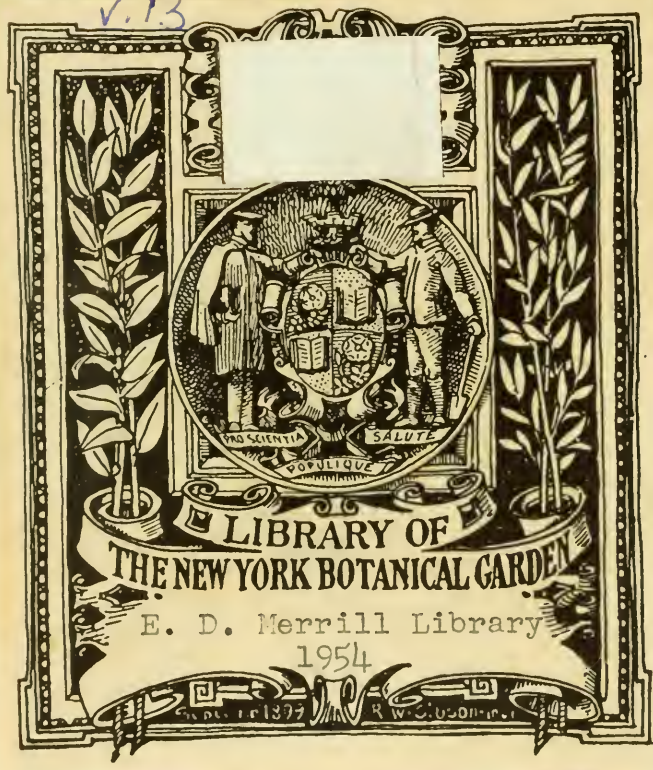


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NEW OR NOTEWORTHY PHILIPPINE PLANTS, XIII

By E. D. METZELL

(From the Botanical Section of the Biological Laboratory, Bureau of
Science, Manila)

Separate from

THE PHILIPPINE JOURNAL OF SCIENCE

Published by the Bureau of Science of the Philippine Government,
Manila, P. I.

VOL. XIII, No. 1, SER. C, BOTANY, JANUARY, 1918

MANILA
BUREAU OF PRINTING
1918

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THE PHILIPPINE
JOURNAL OF SCIENCE

C. BOTANY

VOL. XIII

JANUARY, 1918

No. 1

NEW OR NOTEWORTHY PHILIPPINE PLANTS, XIII

By E. D. MERRILL¹

(From the Botanical Section of the Biological Laboratory, Bureau of
Science, Manila)

The last paper under this title was published in 1915,² the present contribution being essentially similar to the preceding ones of the series. Seventy-two species in thirty-four families are described as new, the groups considered being those that for the most part present comparatively few novelties in current collections. One new genus, *Ilocania*, of the *Cucurbitaceae*, is described. Eight species previously described from extra-Philippine material are for the first time credited to the Archipelago, representatives of these having appeared in our current collections; among these the genus *Zippelia* is new to the Archipelago. A noteworthy species, presenting another striking case of Philippine-Australian distribution is the rare and very characteristic *Ipomoea diversifolia* R. Br., which has definitely been reported only from the small islands in the Gulf of Carpentaria, but which now appears in our collections from north-western Luzon. *Sida longistipula* Merr., described below, a very characteristic and strongly marked species, finds its alliance with a few Australian species rather than with the Asiatic representatives of the genus. *Vitex celebica* Koord. adds another species to the already long list of those known only from the Philippines and Celebes.

¹ Professor of botany, University of the Philippines.

² Merrill, E. D., New or Noteworthy Philippine Plants, XII, *Philip. Journ. Sci.* 10 (1915) *Bot.* 287-349.

ARACEAE

ALOCASIA Schott

ALOCASIA WENZELII sp. nov. § *Eualocasia*.

Planta magna, glabra; foliis longe petiolatis, usque ad 1 m longis, haud peltatis, oblongo-ovatis vel ovatis, coriaceis, nitidis, laevis, margine cartilagineis, sursum angustatis, apice obtusis ad leviter acuminatis, basi profunde lobatis, lobis oblongis, obtusis, 30 ad 50 cm longis; nervis subtus valde prominentibus, utrinque 8 ad 11, patulis, basilaribus deflexis usque ad apicem loborum attingentibus; inflorescentiis longe pedunculatis, spathis oblongis, acutis, usque ad 12 cm longis et 2.5 cm latis, vetustioribus reflexis, spadiceis circiter 10 cm longis.

A large, coarse, glabrous plant, the caudices in old plants up to 0.7 m high and 15 cm in diameter. Petioles stout, up to 1 m in length, when fresh green and mottled or horizontally striped. Leaf-blades oblong-ovate, up to 1 m in length and 45 cm in width in the widest part, pale-olivaceous when dry, from the tip of the basal lobes to the apex attaining a length of 1 m, coriaceous, somewhat shining, smooth on both surfaces, the margins prominently cartilaginous, entire; basal lobes not spreading, oblong, obtuse, attaining a length of 50 cm, the sinus extending to the insertion of the petiole, usually narrow, acute; apex obtuse to obscurely acuminate, the blade gradually narrowed from base to apex; lateral nerves 8 to 11, very prominent on the lower surface, spreading at nearly right angles except the basal pair which is deflexed and extends quite to the tip of the basal lobes, emitting from one to three prominent veins on the outer side; reticulations obscure. Inflorescences numerous, their peduncles up to 45 cm in length. Tube of the spathe oblong, about 2 cm long, the limb at first boat-shaped, oblong, acute or somewhat apiculate, about 12 cm long and 2.5 cm wide, white, ultimately reflexed and deciduous. Spadix cylindric, erect, up to 10 cm in length, the basal pistillate portion about 1.5 cm long and less than 1 cm in diameter, the staminate portion 3 to 3.5 cm long, cylindric, somewhat thicker than the pistillate portion, the appendage acute or acuminate, cylindric, about equalling the staminate and pistillate portions of the spadix. Staminate and pistillate flowers crowded. Stigmas sessile, subcapitate, scarcely lobed. Apex of the anther-bearing body truncate, crenate, about 2 mm in diameter, anthers apparently 8 to 10. Fruiting spadices ovoid or ellipsoid, when dry about 3 cm long.

LEYTE, Dagami, *Wenzel 97* (type), March 28, 1913, on forested slopes, altitude about 60 meters. BILIRAN, *Bur. Sci. 18929 McGregor*, June 22,

1914, in forests, altitude about 300 meters. SAMAR, Catubig River at Pinipisakan, *Bur. Sci.* 24266 Ramos, March 21, 1916, in forests along the river. MINDANAO, Agusan Subprovince, Amparo, *For. Bur.* 7615 Hutchinson, August 23, 1907, in open forests, altitude about 30 meters. It is known in Leyte as *biga*, the common name for *Alocasia macrorrhiza* Schott, and in Samar as *handuroy*.

A remarkable species belonging in the same group with *Alocasia macrorrhiza* Schott, to which, however, it is not closely allied. It is well characterized by its large, oblong-ovate, coriaceous, very smooth, shining leaves, the basal lobes deflexed, not at all spreading, often attaining a length of one-half the lamina, and its very obscure reticulations.

ALOCASIA MAQUILINGENSIS sp. nov. § *Eualocasia*.

Planta robusta; pedunculis et subtus foliis furfuraceo-hispidulis; foliis late ovatis, usque ad 90 cm longis et 50 cm latis, obtusis vel obscure acuminatis, haud peltatis, lobis latissime ovatis, rotundatis, comparate brevibus, nervis utrinque circiter 10 utrinque, subtus valde prominentibus, patulis, curvatis, basilariibus utrinque pinnati-nervosis, leviter deflexis, usque ad apicem loborum attingentibus, reticulis prominentibus; inflorescentiis numerosis, pedunculis usque ad 30 cm longis; spathis circiter 10 cm longis, tubo sub fructu accrescentibus, albis, carnosus, oblongo-ovoideis, usque ad 8 cm longis; spadicis 8 ad 10 cm longis.

A robust plant, the caudices in old specimens stout, attaining a height of about 0.3 m, perhaps higher. Leaves membranaceous, broadly ovate, up to 90 cm long and 50 cm wide, entire, apex obtuse to obscurely acuminate, base not at all peltate, with two very broad, rounded lobes which are at most 20 cm long, and as wide or wider than long, the sinus rather broad, somewhat rounded, the upper surface, when dry, minutely puncticulate-verruculose, the lower uniformly and distinctly furfuraceous-hispidulous on the nerves and reticulations; lateral nerves about 10 on each side of the midrib, prominent on the lower surface, spreading, curved, the basal pair somewhat deflexed and reaching the tip of the lobes, bearing from 3 to 5 pinnately arranged secondary nerves on each side; petioles stout, up to 1.5 m in length, rather densely furfuraceous-pubescent. Inflorescences numerous, up to 30 on each plant, their peduncles pubescent, up to 30 cm in length. Spathes about 10 cm long, the tubular portion 1 to 1.5 cm long, the limb lanceolate or oblong-lanceolate, membranaceous, about 6 cm long, acuminate. Pistillate portion of the spadix about 1 cm long, the flowers crowded; style short, distinct; stigma obscurely lobed. Staminate portion of the spadix about 2 cm long, cylindric, the sterile appendage about 5 cm long. Fruiting spathe ovoid or oblong-ovoid, white, fleshy, up to 8 cm in length, the fruits fleshy, red.

LUZON, Laguna Province, Mount Maquiling, *Baker 868* (type), March 1, 1913, *Bur. Sci. 16926 Serviñas*, November 25, 1912, *Bur. Sci. 6737 Robinson*, April 8, 1909, *Merrill 7153*, September 3, 1910, on forested slopes, altitude 120 to 600 meters.

A species well characterized by its pubescent leaves, petioles, and peduncles, and by its white, fleshy, fruiting spathes.

COMMELINACEAE

ANEILEMA R. Brown

ANEILEMA HUMILE sp. nov. § *Dictyospermum*.

Planta circiter 20 cm alta, erecta, haud ramosa, vaginis et petioles plus minusve hirsutis; foliis paucis, submembranaceis, oblongis ad oblongo-ellipticis, usque ad 10 cm longis, apice tenuiter acuminatis, basi cuneatis; inflorescentiis racemosis, paucifloris, solitariis, e axillis superioribus, circiter 2 cm longis; capsulis ovoideis, glabris, circiter 3 mm longis, 3-ocularibus, 3-valvis, loculis 1-spermis; seminibus osseis, plano-convexis, ellipticis, perspicue rugosis, circiter 2.5 mm longis.

An erect simple plant, or the lower parts of the stem more or less decumbent and geniculate, about 20 cm high, the stems glabrous or very slightly pubescent. Leaves submembranaceous, oblong to oblong-elliptic, 5 to 10 cm long, 1.5 to 3.5 cm wide, subequally narrowed to the slenderly sharp-acuminate apex and to the cuneate base, glabrous, of the same color on both surfaces when dry, scarcely shining, the longitudinal lateral nerves usually three on each side of the midrib, obscure, the petiolar part 3 to 4 mm long, more or less pubescent, the sheaths 1 cm long or less, somewhat inflated, more or less pubescent. Raceme solitary, simple, from the uppermost axil, 2 to 2.5 cm long, few-flowered, glabrous, the base with a narrowly lanceolate, 1 cm long, acuminate bract. Flowers white. Sepals elliptic-obovate, green when fresh, brown when dry, about 3 mm long, concave, somewhat cucullate. Petals very thin, white, oblong-obovate, rounded, about 3.5 mm long, the nerves dark-brown, very prominent. Fertile stamens 3; anthers broadly elliptic-ovate, 1 mm long; staminodes 3. Ovary ovoid, glabrous; style 3 mm long. Capsule ovoid or ovoid-ellipsoid, 3 to 3.5 mm long, 3-valved, 3-celled, the pericarp brittle, shining; seeds solitary in each cell, 2.5 mm long, white, plano-convex, elliptic, prominently rugose.

