

THE CONVULVULACEAE OF MALAYSIA, VI¹⁾

by

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(Rijksherbarium, Leiden)¹

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The genus *Argyreia* Lour. in the Philippine Islands.

This paper on the Philippine species of *Argyreia* forms an addition to that published by the same author in *Blumea* V, 2, (1943) p. 352—383.

As to the description of the genus, the limitation of it against *Rivea* and the inclusion in it of *Lettsonia* may be referred to what has been said on p. 353—356 of that publication.

In the present paper a key is given to the Philippine representatives of *Argyreia*, followed by descriptions of the species under consideration. Two species, though still imperfectly known, as only fruiting branches are represented in the herbaria, proved to be new ones. By lack of knowledge of their floral characters they could not be inserted in the key. Descriptions of them may be found at the end of this paper.

All species of *Argyreia* occurring in the Philippine Islands are endemic with the exception of *A. nervosa* (Burm. f.) Boj., a species introduced from India, which is found here and there as a garden plant, which did not yet escape from culture, as far as known. *Rivea corymbosa* (L.) Hallier f., from tropical America, in the same way cultivated for ornamental purposes is now spontaneous in some places. As has been stated in *Blumea* V, p. 355 it belongs to the genus *Legendrea* [*L. corymbosa* (L.) Van Ooststr.].

The destruction of the invaluable collections of the Manila herbarium during the war made it necessary to study duplicate-specimens of the types formerly preserved at Manila. The present author is greatly indebted to the directors and curators of the following herbaria for the loan of those duplicates and of other specimens from the Philippine Islands: the herbarium of the "Kon. Plantentuin van Indonesië", Buitenzorg (BZ); the Gray Herbarium, Harvard University, Cambridge, Mass. (GH); the herbarium of the Arnold Arboretum, Jamaica Plain, Mass. (A); the herbarium of the Royal Botanic Gardens, Kew, Surrey (K); the herbarium of the British Museum (Natural History), London (BM); the herbarium

¹⁾ Part I in *Blumea* III, 1 (1938) p. 62—94; part II in *Blumea* III, 2 (1939) p. 267—371; part III in *Blumea* III, 3 (1940) p. 481—582; part IV in *Blumea* V, 2 (1943) p. 339—411; part V in *Blumea* V, 3 (1945) p. 689—691.

of the New York Botanical Garden, New York, N. Y. (NY); the herbarium of the Botanic Garden, Singapore (SING); the herbarium of the State University, Utrecht (U); the United States National Herbarium, Washington, D. C. (US) and the "Rijksherbarium", Leiden (L).

Key to the species.

- 1a. Limb of corolla nearly entire or shallowly lobed 2
 b. Limb of corolla deeply 5-lobed to 5-parted 6
 2a. Lower surface of leaves densely greyish or whitish sericeous or tomentose. Corolla large, 6—8 cm long 3
 b. Lower surface of leaves sparsely hairy or glabrous. Corolla smaller 4
 3a. Leafbase deeply cordate. Nerves 11—16 on each side of midrib. Peduncles long, stout. Bracts large, 3.5—5 cm long, long-acuminate 1. *A. nervosa*
 b. Leafbase rounded. Nerves 6—8 on each side of midrib. Peduncles short. Bracts small, at most 0.5 cm long 2. *A. nitida*
 4a. Bracts oblong-lanceolate, 15—20 mm or more long, long persistent. Sepals appressed-pilose outside 3. *A. sorsogonensis*
 b. Bracts minute, deciduous. Sepals sparsely pilose or glabrous 5
 5a. Peduncle short, 0.5—2 cm. Sepals c. 4 mm long, outer ones with some scattered hairs on their middle portion or glabrous. Filaments pilose at base 5. *A. philippinensis*
 b. Peduncle longer, slender. Sepals 6—6.5 mm long, outer ones sparsely appressed-pilose. Filaments glandular-papillose throughout 4. *A. pedicellata*
 6a. Corolla 5-lobed; lobes ovate. Bracts small, lanceolate to narrow-oblong, 3—7 mm long, deciduous. Leaves glabrous or sparsely pilose. Sepals densely appressed-pilose; inner ones with glabrous margins 6. *A. luzonensis*
 b. Corolla 5-parted; lobes linear, at the top with 2 glabrous lobules 7
 7a. Sepals glabrous. Bracts minute, glabrous. Leaves ovate or ovate-oblong, glabrous or nearly so 9. *A. boholensis*
 b. Sepals densely pilose or tomentose. Bracts larger, pilose. Leaves ovate 8
 8a. Upper surface of leaves and of bracts glabrous. Bracts linear to filiform. Sepals c. 6 mm long 8. *A. apoensis*
 b. Leaves and bracts pilose on both surfaces 9
 9a. Bracts lanceolate, acuminate. Sepals 7—8 mm long; outer ones ovate to elliptic, inner ones orbicular. Leaves ovate 7. *A. barnesii*
 b. Bracts linear, with a long and linear to filiform acumen. Sepals smaller, c. 5 mm long 7a. *A. barnesii* var. *urdanetensis*
 Incompletely known *A. paucinervia*, *A. samarensis*

1. *Argyreia nervosa* (Burm. f.) Bojer, Hort. Maurit. (1837) p. 224 (not seen); Merrill, Fl. Manila (1912) p. 386; id., Enum. Philipp. Fl. Pl. III (1923) p. 371; Van Ooststr. in Blumea V, 2, (1943) p. 364 — *Convolvulus nervosus* Burm. f., Fl. Ind. (1768) p. 48, t. 20, fig. 1 — *C. speciosus* L. f., Suppl. (1781) p. 137, excl. patria — *Ipomoea speciosa* Pers., Syn. Pl. I (1805) p. 183 — *Lettsomia speciosa* Roxb., Hort. Bengal (1814) p. 13, nomen — *L. nervosa* Roxb., Fl. Ind., ed. Carey & Wall. II (1824) p. 78 — *Argyreia speciosa* Sweet, Hort. Brit. (1827) p. 289 — *Rivea nervosa* Hallier f. in Bull. Herb. Boiss. V (1897) p. 381.

