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Raphiocarpus hapii (Gesneriaceae), a new species from central Vietnam

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Summary. We describe and illustrate a new species, *Raphiocarpus hapii*, recently discovered in central Vietnam. It resembles *R. sinovietnamicus* but differs in dwarf habit, 20–30 (rarely 50) cm tall, spreading hirsute stems and leaves, shorter corolla, 1.5–1.8 cm long, with a tubular corolla tube, which is pale greyish-pink to dusky greyish-purple, tinged with maroon externally, and white with maroon to crimson internally, having scattered pilose hairs on the lower corolla mouth, and in shorter capsule, 1.8–2.5 cm. According to the IUCN criteria (2024), the new species may tentatively be assessed as Data Deficient (DD).

Raphiocarpus hapii (Gesneriaceae) – новый вид из центрального Вьетнама

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Ключевые слова: биоразнообразие, разнообразие растений, таксономия растений, флора Вьетнама, Центральное Нагорье, эндемизм растений.

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Аннотация. В статье приводится иллюстрированное описание нового вида – *Raphiocarpus hapii*, недавно обнаруженного в центральном Вьетнаме. Он напоминает *R. sinovietnamicus*, но отличается от него карликовым ростом, 20–30 см высотой (редко до 50 см), раскидистыми опушёнными стеблями и листьями, более коротким трубчатым (трубка 1,5–1,8 см дл.) венчиком, окраска которого бледно-серовато-розовая до тёмно-серо-фиолетовой, с тёмно-бордовым оттенком снаружи и белая с бордовым до малинового оттенком внутри, при этом он несёт рассеянное опушение на нижней части зева, и более короткой коробочкой 1,8–2,5 см длины. Согласно критериям МСОП (2024), его можно предварительно отнести к категории видов, данных по которым пока недостаточно (DD).

Introduction

The genus *Raphiocarpus* W. Y. Chun (Chun, 1946) (Gesneriaceae, *Didymocarpoideae*, *Trichosporeae*, *Didymocarpinae*) comprises approximately 18 species distributed from southern and southwestern China to the Central Highlands of Vietnam (GRC, 2025; POWO, 2025; Qian et al., 2025). Of these, 11 species have been recorded in Vietnam (Phuong et al., 2012; Nguyen, Wen, 2018; Vu, 2018; Nguyen et al., 2023; Qian et al., 2025).

Members of the genus are perennial herbs or subshrubs characterized by opposite leaves spreading along the stem, axillary cymose inflorescences with few flowers, a five-lobed calyx dissected from the base, four fertile stamens arranged in two pairs, a bilobed stigma, and narrowly fusiform capsules (Nguyen et al., 2023; Qian et al., 2025).

While examining several specimens of Gesneriaceae, collected in 2025 from Da Nang and Hue cities, we found that these specimens represent a species morphologically conforming to the diagnostic characters of *Raphiocarpus*. At first glance, this species bears some resemblance to *Raphiocarpus sinovietnamicus* Z. B. Xin, L. X. Yuan et T. V. Do (Xin et al., 2022) in its vegetative and floral structures, particularly in its hairy, lanceolate leaves and the inflorescences covered with scattered long gland-tipped hairs. However, it differs markedly in several aspects, especially in the coloration and indumentum of the corolla.

After consulting the relevant literature (Pellegrin, 1930; Chun, 1946; Wang et al., 1998; Ho, 2000; Wei et al., 2010; Phuong et al., 2012; Luu et al., 2018; Vu, 2018; Wei, 2018; Middleton et al., 2021; Wei et al., 2022; Xin et al., 2022; Nguyen et al., 2023; Qian et al., 2025) and carefully examining available *Raphiocarpus* specimens, we found consistent morphological differences between our material and all known taxa. Consequently, we recognize it as a species new to science and describe it here as *R. hapii*, accompanied by a detailed description and illustrations.

Material and Methods

The measurements and descriptions of the studied species are based on observations of living plants collected in 2025. Voucher specimens and additional alcohol-preserved materials are deposited in the HN Herbarium (Institute of Biology, VAST, Hanoi). The conservation status was assessed following the IUCN Red List Categories and Criteria (IUCN, 2024), and the morphological terminology used herein follows Beentje (2012).

Taxonomic treatment

Raphiocarpus hapii K. S. Nguyen, C. W. Lin et Aver., **sp. nov.** (Figs. 1–3).