ALABAT, back of Sangirin, *Merrill 10459*, December 24, 1916, on steep slopes in damp forests, altitude about 80 meters; rare and a few plants observed in only one place.

This very characteristic species is readily distinguished by its inflores-

cence being reduced to a short simple raceme, a character very different from most of the other species in the genus. It is apparently not very closely allied to any previously described form.

LILIACEAE

SMILAX Linnaeus

SMILAX ERECTA sp. nov.

Frutex erectus, glaber, leviter aculeatus, simplex vel parce ramosus, circiter 1 m altus, ecirrhiferus; foliis oblongis, in siccitate brunneis, nitidis, usque ad 20 cm longis, utrinque aequaliter angustatis, apice prominente acuminatis, basi cuneatis, perspicue 3-nerviis; inflorescentiis axillaribus, simpliciter umbellatis, breviter pedunculatis; fructibus ovoideis vel ellipsoideis, circiter 8 mm longis.

An erect shrub about 1 m high, glabrous, simple or at most once dichotomously branched above, without tendrils, the stems terete, pale-brownish, 5 to 6 mm in diameter below and armed with widely scattered, stout, short, straight spines 2 mm in length or less, the upper parts of the stem unarmed. Leaves oblong, subcoriaceous, brown and shining when dry, of nearly the same color on both surfaces, 12 to 20 cm long, 4 to 6 cm wide, equally narrowed to the rather prominently acuminate apex and the acute base, the base prominently 3-nerved, the lateral nerves extending to the tip of the leaf, the reticulations lax, fairly prominent; petioles about 2 cm long, the inflated basal part 1 cm long or less, cucullate. Umbels in the upper axils, solitary, simple, their peduncles 1.5 cm longer less, the pedicels 6 to 10, about 8 mm long. Fruits black when dry, ovoid or ellipsoid, wrinkled, shining, about 8 mm long.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28560 (type), 28472 Ramos & Edaña, May, 1917, on forested slopes.

This most characteristic species is readily distinguished by its erect, simple or but once branched stems which are aculeate below; by its prominently 3-nerved leaves; by the entire lack of tendrils; and by its simple umbels.

SMILAX LUCIDA sp. nov.

Frutex scandens, ramis leviter armatis, distincte circiter 9-angulatis, sulcatis; foliis firme chartaceis vel subcoriaceis, oblongo-ovatis ad oblongo-ellipticis, usque ad 16 cm longis, breviter apiculato-acuminatis, basi in foliis minoribus rotundatis, in majoribus distincte cordatis, utrinque nitidis, 5- vel 7-nerviis; umbellis axillaribus, solitariis, pedunculo 2.5 ad 3 cm longo; fructibus globosis, in siccitate subnigris, nitidis, 8 ad 10 mm diametro.

A scandant shrub, the branches and branchlets pale when dry, distinctly about 9-angled, sulcate, sparingly armed with widely scattered, short, straight, rather stout spines that do not exceed 2 mm in length. Leaves firmly chartaceous to subcoriaceous, subolivaceous when dry, prominently shining on both surfaces, oblong-ovate to oblong-elliptic, 8 to 16 cm long, 3.5 to 10 cm wide, all with a stout apiculate-acuminate apex, the smaller ones rounded at the base, the larger ones prominently cordate, 5- or 7-nerved, the inner pair of nerves much stouter than the outer ones, reaching the apex, the reticulations rather lax, prominent; petioles 1 to 2 cm long, the lower part somewhat sheathing, the tendrils attaining a length of about 10 cm. Umbels axillary, solitary, their peduncles 2.5 to 3 cm long, the pedicels in fruit 1.5 to 2 cm long. Fruits globose, numerous, nearly black when dry, somewhat wrinkled, prominently shining, 8 to 10 mm in diameter; seeds usually 3.

LUZON, Tayabas Province, vicinity of Dingalan, on the Pacific coast, *Bur. Sci.* 26611 Ramos & Edaña, August 27, 1916, on dry slopes at medium altitudes.

A species well characterized by its inflorescences being reduced to a simple umbel. In vegetative characters it somewhat resembles *SMILAX ELMERI* nom. nov. (*Smilax reticulata* Elm. Leaf. Philip. Bot. 8 (1815) 2740, non Desv., nec Heer), but *Smilax elmeri* has racemosely arranged umbels, and its leaves are acute at the base.

PIPERACEAE

ZIPPELIA Blume

ZIPPELIA BEGONIAEFOLIA Blume in Roem. & Schultes Syst. 7 (1830) 1614, 1651.

Zippelia lappacea Benn. Pl. Jav. Rar. (1838) 76, t. 16.

Piper zippelia C. DC. Prodr. 16¹ (1869) 256.

JOLO, Mrs. Clemens 9335, October 15, 1915, in damp forests, altitude about 600 meters.

This monotypic genus is new to the Philippines. Indo-China, Mekong River, Thorel, the Malay Peninsula, Borneo, and Java.

FAGACEAE

QUERCUS Linnaeus

QUERCUS CAGAYANENSIS sp. nov. § *Cyclobalanus*.

Arbor circiter 12 m alta, partibus junioribus densissime ferrugineo-pubescentibus; foliis oblongo-ovatis ad ovato-lanceolatis, integris, coriaceis, usque ad 15 cm longis, basi acutis, apice caudato-acuminatis, supra costa exceptis glabra, nitidis, subtus pallidioribus, ad costa nervisque pubescentibus, nervis utrinque 7 ad 9, subtus prominentibus, curvato-adscendentibus,

haud anastomosantibus, reticulis tenuibus, confertis, obscuris, subparallelis; cupulis obovoideis, pubescentibus, 2 cm diametro, obscure zonulatis, basi contractis, dentibus circiter 1 mm longis, infra distantibus, supra confertis; glans puberulis, 1.5 cm diametro, circiter 1.5 cm longis, subovoideis, apiculatis.

A tree about 12 m high, the younger parts densely ferruginous-pubescent. Branches terete, brownish, glabrous, somewhat lenticellate. Leaves coriaceous, oblong-ovate to ovate-lanceolate, 10 to 15 cm long, 3 to 6 cm wide, entire, base acute, apex slenderly subcaudate-acuminate, the acumen blunt, up to 2 cm in length, the upper surface glabrous except for the pubescent midrib, smooth, shining, pale or brownish-olivaceous when dry, the lower surface paler than the upper, pubescent on the midrib and nerves; lateral nerves 7 to 9 on each side of the midrib, prominent, curved-ascending, not anastomosing, the reticulations slender, close, subparallel, inconspicuous; petioles densely pubescent, 5 to 8 mm long. Infructescences simple, up to 12 cm in length, spike-like, rather stout, lenticellate, when young pubescent, ultimately glabrous, each bearing two or three fruits. Cups obovoid, about 2 cm in diameter, brown-pubescent on both surfaces, rather abruptly contracted below into a stout pseudo-stalk which is 5 to 8 mm long and about 5 mm in diameter, somewhat contracted to the truncate orifice which is 1.5 cm in diameter, the zones obscure, about 10 in all, the lower ones distant and with distant teeth, the upper ones close, the teeth contiguous, the teeth narrow, 1 mm long or less. Glans ovoid from a truncate base, about 1.5 cm long and wide, about two-thirds contained within the cup, puberulent, apiculate.

LUZON, Cagayan Province, Pamplona, *For. Bur.* 26973 Velasco, August 9, 1917, in forests, altitude about 60 meters.

The alliance of this species is not entirely clear, but it is apparently most closely related to *Quercus llanosii* A. DC., from which, however, it is distinguished by numerous characters. It is one of the species that is difficult to place as between the sections *Pasania* and *Cyclobalanus*, but I have placed it in the latter section as the scales have free apices and are not imbricate; the zones are indistinct, distant below, and contiguous above.

QUERCUS MABESAE sp. nov. § *Pasania*.

Arbor circiter 20 m alta, ramulis et subtus foliis minute brunneo-puberulis vel pubescentibus; foliis coriaceis, oblongis, usque ad 14 cm longis, utrinque subaequaliter angustatis, basi acutis, apice tenuiter acuminatis, supra glabris, vel junioribus leviter puberulis, laevis, nitidis, in siccitate brunneis, subtus subconcoloribus vel paullo pallidioribus; nervis utrinque circiter 9, perspicuis, curvatis, obscure anastomosantibus, reticulis sub-

obsoletis; cupulis 2 cm diametro, circiter 1.5 cm altis, truncatis, utrinque dense pubescentibus, zonis circiter 10, contiguis, dentibus numerosis, confertis, 1.5 ad 2 mm longis; glans oblongo-ovoideis, glabris, nitidis, 2.5 cm longis et 1.7 cm diametro.

A tree about 20 m high, the branchlets and lower surface of the leaves minutely brownish puberulent or pubescent. Branches subterete, smooth, subolivaceous. Leaves oblong, coriaceous, 9 to 14 cm long, 3.5 to 6 cm wide, entire, base acute, apex slenderly acuminate, the acumen about 1 cm long, obtuse, the upper surface glabrous, smooth, shining, brownish when dry, or when young slightly puberulent, the lower surface of the same color or slightly paler, brownish-pubescent with very short hairs; lateral nerves about 9 on each side of the midrib, prominent, curved, obscurely anastomosing, the reticulations slender, obscure, often nearly obsolete; petioles castaneous-pubescent, about 5 mm long. Infructescence a simple spike about 10 cm long, the rachis rather stout, pubescent, each bearing but few fruits. Cups cupshaped, 2 cm in diameter, about 1.5 cm high, truncate, densely pubescent with pale-brownish hairs on both surfaces, sessile, the zones about 10, contiguous, the teeth numerous, crowded, oblong, acuminate, 1.5 to 2 cm long. Glans oblong-ovoid, glabrous, shining, brown when dry, 2.5 cm long, 1.7 cm in diameter, apiculate, the lower 7 mm included within the cup.

LUZON, Laguna Province, Mount Maquiling, *For. Bur. 26915 Mabesa*, September 19, 1917, on forested ridges, altitude 300 meters and above, locally known as *ulayan*.

In vegetative characters this species closely resembles *Quercus lipacon* Elm. of Mindanao, but is entirely different in its fruit characters. The cups strongly resemble those of *Quercus jordanae* Laguna, but the present species is not otherwise closely allied to that species.

URTICACEAE

ELATOSTEMA Forster

ELATOSTEMA GRACILIFOLIUM sp. nov.

Herba erecta, 20 ad 40 cm alta, inflorescentiis exceptis glabra, dioica, ramosa, ramis gracilis, adscendentibus; foliis lineari-lanceolatis, usque ad 4 cm longis et 6 mm latis, acuminatis, leviter falcatis, inaequilateralibus, utrinque acutis, margine utrinque dentibus 4 ad 6 conspicuis instructis; inflorescentiis ♂ axillaribus, solitariis, sessilibus, bracteis exterioribus orbicularibus, circiter 3 mm diametro, margine perspicue ciliatis, ad apicem perspicue corniculato-apiculatis, interioribus multo mi-

noribus, circiter 2 mm longis, obovatis, ad oblongo-obovatis vel obovato-spatulatis, navicularibus, haud corniculatis; floribus 4-meris.