A large twiner with milky juice. Stems terete, densely and minutely whitish or fulvous tomentose. Leaves petiolate; petiole shorter than or as long as the blade, tomentose like the stem; blade large, ovate to orbicular, with an obtuse to acute or shortly cuspidate, mucronulate apex and a deeply cordate base, 10—30 cm or more long, 8—25 cm or more broad, glabrous or nearly so above, densely fulvous to greyish or white sericeo-tomentose and shining beneath. Nerves 11—16 on each side of the midrib. Flowers in a subcapitate cyme at the end of a stout peduncle; this

peduncle terete, tomentose like the stem, attaining a length of 20 cm or more; pedicels short, angular; bracts large, ovate to oblong or elliptic, with a long and narrow acumen, pilose outside, glabrous inside, 3.5—5 cm long, deciduous. Sepals equal in length or the interior ones a little shorter, densely whitish tomentose outside, glabrous inside, the two exterior ones broad-elliptic, obtuse or acutish, up to 15 mm long, the three interior ones broad-elliptic, to orbicular, obtuse, about 10—12 mm long. Corolla rose-purple, large, c. 6 cm long, tubular to funnel-shaped, constricted at the base into a narrow tube, and with a slightly lobed limb; densely white appressed-sericeo-lanate without, with exception of the connecting fields and the basal part of the corolla. Stamens and style included; filaments pilose at base. Disk annular. Ovary glabrous, 4-celled. Fruit globose, apiculate, c. 2 cm diam., yellowish-brown, nearly dry.

PHILIPPINE ISLANDS: "Planted here and there but not as yet naturalized" (Merrill). Luzon, prov. Rizal, vicinity of Manila, *Cueper* 4, fl. Nov. 1907.

Distribution: A native of India; cultivated in other tropical countries.

Vernacular name: hoja seda (according to Merrill).

2. *Argyreia nitida* (Desr.) Choise in Mém. Soc. Phys. Genève VI (1833) p. 424; id. in DC., Prodr. IX (1845) p. 331; Miq., Fl. Ind. Bat. II (1857) p. 588; Naves in Blanco, Fl. Filip., ed. 3 (1877—83) t. 412; Merrill, Enum. Philipp. Fl. Pl. III (1923) p. 371 — *Convolvulus nitidus* Desr. in Lam., Encycl. III (1791) p. 544 — *Argyreia mollis* auct., non Choisy; Merrill, Fl. Manila (1912) p. 386 — *A. purpuricarpa* Elmer, Leafl. Philipp. Bot. V (1913) p. 1766; Merrill, Enum. Philipp. Fl. Pl. III (1923) p. 372.

A woody twiner with terete, appressed-hairy, glabrescent stems. Leaves petiolate; petiole much shorter than blade, 6—40 mm long; blade oblong, narrow-ovate, ovate or elliptic, with an acute, mucronulate apex and a rounded base, 6—12 cm long, 2.5—9 cm broad, appressed-sericeous on both sides, but much more densely beneath than above and silvery shining. Nerves about 6—8 on each side of midrib. Peduncles axillary, very much shorter than the leaves, 5—10 mm long, densely appressed-pilose, 1—3-flowered; pedicels hairy like the peduncle, much shorter than the sepals, 4—6 mm long; bracts of lateral flowers lanceolate, 3—4 mm long. Sepals unequal in length, the two exterior ones about 12—18 mm long, oblong, acutish or obtusish, with more or less crisped margin, densely appressed-sericeo-tomentose outside, sparsely hairy near the top inside; the third sepal falcate, about 12 mm long, the two interior ones broad-ovate, acuminate, about 9—10 mm long. Corolla pale purple with white throat, large, up to 8 cm long, funnel-shaped to campanulate, with broad, slightly lobed limb and contracted tube; midpetaline bands pilose with long, appressed hairs, basal portion of corolla and connecting fields glabrous. Stamens and style included; filaments pilose at base. Disk annular. Ovary glabrous, 4-celled. Fruit globular, purplish-red, at its base with the patent, enlarged concave sepals, which are purplish red inside. Seeds 4, c. 5 mm long, glabrous, except the pilose hilum.

PHILIPPINE ISLANDS: "In thickets and secondary forests at low and medium altitudes". Luzon, Central Luzon, without exact locality, *Loher* 4170; prov. Nueva Ecija, *Curran, For. Bur.* 8420, fr. Jan. 1908; prov. Rizal, *Ramos, Bur. Sci.* 36, fl. Nov. 1909;

id., Ramos, *Bur. Sci.* 22002, fl. Oct. 1913; id., Manila, *Merrill, Bur. Sci.* 7352, fl. Dec. 1910; id., San Francisco del Monte, *Loher* 4169, fl. Oct. 1892, and *Loher* 5052, fl. Nov. 1890; id., Jalajala, *Robinson & Ramos, Bur. Sci.* 11920, fl. Oct. 1910; id., Antipolo, *Merrill* 1299, fr. Febr. 1903; prov. Laguna, Mt. Maquiling, *Mabesa, For. Bur.* 27089, fl. Febr. 1918; prov. Tarlac, Concepcion, *Merrill* 3643, fl. Nov. 1903; moreover in Ilocos Norte and Pampanga, according to *Merrill*; Culion, *Merrill* 601, fl. Dec. 1902; Panay, *Vidal* 3354, fr. March 1886; Palawan, Puerto Princesa (Mt. Pulgar), in forests along streams, alt. about 225 m, *Elmer* 12777, type of *Argyreia purpuricarpa* *Elmer*, fr. March 1911 (BZ, L, NY).