Diagnosis. The new species differs from the morphologically closest *Raphiocarpus sinovietnamicus* by the combination of the following morphological characters: stem seldom exceeding 30 cm in height; stems and leaves hispid-hirsute; leaves have 7 pairs of lateral veins; inflorescence bears 2–7 flowers; corolla tubular, 1.5–1.8 cm long with pilose indumentum on the lower part of the mouth; and capsule 1.8–2.5 cm long.

Type: "Vietnam, Da Nang City, Hai Van Ward, Nam My Village, near Hoa Trung Lake area, evergreen broad-leaved forest on sandstone mountain, around point N16.10888°, E108.02244°, at elevation of 500–700 m a. s. l., terrestrial perennial herb 20–30 cm tall, growing in shaded humid places along ravine of mountain slope, locally common. 16 VII 2025. Truong Hoang Hap, THH022" (HN000083322!; iso – HN000083323!, LE).

Etymology. The specific epithet refers to the name of the species discoverer, Mr. Truong Hoang Hap.

Description. Terrestrial, perennial herb, 20–30(50) cm tall. **Stems** pale green to olive green, terete in cross-section, suberect to ascending, branching at the base, somewhat decumbent at the base and rooting at lower nodes; internodes (0.2)3–6(10) cm long, 2–3.5 mm in diameter; densely purplish-red hirsute (with hairs 1–3 mm long), becoming white with age. **Leaves** petiolate, opposite, decussate, and

