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RESEARCH ARTICLE

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Secamone (*Apocynaceae*) in the Philippines

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Key words

Apocynaceae
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taxonomy
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Abstract A taxonomic revision of *Secamone* (*Apocynaceae*) in the Philippines is presented. Nineteen species are recognized of which eight are described as new: *Secamone commutata*, *S. crenata*, *S. edanoi*, *S. fusiformis*, *S. glandulifera*, *S. luzonensis*, *S. mindanaensis* and *S. pyriformis*. Six new combinations are made: *Secamone fenixii* (Tsiang) Klack., *S. glauca* (Decne.) Klack., *S. lepta* (Tsiang) Klack., *S. loheri* (Schltr.) Klack., *S. merrillii* (Schltr.) Klack. and *S. radiata* (Tsiang) Klack. Drawings, descriptions, distribution maps, typifications as well as a key to the Philippine taxa are presented.

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INTRODUCTION

Subfamily *Secamonoideae* (*Apocynaceae*) is widely distributed in the palaeotropics and northern Australia. It is known from southern and tropical Africa, being particularly species rich in Madagascar (Choux 1914, 1926, Goyder 1992, Klackenberg 1992b, 2001, 2019), and is also found at several islands in the Indian ocean. In Asia, it extends from Sri Lanka and southern India to the Himalayas, and from southern China through SE Asia, including all of the Malesian region, to eastern Australia with New Caledonia and Vanuatu as easternmost localities (Tsiang 1939, Klackenberg 1992a, 1995, Forster 1996). About 190–200 species are estimated worldwide, of which 92 in Madagascar (Klackenberg, in prep.), 22 in continental Africa and Socotra (Goyder 1992, Klackenberg 2001, Bruyns 2005, Harris & Goyder 2007) and about 80 in Asia, Australia and Indian ocean islands. This is a slightly higher figure than the estimated 155 species in the subfamily by Endress et al. (2018), a difference mostly based on further examination of Asian material. Subfamily *Secamonoideae* is characterized by having four pollinia on each corpusculum, not two as in *Asclepiadoideae*. Five genera have been described in this subfamily from Asian/Australian material, viz. *Genianthus* Hook.f., *Goniostemma* Wight, *Schistocodon* Schauer, *Secamone* R.Br. and *Toxocarpus* Wight & Arn. Philippine taxa have been assigned to either *Genianthus*, *Secamone* or *Toxocarpus*, distinguished mainly by the style head being short (*Secamone*) or long (*Toxocarpus*) or by adaxially hairy corolla lobes (*Genianthus*). The acceptance of just one, three or more genera in the subfamily has been debated for a long time (Decaisne 1844, Bentham & Hooker 1876, Schumann 1895, Brown 1904, Schlechter 1907, 1913, Choux 1914, Tsiang 1939, Forster 1991, 1996, Li et al. 1995, Klackenberg 1992b, 2001, 2010, Endress et al. 2018, Rodda & Middleton 2019). In the present revision, *Genianthus*, *Secamone* and *Toxocarpus* are considered congeneric, based on the large morphologic variation in key characters observed in Malagasy *Secamonoideae* (Klackenberg 1992b: f. 4 (style heads) and, e.g., f. 13, 47, 90 (corona lobes)), as well as among Philippine taxa seen in the present study. *Secamone* in a broader sense was also applied in Flora of Australia (Forster 1991) and Flora of Singapore (Middleton & Rodda 2019). It is consistent with a recently generated molecular phylogeny (Rodda et al., in prep.), based on a broad analysis of the whole subfamily *Secamonoideae*.

In SE Asia *Secamonoideae* has been treated mostly in local and regional Floras, but also in a larger taxonomic work on Asian *Apocynales* by Tsiang (1934, 1939), as well as in revisions of *Secamone* s.str. and *Genianthus*, respectively (Klackenberg 1992a, 1995). At the time, *Secamone* was identified by the key characters of a short style head and falcate corona lobes, in contrast to a long style head and flat corona lobes for *Toxocarpus*. *Genianthus* was singled out mainly by the sole key character of the corolla lobes being entirely covered by hairs inside, irrespective of the length of style head and shape of corona lobes. Delimited in this way, the majority of Asian *Secamonoideae* correspond best with *Toxocarpus* and were excluded from the revisions by Klackenberg (1992a, 1995). In the Philippines only three species of the 19 now accepted species of *Secamone* were treated, viz. *S. blumei* Decne. and *S. rectinervis* Schltr. (as *Genianthus ellipticus* (Blume) Bakh.f. and *G. rectinervis* (Schltr.) Tsiang) with more or less hairy corolla lobes (Klackenberg 1995), and *S. elliptica* R.Br. with short style head and falcate corona lobes (Klackenberg 1992a). Although less so than in Madagascar, a considerable variation in corona and style head morphology is seen also in Philippine *Secamone*, and in many species the former key characters of *Secamone*, *Genianthus* and *Toxocarpus* contradict each other. In addition to *S. blumei*, *S. elliptica* and *S. rectinervis*, also *S. fusiformis* Klack., sp.nov., *S. pyriformis* Klack., sp. nov., and *S. urdanetensis* Tsiang are examples of species with a short style head, in combination with more or less falcate to flat corona lobes.

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There are several Flora treatments from the region. Eighteen species of *Secamonoideae* were accepted in Southern China by Li et al. (1995), 15 in Indochina (Costantin 1912) of which nine occur in Vietnam (Ho 1993). The subfamily is not known from Taiwan. In the Malesian region eleven species were recognised in the Malay Peninsula (King & Gamble 1908, Ridley 1923), including two from Singapore (Middleton & Rodda 2019), with two more added by Klackenberg (1995, 2010). Twenty-one species have been described from the Greater Sunda islands (Blume 1826, Schlechter 1908, Merrill 1929, Backer 1950, Klackenberg 1995, 2004, 2006, 2010) and another six species from New Guinea and adjacent islands (Decaisne 1844, Schlechter 1905, 1913, Markgraf 1929). Four species were accepted in Australia by Forster (1996) and one in New Caledonia (Liede-Schumann et al. 2020). Blanco (1837) did not mention *Secamone* in Flora de Filipinas. The genus *Toxocarpus* had been described just three years earlier by Wight & Arnott from India (Wight 1834). The first species known from the Philippines are *T. glaucus* Decne. and *T. gracilis* Decne. (both now included in *S. glauca* (Decne.) Klack.), and *S. attenuata* Decne. and *S. multiflora* Decne. (both now included in *S. elliptica*), all four described by Decaisne in 1844, based on collections made by Cuming during his extensive journey to the Philippine islands in 1836 to 1839.

The most comprehensive study to date of *Secamonoideae* in Asia was published by Tsiang (1934, 1939). Tsiang presented 34 species. Nine taxa were accepted in the Philippines, all described from Philippine material including three new taxa. Except for *Toxocarpus rubricaulis* Elmer, a taxon of uncertain status (see below), all taxa presented by Tsiang, with some recombinations and name changes, are accepted in the present revision with *Toxocarpus glaucus* var. *radiatus* Tsiang and *T. merrillii* f. *leptus* Tsiang raised to specific status (as *Secamone radiata* (Tsiang) Klack.) and *S. lepta* (Tsiang) Klack.). A modern Flora of the Philippine area is wanting. However, Co's Digital Flora (Pelser et al. continuously updated), the up to date checklist of Philippine plants, lists eleven species within the subfamily. All but two, with some nomenclatural changes, are accepted in the present revision: *Genianthus ellipticus* = *Secamone blumei*, *G. rectinervis* = *S. rectinervis*, *S. elliptica*, *S. maritima* Blume, *S. urdanetensis* Tsiang, *Toxocarpus batanensis* Hatus. = *S. fenixii* (Tsiang) Klack., *T. glaucus* = *S. glauca*, *T. loheri* Schltr. = *S. loheri* (Schltr.) Klack. and *T. merrillii* Schltr. = *S. merrillii* (Schltr.) Klack. Excluded taxa from Co's list are *S. multiflora*, synonymised with *S. elliptica* (Klackenberg 1992a) and *T. rubricaulis* which is of uncertain affinity – see discussion below under Unsufficiently known taxa.

In the present revision 19 species are recognized, of which eight are described as new, and eight earlier described from Philippine material. Four species are found also outside the Philippine islands, viz. *S. elliptica* (type from Australia), *S. blumei* (type from Java), *S. maritima* (type from Java) and *S. rectinervis* (type from the Philippines). The remaining 15 species are endemic (79 %), a slightly higher figure compared to recent estimations of Philippine endemism based on inventories, e.g., 69 % from Dinagat Island just north of Mindanao (Lillo et al. 2019), half of the tree species on limestone at Ticao Island (Calumpong 2014), 29 % of vascular plants and 47 % of *Rubiaceae* species from Ilocos Norte (Batuyong et al. 2020a, b), 45 % of *Rubiaceae* on limestone in Peñablanca, Cagayan (Biag & Alejandro 2021), and 38 % of vascular plants in limestone areas at Samar Island (Villaneuva et al. 2021). Pelser et al. (continuously updated) in Co's digital flora estimate 54 % of Angiospermes to be unique for the Philippine archipelago. Scarce material and to a large part a still undocumented flora make estimation on endemism uncertain. Several taxa in the present study are still known only from type material and in consequence endemic to one specific island. *Secamonoideae* in the Philippines are undercollected and particularly recent herbarium material is scarce. Furthermore, annotations on labels about habitat and elevation are infrequent. The poor material makes it difficult to establish patterns of variation. Nevertheless, many specimens fall outside known variation and descriptions of existing taxa and are here described as distinct species. Of the 15 endemic Philippine *Secamone*, twelve are known from a single island, of which seven are known from type material only. More information might require a reassessment of the number of species recognized as well as of the seemingly high island endemism. However, high endemism in *Secamone* is observed also in much better collected Madagascar, where almost all of 75 known species are endemic to the island, many of which being local endemics. Only two Malagasy species are non-endemic found also in adjacent Comoro Islands.

MATERIAL AND METHODS

This study is based on herbarium material from the following herbaria: A, B, BM, BO, BR, BRI, E, FI, G, GH, GOET, K, L, M, MICH, MO, NY, P, PNH, S, SING, U, UPS, US, W and Z (herbarium abbreviations follow Thiers continuously updated). All type material cited has been studied if not otherwise stated, those seen only as photo (all from either JSTOR Global Plants continuously updated, or the Global Biodiversity Information Facility (GBIF) continuously updated) are marked with an *.

Measurements of floral parts were made on boiled material, of vegetative parts and fruits on dry material, and the terminology is in accordance with Klackenberg (1992b: f. 2, 3, 4; 2001: 318), but with 'stigma head' substituted by 'style head'.

The drawings were made from herbarium material.

TAXONOMIC TREATMENT

Secamone R.Br.

Secamone R.Br. (1810a) 464; (1810b) 44. — Type: *Periploca emetica* Retz. (= *Secamone emetica* (Retz.) R.Br. ex Schultes; vide Phillips 1951: 606).
Toxocarpus Wight & Arn. in Wight (1834) 61. — Type: *Toxocarpus kleinii* Wight & Arn. (vide Tsiang 1939: 66).
Genianthus Hook.f. (1883) 15. — Type: *Genianthus laurifolius* (Roxb.) Hook.f. (= *Secamone laurifolia* (Hook.f.) K.Schum.; vide Klackenberg 1995: 424, Turner 2018: 41).

Secamone in the Philippines: suffrutescent twiners with at least younger branches more or less hairy, sometimes densely so, often with reddish hairs, probably with latex. *Leaves* decussate on elongated branches, herbaceous; lamina narrowly ovate to obovate or elliptic to almost circular, tapering or cuneate to rounded or cordate at base, rarely subpeltate, flat or slightly revolute at the very margin, acute or acuminate to apiculate at apex or rarely obtuse to retuse, glabrous or with reddish hairs, without or usually with colleters (glands) at the very base above; venation pinnate, arched to looped, sometimes reticulate below when dry; epidermis ± smooth on both sides of leaf; petiole distinct, glabrous to usually hairy. *Inflorescences* extra-axillary, shorter to longer than adjacent leaves; cyme a multiplex thyrse, irregularly branched, with longer and shorter internodes alternating, lax to rather dense, usually many-flowered, at least terminal parts covered by reddish hairs; bracts small, triangular. *Flowers* pentamerous, actinomorphic, from 1.5 mm up to c. 1 cm long. *Calyx* lobes only shortly connate, oblong to elliptic or narrowly to broadly ovate or ± circular, rounded to subacute at apex, glabrous to usually covered by reddish hairs; margin entire, often ciliate or with long usually reddish hairs, inside with single or paired colleters at sinuses. *Corolla* ovoid to globose in bud or rarely pyriform, valvate to usually contorted with right or left lobe margins slightly overlying, white to usually yellow, sometimes tinged with orange, rarely red, in anthesis with lobes

± spreading, fused into a tube for 1/5 to 1/3 or rarely to about 1/2 of their lengths; tube rather narrow and cylindric to broad and urceolate, glabrous to hairy; lobes oblong or ovate to narrowly obovate or rarely triangular, glabrous to hairy at base only or sometimes with dense long hairs covering whole of inner surface, rarely also with some hairs on outer surface, rounded to acute at apex, usually with more or less fleshy ridges forming a V at each lobe sinus. *Stamens* in a column arising from base of corolla tube; filaments broad with sclerified margins (anther wings) below thecae; anther wings long and almost reaching to base of filaments to usually very short and about as long as thecae or shorter and reaching only c. 1/3 to base of filaments; connectives produced into a membranous tip. *Staminal corona* lobes single or double, composed of two ± united parts, if single, then usually laterally compressed and ± falcate, if double, then with one outer broader lobe with flat back and one inner narrower but usually longer lobe, straight or inclined towards style head, projecting or not above the thecae, outer part narrowly triangular to oblong or circular in outline, sometimes near the base broadened to hastate. *Pollinia* minute, two in each anther loculus, ± ascending, ellipsoidal, usually attached directly on a ± semi-ellipsoidal corpusculum, usually free from each other but sometimes glued together 2 and 2, attached to corpusculum by one short flattened caudicle or rarely by two narrow, separate caudicles. *Ovary* superior to subinferior, glabrous or covered by reddish hairs at apical part; ovules numerous. *Style head* short and not protruding to elongate and protruding 2–3 times beyond the anthers, consisting of 2 portions; basal portion swollen, placed directly above ovaries or narrowing rather abruptly to usually gradually into a style-like base, narrowing abruptly into apical portion; apical portion entire to rarely bifid at apex, cylindric to fusiform or towards apex distinctly broadened; stigmatic surfaces localised in 5 spots on the flanks of basal portion of style head. *Follicles* usually paired, often divergent c. 180°, very narrowly ovate to linear in outline, straight to slightly curved, glabrous to slightly hairy near base. *Seeds* flat, narrowly ovate to elliptic in outline, blackish brown, glabrous, crowned by a tuft of hairs (coma).

KEY TO THE SPECIES OF SECAMONE IN THE PHILIPPINES

Notes — 1. *Secamone crassifolia* (Wight) K.Schum., not included in the key, might possibly also be found in the Philippines. *Secamone crassifolia* has a wide distribution in SE Asia from eastern Bangladesh, Thailand, Peninsular Malaysia to Greater Sunda Islands including northernmost Borneo. It is easily distinguished by the inflorescences (branched spike-like thyrses) and hairy, rather long (2.7–4.5 mm) corolla lobes (see Klackenberg (1995: f. 26, as *Genianthus crassifolius* (Wight) Hook.f.).

2. Upon drying, the corollas remain pale or sometimes turn dark. The darker part consists of confluent or sometimes distinct spots, probably dried lactifers, and is often concentrated to the central area of the corolla lobes with the margins remaining pale when dry.

1. Style head not or only slightly projecting above staminal column 2
1. Style head projecting about twice longer or more than staminal column 7
2. Corolla lobes 3 mm long or more; apical portion of style head fusiform . . . . . 7. *S. fusiformis*
2. Corolla lobes up to 2 mm long; style head cylindrical or broadest at apex 3
3. Leaves without colleters at base; corolla in bud contorted with right margins overlying . . . . . 5. *S. elliptica*
3. Leaves with one to usually several colleters at or near base of lamina above; corolla in bud valvate or contorted with left margins overlying 4
4. Corolla lobes densely hairy inside; staminal corona lobes ± circular in outline . . . . . 1. *S. blumei*
4. Corolla glabrous inside or only hairy in tube and at base of lobes; staminal corona lobes ± triangular, obovate or angular-obovate in outline 5
5. Leaves below with erect curved hairs; corolla glabrous . . . . . 19. *S. urdanetensis*
5. Leaves below glabrous or with sparse appressed hairs; corolla hairy at mouth 6
6. Corolla bud contorted; inflorescences up to 1 cm long; staminal corona lobes obovate to angular-obovate in outline . . . . . 16. *S. pyriformis*
6. Corolla valvate; inflorescences more than 3 cm long; staminal corona lobes triangular in outline . . . . . 18. *S. rectinervis*
7. Leaves with colleters on petiole just below lamina; corolla red, in bud with some hairs outside . . . 8. *S. glandulifera*
7. Leaves with colleters at base of lamina; corolla probably white to yellow (colour in some species still unknown), in bud glabrous outside 8
8. Calyx lobes covering major part of corolla in mature bud 9
8. Calyx covering about half or less of corolla in bud . . . 12
9. Outer corona lobe cleft c. 1/2 of its length from inner lobe; leaves usually broadly ovate to heart-shaped 6. *S. fenixii*
9. Corona lobes only shallowly cleft; leaves elliptic 10
10. Outer part of corona lobe flat with two blunt teeth and inner part crenate at apex . . . . . 3. *S. crenata*
10. Outer and inner parts truncate to rounded at apex . . . 11
11. Staminal column widening towards apex, i.e., outer part of staminal corona lobes erecto-patent on a laterally compressed lamina . . . . . 17. *S. radiata*
11. Staminal column ± cylindric, with outer and inner corona lobes close together . . . . . 15. *S. mindanaensis*
12. Inflorescences up to 4 cm long; corolla tube longer than calyx; style head about as long as corolla tube . . . . . 13. *S. maritima*
12. Inflorescences usually more than 4 cm long; corolla tube about as long as or usually shorter than calyx; style head projecting from corolla tube 13
13. Corolla fused for 1/3 to 1/2 of its length into a tube (also in *S. lepta*); staminal corona lobes distinctly hastate; corolla hairy at mouth . . . . . 11. *S. loheri*
13. Corolla usually fused for about 1/3 or less into a tube; staminal corona lobes ovate or angular ovate to triangular but not with bases bent upwards; corolla hairy to glabrous at mouth 14
14. Staminal corona lobes distinctly cleft into an outer and an inner part free at apices 15
14. Staminal corona lobes not to very shortly cleft 18
15. Leaf lamina at base minutely peltate . . . . . 4. *S. edanoi*
15. Leaf lamina attached to the petiole by its very margin 16
16. Corolla hairy in tube and at lobe bases . . 14. *S. merrillii*
16. Corolla glabrous 17
17. Leaf lamina broadly elliptic to broadly ovate, usually truncate to cordate at base, equally green on both sides . . . . . 6. *S. fenixii*
17. Leaf lamina elliptic to oblong, cuneate to truncate at base, glaucous (paler) beneath . . . . . 9. *S. glauca*

