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A new species of *Saprosma* (Rubiaceae) from Nui Chua National Park, South Central Vietnam

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Abstract

A new species of the genus *Saprosma* (Rubiaceae), *S. nuichuaensis* Q.T.Pham, V.S.Dang & Tagane, from Nui Chua National Park of Ninh Thuan Province, southern Vietnam, is described and illustrated. *Saprosma nuichuaensis* is closely related to *S. ternata*, but differs in having terete branches, smaller leaf blades, fewer secondary veins, shorter petioles, smaller calyx lobes, and seeds verrucose on the abaxial side. Photographs, vernacular name and preliminary conservation status are provided.

Key words: flora, Paederieae, Rubioideae, taxonomy

Introduction

The genus *Saprosma* Blume (1826: 956) (Rubiaceae) is a shrubs or small trees that includes about 44 species in tropical Asia (Chen 2011, POWO 2024). This genus can be recognized by terminal or axillary inflorescences, valvate corolla lobes, 2-celled ovary with 1 ovule in each cell, and indehiscent berry-like fruits (Wong *et al.* 2019). Currently, eight species of the genus have been recorded in Vietnam: *S. annamensis* Pierre ex Pitard (1924: 450), *S. chevalieri* Pitard (1924: 401), *S. cochinchinensis* Pierre ex Pitard (1924: 401), *S. gracilis* Pitard (1924: 402), *S. inaequilonga* Pierre ex Pitard (1924: 400), *S. longifolia* Pitard (1924: 402), *S. ternata* (Wallich 1824: 520) Hooker (1882: 193), and *S. verrucosa* Pitard (1924: 400) (Pitard 1924, Pham 2000, POWO 2024).

Nui Chua National Park was established in 2003 with a total area of 298 km^2. It is located in Vinh Hai Commune, Ninh Hai District, Ninh Thuan Province, the South Central of Vietnam. The climate is generally dry with only three rainy months every year from September to November, and the annual rainfall is less than 700 mm. The vegetation is dry thorny woodland at elevations below 450 m, intergrading with deciduous dry thorny forest at elevations below 700 m, and becoming dry lower submontane forest above 700 m (Duc *et al.* 2009). To date, 1585 species of vascular plants belonging to 596 genera and 147 families have been recorded for the National Park (Nui Chua National Park

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2023, Dang *et al.* 2025, Tagane *et al.* 2025a, Yamamoto *et al.* 2025), among which the flora has been known to include many endemic and rare species, and several species have been discovered and described from the national park, such as *Licuala longiflora* Henderson *et al.* (2008a: 150), *Calamus nuichuaensis* Henderson *et al.* (2008b: 196), *Pinanga nuichuensis* Henderson *et al.* (2010: 38), *Curcuma arida* Škorničk. & N.S.Lý in Leong-Škorničková *et al.* (2015: 182), *Aristolochia nuichuaensis* T.V.Do & Luu in Do *et al.* (2018: 108), *Balanites vietnamica* Luu, Th.Trung Nguyen & T.Q.T.Nguyen in Nguyen *et al.* (2023: 57), *Lasianthus nuichuaensis* Dang & Naiki in Dang & Naiki (2023: 108), *Mallotus ninhthuanensis* V.S.Dang, Bao & Tagane in Dang *et al.* (2025: 439), *M. vinhhyensis* V.S.Dang, Tagane & Tak. Yamam. in Dang *et al.* (2025: 442), *Nymphanthus adenophorus* Tak.Yamam., Tagane & V.S.Dang in Yamamoto *et al.* (2025: 19), and *Wrightia nuichaensis* Tagane & V.S.Dang in Tagane *et al.* (2025a: 87).

In December 2023, we carried out a field survey to assess the plant diversity of Nui Chua National Park, and a few specimens of interesting *Saprosma* were collected on the trail from the headquarters to the Treo Lake of the national park. After a careful examination of the *Saprosma* species in Vietnam and surrounding countries, by comparison with the relevant literature (Pitard 1924, Pham 2000, Chen *et al.* 2011) and herbarium specimens at FOF, HN, KAG, and VNM, as well as digitized images of specimens on virtual herbaria website (such as JSTOR, A, and BM), we are convinced that it was an undescribed species and here describe it as *Saprosma nuichuaensis* Q.T.Pham, V.S.Dang & Tagane.

