Blumea 59, 2014: 11–18
www.ingentaconnect.com/content/nhn/blumea

RESEARCH ARTICLE

http://dx.doi.org/10.3767/000651914X681676

# *Ammannia* (*Lythraceae*) in Malesia

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**Key words**

*Ammannia*
*Lythraceae*
Malesia
new species

**Abstract** Enumeration and taxonomic treatment of the seven species of *Ammannia* (*Lythraceae*) occurring in the Malesian area are presented among which one new species *A. herbacea*. A key to the species is given. Two species are illustrated. *Ammannia debilis* is a distinct species endemic to S India.

**Published on** 24 April 2014

## INTRODUCTION

*Ammannia* L. is a genus of mostly annual, often weedy small-flowered herbs of wet situations often confused with *Rotala* L. Since Graham et al. (2011) *Ammannia* is considered to include the rather large genus *Nesaea* Kunth (Africa, Asia, America) and at present it may comprise about 75 species in subtropical and tropical areas all over the world.

In Malesia few species occur, only seven, of which *Ammannia coccinea* is presumably an early introduction. *Ammannia auriculata* is a very widespread, variable species of uncertain circumscription, *A. uniflora* a local montane endemic deviating in several respects from the general facies of *Ammannia*, and *Ammannia herbacea* is here newly described based on a single collection from E Java.

The material studied, mostly that in L, appears to consist of mainly pre-war collections, illustrating the amazing lack of modern collections of inconspicuous herbs.

The now synonymous genus *Cryptotheca* Blume (1826) was described with two species, based mainly on two quite distinct characters, namely the presence of only two stamens and a unilocular ovary with one parietal placenta. Later on it was more closely defined (Blume 1856), and one of the original two species, *Cryptotheca apetala* (at present a synonym of *Ammannia baccifera*) was excluded, leaving *Cryptotheca* monotypic with the only species *C. dichotoma* Blume as lectotype.

Koehne (1880, 1903) accepted *Cryptotheca* as a subgenus in *Ammannia* (subg. *Cryptotheca*), but erroneously considered the species name *C. dichotoma* as a synonym of *Ammannia microcarpa* DC. (1826) which is at present regarded as a synonym of *A. auriculata*, see below. The combination of *Cryptotheca dichotoma* in *Ammannia* was made by Panigrahi (1979, '1976') who also noted that *A. microcarpa* in its original sense cannot be identical with it.

### *Ammannia*

*Ammannia* L. (1753) 119; S.A.Graham (1985) 402; (2007) 236. — Lectotype (Britton & Brown 1913): *A. latifolia* L.

*Nesaea* Comm. ex Kunth (1823) 151; S.A.Graham (2007) 240. — Type: *Nesaea triflora* (L.f.) Kunth.

*Cryptotheca* Blume (1826) 1128; (1856) 9. — *Ammannia* L. subg. *Cryptotheca* (Blume) Koehne (1880) 262. — Lectotype (Blume 1856): *Cryptotheca dichotoma* Blume = *Ammannia dichotoma* (Blume) S.G.Panigrahi.

*Diplostemon* (Wight & Arn.) Miq. (1856) 615. — *Ammannia* sect. *Diplostemon* ('*Dyplostemonae*') DC. (1828) 80. — *Ammannia* subg. *Diplostemon* Wight & Arn. (1834) 304. — Lectotype (Wight & Arnott 1834): *Ammannia octandra* L.f.

*Ammannella* Miq. (1856) 618. — Type: *Ammannella linearis* Miq. = *Ammannia octandra* L.f.

*Hapalocarpum* (Wight & Arn.) Miq. (1856) 618. — *Ammannia* subg. *Hapalocarpum* Wight & Arn. (1834) 305. — Lectotype (here designated): *Ammannia vesicatoria* Roxb.

Annual (or biennial), mostly erect herbs of open wet places, glabrous (calyx glabrous or hairy), branches ± quadrangular. *Leaves* decussate, sessile, 1-nerved. *Inflorescences* dichasial, (1–)3–many-flowered, sessile or peduncled; bracteoles 2, minute. *Flowers* actinomorphic, 4(–6)-merous, *calyx tube* (*hypanthium*) campanulate or urceolate, 4–8-nerved, epicalyx-like appendages obvious, or minute or absent, sepals (calyx lobes) short; *petals* absent or small, fugacious; *stamens* 4(–8), inserted in the lower half of the calyx tube, episepalous, included or exserted; *ovary* incompletely (1–)2–4(–5)-locular, placentas axile (but because of thin incomplete septa in fruit mostly showing up as central), in *A. dichotoma* perietal; style shorter or longer than ovary; disc absent. *Capsule* (sub)globose, thin-walled, not transversely striate, irregularly transversely rupturing. *Seeds* numerous, concave-convex, angular, 0.3–0.5 mm long.

