



Three new species of *Lythraceae* and one new species of *Stemonaceae* described from Indochina

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Key words

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Abstract Formal description of some new taxa from Indochina include in *Lythraceae* a new species of *Lagerstroemia*, *L. poilanei* W.J.de Wilde & Duyfjes with two varieties, var. *poilanei* and var. *grandis* W.J.de Wilde & Duyfjes, two new species of *Rotala*, *R. saxatilis* W.J.de Wilde & Duyfjes and *R. protracta* W.J.de Wilde & Duyfjes and a new variety of *Rotala indica*, *Rotala indica* (Willd.) Koehne var. *minima* W.J.de Wilde & Duyfjes. In *Stemonaceae* a new species, *Stemona hirtella* W.J.de Wilde & Duyfjes, is described.

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INTRODUCTION

The descriptions presented here of new taxa in *Lythraceae* (three species and two varieties) and *Stemonaceae* (one new species) arose from research for the forthcoming treatment of *Lythraceae* for the Flora of Cambodia, Laos and Vietnam and from ongoing assistance in naming collections from SE Asia in families of our expertise.

LYTHRACEAE

Lagerstroemia

Lagerstroemia, a tree genus, is the largest genus in *Lythraceae* with about 60 species in SE Asia, of which about 25 species occur in Indochina. Although the *Lagerstroemia* species of Indochina were revised in a precursory paper (De Wilde & Duyfjes 2016), a previously overlooked group of a few closely related species was identified during a follow-up visit in 2018 to the Paris Herbarium. It concerned specimens filed under the name *Lagerstroemia petiolaris* Pierre ex Laness., the larger part identified as such by the late Pauline Dy Phon, comprising also specimens of the recently described *Lagerstroemia ruffordii* T.T. Pham & Tagane (Pham et al. 2017), from Cambodia and Vietnam not seen by its authors. *Lagerstroemia ruffordii* is similar to *L. petiolaris*, both with comparatively small laminas with a long petiole (10 mm or more) and (sub)glabrous flowers (flower buds). Among the specimens in P with such long petioles and comparatively few-flowered inflorescences with glabrous flowers, three or four entities could be recognised, based on various characters including size and details of flowers and fruits, the characters seemingly merging into each other. This complex material needs further study, but the entity with the smallest flowers is here described as a new species, *Lagerstroemia poilanei*, with a variety (var. *grandis*) for specimens with considerably larger fruit. — Table 1.

Lagerstroemia poilanei W.J.de Wilde & Duyfjes, sp. nov. — Fig. 1a

This species is distinct from the two most similar species, *Lagerstroemia petiolaris* and *L. ruffordii*, both of which have long petioles (10 mm or more), differing in smaller calyx tube with 6 sharp but not winged ridges continuing into the short pseudopedicel 1–2 mm long (fruiting pseudopedicel 2–3 mm long). — Type: *Poilane* 6839 (holo P P05114587; iso P 2 sheets P05114583, P05114586), Vietnam, Nhatrang, Nui Han Heo Peninsula, 12-06-1923, fr.

Etymology. The specific epithet honours Eugène Poilane, 1888–1964, French botanist and coffee planter in Indochina, who made one of the most valuable and largest botanical collections in that area.

Two varieties are recognised.

var. *poilanei*

Shrub or treelet 2.5–6 m tall, bark peeling (?). **Leaves:** petiole glabrous, 9–12 mm long; lamina thin, glabrous, elliptic, small, 3–6 cm long, base short-cuneate, apex subacute or bluntish; intercostal venation reticulate. **Inflorescences** terminal, paniculate, 3–6-flowered. **Flowers:** buds ± obconical to obovoid, (sub)glabrous; **calyx tube** c. 5 mm long, c. 5 mm diam at apex, 6-ridged, ridges sharp, not winged, running onto the pseudopedicel; **pseudopedicel** 1–2 mm long; **auricles** absent; **calyx lobes** 6, reflexed at anthesis, long-triangular, c. 3 by 2 mm, (densely) fine hairy at apex within; **petals** pinkish, c. 15 mm long including c. 3 mm long claw, margin short crispate-dentate; **stamens** numerous, radial symmetric, presumably dimorphic (outer stamens longer than numerous inner ones); **ovary** hairy. **Capsules** dark brown or black, smooth, not shagreen, glabrous or minutely hairy at apex, 5-valved, c. 10 mm long, c. 9 mm diam, apex rounded, calyx 6-ridged, ridges low, running onto the c. 2 mm long fruiting pseudopedicel; calyx lobes glabrous within, finally reflexed.