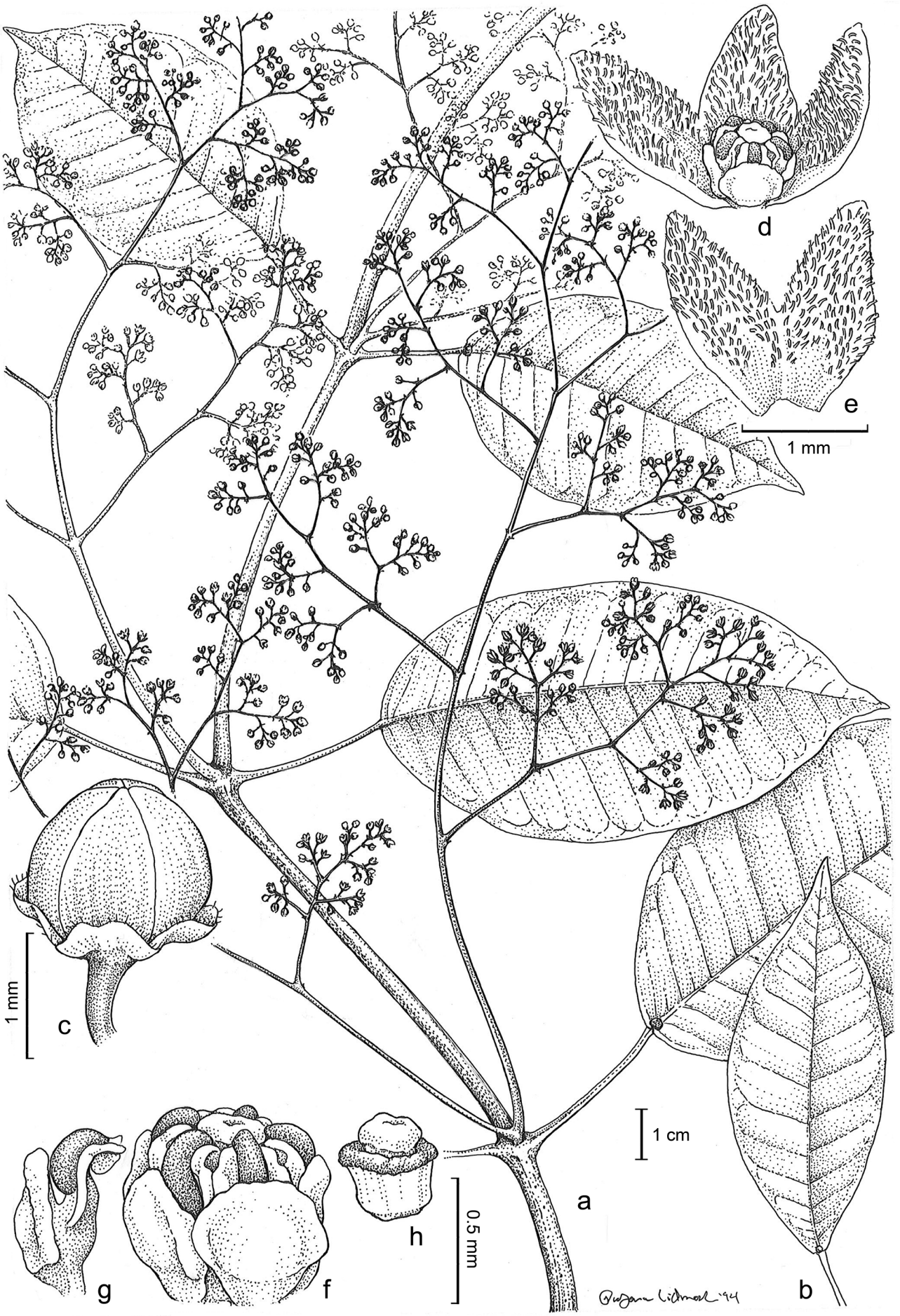
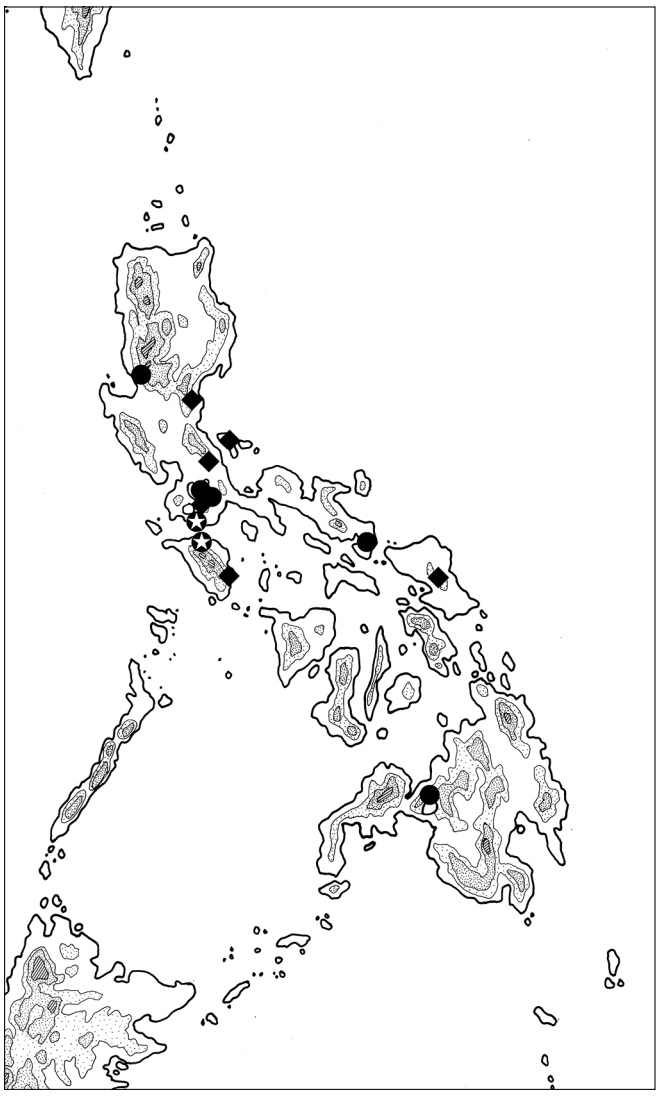


Fig. 1 *Secamone blumei* Decne. a. Habit; b. leaf; c. flower in bud; d. flower with calyx and two corolla lobes removed; e. portion of corolla from within; f. gynostegium; g. anther, lateral view; h. style head (a, c–h: *Ramos BS 17658*; b: [*Blume*] *1663*; all L). — Drawn by Pollyanna von Knorring. From Klackenberg (1995, as *Genianthus ellipticus*).

18. Inflorescences and leaves up to 20 cm long; leaf lamina rounded or shallowly cordate at base; tube 2/5 to 1/3 of corolla length; corolla papillate or very shortly hairy at mouth and along c. 1/3 of lobes (seen best in dry state) . . . . . 10. *S. lepta*
18. Inflorescences and leaves usually less than 10 cm long; leaf lamina cuneate at base; tube 1/5 to 1/4 of corolla length; corolla hairy in tube and as a short V basally at each lobe 19
19. Leaves glabrous below; staminal corona with inner and outer lobe parts united to the apex, about as long as thecae or shorter; style head protruding about twice longer than staminal column . . . . . 12. *S. luzonensis*
19. Leaves with erect hairs below; staminal corona with the two lobe parts hardly separated but with the inner part longer and protruding above thecae; style head protruding about three times longer than staminal column . . . . . 2. *S. commutata*

1. *Secamone blumei* Decne. — Fig. 1; Map 1

Secamone blumei Decne. (1844) 502. — Lectotype (designated by Klackenberg 1995: 439): *Blume s.n.* (lecto P [P00622445], also isolecto of *Leptadenia elliptica* Blume; isolecto L [L.2727765, L.2727766]), [Indonesia,] Java.
Leptadenia? elliptica Blume (1826) 1066. — *Genianthus ellipticus* (Blume) Bakh.f. (1949) 26, in clavi; (1950) 371. — Lectotype (designated by Klackenberg 1995: 439 as *Blume 1662/6* sphalm.): *Blume 1663/6* (lecto L [L.2727766]; isolecto L [L.2727765], P *s.n.* [P00622445]), [Indonesia,] Java.



Map 1 Distribution of *Secamone blumei* Decne. (◆), *S. glauca* (Decne.) Klack. (✪) and *S. rectinervis* Schltr. (●).

Toxocarpus borneensis Schltr. (1908) 1. — Type: *Schlechter 13378* (holo B lost; SYS (photo) fide Tsiang 1939: 62, not seen), [Indonesia,] Borneo, zwishen Gebüsch an den Ufern des Long Wahan (Koetei).
Secamone syringifolia Schltr. (1915) 538. — *Genianthus syringifolius* (Schltr.) Tsiang (1939) 60. — Lectotype (designated by Klackenberg 1995: 439): *Witford 1399* (lecto US [628515]), Philippines, Mindoro, Bongabong-River, 1906.

Leaf lamina ovate to oblong or elliptic, acuminate at apex, glabrous or with small sparse appressed reddish hairs below, with many colleters at base of lamina. *Cyme* longer to much longer than subtending leaf. *Corolla* in bud almost spherical, valvate; lobes 2–3 times longer than tube, triangular, with long dense hairs on whole of inner surface, white. *Staminal corona* lobes with two parts; outer part dorsiventrally compressed, ± circular to transversely ovate, much shorter than staminal column; inner part as longitudinal pad between thecae. *Style head* not protruding from staminal column; upper portion much shorter than lower portion; style lacking.

Distribution — Java, Borneo (Sarawak, Kalimantan), Philippines (Luzon, Samar, Mindoro, Polillo Is.), Sulawesi.

Habitat & Ecology — Flowering: October, January to April.

Notes — 1. *Secamone blumei* differs from all other *Secamone* in the Philippines by its corolla lobes being hairy all over its surface adaxially. It is in this and other floral characters similar to *S. crassifolia*, a species with a wide distribution in SE Asia and known from Northern Borneo, but hitherto not recorded from the Philippines. Both species are characterized by densely hairy corolla lobes, but *S. crassifolia* differs by flowers being concentrated on brachyblasts in branched lax spike-like inflorescences (see Klackenberg 1995: f. 26, as *Genianthus crassifolius*).

2. For full description, specimen list and comments on typifications see Klackenberg (1995: f. 18, as *Genianthus ellipticus*).

2. *Secamone commutata* Klack., *sp. nov.* — Fig. 2; Map 2

Etymology. The epithet alludes to the confusion connected to this taxon. See discussion under Unsufficiently known taxa.

This species is similar to *Secamone radiata* but differs by hairy leaves, longer style head and by the corolla buds protruding distinctly above the calyx (vs more or less covered by the calyx). — Type: *Elmer 17289* (holo US[1050564]; iso A, BM, BO, FI, G, GH, K*[K000910094], L, MICH, MO[835779], NY, P*[P03874893], PNH (n.v.), U, US*[3416713], Z), Philippines, Luzon, Prov. of Sorsogon, Irosin (Mt Bulusan), Sept. 1915.

Toxocarpus sorsogonensis Elmer (1938) 3598, pro parte quoad *Elmer 17289*, nom. nud., pro syn.

Liana with younger branches rather densely covered by erect reddish hairs, glabrescent. *Leaf lamina* elliptic to ovate, 7–11 by 3–5.5 cm, rounded to truncate at base, acute to acuminate at apex, glabrous above except for midrib near base, with sparse reddish curved hairs below, with a couple of colleters at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and veins raised below when dry; petiole 10–15 mm long, hairy. *Inflorescences* extra-axillary, shorter than adjacent leaves, c. 4 cm long; cymes lax, many-flowered, irregularly di- to monochasially branched with alternating short and long (up to 1.5 cm) internodes, with rather dense reddish hairs; pedicels 2–3 mm long; bracts up to 1–1.5 mm long, triangular. *Calyx* lobes ovate, 1.9–2.1 by 0.9–1.2 mm, about as long as tube to slightly longer, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for about 1/4 of their length into a tube, not twisted, glabrous outside, with flattened and white (when dry) hairs inside most of tube and at base of lobes particularly along V-formed ridges, colour unknown; tube campanulate to cylindric, c. 1.5 mm long; lobes ± straight, oblong, c. 4.7 by 1.3 mm, ob-

tuse at apex. *Staminal column* c. 1 mm high. *Staminal corona* lobes with two parts united and not cleft at apex, dorsally flattened, angular-ovate and truncate but with narrow apical (inner) part projecting above thecae and inclined towards style head. *Anther wings* 0.15 mm long, about as long as thecae. *Pollinia* broadly ellipsoidal, c. 0.1 mm long. *Style head* projecting about 2–3 times longer than staminal column, distinctly exserted from corolla tube; apical portion c. 2–2.7 mm long, 4–6 times longer than basal portion, cylindric, entire at apex; ovary glabrous. *Follicles* narrowly ovate, c. 10 by 1.3 cm, straight, thin-walled, with short hairs, recurved 90°. *Seeds* not seen.

Distribution — Philippines (Luzon). Only known from the type.

Habitat & Ecology — Parang vegetation (grassland/brushland). Flowering: September.

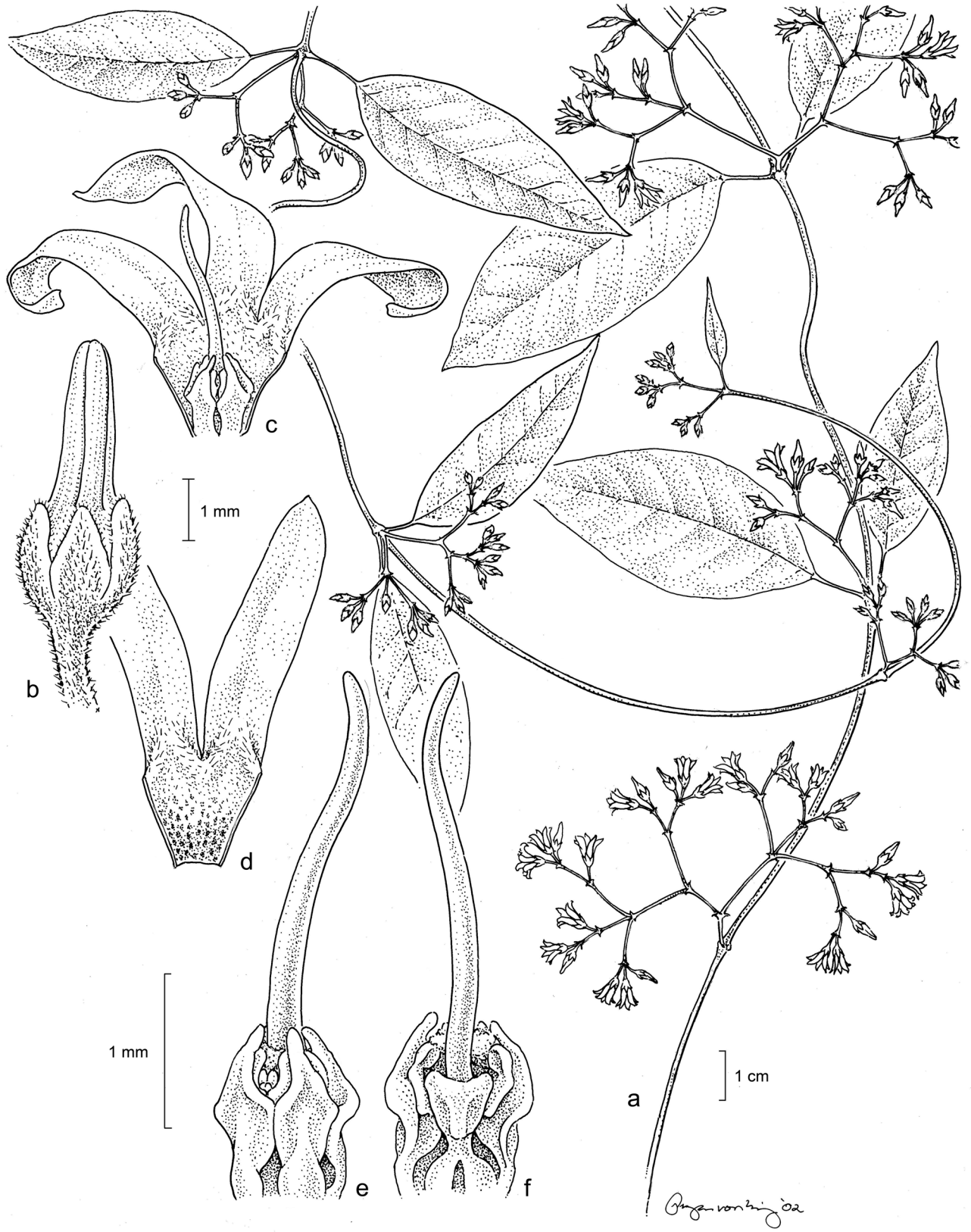
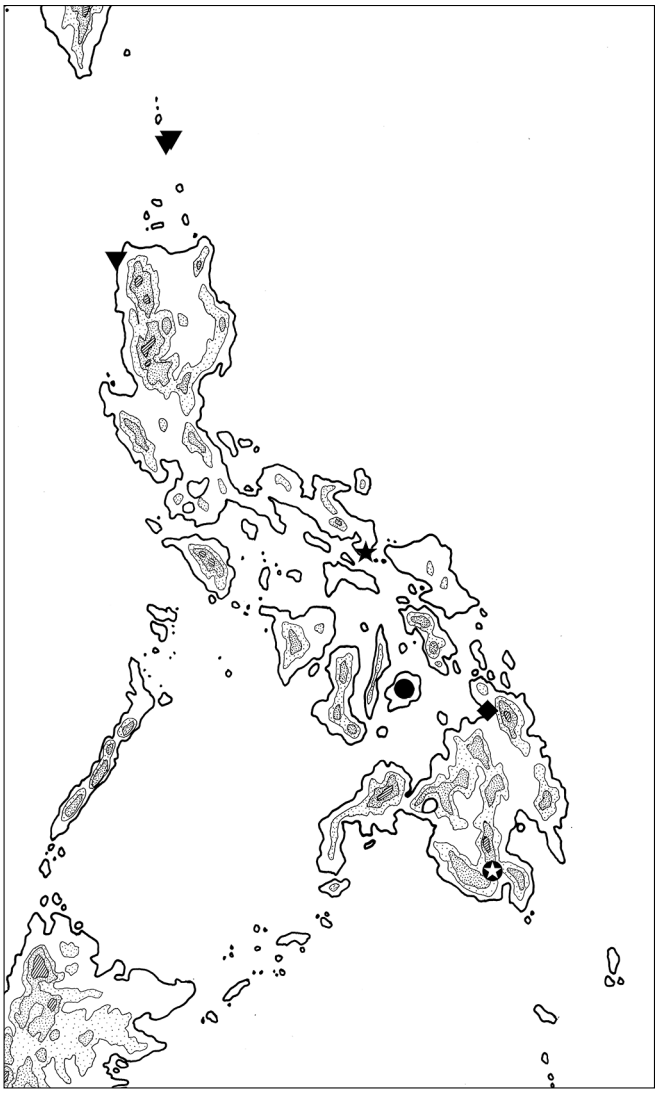
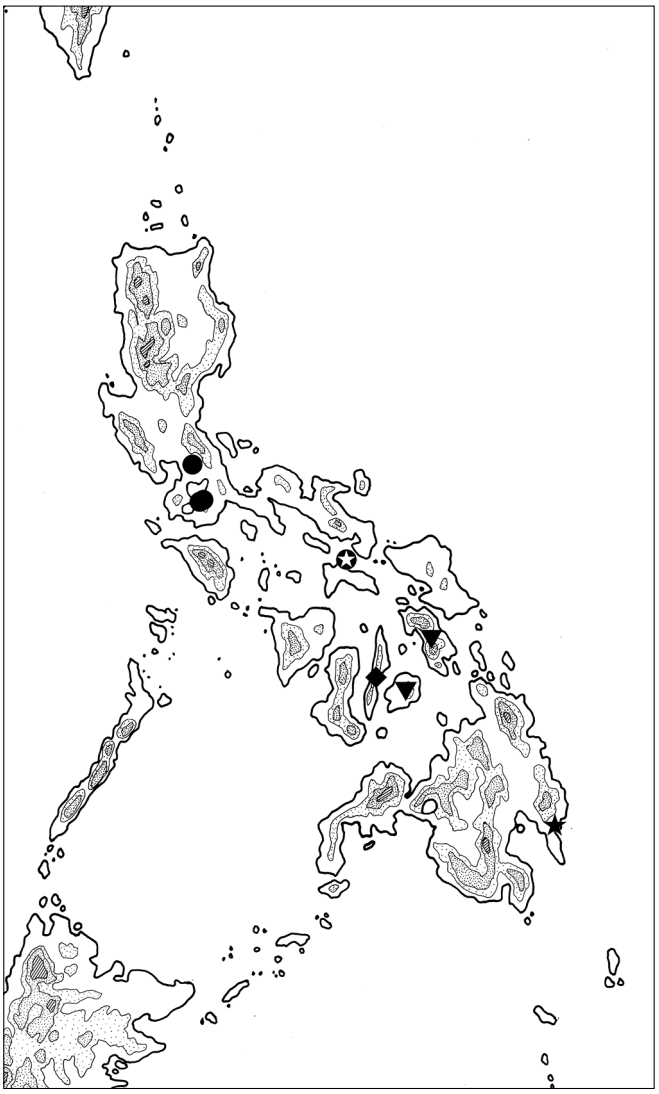


Fig. 2 *Secamone commutata* Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. gynostegium with two anthers removed (all: *Elmer 17289*, US). — Drawn by Pollyanna von Knorring.



Map 2 Distribution of *Secamone commutata* Klack. (★), *S. fenixii* (Schltr. ex Tsiang) Klack. (▼), *S. fusiformis* Klack. (●), *S. glandulifera* Klack. (✪) and *S. urdanetensis* Elmer ex Tsiang (◆).



Map 3 Distribution of *Secamone crenata* Klack. (◆), *S. lepta* (Tsiang) Klack. (▼), *S. merrillii* (Schltr.) Klack. (●), *S. mindanaensis* Klack. (★) and *S. radiata* (Tsiang) Klack. (✪).