## KEY TO THE MALESIAN SPECIES

1. Inflorescence 1-flowered. Stem decumbent, rooting at the nodes. — Plants from montane areas in E New Guinea . . . . . 7. *A. uniflora*
1. Inflorescence (1–)several or many-flowered. Stem erect, not rooting at the nodes. — Plants from lowland or montane areas . . . . . 2
2. Leaf base attenuate. Inflorescences congested, (sub)sessile. Petals absent. Stamens 4 . . . . . 2. *A. baccifera*
2. Leaf base (broadly) rounded or cordate. Inflorescences (congested or) open, subsessile or short-pedunculate. Petals present (sometimes minute and early deciduous). Stamens 4–8 . . . . . 3
3. Flowers small, calyx (calyx tube) (0.5–)1–2 mm long . . . 4
3. Flowers larger, calyx (calyx tube) (2.5–)3–5 mm long . . 6

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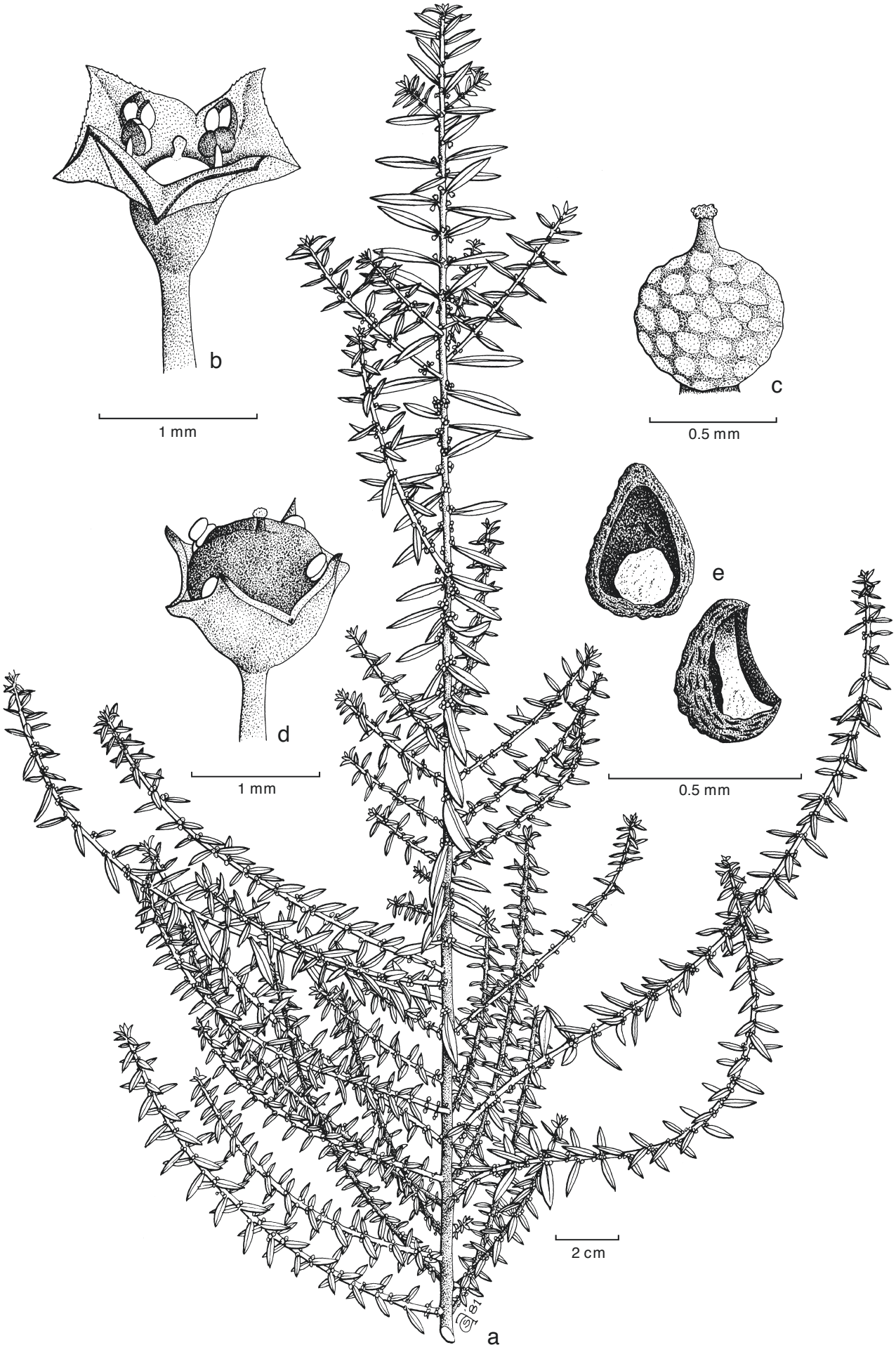


**Fig. 1** *Ammannia baccifera* L. a. Habit of apex of stout plant; b. flower; c. pistil; d. fruit within persistent calyx; e. seed, two views. — Reproduced with permission from Soerjani et al. (1987).

4. Stamens 2. Placenta single, parietal . . . . 4. *A. dichotoma*
4. Stamens 4(–8). Placentas axile (septa incomplete, and in fruit showing up as central) . . . . . 5
5. Plant with many branches in upper part. Inflorescences (1–)4–10(–18) mm pedunculate. Style as long as or longer than ovary . . . . . 1. *A. auriculata*
5. Plant with few branches at base. Inflorescence c. 0.5 mm pedunculate. Style shorter than ovary . . . . 5. *A. herbacea*
6. Calyx (calyx tube) sharply 4-angled. Stamens 8 . . . . . 6. *A. octandra*
6. Calyx (calyx tube) low-ridged but not conspicuously angular or ridged. Stamens 4(–7) . . . . . 3. *A. coccinea*

**1. *Ammannia auriculata*** Willd.

*Ammannia auriculata* Willd. (1803) pl. 7; Koehne (1903) 45, f. 5: B; S.A.Graham (1985) 403; Hewson (1990) 99, f. 32: D–F; Verdc. (1994) 37; P.H.Hô (1992) 31, f. 3680; H.N.Qin & S.A.Graham (2007) 276; H.N.Qin et al. (2008) f. 292: 5–7. — Type: *Unknown collector B-W 3081* (holo B, barcode B-W 03081-01 0), Egypt (see also Graham 1985).