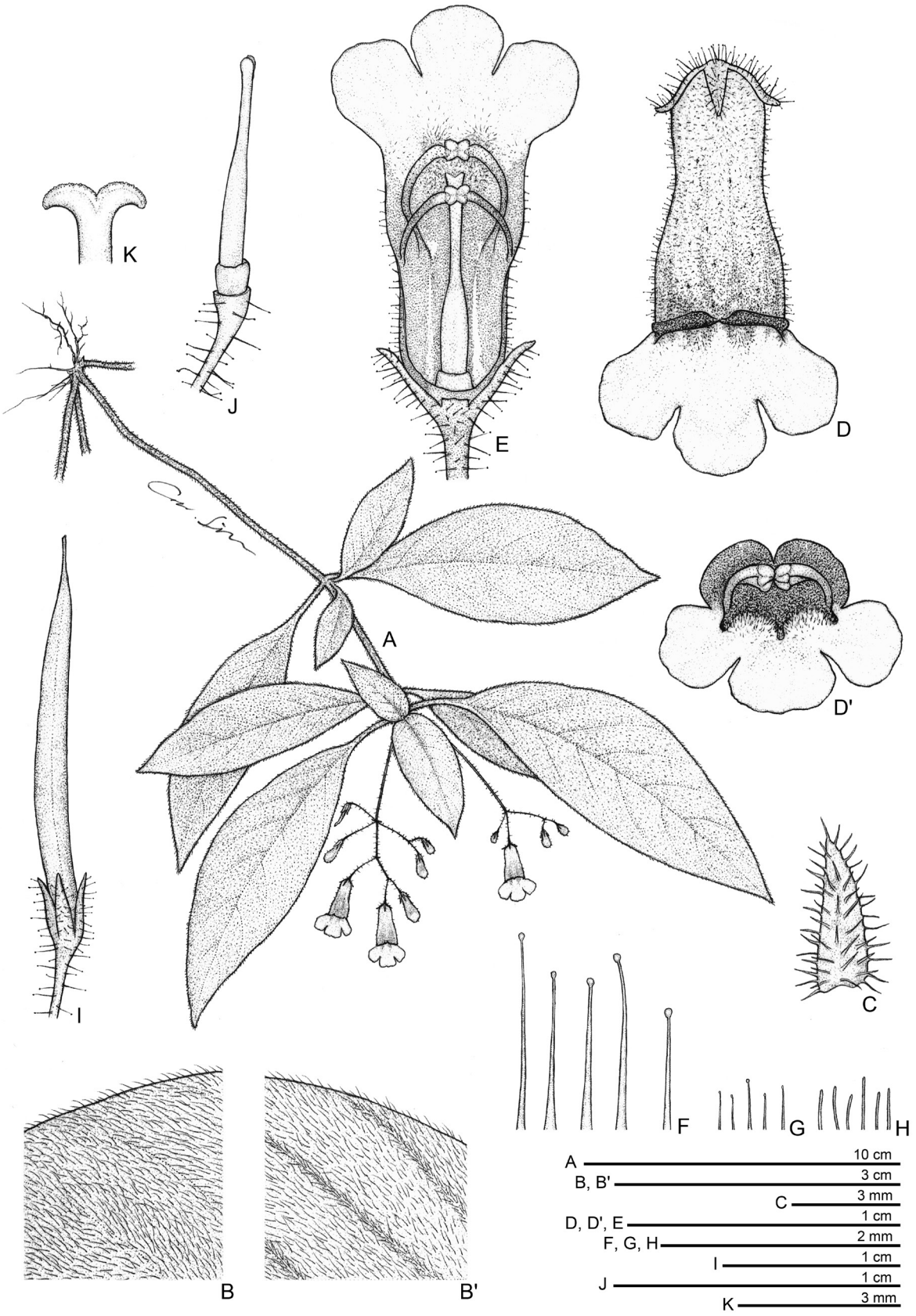

Fig. 1. *Raphiocarpus hapii*: A – habit; B, B' – portion of leaf, adaxial (B) and abaxial (B') surfaces; C – bract; D, D' – flower, front (D) and lateral (D') views; E – dissected corolla, showing stamens and pistil; F, G, H – hairs of reproductive structures: F – glandular hirsute-hispid hairs on peduncle, pedicel, and calyx; G – glandular and simple hirsute-hispid hairs on corolla (outside); H – simple pilose hairs inside corolla; I – capsule; J – pistil, also showing disc; K – stigma. Drawing by C. W. Lin from the type (THH 022) and paratype (THH 028) specimens.

