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Studies on the genus *Capparis* L. (Capparaceae) in Lao PDR. IV: A new species from the Khammouan Province

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Abstract

A new species of *Capparis*, *C. florida*, is described and illustrated from the Hin Nam No National Protected Area, Khammouan Province in central Lao PDR. The new species, collected in forest habitats of the Khammouan karst, belongs to sect. *Monostichocalyx*. It is an erect shrub characterized by the widely ovate or elliptical leaf-blade, by the flowers serial in supra-axillary rows, and by the slender ovary with evident style. Its affinities with related taxa, such as the widespread *C. micracantha*, are discussed and its conservation status assessed.

Keywords: *Capparis* sect. *Monostichocalyx*, ecology, Hin Nam No National Protected Area, Khammouan karst, Seriales-Group

Introduction

The genus *Capparis* Linnaeus (1753: 503) has a main centre of speciation in the eastern part of the Indochinese Peninsula, including Cambodia, Lao PDR and Vietnam, where Jacobs (1965) recorded 31 species, seven of which endemic. Following the same author these taxa are widespread in lowlands, occasionally in mountains, mostly preferring areas with seasonal drought and in some cases rain forest conditions. Recently a few new species of *Capparis* were described from different areas of south-eastern Asia, i.e. in Vietnam (Thuong *et al.* 2013, 2015) and Thailand (Srisanga & Chayamarit 2004).

With regard to Lao PDR, the taxonomic treatment of the genus is so far critical, with a discordant number of species reported by different authors (Gagnepain 1908a, Newman *et al.* 2007, Inthakoun & Delang 2008). Field and herbarium investigations were undertaken in this country during the last years to investigate the diversity of *Capparis*; based on these researches the distribution and variation of some less known taxa were examined and two new species were described (Fici 2016, Fici *et al.* 2018, Souvannakhoummane *et al.* 2018). During recent botanical inventories carried out in the Hin Nam No National Protected Area (Khammouan Province), populations of *Capparis* were studied in forest habitats of the Khammouan Karst. These populations were recognized as a new species, here described and illustrated. The new species belongs to the sect. *Monostichocalyx* Radlkofer (1884: 101) and is characterized by spreading-arcuate branches, widely ovate or elliptical leaves, flowers serial in supra-axillary rows and ovary with elongated style.

Capparis florida Fici & Souvannakhoummane, *sp. nov.*

Type:—Lao PDR. Khammouan Province, Boualapha District, Hin Nam No National Protected Area, forest in proximity of Xe Bang Fai River, 180 m, 27 March 2018, Fici *et al.* 11 (holotype PAL!, isotype FOF!).

Diagnosis:—A *C. micracantha* DC. cataphyllis nullis, foliis late ovatis vel ellipticis, petalis lanatis, ovario minore, stylo elongato differt.