*Ammannia multiflora* Roxb. (1820) 447; Koehne (1903) 48; Backer (1930) 465; (1964) 253; (1973) pl. 440. — Type: *Roxburgh s.n.* (iso K, barcode K000729678, right-hand specimen), East India (see also Panigrahi 1979, '1976': 186).

*Ammannia microcrpa* DC. (1826) 93; (1828) 78. — Type: *Unknown collector*, 'Timor', see note.

*Ammannia debilis* auct. non Aiton: Moritzi (1846) 12. — *Ditheca debilis* (Aiton) Miq. (1856) 615, p.p., based on misidentification of Zollinger specimens from Java, not seen, see note.

Erect, annual, glabrous herb, 40–60 cm tall, much-branched in upper part; stem 4-angular, not winged. *Leaves* sessile; lamina narrowly elliptic or lanceolate, (0.5–)1.5–8 by 0.2–0.8(–1.2) cm, base broadened, broadly rounded or shallowly cordate, apex acute, 1-nerved; leaves often deciduous when plant fruiting. *Inflorescences* 3–15(–20)-flowered cymes; peduncle slender, (1–)4–10(–18) mm long. *Flowers* 4-merous; pedicel 0.5–3(–6) mm long, articulate at base and with 2 minute bracteoles; *calyx tube* glabrous, campanulate, 1–1.5 mm long, (4- or) 8-ribbed, lobes suberect, broadly triangular, c. 0.3 mm long, acute, calyx appendages minute or absent; *petals* pink or red, spreading, obovate, 0.7–1(–1.5) mm long, margin (sub)entire, fugaceous; *stamens* 4(–8, not seen in Malesia), c. 1.5 mm long, exserted; *ovary* broadly ellipsoid, c. 1 mm diam, style red, slender, 1–1.2 mm long, as long as or longer than the ovary; placenta central. *Capsules* purple, subglobose, 1.5–2 mm diam, somewhat exserted from the calyx. *Seeds* numerous, brown, flattish at one side, c. 0.3 mm long.

Distribution — Widespread: Africa (Egypt, type), tropical and subtropical N & S America, SE & E Asia, east to Australia; *in Malesia*: East Java, the Philippines (Luzon).

Habitat & Ecology — Damp places; in Malesia in paddy fields at low altitudes. Flowering all year round.

*Malesian material examined*. Java, Backer 36534; Clason 196. – Philippines, Luzon, Merrill 4246.

Notes — *Ammannia auriculata* is here, for the Malesian area, accepted in a broad sense as discussed by Graham (1985) for the western hemisphere but as also widely occurring in the Old World including SE Asia. Graham (1985) accepts for areas outside Malesia a variable number of stamens, 4–8, including the synonym *A. racemosa* Roth, from India, with 8 stamens, as an '8-staminate form' of *A. auriculata*. *Ammannia auriculata* (described from Egypt) is depicted and described with flowers with 8 stamens. We have not inspected the flowers of the type ourselves.

The synonym *A. multiflora* covers plants from SE Asia with generally smaller flowers and with 4 stamens. This name is employed in Backer (1964) for Java. The name *A. auriculata* (for a very closely related widespread species) beside a second name *A. multiflora* (for a widespread closely related species as well) is employed in Qin & Graham (2007) for China and by Hewson (1990) for Australia. Unfortunately, collections of this complex for the Malesian area are too limited to allow for a well-founded opinion on whether one or two species should be accepted. Verdcourt (1994) for E Africa, used the name *A. auriculata* for a very variable widespread species, but he did not mention *A. multiflora* described for Asia as a synonym.

The epithet '*microcarpa*' could raise the suspicion that De Candolle (1826) had the species at present named *A. dichotoma* (also occurring in Timor) in mind, namely a plant with small flowers and small fruit indeed, but the description does not match it. De Candolle described a plant from Timor with leaves cordate at base, flowers without petals, with 4 stamens, the capsule about as long as the calyx, and with a central placenta. Although the alleged type specimen G-00454022 (G-DC) belongs to *A. dichotoma*, the specimen described by De Candolle is still unknown, but obviously concerns *A. multiflora*, which is in our present paper regarded a synonym of the widespread polymorphic *A. auriculata*.

*Ammannia debilis* was described by Aiton (1789) from plants cultivated in Kew, introduced by Banks from East India. The description mentions leaves narrowed at the base (as in *A. baccifera*) and petals present (as in *A. multiflora*, here treated as a synonym of *A. auriculata*). Moritzi (1846) cited *A. debilis*, a misidentification of a Zollinger collection, for Java; Miquel (1856) accepted *Ditheca debilis* (based on *A. debilis*) for Java without having seen specimens; Clarke (1879) placed *A. debilis* in the synonymy of *A. baccifera*; and Koehne (1903) mentioned *A. debilis* with a question mark under *A. multiflora*. Specimens collected by Rottler and named *A. debilis* (in K and G) cannot be regarded as useful for the interpretation of the name. After seeing a digital photograph of the type specimen in addition to the protologue the present authors concluded that *A. debilis* represents a distinct species, endemic to S India. Its literature reference runs as follows:

*Ammannia debilis* Aiton (1789) 163; DC. (1828) 79. — *Ditheca debilis* (Aiton) Miq. (1856) 615, p.p., for the type only. — Type: BM001122163, a specimen in Bank's Herbarium (BM) with a determination, allegedly in Bank's handwriting: "Ammannia debilis MS" and on the back of the sheet "Hort. Kew 1788".