Notes — 1. The leaves in *S. commutata* are covered by sparse erect reddish hairs. The upper part of the staminal corona lobes is distinctly dorsiventrally flattened, longer than thecae and inclined towards style head. It is in habit similar to *S. radiata* from adjecent Ticao island but differs by hairy leaves and longer style head, but also by the corolla buds that have a spherical base topped by a long ± cylindric apical portion not covered by the calyx lobes (vs ovoid corolla buds mostly covered by the calyx lobes in *S. radiata*). *Secamone commutata* also resembles *S. glauca* but differs by its hairy leaves and basally hairy corolla lobes (vs glabrous in *S. glauca*).

2. Elmer (1938) referred to two collections from Mt Bulusan to his superfluous name *Toxocarpus sorsogonensis*, one in flower (*Elmer 17289*, type for *Secamone commutata*) and one in fruit. The fruiting specimen (*Elmer 15587*) has almost glabrous leaves and is identified to *S. luzonensis*. See also 'Unsufficiently known taxa'.

3. *Secamone crenata* Klack., *sp. nov*. — Fig. 3; Map 3

Etymology. The epithet alludes to the crenate apex of the staminal corona lobes.

This species is morphologically most similar to *Secamone radiata* but differs by its narrower, cylindric staminal column and by its apically crenate corona lobes. — Type: *Bricknell 537* (holo BRI [537264]; iso L* [L.3738654]), Philippines, Cebu Island, 1994.

Liana with younger branches hairy, glabrescent. *Leaf lamina* elliptic, 4–7 by 2.5–3.5 cm, cuneate to rounded at base, acute to apiculate at apex, with spares reddish hairs, soon glabrescent above, with few colleters at base; venation pinnate, looped, hardly visible above, with secondary veins reticulate below when dry; midrib impressed at basal part above, raised below when dry; petiole 7–12 mm long, with reddish hairs. *Inflorescences* extra-axillary, shorter than adjacent leaves, 1–2 cm long; cymes lax, few-flowered, irregularly di- to monochasially branched, with alternating longer (up to 7 mm) and shorter internodes, with reddish hairs; pedicels 1–2 mm long; bracts c. 1 mm long, triangular. *Calyx* lobes ovate, 2.5–2.8 by 1.2–1.4 mm, distinctly longer than corolla tube, rounded at apex, with sparse reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused at base for 1/3 to 1/4 of their length into a tube, not twisted, glabrous, yellow; tube distinctly broadened towards mouth, 1.3–1.4 mm long; lobes ± straight, oblong, 3.3–3.7 by 1.5–1.7 mm, rounded at apex. *Staminal column* 1–1.3 mm high. *Staminal corona* lobes indistinctly to very shallowly cleft at apex into two parts; outer part dorsally flattened, narrowly ovate to rectangular, truncate with two horns at apex; inner part dorsiventrally flattened, inclined towards style head, projecting above thecae, truncate with slightly crenate apex. *Anther wings* c. 0.3 mm long, about as long as thecae. *Pollinia* ellipsoidal, 0.1–0.15 mm long. *Style head* projecting about 1–1.5 times longer than staminal column,

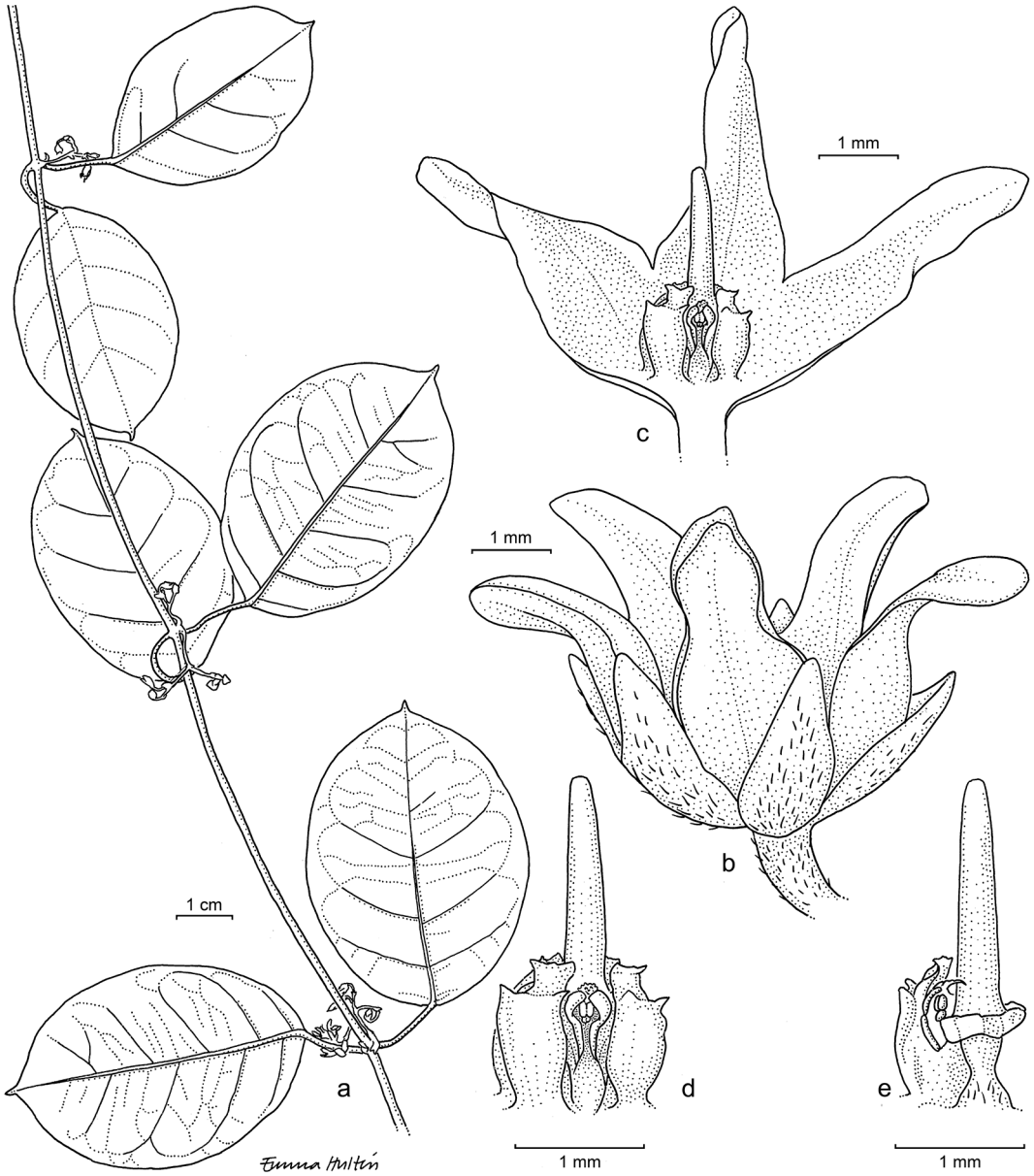


Fig. 3 *Secamone crenata* Klack. a. Habit; b. flower; c. flower with calyx and two corolla lobes removed; d. gynostegium; e. part of ovary, style and style head with one stamen in situ (all: *Bricknell 537*, BRI). — Drawn by Emma Hultén.

distinctly exserted from corolla tube; apical portion 1.7–2 mm long, c. 4 times longer than basal portion, cylindric, entire at apex; ovary hairy at top. *Fruits* not seen.

Distribution — Philippines (Cebu). Known only from the type.

Habitat & Ecology — No information.

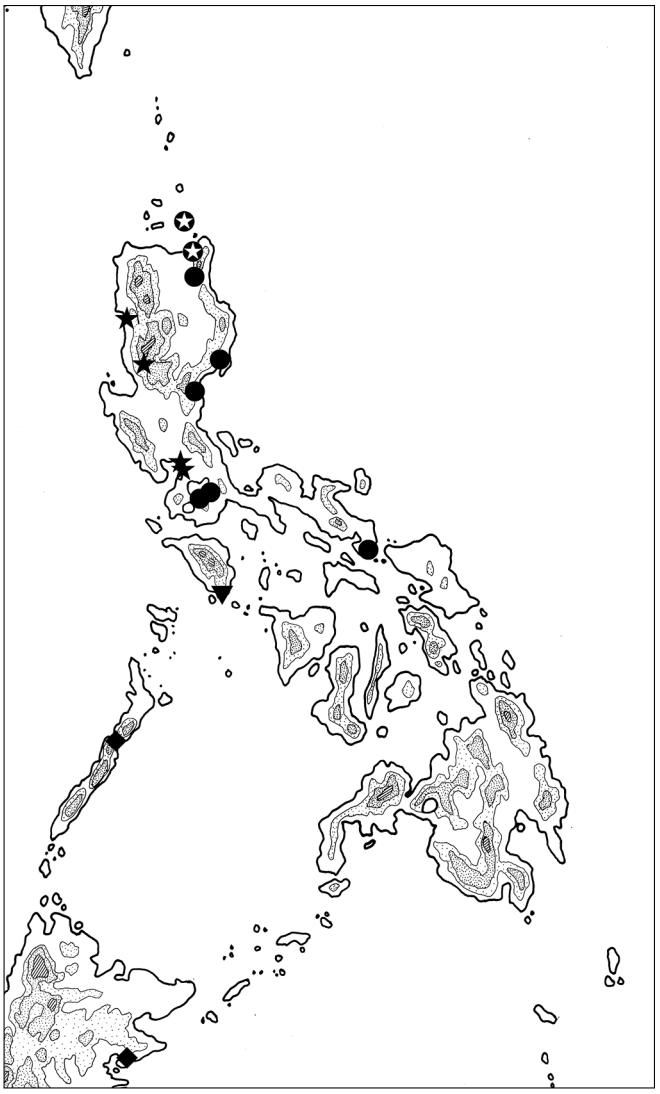
Note — See *Secamone radiata* and *S. mindanaensis.*

4. *Secamone edanoi* Klack., *sp. nov*. — Fig. 4; Map 4

This species is similar to *Secamone luzonensis* and *S. loheri* but differs by its cleft staminal corona lobes and by its finely peltate leaves. — Type: *Edaño BS 78282* (holo A), Philippines, Luzon, Cagayan Prov., Gonzaga, 1929.

Liana with younger branches covered by sparse reddish hairs, soon glabrescent. *Leaf lamina* elliptic, 6–8 by 3–5 cm, rounded and subpeltate at base, acute to shortly acuminate at apex, glabrous on both sides except for sparse reddish hairs along major nerves mostly at the very base, with a couple of colleters at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and veins raised below when dry; petiole 10–20 mm long, with sparse reddish hairs. *Inflorescences* extra-axillary, shorter to longer than adjacent leaves, 5–9 cm long; cymes rather lax, many-flowered, irregularly di- to monochasially branched with alternating short and long (up to 2.5 cm) internodes, with rather sparse and patchy reddish hairs; pedicels 1–2 mm long; bracts triangular, c. 1 mm long. *Calyx* lobes broadly ovate, c. 1.3 by 1 mm, about as long as tube, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for about 1/4 of their length into a tube, not to slightly twisted, glabrous except for some flattened and white (when dry) hairs along V-formed ridges at base of lobes inside, colour unknown; tube campanulate, c. 1.3 mm long; lobes ± straight, oblong, c. 3.7 by 1.5 mm, obtuse at apex. *Staminal column* c. 0.8 mm high. *Staminal corona lobes* cleft for about half of their lengths into two distinct parts; outer part ± ovate, dorsally flattened, subobtuse at apex, broadened at base, projecting about as long as thecae; inner part dorsiventrally flattened, narrow, acute, projecting distinctly longer than outer part. *Anther wings* 0.25 mm long, about as long as thecae. *Pollinia* broadly ellipsoidal to almost globular, c. 0.1 mm long. *Style head* projecting, about 1.5 times longer than staminal column, distinctly exserted from corolla tube; apical portion c. 1.8 mm long, 3–4 times longer than basal portion, cylindric, entire at apex; ovary hairy at top. *Follicles*

Fig. 4 *Secamone edanoi* Klack. a. Habit; b. magnification of basal part of leaf lamina; c. flower in bud; d. flower with calyx and two corolla lobes removed; e. portion of corolla from within; f. gynostegium; g. basal part of style head and one stamen; h. pollinaria; i. follicles (a–h: *Edaño BS 78282*; i: *Edaño BS 79352*, all A). — Drawn by Andrea Klintbjer.



Map 4 Distribution of *Secamone edanoi* Klack. (✪), *S. loheri* (Schltr.) Klack. (★), *S. luzonensis* Klack. (●), *S. maritima* Blume (◆) and *S. pyriformis* Klack. (▼).

narrowly ovate in outline, c. 10 by 1.5 cm, thin-walled, glabrous, recurved ± 90°. *Seeds* not seen.

Distribution — Philippines (Northern Luzon, Babuyan islands).

Habitat & Ecology — Flowering: October.

Additional specimen examined. PHILIPPINES, Babuyanes, Camiguin Island, Mt Mapolapola, 1930, *Edaño BS 79352* (A).

Note — *Secamone edanoi* is in habit similar to *S. luzonensis* and *S. commutata* by its elliptic to oblong and almost glabrous leaves, short corolla tubes and also by its pale corolla when dry, except for some darker spots towards base of tube (vs dark corolla when dry except for a contrasting pale lobe margin characteristic for *S. glauca*, *S. loheri* and *S. merrillii*). *Secamone edanoi* differs by the distinctly cleft staminal corona lobes into two dorsiventrally flattened parts, the outer one being broader but shorter than the inner one. Furthermore, it differs by its subpeltate leaves, i.e., the lamina is united at the very base below the colleters. This inconspicuous but distinct character has in the Philippines been observed only in *S. edanoi* but is present also in *S. subpeltata* (Klack.) Rodda & Klack. from the Malay Peninsula. It is in contrast to the ordinary cuneate leaf bases seen in *S. luzonensis* and *S. fenixii*, two adjacent species distributed to the north and south of *S. edanoi*. *Secamone edanoi* and the probably sympatric *S. fenixii* from northern Luzon and Basco Islands are similar in floral characters, but clearly differ in leaf shape (elliptic and subpeltate vs usually broadly ovate with cordate base in *S. fenixii*).

5. *Secamone elliptica* R.Br. — Fig. 5

Secamone elliptica R.Br. (1810a) 464. — Lectotype (designated by Forster & Harold 1989: 70): *Brown 8*, *Iter Australiense no 2871* (lecto BM [BM001040504]; isolecto BRI* [BRI-AQ0333111], MEL* [MEL1553064]), Australia, N Territory, Carpentaria, Groote Island, 4 Jan. 1803.

Secamone attenuata Decne. (1844) 501. — Lectotype (designated by Klackenberg 1992a: 601): *Cuming 1536* (lecto P [P04547003]; isolecto BM [BM001014104], C [C10006841]*, E, G [G00177436, G00177437], K [K000910028, K000910029], L* [L0931186], MO, MW (n.v.), P [P04547004], UPS), Philippines.

Secamone multiflora Decne. (1844) 501. — Lectotype (designated by Klackenberg 1992a: 601): *Cuming 1284* (lecto P [P04546991]; isolecto BM [BM001014103], BRI* [BRI-AQ0333115], E [E00288562], G [G00177438], GOET [GOET005771], K [K000910025], L [L 0004396], MEL* [MEL1553192], MO, MW (n.v.), P [P04546992, P04546994], UPS, W), Philippines.

Leaf lamina narrowly ovate to ovate or elliptic, acute to usually acuminate at apex, glabrous, without colleters at base of the lamina. *Cyme* much shorter than subtending leaf. *Corolla* in bud broadly ovoid, with right lobe margins overlying, yellow; lobe 2–3 times longer than tube, oblong-ovate, puberulous-papillate at mouth. *Staminal corona* lobes entire, ± compressed laterally, falcate, shorter than to ± equalling staminal column. *Style head* not or only slightly protruding from staminal column; upper portion about as long as lower portion; style lacking.

Distribution — From S China, SE Asia mainland throughout Malesia to Australia, Vanuatu and New Caledonia. In the Philippines: Luzon, Mindanao, Mindoro, Palawan, Panay and Romblon, but probably present at all islands.

Habitat & Ecology — Open rain forest and vine forest; scrub; disturbed areas or road-sides on clay; sandy sea-shores. Elevation up to 2700 m (in China). Flowering: all year through.

Fig. 5 *Secamone elliptica* R.Br. from Palawan. — Photograph by © Danilo Tandang.

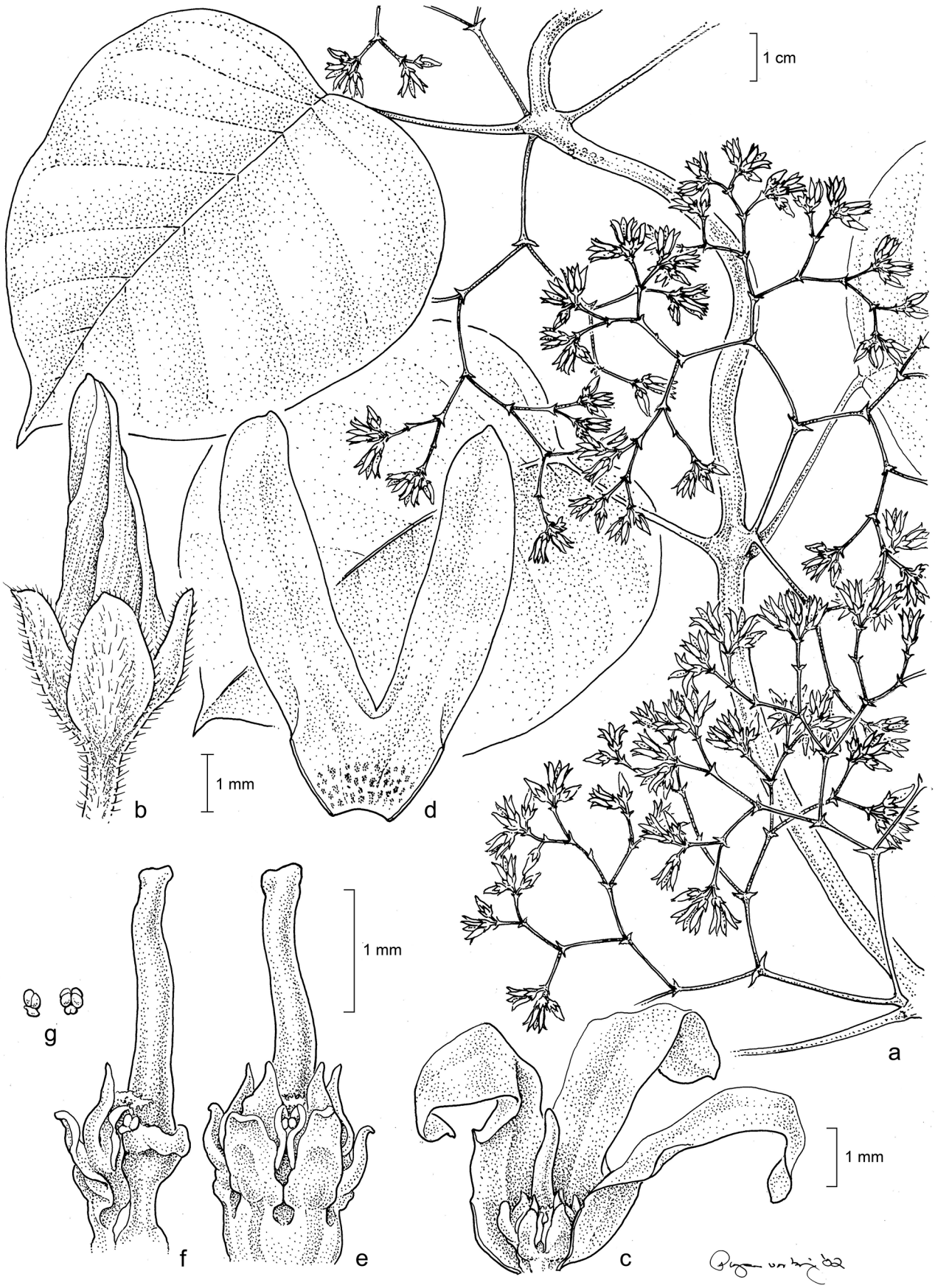


Fig. 6 *Secamone fenixii* (Schltr. ex Tsiang) Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. part of ovary, style and style head with one stamen and pollinarium in situ; g. pollinaria (all: *Ramos BS 80412*, A). — Drawn by Pollyanna von Knorring.

Notes — 1. The corolla lobes are in *S. elliptica* overlying with their right margins in bud in contrast to the prevalent aestivation with lobes overlying to the left or valvate seen in other Asian species of *Secamonoideae*. Furthermore, it is together with the Indian / Sri Lankan *S. emetica* the only Asian species lacking colleters at the bases of leaves. It is the most widspread and most common (often collected) species in the subfamily.

