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Smilax bolavenensis, a new species of Smilacaceae from southern Laos

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Abstract

A new species of *Smilax*, *S. bolavenensis* (Smilacaceae), is described from the Bolaven Plateau, southern Laos. It is similar to *S. elegantissima* in its elongated inflorescence with slightly zigzagged rachis longer than 20 cm, but the new species is distinguished by its terete stem and petiole (vs. 4-angled with each corner narrowly winged in *S. elegantissima*) and 42–54-flowered umbels (vs. 7–12). A description, photographs and preliminary conservation status are also provided for *S. bolavenensis*.

Keywords: Bolaven Plateau, Liliales, Southeast Asian flora

Introduction

Smilax Linnaeus (1753: 1028) became the sole genus of Smilacaceae after *Heterosmilax* Kunth (1850: 270) was reduced to *Smilax* (Cameron & Fu 2006, Qi *et al*. 2013a, b). It consists of about 300 species, collectively distributed in tropical, subtropical and temperate regions (Chen & Koyama 2000, POWO 2022). The species are dioecious, often woody climbers and shrubs, sometimes herbs, with simple lamina with 3–7 main veins arising from the base, netted leaf venation, axillary inflorescences are composed of 1(–3) umbel(s) or paniculately, racemosely or spicately disposed several umbels, 6 tepals, superior ovary and drupes or berries (Chen & Koyama 2000, Qi *et al.* 2013a). In Laos, 19 species have been recorded (Gagnepain 1934, Koyama 1983, Newman *et al.* 2017 onwards, Kladwong *et al.* 2018, 2022).

The Bolaven Plateau, southern Laos, is one of the biodiversity hotspots in Indochina (Profile 2012). Indeed, our recent extensive fieldwork carried out in the area 2018–2020 has resulted in discovery of more than 17 new taxa endemic to the Bolaven Plateau and 70 new records for Laos (e.g., Souladeth *et al.* 2020, Tagane *et al.* 2020, Phonepaseuth *et al.* 2021, Souvannakhoummane *et al.* 2021, Vongthavone *et al.* 2021, Yamazaki *et al.* 2021, Noyori *et al.* 2022). During our botanical inventories, we collected seven species of *Smilax*, of which six were identified as *S. bockii* Warburg ex Diels (1900: 252), *S. corbularia* Kunth (1850: 262), *S. extensa* Wallich in Hooker (1892: 309), *S. glabra* Roxburgh (1832: 792), *S. lanceifolia* Roxburgh (1832: 792) and *S. megacarpa* Candolle (1878: 186). However, one species did not match descriptions of species recorded in Laos and surrounding countries.

The two unknown specimens were collected during our field surveys in Bolaven Plateau in 2018 and 2019. We examined the putative new species and referred to herbarium specimens at FOF and KAG and digital specimen images available on online (e.g. JSTOR Global Plants https://plants.jstor.org). Floral measurements were made on rehydrated specimens, and we consulted the relevant literature (Gagnepain 1934a, Koyama 1975, 1983, Hô 2000, Li *et al.* 2011, Heckroth *et al.* 2014, Sun *et al.* 2015, Jin *et al.* 2016, Qi *et al.* 2016, Newman *et al.* 2017 onwards, Baruah *et al.* 2018, Kladwong *et al.* 2018, 2020, Feng *et al.* 2022). Based on these studies, it was clear this is an undescribed species, which we formally described below.

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Taxonomy

Smilax bolavenensis Tagane & Soulad., *sp. nov*. (Figs 1, 2)

TYPE:—LAOS. Champasak Province: Paksong District, near Nong Luang Village, Dong Hua Sao National Park (Bolaven Plateau), 15°04′44.53″N, 106°12′27.36″E, 1249 m a.s.l., 17 Dec 2019, *Souladeth et al. L3342* (holotype: FOF 0006673; isotypes BKF, KAG 155707).

Smilax bolavenensis is similar to *S. elegantissima* Gagnepain (1934b: 619) from Vietnam in having an elongate inflorescence with slightly zigzag rachis longer than 20 cm, but clearly distinguished from it by its terete stem and petiole (vs. 4-angled with each corner narrowly winged) and 42–54-flowered umbels (vs. 7–12).

FIGURE 1. *Smilax bolavenensis* (holotype, *Souladeth et al. L3342*, FOF0006673).