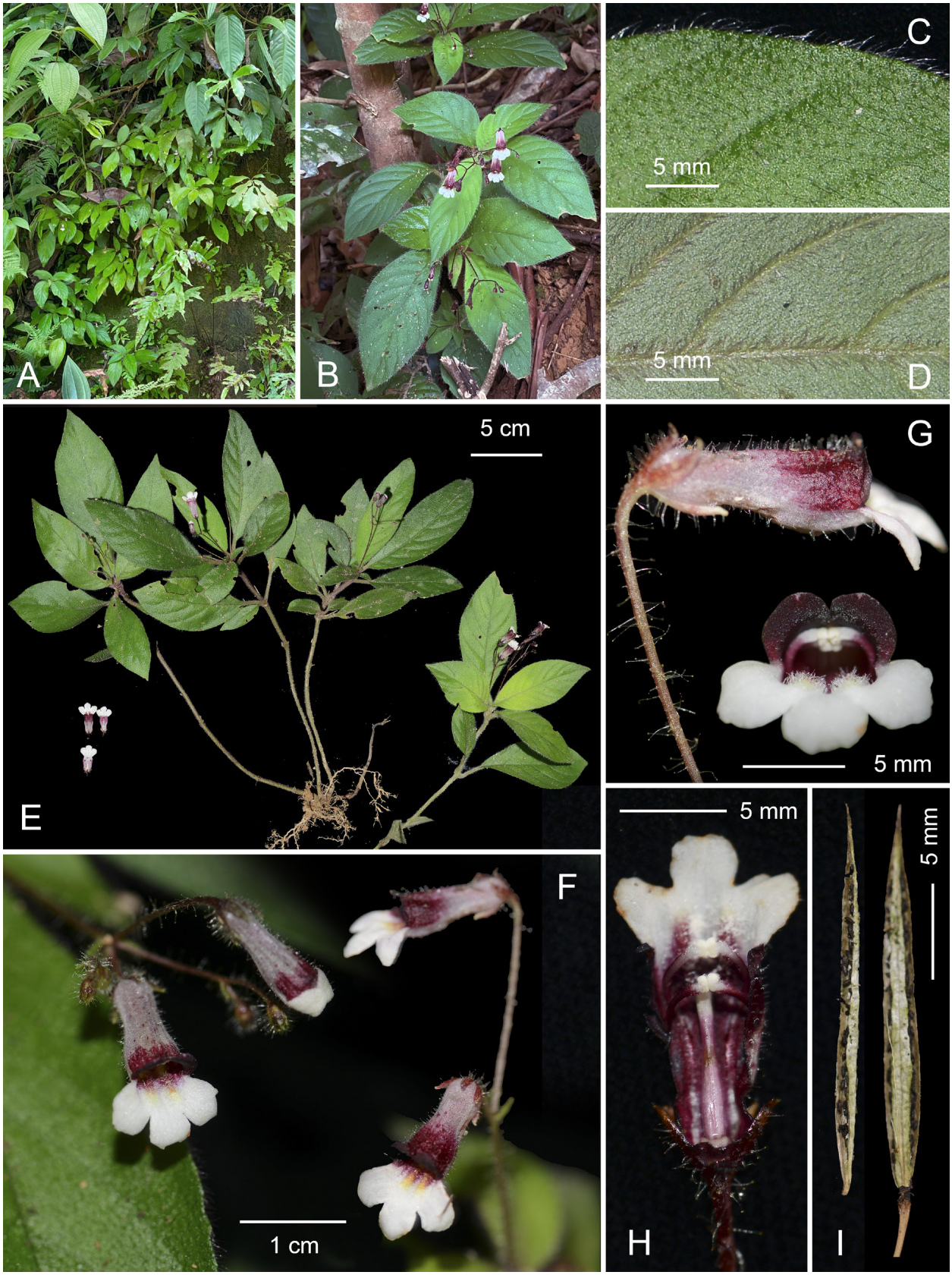

Fig. 2. *Raphiocarpus hapii*: A, B – plant in natural habitat; C, D – portion of leaf, adaxial (C) and abaxial (D) surfaces; E – plant habit; F – inflorescences; G – flower, front and lateral views; H – dissected corolla, showing stamens and pistil; I – old capsule. Photos by Truong Hoang Hap, A–H from THH 022, and I from THH 028.

Fig. 3. *Raphiocarpus hapii*: A – holotype herbarium sheet (Truong Hoang Hap, THH022 holotype HN000083322); B – paratype (Truong Hoang Hap, THH028 (HN000083324)).

held horizontally, unequal in a pair, rarely subequal; petiole pale green, (2)6–20 mm long, half-circular and slightly concave adaxially in cross-section, densely hirsute; leaf blade symmetrical or sub-symmetrical, elliptic-lanceolate to obovate-elliptic or rhombic-lanceolate, sometimes slightly falcate, chartaceous; adaxially bright green, moderately to densely hirsute; abaxially whitish-green, moderately to densely hirsute, more densely on veins; of a pair of leaves, the smaller one (1.5)2–4.5(5) × (0.8)1–1.8(2) cm, with 5–6 pairs of lateral veins, the bigger one (4.5)5–9(11) × (1.5)2–3.5(4.5) cm, with 6–7 lateral veins on each side of median vein, lateral veins slightly impressed on the adaxial surface and prominent on the abaxial surface, tertiary veins inconspicuous on both surfaces; base of leaf blade attenuate, apex acute to shortly acuminate, margin entire. **Inflorescence** a dichasial cyme, sometimes sub-umbellate, axillary, with 1 or 2 orders of branching, 2–7 flowered; peduncle maroon to pale green with purplish-red tint, erect to ascending, 2.5–4 cm long, moderately glandular hirsute-hispid (with hairs ca. 2 mm long); bracts in a pair at each node of the inflorescence, bright green to pinkish-green, ovate-lanceolate, persistent, up to 4 × 1.5 mm, abaxially hirsute-hispid; bracteoles similar to bracts but gradually smaller towards the inflorescence apex; pedicels maroon to reddish-green, (5)10–18 mm long, moderately glandular hirsute-hispid. **Calyx** 5-lobed to the base, maroon or dusky pinkish-green with maroon mottling, lobes lanceolate, 3–4.5 × 1–1.5 mm, margin entire, apex acuminate, glandular hirsute-hispid abaxially, glabrous adaxially. **Corolla** 1.5–1.8 cm long, 4.5–5.5 mm in diameter at the mouth; tube tubular, 0.9–1.1 cm long, 6–7 mm in diameter at the middle, gradually narrowing toward the base to 3.5–4.5 mm in diameter; outside pale greyish-pink to dusky greyish-purple, becoming tinged with maroon on the distal adaxial one-third to one-half, densely shortly glandular hirsute-hispid (with hairs ca. 1 mm long); inside maroon, glabrous except for the lower part of the mouth and two light-yellow ridges with maroon mottling on the floor of the tube extending from the base of the stamens to the throat entrance, these ridges densely pilose (with hairs 0.3–0.6 mm long); limb distinctly 2-lipped; adaxial lip 2-lobed to about the middle, maroon to crimson, depressed crescent-shaped, slightly oblique, rounded at apex, 1.5–2 × 3–4 mm; abaxial lip 3-lobed to about the middle, white, lateral lobes slightly oblique and oblong-orbicular, 2.8–4 × 3–4.2 mm; central lobe oblong-orbicular, rounded at apex, 3.2–4.2 × 3.5–4.5 mm. **Stamens** 4, in 2 pairs, each pair adnate at the anthers, filaments filiform, adnate to above the middle of corolla tube, maroon tinged white towards apex, verrucose; adaxial pair