2. Three subspecies of *S. elliptica* are recognised (Klackenberg 1992a), viz. subsp. *elliptica*, subsp. *minutiflora* (Tsiang) Klack. and subsp. *siamica* (Kerr) Klack. Only the autonymous subspecies is present in the Philippines.

3. For extended description with illustrations and synonymy outside the Philippines, see Forster & Harold (1989) and Klackenberg (1992a).

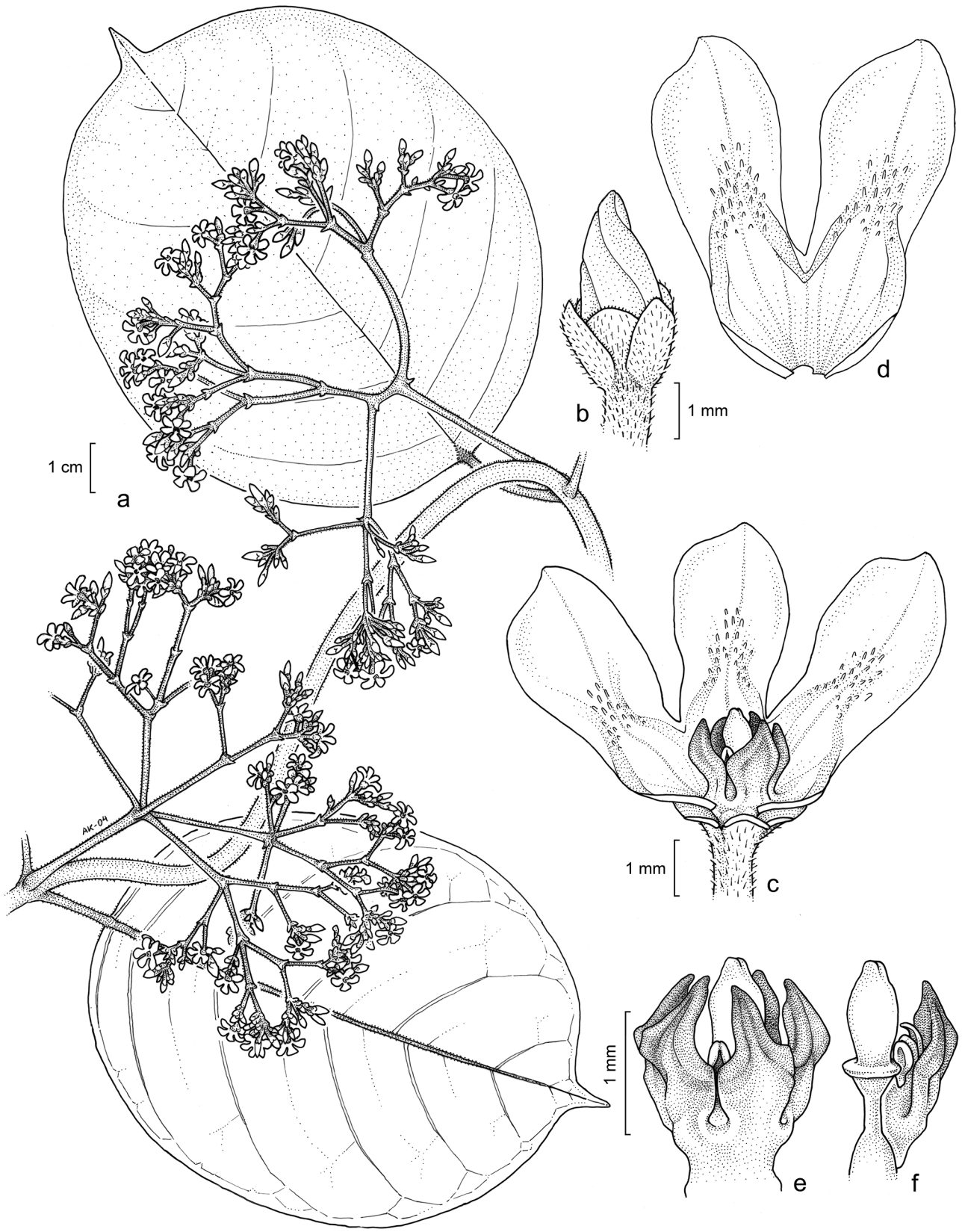


Fig. 7 *Secamone fusiformis* Klack. a. Habit; b. flower in bud; c. flower with part of calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. part of ovary, style and style head with one stamen in situ (all: *Ramos BS 43357*, A). — Drawn by Andrea Klintbjer.

6. *Secamone fenixii* (Schltr. ex Tsiang) Klack., *comb. nov.* — Fig. 6; Map 2

Toxocarpus fenixii Schltr. ex Tsiang, Sunyatsenia 4 (1939) 74. — Type: *Fenix BS 3658* (holo PNH, lost). Neotype (designated here): *Ramos BS 80412* (neo A), Philippines, Batanes Prov., Batan Island, Mahataw, May 1930.
Toxocarpus batanensis Hatus. (1966) 46. — Type: *Hatusima & Sato 28634* (holo KAG* [KAG006264]), Philippines, Batan Islands, 9–16 Nov. 1964.

Liana with glabrous branches. *Leaf lamina* broadly elliptic to broadly ovate, 8–11 by 5–9 cm, rounded to truncate at base, rounded or retuse to usually apiculate at apex, sparsely hairy on both sides, glabrescent but with persisting hairs along main veins, with c. 5 colleters at base; venation pinnate, looped, with secondary veins distinct and reticulate below when dry; midrib ± flush with leaf surface above, midrib and veins raised below when dry; petiole 2–4.5 cm long, hairy. *Inflorescences* extra-axillary, up to about as long as adjacent leaves but usually shorter, 4–10 cm long; cymes rather lax, profuse, irregularly di- to monochasially branched, with alternating longer (up to 25 mm) and shorter internodes, with reddish hairs; pedicels 1–3.5 mm long; bracts triangular, 1–2.5 mm long. *Calyx* lobes ovate, 2.3–2.8 by 1.2–1.3 mm, longer than corolla tube, obtuse at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for about 1/5 of their length into a tube, not twisted, glabrous, yellow; tube widening towards mouth, 1.3–1.5 mm long; lobes bent outwards, oblong, 5.2–6.4 by 1.5–1.7 mm, obtuse to rounded at apex. *Staminal column* c. 1.3 mm high. *Staminal corona* lobes cleft for about half of their lengths into two distinct parts; outer part at base thick and dorsally rounded but towards apex thinner and dorsiventrally flattened, ovate, rounded at apex, erect to bent outwards; inner part dorsiventrally flattened, acute at apex, erect, projecting above outer part. *Anther wings* c. 0.15 mm long, about as long as thecae. *Pollinia* ellipsoidal, c. 0.1 mm long. *Style head* projecting 2–3 times longer than the staminal column, distinctly exserted from corolla tube; apical portion c. 2.1 mm long, 2.5–3 times longer than basal portion, cylindric, entire to slightly bifid at apex; ovary glabrous. *Follicles* narrowly ovate, 7–13 by 1–1.5 cm, slightly curved, thin-walled, glabrous, recurved 90–135°. *Seeds* c. 4 mm long; coma 2–3 cm long.

Distribution — Philippines (Northern Luzon and Batanes Islands).

Habitat & Ecology — Littoral thickets, evergreen disturbed forest. Flowering: May.

Additional specimens examined. Philippines, Batanes Prov., Batan Island, *Hatusima & Sato 28782* (KAG); Basco, Tukon trail, elev. 200 m, 1996, *Madulid et al. PPI 23985* (L); Basco, 1930, *Ramos BS 79824* (A); Mt Iraya, 1930, *Ramos BS 80260* (A); 1930, *Ramos BS 80633* (A). – Luzon, Ilocos Norte Prov., Burgos, *Ramos BS 27110* (NY, P, US).

Notes — 1. *Secamone fenixii* is together with *S. fusiformis*, *S. lepta* and *S. merrillii* characterized by large broadly elliptic to rounded leaves and profuse inflorescences. *Secamone fenixii* differs by its glabrous corolla. In floral characters *S. fenixii*, *S. edanoi* and *S. luzonensis*, all present in northern Luzon, share a similar gynostegial structure with long cylindric style heads and distinctly cleft corona lobes of which the outer lobe is shorter. *Secamone fenixii* differs by its broad and cordate leaves (vs elliptic).

2. Tsiang (1939) designated *Fenix BS 3658* from Batanes Islands as type, more specifically a sheet with an annotation '*Toxocarpus fenixii*' by Schlechter that he saw in the Philippine National Herbarium. In the protologue Tsiang also mentioned a paratype collection, *Ramos BS 33062*, from Ilocos Norte province of Luzon. These sheets are not extant at PNH and are considered destroyed. No duplicate of the holotype is known. However, paratype material is present at L and SING. These specimens are in fruit, and although the leaves are similar to material of *Secamone* from Batanes Islands, the inflorescence and fruits do not fit in genus *Secamone* and the *Ramos BS 33062* collection does in fact not belong to *S. fenixii*. A neotype, corresponding to Tsiang's protologue and detailed illustration of the flowers, is here designated.

7. *Secamone fusiformis* Klack., *sp. nov.* — Fig. 7; Map 2

Etymology. The epithet alludes to the spindle-shaped upper part of the style head.

This new species agrees in habit with *Secamone merrillii* by its broad and hairy leaves but differs by its shorter corolla tube, by its ovoid corolla buds (vs cylindric), and by its short and spindle-shaped style head (vs long and cylindric). — Type: *Ramos BS 43357* (holo A; iso BM, BO, G, SING [SING0122567], US [1377287], W), Philippines, Bohol, Aug.–Oct. 1923.

Liana with branches covered by dense erect reddish hairs. *Leaf lamina* circular to very broadly elliptic, 10–11 by 8.5–9.5 cm, rounded to very shallowly cordate at base, apiculate at apex, with dense erect reddish hairs below, sparsely hairy above, with few colleters at base covered by hairs; venation pinnate, looped, with secondary veins distinct and reticulate below when dry; midrib impressed above, midrib and primary veins raised below when dry; petiole 20–25 mm long, with dense reddish hairs. *Inflorescences* extra-axillary, rather long and about as long as adjacent leaves to usually shorter, 7–12 cm long; cymes with flowers rather densely clustered apically, profuse, di- to monochasially branched with longest (up to 5 cm) internodes basally becoming shorter towards apex, with dense reddish hairs; pedicels 2–4 mm long; bracts triangular, c. 1.5 mm long. *Calyx* lobes broadly ovate, c. 1.5 by 1.2 mm, about as long as corolla tube, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for c. 1/4 of their length into a tube, not to only slightly twisted, papillately hairy on and between V-formed ridges at lower part of lobes but glabrous at upper half and at basal 0.5 mm of lobes, colour unknown; tube widening towards mouth, c. 1.5 mm long, glabrous; lobes bent outwards, oblong to obovate, c. 4.7 by 2.2 mm, rounded at apex. *Staminal column* c. 1.4 mm high. *Staminal corona* lobes cleft for about half of their lengths into two distinct parts; outer part dorsiventrally flattened, ovate to angular-ovate, acute at apex, straight, projecting about as long as style head to slightly shorter; inner part very small and narrow, bent over connective towards style head. *Anther wings* c. 0.15 mm long, shorter than thecae. *Pollinia* ellipsoidal, c. 0.15 mm long. *Style head* distinctly projecting above staminal column but only slightly longer than corona lobes, about as long as corolla tube to slightly projecting; apical portion c. 1 mm long, slightly longer than basal portion, fusiform, entire at apex; ovary glabrous. *Fruits* not seen.

Distribution — Philippines (Bohol). Known only from the type.

Habitat & Ecology — Flowering: August to October.

Note — *Secamone fusiformis* is in habit similar to *S. lepta* and *S. merrillii* by its lax and many-flowered inflorescences and by its broad and hairy leaves, but is easily distinguished from these two species by its short and fusiform stigma head, which is only barely projecting from the corona lobes (vs cylindric stigma heads projecting about twice above the corona lobes). The corona lobes are distincly darker than the corolla and style head when dry. Furthermore, the anther wings are only half the length of the theca in *S. fusiformis*, much shorter than in other species.

8. *Secamone glandulifera* Klack., *sp. nov*. — Fig. 8; Map 2

Etymology. The epithet refers to the prominent leaf glands.

This species is distinguished by its foliar glands being situated at the petiole below the base of the lamina (vs at the base of the lamina seen in all Philip-

Fig. 8 *Secamone glandulifera* Klack. a. Habit; b. magnification of leaf base; c. flower in bud; d. flower with calyx and one corolla lobe removed; e. portion of corolla from within; f. gynostegium; g. style head with one stamen and pollinarium in situ; h. pollinaria (all: *Ramos & Edaño BS 85047*, A). — Drawn by Andrea Klintbjer.

pine congeners) and by its red corolla. — Type: *Ramos & Edaño BS 85047* (holo A; iso A), Philippines, Mindanao, Prov. of Cotabato, Mt Matutum, elev. 2000 ft, 27 Apr. 1932.

Liana with younger branches covered by erect reddish hairs, soon glabrescent. *Leaf lamina* elliptic, 9–12 by 5–7 cm, rounded at base, apiculate at apex, with sparse erect reddish hairs below but above mostly at the very base only; colleters 5–10 at petiole below lamina; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and veins raised below when dry; petiole 15–20 mm long, with reddish hairs, glabrescent. *Inflorescences* extra-axillary, longer to shorter than adjacent leaves, 10–12 cm long; cymes lax, few- to many-flowered, irregularly di- to monochasially branched with alternating short and long (up to 5 cm) internodes, with reddish hairs; pedicels 1.5–5.5 mm long; bracts triangular, 1–1.5 mm long. *Calyx* lobes ovate, 2.3–2.5 by 1.3–1.5 mm, slightly longer than corolla tube, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused at the very base for 1/5–1/6 of their length into a tube, not twisted, with some reddish hairs outside, hairy inside tube and at base of lobes particularly along V-formed ridges, red; tube short and ± cylindric, c. 1.3 mm long; lobes slightly curved, oblong, 6.0–7.4 by 1.4–1.6 mm, obtuse to subacute at apex. *Staminal column* c. 1.2 mm high. *Staminal corona* lobes only shallowly cleft at apex into two parts; outer part ± triangular and dorsally flattened with free margins, slightly hastate at base, subobtuse at apex; inner part slightly longer and narrower, inclining towards style head, projecting above thecae. *Anther wings* c. 0.4 mm long, twice as long as thecae. *Pollinia* ellipsoidal, c. 0.15 mm long. *Style head* projecting about

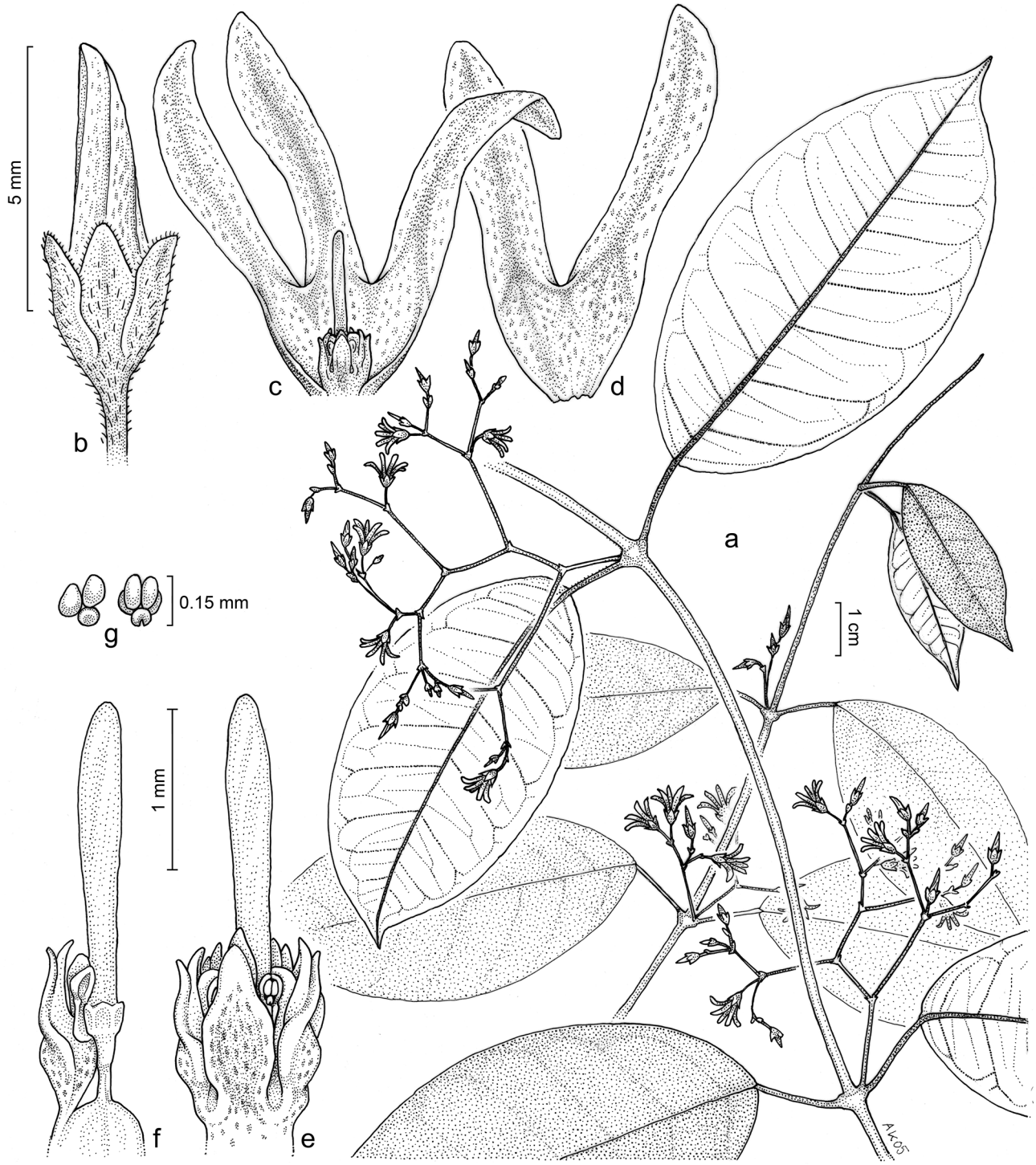


Fig. 9 *Secamone glauca* (Decne.) Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. part of ovary, style head and one stamen; g. pollinaria (all: *Cuming 1571*, G). — Drawn by Andrea Klintbjer.

twice longer than staminal column, exserted from corolla tube; apical portion c. 1.7 mm long, c. 3 times longer than basal portion, cylindric, entire at apex; ovary glabrous. *Fruits* not seen.

Distribution — Philippines (Mindanao). Known only from the type.

Habitat & Ecology — Collected along stream in forest at c. 670 m elevation. Flowering: April.

Note — *Secamone glandulifera* is recognized by its foliar colleters situated at the petiole below the base of the lamina (vs at the base of the lamina) and by its red flowers, a colour rarely seen in *Secamonoideae*, and hitherto not reported from the Philippines. The inflorescence is lax and the bases of the corolla lobes are furnished with fleshy deeply V-formed lines uniting along the lobe sinuses. The corolla lobes are slightly hairy also on the outside.

9. *Secamone glauca* (Decne.) Klack., *comb. nov*. — Fig. 9; Map 1

Toxocarpus glaucus Decne. in DC., Prodr. 8 (1844) 505. — Type: *Cumming* [*Cuming*] *1571* (holo P), Manille, sine anno.
Toxocarpus gracilis Decne. (1844) 506. — Type: [*Cuming*] *1559* (holo P, sine loco vel anno; iso K [K001222318] 'Ins. Philippinae, Prov. Batangas, Luzon'; BM[BM000793232], G, W, 'Ins. Philippinae').