Distribution — Southern Vietnam: Nhatrang, Phanrang.

Habitat & Ecology — On poor sandy or rocky soil.

Specimens studied. VIETNAM, Khanh Hoa Prov., *Poilane* 2858, Isl. Tre near Nhatrang, 30 Mar. 1922, fr.; *Poilane* 3111, Isl. Tre near Nhatrang (Moi village), 22 Apr. 1922, fr. (P05115298); *Poilane* 4654, between Nhatrang and Ninh Hoa, 7 km N of Nhatrang, 21 Sept. 1922, fl.; *Poilane* 4848, Nui Han Heo near Nhatrang, 3 Oct. 1922, fl.; *Poilane* 6148, Hone Cohé near Ninh

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Table 1 Comparison of *Lagerstroemia poilanei* var. *poilanei*, *L. poilanei* var. *grandis*, *L. ruffordii* and *L. petiolaris*.

	<i>L. poilanei</i> var. <i>poilanei</i>	<i>L. poilanei</i> var. <i>grandis</i>	<i>L. ruffordii</i>	<i>L. petiolaris</i>
petal length (including claw) (mm)	c.15	–	15–18	c. 30
calyx tube size (mm) in flower (excl. pseudopedicel)	4–5 by c. 5	–	7–8 by 5–7	(6–)8–10 by c. 8
calyx tube size (mm) in fruit (excl. pseudopedicel)	5–6 by c. 6	c. 5 by 10	c. 10 by 9–11	c. 10 by 9–11
calyx ridges	rather high, c. 1 mm, sharp but not winged, Fig. 1a	hardly 1 mm high, sharp but not winged, Fig. 1d	1–2 mm high, sharp and winged, Fig. 1b	low, less than 1 mm high, not winged, Fig. 1c
pseudopedicel length (mm) in flower	1–2	–	2–3	c. 6
calyx lobes	hairy within	glabrous within (in fruit)	hairy within	glabrous within
capsule shape and length (mm) (part above calyx-tube)	ellipsoid 8–10	ellipsoid 14–15	ellipsoid 12–15	subglobose c.12 mm diam
fruiting pseudopedicel length (mm)	c. 2	2–3	3–4(–10)	6–10