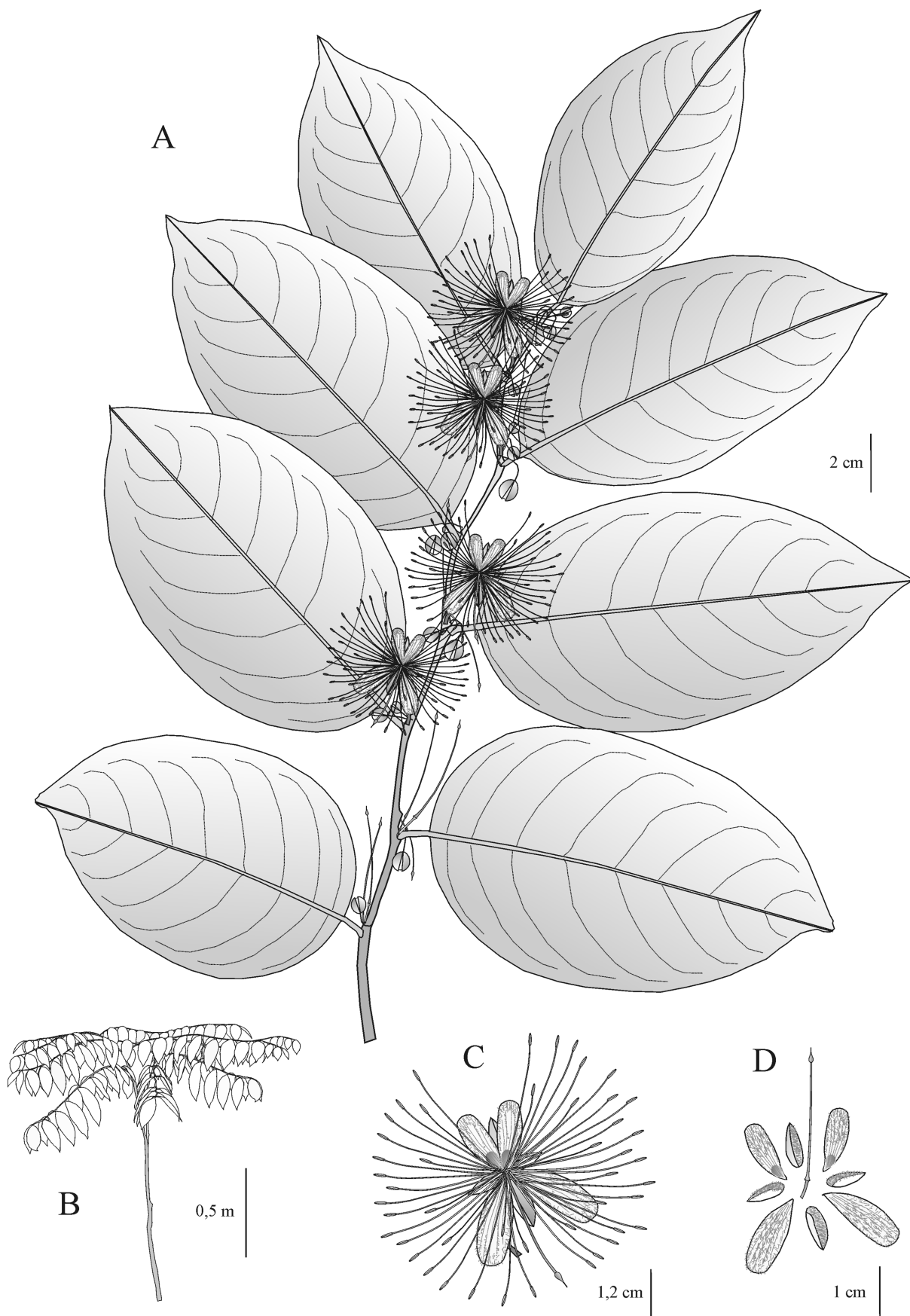


FIGURE 1. *Capparis florida*. **A.** Flowering branch. **B.** Habit. **C.** Flower. **D.** Dissected flower showing sepals, petals, gynophore and ovary (A, C, D from Fici et al. 11). Drawn by Silvio Fici.

Erect shrub up to c. 2.5 m tall; trunk greyish, bearing small knobs surmounted by a thorn. Branches stout, spreading-arcuate, markedly zig-zag, glabrous; shoots without cataphylls at the base. Stipular thorns straight, upwards or patent, c. 1–3 mm long or wanting. Petioles (6–) 7–10 (–11) mm long, glabrous. Leaf-blades ovate or elliptical, (1.4–) 1.5–2.1 (–2.4) times as long as wide, (10–) 10.5–14 (–15) × (5–) 5.5–8 (–8.7) cm, bright green, in some cases the lower side reddish; base rounded, sometimes blunt; apex slightly acuminate or acute, mucronulate; surfaces glabrous; veins c. 6–8 on each side of the midrib. Flowers 2–6 in supra-axillary rows; pedicels (0.6–) 0.8–1.5 (–1.6) cm long, glabrous. Sepals (6–) 7–10 × 3–3.5 mm, acute at apex, glabrescent outside, pubescent inside and at margins, outer pair boat-shaped, coriaceous, inner pair thinner. Petals oblong to narrowly spatulate, (11–) 12–18 (–22) × (3–) 4–5 (–6) mm, white, woolly outside and at margins, loosely woolly inside, often the upper pair with honey-guide yellow, turning dark red or violet. Stamens c. 47–61; filaments (2–) 2.5–3.5 cm long; anthers basifixed, 1.5–2 mm long. Gynophore (2–) 2.5–3.4 cm long, glabrous; ovary pear-shaped or ovoid, 1.5–2 × 1 mm, glabrous, passing into a slender style c. 0.6–1 mm long with small knob-shaped stigma. Fruit not observed. Fig. 1.