Liana with younger branches covered by erect reddish hairs. *Leaf lamina* oblong to usually elliptic, 6–10 by 3–6 cm, cuneate to truncate at base, acuminate at apex, with sparse reddish hairs when young but soon glabrescent except for the very base and major veins, with a couple of colleters at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and primary veins raised below when dry; petiole 15–20 mm long, with reddish hairs. *Inflorescences* extra-axillary, shorter than adjacent leaves, 4–7 cm long; cymes lax, many-flowered, irregularly di- to monochasially branched with alternating short and long (up to 2 cm) internodes, with reddish hairs; pedicels 1–3 mm long; bracts triangular, 1–1.5 mm long. *Calyx* lobes ovate, 2.1–2.3 by 1.1–1.2 mm, about as long as to longer than corolla tube, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused only at the very base for 1/3–2/7 of their length into a tube, not to slightly twisted, glabrous, colour unknown; tube cylindric, c. 2 mm long; lobes ± straight, oblong, 4.3–5 by 1–1.2 mm, obtuse to subacute at apex. *Staminal column* 0.9–1 mm high. *Staminal corona* lobes distinctly cleft at apex into two parts; outer part dorsiventrally compressed, ovate, subobtuse at apex, projecting to or slightly above thecae; inner part much narrower, about as long as outer part. *Anther wings* 0.2–0.25 mm long, about as long as thecae. *Pollinia* ellipsoidal, 0.1–0.15 mm long. *Style head* projecting 1.5–2 times longer than staminal column, exserted from corolla tube; apical portion c. 2 mm long, c. 2.5 times longer than basal portion, cylindric, entire at apex; ovary glabrous. *Fruits* not seen.

Distribution — Philippines (Luzon, Mindoro).

Habitat & Ecology — Probably in monsoon forest or savannah.

Additional specimens studied, *possibly isotypes*. PHILIPPINES, Ins. Philippinae, Mindoro, BM [BM000793237], Ins. Philippinae, Luzon, Prov. Batangas, K [K001222316], *Cuming 1571*, E, G, W.

Notes — 1. *Secamone glauca* has glaucous leaves underneath. It is in habit most similar to *S. luzonensis*, but differs by its glabrous corolla (vs distinctly hairy inside tube and at lobe bases in *S. luzonensis*) and by its bifid staminal corona lobes (vs inner and outer parts of lobe united to apex). Furthermore, the corolla turns dark brown upon drying, in contrast to *S. luzonensis* in which the corollas remain pale.

2. Decaisne simultaneosly published *Toxocarpus glaucus* and *T. gracilis*. Tsiang (1939: 71) synonymized these two species and added also *T. loheri* under the chosen epithet *glaucus*, arguing that there are practically no floral nor vegetative differences between these taxa. *Toxocarpus loheri* is in the present revision treated as a distinct species, *Secamone loheri.*

3. Decaisne (1844) gave 'circa Manillam?' with a question mark as a vague geographical location for both *Toxocarpus glaucus* and *T. gracilis*, referring to sheets in Paris Natural History Museum. A sheet of *T. glaucus* in Paris, identified by Decaisne, is furnished with a Herb. Mus. Paris preprinted label with the text 'Manille. Collect. de Cumming', a locality Decaisne seems to have doubted by his question mark in the protologue. Cuming's plants were distributed to many herbaria, but often without localities added to the duplicate series. Furthermore, the collection numbers distributed are not field numbers, but numbers given by Cuming in connection with the distribution of duplicates some years after his return to England. A complete list of collection sites and dates cannot be found, either lost or was maybe never compiled (Rolfe 1908). An incomplete list of Cuming's collections was published by Vidal y Soler (1885). According to this list Cuming's numbers between *1430* and *1603*, i.e., including both *1571* (*T. glaucus*) and *1559* (*T. gracilis*), were mainly collected in Batangas province, but also in other places like the Province of Camarines Sur or Mindoro island. The most complete sets of Cuming's collections are kept at K and BM. The *Cuming 1571* sheets at K [K001222316] and BM [BM000793237] are labelled 'Ins. Philippinae Prov. Batangas, Luzon' and 'Mindoro', respectively. Thus, the two main sets of Cuming's herbarium are annotated from different localities and cannot be considered isotypes. One of them might be and both places are possible type localities. Other duplicates of *Cuming 1571* lack information other than Philippines. Also *T. gracilis* was described on Cuming's material seen by Decaisne in the Paris herbarium. There is one duplicate sheet of *Cuming 1559* at P that partly corresponds to the protologue. However, this duplicate too lacks information on both collection site and collector's name, but has small pieces of paper pinned to it with Cuming's collection number and a latin description by Decaisne's hand, which in parts corresponds to the protologue. *Cuming 1559* at Kew is labelled 'Prov. Batangas', sheets in other herbaria lack specific locality other than Philippines. In this case, as no contradictory information is known, these sheets are considered isotypes.

10. *Secamone lepta* (Tsiang) Klack., *comb. & stat. nov.* — Fig. 10; Map 3

Toxocarpus merrillii Schltr. f. *leptus* Tsiang, Sunyatsenia 4 (1939) 67. — Lectotype (designated here): *Wenzel 413* (lecto BM; isolecto A [00003605]), Philippines, Leyte, 8 Sept. 1914.

In the description below deviating characters of the collection from Bohol are given between brackets. See note under description for explanation.

Liana with branches covered by erect reddish hairs. *Leaf lamina* oblong to elliptic, (8–11 by 4–5) 11–20 by 7–13 cm, (truncate to) rounded to cordate at base, apiculate at apex, with erect reddish hairs below (to almost glabous), more sparsly hairy (to glabrous) above, with few colleters at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and veins raised below when dry; petiole (c. 1) 2–3 cm long, with reddish hairs. *Inflorescences* extra-axillary, longer to shorter than adjacent leaves, (c. 10) 15–20 cm long; cymes lax, profuse, di- to monochasially branched with longest internodes at base up to (3) 10 cm becoming shorter towards apex, with dense reddish hairs; pedicels (1–2) 2–5 mm long; bracts triangular, 1–1.5 mm long. *Calyx*

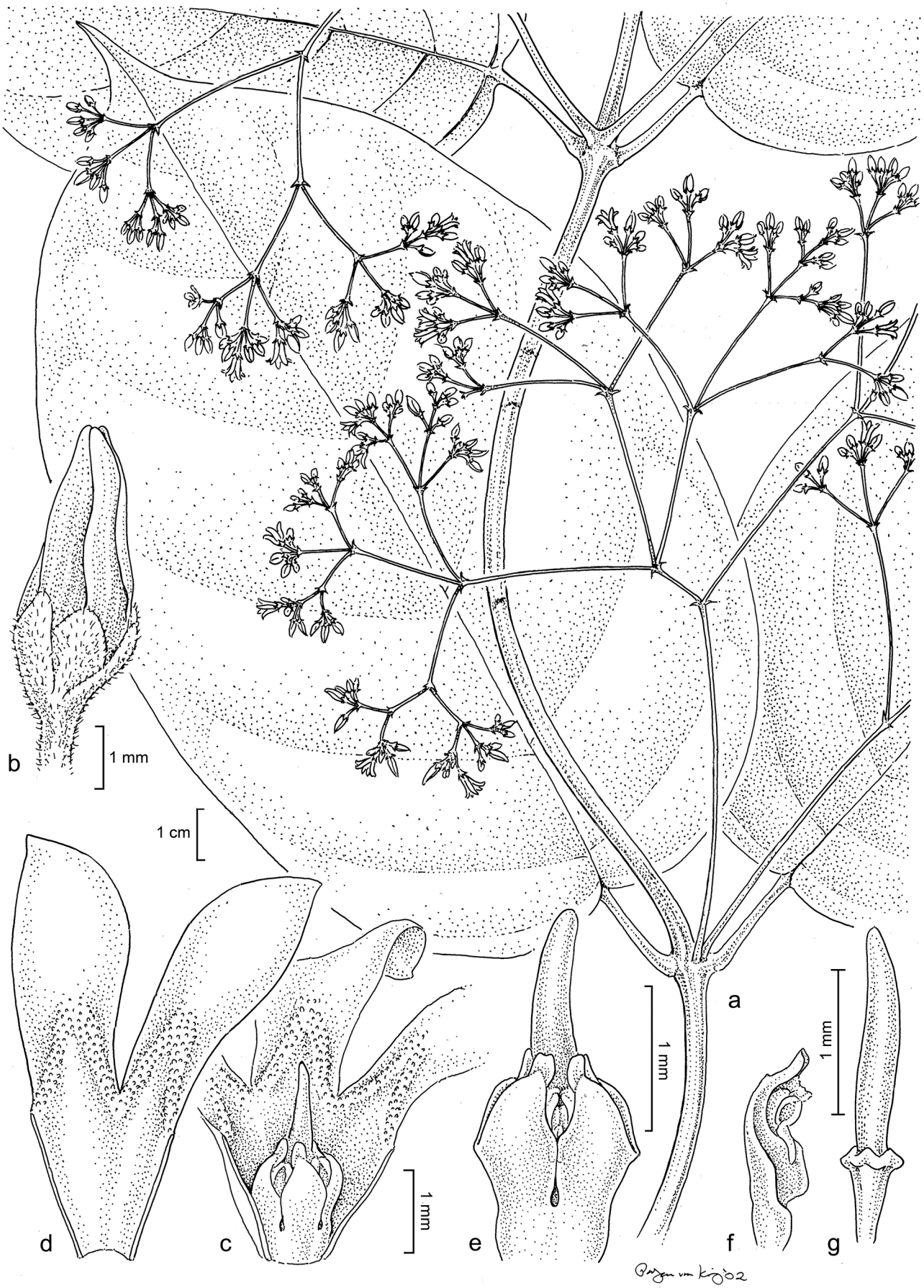


Fig. 10 *Secamone lepta* (Tsiang) Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. anther; g. style head (all: *Wenzel 413*, BM). — Drawn by Pollyanna von Knorring.

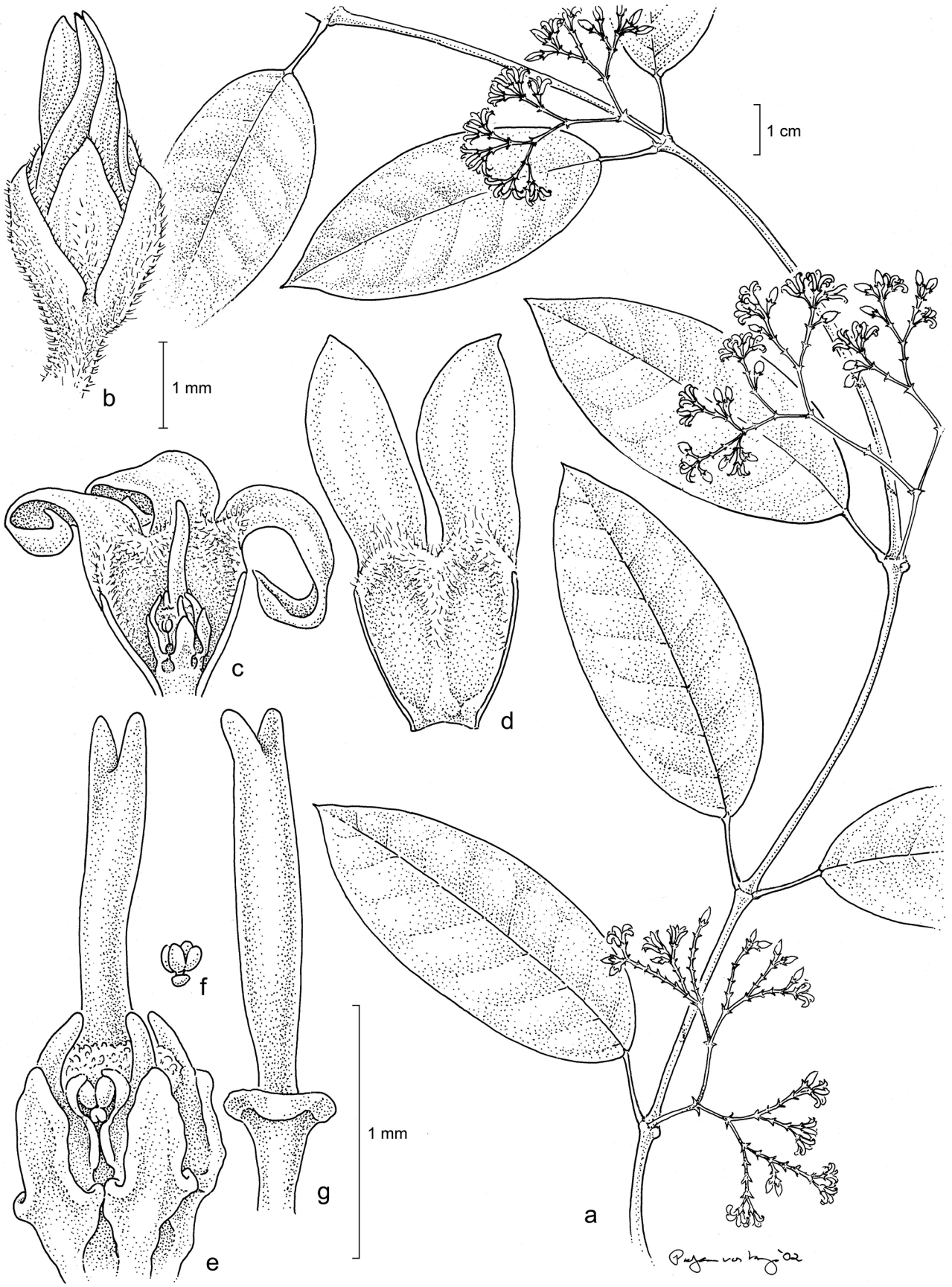


Fig. 11 *Secamone loheri* (Schltr.) Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. pollinarium; g. style head (all: *Mendoza PNH 4262*, BR). — Drawn by Pollyanna von Knorring.

lobes ovate, (1–1.1 by 0.6–0.7) 1.3–1.8 by 0.8–1 mm, shorter than corolla tube, rounded at apex, with reddish appressed hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margins overlying and with lobes fused for 2/5–1/3 of their length into a tube, not to slightly twisted, glabrous outside, papillate to shortly hairy inside upper half of tube and at base of each lobe particularly along V-formed ridges c. 1/3 of its length (seen best when dry), colour unknown; tube widening towards mouth, (1.3–1.5) 2–2.4 mm long; lobes bent outwards, triangular to slightly obovate, (3–3.5 by c. 1.3) 3.4–4 by 1.8–2 mm, rounded at apex. *Staminal column* 0.7–1 mm high. *Staminal corona* lobes with outer and inner parts united and not cleft at apex, dorsally flattened, ± triangular with narrower apical (inner) part inclining towards style head, rounded at apex, projecting above thecae. *Anther wings* 0.2–0.25 mm long, about as long as thecae. *Pollinia* ellipsoidal, c. 0.15 mm long. *Style head* projecting about twice (three times) longer than staminal column, exserted from corolla tube; apical portion cylindric, 1.2–1.6 mm long, 2–2.5 times longer than basal portion, entire to slightly bifid at the very apex; ovary glabrous. *Fruits* not seen.

Distribution — Philippines (Bohol, Leyte).

Habitat & Ecology — Flowering: August and September.

Additional specimen examined. Philippines, Bohol, 1923, *Ramos BS 43291* (A, BM, G, K, P, PNH, SING, US); Leyte, 1913, *Wenzel 313* (BM).

Notes — 1. *Secamone lepta* resembles *S. fusiformis* from Bohol Island as well as *S. fenixii* from northern Philippines by its large leaves, profuse inflorescences and funnel-shaped corolla tube. It differs, however, from *S. fusiformis*, the only other *Secamone* at present known from Bohol Island, by a narrower and longer corolla tube as well as by a cylindric and longer style head which projects about twice as long or more than the staminal column (vs short open corolla tube and fusiform style head only slightly longer than the staminal column in *S. fusiformis*). It is distinguished from *S. fenixii* by the corolla lobes being hairy at base, particularly along V-formed ridges (vs glabrous in *S. fenixii*).

2. Floral characters of *Ramos BS 43291* (between brackets in description above) from Bohol conforms with the collections of *S. lepta* from Leyte except for being smaller in all parts. Also the leaves are smaller, almost glabrous and with shorter petioles.

3. *Secamone lepta* was first described as a form of *S. merrillii*, distinguished by larger leaves as well as inflorescences (Tsiang 1939). In fact, the type material has conspicuously large leaves but other material is not constant in this character. However, profuse inflorescences, together with outer and inner parts of corona lobes only indistinctly separated, clearly distinguishes *S. lepta* from *S. merrillii.* In addition, the corolla in *S. lepta* is in the dry state evenly pale with some darker spots only, in contrast to the entirely dark corolla with a pale margin seen in *S. merrillii.*

11. *Secamone loheri* (Schltr.) Klack., *comb. nov.* — Fig. 11; Map 4

Toxocarpus loheri Schltr. in Perkins, Fragm. Fl. Philipp. (1904) 122. — Lectotype (designated here): *Loher 4032* (lecto K; isolecto M [M-0175147]*), Philippines, Luzon Central, San Francisco del Monte, 8 Dec. 1892.

Liana with younger branches covered by erect reddish hairs, soon glabrescent. *Leaf lamina* elliptic, 5–8 by 2.5–4 cm, cuneate to rounded or usually truncate at base, acute to shortly acuminate at apex, glabrous on both sides or with few reddish hairs along major nerves mostly at the very base, with 5–10 colleters at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and primary veins raised below when dry; petiole 7–15 mm long, with reddish hairs, glabrescent. *Inflorescences* extra-axillary, much shorter than adjacent leaves, 1.5–4 cm long; cymes rather dense, many-flowered, di- to monochasially branched with alternating short and long (up to 1 cm) internodes, with sparse short reddish hairs; pedicels very short, to 1 mm long; bracts triangular, 0.5–1 mm long. *Calyx* lobes ovate, 1.6–1.7 by 0.9–1.2 mm, about as long as tube, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for about 1/3 of their length into a tube, not to slightly twisted, glabrous outside, with flattened white and conspicuous (when dry) hairs covering most of tube inside and base of lobes particularly along V-formed ridges, dark yellow turning purplish; tube campanulate to cylindric, 1.3–1.5 mm long; lobes ± straight to probably bent outwards, oblong, 2.4–3 by 1–1.1 mm, obtuse to subacute at apex. *Staminal column* 0.6–0.7 mm high. *Staminal corona* lobes not or only slightly cleft at apex into two parts; outer part broader, dorsally flattened, ovate and distinctly hastate, subobtuse at apex; inner (upper) part narrow, projecting above thecae. *Anther wings* c. 0.15 mm long, about as long as thecae. *Pollinia* ellipsoidal to broadly ellipsoidal, 0.1–0.15 mm long. *Style head* projecting 2–3 times longer than staminal column, exserted from corolla tube; apical portion 1.5–1.9 mm long, 3–4 times longer than basal portion, cylindric, entire or slightly bifid at apex; ovary glabrous. *Follicles* narrowly ovate, c. 10 by 1 cm, straight, thin-walled, glabrous, recurved 90°. *Seeds* c. 10 mm long; coma c. 3 cm long.

Distribution — Philippines (Luzon).

Habitat & Ecology — Seems to be restricted to monsoon and savannah climate. Known from thicket at edge of rice paddies. Flowering: December.

Additional specimens examined. Philippines, Luzon, Ilocos Sur prov., San Estaban, 1928, *Clemens 17922* (BO, S, SING, W); Benguet, Tonglon [Santo Tomas], *Loher 4027* (US); Luzon central, San Francisco del monte Manila, 1892, *Loher 4030* (K); Bulacan, Polo, 1946, *Mendoza PNH 4262*) (A, BR, PNH).

Notes — 1. Tsiang (1939) synonymized this species under *S. glaucus* (as *Toxocarpus*). *Secamone loheri* differs, however, in several characters, e.g., by the structure of the staminal column (hastate corona lobes), by having flat rather broad hairs at the mouth of the corolla tube (vs glabrous), and by the proportionally long tube (corolla lobes united 2/5 of their lengths vs 1/3 in *S. glauca*).

2. *Loher 3877* (K), a specimen from Central Luzon, is similar to *Secamone loheri* but deviates by having more distinctly cleft corona in an outer and an inner lobe at apex.

12. *Secamone luzonensis* Klack., *sp. nov*. — Fig. 12; Map 4

This species is in habit similar to *Secamone loheri* and *S. glauca* but differs from the former by having entire corona lobes equalling the staminal column (instead of outer and inner lobes of different lenghts) and by a short corolla tube, and from the latter by its hairy leaves as well as its hairy corolla tube and lobe basis. — Type: *Quisumbing PNH 2056* (holo A; iso PNH n.v.), Philippines, Tayabas, Baler, 5 May 1947.

Toxocarpus sorsogonensis Elmer (1938) 3598, pro parte quoad *Elmer 15587*, nom. nud., pro syn. (A, BM, BO, G, GH, K* [K000910093], L, MICH, P* [P03874894], PNH (n.v.), S [S23-20071], U, US [1050565, 3416712*], Z), Philippines, Luzon, Prov. of Sorsogon, Irosin (Mt Bulusan), 1915.

NB. *Elmer 15587* at NY and US*[03266832] are *Dischidia diphylla* Elmer, wrongly labelled as Elmer's *Toxocarpus sorsogonensis*, maybe a mix up with *Elmer 15870* from the same locality.