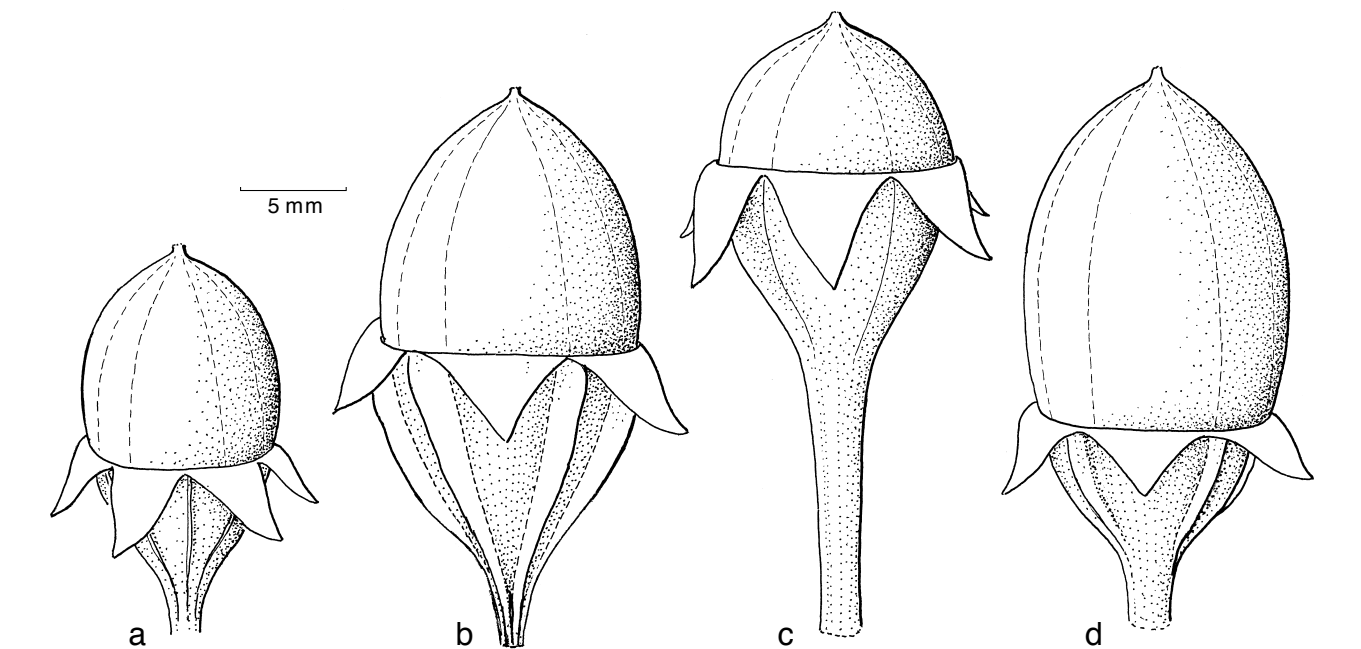


Fig. 1 Fruits of the four *Lagerstroemia* species most similar in their comparatively long petioles, small few-flowered inflorescences, glabrous flower buds, and hairy ovaries. Note differences in size and expression of calyx ridges. a. *Lagerstroemia poilanei* W.J.de Wilde & Duyfjes var. *poilanei*, type; b. *L. ruffordii* T.T.Pham & Tagane; c. *L. petiolaris* Pierre ex Laness.; d. *L. poilanei* W.J.de Wilde & Duyfjes var. *grandis* W.J.de Wilde & Duyfjes (a: *Poilane* 6839, P; b: *Tagane* et al. 6971, L; c: *Pierre* 928, P; d: *Poilane* 8541, P). — Drawn by Jan van Os.

Hoa, Nhatrang, 30 Apr. 1923, fr.; *Poilane* 6836 B, Annam, Peninsula Nui Han Heo, 13 June 1923, fl. (P05114584); *Poilane* 6839, Annam, Peninsula Nui Han Heo, 12 June 1936, fr., type; *Poilane* 9751, Ba Ran, 27 Feb. 1924, fr.; *Poilane* 9753, Ba Ran, 27 Feb. 1924, fl.; *Schmid* s.n., Ba Ngoi, 22 Nov. 1961. fr. – Ninh Thuân Prov., *Poilane* 5586, Annam, Ca-Na, 5 Mar. 1923, fl.

Note — With capsule is meant the visible part of the fruit above the calyx tube, the latter hiding the base of the capsule. The pseudopedicel is the narrowed pedicelliform basal part below the calyx tube and belongs to the flower; at base it articulates with the true pedicel.

var. **grandis** W.J.de Wilde & Duyfjes, var. *nov.*

Differs from the type-variety var. *poilanei* in larger fruit (visible part of capsule) 14–15 mm long vs fruit 8–10 mm. — Type: *Poilane* 8541 (holo P P04711372), Annam, Prov. Phanrang, 12 Feb. 1923, fr.

Etymology. The variety epithet *grandis* (Latin, grandis = big) refers to the larger fruits.