Etymology:—The specific epithet *florida*, meaning profusely flowering, refers to the showy, white flowers elegantly arranged in abundant supra-axillary rows, standing out against the bright green leaves.

Distribution and habitat:—*Capparis florida* is known from two localities of the Hin Nam No National Protected Area (HNN-NPA), in the semi-deciduous forest at c. 180–190 m elevation (Fig. 2). The species has been observed on silty-sandy soils in flatlands in proximity of the Xe Bang Fai River, and at the base of limestone cliffs. This area falls within the Khammouan Karst, extended from Lao PDR to Vietnam and belonging to the central Indochina limestone karst ecoregion. The Khammouan Formation, constituted by Permo-Carboniferous limestones, hosts a variety of karstic landscape characterized by cliffs, cones and dolines, mixed with alluviated plains and sandstone basins (Ponta & Aharon 2014; Waltham & Middleton 2000).

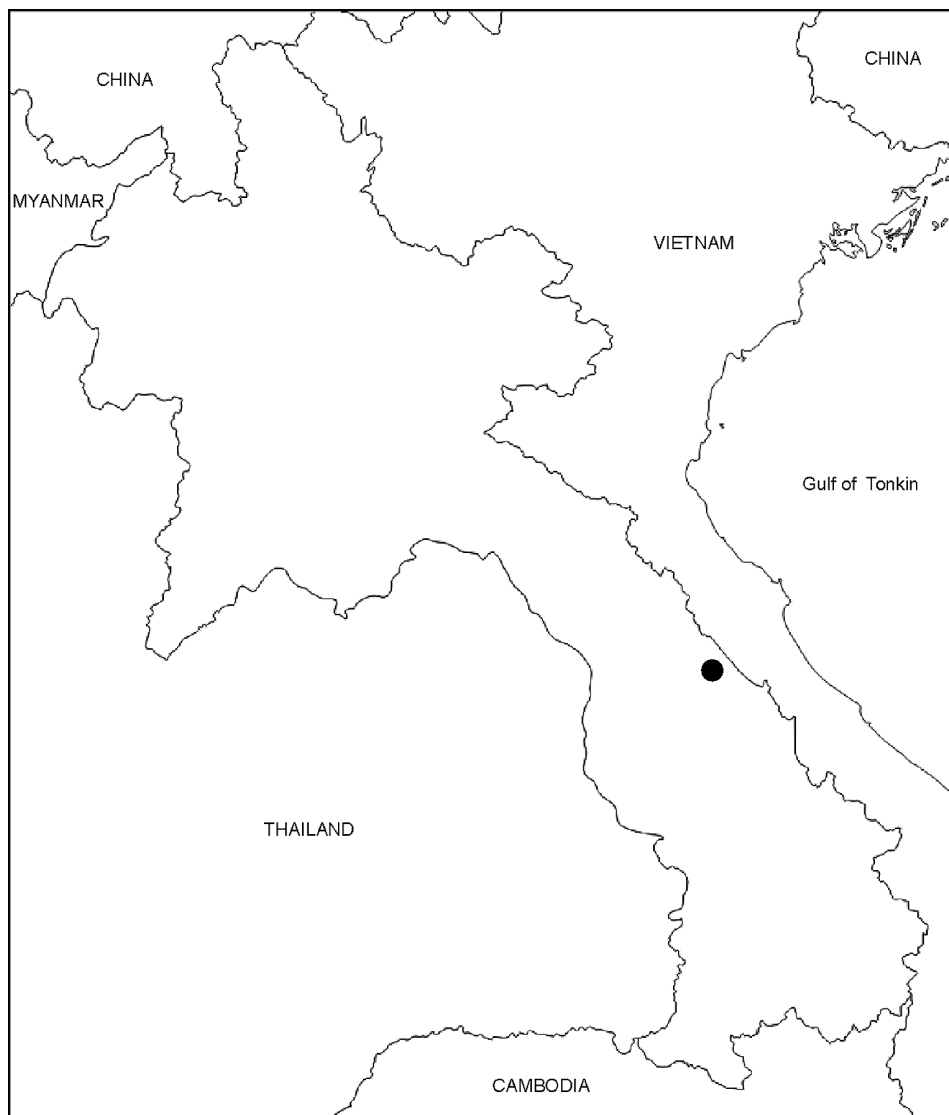


FIGURE 2. Known distribution of *Capparis florida*.