Taxonomic treatment

Saprosma nuichuaensis Q.T.Pham, V.S.Dang & Tagane, *sp. nov.* (Figures 1, 2)

TYPE:—VIETNAM. Ninh Thuan Province, Ninh Hai District, Nui Chua National Park, in evergreen forests, 11°46'21.50"N, 109°10'09.37"E, at elevation 259 m a.s.l., 22 December 2023, with flowers and fruits, *S. Tagane et al. N376* (holotype: VNM [VNM00070333!]; isotypes: FOF [FOF0009047!], KAG [KAG186375!], VNM!).

Diagnosis:—*Saprosma nuichuaensis* is morphologically similar to *S. ternata* in having shrubby habit and terminal inflorescence with long peduncle 1–4.5 cm long, but differs in having terete branches (vs. angled in *S. ternata*), opposite leaves (vs. whorls of 3 or sometimes opposite), smaller leaf blades (5–9.5 × 2–3.5 cm vs. 8–15 × 3–6.5 cm), fewer secondary veins (5–8 pairs vs. 7–10 pairs), shorter petioles (2–5.5 mm long vs 6–12 mm long), smaller calyx lobes (0.2–0.5 mm long vs ca. 1 mm long), and abaxially verrucose seed surface (vs. smooth).

Shrubs, up to 2 m tall. Young branches terete, ca. 2 mm in diam., green *in vivo*, dull yellowish-brown to reddish brown *in sicco*, glabrous; internodes (0.7–)2–6 cm long. **Leaves** opposite; blades elliptic, oblong-elliptic, oblong-lanceolate, 3.9–10.2 × 1.5–4.3 cm, subcoriaceous, dark grayish brown to dark brown adaxially, pale gray to yellowish brown abaxially, glabrous on both surfaces, apex acuminate, base acute to cuneate, margin entire, recurved when dry, midrib prominent to flat adaxially, prominent abaxially, secondary veins 5–8 pairs, ascending at the angle of 40–60° from midrib, curved to the margin, without domatia, tertiary veins reticulate; petioles 2–5.5 mm long, brackish *in sicco*, glabrous. **Stipules** narrowly triangular to lanceolate, 2–2.5 mm long, glabrous on both surfaces, caducous. **Inflorescences** terminal and in the axils of leaves, cymose, 1.5–4.5 cm long, 1–5-flowered; peduncles 0.6–1.5 cm long; bracts triangular-lanceolate, 1–4 mm long, puberulent on both surfaces. **Flowers** 4-merous, sessile to short pedicellate in anthesis, elongated to 4 mm long in fruiting; calyx obconical to campanulate, tube 1–2 mm long, yellowish green *in vivo*, blackish *in sicco*, glabrous, lobes 4, very broadly triangular, 0.2–0.5 mm long, glabrous, apex acute; corolla cylindrical, white, tube 3–7 mm long, outside puberulent on upper part, inside villous, lobes 4, triangular with expanded crisped margins, 2–3 mm long, pubescent on both surfaces, apex acuminate, the throat hairy; stamens 4, partially exserted, filaments ca. 1 mm long, basally connate to corolla, anthers ca. 0.5 mm long, dorsifixed near base; ovary 2-locular, ovules 1 in each locule, style 1–1.2 mm long, stigma 2-lobed, included or exserted. **Fruits** subglobose to obovoid-ellipsoid, 7–10 mm long, ca. 6 mm in diam., green when young, dark blue-purple when ripe, glabrous; pyrenes 2. **Seeds** plano-convex, 5–7 mm long, verrucose abaxially, endosperm fleshy, blackish brown when dry.

Additional specimens examined (paratype):—VIETNAM. Ninh Thuan Province, Ninh Hai District, Nui Chua National Park, in evergreen forests, 11°44’06.14”N, 109°13’05.20”E, 212 m elevation, 20 December 2023, with flowers and fruits, *S. Tagane et al. N190* (FOF [FOF0008858!], KAG [KAG186189!], VNM!).