Distribution: Endemic.

Vernacular names: Baging-kastila (Tagalog); bulákan (Panay Bisáya); bulalakan (Panay Bisáya).

A species, closely related to *A. mollis*. Differs chiefly in the form and size of the sepals and in the much shorter and more appressed hairs on the sepals.

Argyreia purpuricarpa Elmer, based on fruiting specimens from the island of Palawan, seems to be identic.

3. *Argyreia sorsogonensis* (Elmer) Van Ooststr., nov. comb. — *Rivea sorsogonensis* Elmer, *Leafl. Philipp. Bot.* X (1939) p. 3721.

A woody twiner with terete, solid, very sparsely pilose, light to dark brown stems. Leaves petiolate; petiole 3.5—7 cm long, with hairs like those of the stem; blade narrow-ovate to oblong, gradually attenuate towards the acute apex, rounded at the base, 7—15 cm long, 3—6 cm broad, sparsely strigillose or glabrous above, subglabrous beneath or slightly strigillose on the nerves; nerves about 8 on each side of the midrib. Inflorescences axillary, peduncle up to 18 cm long, strigillose; flowers at the end of the peduncle in a few-flowered cyme with long-persistent, oblong-lanceolate, sparsely appressed-pilose bracts, 15—22 mm long; pedicels 2—3 mm long, densely appressed-pilose with greyish hairs. Sepals 7.5—8 mm long, the two outer ones ovate, obtuse or shortly apiculate, densely greyish appressed-pilose outside, glabrous inside; third sepal slightly broader, obtuse, with one glabrous margin; two inner sepals broad-ovate, obtuse, with two glabrous margins. Corolla funnelshaped (only seen in bud); the limb subentire, slightly undulate; midpetaline bands sericeous outside; connecting fields and basal portion of corolla glabrous. Filaments inserted near base of corolla. Ovary conical, glabrous, 2-celled.

PHILIPPINE ISLANDS: Luzon, prov. Sorsogon, Irosin (Mt. Bulusan), "in light woods among shrubberies at 1000 feet altitude", *Elmer* 16992, type number, fl. Aug. 1916 (A, BZ, GH, K, NY, U, US).

Distribution: Endemic.

4. *Argyreia pedicellata* Van Ooststr. in *Blumea* V (1943) p. 379, fig. 2, h—j.

A woody twiner with terete, pale greyish brown, lenticellate stems; the young parts appressed-pilose, soon glabrous. Leaves petiolate; petiole 1.5—5 cm long; blade oblong to ovate-oblong, attenuate towards the obtusish or acute, mucronulate apex, or slightly acuminate, obtuse or acutish at the base, 5—12 cm long, 1.5—6 cm broad, glabrous above except for the midrib, sparsely appressed-pilose and glabrescent beneath; nerves 5—8 on each side of the midrib. Peduncle axillary, 5—10 cm long, sparsely appressed-pilose, lenticellate, cymosely ramified at the top, few- to several-flowered; pedicels sparsely appressed-pilose, more densely so near their

base, 7—12 mm long, in fruit elongate, up to 25 mm long, nodding and slightly curved at the base. Sepals subequal or the outer ones a little shorter; two outer sepals oblong to ovate-oblong, 6—6.5 mm long, sparsely appressed-pilose, third sepal ovate, 6—6.5 mm long, with one thin glabrous margin; two inner sepals broad-ovate to triangular, c. 7 mm long, with two glabrous margins. Corolla white (*Williams*), broadly funnel-shaped, the limb subentire, c. 4.5—5 cm diam.; midpetaline bands sericeous, connecting fields and basal portion glabrous. Filaments inserted near the corolla base, glandular-pubescent, c. 18 mm long; anthers with sagittate base, c. 5 mm long. Style glabrous, filiform, c. 24 mm long. Ovary glabrous, 2-celled. Disk annular, c. 1 mm high. Fruit ellipsoid, up to 12 mm long, with 1 ellipsoid seed.

PHILIPPINE ISLANDS: Luzon, prov. Benguet, Baguio, *Elmer 5898*, fr. March 1904; id., *Elmer 8439*, fr. March 1907 [A, BZ, K, L (*type*), NY, US]; id., *Williams 1267*, fl. July 1904; prov. Abra, Mt. Posuey, *Ramos, Sci. 27021*, fr. Febr. 1917.

Distribution: Endemic.

The specimen *Ramos, Bur. Sci. 27021*, has the fruiting pedicels and the lower surface of the leaves densely hairy.

A. pedicellata has been based by the present author on a fruiting specimen, *Elmer 8439* in the Leiden Herbarium. Fine flowering specimens, collected by *Williams (1267)* and deposited in the herbarium of the New York Botanical Garden and in the United States National Herbarium are believed to be identic. They have been distributed under the name of *Rivea luzonensis* Hallier f., but are at once distinguishable from that species by the subentire, not deeply lobed corolla limb, the more sparsely pilose sepals and the longer pedicels. In fruiting stage *A. pedicellata* differs from *A. luzonensis* in the much longer pedicels (up to 25 mm, in *A. luzonensis* up to 8 mm, but often shorter) and in the ellipsoid fruit (in *A. luzonensis* globose). Specimens collected by Mrs. *Clemens* in Mindanao, Camp Keithley, Lake Lanao, n. 50, young flowers Sept. 1907 in the United States National Herbarium; id. s. n., fr. March 1906 in the Buitenzorg herbarium and mentioned under this species in *Blumea* l. c., are specifically distinct. The specimens are too imperfect for an accurate description. Another specimen from Mindanao, prov. Lanao, vicinity of Davis Falls, alt. 200—300 m, collected by *Lynn Zwickey (n. 562)*, herb. Arnold Arb. with young fruits is probably identic.