Liana with younger branches usually sparsely covered by reddish hairs, glabrescent. *Leaf lamina* ± elliptic, 9–11 by 3–6 cm, cuneate to rounded at base, acuminate to shortly acuminate at apex, glabrous or with very sparse reddish hairs on both sides mostly along the midrib, with a couple of colleters at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and

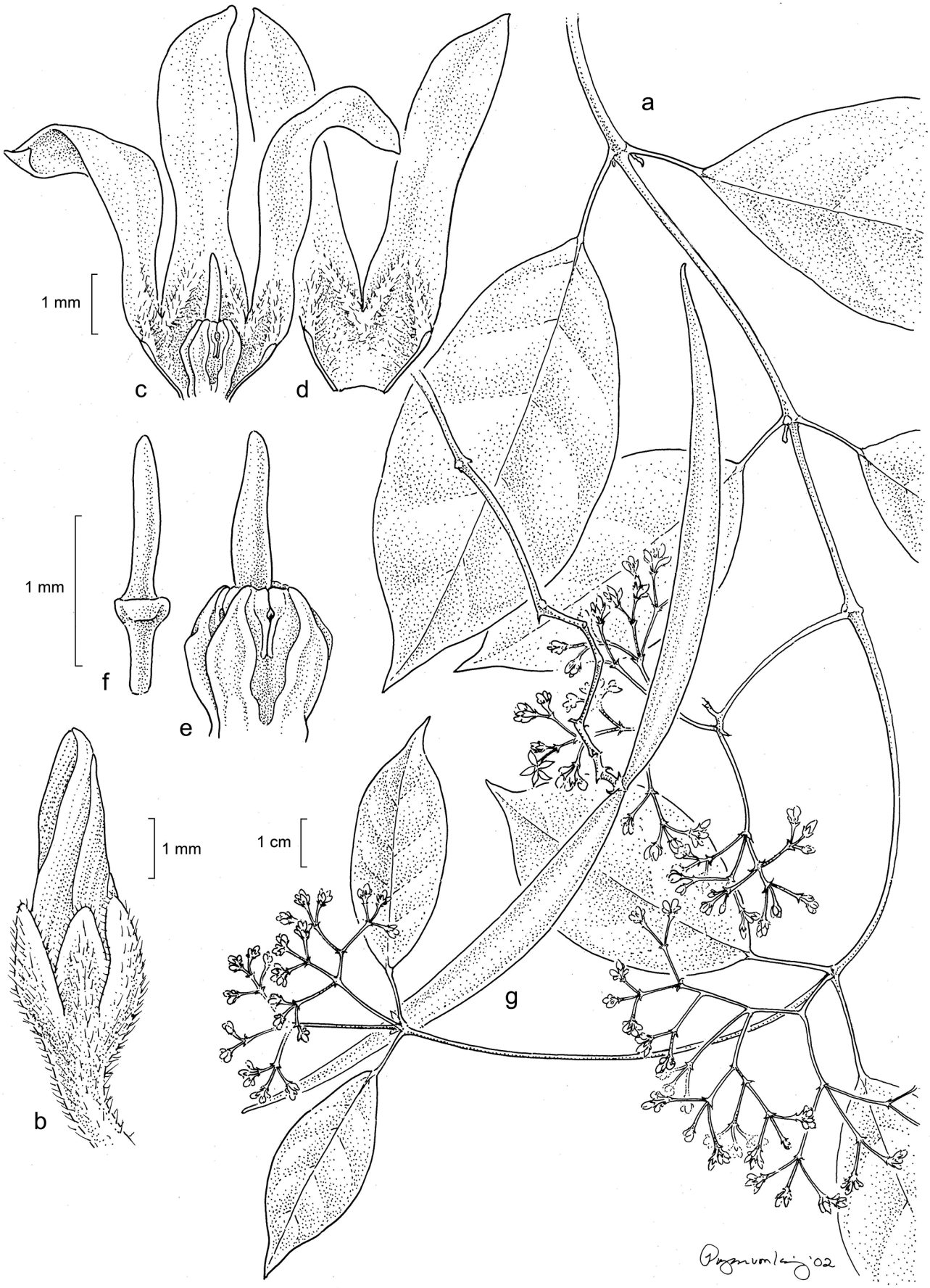


Fig. 12 *Secamone luzonensis* Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. style head; g. follicles (a, g: *Ramos & Edaño BS 45522*, NY; b–f: *Quisumbing PNH 2056*, A). — Drawn by Pollyanna von Knorring.

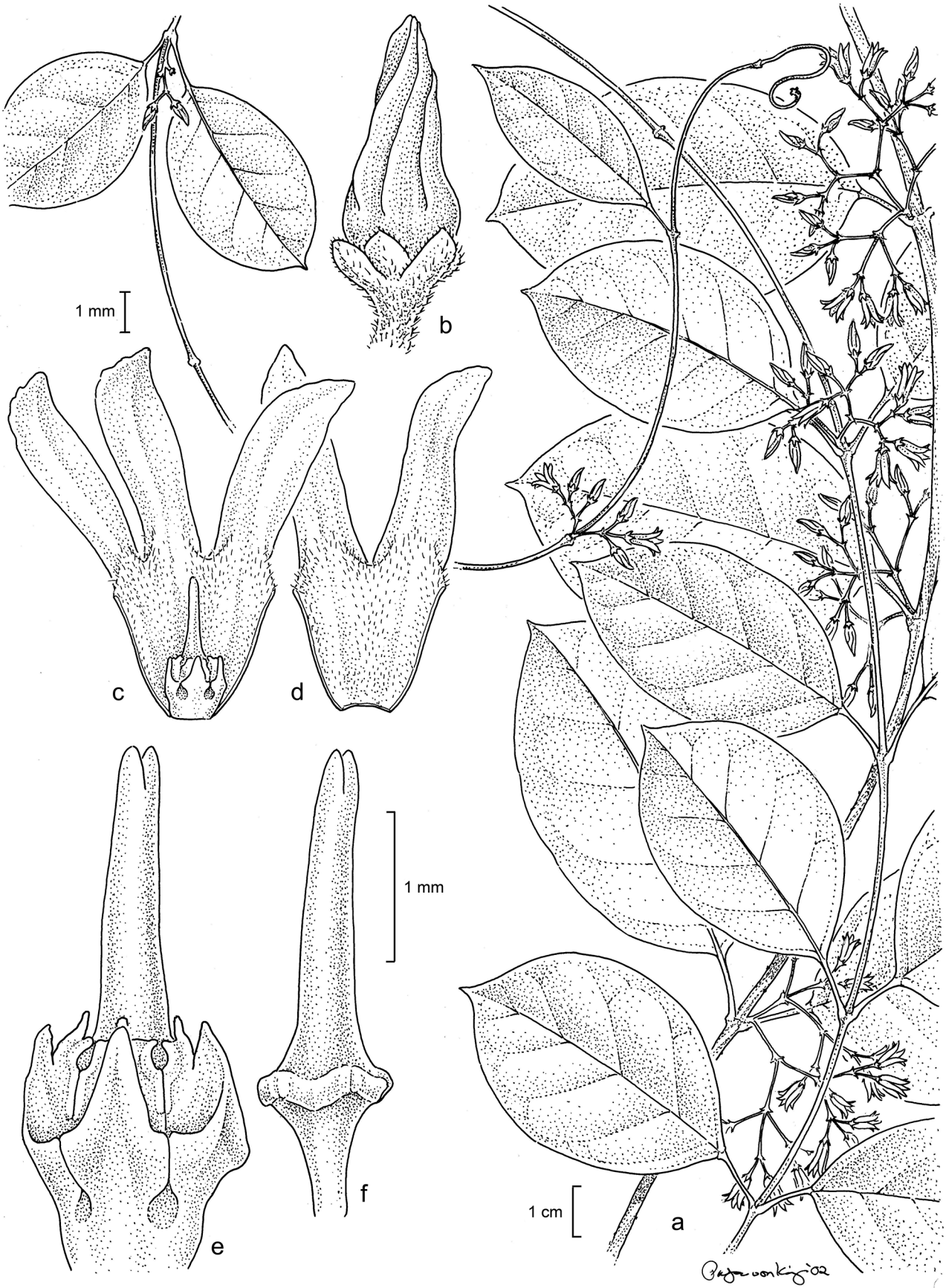


Fig. 13 *Secamone maritima* Blume. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. style head (all: *Elmer 13014*, A). — Drawn by Pollyanna von Knorring.

veins raised below when dry; petiole 10–20 mm long, hairy. *Inflorescences* extra-axillary, about as long as to usually shorter than adjacent leaves, 3–7 cm long; cymes lax, many-flowered, irregularly di- to monochasially branched with alternating short and long (up to 3 cm) internodes, with rather dense reddish hairs; pedicels 1–3 mm long; bracts triangular, up to 1–2 mm long. *Calyx* lobes ovate, 1.2–2.2 by 0.9–1.2 mm, distinctly longer than tube, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for about 1/6–1/5(–1/4) of their length into a tube, not to slightly twisted, glabrous outside, with flattened and white (when dry) hairs inside most of tube and at base of lobes particularly along V-formed ridges, yellow; tube campanulate to broadly campanulate, 0.9–1.2 mm long; lobes ± straight, oblong, 3.3–5.4 by 1.1–1.4 mm, obliquely obtuse at apex. *Staminal column* 0.7–0.9 mm high. *Staminal corona* lobes with two parts united to the apex, dorsally flattened, ovate, narrowing and acute at apex, shorter or projecting about as long as thecae. *Anther wings* 0.15–0.2 mm long, about as long as to usually slightly longer than thecae. *Pollinia* broadly ellipsoidal to almost globular, c. 0.1 mm long. *Style head* projecting 2–2.5 times longer than staminal column, exserted from corolla tube; apical portion 1–1.5 mm long, 2–3 times longer than basal portion, cylindric, entire at apex; ovary hairy at top. *Follicles* linear, 9–10 by 0.5 cm, slightly bent, thin-walled, with short hairs, recurved 90°. *Seeds* c. 13 mm long, dark brown with paler margin when dry; coma c. 2.5 cm long.

Distribution — Philippines (Luzon).

Habitat & Ecology — Seems to be restricted to rainforest climate. Known from Mt Bulusan in Parang vegetation (grassland/brushland). It has been found at 100–115 m elevation. Flowering: February to June, September.

Additional specimens examined. Philippines, Luzon, Laguna Prov., 115 m elev., 1949, *Canicosa 342* (A); Laguna Prov., 1915, *Mabesa FB 24074* (P, US); Quezon Prov., Baler, 100 m elev., 1949, *Quisumbing PNH 8039* (A, BM, K, L); *Ramos BS 1014*, Mt Maquiling, Prov. of Laguna, 1911 (U); Cagayan Prov., Peñablanca, 1929, *Ramos BS 76716* (A), *BS 76871* (A); Tayabas Prov., Casiguran, 1925, *Ramos & Edaño BS 45522* (A, B, BM, NY).

Note — The seven collections studied have been identified in herbaria to *Toxocarpus glaucus*, *T. gracilis*, *T. rubricaulis* and *T. sorsogonensis*. *Secamone luzonensis* is characterized by its entire corona lobes and by its short open corolla tube. The corolla remains pale when dry except for the lower part of the tube which turns dark. See further comments under *S. edanoi* and 'Unsufficiently known taxa'.

13. *Secamone maritima* Blume — Fig. 13; Map 4

Secamone maritima Blume (1826) 1050. — *Toxocarpus maritimus* (Blume) Miq. (1856) 476. — Lectotype (designated here): *Blume 1640* (lecto L [L 0414856]; isolecto L [L 0414857]), [Indonesia,] Java.

Toxocarpus elmeri Merr. (1929) 257. — Lectotype (designated here): *Elmer 21091* (lecto UC* [UC312117]; isolecto A [00003599], BM [BM000793231], BO (n.v.), BR* [BR696710], G, GH [00003600], K [K000881933], L [L 0004401], M* [M-0175149], MICH, MO [933266], NY, P* [P03874907], S [S-G-6127], SING* [SING0059551], U, Z), [Malaysia,] British North Borneo, Elphinstone Province, Tawao, 1922–1923.

NB. Data from two collections from Sabah, Borneo (*Elmer 20116* and *21091*, type of *Toxocarpus elmeri*) are included in the description between brackets.

Liana with younger branches covered by erect reddish hairs, soon glabrescent. *Leaf lamina* elliptic, 5–9 (10) by 2.5–5 cm, cuneate (to rounded) at base, apiculate to shortly acuminate at apex, glabrous on both sides or with few reddish ± appressed hairs along major nerves mostly at the very base; colleters 1–5 (10) at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and veins raised below when dry; petiole 7–15 mm long, with reddish hairs. *Inflorescences* extra-axillary, much shorter than adjacent leaves, 1.5–4 cm long; cymes rather dense, many-flowered, irregularly di- to monochasially branched with alternating short and long (up to 1 cm) internodes, with rather dense reddish hairs; pedicels 1–2 mm long; bracts triangular, up to 1 mm long. *Calyx* lobes ovate, 1.3(–1.7) by 0.9–1 mm, distinctly shorter than (to almost as long as) corolla tube, rounded at apex, with rather sparse reddish hairs outside and along margin, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for about 1/3 of their length into a tube, not to slightly twisted, glabrous outside, papillately to shortly hairy inside tube and at base of lobes with slightly longer hairs along V-formed ridges, pale yellow; tube campanulate to slightly urceolate, (1.9–)3.2 mm long; lobes ± straight, (4–)5.7 by (1–)2 mm, oblong, obliquely obtuse or truncate at apex. *Staminal column* 1–1.1 mm high. *Staminal corona* lobes cleft at apex into two parts; outer part dorsally flattened, angular-ovate, subobtuse at apex, projecting about as long as thecae; inner part about as long as outer part to slightly longer. *Anther wings* (0.15–)0.25 mm long, shorter than thecae. *Pollinia* ellipsoidal (to almost globular), c. 0.1 mm long. *Style head* projecting c. 2(–2.5) times longer than staminal column, about as long as (to slightly projecting from) corolla tube; apical portion (1.1–)2.0 mm long, (1.5–)2 times longer than basal portion, cylindric but broader towards base, entire to slightly bifid at the very apex; ovary glabrous. *Fruits* not seen.

Distribution — Java, Borneo, Philippines (Palawan).

Habitat & Ecology — No information from the Philippines, but the type material from Java was collected by the sea. In Borneo, it is known from dense forests and from thickets near mangrove swamp. Flowering specimens seen from April, in Borneo also during October to December.

Additional specimen examined. Philippines, Palawan, Puerto Princesa, Mt Pulgar, 1911, *Elmer 13014* (A, BM, BO, E, FH, FI, G, L, MO, NY, P, U, US, W, Z).

Note — *Secamone maritima* is recognized by its short inflorescences, ± urceolate corolla tube that is longer than the calyx, but also by having glabrous leaves and pale corolla when dry.

14. *Secamone merrillii* (Schltr.) Klack., *comb. nov*. — Fig. 14; Map 3

Toxocarpus merrillii Schltr., Philipp. J. Sci. 1 (1906) 295. — Lectotype (designated here): *Merrill 2810* (lecto US [437780]; isolecto K* [K001222314], L, LY* [LY0429951], NY, P* [P03874888], US [710088]), Philippines, Luzon, Prov. of Rizal, Bosoboso, July 1903.

Liana with younger branches covered by reddish hairs. *Leaf lamina* elliptic to usually broadly elliptic or almost circular, 4–13 by 4–11 cm, rounded at base, apiculate at apex, with erect reddish rather dense hairs below, glabrescent above but usually with some hairs remaining at the very base and along larger veins, with few colleters at base; venation pinnate, looped, with secondary veins visible and reticulate when dry; midrib impressed above, midrib and veins raised below when dry; petiole 10–30 mm long, with dense reddish hairs. *Inflorescences* extra-axillary, longer to shorter than adjacent leaves, 5–15 cm long; cymes lax, many-flowered, dichasially branched at base with alternating short and long (up to 4 cm) internodes but more irregularly branched towards apex with flowers clustered in small groups, with reddish hairs; pedicels 1–1.5 mm long; bracts triangular, 0.5–1 mm long. *Calyx* lobes ovate, 2.1–2.7 by 1.3–1.8 mm, about as long as to shorter than corolla tube, subacute to usually rounded at apex, with dense reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for 1/4–1/3 of their length into a tube, not to slightly twisted to the left, glabrous outside, distinctly hairy inside most of tube and particularly along V-formed ridges at base of lobes, yellow to

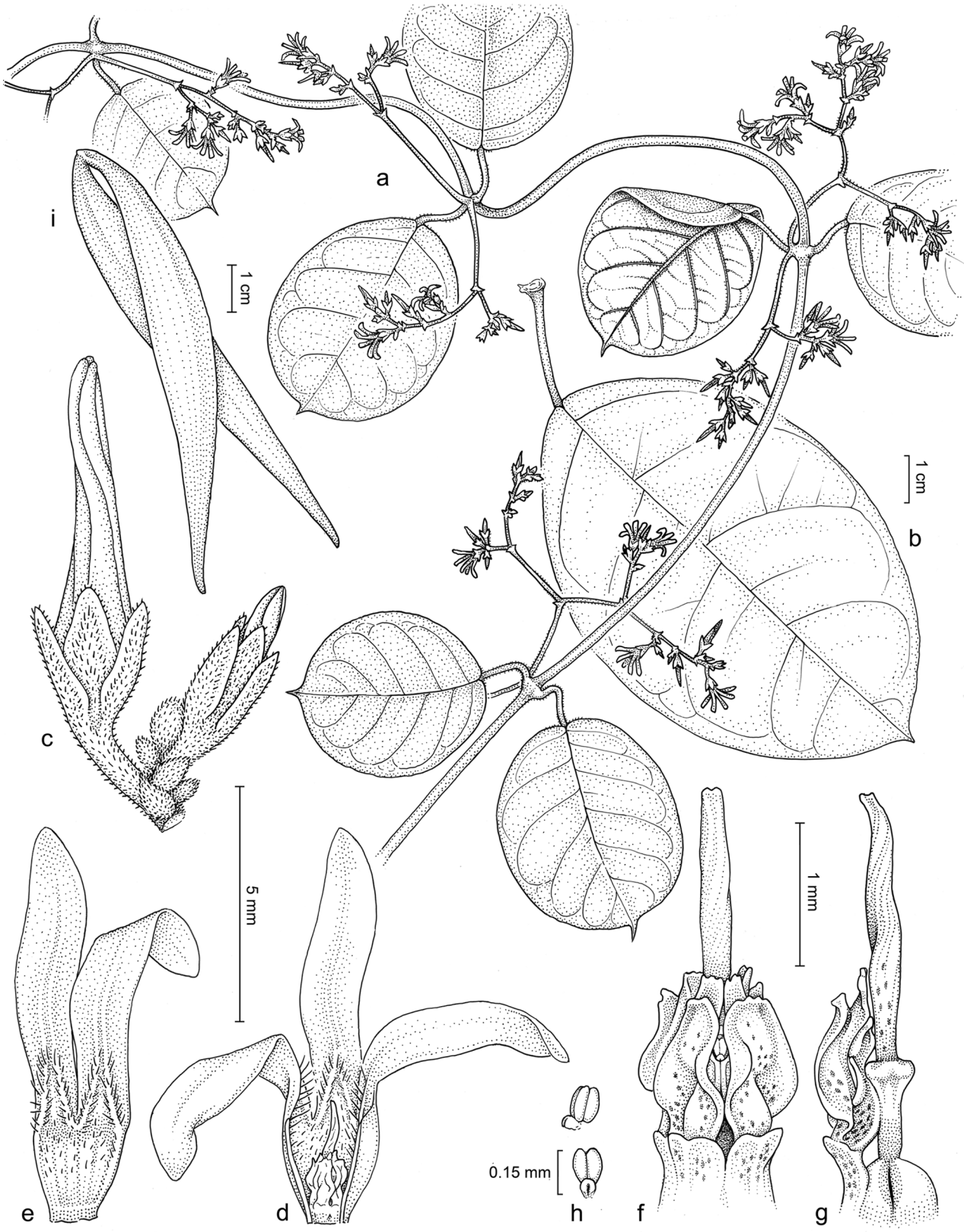


Fig. 14 *Secamone merrillii* (Schltr.) Klack. a. Habit; b. leaf; c. flowers in bud; d. flower with calyx and two corolla lobes removed; e. portion of corolla from within; f. gynostegium; g. part of ovary, style head and one stamen; h. pollinaria; i. follicles (a, c–h: *Merrill 2810*, US; b: *Elmer 18296*, A; i: *Canicosa 426*, A). — Drawn by Andrea Klintbjer.

yellowish purple inside; tube narrowly funnelform to campanulate, 1.9–3.2 mm long; lobes ± straight, oblong to narrowly elliptic, 5.7–7.6 by 1.2–2.1 mm, obtuse at apex. *Staminal column* 0.9–1.1 mm high. *Staminal corona* lobes minutely to usually shallowly cleft at apex into two parts; outer part dorsally flattened, ± ovate, acute to rounded at apex; inner part dorsiventrally flattened, rounded at apex, projecting above outer part, inclined towards style head above thecae. *Anther wings* 0.3–0.4 mm long, about as long as thecae. *Pollinia* ellipsoidal, c. 0.15 mm long. *Style head* projecting 2–3 times longer than staminal column, exserted from corolla tube or slightly shorter; apical portion 1.7–2.6 mm long, 2–4 times longer than basal portion, cylindric, entire at apex; ovary glabrous. *Follicles* narrowly ovate in outline, c. 10 by 1 cm, thin-walled, hairy, recurved 180°. *Seeds* not seen.