**2. *Ammannia baccifera*** L. — Fig. 1

*Ammannia baccifera* L. (1753) 120; Koehne (1903) 53; Gagnep. (1921) 967, f. 105: 3; Backer (1930) 464; Craib (1931) 715; Backer (1964) 253; (1973) pl. 438; S.A.Graham (1985) 405; Soerjani et al. (1987) 338, f. 4.154; Hewson (1990) 97; P.H.Hô (1992) 31, f. 3681; Verdc. (1994) 45; H.N.Qin & S.A.Graham (2007) 275; H.N.Qin et al. (2008) f. 292: 1–4. — Lectotype (Graham 1985): *LINN 156.4*, "Habitat in China. Osbeck".

*Ammannia indica* Lam. (1791) 311. — *Hapalocarpum indicum* (Lam.) Miq. (1856) 618. — Type: *Sonnerat s.n.*, in herb. Lamarck (holo P, barcode P00297859), India.

*Ammannia vesicatoria* Roxb. (1820) 447; (1832) 426; Moritzi (1846) 12. — *Hapalocarpum vesicatorium* (Roxb.) Miq. (1856) 618. — Type: *Roxburgh s.n.* (not seen).

*Cryptotheca apetala* Blume (1826) 1129. — Type: *Blume s.n.*, Java, "ad flumen Tjidanie cerca Tjikao", not found.

Erect, annual, glabrous herb, 10–40(–100) cm tall, often branched from the base, branches ascending; stem ± 4-angular, not winged. *Leaves* (sometimes alternate) sessile; lamina (narrowly) elliptic or oblanceolate, 1–7 by 0.2–0.8(–1.5) cm, base narrowed (broad at base in var. *aegyptiaca* (Willd.) Koehne, Africa), apex (sub)acute,1-nerved. *Inflorescences* compact few- or many-flowered thyrses, peduncle 1–2 mm long. *Flowers* greenish, 4-merous; pedicel 0.5–2.5 mm long, bracteoles minute; *calyx tube* narrowly campanulate, 1–1.5 mm long, 8-ribbed;

lobes purplish at apex, wide-triangular, 0.5–1 mm long; calyx appendages (almost) absent; *petals* absent; *stamens* 4, inserted about halfway the calyx tube, as long as calyx lobes or shorter; *ovary* 1-locular, globose, style short, to 0.3 mm long; placenta central. *Capsules* covered for (over) halfway by the persistent calyx, (depressed) globose, 1(–2) mm diam. *Seeds* red, numerous, concave-convex, c. 0.3 mm diam.

Distribution — Widespread: Africa, S & SE Asia (China, type), Australia; introduced in America and Europe; *in Malesia*: widespread.

Habitat & Ecology — Lowland; soggy rice fields, wet open places. Flowering and fruiting all year round.

*Malesian material examined*. Peninsular Malaysia, Sinclair 10701 (Johore). –Sumatra, Asdat 198; De Wilde & Duyfjes 4095; Iwatsuki et al. S 1534; Lörzing 12932; Meijer 5690a. – Java, Backer 7807, 15328, 20479 (Madoera), 27798 (Kangean), 33033, 36571, 36854, 37134, s.n. L0931491; Blume 112b, s.n. L0931494, s.n. L0931495, s.n. L0931496, s.n. L0931682, s.n. L2478462; Boerlage s.n. L0931489; Clason A50, 142, 173, 226, 233; Coert 483; De Voogd s.n. L2478376; Hoogerwerf s.n. L2478372; Kievits 2488, 2509; Kooper 526; Koorders 28281, 40915 (Bantam); Kuhl & Van Hasselt s.n. L0931490; Radermacher s.n. L2478371, s.n. L2478372, s.n. L2478464. – Philippines, Luzon, Hallier 4361; Iwatsuki et al. P 26; McGregor BS 41462; Merrill 425, 775; Milicante 71; Ramos BS 2691; Mindanao, Edaño PNH 11314. – Lesser Sunda Islands, Sumba, Monod de Froideville 2002; Verheijen 4177; Pulau Roti, Verheijen 2441; Timor, Kooy 34, 920; Riedlé s.n. L0931683; Schmutz 2390; Van Steenis 18200; Walsh 486; Tanimbar, Buwalda 4670 (Pulau Jamdena). – Irian Jaya, Edwards et al. 4095. – Papua New Guinea, Schodde 2618.

Notes — *Ammannia vesicatoria* is according to Roxburgh (1820, 1832) an exceedingly acrid herb. We have not perceived this character ('acrid') in living specimens in the wild.

The specimens under *Wallich 2098* belong to the present species *A. baccifera*, but we have no indications that they are original specimens for Roxburgh's name *vesicatoria*.

### 3. *Ammannia coccinea* Rottb.

*Ammannia coccinea* Rottb. (1773) 7; Koehne (1903) 49; S.A.Graham (1985) 407. — Neotype (Graham 1985): *G. Proctor 18339* (holo NY; iso A), Jamaica.