Tree 6–12 m tall, bark not recorded. **Leaves:** petiole glabrous, 10–12 mm long; lamina thin, glabrous, (ovate-)elliptic, c. 8 cm long, base (broadly) rounded or short cuneate, apex bluntish; intercostal venation reticulate. **Inflorescences (infructescences)**

terminal, paniculate, 5–10-flowered. **Flowers** or flower buds unknown. **Capsules** black, smooth, not shagreen, glabrous (sparse weak minute hairs less than 0.1 mm long excepted), 5-valved, 14–15 mm long, c. 10 mm diam, apex rounded with short beak, calyx 6-ridged, glabrous, ridges low, hardly 1 mm high, shortly running onto the 2–3 mm long pseudopedicel; calyx lobes glabrous within, somewhat reflexed.

Distribution — Southern Vietnam (Annam): Nhatrang, Phanrang.

Habitat & Ecology — Rocky soil; fruiting in February and September.

Specimen studied. VIETNAM, Khang Hoa Prov., Nhatrang, near Banghoi, *Fléury* in *Chevalier* 39029 (P P05114593), 27–29 Sept. 1918, fr.

Rotala

The two new *Rotala* species concern one species endemic in Laos with yellow flowers, a unique character in the genus, and one species discovered among the material of the widespread *Rotala cordata*. In the very variable and widespread *R. indica* some deviating specimens are here described as a new variety of *R. indica*.