5. *Argyreia philippinensis* (Merrill) Van Ooststr., nov. comb. — *Lettsomia philippinensis* Merrill in *Philipp. Journ. Sci.* XXVI (1925) p. 488.

A woody twiner with terete, in dry state longitudinally wrinkled, very sparsely appressed-pilose, glabrescent, pale greyish-brown stems. Leaves petiolate; petiole 1.5—6 cm long, very sparsely pilose like the stems and the peduncles; blade ovate to ovate-oblong or narrower, oblong-lanceolate to narrow-lanceolate, acuminate or attenuate towards the acute apex, rounded to truncate at the base or in the narrower leaves acute to cuneate, 7.5—12.5 cm long, (1.5—)4—7 cm broad, glabrous on both sides except for a few scattered hairs, mainly along the nerves and especially beneath; nerves 5—7 on each side of the midrib, secondary veins parallel. Peduncles axillary, short, 0.5—2 cm long, sparsely hairy, cymosely

branched at the top, few-flowered; pedicels sparsely hairy, 2.5—5 mm long; bracts small, triangular, 1—2 mm long. Sepals about equal in length, c. 4 mm long, the two outer ones ovate-elliptic, the interior ones broader, all obtuse, the outer ones with some scattered hairs on the middle portion or entirely glabrous. Corolla white (*Merrill*), about 1.5 (*Merrill*)—2.5 cm long, tubular, the limb very shortly lobed, the midpetaline bands with appressed hairs outside, for the rest glabrous. Filaments (in young flowers) inserted 3 mm above the corolla base, 4 mm long, their dilated base with hairs along the margins; anthers 1.5 mm long. Ovary ovoid, glabrous, 2-celled; style glabrous, about 10 mm long. Fruits ovoid, glabrous, about 12 mm long on pedicels 5—8 mm long.

PHILIPPINE ISLANDS: "In damp forests at low altitudes" (*Merrill*). Luzon, prov. Cagayan, Abulog river, *Ramos*, *Bur. Sci.* 1100, fr. Febr. 1912; prov. Laguna, San Antonio, *Ramos*, *Bur. Sci.* 10964 (*type number*), fl. Aug. 1910 (L) and *Ramos*, *Bur. Sci.* 23795, fr. Oct. 1915; prov. Camarines Sur, Mt. Potianay, *Edaño*, *Bur. Sci.* 75961, fr. Nov. 1928 (on slopes in forest, 2700 ft); Catanduanes Island, *Ramos*, *Bur. Sci.* 30212, fr. Nov.—Dec. 1917.

Distribution: Endemic.

Distributed under the name *Rivea luzonensis* [= *Argyreia luzonensis* (*Hallier* f.) *Van Ooststr.*] from which the species is at once distinguishable by its short-peduncled cymes and its nearly glabrous or glabrous calyces. Moreover the corolla limb in *A. luzonensis* is distinctly 5-lobed with ovate lobes, whereas in *A. philippinensis* it is nearly entire.

6. *Argyreia luzonensis* (*Hallier* f.) *Van Ooststr.* in *Blumea* V (1943) p. 379 — *Rivea luzonensis* *Hallier* f. in *Bull. Herb. Boiss.* VI (1898) p. 714, t. 19 — *R. glabrata* *Elmer*, *Leafl. Philipp. Bot.* I (1908) p. 334.

A woody twiner with terete, in dry state longitudinally wrinkled, sparsely appressed-pilose, greyish-brown stems. Leaves petioled; petiole 1.5—4(—8) cm, sparsely appressed-pilose; blade broad- to narrow-ovate, or oblong, attenuate or acuminate at the apex, truncate or subcordate at the base, 7—18 cm long, 3.5—13 cm broad, glabrous above or with some scattered hairs, sparsely pilose with appressed hairs beneath; nerves 6—7 on each side of the midrib, finer venation reticulate with subparallel secondary veins. Peduncles axillary, slender, terete or angular, 7—20 cm long, sparsely appressed-pilose, or more densely so towards the apex, cymosely ramified at the apex, with many (rarely few) flowers in an umbellate cyme; pedicels very short, 1—2 mm long, densely appressed; pubescent as are the branches of the peduncle; bracts lanceolate to narrow-oblong, obtuse, 3—7 mm long, densely appressed-pubescent outside, deciduous. Sepals equal in length or the interior ones a little shorter, ovate-oblong, obtuse or sometimes acutish, about 5—6 mm long and 3 mm broad, densely greyish or whitish appressed-pilose outside, the third sepal with one thin glabrous margin, the two inner sepals with two thin glabrous margins; all sepals glabrous inside. Corolla reddish, funnel-shaped, about 2.5—3 cm long, the limb distinctly 5-lobed, c. 4 cm diam., the lobes ovate, the midpetaline bands densely appressed-sericeous; their tips penicillate, the corolla tube and the connecting fields glabrous. Filaments glandular-papillose. Ovary glabrous, 2-celled; disk annular. Fruit purple (*Williams*), or pinkish red (*Foxworthy*), globose, about 1 cm or slightly more in diam.,

the sepals slightly enlarged in fruit, the inner ones with red, glabrous margins; the fruiting pedicels up to 8 mm long, but often shorter. Seed 1, globose.