Robust, annual, (sub)glabrous herb, 30–100 cm tall, (unbranched or) much-branched; stem (sub)4-angular. *Leaves* sessile; lamina linear-oblong or narrowly elliptic, 2–8 by 0.2–0.3(–1.5) cm, base auriculate or cordate, apex acute. *Inflorescences* sessile or short-peduncled 3–5-flowered cymes; peduncle to 9 mm long, with 2 small bracts. *Flowers* 4-merous; pedicel 2 mm long or less, bracteoles minute; *calyx tube* urceolate(campanulate), (2.5–)3–4 mm long, with (4 or) 8 longitudinal low ridges, lobes 4 (or 5), triangular, appendages long or short, thickened, outwards directed; *petals* 4 (or 5), deep rose-purple, obovate, c. 2 mm long; *stamens* 4(–7), exserted, anthers yellow; *ovary* subglobose, c. 2.5 mm diam, style slender, equal to or longer than the ovary, exserted. *Capsules* subglobose, 3.5–5 mm long, included or slightly exserted from calyx. *Seeds* numerous, c. 0.3 mm long.

Distribution — North, Central and NE South America; naturalized in the Pacific Islands (Guam, Hawaii), China (Taiwan), and the Philippines; Europe (Portugal, Italy).

Habitat & Ecology — Damp sites; in Malesia in lowland paddy fields. Flowering and fruiting recorded from October.

*Malesian material examined*. Philippines, Luzon, Mendoza PNH 22503.

Note — *Ammannia coccinea* is an amphidiploid species derived from *A. auriculata* and *A. robusta* (an American species); see Graham 1985.

### 4. *Ammannia dichotoma* (Blume) S.G.Panigrahi — Fig. 2

*Ammannia dichotoma* (Blume) S.G.Panigrahi (1979, '1976') 186. — *Cryptotheca dichotoma* Blume (1826) 1129; DC. (1828) 76; Blume (1856) 129. — *Suffrenia dichotoma* (Blume) Miq. (1856) 616. — Lectotype (here designated): *Blume s.n.* (holo L, barcode L0931682), Java.

*Ammannia microcarpa* auct. non DC.: Decne. (1834) 453; Koehne (1880) 247; (1903) 55; Backer (1930) 465; (1964) 253; (1973) pl. 439; Soerjani et al. (1987) 340, f. 4.155.

Erect, annual, glabrous herb, 25–85 cm tall, much-branched; stem 4-angular, not winged. *Leaves* sessile; lamina narrowly elliptic or linear, 1.5–7.5 by 0.2–1.2 cm, base broadened, rounded or cordate, apex acute. *Inflorescences* short-peduncled 3- to many-flowered cymes; peduncle 5(–10) mm long. *Flowers* 4-merous; pedicel 2–4 mm long, bracteoles minute; *calyx tube* obpyramidal, (1–)1.5 mm long, faintly 8-ribbed, lobes triangular, acute, appendages minute; *petals* 4, red, obovate or circular, nearly 0.5 mm long, margin entire or somewhat toothed, caducous; *stamens* 2, exserted, filaments red, anthers yellow; *ovary* ellipsoid, c. 1.5 mm long, style 1.5(–2) mm long, faintly curved; placenta 1, parietal. *Capsules* ellipsoid, c. 2 mm long, exserted for 1/3–1/2, style usually curved. *Seeds* c. 0.3 mm diam.

Distribution — Sumatra, Java, S Sulawesi, Lesser Sunda Islands (Lombok, Flores, Timor).

Habitat & Ecology — In wet and muddy places, often in rice fields; also on limestone; from sea level to 1 500 m. Flowering and fruiting all year round.

*Malesian material examined*. Sumatra, Alston 13776. – Java, Backer 7807, 37355, s.n. L0931491; Bakhuizen van den Brink 1032; Beumé 5679; Blume 112b, s.n. L0931494, s.n. L0931495, s.n. L0931496, s.n. L0931682 (type); Boerlage s.n. L0931489; Clason 186, 226, 255, 264, 266, A49; Coert s.n. L0931482; Danser 5679; Koorders 21794, 28076; Kuhl & van Hasselt s.n. L0931490; Nedi & Idjan 226; Winckel 1565. – Sulawesi, Bünnemeijer 11104, 11402; Noerkas (exp. van Vuuren) 317; Robinson 2462. – Lesser Sunda Islands, Lombok, Elbert 120, 2367; Flores, Kostermans s.n. L0931467; Schmutz 5914; Verheijen 4456, s.n. HLB993114027; Timor, Kooy 501; Riedlé s.n. L0931683; Schmutz 2338; Teijsmann L0931475; Unknown s.n. L0931474, s.n. L0931475; Verheijen 2165, 2166, 2167; Zippelius L0931477.

### 5. *Ammannia herbacea* W.J.de Wilde & Duyfjes, *sp. nov.*

Herba basin pauciramosa, folia basi subauriculata, inflorescentiae subsessiles, (pedunculus c. 0.5 mm longus), petala adsunt, stamina 4, stylus ovario breviore, placenta centralis ut videtur. — Typus: *Clason 267* (holo L), Indonesia, E Java.