adnate to 5.5–6 mm above the corolla base, ca. 4 mm long, 0.5 mm in diameter, abaxial pair adnate at 6.5–7.5 mm above the corolla base, ca. 5 mm long, 0.8 mm in diameter; anthers reniform, creamy white, ca. 0.5 × 1 mm, glabrous; staminode 1, short clavate, ca. 0.4 mm long, adnate to the corolla tube ca. 2.5 mm above the base, glabrous. **Disc** ring-like, yellowish-white with maroon tint, ca. 1 mm high, glabrous. **Pistil** filiform, 9–12 mm long, glabrous; ovary 6–7 mm long; style 2.5–3.5 mm long; stigma ca. 0.5 mm long, bilobed. **Capsule** obliquely fusiform, 1.8–2.5 cm long, ca. 2 mm in diameter, almost straight, dehiscing loculicidally to base, splitting along one suture, valves 2, straight, not twisted. **Seeds** ellipsoidal, ca. 0.5 mm long, ca. 0.3 mm in diameter, without appendages.

Ecology and habitat. This species, locally not rare, is found in primary and secondary broad-leaved evergreen lowland and submontane forests on sandstone at elevation of 500–950 m a. s. l., usually along small ravines of mountains.

Phenology. Flowers were observed in July, mature fruits in late September.

Distribution. Endemic to central Vietnam: Hue City (A Luoi 2 Commune, formerly Hong Bac Commune of A Luoi District) and Da Nang City (Hai Van Ward, formerly Hoa Hiep Bac Commune of Lien Chieu District).

Conservation status. As reported by Truong Hoang Hap, around 150 mature individuals inhabit an area of less than 1 km^2 along ravines of a sandstone mountain covering approximately 9 km^2 in Hai Van Ward (Da Nang City). The second population, located at A Bia Hill about 90 km northwest of the type locality, was preliminarily estimated to contain 50 mature individuals. Additional populations of *Raphiocarpus hapii* are expected to occur within the continuous mountain range between these two locations and may potentially extend into the Xesap National Park (Salavan and Sekong provinces) of Laos. Based on the current information, the conservation status of this new species is proposed as Data Deficient (DD), in accordance with the Guidelines for Using the IUCN Red List Categories and Criteria, version 16 (IUCN, 2024).

Notes. *Raphiocarpus sinovietnamicus* is a widespread species occurring from southern China (Hainan) to central Vietnam (Ha Tinh and Kon Tum). Within the genus, this species is notable for its broadly tubular corolla tube having remarkable bicoloration. The new species described here shares several traits with *R. sinovietnamicus*, including elliptic, hairy leaves; sparsely flowered cymose inflorescences with scattered glandular hairs; and a bicolored tubular corolla. Nevertheless, the new species can be readily distinguished from *R. sinovietnamicus* by a combination of morphological characters. It is markedly shorter, seldom exceeding 30 cm in height (vs. up to 80 cm); its stems and leaves bear hirsute hairs (vs. appressed hairs); the leaves have 5–7 pairs of lateral veins (vs. 9–11 pairs); the inflorescence bears 2–7 flowers (vs. 1–4); the corolla is 1.5–1.8 cm long (vs. 2.8–3.2 cm), with a tubular (vs. broadly tubular) tube, outside pale greyish-pink to dusky greyish-purple tinged with maroon on the distal adaxial one-third to one-half (vs. red to purple-red or purplish-yellow), inside white with maroon to crimson (vs. reddish-yellow), pilose indumentum on the lower part of the mouth (vs. glabrous); filaments adnate to above middle (vs. lower one-thirds) corolla tube, and shorter free part of filaments 4–5 mm long (vs. 12–14 mm), pistil 9–12 mm long (vs. 15–20 mm), and capsule 1.8–2.5 mm long (vs. 4.5–5.5 cm).

Additional specimens examined (paratypes). "Vietnam, Da Nang City, Hai Van Ward, Nam My Village, near Hoa Trung Lake area, evergreen broad-leaved forest on sandstone mountain, same type locality, plants bearing ripe capsules, 29 IX 2025, Truong Hoang Hap, THH028" (HN000083324!, LE). "Vietnam, Hue City, A Luoi 2 Commune, Le Loc Village, A Bia (A Biah, or Hamburger) Hill, evergreen broad-leaved forest on sandstone mountain, around point N16.25174°, E107.17608°, at elevation of 850–950 m a. s. l., terrestrial perennial herb ca. 30 cm (rarely 50 cm) tall, growing at shaded humid places along ravine of mountain slope, not rare, 22 VII 2025, Ninh Khac Ban, Vu Huong Giang, Van Thanh Bui, Khang Sinh Nguyen, Dinh Van Bien, Nguyen Van Son, AL182" (HN000083325!).

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