A slender, erect, branched herb 20 to 40 cm high, glabrous except the inflorescences. Stems greenish when dry, about 3 mm in diameter, the branches slender, ascending, up to 16 cm in length, less than 1 mm in diameter, with numerous cystoliths. Leaves linear-lanceolate, somewhat falcate, subchartaceous, dark-green when dry, 3 to 4 cm long, 3 to 6 mm wide, slenderly acuminate, base acute, somewhat inequilateral, both surfaces with numerous, irregularly arranged cystoliths, margins prominently and sharply toothed above the middle, 4 to 6 teeth on each side; wider side of the leaf with a single ascending nerve leaving the midrib 2 to 3 mm above the base and extending one-fourth to one-third to the apex, the nerves and reticulations otherwise obsolete; petioles 0.5 mm long. Staminate inflorescences axillary, sessile, 3 to 4 mm in diameter, ciliate, the outer two bracts orbicular, 3 mm in diameter, the tip with a 0.5 mm long apiculus, margins prominently glabrous, the inner ones smaller, the innermost about 2 mm long, oblong-obovate to oblong or oblong-spatulate, navicular, hooded, ciliate toward the tips, not corniculate. Staminate flowers 4-merous, their pedicels up to 1.5 mm long, the perianth about 1 mm long, the segments obscurely penicillate.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26428 Ramos & Edaño, August 18, 1916, on rocks in forests.

A most characteristic species readily distinguished by its slender branches and very narrow, prominently toothed leaves, which, except for the midrib and single basal nerves, are without evident nerves or reticulations.

ARISTOLOCHIACEAE

ARISTOLOCHIA Linnaeus

ARISTOLOCHIA HUMILIS sp. nov.

Species *A. philippinensis* Warb. affinis. Suffrutex erectus circiter 40 cm altus, simplex vel parce ramosus; foliis membranaeis ad chartaceis, ovatis ad oblongo-obovatis, usque ad 25 cm longis, supra olivaceis, nitidis, glabris, subtus pallidioribus et parce pubescentibus, basi subacutis ad rotundatis, apice acutis, obtusis, vel latissime obtuse acuminatis, nervis utrinque circiter 7, prominentibus, adscendentibus; racemis axillaribus, usque ad 6 cm longis; floribus tenuibus, circiter 3 cm longis; fructibus oblongo-ellipsoideis, circiter 2.5 cm longis, 6-carinatis, apice obtusis, basi acuminato-attenuatis.

An erect undershrub about 40 cm high, simple or sparingly branched, the stems 5 to 10 cm thick, terete, brownish, glabrous, the younger parts sparingly pubescent. Leaves few, 4 to 7 on each plant, ovate to oblong-obovate, membranaceous to chartaceous, 13 to 25 cm long, 6 to 11 cm wide, the upper surface olivaceous, glabrous, shining, the lower paler, sparingly pubescent with very short hairs on the midrib, nerves, and reticulations, the base subacute to rounded, the apex acute, obtuse, or broadly and bluntly acuminate; lateral nerves about 7 on each side of the midrib, prominent, ascending, anastomosing, the reticulations lax, prominent; petioles 2 to 3 cm long, sparingly pubescent, becoming nearly or quite glabrous. Racemes axillary, 4 to 6 cm long, or when young much shorter, many flowered, but only one or two flowers developing at one time, the bracts oblong, somewhat pubescent. Flowers apparently purplish, slender, about 3 cm long, their pedicels 3 to 4 mm in length. Ovary oblong, somewhat keeled, about 3 mm long, the corolla-tube above the ovary slender, cylindric, about 7 mm long, the inflated part ovoid or ellipsoid, base somewhat inequilateral, about 6 mm long, the cylindric tube above the inflated part 5 to 7 mm long, the limb 1-lipped, the lip linear to linear-oblancheolate, about 18 mm long, 3 to 4 mm wide. Anthers 6, the cells contiguous. Capsule brown when dry, glabrous, oblong-ellipsoid, about 2.5 cm long, 6-keeled, the apex obtuse, the base attenuate-acuminate.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28480 (type), 28838 Ramos & Edaña, May, 1917; Infanta-Siniloan trail, Ramos s. n., June 14, 1917; Mount Pular, *Bur. Sci.* 19423 Ramos, January 21, 1913, along streams in damp forests at low altitudes.

The alliance of this species is manifestly with *Aristolochia philippinensis* Warb., from which it differs in very numerous characters, notably in its low stature and larger, differently shaped leaves.

MENISPERMACEAE

COCCULUS de Candolle

COCCULUS SARMENTOSUS (Lour.) Diels, var. **STENOPHYLLUS** var. nov.

A typo differt foliis lanceolatis, oblongo-lanceolatis, vel oblancheolatis, basi acutis, 3 ad 5 cm longis, 8 ad 15 mm latis.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27231 Ramos, March 4 1917, climbing on trees in forests at low altitudes.

This form differs so radically from the typical form of the species, which is represented by *Bur. Sci.* 27213 Ramos from the same locality, that I believe that it is worthy of at least varietal rank. In this connection *Clemens* 749 from Camp Keithley, Mindanao, cited under *Cocculus sar-*

mentosus (Lour.) Diels and also under *Hypserpa jagori* Diels,³ pertains entirely to *Cocculus* and represents a form distinctly allied to the variety *stenophylla* Merr., but with larger leaves which attain a length to 7.5 cm and a breadth of 2.6 cm.

MAGNOLIACEAE

MICHELIA Linnaeus

MICHELIA PLATYPHYLLA sp. nov.

Arbor glabra; foliis oblongo-ellipticis, chartaceis, usque ad 30 cm longis et 13 cm latis, obtuse acuminatis, basi subacutis, in siccitate pallidis vel subolivaceis, utrinque nitidis, nervis utrinque 18 ad 23, perspicuis; floribus longe pedicellatis, perianthii segmentis circiter 12, oblanceolatis, acuminatis, 2.5 cm longis; antheris circiter 25, 12 mm longis.

A glabrous tree, the branchlets terete, smooth, about 5 mm in diameter, dark-brown, marked with a few conspicuous lenticels and the conspicuous stipular scars, the internodes 2 to 3 cm long. Leaves chartaceous, oblong-elliptic, 23 to 30 cm long, 9 to 13 cm wide, when dry pale or subolivaceous, shining on both surfaces, the base subacute, the apex shortly and obtusely acuminate; lateral nerves 18 to 23 on each side of the midrib, conspicuous on both surfaces as are the rather close, raised reticulations; petioles 2 to 3 cm long; stipules lanceolate, dark-brown and rugose when dry, about 6 mm long, deciduous. Flowers white, axillary, solitary, their pedicels 4 to 5 cm long, with a rather conspicuous bracteole scar above the middle. Buds oblong-ovoid, brown when dry, acute, about 2.5 cm long, the bud-scale splitting down one side, deciduous. Perianth-segments about 12, oblanceolate, acuminate, the outer ones about 2.5 cm long and 1 cm wide, the inner ones smaller and narrower. Stamens about 25, the anthers linear, 12 mm long.

LEYTE, Burauen, Cagañon, *For. Bur. 26866 Tomeldan*, May 21, 1917, in semi-open country (parang) at an altitude of 50 meters, locally known as *hañguilo*.

This species is well characterized by its remarkably large leaves. Its alliance is with the extra-Philippine *Michelia montana* Blume, to which, however, it is not very closely related.

MONIMIACEAE

MATTHAEA Blume

MATTHAEA INTERMEDIA sp. nov.

Frutex circiter 4 m altus inflorescentiis exceptis glaber, ramulis brunneis vel atro-brunneis; foliis subcoriaceis, oblongo-

³ Engl. Pflanzenreich 46 (1910) 211, 232.

ellipticis, usque ad 13 cm longis, integerrimis, breviter acute acuminatis, basi rotundatis et leviter decurrento-acuminatis, in siccitate subolivaceis, subtus pallidioribus; nervis primariis circiter 8, distinctis, supra haud impressis; inflorescentiis axillaribus, pedunculatis, depauperato-cymosis, pubescentibus, 1 ad 2 cm longis; receptaculis ♂ depresso-turbinatis, pubescentibus, circiter 4 mm diametro, tepalis reniformibus, rotundatis, circiter 1.5 mm longis; antheris 3 vel 4, confertis, sessilibus, connectivo haud producto.

A shrub about 4 m high, glabrous except the inflorescence. Branches and branchlets terete, smooth, the former straw-colored, the latter reddish-brown or dark-brown when dry. Leaves subcoriaceous, oblong-elliptic, entire, 8 to 13 cm long, 3 to 6 cm wide, the apex shortly and acutely acuminate, base rounded and somewhat decurrent-acuminate, shining when dry, the upper surface subolivaceous, the lower somewhat paler; primary lateral nerves about 8 on each side of the midrib, spreading, rather prominently arched-anastomosing distant from the margin, not at all impressed on the upper surface and scarcely projecting on the lower surface, the reticulations lax; petioles dark-brown, 1 to 1.5 cm long. Staminate inflorescences axillary, depauperate-cymose, few-flowered, peduncled, 1 to 2 cm long, appressed-pubescent with short, brownish hairs. Receptacles depressed-turbinate, externally sparingly pubescent, about 4 mm in diameter, the bracts oblong, pubescent, 1.5 mm long, the pedicels 5 mm long or less. Tepals subreniform, rounded, about 1.5 mm long, glabrous. Anthers 3 or 4, sessile or subsessile, broadly ovoid or orbicular-ovoid, 1 mm long, the connectives not produced.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28614 Ramos & Edaño, May, 1917, in forests, altitude about 1,000 meters.

If the entire leaves be any criterion this species comes near *Matthaea calophylla* Perk. and *M. latifolia* Perk., but it is not otherwise closely allied to these species. It seems to be much more closely allied to *Matthaea sancta* Blume, and in many respects is very similar to the entire-leaved forms of *M. sancta* Blume var. *venulosa* Perk. From this it is easily distinguished by its olivaceous leaves, its dark-brown branchlets, and the lateral nerves rather obscure and not at all impressed on the upper surface of the leaves.

CAPPARIDACEAE

CAPPARIS Linnaeus

CAPPARIS LONGIPES sp. nov.

Frutex scandens, glaber; foliis lanceolatis, membranaceis ad chartaceis, usque ad 11 cm longis, acutissime acuminatis, basi acutis, nervis utrinque circiter 15, distinctis; infructescentiis

axillaribus, tenuibus, parce ramosis, usque ad 20 cm longis; fructibus longe pedicellatis, globosis, circiter 12 mm diametro.

A scandent glabrous shrub, the branches slender, terete, brownish or olivaceous, the ultimate branchlets about 1 mm in diameter, the stipular spines straight, usually about 2 mm long. Leaves lanceolate, membranaceous to chartaceous, green or greenish-olivaceous when dry, somewhat shining, 7 to 11 cm long, 2 to 3 cm wide, narrowed upward to the very slender apex, sharply acute-acuminate, base acute; lateral nerves about 15 on each side of the midrib, slender, distinct on both surfaces, anastomosing, the primary reticulations lax, the ultimate ones close, both distinct; petioles 2 to 3 mm long. Infructescences axillary, very slender, sparingly branched, up to 20 cm in length, each branch bearing a single fruit, its pedicel about 3 cm long. Fruit globose, brown when dry, glabrous, about 12 mm in diameter.

LUZON, Abra Province, Mount Posuey, *Bur. Sci.* 26980 Ramos, February 4, 1917, in forests along streams and on cliffs.

