

Raphiocarpus tamdaoensis sp. nov. (Gesneriaceae) from Vietnam

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A new species of Gesneriaceae, *Raphiocarpus tamdaoensis* V. X. Phuong, D. T. Xuyen & Y. G. Wei, is described and illustrated from Vietnam. It is similar to *R. asper* (Drake) B. L. Burtt and *R. evrardii* (Pellegr.) B. L. Burtt, but is easily differentiated by leaf blades being ovate–elliptic or obovate, 4–10 × 1.5–3.5 cm, one cyme with only one flower, peduncle linear, 3.0–5.0 cm long, corolla light yellow, 3.0–4.5 cm long, and a pubescent ovary.

The genus *Raphiocarpus* (Gesneriaceae), with eleven currently recognized species, has its main distribution in south and southwestern China (Li and Wang 2004, Zhang et al. 2010). *Raphiocarpus petelotii* (Pellegr.) B. L. Burtt does also occur in Vietnam (Li and Wang 2004). The distribution area of *Raphiocarpus sinicus* Chun, *R. longipedunculatus* (C. Y. Wu ex H. W. Li) B. L. Burtt and *R. maguanensis* Y. M. Shui & W. H. Chen in Chinese Guangxi (Longzhou, Shangsi, Fangcheng) and Yunnan (Pingbian, Maguan, Jinping, Lüchun) are very close to the border of Vietnam and these species might be discovered in Vietnam in the future (Li and Wang 2004, Wei et al. 2010, Zhang et al. 2010). Recently, we recognized and identified three species of this genus from the specimens of Gesneriaceae in the Hanoi Herbarium (HN), namely *R. asper* (Drake) B. L. Burtt, *R. evrardii* (Pellegr.) B. L. Burtt and one unknown species. However, the ‘Checklist of plant species of Vietnam’ does not include any species of *Raphiocarpus* in Vietnam (Phuong 2005). After consulting relevant literature (Pellegrin 1930, Burtt 1954, Burtt and Tan 1984, Wang et al. 1992, 1998, Ho 2000, Weber 2004, Wei et al. 2010, Zhang et al. 2010), as well as herbarium specimens in Vietnam, China and France, we considered that our unknown species is an undescribed species of *Raphiocarpus*, which is described and illustrated here. It is similar to *R. asper* (Drake) B. L. Burtt and *R. evrardii* (Pellegr.) B. L. Burtt, but some characteristics of our specimens show that it is totally different: leaf blades ovate–elliptic or obovate, 4–10 × 1.5–3.5 cm, one cyme with only one flower, peduncle linear, 3.0–5.0 cm long, corolla light yellow, 3.0–4.5 cm long, and a pubescent ovary.

Raphiocarpus tamdaoensis V. X. Phuong, D. T. Xuyen & Y. G. Wei sp. nov. (Fig. 1, 2)

Species nova Raphiocarpo aspero et R. evrardii affinis, sed lamina ovato-ellipticis, ellipticis vel obovatis, 4–10 × 1.5–3.5 cm; floribus solitariis; pedunculis linearibus, 3.0–5.0 cm longis; corollis pallido-luteis, 3.0–4.5 cm longis; ovario pubescente differt.

Type: Vietnam. Vinh Phuc Province, Tamdao mountain, in lower montane forest, alt. 1300 m a.s.l., 21 Jun 2003, Tran The Bach and Bui Thu Ha Bach-Ha 19 (holotype: HN, isotype: HN).

Etymology

The specific epithet is derived from its’ type locality, Tam Dao national Park, Vietnam.

Description

Perennial herb, to 40–50 cm tall. Stems erect or prostrate at base, branched, vellutinous when young, becoming glabrous with age. Leaves opposite, blades of each pair unequal, rarely equal, ovate–elliptic or obovate, 4–10 × 1.5–3.5 cm, with long erect pubescence on both surfaces, ca 0.8–1.0 mm long, oblique, obtuse or almost rounded at base, margin serrate to almost entire, acute or acuminate at apex; adaxial midrib depressed, abaxial midrib protuberant; lateral veins in 5–6(8) pairs, distinct on both surfaces, adaxial veins purplish–red; petiole 0.3–1.5 cm long, densely vellutinous. Cymes 1-flowered, axillary; peduncle 3.0–5.0 cm long, linear, with sparse erect pubescence; bracts 2, ovate–oblong or