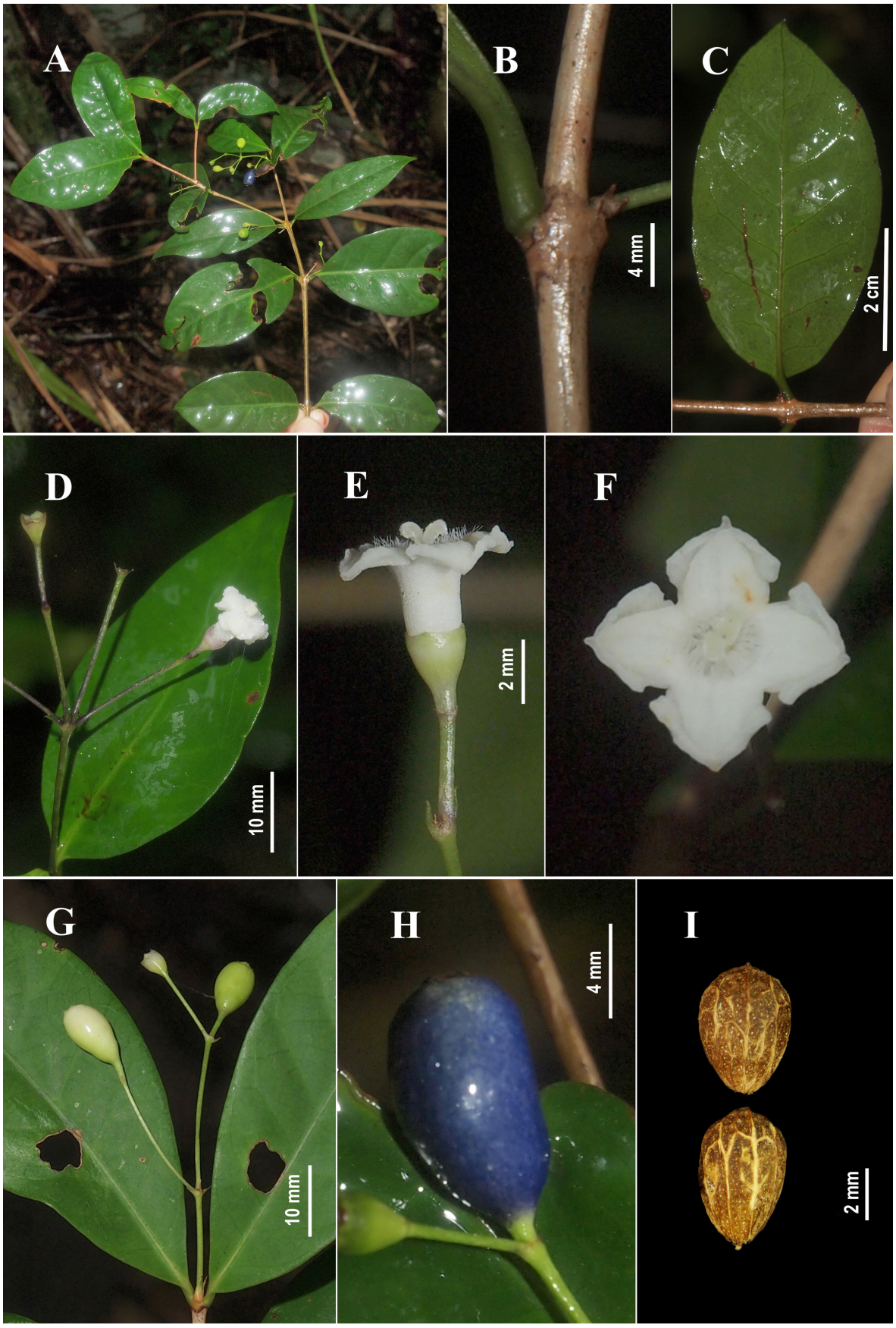

FIGURE 1. *Saprosma nuichuaensis* Q.T.Pham, V.S.Dang & Tagane, *sp. nov.* **A.** Fruiting branch, **B.** Stipule, **C.** Abaxial leaf surface, **D.** Portion of inflorescence, **E–F.** Flowers, lateral view and top view, **G.** Infructescence, **H.** Mature fruit, **I.** Seeds. Photoed by Shuichiro Tagane (A–H) and Quoc Trong Pham (I).