A remarkable species on account of its greatly elongated, axillary, very slender infructescences. Its alliance is with *Capparis loheri* Merr., from which it is distinguished not only by its infructescence but also by its much smaller, entirely glabrous leaves.

CAPPARIS ILOCANA sp. nov.

Frutex glaber, ut videtur scandens, ramis ramulisque teretibus; foliis membranaceis vel chartaceis, oblongo-ellipticis, usque ad 7 cm longis, apice breviter acuteque acuminatis, basi obtusis, nervis utrinque circiter 10, tenuibus, distinctis; inflorescentiis terminalibus, umbellatis, 5- vel 6-floris; floribus longe pedicellatis, pedicellis 2 ad 2.5 cm longis, alabastro globoso, 5 mm diametro.

A glabrous shrub, apparently scandent, the branches slender, terete, brownish-black when dry, the stipular spines very short, straight, about 1 mm long, the branchlets pale-greenish. Leaves pale-greenish when dry, oblong-elliptic, membranaceous to chartaceous, 5 to 7 cm long, 2.5 to 3.5 cm wide, slightly shining, the apex shortly and acutely acuminate, base obtuse; lateral nerves about 10 on each side of the midrib, slender, distinct, anastomosing, the primary reticulations lax, the ultimate ones close, indistinct; petioles 2 to 4 mm long. Inflorescence a simple terminal, few-flowered umbel, the flowers usually 5 or 6, their pedicels 2 to 2.5 cm long. Buds globose, about 5 mm in diameter.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27120 Ramos, March 18, 1917, in thickets near the sea.

A species characterized by its terminal, simple, few-flowered umbels

of long-pedicelled flowers. It may be as closely allied to *Capparis sepiaria* Linn. as to any other species, but it is entirely different from the numerous forms of this Linnean species in its vegetative and inflorescence characters.

ROSACEAE

RUBUS Linnaeus

RUBUS EDANOII sp. nov. § *Malachobatus*, *Elongati*.

Frutex scandens, minute aculeatus, ramulis et inflorescentiis pilosis; foliis simplicibus, coriaceis, ovatis ad oblongo-ovatis, usque ad 12 cm longis, acute acuminatis, basi truncato-rotundatis cordatisque, prominente 5- vel 7-nerviis, nervis lateralibus utrinque 5 ad 7, rectis, adscendentibus, in pagina superiore ad costa nervisque pilosis, subtus pilosis et minute leviter aculeatis, margine apiculato-dentatis; inflorescentiis terminalibus, elongatis, circiter 20 cm longis, dense subadpresse pilosis; sepalis oblongo-ovatis ad ovato-lanceolatis, circiter 6 mm longis, petalis brevibus, caducis, oblongo-obovatis, circiter 4 mm longis, basi angustatis, apice prominente dentatis.

A scandent shrub, the branches terete, brown, more or less pilose, and with small, reflexed, scattered aculei 1 mm long or less. Leaves simple, thickly coriaceous, olivaceous, ovate to oblong-ovate, 6 to 12 cm long, 3 to 7 cm wide, shining, apex sharply acuminate, base broadly truncate-rounded and distinctly cordate, prominently 5- or 7-nerved, the nerves straight, the primary ones all ascending, 5 to 7 on each side of the midrib, the primary reticulations subparallel, prominent, the margins acuminate-dentate, the upper surface glabrous or pilose on the midrib and lateral nerves, the lower surface pilose on the midrib and nerves and also with few scattered, minute aculei; petioles pilose, minutely aculeate, 1 to 1.5 cm long; stipules narrowly oblong, free or nearly so, deciduous, about 4 mm long. Panicles terminal, narrow, up to 20 cm long, pilose, the younger parts very densely so, slightly aculeate, the lower branches 3 cm long or less, spreading, widely scattered. Flowers about 1.8 cm in diameter, their pedicels 10 mm long or less. Sepals oblong-ovate to ovate-lanceolate, somewhat acuminate, externally densely pilose with pale appressed hairs, internally densely cinereous-puberulent. Petals thin, glabrous, caducous, narrowly oblong-obovate, about 4 mm long, glabrous, base narrowed, apex prominently toothed. Stamens indefinite. Carpels few, usually 6 or fewer, glabrous or with very few scattered hairs, including the slender styles 2 to 2.5 mm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26505 *Ramos & Edaño*, September 6, 1916, in the mossy forest, altitude 300 meters.

A species allied to *Rubus cumingii* O. Kuntze, from which it is distinguished at once, among other characters, by its sharply acuminate leaves. *Rubus cumingii* O. Kuntze is figured by Focke, a photogravure of the type specimen, *Species Ruborum* Bibl. Bot. 17 (1910) 59, fig. 21.

CONNARACEAE

CONNARUS Linnaeus

CONNARUS SUBFOVEOLATUS sp. nov.

Frutex scandens, ramulis junioribus inflorescentiisque exceptis glaber; foliis trifoliolatis, foliolis ovatis ad subellipticis, usque ad 13 cm longis, in siccitate pallidis, nitidis, utrinque jejune foveolatis, basi obtusis, apice subabrupte et prominente acuminatis, nervis utrinque 4, adscendentibus, perspicuis; paniculis axillaribus et terminalibus, usque ad 12 cm longis, ferrugineo-pubescentibus; floribus circiter 3 mm longis, petalis in siccitate verruculosus, glabris, perspicue rubro-glandulosis; carpellis solitariis, subglobosis, pubescentibus.

A scandent shrub attaining a length of about 6 m, glabrous except the branchlets and inflorescences, the branches terete, brown, about 4 mm in diameter, lenticellate, the young branchlets sparingly pubescent. Leaves 3-foliolate, the petiole and rachis 6 to 7 cm long. Leaflets firmly chartaceous, ovate to subelliptic, 9 to 13 cm long, 4.5 to 6.5 cm wide, pale and shining when dry, both surfaces manifestly and densely foveolate, the pits shallow, base obtuse, sometimes minutely peltate, the apex rather abruptly and prominently acuminate, the acumen blunt and 8 to 12 mm long; lateral nerves 4 on each side of the midrib, prominent, curved-ascending, anastomosing; petiolules 3 to 5 mm long. Panicles axillary and terminal, up to 12 cm in length, rather lax, densely ferruginous-pubescent with short simple hairs. Flowers brownish-pink, their pedicels 1 to 2 mm long. Sepals oblong, obtuse, pubescent, 2 mm long. Petals narrowly oblong, obtuse, 3 to 3.5 mm long, 0.8 mm wide, verruculose when dry, glabrous, prominently glandular with reddish glands. Carpels solitary, subglobose, pubescent; styles 3 mm long, glabrous.

LUZON, Apayao Subprovince, Ngagan, *Bur. Sci.* 28240 *Fénix*, May 8, 1917, in damp forests.

A species strongly characterized by its trifoliolate leaves and the densely and shallowly foveolate leaflets.

LEGUMINOSAE

ALBIZZIA Durazzini

ALBIZZIA MEGALADENIA sp. nov.

Arbor circiter 8 m alta, subglabra, partibus junioribus leviter pubescentibus; foliis 14 ad 18 cm longis, petiolis et rachibus inter pinnis ultimis glandulis magnis ovoideis instructis; pinnis 6- ad 9-jugatis, 5 ad 7 cm longis; foliolis 20- ad 30-jugatis, oblongis, obtusis, 5 ad 7 mm longis, inaequilateralibus; fructibus anguste oblongis, usque ad 8 cm longis, circiter 1.4 cm latis, obtusis, nitidis, reticulatis; seminibus 15 ad 20, contiguis.

A tree about 8 m high, nearly glabrous. Branches terete, glabrous, dark reddish-brown or nearly black when dry, the branchlets paler in color, also glabrous. Leaves bipinnate, 14 to 18 cm long, 6- to 9-jugate, the petiole at or above the middle with a very prominent, dark-brown, ovoid, projecting, 7 to 9 mm long gland, a similar but smaller one usually present between the ultimate pinnae; pinnae 5 to 7 cm long, the rachis very sparingly pubescent; leaflets oblong, inequilateral, glabrous or nearly so, 20 to 30 pairs on each pinna, 5 to 7 mm long, 1.5 to 2 mm wide, rounded at the apex, the base rounded on the broader side, subacute or obtuse on the narrow side, the nerves indistinct. Pods brownish when dry, shining, somewhat reticulate, narrowly oblong, 7 to 8 cm long, about 1.4 cm wide, rather thin, rounded at the apex, the base acuminate, margins somewhat thickened; seeds 15 to 20, contiguous, subelliptic, compressed, about 4 mm long.

LUZON, Tayabas Province, Umiray, *Bur. Sci.* 29023 Ramos & Edaña, June, 1917, in forests along the Umiray River.

This species in vegetative characters somewhat resembles *Albizzia lebekoides* Benth., but is entirely different in its fruit characters, and in its remarkably large, ovoid, projecting petiolar and rachis glands. The pods, although much smaller, resemble those of *Leucaena glauca* Benth., but are indehiscent and reticulate.

NEPTUNIA Loureiro

NEPTUNIA DEPAUPERATA sp. nov.

Suffrutex prostratus e basi lignosus, usque ad 40 cm longis, ramosis, ramis ramulisque tenuibus, teretibus vel ramulis obscurissime angulosis; foliis 1.5 ad 3 cm longis, 1- ad 4-jugatis; foliolis oblongis, 2 ad 3 cm longis, confertis, crassis, margine leviter ciliatis, obscurissime venosis; capitulis axillaribus, solitariis, pedunculatis; floribus 5-meris, staminibus 5; floribus inferioribus neutris, staminoideis petaloideis, circiter 10 mm lon-

gis, lineari-oblongeolatis, planis; ovario 6-ovulatis; leguminibus oblongis, planis, 2 cm longis.

A prostrate undershrub from a much thickened woody root, the branches spreading, prostrate, distinctly woody, slender, up to 40 cm in length, branched, the branches and branchlets dark reddish-brown, glabrous, terete, or the ultimate ones very obscurely angular. Leaves 1.5 to 3 cm long, 1- to 4-jugate, the pinnae 1 cm long or less; leaflets 12 to 16 pairs, sessile, oblong, thick, 2 to 3 mm long, obscurely nerved, base inequilaterally rounded, apex obtuse to minutely apiculate, margins in young leaves sparingly ciliate; stipules inequilateral, slenderly acuminate, ovate, about 3 mm long. Heads axillary, yellow, their peduncles slender, 2 to 3 cm long. Lower flowers neuter. Calyx less than 1 mm long. Petals somewhat oblong-oblongeolate, 2 mm long, free. Staminodes petaloid, yellow, flat, membranaceous, linear-oblongeolate, about 1 cm long. Perfect flowers: Calyx 1.5 to 2 mm long, the teeth 5, ovate, obtuse to subacute, 0.5 mm long. Petals 5, free, about 2.5 mm long, oblong-spatulate. Filaments filiform, 4 mm long; anthers oblong-elliptic, 1 mm long, falling very soon after anthesis, tipped with a minute sessile gland. Ovary subsessile, compressed, oblong, inequilateral, glabrous; ovules about 6; style 3 mm long. Pods oblong, thin, brown, about 2 cm long and 5 mm wide, minutely apiculate.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27169 Ramos, March 13, 1917, in old dry rice paddies at low altitudes.