Phenology:—Flowers in March and April.

Conservation status:—The new species is assessed here as Vulnerable (VU D2), according to IUCN Red List Categories and Criteria (IUCN 2012), due to its restricted area of occupancy and low number of locations so far known. A factor of risk for its habitat is represented by logging, traditionally practiced in the forest formations of the area.

Notes:—The new species belongs to *Capparis* sect. *Monostichocalyx*, which includes several species from Africa, Asia, Australia and Oceania. Within this section Jacobs (1965) recognized various “tentative” Groups, among which the Seriales-Group, including species with flowers in supra-axillary rows, is represented in Lao PDR by about eight species, i.e. *C. acutifolia* Sweet (1830: 585), *C. echinocarpa* Pierre ex Gagnepain (1908b: 212), *C. micracantha* Candolle (1824: 247), *C. pyrifolia* Lamarck (1785: 606), *C. radula* Gagnepain (1908b: 213), *C. tenera* Dalzell (1850: 41), *C. urophylla* Chun (1948: 419) and *C. zeylanica* Linnaeus (1762: 720). Within the Seriales-Group, *C. florida* (Fig. 3, 4) shows affinities with *C. micracantha* var. *micracantha*, a taxon widespread in south-eastern Asia, Philippines and Indonesia, which, however, differs in various characters, i.e., cataphylls at the base of shoots, leaves 1.7–2.9 (–4.1) times as long as wide, ovary ovoid or ellipsoid, c. 3 × 2 mm, without an evident style (Jacobs 1965). The new species is also related to *C. buwaldae* Jacobs (1960: 85) from Borneo, and to *C. cucurbitina* King (1889: 395) endemic to Perak (Malaysia), both differing in the shorter sepals and lower number of stamens.