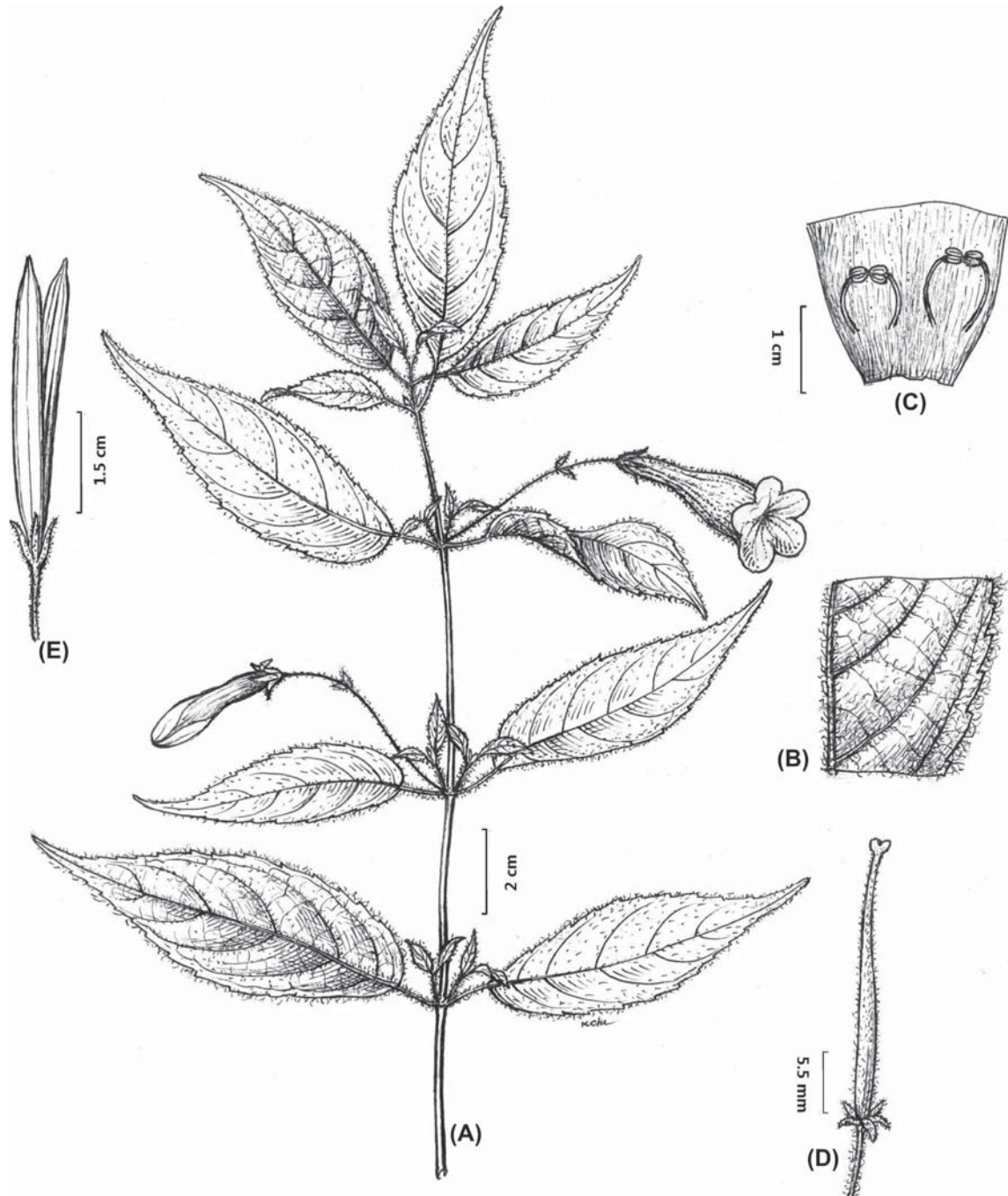


Figure 1. *Raphiocarpus tamdaoensis* sp. nov. (A) habit, with flowering branch, (B) piece of abaxial leaf blade, (C) corolla, opened with stamens exposed, (D) ovary, (E) ripe capsule with valves split. Drawn by L. K. Chi based on the holotype, Tran The Bach and Bui Thu Ha Bach-Ha 19, HN.