PHILIPPINE ISLANDS: "Common in thickets and forests, especially along mountain streams at low and medium altitudes, ascending to 1500 m" (Merrill). Luzon, prov. Ilocos Norte, Bangui, *Mc Gregor, Bur. Sci. 43519*, fl. Nov. 1923; prov. Ifugao, *Mc Gregor, Bur. Sci. 20019*, fr. Febr. 1913; prov. Benguet, *Clemens 17236*, fr. Dec. 1926; id., Baguio, near Sablan, *Elmer 8923*, type of *Rivea glabrata* Elmer, fr. March 1907 (A, K, NY, US); id., Baguio, dense jungles along the Bued river gorge, *Elmer 8482*, fr. March 1907; prov. Pangasinan, Labrador, Mt. San Isidro, *Fénix, Bur. Sci. 29994*, fr. Nov. 1917; prov. Zambales, Castillejos, Mt. Canaynayan, *Edaño, Bur. Sci. 26842*, fr. Dec. 1916; id., Mt. Tapolao, *Ramos & Edaño 44765*, fr. Nov.—Dec. 1924; prov. Nueva Ecija, Mt. Umingan, *Ramos & Edaño 26509*, fl. Aug.—Sept. 1910; prov. Bataan, Lamao river, *Barnes, For. Bur. 60*, fl. Oct. 1903 and *351*, fr. March 1904; id., Lamao river, Mt. Mariveles, *Borden, For. Bur. 2048*, fl. Sept.—Dec. 1904 and *2391*, fr. Jan. 1905; *Merrill 3120*, fl. Oct. 1903; *Meyer, For. Bur. 2253*, fr. Dec. 1904 and *2417*, fr. Jan. 1905; *Whitford 1035*, fr. Jan. 1905; *Williams 406 bis*, fr. Jan. 1904 and *508*, fr. Jan. 1904; id., Lamao Forest Reserve, *Foxworthy, Bur. Sci. 1652*, fl. Oct. 1906; id., Dinalupijan, *Merrill 1540*, fr. Jan.—Febr. 1903; prov. Rizal, San Mateo, *Vidal 1622*, fl. Nov. 1884; id., Lucutan, *Loher 4153*, fl. Nov. 1890; id., Montalban, *Loher 4154*; *6593*, fl. Aug. 1905; *6682*, fl. Oct. 1903; *6685*, fr. Jan. 1906; *7288*, fr. Dec. 1904; id., Rio Macaharing (Montalban), *Loher 4152*, fr. Febr. 1891; prov. Laguna, *Mabesa, For. Bur. 24914*, fr.; id., Calawang, *Cuming 692*, type number, fl. (K, L); id., Mt. Maquiling, *Foxworthy, Bur. Sci. s.n., Field n. 43*, fr. Nov.—Dec. 1914; id., San Antonio, *Ramos, Bur. Sci. 23819*, fl. Oct. 1915; id., Pililla-Mabitae trail, *Robinson & Ramos, Bur. Sci. 11952*, fl. Oct. 1910; prov. Sorsogon, Irosin, Mt. Bulusan, *Elmer 15431*, fr. Dec. 1915.

Distribution: Endemic.

Vernacular name: Busilád (Tagalog); deno(k)dokto (Igorot); sabaltukon (Tagalog); taud-taud (Negrito); philippino wire.

Use: The stems are used for tying purposes (*Elmer*).

7. *Argyreia barnesii* (Merrill) Van Ooststr., nov. comb. — *Rivea barnesii* Merrill in *Bur. Govt. Lab. Publ. 17* (1904) p. 40; id. in *Philipp. Journ. Sci. I* (1906) Suppl. p. 119; id. in *Enum. Philipp. Fl. Pl. III* (1923) p. 371 — *R. cinerea* Elmer, *Leafl. Philipp. Bot. I* (1908) p. 335.

A woody twiner with terete stems; the ultimate parts densely greyish or brownish pubescent to tomentose, the adult parts glabrescent. Leaves petiolate, petiole 2—5 cm long, with a pubescence similar to that of the stem; blade ovate-oblong, ovate or broad-ovate, shortly or long acuminate to caudate and mucronulate at the apex, rounded or cordate at the base, 6—18 cm long, 3.5—13 cm broad, more or less densely and softly pilose to tomentose on both sides. Nerves 7—9(—12) on each side of midrib. Peduncles axillary, 1—many-flowered, pubescent like the stems, 2—14 cm long; pedicels much shorter than or nearly as long as the sepals, elongated in fruit; bracts lanceolate, acuminate, the lower ones of the cyme about 1—2 cm long, pubescent on both sides. Sepals nearly equal in length, 7—7.5 mm long, the two exterior ones ovate to broadly elliptic, obtuse or minutely mucronate, densely pubescent to tomentose outside; third sepal with a glabrous margin at one side, broadly elliptic to orbicular, obtuse or truncate, two interior ones orbicular, emarginate, with 2 glabrous margins; inside of all sepals glabrous. Corolla lavender, 5-parted, the lobes linear, c. 20 mm long and 3—4 mm broad, at the top with two triangular membranous glabrous lobules (connecting fields), outside densely sericeous to the base, the tube c. 9 mm long, glabrous. Filaments c. 15 mm long,

with a large tooth above the base, glabrous. Ovary 2-celled. Fruit purple (*Elmer*), enclosed at base by the slightly enlarged sepals, ellipsoid, up to 1.5(—2, *Elmer*) cm long, 1-seeded; seed ellipsoid, 1 cm long.