This species in many respects resembles *Neptunia triquetra* Benth., which extends from India to Indo-China, but is smaller, with much smaller leaves, and with but five stamens, and very different staminodes. It is distinctly woody, the root being much thickened, the prostrate stems not at all herbaceous. On account of its five stamens its true alliance is with the Australian *Neptunia gracilis* Benth. and *N. monosperma* F. Muell., being more distinctly allied to the former. It is easily distinguished from *Neptunia gracilis* Benth. by its much smaller leaflets.

CROTALARIA Linnaeus

CROTALARIA TRIFOLIASTRUM Willd. Sp. Pl. 3 (1806) 983.

LUZON, Province of Ilocos Norte, Burgos, *Bur. Sci.* 27265 Ramos, March 15, 1917, in open places near streams at low altitudes.

Tropical Asia to northeastern Australia; new to the Philippines.

SPATHOLOBUS Hasskarl

SPATHOLOBUS PHILIPPINENSIS sp. nov.

Frutex scandens inflorescentiis exceptis glaber; foliolis oblongo-ovatis ad ovatis, chartaceis, usque ad 11 cm longis, obtusis, glaberrimis, nervis utrinque circiter 7; leguminibus circiter 11 cm longis et 3 cm latis, in siccitate brunneis, nitidis,

leviter falcatis, utrinque obtusis vel apice breviter apiculatis, valvis perspicue reticulatis.

A scandent shrub of indefinite length, entirely glabrous except the somewhat ferruginous-pilose inflorescences. Branches and branchlets slender, terete, reddish-brown, smooth. Leaves 3-foliolate, the petioles 2.5 to 6 cm long; leaflets firmly chartaceous, oblong-ovate to ovate, brownish or pale-olivaceous when dry, shining, 7 to 11 cm long, 3 to 6 cm wide, base usually rounded, apex usually obtuse; lateral nerves about 7 on each side of the midrib, distinct, the reticulations evident and rather close on both surfaces. Panicles terminal and in the upper axils, somewhat ferruginous-pilose with subappressed hairs as are the very young calyces. Mature flowers not seen, the panicles before anthesis up to 16 cm in length. Pods glabrous, shining, brownish when dry, thin, in general oblong, somewhat falcate, about 11 cm long and 3 cm wide, base inequilaterally rounded, apex rounded or obtuse, often slightly apiculate, the valves conspicuously reticulate.

LUZON, Laguna Province, Mount Maquiling, *For. Bur.* 26841 Mabesa, July 23, 1917, along trails on rather open slopes, altitude 100 to 200 meters. The same species is represented by *Bur. Sci.* 2630 Ramos and *For. Bur.* 466 Ahern's collector, from Rizal Province, Luzon, both of these specimens being with very young buds.

Spatholobus philippinensis Merr. is entirely different from the few other representatives of the genus known from the Philippines. It is well characterized by being entirely glabrous except for the sparingly pubescent inflorescences. In vegetative characters it is somewhat similar to *Spatholobus harmandii* Gagnep. of Indo-China.

RUTACEAE

EVODIA Forster

EVODIA GLABERRIMA sp. nov.

Frutex glaberrimus, foliis 1- ad 3-foliolatis; foliolis oblongis ad oblongo-lanceolatis, in siccitate nitidis, viridi-olivaceis, utrinque acuminatis, papyraceis, nervis primariis utrinque circiter 16, patulis, anastomosantibus, utrinque perspicue glandulosis; paniculis axillaribus, 3 ad 4 cm longis, paucifloris, floribus circiter 3 mm longis.

An erect, entirely glabrous shrub, the branches and branchlets pale when dry, slender, terete. Leaves opposite, 1- to 3-foliolate on the same branch, the petioles 3 to 5 cm long, the petiolules 1 cm long or less and like the petioles glandular-punctate; leaflets chartaceous, oblong to oblong-lanceolate, greenish-olivaceous and shining when dry, conspicuously glandular-punctate on both sur-

faces, subequally narrowed to the acuminate base and apex, the apical acumen obtuse, stout, about 1 cm long; primary lateral nerves about 16 on each side of the midrib, spreading, distinct, anastomosing, the reticulations distinct. Panicles axillary, solitary, 3 to 4 cm long, peduncled, narrowly pyramidal, few-flowered, the lower branches 1 cm long or less. Young flowers about 3 mm long, the petals 4, oblong, obtuse, glandular. Sepals, ovate, obtuse, 1 mm long. Staminodes 4, about 1 mm long. Ovary glabrous, deeply 4-lobed, the immature carpels brown, about 3.5 mm long.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28864 Ramos & Edaño, May 20, 1917, in forests along streams at low altitudes.

The alliance of this species is apparently with *Evodia ternata* (Blanco) Merr., from which it is readily distinguished by its thicker leaflets which vary in number from 1 to 3; its short, few-flowered inflorescences; and in being entirely glabrous in all parts.

TETRACOMIA Hooker f.

TETRACOMIA PACHYPHYLLA sp. nov.

Arbor glabra, circiter 15 m alta, ramis crassis, rugosis, cicatricibus perspicuis instructis; foliis crasse coriaceis, obovatis, in siccitate olivaceis vel olivaceo-brunneis, usque ad 11 cm longis, apice latissime rotundatis, basi cuneatis, obscure punctatis, nervis utrinque circiter 8; inflorescentiis usque ad 15 cm longis, longe pedunculatis; floribus circiter 5 mm diametro, petalis latissime ovatis, acutis vel obscure acuminatis, circiter 2.5 mm longis latisque.

A glabrous tree about 15 m high. Branches stout, rugose, about 6 mm in diameter, grayish or grayish-brown, marked with numerous large petiolar scars. Leaves thickly coriaceous, obovate, 6 to 11 cm long, 4 to 7 cm wide, shining, olivaceous or brownish-olivaceous when dry, the lower surface often paler than the upper, the apex very broadly rounded, the base cuneate, the upper surface obscurely pitted, the lower obscurely glandular-punctate; lateral nerves about 8 on each side of the midrib, rather conspicuous, anastomosing, the reticulations lax; petioles 1 to 2 cm long. Inflorescences from the upper axils and sub-terminal, long-peduncled, up to 15 cm long, the branches few, the lower primary ones up to 6 cm in length. Flowers fragrant, yellowish-green, dark-brown when dry, about 5 mm in diameter, somewhat crowded on the ultimate branchlets, shortly pedicelled. Calyx somewhat turbinate, 2.5 to 3 mm in diameter, shallowly toothed. Petals broadly ovate, about 2.5 mm long and wide, acute or somewhat acuminate. Filaments about 3 mm long.

Staminodes 0.5 mm long or less, or sometimes obsolete, the petals then with an evident gland in the median portion.

MINDANAO, Surigao Province (Dinagat Island), *For. Bur.* 26985 Ponce, July 22, 1917, in thin poor soil on semi-open slopes, altitude about 20 meters.

The alliance of this species is manifestly with *Tetractomia tetrandra* (Roxb.) Merr. in Journ. Str. Branch Roy. As. Soc. 76 (1917) 87 (*T. roxburghii* Hook. f.), from which it is distinguished especially by its differently shaped leaves which are broadly rounded at their apices.

POLYGALACEAE

POLYGALA Linnaeus

POLYGALA CARDIOCARPA Kurz in Journ. As. Soc. Beng. 41² (1872) 293; Gagnep. in Lecomte Fl. Gén. Indo-Chine 1 (1899) 253.

NEGROS, near Dumaguete, *Eskridge s. n.*, 1913, with the Visayan name *chicate*.

This species, previously reported only from Burma and Indo-China, is allied to *Polygala triphylla* Ham. The Philippine specimen agrees closely with duplicates of Thorel's Mekong collections cited by Gagnepain as representing Kurz's species.

POLYGALA ELONGATA Klein in Willd. Sp. Pl. 3 (1806) 879.

MINDANAO, Bukidnon Subprovince, Tanculan, *Bur. Sci.* 26016 *Fénix*, July 12, 1916, in open grasslands: Cotabato District, Makar, *Copeland s. n.*, December, 1911.

This species is reported only from India. The identification of the above specimens has been made entirely from the descriptions; they seem to conform more closely to the form described by Hasskarl as *Polygala eumekes* which Chodat has reduced to *Polygala elongata* Klein as forma *heyneana* (Wall.) Chodat.

HIPPOCRATEACEAE

HIPPOCRATEA Linnaeus

HIPPOCRATEA MEGALOCARPA sp. nov.

Frutex scandens, glaber; foliis coriaceis, integris, ellipticis ad late ellipticis, apice rotundatis vel brevissime abrupte obtuseque acuminatis, nervis utrinque 5 vel 6, distinctis; capsulis oblongo-ellipticis circiter 10 cm longis et 4 cm latis, seminibus 5.

A scandent glabrous shrub, the branches and branchlets terete, brownish. Leaves elliptic to broadly elliptic, entire, coriaceous, rather pale and slightly shining when dry, of the same color on both surfaces, 7 to 13 cm long, 5 to 10 cm wide, apex rounded or very shortly and abruptly blunt-acuminate, base usually rounded; lateral nerves 5 or 6 on each side of the midrib, rather prominent, reticulations lax; petioles stout, 8 to 10 mm long.

Capsules hard, flattened, oblong-elliptic, about 10 cm long and 4 cm wide, apex rounded, base obtuse, subequally narrowed at both ends, the valves pale, somewhat shining, more or less woody. Seeds 5 in each capsule, the seed proper 2 to 2.2 cm long, about 8 mm wide, brown, narrowed upward, compressed, the basal part a prominent, smooth submembranaceous wing attaining a length of 6 cm and a width of 2.7 cm.

LUZON, Laguna Province, Mount Maquiling, *For Bur.* 24921 Mabesa, December 16, 1915, on dry ridges along the Puting Lupa trail, altitude about 177 meters.

A characteristic species distinguishable by its elliptic entire leaves and its unusually large fruits.

HIPPOCRATEA TRICHOPETALA sp. nov.

Frutex scandens, inflorescentiis dense subferrugineo-pubescentibus exceptis glaber; ramis ramulisque teretibus, rubro-brunneis vel atro-brunneis; foliis ellipticis, subcoriaceis, usque ad 10 cm longis, in siccitate utrinque pallidis nitidisque, apice rotundatis, basi acutis, nervis primariis utrinque 6 vel 7, distinctis; cymis axillaribus, pedunculatis, paucifloris, 2 ad 3 cm longis, floribus circiter 9 mm diametro, petalis oblongis, acutis, circiter 4.5 mm longis, extus dense puberulis, intus in $\frac{1}{2}$ superiore parte perspicue pilosis; discus carnosus, circiter 2.5 mm diametro, apice densissime pilosus.

A scandent shrub, glabrous except the inflorescence, the branches and branchlets slender, terete, smooth, dark-brown or reddish-brown. Leaves elliptic, pale and shining on both surfaces when dry, 6 to 10 cm long, 3 to 6 cm wide, apex rounded, base acute, entire; primary nerves 6 or 7 on each side of the midrib, distinct, anastomosing, the reticulations prominent on the lower surface; petioles about 5 mm long. Cymes axillary, few-flowered, peduncled, 2 to 3 cm long, all parts subferruginous-pubescent with short hairs or the peduncles glabrous, dichotomously branched, the branches about 1 cm long. Flowers green, about 9 mm in diameter, the buds ellipsoid, rounded, their pedicels up to 6 mm in length. Calyx about 3 mm in diameter, short, the teeth 5, very short, acute. Petals oblong, outside densely puberulent, inside in the upper one-half and on the margins conspicuously and densely pilose with weak crisped hairs, acute, about 4.5 mm long. Disk fleshy, 2.5 mm in diameter, about 1.5 mm high, glabrous on the sides, the margin densely pilose with crisped hairs. Stamens 3, the filaments very broad, short, the anthers about 1 mm in diameter. Ovary ovoid,

sunk in the disk, glabrous, triangular, 3-celled, the stigma subsessile, minutely 3-lobed. Fruits unknown.