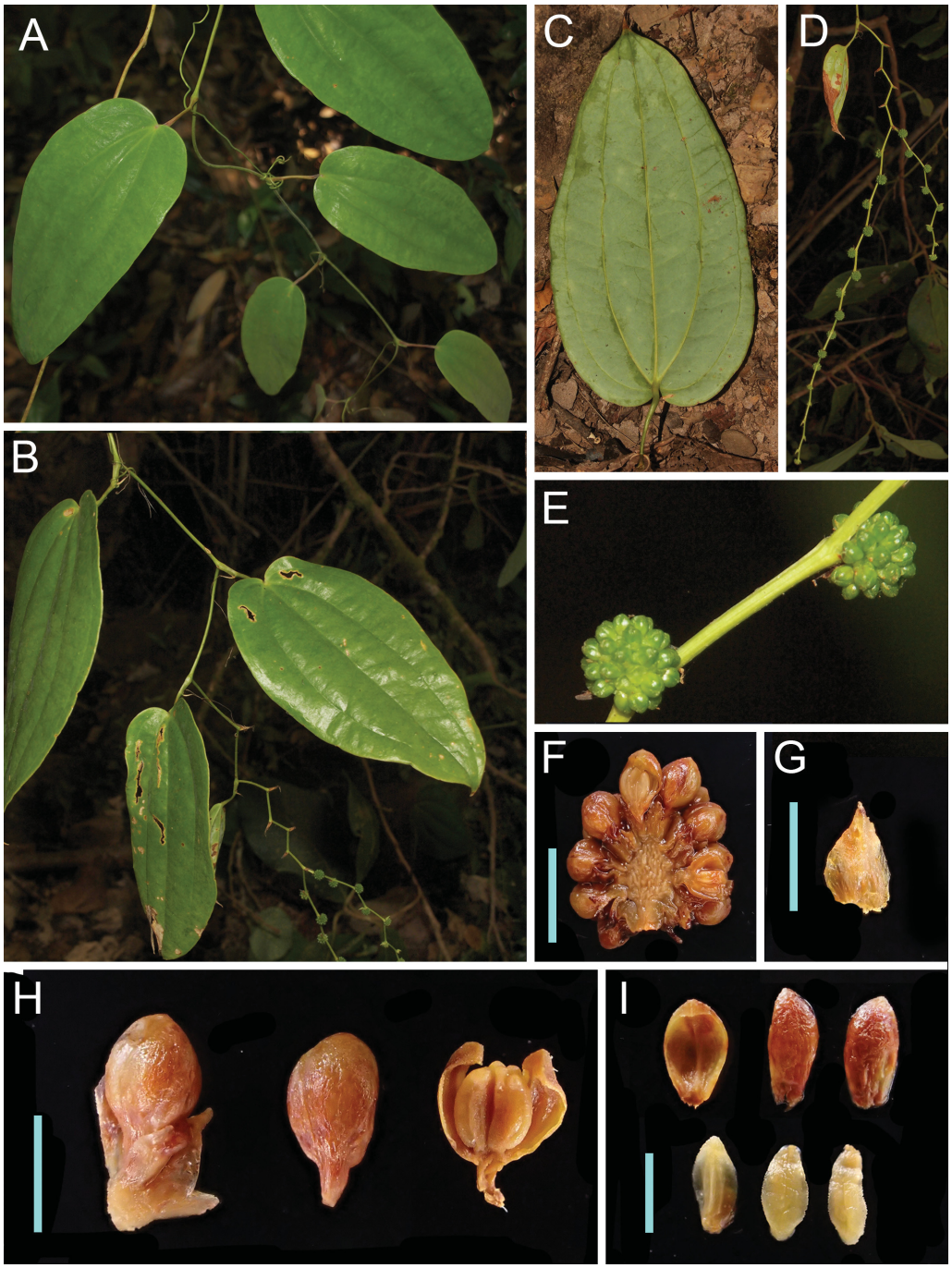

FIGURE 2. *Smilax bolavenensis*. A. Leafy branch. B. Branch with staminate inflorescence. C. Abaxial leaf surface. D., E. Staminate inflorescence. F. Longitudinal section of a staminate umbel. G. Bracteole. H. Staminate flower bud with bracteoles (left), staminate flower bud (middle), and staminate flower bud outer three tepals and one inner tepal removed showing stamens (right). I. Outer tepals (top) and inner tepals (bottom), adaxial side (left), abaxial side (middle and right). A–C from *Tagane et al. L1964* (KAG); D–G from *Souladeth et al. L3342* (KAG). Scale bars: F = 5 mm, G–I= 2 mm. Photographed by S. Tagane.