PHILIPPINE ISLANDS: "In forests at low and medium altitudes" (*Merrill*). Luzon, prov. Benguet, Baguio, near Sablan, *Elmer 8882*, fr. March 1907, type of *Rivea cinerea* *Elmer* (A, BZ, K, L); and *Fénix*, *Bur. Sci. 467*, fr. Nov. 1910; prov. Pangasinan, Labrador, Mt. San Isidro, *Fénix*, *Bur. Sci. 29917*, fr. Nov. 1917; prov. Bataan, Lamao River, in dry hill forests, 100 m alt., *Barnes*, *For. Bur. 68*, fl. Nov. 1903, type number (BZ, K, NY, SING, US); prov. Rizal, Bosoboso, *Vidal 840*, fr. and young fl. Jan. 1884; and *Ramos*, *Bur. Sci. 1062*, young fl. July 1906; id., Mt. Irig, *Ramos*, *Bur. Sci. 41952*, fr. Febr. 1923; id., Mt. Susong-Dalaga, *Ramos & Edaña*, *Bur. Sci. 29317*, fl. Aug. 1917; id., Orind, *Loher 5577*, fl. Aug. 1905; id., Balaabac, *Loher*, *Bur. Sci. 13050*, fr. May 1916; id., Antipolo, Morong, *Merrill 1657*, fr. March 1903; prov. Camarines, Mt. Iriga, *Ramos*, *Bur. Sci. 22202*, fr. Dec. 1913; Mindoro, Paluan, *Ramos*, *Bur. Sci. 39593*, fr. Apr. 1921; Guimaras Island, *Vidal 3351*, fr. March 1883; Samar, according to *Merrill*; Leyte, Dagami, *Wenzel 472*, fl. Sept. 1913; Mindanao, Bukidnon subprov., Tangulan, *Ramos & Edaña*, *Bur. Sci. 39036*, fl. June, July 1920.

Distribution: Endemic.

Vernacular names: Quahal, guahal (Igorot).

The density of the indument is extremely variable in this species. In the specimens *Ramos & Edaña*, *Bur. Sci. 29317* and *Ramos*, *Bur. Sci. 1062* the leaves are densely tomentose on both surfaces; the same is found in *Elmer 8882*, the type of *Rivea cinerea* *Elmer*. The type of *Rivea barnesi* *Merrill*, *Barnes*, *For. Bur. 68* has the leaves much less densely pilose; still less hairy are the specimens *Fénix*, *Bur. Sci. 29917* and *Ramos & Edaña*, *Bur. Sci. 44770*. In the last-named specimen the upper leaf surface is glabrous, whereas the lower surface is sparsely pilose, as are the petioles; the stems are nearly glabrous, the young parts being sparsely appressed-pilose; the calyx is also much less pubescent than in the other specimens.

var. *urdanetensis* (*Elmer*) *Van Ooststr.*, nov. var. — *Rivea urdanetensis* *Elmer*, *Leafl. Philipp. Bot. VII* (1915) p. 2605. Characterised by its smaller, 5 mm long sepals and by the corolla lobes being glabrous in their basal portion instead of pilose to the base. Moreover the bracts are narrower than in typical specimens of the species.

PHILIPPINE ISLANDS: Mindanao, prov. Agusan, Cabadbaran (Mt. Urdaneta). *Elmer 13361* (13351 in the original description), type number, fl. July 1912 (A, BZ, GH, K, L, NY, U, US). A specimen with nearly glabrous leaves and very young flowers, collected in Luzon, prov. Zambales, *Elgincolin*, *For. Bur. 28662*, fl. Aug. 1921 probably also belongs here.

Distribution: Endemic.

Vernacular name: Cawilan, kaulilan (Manóbo).

8. *Argyreia apoensis* (*Elmer*) *Van Ooststr.*, nov. comb. — *Rivea apoensis* *Elmer*, *Leafl. Philipp. Bot. VII* (1915) p. 2604; *Merrill* in *Enum. Philipp. Fl. Pl. III* (1923) p. 370.

A woody twiner with sparsely appressed-pilose, glabrescent stems. Leaves petiolate; petiole 2—3 cm long, appressed-pilose; blade ovate, truncate or slightly cordate at the base, acute to acuminate at the apex, 6—10 cm long, 3.5—6 cm broad, glabrous above, appressed-pilose beneath, especially along the nerves. Nerves 6—8 on each side of the midrib. Inflorescences in the axils of the uppermost leaves; peduncle up to 9 cm long, appressed-pilose towards the top with yellowish-grey hairs; flowers in few-flowered umbellate cymes; branches of the cyme and pedicels rather

densely appressed-pilose with yellowish-grey hairs; pedicels 2—4 mm long; bracts linear to filiform, ending in a narrow point, 8—12 mm long, hairy beneath, glabrous above. Sepals nearly equal in length, the two outer ones elliptic-oblong, obtuse, mucronulate, 6.5 mm long, 4—4.5 mm broad, densely appressed-pilose outside; third sepal broader, similarly pilose, with a glabrous margin at one side; fourth and fifth sepal broad-ovate to orbicular, similarly pilose, with two glabrous margins, about 6.5 mm long and 7 mm broad. Corolla, "whitish outside, purplish or violaceous inside" (*Elmer*), 5-parted, the lobes linear, recurved and twisted, c. 24 mm long, 3 mm broad, broadened at the top and there with two glabrous membranaceous wings (connecting fields), the midpetaline bands sericeous outside towards the apex, glabrous inside; the tube glabrous, c. 11 mm long and 4—5 mm diam. Filaments inserted with slightly dilated thick and papillose bases at the mouth of the tube, "10 mm long, anther 3 mm" (*Elmer*). Ovary globose, glabrous, 2-celled. Style "glabrous" (*Elmer*). Disk annular, almost entire, 1 mm high.