Erect, annual, glabrous herb, 25–50 cm tall, few-branched at base, the branches about as long as the main stem; stem 4-angular but angles rounded. *Leaves* sessile; lamina narrowly elliptic, 1.5–4 by 0.4–1.2 cm, base broadened, subauriculate, apex blunt (rounded) or acute, 1-nerved. *Inflorescences* 1–4-flowered (sub)sessile clusters; peduncle up to 0.5 mm long. *Flowers* 4-merous; pedicel 0.2(–0.5) mm long, (articulate?); *calyx tube* campanulate, (0.5–)1 mm long, faintly 8-ribbed, lobes patent, broad-triangular, c. 0.5 mm long, acute, appendages conspicuous, c. 0.3(–0.5) mm long, acute; *petals* pale pink, subcircular, c. 0.2 mm diam; *stamens* 4, included, inserted towards the base of the tube; *ovary* broad-ellipsoid, c. 0.8 mm long, style c. 0.3 mm long; placenta axile, in fruit showing up as central. *Capsules* globose, (1.5–)2 mm diam, for c. 1/3 exserted from calyx; style c. 0.4 mm long. *Seeds* numerous, yellow-brown, c. 0.3 mm long.

Distribution — E Java (Malang), known only from the type.

Habitat & Ecology — In ripe paddy fields on good soil; altitude not indicated. Flowering and fruiting in June.

Collector's notes — Plant more sappy than other Ammannias, common.

Note — This species, known only from a single gathering, was annotated as common. Possibly it originated as a hybrid, and in that case perhaps with *A. baccifera* and *A. auriculata*

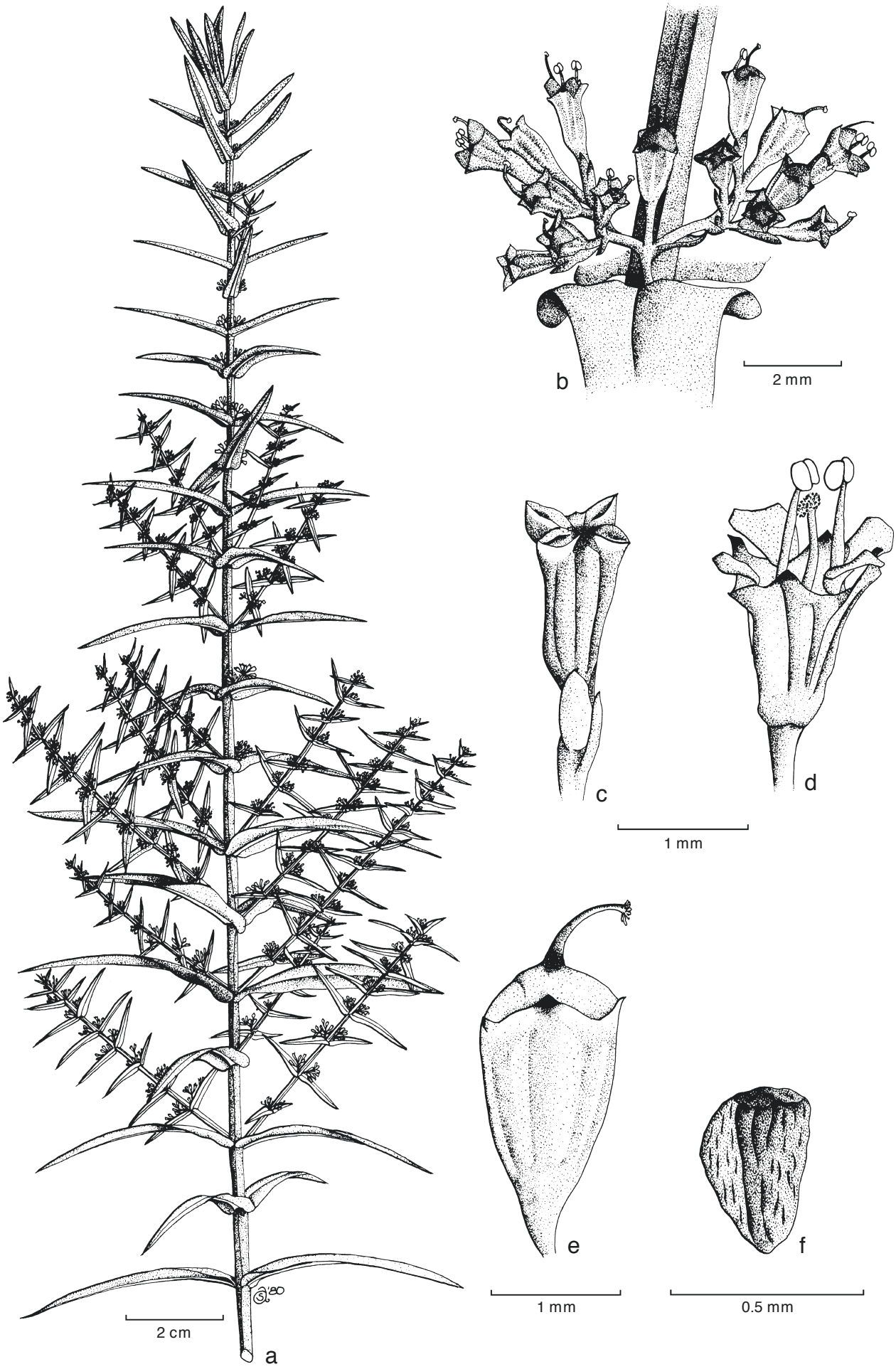


**Fig. 2** *Ammannia dichotoma* (Blume) S.G.Panigrahi. a. Habit of apical half of plant; b. node with inflorescence in leaf axil; c. flower bud; d. open flower; e. fruit within persistent calyx; f. seed. — Reproduced with permission from Soerjani et al. (1987).