LUZON, Tayabas Province, Umiray, *Bur. Sci.* 28958 Ramos & Edaño, June 2, 1917, in forests along the Umiray River.

This most characteristic species is readily distinguished by its pale, elliptic, rounded leaves and especially by its petals being conspicuously pilose in the upper one-half inside, the hairs about 1 mm long. In its petal characters it is very similar to *Hippocratea cumingii* Laws., which must be typified by the Malacca specimen cited (*Griffith*) to which the description applies; the Philippine specimen, *Cuming* 1725 from Samar, is not cited by Lawson in the original description and may or may not represent the same species as the Malacca one.

SALACIA Linnaeus

SALACIA EUPHLEBIA sp. nov.

Frutex scandens, glaber, ramis teretibus, junioribus obscure angulatis; foliis oblongis, coriaceis, olivaceis, nitidis, usque ad 15 cm longis, basi acutis ad subrotundatis, apice acuminatis, margine distanter apiculato-serrulatis; nervis utrinque circiter 9, subtus prominentibus, anastomosantibus, reticulis laxis, distinctis; inflorescentiis axillaribus, solitariis, quam petiolo brevioribus, depauperato-cymosis vel floribus fasciculatis; floribus 5-meris, circiter 3 mm longis, breviter pedicellatis.

A scandent glabrous shrub at least 3 m high, the branches pale-brownish or grayish, terete, or the younger ones obscurely angled, often pruinose. Leaves opposite, coriaceous, oblong, olivaceous, shining, of the same color on both surfaces, 9 to 15 cm long, 3.5 to 5 cm wide, base acute to somewhat rounded, apex distinctly acuminate, margins distantly apiculate-serrulate; lateral nerves about 8 on each side of the midrib, very prominent on the lower surface, spreading, somewhat curved-anastomosing, the primary reticulations distinct; petioles 5 to 8 mm long. Inflorescences axillary, solitary, very few-flowered, depauperate-cymose, the rachis once forked, or simple, very short, supplied with small bracts, or sometimes the inflorescence reduced to a fascicle; when a depauperate cyme but from 1 to 3 flowers produced at one time. Pedicels about 1 mm long. Flowers 5-merous, oblong, about 3 mm long. Calyx-lobes broadly ovate, rounded, about 1 mm long and wide. Petals oblong, rounded, about 2.8 mm long. Disk prominent, cylindric, enclosing the ovary, about 1 mm high. Filaments flattened, 0.8 mm long.

MINDANAO, Surigao Province, Placer, *Wenzel* 1867, July 4, 1916, in forests, altitude about 150 meters, the flowers greenish-yellow.

A species well characterized by its oblong, apiculate-denticulate, prominently nerved leaves, its greatly reduced inflorescences, and short-pedicelled

flowers. Its alliance is apparently with *Salacia subscandens* Elm. of Palawan.

SALACIA WENZELII sp. nov.

Frutex scandens, glaber; foliis oppositis, coriaceis, oblongo-ellipticis ad ellipticis, integris, usque ad 14 cm longis, obtuse acuminatis, basi subrotundatis, nervis utrinque 5 vel 6, subtus prominentibus, curvato-adscendentibus; inflorescentiis breviter pedunculatis, umbellatis vel depauperato umbellato-cymosis; floribus circiter 6.5 mm diametro, calycibus truncatis.

A scandent glabrous shrub, the branches terete. Leaves opposite, coriaceous, oblong-elliptic to elliptic, brownish to olivaceous when dry, somewhat shining, 10 to 14 cm long, 4.5 to 7 cm wide, entire, apex rather prominently but obtusely acuminate, base rounded to subacute; lateral nerves 5 or 6 on each side of the midrib, prominent on the lower surface, curved-ascending, anastomosing, the reticulations fine, rather close, distinct; petioles 1 cm long or less. Inflorescences solitary, axillary, of short peduncled umbels or of depauperate umbellate cymes, the peduncles shorter than the petioles, the flowers green, numerous, crowded, 6 to 7 mm in diameter, their pedicels up to 8 mm in length, grouped in fascicles on the peduncle or its very greatly reduced, short, stout branchlets. Calyx somewhat saucer-shaped, truncate, about 3 mm in diameter, not toothed. Petals 5, oblong-ovate, obtuse, 3.5 to 4 mm long. Stamens 3, about 2 mm long. Ovary and style slightly 3-angled. Disk very prominent.

LEYTE, Tigbao, near Tacloban, *Wenzel 1534*, July 18, 1915, a vine reaching a height of about 4 meters.

Readily distinguished from the other Philippine forms by its densely many-flowered, short-peduncled, umbellate or depauperate cymose-umbellate inflorescences, the peduncles shorter than the petioles, the flowers arranged in fascicles on the peduncle or on its very short stout branchlets, appearing like a true umbel. The very young fruits are ovoid.

SAPINDACEAE

NEPHELIUM Linnaeus

NEPHELIUM SCHNEIDERI sp. nov.

Species *N. mutabile* et *N. intermedio* affinis, differt nervis lateralibus magis numerosis, utrinque circiter 18. Arbor usque ad 9 m alta, partibus junioribus et inflorescentiis exceptis glabra; foliis 25 ad 35 cm longis, foliolis 5 vel 7, oblongis, chartaceis vel subcoriaceis, usque ad 20 cm longis, nitidis, subtus subglaucescentibus, nervis utrinque circiter 18, perspicuis; fructibus globosis, circiter 3 cm diametro, in siccitate castaneis, processibus

subrectis, subtruncatis, compressis, rigidis, sulcatis, circiter 6 mm longis.

A tree about 9 m high, glabrous except the younger parts and the inflorescence. Branches subterete, pale-grayish, often sulcate. Leaves 25 to 35 cm long, glabrous, the leaflets 5 or 7, oblong, chartaceous to subcoriaceous, oblong, 16 to 20 cm long, 5.5 to 8 cm wide, distinctly acuminate, base acute, when dry pale-brownish to pale-olivaceous, shining, the lower surface paler than the upper and usually slightly glaucous; lateral nerves about 18 on each side of the midrib, prominent, the reticulations distinct. Panicles terminal, densely subferruginous-pubescent, the branches few, up to 7 cm in length. Buds rather densely crowded, globose; petals ovate, minute. Fruits globose, pale greenish-yellow when fresh, castaneous when dry, 3 cm in diameter, the spines numerous, spreading, straight or slightly falcate, compressed, striate, subtruncate, about 6 mm long and 1.5 mm wide.

MINDANAO, Zamboanga District, Talisay, *For. Bur. 18775 Foxworthy, DeMesa, & Villamil*, June 18, 1913 (type), in the virgin forest, altitude about 20 meters, locally known as *buli*. The same species is represented by *For. Bur. 24052 Acuña* from Kalambugan, Lanao District, Mindanao, May 17, 1915, with immature flowers.

Its alliance is with *Nephelium mutabile* Blume and *N. intermedium* Radlk., the latter being scarcely distinguishable from the former; from these it is distinguished especially by its much more numerous lateral nerves. The species is dedicated to Mr. E. E. Schneider, wood expert of the Bureau of Forestry, who called my attention to the fact that the wood of this species was entirely different from that of *Nephelium mutabile* Blume as the type specimen was originally identified by me.

OTOPHORA Blume

OTOPHORA CAULIFLORA sp. nov.

Frutex glaber; foliis circiter 40 cm longis, foliolis 5 vel 6, oblongis ad oblongo-ellipticis, usque ad 25 cm longis, nitidis, acuminatis, basi acutis, nervis primariis utrinque circiter 10; stipulis suborbicularis, subcoriaceis, inaequilateralibus, 1 ad 2 cm longis; inflorescentiis paniculatis e ramis vetustioribus, circiter 20 cm longis, anguste pyramidatis, ramis paucis, inferioribus 3 ad 4 cm longis; fructibus carnosus, subglobosis, 3 ad 4 cm diametro, in siccitate brunneis, 2 ad 3 cm diametro.

A glabrous shrub, 1 m high according to the collector, but probably higher. Branches terete, brownish or grayish, lenticellate. Leaves about 40 cm long, the leaflets 5 or 6, chartaceous to subcoriaceous, oblong to oblong-elliptic, or the lower ones subovate, 15 to 25 cm long, 7 to 9 cm wide, base acute, apex

acuminate, pale when dry, of about the same color and shining on both surfaces; primary lateral nerves about 10 on each side of the midrib, prominent, curved, anastomosing, the reticulations prominent on both surfaces; stipules suborbicular, 1 to 2 cm long, similar to the leaves in texture and color, inequilateral, very shortly obtuse-acuminate or obtuse. Panicles from the trunk or larger branches, narrowly pyramidal, about 20 cm long, the branches few, spreading, the lower ones 3 to 4 cm long. Fruits fleshy, white or somewhat pink when fresh and 3 to 4 cm in diameter, when dry subglobose, 2 to 3 cm in diameter, brown, with one or two large, castaneous, shining seeds 1.5 to 2 cm in diameter.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28533, 28516 (*type*) Ramos & Edaño, May 8 and 19, 1917, in forests along streams at low altitude.

This species is allied to *Otophora fruticosa* Blume, but is readily distinguished, among other characters, by its very much larger fruits.

RHAMNACEAE

VENTILAGO Gaertner

VENTILAGO BRUNNEA sp. nov.

Frutex scandens, inflorescentiis exceptis glaber; foliis in siccitate brunneis, utrinque concoloribus, nitidis, oblongis, usque ad 20 cm longis, subcoriaceis, basi subacutis ad rotundatis, apice latissime acuminatis et obtusis vel leviter retusis, nervis utrinque circiter 9; inflorescentiis axillaribus terminalibusque, subferrugineo-pubescentibus, simplex vel e basi parce ramosis, usque ad 13 cm longis; floribus numerosis, fasciculatis, breviter pedicellatis, 3 ad 4 mm diametro, petalis obovatis, retusis, circiter 1 mm longis.

A scandent shrub, glabrous except the inflorescence. Branches and branchlets dark-brown, terete, smooth. Leaflets uniformly brown and shining on both surfaces when dry, subcoriaceous or firmly chartaceous, oblong, 12 to 20 cm long, 4 to 6 cm wide, base rounded to subacute, narrowed upward to the very broadly acuminate apex, the acumen rounded or slightly retuse and 3 to 5 mm wide at the tip; primary lateral nerves about 9 on each side of the midrib, prominent, curved, obscurely anastomosing close to the margin, the reticulations dense; petioles brown, 3 mm long or less. Inflorescences axillary and terminal, simple or branched from the base, the branches few, up to 13 cm in length, all parts uniformly pubescent with short, subferruginous or sometimes cinereous hairs. Flowers yellowish-white, numerous,

fascicled along the branches, 3 to 10 in a fascicle, 3 to 4 mm in diameter, their pedicels pubescent, 1 to 1.5 mm long. Calyx dark-brown when dry, externally slightly pubescent, the lobes broadly triangular, acute, 1.5 mm wide at the base, 1.2 mm long. Petals membranaceous, obovate, retuse, 1 mm long. Disk about 2 mm in diameter; styles 2, very short. Fruits unknown, the very young ones when 1 cm long or less very slightly pubescent, apparently soon entirely glabrous.

LUZON, Tayabas Province, Umiray River, *Bur. Sci.* 29053 Ramos & Edaña, June 3, 1917, in forests along the Umiray River at low altitudes.