PHILIPPINE ISLANDS. "In forests, altitude about 450 m" (*Merrill*). Mindanao, Davao district, Todaya (Mt. Apo), *Elmer 11231*, type number, fl. July 1909 (A, BZ, GH, K, L, NY, US).

Distribution: Endemic.

Vernacular name: Dalumosip (Bagóbo).

Closely related to *A. barnesii* and possibly only a variety of that species.

9. *Argyreia boholensis* (*Merrill*) Van Ooststr., nov. comb. — *Lettsomia boholensis* *Merrill* in *Philipp. Journ. Sci.* XXIX (1926) p. 485.

A woody twiner with pale greyish-brown, terete or upwards slightly angular, glabrous stems. Leaves petiolate; petiole 2—3.5 cm long, glabrous; blade ovate or ovate-oblong, rounded or very slightly cordate at the base, acute to shortly acuminate at the apex, 4—10 cm long, 1.5—7 cm broad, thinly coriaceous, in dry state of a greyish or olivaceous colour, glabrous or with a few hairs on the nerves, mainly on the midrib beneath; nerves 8—10 on each side of the midrib. Peduncles in the upper axils, cymosely 1—3(—5)-flowered, 2—7.5 cm long, glabrous or with some hairs; pedicels glabrous, those of the central flower of a cyme about 8—10 mm, of the lateral flowers often shorter; bracts narrow-triangular, with incurved apex, about 2 mm long, glabrous. Sepals glabrous, coriaceous, two outer ones broad-ovate-triangular, obtuse, 5 mm long, third sepal broad-ovate, obtuse, with broad thinner margin at one side, 5 mm long, two inner sepals broader than long, broadly rounded, strongly concave, with two broad thinner margins, about 4 mm long. Corolla with cylindric tube, and deeply divided limb; tube about 8 mm long, glabrous; segments of the limb linear, reflexed and twisted, about 18 mm long, densely sericeous outside, at the top with 2 triangular membranous glabrous lobules (connecting fields). Filaments inserted at the mouth of the corolla tube, geniculate near their thick broadened base, about 11—12 mm long, pubescent. Ovary glabrous, 2-celled, style about 17 mm long. Disk annular, with slightly undulate margin. "Young fruits oblong-ellipsoid, glabrous, about 1 cm long" (*Merrill*).

PHILIPPINE ISLANDS: "In openings in the forest and along streams, altitude 300 to 600 m" (*Merrill*). Bohol, Ramos, *Bur. Sci.* 42772, type number, fl. Aug.—Sept. 1923 (A, HZ, K, US). *Merrill* still mentions another specimen from Bohol, Ramos, *Bur. Sci.* 43247.

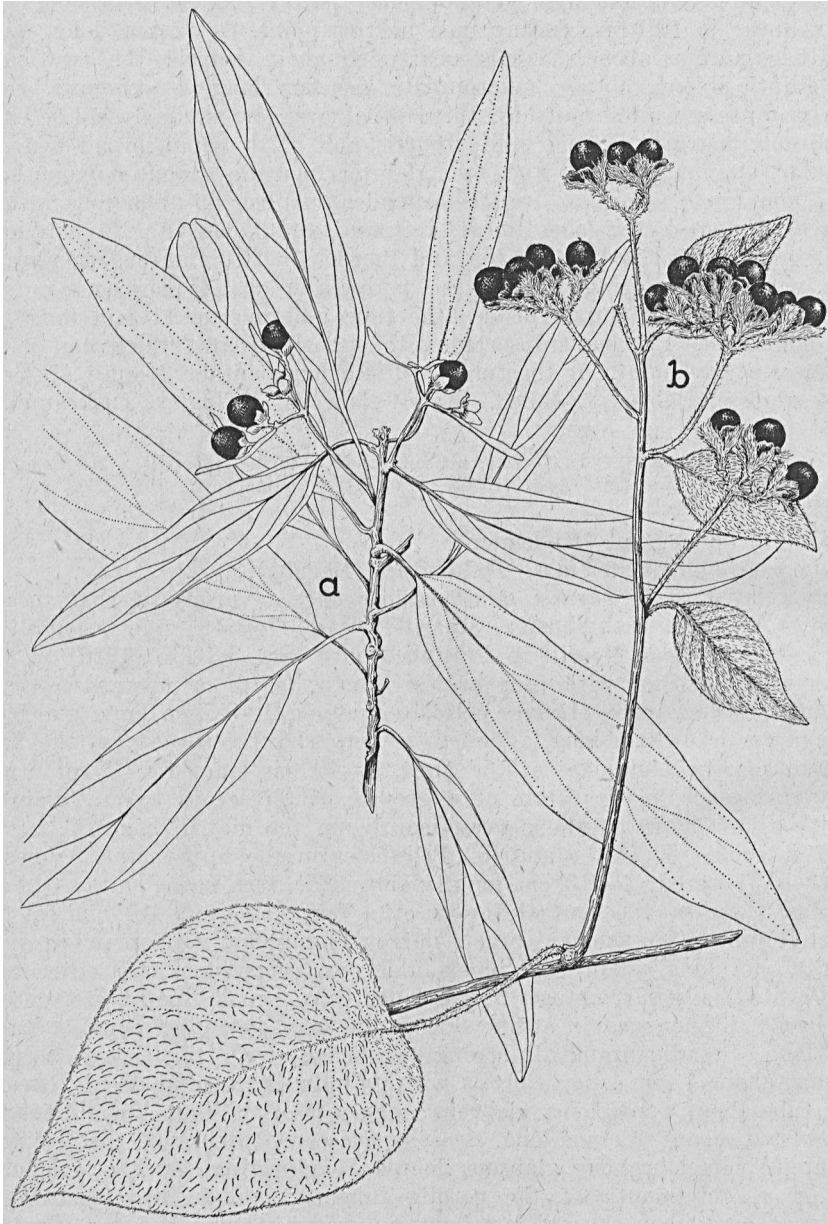


Fig. 1. a: *Argyreia paucinervia* Van Ooststr.
b: *Argyreia samarensis* Van Ooststr.
 $\pm \frac{1}{2} \times$ nat. size.