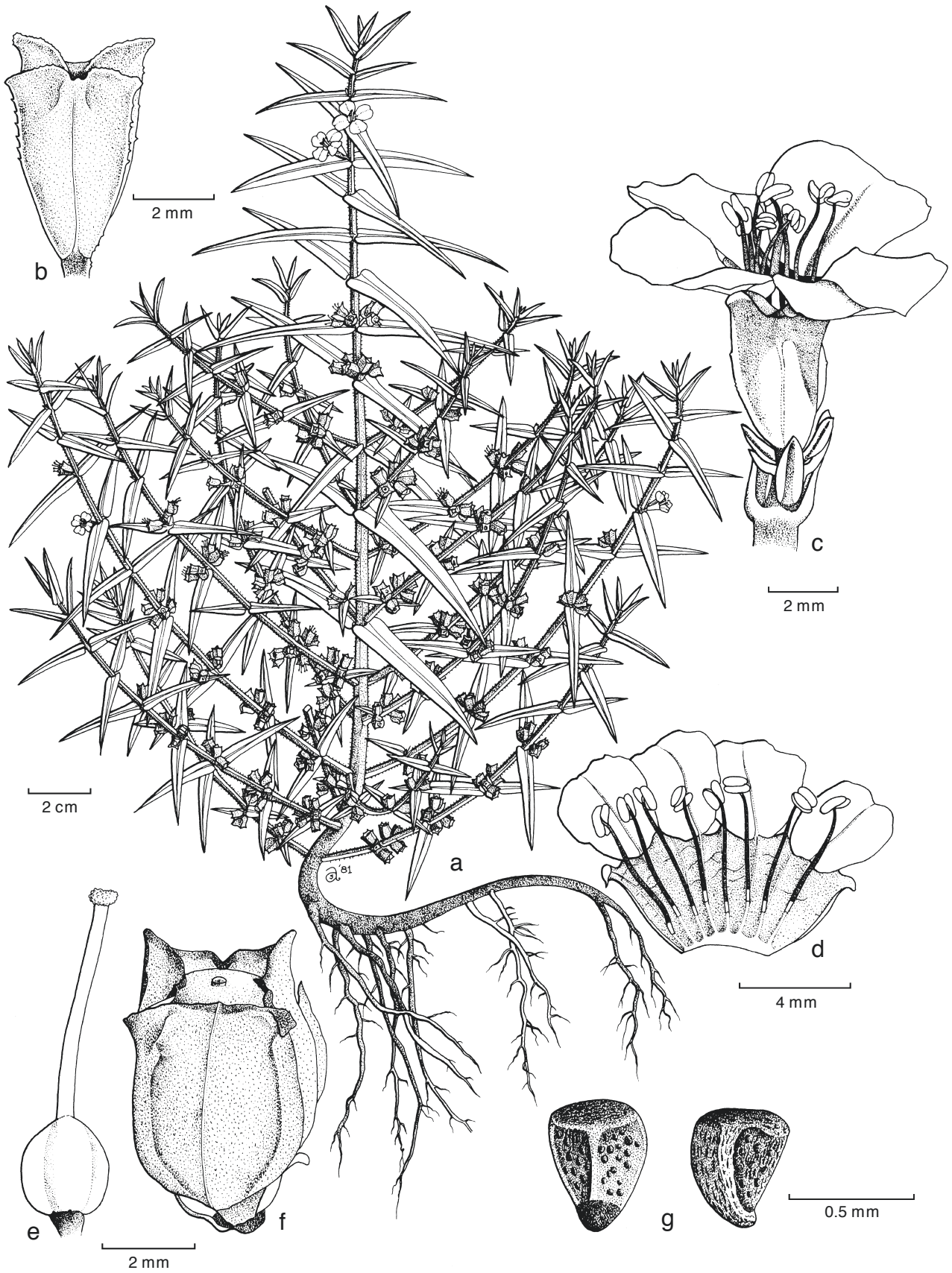


**Fig. 3** *Ammannia octandra* L.f. a. Habit of plant; b. flower bud; c. flower; d. flower, opened; e. pistil; f. fruit within persistent calyx; g. seed, two views. — Reproduced with permission from Soerjani et al. (1987).

as parents, both species widespread and extremely polymorphic, and both occurring in E Java. *Ammannia herbacea* with a different general habit (i.e. few-branched at base and more weakly built and juicy) cannot go, however, with either of these species: *A. baccifera* differs in having leaf lamina attenuate at base (in Asia) and lacking petals, while *A. auriculata* differs in having peduncled inflorescences and a style longer than the ovary. We checked whether it could be an introduction by consulting regional revisions of *Ammannia* outside Malesia viz. Qin & Graham (2007) for China, Hewson (1990) for Australia, Fernandes (1970, 1978, 1980) for southern Africa, Immelman (1991) for South Africa and Verdcourt (1994) for E Africa, but the taxon does not fit any of the species accounted for there. *Ammannia herbacea* was recorded as common, but apparently as yet has not dispersed outside its locality.