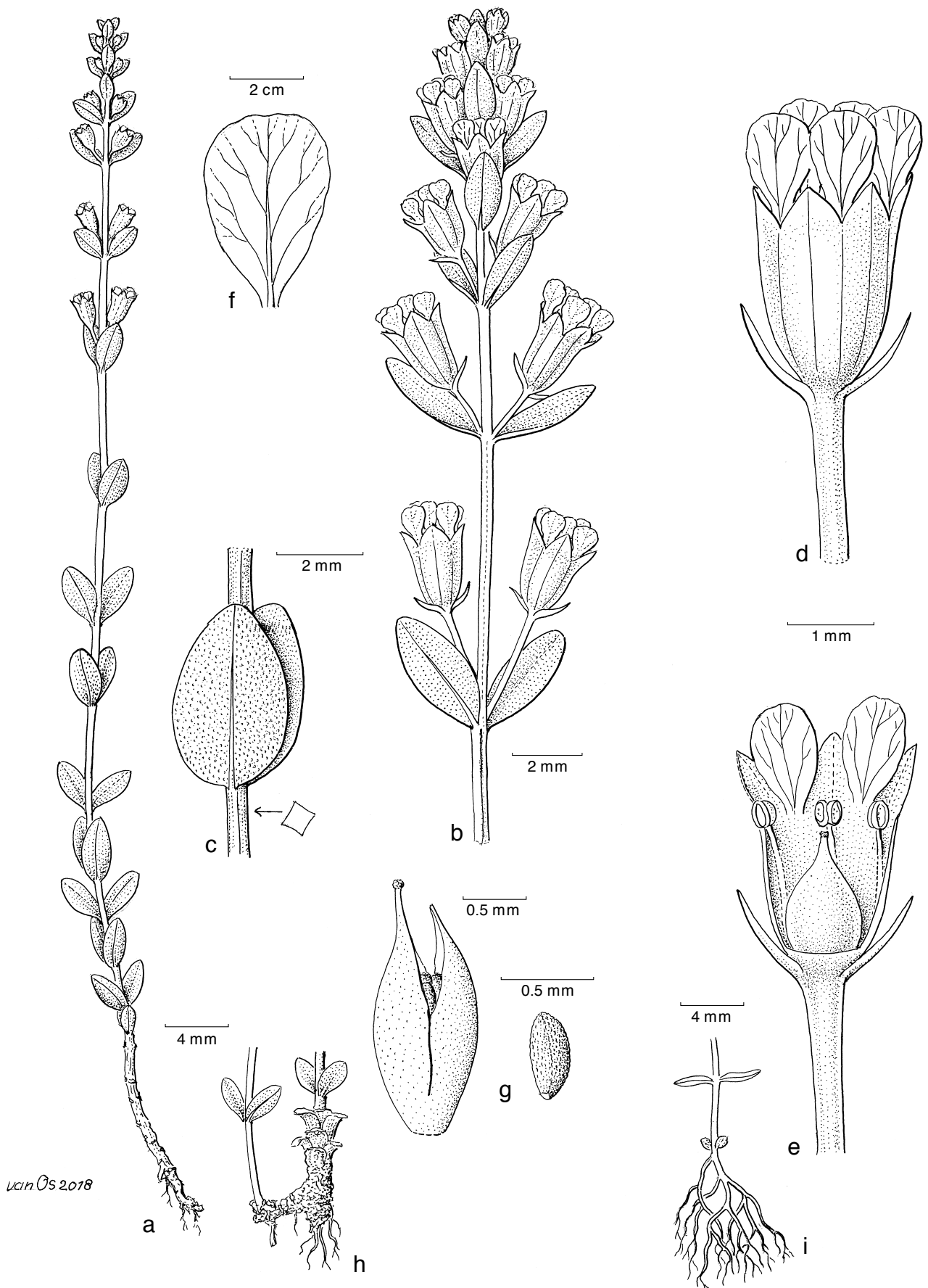


Fig. 2 a–h. *Rotala saxatilis* W.J.de Wilde & Duyfjes. a. Habit; b. inflorescence; c. detail of stem (note stem quadrangular), leaves with minute cystoliths; d. flower; e. flower with half the calyx removed; f. petal; g. fruit and seed, (note stigma at apex of one valve); h. portion of plant with woody rhizome. — i. *Rotala serpyllifolia* (Roth) Bremek. Portion of plant with thread-like roots, without a rhizome (a–h: *Poilane 20144* (L.2487636); i: *Hooker s.n.* (L.2487638), (India); all L). — Drawn by Jan van Os.

***Rotala indica* (Willd.) Koehne var. *minima* W.J.de Wilde & Duyfjes, var. nov.**

This variety differs from the variable and widespread type variety in its tiny habit, erect or decumbent branches that do not root at the nodes and base, and its flowers in terminal spikes with bracts supporting single flowers about as long as the bract. In *R. indica* var. *indica* the (decumbent) basal portions of the branches root at the nodes and the bracts in the flower spikes are much longer than the flowers. — Type: *Robinson 1530* (holo P P05134476), Vietnam, Annam, Nha-Trang and vicinity, 11–26 Mar. 1911.

Etymology. The variety epithet *minima* (Latin, minimus = small, very little) refers to the tiny habit of the plant.

Plants herbaceous, to 10 cm tall, erect or with few spreading or decumbent branches, not rooting at the nodes. *Leaves* 4–6 mm long, with cartilaginous margin. *Inflorescences* terminal, spike-like, the *flowers* solitary in the axils of bracts, as long as the bracts; bracts broadly elliptic, more or less imbricate, c. 3 mm long, about as long as the flowers, at apex broadly rounded or short-acute. *Flowers* as in the type variety. *Capsules* opening by 2 valves.

Distribution — Vietnam (Annam): Khang Hoa Prov., Nha-trang and vicinity.

Habitat & Ecology — Flowering and fruiting in March.

Specimens studied. VIETNAM, Khang Hoa Prov., Nhatrang and vicinity, *Pham Hoang Ho 5082*, 1960, fl., fr.; *Robinson 1512*, *Robinson 1235*, *Robinson 1530*, type, all 11–26 Mar. 1911, fl., fr.

Note — The flowers are recorded as white (*Robinson 1235*).

***Rotala saxatilis* W.J.de Wilde & Duyfjes, sp. nov. — Fig. 2**

Markedly different from other *Rotala* species in its yellow flowers. It most resembles *Rotala serpyllifolia* (Roth) Bremek., from which it is different in its erect, more-or-less solitary, unbranched 4-angled stem growing from a small woody rhizome, flower-spike rather lax, pedicels distinct, style short, 0.2–0.3 mm long. In *R. serpyllifolia*, the stem is terete and towards the base more-or-less decumbent, with numerous roots, the flower spike more-or-less peduncled, with densely packed flowers, flowers (sub)sessile, style c. 1 mm long. — Type: *Poilane 20144* (holo P P05134370; iso P P05134364, L L.2487636), Laos, Luang Prabang Province, between Dauh Quau and Luong Prabang, 200 m alt., received 27 Aug. 1932.