Distribution: Endemic.

A fruiting specimen with ellipsoid, 12—14 mm long, pink fruits, collected in Luzon, prov. Tayabas, Kinatakutan, *Oro, For. Bur. 30672*, fr. Jan. 1929, in the herbarium of the New York Botanical Garden much resembles this species, but has the sepals appressed-pilose outside.

10. *Argyreia paucinervia* Van Ooststr., nov. spec. Fig 1, a.

Frutex scandens. Ramuli ultimi in sicco longitudinaliter rugosi vel angulosi, pallide fulvi vel cinerei, partibus junioribus appresse pilosis mox glabris, foliis crebris. Folia petiolata, petiolo quam lamina multo breviora, 1—2.5 cm longo, pilis brevibus appressis nonnullis praedito vel glabro; lamina oblonga vel anguste oblonga vel lanceolata, apicem obtusiusculum minute mucronatum versus gradatim attenuata, basi acute attenuata vel cuneata, 10—16 cm longa, 2—4 cm lata, juniora subtus pilis brevibus appressis nonnullis praedita, adultiora glaberrima; nervo mediano nervisque lateralibus angulis acutis ascendentibus utrinque 3—4 supra et subtus planis. Pedunculi (fructiferi) in axillis foliorum superiorum, 2—3 cm longi, pilis brevibus appressis nonnullis praediti, glabrescentes, apice cymoso-ramosi, 3—5-flori, ramis 8—10 mm longis valde divaricatis; bractae elevatae usque ad basin pedicelli, lineares vel angustissime spatulatae obtusae 20—25 mm longae, c. 3 mm latae sparsim appresse pilosae vel glabrae; pedicelli (fructiferi) pilis brevibus nonnullis praediti vel glabri 2—4 mm longi. Sepala in media parte pilis appressis nonnullis praedita vel glabra, inter se aequilonga c. 6—7 mm longa, exteriora tria ovata apice obtusiuscula, interiora dua late ovata apice obtusa plusminusve emarginata vel irregulariter dentata. Bacca globosa c. 1 cm diam.; semen 1, globosum.

PHILIPPINE ISLANDS: Luzon, prov. Isabella, Mt. Moises, *Ramos & Edaña, Bur. Sci. 47260*, fr. March 1926 (NY, type; BM, US).

Distribution: Endemic.

Much resembling narrow-leaved specimens of *A. philippinensis*, but differing in the globular fruits (in *A. philippinensis* ellipsoid), in the long, linear bracts (in *A. philippinensis* minute, triangular) and in the number (3—4) of lateral nerves of the leaves (in *A. philippinensis* 5—7 on each side of the midrib):

11. *Argyreia samarensis* Van Ooststr., nov. spec. Fig. 1, b.

Frutex scandens. Ramuli in sicco longitudinaliter rugosi vel angulosi, pallide fulvi, partibus junioribus hirsuti, glabrescentes. Folia sparsa petiolata, petiolo quam lamina multo breviora, 2—5 cm longo, hirsuto; lamina late vel anguste ovata, apice acuta vel paullo acuminata, basi late rotundata (vel subcordata), (5—)9—14 cm longa, (2.5—)4—9 cm lata, utrinque sparse hirsuta, nervo mediano nervisque lateralibus utrinque 8—11 subtus subprominentibus. Pedunculi (fructiferi) in axillis foliorum, 4—10 cm longi, hirsuti, apice cymoso-ramosi, 3—8-flori, ramis pedicellis hirsutis; bractae deciduae, in specimenibus siccis desunt; pedicelli (fructiferi) 5—10 mm longi, hirsuti, apicem versus incrassati. Sepala dua exteriora elliptica obtusa, 9 mm longa, externe hirsuta interne glabra, sepalum tertium orbiculare apice rotundatum, 8 mm longum, externe margine uno latere excepto hirsutum interne glabrum, sepala dua interiora orbicularia apice rotundata vel paullo emarginata, 8 mm longa, externe marginibus lateralibus exceptis hirsuta interne glabra. Bacca ellipsoidea vel ovoidea, c. 18 mm longa; semen 1, ellipsoideum, c. 15 mm longum.

PHILIPPINE ISLANDS: Samar, Ramos, Bur. Sci. 17489, fr. March—April 1914 (L, type; BM, K, US).

Excluded species.

Argyreia malabarica Choisy, *A. nellygherya* Choisy and *A. populifolia* Choisy, mentioned by Fernandez Villar, Novissima Appendix (1880) p. 139, do not occur in the Philippine Islands.

Rivea corymbosa (L.) Hallier f. in Engl., Bot. Jahrb. XVIII (1894) p. 157; Merrill, Fl. Manila (1912) p. 387; id., Enum. Philipp. Fl. Pl. III (1923) p. 371, according to Merrill introduced in the Philippine Islands from tropical America; in some places now spontaneous in thickets and secondary forests = *Legendrea corymbosa* (L.) Van Ooststr. in Blumea V, 2 (1943) p. 355.

Rivea leucocarpa Elmer, Leafl. Philipp. Bot. X (1939) p. 3720, based on Elmer 15766, Luzon, prov. Sorsogon, Irosin, Mt. Bulusan, fr. Apr. 1916 = *Ehretia* spec. (Boraginaceae).