### 6. *Ammannia octandra* L.f. — Fig. 3

*Ammannia octandra* L.f. (1782) 127; Koehne (1903) 50; Backer (1930) 466; (1964) 253; (1973) pl. 441; Soerjani et al. (1987) 342, f. 4.156. — *Diplostemon octandra* (L.f.) Miq. (1856) 615. — Type: *Koenig s.n.* (holo BM (typ. cons.); iso C, LINN 156.5), India, Madepala.

*Amanella linearis* Miq. (1856) 619. — Type: *Horsfield s.n.* (holo BM; iso K, barcode K000729675, U).

Erect, annual, glabrous herb, 25–100 cm tall, much-branched; stem 4-angular, not winged. *Leaves* sessile; lamina glabrous, linear-lanceolate, 3–8 by 0.3–1 cm, base broadly cordate, apex acute, midrib stout, raised beneath. *Inflorescences* peduncled 2–4-flowered cymes; peduncle 1.5–4 mm long, bracts minute. *Flowers* 4-merous; pedicel short, c. 0.5 mm long; *calyx tube* green, glabrous, 4–5 mm long, sharply 4-angled or (nearly) winged, margin often finely serrate, lobes 1–1.5 mm long, appendages minute, acute, curved towards inside; *petals* 4, red, broadly obovate, 3–4 mm long, caducous; *stamens* 8, inserted just below halfway in the tube, filaments red, finally exserted, anthers yellow; *ovary* broadly ellipsoid c. 2 mm long, faintly 4-grooved, style red with green at apex, 4–5 mm long, stigma minute. *Capsules* included within the calyx, c. 5 mm long. *Seeds* brown-yellow, 0.3–0.4 mm long.

Distribution — India, Thailand; *in Malesia*: West and East Java.

Habitat & Ecology — In wet paddy fields, at low altitudes. Flowering all year round.

*Malesian material examined*. Java, Backer 5479, 33628, s.n. L0931462; Coert 794; Dorgelo 608; Houwing 22; Kooper 518; Koorders 20883; Unknown s.n. L931459.

Note — *Ammannia octandra* is not common in Java, but Backer (1964) noted that it is sometimes locally abundant.

### 7. *Ammannia uniflora* Meijden

*Ammannia uniflora* Meijden (1966) 245, f. 1. — Type: *Womersley NGF 15301* (holo L; iso BRI, CANB, LAE).

Decumbent, annual, glabrous herb, c. 10 cm tall, few-branched, rooting at the nodes; stem 4-angular, not or faintly winged. *Leaves* sessile; lamina subcircular or broadly ovate, 0.3–0.7 by (0.2–)0.3–0.6 cm, base narrowed into an up to 1 mm long petiole, apex broadly rounded; lateral nerves (1–)3(–4) per side. *Inflorescences*: flowers solitary, sessile; peduncle absent. *Flowers* 4-merous; pedicel 1–2 mm long (in fruit to 4 mm long), at base with 2 minute bracteoles; *calyx tube* glabrous, (narrowly) campanulate, 1.5–2 by 1.5 mm, 8-nerved, lobes suberect, broadly triangular, c. 0.5 mm long, acute, appendages 0.1–0.2 mm long; *petals* 'pale blue' (see note), broadly ovate, 1–1.5 mm long, caducous; *stamens* inserted at c. 1/3 from the base in the tube, included; *ovary* glabrous, broadly ellipsoid, c. 1 mm long, style c. 0.5 mm long, placenta central. *Capsules* greenish, subglobose, c. 1.8 mm diam, included or hardly exserted. *Seeds* 10–15, brownish, flattened at one side, c. 0.5 mm long.

Distribution — Papua New Guinea (Western Highlands) known from 3 collections: *Eichler 18268*, *WalkerANU 563*, *Womersley NGF 15301*.

Habitat & Ecology — Prostrate herb in peat swamp; c. 2 500 m altitude. Flowering and fruiting from May to August.

Fieldnotes — The stem is recorded as juicy and the petals as pale blue, but it is likely that the colour of the latter is more purplish or pinkish.

Note — According to S.A. Graham (Missouri, in litt.), who examined all three collections known to date, this species belongs in the genus *Ammannia.* However, its procumbent habit is infrequent in *Ammannia* s.str., and a similar spreading habit occurs in some *Nesaea* species, now included in *Ammannia*. Furthermore, the few and larger seeds are also a-typical. The pollen is of the *Ammannia-Nesaea* type, although very small (min. 16 by 12 µm) for the genus.

## EXCLUDED NAME

*Ammannia pinnatifida* L.f. (1782) 127.

Note — This name is based on the collection "*Sonnerat* in *Thouin*", from Java and apparently kept in P (not seen). However, the description, particularly of the leaves, cannot pertain to *Lythraceae*.

**Acknowledgements** We thank the curators of BK, BKF, BM, K, L for permitting us to study their material. We are grateful to Laurent Gautier (G) for giving us the opportunity to study a fragment of the specimen G-00454022 and for a digital photo of that specimen (*Ammannia microcarpa*), Jacek Wajer (BM) for a digital photo of and commentary on the *Ammannia debilis* type collection harboured in Bank's Herbarium, and Shirley Graham (MO) for examining the three mentioned specimens of *Ammannia uniflora*. Jan-Frits Veldkamp (L) kindly translated the diagnosis of the new species into Latin, Ahmad Satiri (BIOTROP) made the drawings and Esmée Winkel (L) prepared them for publication.

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