oblong-lanceolate, ca $1-3 \times 0.5-1.0$ mm, margin entire, with both surfaces densely vellutinous; pedicel $0.5-1.5$ cm, vellutinous. Calyx 5-parted from base, lobes ovate-lanceolate, $3-5 \times 1-2$ mm, acuminate at apex, margin entire, vellutinous outside, glabrous inside. Corolla light yellow to yellow, $3.0-4.5$ cm long, sparsely vellutinous outside; tube $2.5-3.5$ cm long; limb 2-lipped; adaxial lip 2-lobed, lobes broadly ovate or rounded, $3-5 \times 4-6$ mm, glabrous inside; abaxial lip 3-lobed, longer than the adaxial lip, almost

rounded, ca $4-7 \times 5-8$ mm, glabrous inside. Stamens 4, adnate to near lower third of corolla tube, coherent in pairs at the anther, anthers glabrous, sometimes vellutinous. Filaments glabrous, adaxial stamens ca $0.5-0.8$ cm long, abaxial ones ca $0.6-0.9$ cm long; staminode absent. Disc ringlike, $1.0-1.5$ mm high. Pistil $2-3$ cm long, ovary linear, densely vellutinous; style linear; stigmas 2, oblong or almost rounded. Capsule pubescent, $3-4$ cm long. Flowering in May-July, and fruiting in June-September.



Figure 2. Holotype (left, HN) and isotype (right, HN) of *Raphiocarpus tamdaoensis* sp. nov.

Ecology and conservation status

Raphiocarpus tamdaoensis grows in damp and unctuous soil on mountains, in evergreen broad-leaf forest, at 800–1300 m a.s.l. It has only been found in Tam Dao national Park, Vinh Phuc province, Vietnam. As the present population is not large, and the environment is easily influenced by human disturbance, we assess it as ‘Vulnerable’ (VU A1c) according to the IUCN categories and criteria (IUCN 2001).

Similar species

Raphiocarpus tamdaoensis is closely related to *R. asper* (Drake) B. L. Burtt, but is easily differentiated by leaf blades being ovate–elliptic, or obovate, $4\text{--}10 \times 1.5\text{--}3.5$ cm, one cyme with only one flower, peduncle linear, $3.0\text{--}5.0$ cm

Table 1. Morphological comparison between *Raphiocarpus tamdaoensis* sp. nov. and its close relative *R. asper*.

Characteristic	<i>R. tamdaoensis</i>	<i>R. asper</i>
Leaf blades (cm)	ovate–elliptic, elliptic or obovate, $4\text{--}10 \times 1.5\text{--}3.5$	broadly ovate, $10\text{--}20 \times 5\text{--}8$
Peduncle	linear, $3.0\text{--}5.0$ cm long	hard and thick, $10\text{--}20$ cm long
Cymes	1-flowered	3–5-flowered
Ovary	pubescent	glabrous

Table 2. Morphological comparison between *Raphiocarpus tamdaoensis* sp. nov. and its close relative *R. evrardii*.

Characteristic	<i>R. tamdaoensis</i>	<i>R. evrardii</i>
Cymes	1-flowered	3–5-flowered
Peduncle (cm)	short, $3.0\text{--}5.0$	long, $7.0\text{--}9.0$
Corolla colour	light yellow	whitish, with a violet line in corolla
Corolla, size (cm)	$3.0\text{--}4.5$	$4.5\text{--}5.5$

long, corolla light yellow, $3.0\text{--}4.5$ cm long, and ovary pubescent (Table 1).

The new species is also similar to *R. evrardii* (Pellegr.) B. L. Burtt, but differs chiefly by having a cyme with only one flower, peduncle $3\text{--}5$ cm long, corolla light yellow, $3.0\text{--}4.5$ cm long. A morphological comparison between these two similar species is given in Table 2.

Additional specimens examined (paratypes)

Vietnam. Vinh Phuc Province, Tamdao mountain, 13 Aug 1976, Severtsova, Arnautov, N. T. Ban, L. K. Bien and N. K. Khoi LXVN 320 (HN).

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Garden, Chinese Academy of Sciences, China (IBSC); the herbarium of the Kunming Inst. of Botany, Chinese Academy of Sciences, China (KUN); Museum National d'Histoire Naturelle, Paris, France (P). We all thank Prof. Dr D. J. Millett, Dr Tran The Bach for providing some material and creating an opportunity for us studying this, Chia-Cheng Liu (Hong Kong) and Kin Chee (Singapore) for linguistic comments on the manuscript. This work was supported by the Guangxi Natural Science Foundation (2011GXNSFB018050), Science Research Foundation of Guangxi Inst. of Botany (Guizhiye11001), Science and Technology Innovation Program of Guangxi Academy of Sciences and West Light Foundation of The Chinese Academy of Sciences.

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