Distribution — Philippines (Luzon).

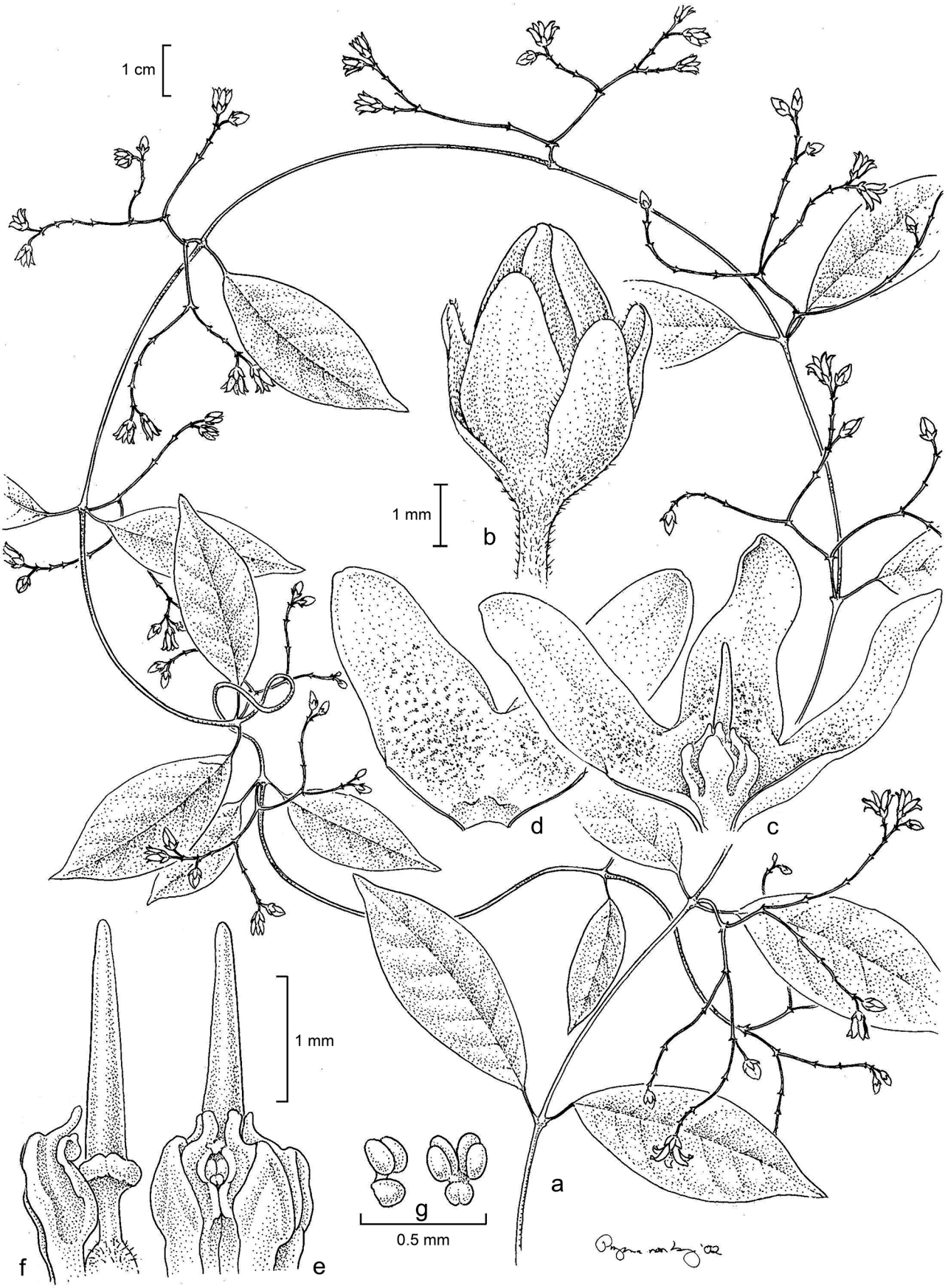


Fig. 15 *Secamone mindanaensis* Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. part of ovary, style and style head with one stamen in situ; g. pollinaria (all: *Elmer 12028*, GH). — Drawn by Pollyanna von Knorring.

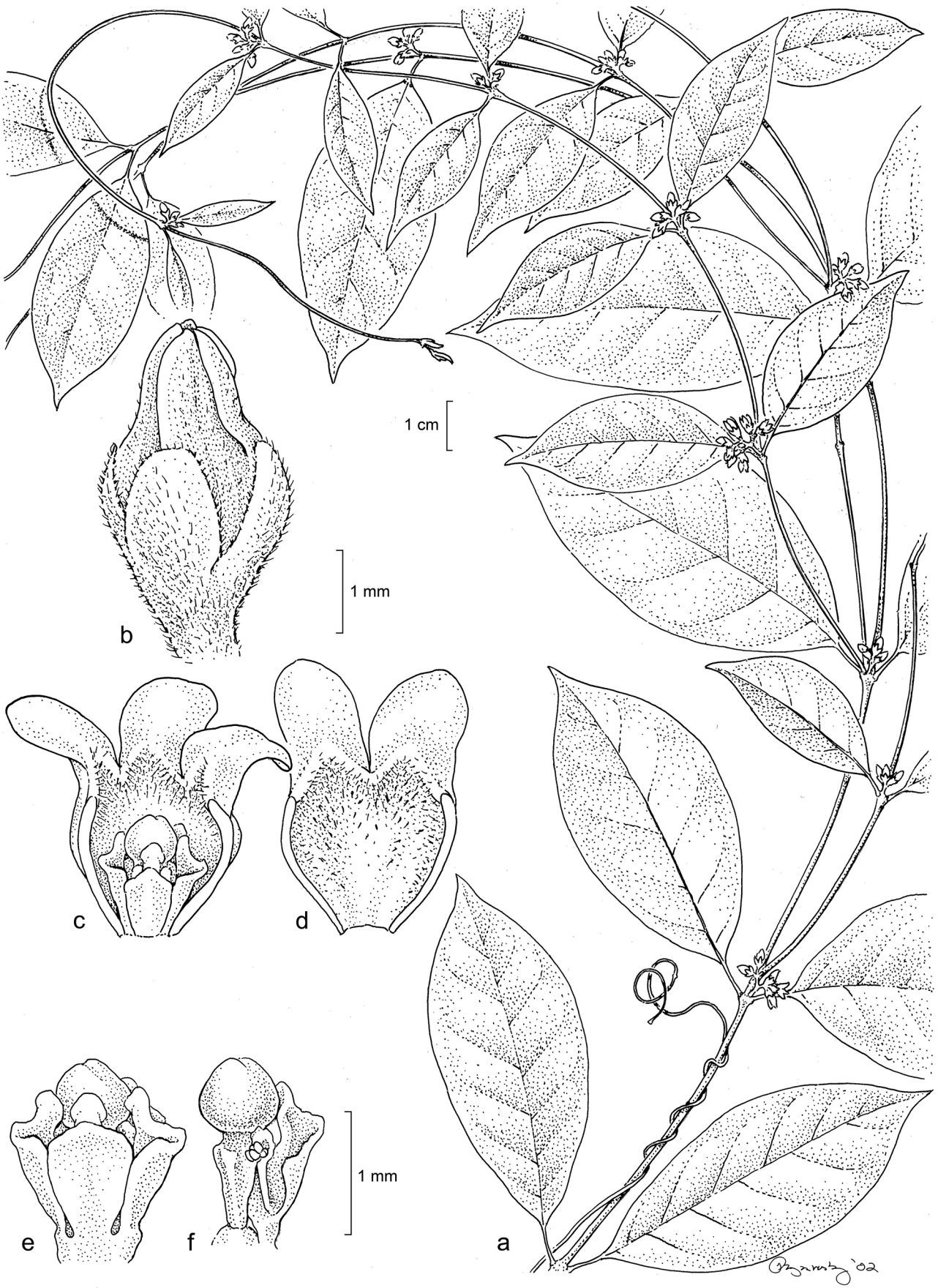


Fig. 16 *Secamone pyriformis* Klack. a. Habit; b. flower in bud; c. flower with calyx and two corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. part of ovary, style and style head with one stamen and pollinarium in situ (all: *Sulit & Conklin PNH 17625*, A). — Drawn by Pollyanna von Knorring.

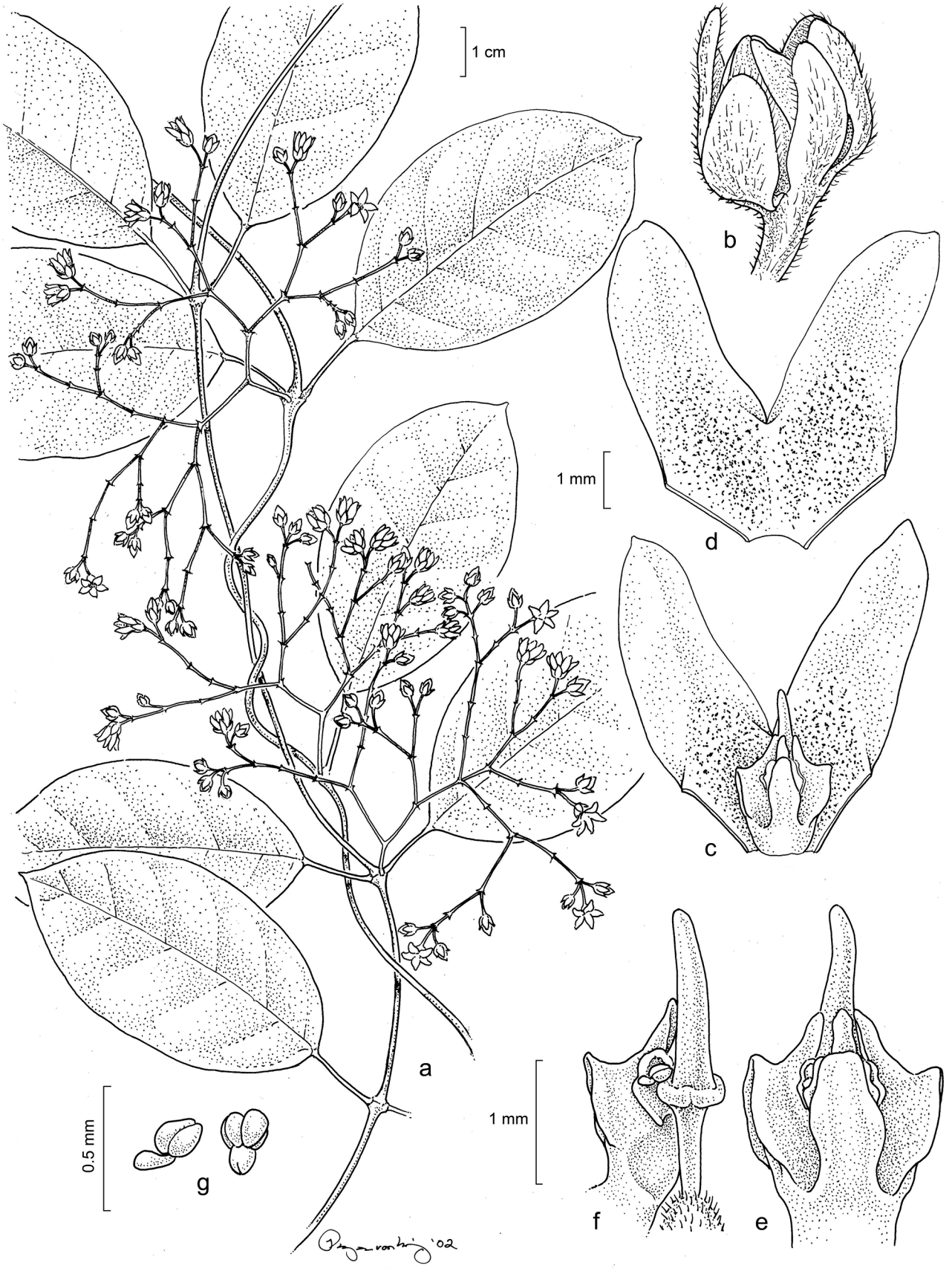


Fig. 17 *Secamone radiata* (Tsiang) Klack. a. Habit; b. flower in bud; c. flower with calyx and three corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. part of ovary, style and style head with one stamen and pollinarium in situ; g. pollinaria (all: *Clark FB 2538*, MO). — Drawn by Pollyanna von Knorring.

Habitat & Ecology — In monsoon or savannah climate. It has been found in pasture-land from sea level up to 100 m elevation. Flowering: June to September.

Additional specimens examined. Luzon, Rizal prov., Mt Paningtigan [Pamintinan?], 1937, *Brown 3728* (SING); Laguna prov., Maitim Bay, 1949, *Canicosa 321* (A); Los Baños, 1917, *Catalan FB 26921* (BM, NY, P, US); Los Baños, Mt Maquiling, 1917, *Elmer 18296* (A, BM, G, GH, L, MICH, MO, NY, P, PNH, U, US, W, Z); Quezon prov., College of Agriculture, 1950, *Canicosa 426*, *456* (A).

Notes — 1. The style head in *S. merrillii* is long protruding, narrow and cylindric. This species is furthermore characterized by broadly elliptic to broadly oblong hairy leaves with few (usually 4), curved veins. The leaves in *S. glauca* and *S. loheri* are elliptic with 6–7 ± straight veins on each side of midrib. *Secamone merrillii* differs from *S. glauca* also by its hairy corolla and leaves (vs whole plant glabrous), and from *S. loheri* by the corona lobes being narrowed at base (vs hastate). The corolla turns dark brown upon drying, a character also seen in *S. glauca* and *S. loheri*.

2. Two collections from Rodriguez (Montalban), Luzon, viz. *Bartlett 14448* (A, MICH) and *Loher 3879* (K), differ somewhat from *S. merrillii* by having slightly broadened, almost glabrous corolla tubes.

15. *Secamone mindanaensis* Klack., *sp. nov*. — Fig. 15; Map 3

This species is similar to *Secamone radiata* and shares with this species a characteristic large calyx covering most of the corolla in bud, but differs by a narrower and cylindric staminal column. — Type: *Elmer 12028* (holo GH; iso A, BM, E, FI, G, L [L.0414819], MO [706146], NY, P* [P03874905], U, US [779715, 3416708], W, Z), Philippines, Mindanao, Mati, Oct. 1909.

Liana with younger branches hairy, glabrescent. *Leaf lamina* elliptic, 4–7 by 1.5–3.5 cm, cuneate to rounded at base, acute to apiculate at apex, with sparse reddish hairs, soon glabrescent above, with few colleters at base; venation pinnate, looped, hardly visible above, with secondary veins reticulate below when dry; midrib impressed at basal part above, raised below when dry; petiole 7–9 mm long, with reddish hairs. *Inflorescences* extra-axillary, shorter to longer than adjacent leaves, 4–6 cm long; cymes lax, few-flowered, irregularly di- to monochasially branched, with alternating longer (up to 13 mm) and shorter internodes, with reddish hairs; pedicels 1.5–3 mm long; bracts triangular, 0.5–1 mm long. *Calyx* lobes c. 3.5 by 1.7 mm, distinctly longer than corolla tube, ovate, rounded at apex, with sparse reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused at base for c. 1/4 of their length into a tube, not twisted, glabrous, colour unknown; tube distinctly broadened towards mouth, c. 1.3 mm long; lobes ± straight, oblong, c. 4.4 by 2.0 mm, rounded at apex. *Staminal column* c. 1 mm high. *Staminal corona* lobes indistinctly to very shallowly cleft at apex into two parts; outer part dorsally flattened, narrowly ovate, subobtuse at apex; inner part dorsiventrally flattened, inclined towards style head, projecting above thecae. *Anther wings* c. 0.3 mm long, about as long as thecae. *Pollinia* ellipsoidal, c. 0.1–0.15 mm long. *Style head* projecting about 1.5 times longer than staminal column, distinctly exserted from corolla tube; apical portion c. 2.1 mm long, c. 2.5 times longer than basal portion, cylindric, entire at apex; ovary hairy at top. *Fruits* not seen.

Distribution — Philippines (Mindanao). Known only from the type.

Habitat & Ecology — Flowering: October.

Note — *Secamone mindanaensis* is similar to *S. radiata* and *S. crenata* and likewise has a large calyx that covers the corolla in young bud, a broad open corolla tube and hairy ovary. It is distinguished, however, from *S. radiata* by a narrower staminal column with anther wings diverging at an angle about 70° from the style head (vs about 45° in *S. radiata*), and from *S. crenata* by corona lobes being rounded at apex (vs crenate).

16. *Secamone pyriformis* Klack., *sp. nov*. — Fig. 16; Map 4

This species differs from all other Philippine members of the genus by the combination of short inflorescences, urceolate corolla tube and a spherically broadened style head. — Type: *Sulit & Conklin PNH 17625* (holo A; iso L), Philippines, Mindoro, Mt Yagaw (Eastern slope), 430 m, 30 May 1953.

Etymology. The epithet alludes to the pear-shaped corolla buds.

Liana 1–2 m with younger branches covered by sparse appressed reddish hairs, soon glabrescent. *Leaf lamina* elliptic, c. 8.5 by 4.5 cm, rounded to cuneate at base, acuminate to apiculate at apex, with sparse appressed reddish hairs below, very sparsely hairy above and glabrescent, with 5–10 colleters at base; venation pinnate, looped, with secondary veins distinct and reticulate when dry; midrib ± flush with leaf surface above, midrib and veins raised below when dry; petiole 5–10 mm long, with reddish hairs, glabrescent. *Inflorescences* extra-axillary, much shorter than adjacent leaves, c. 1 cm long; cymes dense, many-flowered, di- to monochasially branched with short (up to 1.5 mm long) internodes, with reddish hairs; pedicels 0.5–1 mm long; bracts triangular, 0.5–1 mm long. *Calyx* lobes elliptic to ovate, c. 1.6 by 1 mm, shorter than corolla tube, rounded at apex, with reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for about half of their length into a tube, not twisted, sparsely hairy outside, hairy in tube and in triangles at bases of each lobe, white; tube urceolate, c. 1.8 mm long; lobes bent outwards, oblong, c. 1.7 by 1.1 mm, rounded at apex. *Staminal column* c. 1.1 mm high. *Staminal corona* lobes only shallowly cleft at apex into two parts; outer part dorsiventrally compressed, obovate to angular-obovate, rounded to truncate at apex, erect to erecto-patent, projecting above thecae; inner part narrower, dorsiventrally compressed, ± erect, projecting above outer part. *Anther wings* c. 0.5 mm long, about three times as long as thecae. *Pollinia* ± spherical, c. 0.1 mm long. *Style head* projecting only slightly above staminal column, included in corolla tube; apical portion c. 0.9 mm long, shorter than basal portion, with almost spherical apical part on short cylindric base, entire; ovary glabrous. *Follicles* linear, 5–8 by 0.2–0.3 cm, thin-walled, hairy, recurved 90–135°. *Seeds* not seen.

Distribution — Philippines (Mindoro). Known only from the type.

Habitat & Ecology — Known from rock at edge of forest, 430 m elevation. Flowering: May.

Note — *Secamone pyriformis* is easily recognized by its short inflorescences and urceolate corolla tubes, as well as by its almost spherical apical part of the style head. This combination of characters distinguishes it from all other Philippine congeners. Moreover, it has unusually long anther wings, about twice the length of the thecae, reaching almost to the base of the staminal column (vs about as long as thecae in most other Philippine species).

17. *Secamone radiata* (Tsiang) Klack., *comb. & stat. nov*. — Fig. 17; Map 3

Toxocarpus glaucus Decne var. *radiatus* Tsiang, Sunyatsenia 4 (1939) 73. — *Toxocarpus radiatus* Schltr. ex Tsiang (1939) 73, nom. inval., pro syn. — Lectotype (designated here): *Clark FB 2538* (lecto MO [2760349]; isolecto NY), Philippines, Island of Ticao, 1904.

