6.5 × 1.2-2.2 cm, minutely glandular on both sides, base long attenuate, margin narrowly revolute, apex acute to obtuse; veins 3 or 4 pairs, prominent abaxially; veinlets invisible. Flowers solitary, axillary. Pedicel 2.5-4 cm long, densely minutely glandular. Calyx c. 1 cm long, divided to base, lobes lanceolate, c. 1 cm × 1.5-2 mm, densely minutely glandular, especially so at the base, with 1 midvein, reticulate veins inconspicuous. Corolla yellow, divided near base, lobes oblong-lanceolate, 7-8 mm × c. 2 mm, apex acute to obtuse, glabrous. Stamens 5, filaments c. 1 mm long, connate basally into a ring, free parts c. 0.7 mm long; anthers 4-5 mm, basifixed, opening by apical pores. Style c. 6 mm long, glabrous; stigma puncate, ovary sub-globose, glabrous. Capsule subglobose, c. 4 mm in diam. Flowering April-May, fruiting May-August.

REMARKS

Because of the similar vegetative appearance, Chen & Hu (1979) assigned Lysimachia rupestris together with L. alpestris Champ. ex Benth. to subgenus Lysimachia section Rosulatae R. Knuth only according to the flower characters of L. alpestris, i.e. the dorsifixed anthers opening by lateral slits, which is an important feature of subgenus Lysimachia, although it also has short filaments connate basally into a very short ring and does not bear colored glands, which are the features of subgenus Idiophyton. In contrast, Chen & Hu (1979) assigned L. rupestris to subgenus Idiophyton. Hence, it was not possible to assign L. rupestris to any of these two subgenera. The third species with the spirally aggregated leaves forming nearly rosettes is the recently described L. verbascifolia (Phan & Hu 2011). This species also has basifixed anthers opening by apical pores, which shows its affinity of L. rupestris. However, the lack of stolons in L. verbascifolia adds confusion to the relationship between these species. Thus, there is still much work to do to figure out their systematic position.

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**Fig. 1.** — *Lysimachia rupestris* Chen & C.M. Hu (Nian He Xia, Viet Lam Le & Duy Hung Vuong, s. n. [IBSC]): **A**, habit; **B**, glands on leaves; **C**, leaf base; **D**, calyx; **E**, flower with corolla removed; **F**, corolla opened up showing stamens; **G**, fruit. Drawing: Ding-han Cui. Scale bars: **A**, 2 cm; **B, C**, not to scale; **D**, 5 mm; **E, F**, 4 mm; **G**, 2 mm.
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