This species is manifestly allied to *Ventilago dichotoma* (Blanco) Merr., from which it is readily distinguished by its much larger leaves.

VITACEAE

TETRASTIGMA Planchon

TETRASTIGMA CORNICULATUM sp. nov.

Frutex scandens, inflorescentiis et stipulis exceptis glaber; foliis pedatim 5-foliolatis, foliolis chartaceis vel subcoriaceis, ovatis ad oblongo-ovatis, acuminatis, basi subrotundatis, usque ad 9 cm longis grosse serrato-dentatis, nervis utrinque circiter 6; inflorescentiis pedunculatis, subcorymboso-umbellatis, usque ad 5 cm longis, multifloris; sepalis lanceolatis, acuminatis, petalis extus pubescentibus, circiter 4 mm longis, apice prominente acuminato-corniculatis.

A scandent shrub, glabrous except the stipules and the inflorescences, the branches subterete, brown when dry. Leaves pedately 5-foliolate, their petioles up to 10 cm long; stipules inequilateral, oblong-ovate, acute to somewhat acuminate, up to 1 cm long, externally densely ferruginous-puberulent; leaflets ovate to oblong-ovate, subcoriaceous, slightly shining when dry, subolivaceous, 6 to 9 cm long, 4 to 6 cm wide, base usually rounded, often inequilateral, apex rather prominently acuminate, margins rather coarsely serrate-dentate; lateral nerves about 6 on each side of the midrib, slender, distinct; petiolules usually about 1 cm long. Inflorescences in the upper axils, peduncled, umbellate-corymbose, cinereous-puberulent, many flowered. Flowers greenish, umbellately arranged on the ultimate branchlets, their pedicels cinereous-puberulent, 5 to 6 mm long. Sepals 4, lanceolate, pubescent, acuminate, about 1 mm long. Petals oblong-lanceolate, externally rather densely cinereous-puberulent, 4 mm long, prominently acuminate-corniculate, the apical appendage somewhat spreading. Filaments about 2 mm long. Female flowers not seen.

LEYTE, Tigbao, near Tacloban, Wenzel 1240, May, 1915, a vine with greenish flowers, reaching a height of about 10 meters.

A species well characterized by its prominently corniculate, pubescent petals, in vegetative characters resembling *Tetrastigma sepulchrei* Merr., but apparently not closely allied to that species.

ELAEOCARPACEAE

ELAEOCARPUS Linnaeus

ELAEOCARPUS BONTOCENSIS sp. nov. § *Dicera*.

Arbor circiter 8 m alta, partibus junioribus inflorescentiisque exceptis glabra; foliis coriaceis, nitidis, elliptico-ovatis, usque ad 7 cm longis, utrinque subaequaliter angustatis, basi acutis, apice breviter obtuseque acuminatis, margine crenato-serrulatis, nervis utrinque circiter 5, axillis glandulosis; racemis leviter pubescentibus, axillaribus, solitariis, 1 ad 2 cm longis, paucifloris; floribus 4- et 5-meris, parvis; petalis margine parcissime ciliatis, apice breviter laceratis; staminibus 20, obtusis, haud ciliatis; ovario 3-locellato, puberulo.

A tree about 8 m high, glabrous except the very young parts and the sparingly pubescent racemes. Branches terete, reddish-brown, rather slender, the tips of the branchlets more or less appressed-pubescent. Leaves elliptic-ovate, coriaceous, rather pale when dry, shining, 4 to 7 cm long, 2 to 4 cm wide, subequally narrowed to the acute base and short, blunt-acuminate apex, margins distinctly crenate-serrate; lateral nerves about 5 on each side of the midrib, rather prominent, their axils glandular, reticulations slender, rather lax; petioles 1 to 1.5 cm long. Racemes axillary, solitary, short, few-flowered, 1 to 2 cm long, sparingly pubescent. Flowers small, 4- and 5-merous, their pedicels about 4 mm long. Sepals oblong-ovate, acute, slightly pubescent, 4 mm long, 2 mm wide. Petals oblong-obovate to obovate, about 3.5 mm long, 2 mm wide, margins and surface inside in the lower part very sparingly ciliate with slender, white hairs, the apical 1 to 1.5 mm cut into 10 to 12 narrow divisions, none of these more than 1 mm in length. Stamens 20, 2 to 2.5 mm long, the filaments short, the anthers narrow, obtuse, scabrid, the cells equal, not awned or ciliate. Disk gray-puberulent. Ovary ovoid, densely gray-puberulent, 3-celled; style puberulent, about 2 mm long.

LUZON, Bontoc Subprovince, Bauco, Vanoverbergh 3892, January, 1914, in forests, altitude about 1,700 meters, the flowers pink.

A species well characterized by its very short, few-flowered racemes; 4- and 5-merous, small flowers; its very short petal-segments, very sparingly ciliate petals; and obtuse, not at all awned or ciliate anthers.

ELAEOCARPUS SURIGAENSIS sp. nov. § *Dicera*.

Arbor circiter 20 m alta, inflorescentiis exceptis glaber; foliis oblongis, coriaceis, usque ad 23 cm longis, longe petiolatis, in siccitate brunneo-olivaceis, breviter acuminatis, basi acutis, interdum distincte inaequilateralibus, margin minute distanter cuspidato-denticulatis, nervis utrinque circiter 10, distinctis; racemis axillaribus, usque ad 11 cm longis, laxis, paucifloris, griseo-pubescentibus; floribus 5- vel 6-meris, circiter 7 mm longis, sepalis petalisque extus uniformiter adpresse cinereo-pubescentibus; petalis fimbriatis, staminibus circiter 20, antheris 2.5 ad 3.5 mm longis, muticis; ovario dense pubescente, 3-loculare.

A tree about 20 m high, entirely glabrous except the cinereous-pubescent inflorescence. Branches terete, brownish, rugose, the ultimate ones somewhat thickened, 5 to 10 mm in diameter, the petiolar scars rather prominent. Leaves alternate, oblong, coriaceous, brownish-olivaceous when dry, 17 to 23 cm long, 7.5 to 10 cm wide, subequally narrowed to the shortly acuminate apex and to the acute base, the base sometimes distinctly inequilateral, the margins distantly and obscurely cuspidate-denticulate; lateral nerves about 10 on each side of the midrib, prominent, anastomosing, the reticulations rather close, distinct; petioles 2.5 to 6 cm in length. Racemes axillary, solitary, rather numerous, 9 to 11 cm long, rather lax, few-flowered, all parts uniformly appressed cinereous-pubescent, the pedicels 1 to 1.5 cm long, the subtending bracteoles oblong to lanceolate, 3 to 5 mm long. Flowers 5- and 6-merous, yellow, fragrant, perfect, about 7 mm long. Sepals lanceolate, narrowed upward, acute, about 7 mm long, outside uniformly appressed cinereous-pubescent, inside glabrous in the lower one-half, sparingly pubescent above. Petals equaling the sepals in length, oblong, slightly narrowed below, outside uniformly appressed-pubescent, inside along the median portion and margins densely pubescent, slightly so elsewhere, the upper 2 to 3 mm cut into about 15 slender fimbriae. Stamens about 20, their filaments 1.5 to 2 mm long; anthers narrowly oblong, scabrid, 2.5 to 3.5 mm long, one cell slightly exceeding the other, the tip slightly projecting, not awned. Ovary ovoid, densely pubescent, 3-celled; style pubescent near the base, glabrous above, about 4 mm long.

MINDANAO, Surigao Province, near Mabini, *For. Bur.* 26000 Ponce, May 11, 1916, in level rich soil at the edge of the forest, altitude about 50 meters, locally known as *yagao-yagao*.

In general appearance this species somewhat resembles *Elaeocarpus octopetalus* Merr. and *E. leytensis* Merr. but belongs in a different section

of the genus than either of the above. It does not appear to be closely allied to any previously described Philippine form.

ELAEOCARPUS MONOCERA Cav. Ic. 6 (1801) 1, t. 501.

Elaeocarpus megacarpa Elm. Leaf. Philip. Bot. 7 (1915) 2627.

This species, a very characteristic one, is widely distributed in the Philippines. The type material, on which Cavanilles's description and figure were based was from Los Baños and Jala-jala, Luzon, points on opposite sides of Lake Bay. I can see absolutely no reason for distinguishing *Elaeocarpus megacarpa* Elm. from *E. monocera* Cav. The species is represented by the following specimens:

LUZON, Cagayan Province, Aparri, *For. Bur.* 23687 Bernardo, locally known to the Negritos as *tabian*; *For. Bur.* 17916 Bernardo, locally known to the Ilocanos as *panulauen* (specimen erroneously localized as from Isabela Province on the herbarium label): Rizal Province, *Phil. Pl.* 1051 Merrill: Laguna Province, San Antonio, *Bur. Sci.* 20564 Ramos; Los Baños and Mount Maquiling, *Calycosa s. n.*, *For. Bur.* 20484, 22921 Villamil, *For. Bur.* 13150 Curran: Bataan Province, *For. Bur.* 1754, 1804 Borden: Tayabas Province, Merrill 1993: Camarines Province, *For. Bur.* 21142 Miranda, known to the Bicol's as *opong-opong*. SAMAR, Palapag, *Bur. Sci.* 24451 Ramos, known to the Visayans as *upong-upong*. MINDANAO, Agusan Province, Elmer 14059 (type of *Elaeocarpus megacarpa* Elm.).

MALVACEAE

ABELMOSCHUS Medikus

ABELMOSCHUS VANOVERBERGHII sp. nov.

Herba erecta, usque ad 60 cm alta, hispido-hirsuta, leviter ramosa, e basi valde incrassata; foliis palmatim 5- vel 7-lobatis, usque ad 9 cm longis, lobis oblongo-ovatis ad lineari-lanceolatis, grosse serratis; floribus circiter 4 cm longis, flavis, calycibus spathaceis, circiter 2 cm longis, hirsutis, bracteis 10, linearis, circiter 1.5 cm longis, ciliato-hirsutis; capsulis ovoideis vel subellipsoideis, dense hispido-hirsutis, obtusis, circiter 3 cm longis.

An erect, somewhat branched perennial herb from a much thickened underground base, the branches up to 60 cm in length, these, the branchlets, leaves and bracts prominently hispid-hirsute with spreading, stiff, rather pale hairs. Leaves variable, 4 to 9 cm long, palmately 5- or 7-lobed, the lobes oblong ovate and extending half-way to the base to linear-lanceolate and extending nearly to the base, all acute or somewhat acuminate and rather coarsely toothed, scabrid, somewhat hispid-hirsute on both surfaces; petioles 2 to 6 cm long. Flowers yellow, with dark-purple or brown spots at the base of the petals, several on each branch but only one or two opening at one time. Calyx spathaceous, deciduous, about 2 cm long, short appressed-hirsute, grayish when dry, with short narrow lobes at the apex. Corolla about 4 cm long, campanulate. Bracts 10, linear, prominently

hirsute with spreading hairs, about 1.5 cm long. Capsules ovoid to subellipsoid, obtuse, about 3 cm long and 2 cm in diameter, externally densely hirsute with stiff, spreading, pale hairs. Seeds not at all musky.

LUZON, Cagayan Province, *Bolster 122*, July, 1905, *For. Bur. 16493 Bacani*, January, 1909, *Bur. Sci. 7839 Ramos*, April, 1909: Lepanto District, near Cervantes, *Merrill 4480*, November, 1905; Bontoc Subprovince, *Vano-verbergh 879, 1221* (type), October and May, 1911.