Liana with younger branches hairy, glabrescent. *Leaf lamina* elliptic, 4–8 by 2–4.5 cm, rounded at base, acute to apiculate at apex, with sparse appressed reddish hairs, glabrescent, with

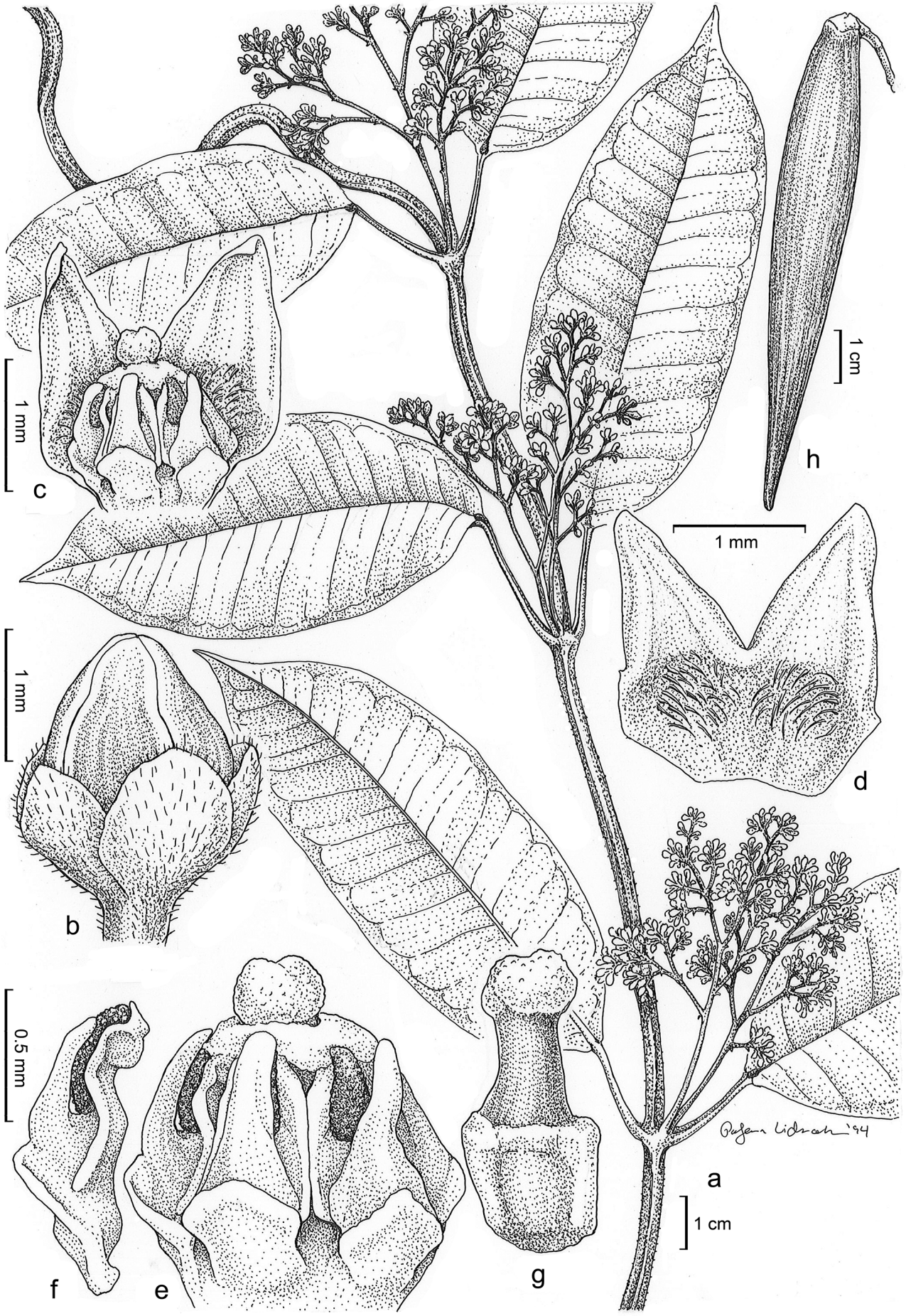


Fig. 18 *Secamone rectinervis* Schltr. a. Habit; b. flower in bud; c. flower with calyx and three corolla lobes removed; d. portion of corolla from within; e. gynostegium; f. anther, lateral view; g. style head; h. follicle (a: *Ramos BS 20540*; b–g: *Elmer 16964*; h: *Fenix BS 12582*). — Drawn by Pollyanna von Knorring. From Klackenberg 1995, as *Genianthus rectinervis*.

few colleters at base; venation pinnate, looped, with secondary veins distinct and reticulate below when dry; midrib impressed at basal part above, midrib and veins raised below when dry; petiole 12–25 mm long, with reddish hairs, glabrescent. *Inflorescences* extra-axillary, up to about as long as adjacent leaves but usually shorter, 4–9 cm long; cymes lax, many-flowered, irregularly di- to monochasially branched, with alternating longer (up to 15 mm) and shorter internodes, with reddish hairs; pedicels 2–3.5 mm long; bracts triangular, 0.5–1 mm long. *Calyx* lobes ovate, 3–3.4 by c. 1.7 mm, distinctly longer than corolla tube, rounded at apex, with rather sparse reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused at base for 2/7–1/3 of their length into a tube, glabrous, not twisted, colour unknown; tube distinctly broadened towards mouth, c. 1.7 mm long; lobes ± straight, triangular, c. 4 by 2.2 mm, rounded at apex. *Staminal column* c. 1.5 mm high. *Staminal corona* lobes only shallowly cleft at apex into two parts; outer part dorsally flattened, ± rectangular to ovate, rounded to truncate at apex, attached along inner part by laterally compressed section jutting out distincly from stamens; inner part dorsiventrally flattened, inclined towards style head, projecting above thecae. *Anther wings* c. 0.3 mm long, about as long as thecae. *Pollinia* ellipsoidal, c. 0.15 mm long. *Style head* projecting about twice longer than staminal column, distinctly exserted from corolla tube; apical portion c. 1.5 mm long, c. 1.5 times longer than basal portion, cylindric, entire at apex; ovary hairy at top. *Fruits* not seen.

Distribution — Philippines (Ticao). Known only from the type.

Habitat & Ecology — Flowering: October.

Note — *Secamone radiata* is similar to *S. mindanaensis* and *S. crenata* by its short open corolla that in bud is covered by a large calyx. These three species are known by only one specimen each from three different islands at considerable distance from each other. The specimens differ in staminal corona morphology. *Secamone radiata* (Ticao) has the dorsally flattened part of the corona lobes jutting out on laterally compressed laminae, together forming a somewhat cup-shaped staminal column. In *S. crenata* (Cebu) both outer and inner corona lobes are crenate at apex, in contrast to the rounded apices seen in *S. radiata* and *S. mindanaensis*.

18. *Secamone rectinervis* Schltr. — Fig. 18; Map 1

Secamone rectinervis Schltr. (1915) 537. — *Genianthus rectinervis* (Schltr.) Tsiang (1939) 61. — Lectotype (designated by Klackenberg 1995: 445): *Clemens 988* (lecto M), Philippines, Mindanao, Camp Keithey, Lake Lanao, 1907.

Leaf lamina somewhat ovate to oblong or elliptic, acuminate at apex, glabrous or with small sparse appressed reddish hairs below, with many colleters at base of lamina. *Cyme* often longer than subtending leaf. *Corolla* in bud broadly ovoid, valvate; lobes about as long as tube, triangular, glabrous to usually hairy at mouth, colour unknown. *Staminal corona* lobes with two parts; outer part dorsally flattened at base and with narrowly triangular free part, about as long as staminal column; inner part as longitudinal pad between thecae. *Style head* not to only slightly protruding from staminal column, upper portion about as long or slightly longer than lower portion; style lacking.

Distribution — Philippines (Luzon, Mindanao).

Habitat & Ecology — Flowering: February and August.

Notes — 1. *Secamone rectinervis* is similar in habit to *S. blumei*. Both are characterized by small valvate corolla lobes and leaves with parallel and straight primary nerves. *Secamone rectinervis* is distinguished by triangular staminal corona lobes, in contrast to circular ones in *S. blumei*. Furthermore, *S. rectinervis* is pubescent mostly in mouth of the corolla, leaving major part of corolla lobes glabrous.

2. A specimen from Mindanao, *Sulit PNH 9988* (L), lacks free coronal lobes and might represent a new taxon.

3. For a full description and specimen list see Klackenberg (1995; as *Genianthus rectinervis*).

19. *Secamone urdanetensis* Elmer ex Tsiang — Fig. 19; Map 2

Secamone urdanetensis Elmer ((1938) 3592, nom. inval.) ex Tsiang (1939) 59. — Type: *Elmer 13587* (holo BO (not seen); iso A* [00076845], BM [BM000793227], FI, G, GH [00076844], K, L, MO [835879], NY, P [04547179]* U, US [1050562, 3619015], Z [Z-000025181]), Philippines, Mindanao, Prov. of Agusan, Cabadbaran, Mt Urdaneta [Mt Hilong-Hilong], Aug. 1912.

Liana with younger branches covered by dense erect reddish hairs, glabrescent. *Leaf lamina* elliptic, 6–10 by 3–7 cm, cuneate to rounded at base, acute to apiculate at apex, with erect reddish hairs on both sides, glabrescent above, with up to c. 5 colleters at base; venation pinnate, looped, with secondary veins reticulate below when dry; midrib impressed at basal part above, midrib and primary veins raised below when dry; petiole 7–15 mm long, with dense reddish hairs. *Inflorescences* extra-axillary, much shorter than adjacent leaves, 2–4 cm long; cymes many-flowered, irregularly di- to monochasially branched, with alternating longer (up to 10 mm) and shorter internodes and with the flowers in dense clusters apically, with dense erect reddish hairs; pedicels 1–3.5 mm long; bracts triangular, 1–1.5 mm long. *Calyx* lobes ovate, c. 2.7 by 1.3 mm, longer than corolla tube, rounded at apex, with dense reddish hairs outside, glabrous inside. *Corolla* contorted in bud with left lobe margin overlying and with lobes fused for almost half of their length into a tube, not twisted, glabrous, colour unknown; tube ± cylindric, c. 1.6 mm long; lobes bent outwards and ± erecto-patent, c. 1.9 by 1.3 mm, oblong, obtuse at apex. *Staminal column* c. 0.9 mm high. *Staminal corona* lobes entire, dorsally flattened, ± triangular in outline with slightly broadened base (angular-ovate) with a narrow apex projecting horizontally towards style head above thecae, attached along a laterally compressed section jutting out from the stamens. *Anther wings* c. 0.4 mm long, slightly shorter than thecae. *Pollinia* ellipsoidal, 0.1–0.15 mm long. *Style head* not exserted from staminal column; apical portion c. 0.4 mm long, about as long as basal portion, cylindric, slightly bifid at the very apex; ovary glabrous. *Fruits* not seen.

Distribution — Philippines (Mindanao). Known only from the type.

Habitat & Ecology — Humid forests at c. 300 m elevation. Flowering: August.

Notes — 1. *Secamone urdanetensis* is characterized by its short corolla of which half or more is fused into a tube, by its entire corona lobes and short style head that does not protrude above the staminal column. In these latter two characters, it is similar to *S. elliptica*, but differs by its broad, hairy leaves that furthermore are furnished with colleters at base of the lamina above (vs glabrous and lacking colleters).

2. Elmer (1938: 3592) omitted a latin description, an error that was corrected by Tsiang one year later (Tsiang 1939: 59). Elmer pointed out his own collection *Elmer 13587* as type, widely distributed to herbaria as *S. urdanetensis*. This is the only collection known of this species. Tsiang, when validating Elmer's species, designated Elmer's duplicate at BO as type. This specimen is numbered *Elmer 13585*, deviating from all others, probably an error. Tsiang noted that his type sheet was differently numbered but at the same time clearly stated that *Elmer 13587* is the type collection of this species. Consequently, the holotype sheet of *S. urdanetensis* is numbered *Elmer 13585* and all known isotypes *Elmer 13587*.

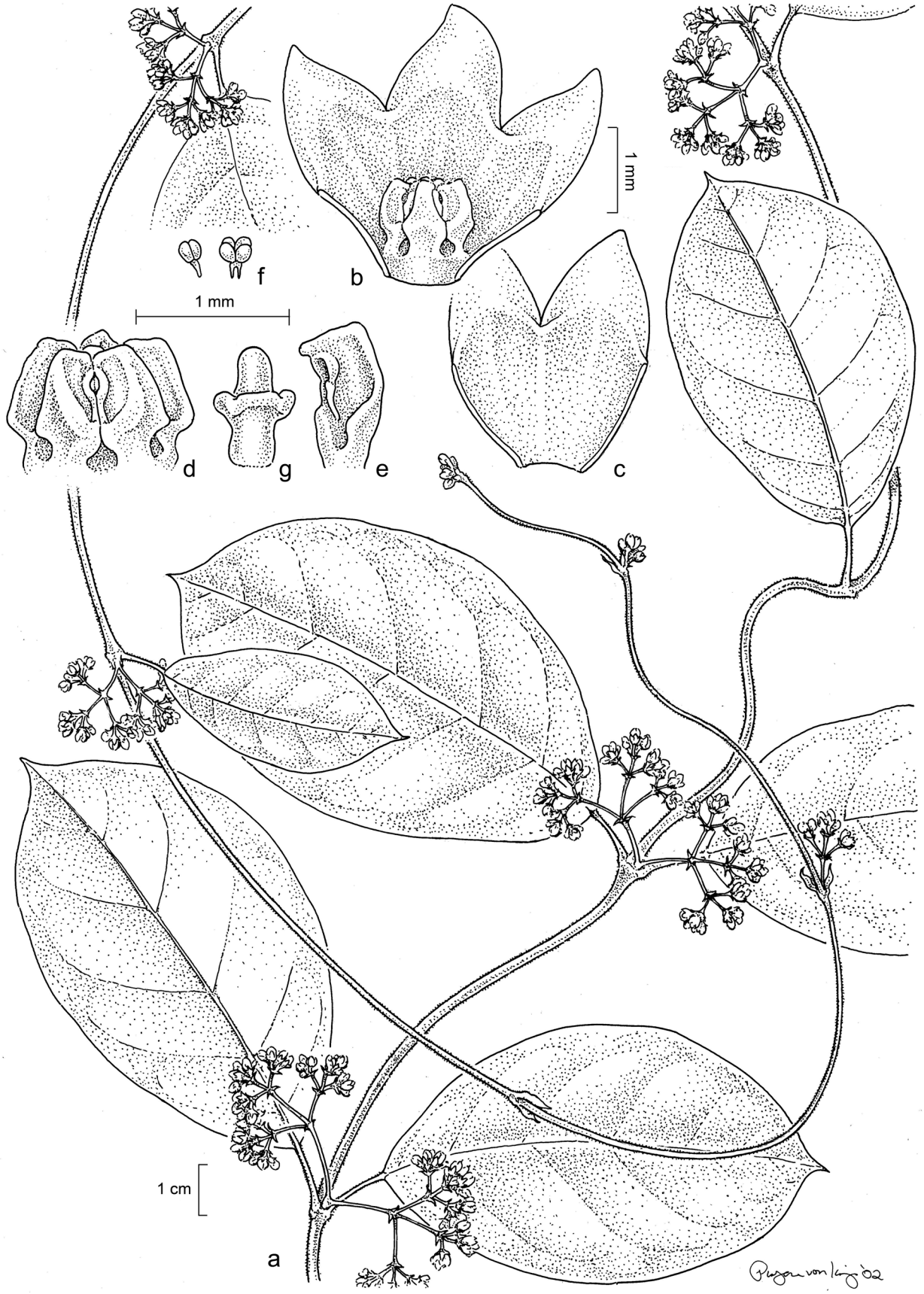


Fig. 19 *Secamone urdanetensis* Elmer ex Tsiang a. Habit; b. flower with calyx and two corolla lobes removed; c. portion of corolla from within; d. gynostegium; e. anther; f. pollinaria; g. style head (all: *Elmer 13587*, G). — Drawn by Pollyanna von Knorring.

INSUFFICIENTLY KNOWN TAXA

Toxocarpus rubricaulis Elmer (1919) 3075. — Lectotype (designated here): *Elmer 18297* (lecto GH [00003611]; isolecto A [00003610], BM, BO, FI [FI015498], G, L, MO [839833], NY, S [S23-20069], U, US [1237704], W, Z), Philippines, Luzon, Prov. of Laguna, Los Baños, Mt Maquiling.

The type collection of *Toxocarpus rubricaulis* is represented in several herbaria. Although a description of the flower was made in the protologue by Elmer (1919) only sterile or specimens with immature follicles are to be found. Elmer's type material at PNH was presumably destroyed during the Second World War. However, already in a revision of Asiatic *Apocynales* made before the war, Tsiang (1939) noted that also in the Manila herbarium the *Elmer 18297* specimen was in fruit only and lacked flowers. The type material of *Toxocarpus rubricaulis* is profusely furnished with colleters at the base of the leaf lamina. The leaf has a characteristic venation with many straight, parallel, secondary nerves and lamina is sparsely covered with appressed, reddish, hairs underneath. This combination of characters is present also in former *Genianthus*, of which two species are known from the Philippines, viz. *Secamone blumei* (as *G. ellipticus*) and *S. rectinervis* (as *G. rectinervis*) (Klackenberg 1995: f. 1B, E, H). Large inflorescences and reddish stems mentioned by Elmer in his protologue are also characteristic for these two species. Furthermore, *S. blumei* and *S. rectinervis* have both been collected in Laguna Province near or at the same locality (Makiling National Park) as the type for *T. rubricaulis*. It is not possible to distinguish *S. blumei*, *S. rectinervis* and the type material of *T. rubricaulis* by leaf characters alone. Elmer's (1919) description of the flowers (glabrous corolla, style head spindle shaped, corolla imbricate and with large 5 mm long lobes) does not fit *S. blumei* nor *S. rectinervis*, neither any other material studied. The protologue lacked information on staminal column and corona lobes. Consequently, if judged by the type material, *T. rubricaulis* is most probably a synonym to *S. blumei* or *S. rectinervis*, but if the description in the protologue of the missing flower material is correct, this taxon does not fit any known *Secamonoideae*.

Duplicates of *Elmer 15587* (in fruit) and *Elmer 17289* (in flower) were distributed to several herbaria under the tentative name *Toxocarpus sorsogonensis*. This species was never correctly published, but was instead later by Elmer (1938) mentioned as a synonym of his *T. rubricaulis*. However, the venation and distinct patch of colleters at base of leaf lamina, characteristic for type specimen of *T. rubricaulis*, as well as for *Secamone blumei* and *S. rectinervis*, are not present in Elmer's two collections of *T. sorsogenensis*. Furthermore, in contrast to the appressed reddish hairs of *T. rubricaulis*, these two collections have leaves with more or less erect, although curved, hairs. Consequently, Elmer's *T. sorsogonensis* is not conspecific with *T. rubricaulis*. This is further corroborated by the disagreement between Elmer's (1919) description of the flowers of *T. rubricaulis* (corolla glabrous, style head spindle shaped) and the original material (*Elmer 17289*) of *T. sorsogonensis* (corolla hairy, style head long and narrowly cylindric). This material does in fact not fit well with any known taxon and is described as a new species, *Secamone commutata* (see above). The fruiting specimen (*Elmer 15587*) with almost glabrous leaves is *S. luzonensis*.

EXCLUDED TAXA

Toxocarpus makilingensis Elmer ex Merr. (1923) 336, nom. nud., pro syn. — *Toxocarpus makilingensis* Elmer (1939) 3810, nom. nud., pro syn. — Original collection: *Elmer 17716* (A, GH, K, L, MO, P*, PNH (n.v.), U) = *Ichnocarpus frutescens* (L.) W.T.Aiton (see Middleton 1994: 78).

Apocynum mucronatum Blanco (1837) 852. — *Toxocarpus mucronatus* (Blanco) Woodson (1930) 147. — Type: from seed sent from China, not preserved = *Jasminanthes mucronata* (Blanco) W.D.Stevens & P.T.Li (see Gilbert et al. 1995).

Secamone macrostachya Turcz. (1848) 252. — Type: *Cuming 514* (C*, G, KW*, L*), Philippines = *Vincetoxicum flexuosum* (R.Br.) Kuntze var. *perrottetianum* (Decne.) Schneidt, Meve & Liede.

Acknowledgements The staff and the curators of the herbaria cited in the text are kindly acknowledged for the loan of plant material, with special thanks to PNH for preparing images of their holdings. I would also like to thank Danilo Tandang for sharing his image of *Secamone elliptica* and Pollyanna von Knorring, Andrea Klintbjer and Emma Hultén for preparing the line drawings.

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