Etymology. The specific epithet *saxatilis* refers to the locality, as it was found on rocks.

Perennial herbs, 5–10 cm tall, possibly gregarious, but not tufted or cushion-forming; *stems* erect, purplish, 4-angled, solitary, usually unbranched, growing from short, entangled somewhat woody short rhizomes c. 0.5 cm long. *Leaves* decussate, sessile; lamina with minute cystoliths, (broadly) ovate, 2–5 by 1–3 mm, base obtuse or cuneate, apex obtuse. *Inflorescence* a rather lax terminal spike, 1–1.5(–2) cm long, not or hardly pedunculate, the lower flowers in bracts approaching the size of upper leaves; *bracts* leaf-like, smaller than foliage leaves, as long as or longer than the flowers, base obtuse; bracteoles 2, lanceolate, c. 1 mm long. *Flowers*: pedicel 1.5–3 mm long; *calyx tube* somewhat urceolate, c. 2 mm long; *calyx lobes* 4, triangular, c. 0.8 mm long; *calyx appendages* absent; *petals* 4, yellow (according to the field label, see note), persisting in fruit, obovate, 1–1.2 mm long; *stamens* 4; filaments inserted c. half-way up the calyx tube; anthers c. 0.3 by c. 0.4 mm, included, level or somewhat above the apex of the calyx tube; *ovary* ovoid, c. 1.2 mm long, style short, 0.2–0.3 mm long. *Capsules* narrowly ellipsoid, c. 2 by c. 1 mm, opening by 2 valves. *Seeds* oblong, c. 0.5 mm long.

Distribution — Laos, Luang Prabang Province, between Dauh Quau and Luong Prabang, where known only from the type.

Habitat & Ecology — Growing on rocks along river at 200 m altitude.

Note — The flower colour, recorded as yellow, is remarkable as to date only pink, lilac or white flowers have been observed for *Rotala* species (Cook 1979).

***Rotala protracta* W.J.de Wilde & Duyfjes, sp. nov.**

Distinct from the most similar species, *Rotala cordata* Koehne in its (4–)5-merous flowers, vs flowers 4-merous, stamens long-protruding from the perianth, vs stamens level with the tips of the calyx lobes. — Type: *Schmid 981* (holo P P05103028; iso P P05103027), Vietnam, Dac Lac Prov., Ban Brieng, Nov. 1949.

Etymology. The specific epithet *protracta* (Latin, protractus = drawn out, lengthened) refers to the protruding stamens.

Amphibious or terrestrial annual herb, erect or at base decumbent and rooting, 20–30 cm long, stem broadly 4-winged. *Leaves* decussate, sessile; lamina (narrowly) ovate-elliptic or elliptic or oblong, c. 1 by c. 0.5 cm, base narrowly cordate, apex more-or-less obtuse. *Flowers* solitary in leaf axils, towards apex of branches forming spikes, with the bracts about twice as long as the flowers, bract apex subacute. *Flowers* (4–)5-merous, sessile, bracteoles scarious, minute; *calyx* campanulate, tube c. 1.5 mm long, lobes c. 0.3 mm long; *calyx appendages* absent; *petals* rose-purple, persistent, 1–1.5 mm long, obtuse; *stamens* (4–)5, inserted near the base of the calyx (but filaments about halfway adherent to the calyx tube when young), *filaments* long, c. 4 mm long, c. twice the length of the calyx, carrying the anthers far outside the flower; *ovary* about half as long as the calyx tube, style as long as ovary. *Capsule* globose, as long as calyx tube, opening by 3 valves. *Seeds* c. 0.5 mm long.

Distribution — Cambodia, Laos and Vietnam.

Habitat & Ecology — Moist places; on basalt bedrock; 100–500 m altitude; flowering and fruiting in October and November.