Climbers to 4 m tall, all parts glabrous. Stems and branches subterete, without prickles and wings. Petioles 3.5–4.5 cm long, subterete; sheaths 1.2–1.7 × 0.7–1 cm. Tendrils up to 10.0 cm long, 1.0–1.5 cm above from the base of sheath. Lamina ovate-oblong to narrowly ovate, (11.0–)15.2–22.4 × (3.5–)5.8–13.6 cm, shiny brownish red to brownish yellowish on both surfaces when dry or paler and glaucous abaxially, apex acuminate, acumen up to 0.6 cm long, base cordate, 5-veined, major veins diverging at base of lamina, prominent abaxially, (0.9–)1.7–2.5 cm interval (at widest point of lamina), connected with reticulate veinlets. Staminate inflorescence composed of spicately disposed umbels, to 33 cm long, 2–4-branched, rachis slightly zigzagged, not winged; umbels sessile, 22 per inflorescence, 42–54-flowered, prophylls ovate-lanceolate, 3.0–4.5 × 1.0–1.2 mm, apex acuminate; receptacle of an umbel globose, 2.8 mm

in diam.; bracteoles 4–5, ovate-triangular to oblong-obovate, 1.6–2.5 × 0.6–1.2 mm, apex acute. Staminate flower (before anthesis), tepals 6, free from base, outer ones ovate-oblong, 2.5–2.9 × 1.3–1.5 mm, inner ones narrowly ovate, 2.0–2.2 × 0.9–1.0 mm long, apex acute, stamens 6, filaments sessile, anthers oblong, 1.3 mm long; pedicels 0.3–0.7 mm long. Pistillate inflorescence, fruits and seeds not seen.

Distribution:—Thus far known only from the Bolaven Plateau.

Habitat:—Montane forests, 1240–1250 m a.s.l., dominated by Fagaceae, Lauraceae and Myrtaceae, along with some subcanopy trees such as *Taberaemontana bovina* (Apocynaceae), *Aporosa yunnanensis* (Phyllanthaceae), and *Camellia bolavenensis* (Theaceae).

Phenology:—Staminate inflorescence with flower buds collected in December.

Etymology:—Referring to the type locality, Bolaven Plateau.

Vernacular name:—*Kheau kheaung Bolaven* (ເຄືອເຂືອງບໍ່ລະເວນ; **Lao**), suggested here. *Kheau kheaung* in Lao refers to a common name for *Smilax*.

Preliminary conservation assessment:—Critically endangered (CR). During our five intensive field surveys in Bolaven Plateau 2018–2020, we found only one population with a few individuals in lower montane forest on the top of a plateau where we collected the above two specimens. Therefore, the most appropriate initial assessment of the IUCN conservation status for this species is critically endangered (CR) under criteria D (IUCN 2012). In the Bolaven Plateau, the forests at higher elevation have been decreasing due to dam construction and coffee plantations, which may produce negative effects for *S. bolavenensis*. Further information on its distribution and number of individuals/populations is needed to accurately assess its status and conserve this species.

Note:—Among the *Smilax* species in Laos, *S. bolavenensis* resembles *S. glabra* in leaf texture and venation patterns, and both species occur in Bolaven Plateau (specimens of *S. glabra*: *Souladeth et al. L3754*, FOF, KAG). However, *S. bolavenensis* is easily distinguishable from *S. glabra* by its long-spicately disposed sessile umbels (vs. only 1 umbel axillary in *S. glabra*) and its cordate leaf base (vs. cuneate to rounded).

Additional specimen examined:—LAOS. Champasak Province: Paksong District, near Nong Luang Village, Dong Hua Sao National Park (Bolaven Plateau), 15°04′19.26″N, 106°12′38.67″E, 1248 m a.s.l., 10 Dec 2018, *Tagane et al. L1964* (FOF 005293, FU, KAG 128065).

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