FIGURE 2. Holotype of *Saprosma nuichuaensis* Q.T.Pham, V.S.Dang & Tagane, *sp. nov.* (VNM [VNM00070333]). Photoed by Quoc Trong Pham.

Distribution, habitat and phenology:—Vietnam (so far known only from Nui Chua National Park, Ninh Thuan Province). *Saprosma nuichuaensis* was found in an evergreen forest at 100–300 m elevation. Flowering and fruiting in December.

Etymology:—The species epithet is named after its type locality, Nui Chua National Park, Ninh Thuan Province, Vietnam.

Vernacular name:—Hoại hương núi chúa.

Preliminary conservation status:—Endangered (EN). *Saprosma nuichuaensis* is only known from two populations in Nui Chua National Park, Ninh Thuan Province, Vietnam. The Extent of Occurrence (EOO) is less than 298 km^2, corresponding to the area of the national park and the known Area of Occupancy (AOO) is 8 km^2. In each population, about 60 mature individuals were observed along nature trails in an evergreen forest. Considering the forest along nature trails is easily affected by human tourism activities, we propose the category of *S. nuichaensis* as Endangered (EN) according to the IUCN Red List Categories and Criteria, B1a, b(i, ii, iii) + B2a,b(i, ii, iii) + D (IUCN 2024).

Notes:—This new species resembles *Saprosma ternata*, which is known from Bangladesh, Bhutan, China, India, Laos, Malaysia (Peninsula), Myanmar, Thailand, and Vietnam, but differs from that species based on several morphological characteristics summarized in Table 1. In addition to *S. ternata*, *S. nuichuaensis* may resemble *S. annamensis* in its leaf shape and size, but is distinguished by its longer petioles 2–5.5 mm long (vs. to 2 mm long in *S. annamensis*), 4-merous flowers (vs. 5-merous), and longer corolla tube 3–7 mm long (vs. 2.5 mm long) (Table 1).

TABLE 1. Comparison of *Saprosma nuichuaensis* with its morphologically closest species (Pitard 1924, Pham 2000, Chen *et al.* 2011).

Characters	*S. nuichuaensis*	*S. annamensis*	*S. ternata*
Branches	terete	terete	angled
Leaf arrangement	opposite	opposite	whorls of 3 or opposite
Leaf blade size (cm)	5–9.5 × 2–3.5	8–10.5 × 2–3.5	8–15 × 3–6.5
Number of secondary veins (pairs)	5–8	7–8	7–10
Petiole length (mm)	2–5.5	2	6–12
Stipule length (mm)	2–2.5	1.5–2	5–12
Peduncle length (mm)	10–45	10–20	10–40
Bract length (mm)	1–4	NA	1–5
Flowers	4-merous	5-merous	4- or 5-merous
Calyx tube length (mm)	1–2	2.5	1–2
Calyx lobe length (mm)	0.2–0.5	1	ca. 1
Corolla tube length (mm)	3–7	2.5	3–8
Corolla lobe length (mm)	2–3	2	3–4
Fruit size	7–10 mm long, 6 mm in diam.	NA	8–12 mm long, 7 in diam.
Seed surface	verrucose abaxially	NA	smooth abaxially

According to the classifications of Rydin *et al.* (2009), *Saprosma nuichuaensis* is placed in the tribe *Paederieae* de Candolle (1830: 342) subfamily *Rubioideae* Verdcourt (1958: 280), together with four genera, *Leptodermis* Wallich (1824: 191), *Paederia* Linneaus (1767: 189), *Serissa* Commerson ex Jussieu (1789: 209), and *Spermadictyon* Roxburgh (1815: 32), in the point of its small shrubs, often foetid, flowers 4-merous, stamens inserted in the corolla tube, ovary 2-locular with a single erect ovule in each locule, and fruits indehisce when dry.

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