Specimens studied. CAMBODIA, Kompong Cham Prov., Chup near Kompong Cham, *Evrard 720*, Nov. 1921 (P05134365, P05134366, P05134367). — LAOS, Prov. Champassak, *Poilane 16051*, Bassac, near Kuang si, 100 m, 20 Oct. 1928 (P05134533); *Thorel s.n.*, Expédition du Mékong, Sedone, 1866–1868 (P05134537). — VIETNAM, Càn Tho prov., *Vu Van Cuong 1028*, 1966 (P05134526); Daclac Prov., Ban Brieng, *Schmid 981*, 450–500 m, Nov. 1949, type (P05103027, P05103028).

Note — *Rotala protracta* deceptively resembles *R. cordata* in general appearance, both species share conspicuously 4-winged branches, and most specimens assigned to *R. protracta* were formerly determined as *R. cordata*. Cook (1979) apparently did not examine Indochinese specimens of *R. cordata* in P.

STEMONACEAE

Stemona

***Stemona hirtella* W.J.de Wilde & Duyfjes, sp. nov. — Fig. 3**

In the key to the species from Thailand (Duyfjes & Inthachub 2011) or China (Zhanhe & Duyfjes 2000), this new species keys out next to *Stemona kerrii* Craib because it is hairy on many parts. *Stemona kerrii* is a twiner and differs further in various details, among which peduncled inflorescences. Diagnostic features for *Stemona hirtella* are its 1) hairiness; 2) erect habit; 3) sessile, non-peduncled inflorescences; 4) small flowers; 5) thecal appendages present; and 6) the squamulose-rugose abaxial side of stamens. — Type: *Mai Van Xing & N.H. Quang MVX 277* (holo L; iso CPNP, F, HN, all n.v.), Vietnam, Ninh Binh Prov., No Quan Distr., Cuc Phuong National Park, N20°17'67" E105°40'16", Cite No. CP1136, 26 Mai 2004.

Etymology. The specific epithet *hirtella* (Latin, hirtus = hairy. With smallish hairs) refers to the finely hairiness of the plant.

Erect, little-branched herb 30–40 cm tall (known from one collection only), very finely hairy almost all over, except adaxial lamina, hairs c. 0.1 mm long. *Leaves* alternate; *petiole* 3.5–7.5 cm long; *lamina* ovate, 11–16 by 5.5–9 cm, base cordate, apex