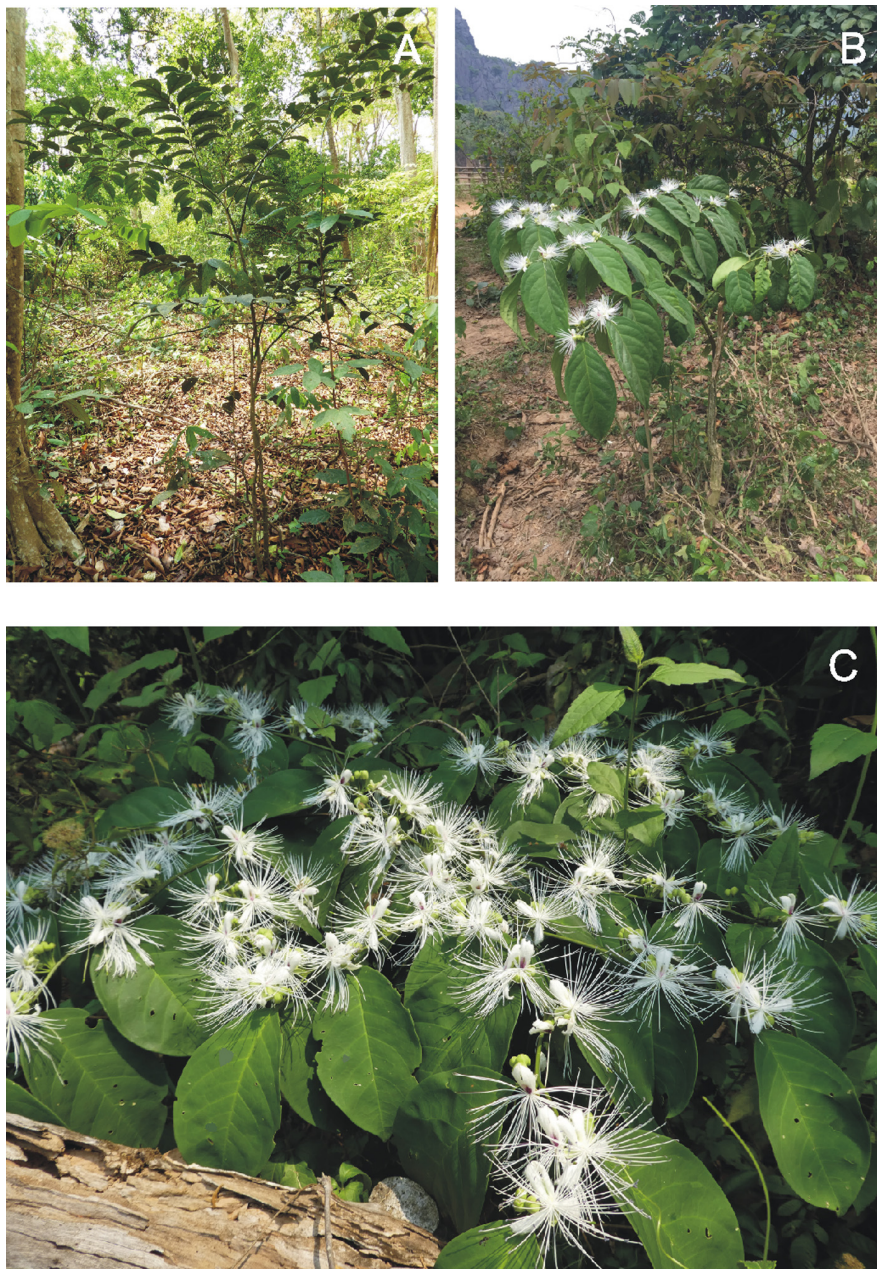


FIGURE 3. *Capparis florida*. A, B. Habit. C. Flowering branches.



FIGURE 4. *Capparis florida*. A. Trunk bearing knobs with thorns. B. Stipular thorns. C. Flower buds in supra-axillary rows. D. Flower.

Capparis florida has been collected in the western part of the Hin Nam No National Protected Area, which covers 82,000 hectares of mainly limestone landscape in Boualapha District, Khammouan Province. The Khammouan karst, as well as the whole central Indochina limestone karst ecoregion, hosts a vascular flora with high rate of endemism (Inthakoun & Delang 2008). The type locality of *Capparis florida* is located at short distance from the one of the recently described *C. hinnamnoensis* Souvannakhoummane & Fici (2018: 175), belonging to the same sect. *Monostichocalyx*. Based on observations carried out during field researches in the area, this section of *Capparis* shows here remarkable differentiation, being represented by other two taxa, i.e. *C. micracantha* var. *micracantha* and *C. pyrifolia*.

Other collection seen:—LAO PDR. Khammouan Province, Boualapha District, Hin Nam No National Protected Area, at base of limestone cliff, 190 m, 30 March 2018, Fici *et al.* 18 (PAL).

Key to the species of the Seriales-Group in Lao PDR

- 1 Shoots with cataphylls at the base *C. micracantha*
- Shoots without cataphylls at the base 2
- 2 Innovations firstly with reddish or orangish tomentum, later pale or greyish; gynophore during anthesis hairy at base
..... *C. zeylanica*
- Innovations glabrous or with fulvous-brownish tomentum; gynophore during anthesis nearly always glabrous 3
- 3 Stamens more than 40 *C. florida*
- Stamens less than 40 4
- 4 Sepals (4–) 5–9 mm long; stamens 20–40 5
- Sepals up to 5 (–5.5) mm long or shorter; stamens 7–25 6
- 5 Sepals \pm 9 mm long; stamens 30–40; fruit 3–4 cm in diameter *C. radula*
- Sepals (4–) 5–8 (–9) mm long; stamens 20–35; fruit 1–1.5 cm in diameter *C. acutifolia*
- 6 Thorns straight, slightly recurved upwards or wanting 7
- Thorns vigorous, recurved 8
- 7 Sepals 2.5–4 mm wide, minutely hairy outside; stamens 20–25 *C. pyrifolia*
- Sepals 2–3 mm wide, glabrous outside; stamens \pm 14–20 *C. urophylla*
- 8 Sepals (2.5–) 3–4.5 (–5.5) mm long; fruit \pm 0.7–1 (–1.3) cm in diameter, smooth or sometimes pointed *C. tenera*
- Sepals \pm 5 mm long; fruit \pm 2 cm in diameter, sculptured *C. echinocarpa*

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