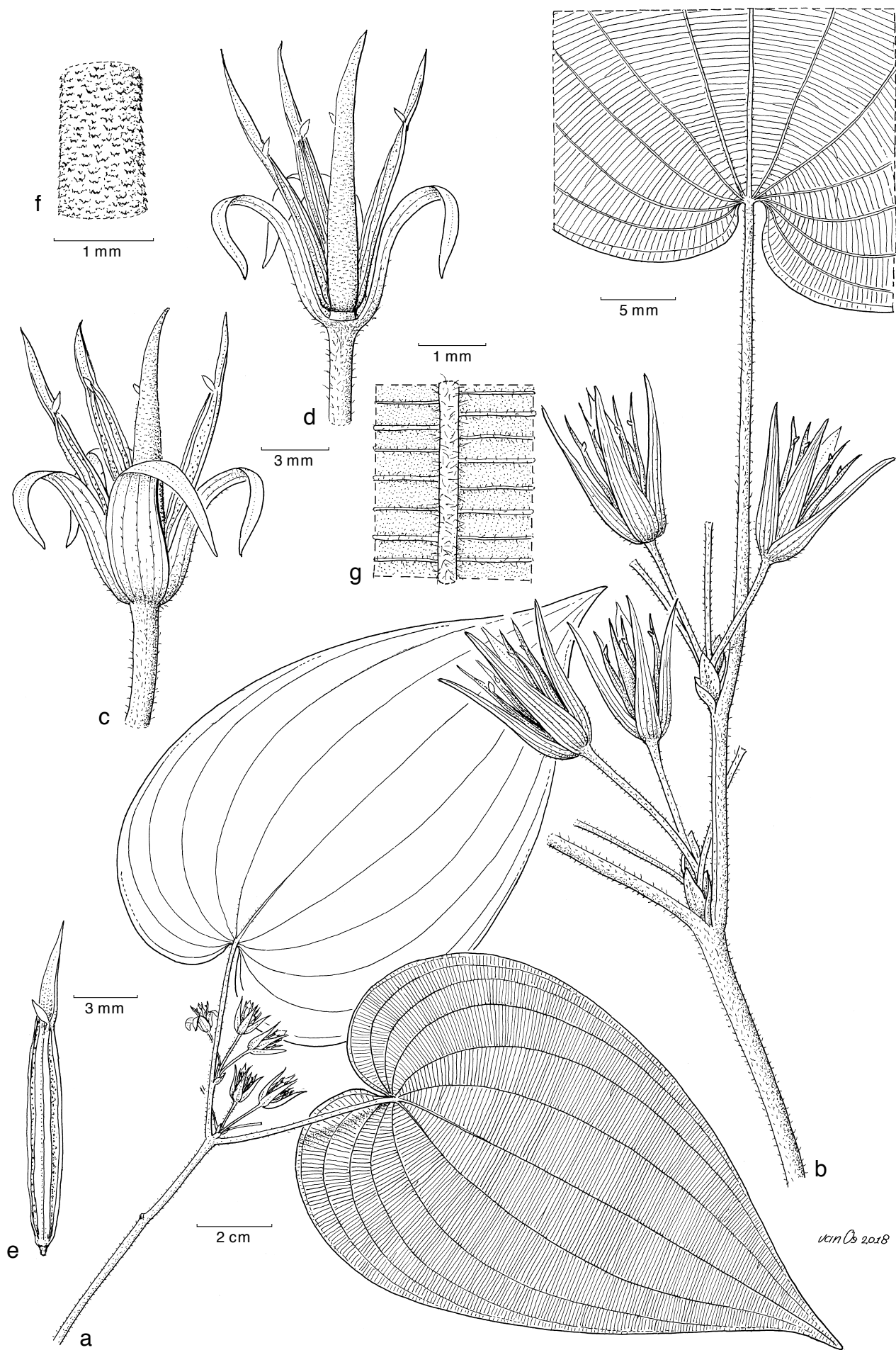


Fig. 3 *Stemona hirtella* W.J.de Wilde & Duyfjes. a. Portion of flowering stem; b. idem, flowering portion enlarged; c. flower; d. idem, one tepal removed, showing 4 stamens, one seen abaxially; e. stamen adaxially, note additional appendage; f. portion of the squamulose-rugose abaxial surface of stamen; g. detail of hairy lower leaf surface (all: *Mai Van Xinh & N.H. Quang MVX_277, L.*). — Drawn by Jan van Os.

acute-acuminate; 9–13-veined. *Inflorescences* axillary, 1–4-flowered, sessile (peduncle absent); bracts c. 5 mm long. *Flowers*: *pedicel* 12–16 mm long; *tepals* narrowly ovate to lanceolate, gradually narrowed into acute apex, 10–11 by (2–)3 mm, (sparingly) hairy abaxially, glabrous within, margin without hairs; *stamens* c. 12 mm long, c. 0.8 mm wide, abaxially conspicuously squamulose (bran-like)-rugose, filaments c. 1 mm long, anthers c. 8 mm long, ridge separating the thecae c. 0.5 mm high, petaloid outgrowth of the connective c. 5 mm long, additional appendage c. 1 mm long; *ovary* minute, c. 1.5 mm long. *Fruits* and *seeds* not seen.

Distribution — Vietnam, Cuc Phuong National Park, only known from the type.

Notes — 1. The plant is annotated as being a liana of 60 cm long (but this does not show on the herbarium specimen); the flowers are recorded as violet with light white calyx and the fruits as 8 mm long; additional data about habitat and ecology are not known.

2. The minutely squamulose-rugose surface of the abaxial side of the (dried) stamens is also present in some other species (Inthachub 2008), e.g., in *Stemona kerrii*, however, less pronounced.

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