This species grows in open grasslands, and is characterized by its thickened, woody, underground base; it is manifestly a perennial plant, differing in this character from *A. moschatus* to which it is evidently allied. It is very closely allied to *Abelmoschus sagittifolius* Kurz, which Hochreutiner has reduced to *A. abelmoschus*, but has smaller flowers which are yellow, not at all pink or red, and differently shaped leaves.

HIBISCUS Linnaeus

HIBISCUS VITIFOLIUS Linn. Sp. Pl. (1753) 696; Mast. in Hook. f. Fl. Brit. Ind. 1 (1874) 338.

LUZON, Union Province, San Fernando, *R. Lete 117, 144*, July and August, 1916, locally known as *mapua*.

Not previously reported from the Philippines; tropical Africa and Asia to tropical Australia.

SIDA Linnaeus

SIDA LONGISTIPULA sp. nov.

Herba annua, prostrata, caulis numerosis, usque ad 20 cm longis, simplex vel rariter ramosis, ciliato-pilosis; foliis oblongis, usque ad 1.8 cm longis, basi cordatis, 3-nerviis, apice obtusis, in $\frac{1}{2}$ vel $\frac{1}{3}$ superiore parte prominente serratis; stipulis linearis vel lineari-spatulatis, circiter 1 cm longis; floribus breviter pedicellatis, axillaribus, plerumque ad apicem ramulorum confertis; calycibus teretibus, haud angulatis vel costatis, 5-lobatis, extus pubescentibus pilosisque, 6 ad 7 mm longis; carpellis 5 ad 8, prominente muricatis, facies interioribus prominente reticulatis, brevissime biaristatis.

An annual herb, the stems numerous, tufted from the apex of the stout perpendicular root, prostrate, spreading, all parts more or less pubescent with sparingly stellate, long, white ciliate-pilose hairs, the stems up to 20 cm in length, simple, rarely branched. Leaves oblong, 1 to 1.8 cm long, 3 to 7 cm wide, long petioled, base cordate, 3-nerved, apex obtuse, in the upper one-half or one-third prominently serrate, the upper surface glabrous, the lower more or less stellate-pilose, the margins sparingly ciliate; petioles up to 1 cm in length, sparingly ciliate-pilose; stipules linear or linear-spatulate, about 1 cm long. Flowers mostly crowded at the apices of the stems, forming a

subcapitate leafy inflorescence, sometimes solitary ones in the lower axils, their pedicels not jointed, 2 to 3 mm long. Calyx 6 to 7 mm long, terete, not ribbed or angled, rather densely cinereous-pubescent and with long, white, ciliate hairs intermixed, the lobes 5, oblong-ovate, acute, 4 to 5 mm long. Corolla-lobes 5 to 6 mm long, oblong-obovate, obtuse, the tube very short. Stamens about 18, the tube about 1.5 mm long. Ovary depressed about 8-celled; styles 8, about 3 mm long; stigmas capitate. Mature carpels 5 to 8, prominently muricate, 3 to 4 mm long, the projections with a minute tuft of hairs at the tips, the inner faces very prominently reticulate, the apex biaristate, the awns 1 mm long or less.

LUZON, Ilocos Norte Province, Bangui and Burgos, *Bur. Sci.* 27445 (type), 27311, 27492 Ramos, February and March, 1917, in dry open places at low altitudes.

The relationship of this strongly marked species is apparently with the Australian *Sida subspicata* F. Muell., but it is not closely allied to that species. It is well characterized by its tufted, simple stems, its long petioled, oblong, 3-nerved, cordate, small leaves which are prominently toothed in the upper part; its long stipules; its crowded flowers which form a dense, subcapitate, leafy inflorescence; and its prominently muricate, short-awned carpels which are strongly reticulate on the inner faces.

DILLENACEAE

SAURAUIA Willdenow

SAURAUIA ALVAREZII sp. nov.

Arbor circiter 6 m alta prominente patule setosis, foliis subcoriaceis, oblongis ad elliptico-oblongis. usque ad 20 cm longis, acutis vel breviter acuminatis, basi obtusis, margine irregulariter spinuloso-serratis, nervis utrinque 10 ad 12, prominentibus, supra olivaceis, subtus pallidis, costa nervisque utrinque setosis; floribus axillaribus, solitariis, longe pedicellatis, pedicellis sub fructu 2 ad 4 cm longis, densissime patule setosis; sepalis 12 ad 14 mm longis, densissime setosis; fructibus 4-locellatis, circiter 12 mm longis, puberulis.

A tree about 6 m high, all parts prominently setose, the setae pale-brownish, rather soft, spreading, thickened below, slenderly acuminate and minutely puberulent. Branches brown, terete, the branchlets very uniformly and densely setose. Leaves alternate, subcoriaceous, oblong to elliptic-oblong, 11 to 20 cm long, 5 to 8 cm wide, the upper surface dark-olivaceous, the lower pale, apex acute to acuminate, base obtuse, margins irregularly spinulose-serrate, midrib on the upper surface spinulose-setose, the epidermis with widely scattered similar hairs, the lower

surface with much more numerous setae; lateral nerves 10 to 12 on each side of the midrib, prominent, curved, anastomosing, the reticulations prominent; petioles densely setose, 1.5 to 2.5 cm long. Flowers axillary, solitary, the pedicels and the sepals externally very densely setose, the pedicels, in fruit, 2 to 4 cm long, often with one or two scars at about the middle. Sepals subcoriaceous, elliptic-ovate to broadly ovate, or the inner ones obovate, 12 to 14 mm long, very densely setose, glabrous inside, the marginal parts of the inner ones thinner, mostly acute. Fruit capsular, about 12 mm long, subellipsoid, 4-celled, externally puberulent, dehiscing in the upper part only.

MINDANAO, Lanao District, Lanao-Cotabato trail, *For. Bur. 25202 Alvarez*, March 21, 1916, in dipterocarp forests, altitude about 1,000 meters, locally known as *carimog*.

A very characteristic species, distinguishable by its long-pedicelled, rather large flowers; its dense indumentum which consists of pale-brownish, spreading, acuminate, rather soft setae, the setae themselves puberulent; and its capsular fruits.

SAURAUIA BICOLOR sp. nov.

Frutex circiter 2 m altus vix setosus, subtus foliis et inflorescentiis densissime cinnamomeo-pubescentibus; foliis chartaceis, oblongis ad oblanceolatis, usque ad 20 cm longis, acuminatis, basi acutis, margine perspicue subglanduloso-denticulatis, supra laevis, glabris, atro-brunneis vel atro-olivaceis, subtus cinnamomeis, nervis utrinque 13 ad 15, perspicuis; inflorescentiis axillaribus, brevibus, paucifloris vel 1-floris, floribus pro ratione magnis, sepalis suborbicularibus, circiter 1 cm diametro, petalis circiter 14 mm longis; ovario dense pubescente, stylis 4, glabris, circiter 8 mm longis, ad basim connatis.

A shrub about 2 m high, the younger branchlets, petioles, inflorescences, and lower surface of the leaves very densely cinnamomeous-pubescent, the indumentum felted. Branches terete, dark reddish-brown, glabrous, the branchlets and petioles with few, widely scattered, appressed, oblong-ovate scales 2 mm long or less. Leaves chartaceous, oblong to oblanceolate, 11 to 20 cm long, 4 to 8 cm wide, narrowed below to the cuneate base, the apex shortly and sharply acuminate, the margins, except at the base, conspicuously denticulate with somewhat spreading, oblong-obtuse, gland-like teeth about 1 mm in length, the upper surface smooth, glabrous, or when young sparingly puberulent, dark-brown or dark-olivaceous, in striking contrast to the densely cinnamomeous-pubescent lower surface where the indumentum is closely felted; lateral nerves 13 to 15 on each side of the

midrib, prominent, curved-ascending, the reticulations slender; petioles 1.5 to 2.5 cm long, the younger ones densely cinnamomeous-pubescent, the older ones glabrous. Inflorescences axillary, few-flowered, sometimes only 1-flowered, shorter than the petioles, the bracts oblong, obtuse, 5 to 6 mm long. Petals about 10 mm in diameter, rounded, suborbicular, outside very densely felted-pubescent. Petals broadly obovate about 14 mm long, retuse. Ovary densely pubescent; styles 4, glabrous, 8 mm long, united for the lower 1.5 mm.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28735 Ramos & Edaña, May 12, 1917, on forested ridges.

A most characteristic species, its indumentum similar to *Saurauia mindorensis* Merr., but otherwise not at all closely allied to that species. It is otherwise well characterized by being non-setose, the few scales on the branchlets and petioles being closely appressed.

SAURAUIA GLABRIFOLIA sp. nov.

Frutex circiter 3 m altus, glaber vel ramulis junioribus par-cissime furfuraceis; foliis in siccitate viridis, nitidis, subcoriaceis, usque ad 18 cm longis, oblongis ad oblongo-obovatis, acute acuminatis, basi acutis, margine irregulariter glanduloso-serrulatis, nervis utrinque circiter 9, utrinque prominentibus, obscure anastomosantibus, reticulis laxis, obscuris; floribus axillaribus, solitariis vel depauperato-fasciculatis, longe pedicellatis, circiter 13 mm diametro, sepalis margine leviter ciliatis exceptis glabris; ovario glabro; stylis 3, liberis.

A shrub about 3 m high, the younger branchlets usually with few, scattered, closely appressed, rather prominent ovate or orbicular scales less than 1 mm in diameter, otherwise entirely glabrous except the ciliate margins of the sepals. Branches reddish-brown, terete, smooth, the branchlets of the same color, somewhat angular when dry. Leaves alternate, subcoriaceous, greenish when dry, shining, oblong to oblong-obovate, 13 to 18 cm long, 5 to 7 cm wide, the apex prominently and sharply acuminate, the base acute, the margins irregularly glandular-denticulate; lateral nerves about 9 on each side of the midrib, curved, rather prominent on both surfaces, obscurely anastomosing, the reticulations lax, indistinct; petioles 1 to 2 cm long. Flowers white, axillary, solitary or in depauperate fascicles of two or three flowers each, their pedicels slender, up to 1.5 cm in length. Sepals 5, equal, elliptic, rounded, 6 mm long, their margins ciliate, otherwise glabrous. Petals 5, oblong-obovate, about 7 mm long, the apex prominently inequilateral, retuse. Stamens about 20, their anthers about 2 mm long. Ovary globose, glabrous; styles 3, free to the base, about 5 mm long.

MINDANAO, Surigao Province, Placer, *Wenzel 1866*, July 4, 1916, in forests, altitude about 150 meters.

A strongly marked species, well characterized by its entirely glabrous leaves and slenderly pedicelled flowers. The almost entire absence of indumentum of any type is rather remarkable, as most of the Indo-Malayan species of the genus are prominently pubescent, setose, or ciliate. In the present species the indumentum is reduced to small, widely scattered, closely appressed scales, and these only on the younger parts of the plant.

FLACOURTIACEAE

CASEARIA Linnaeus

CASEARIA EUPHLEBIA sp. nov.

Frutex glaber, ramis ramulisque teretibus; foliis integris, chartaceis vel subcoriaceis, oblongo-ovatis ad oblongo-ellipticis, usque ad 13 cm longis, acuminatis, basi subacutis ad rotundatis, aequilateralibus vel leviter inaequilateralibus, distincte pellucido-punctatis, nervis utrinque circiter 7, subtus valde prominentibus; floribus axillaribus, solitariis, breviter pedicellatis, circiter 4 mm longis, filamentis cum staminoideis adnatis.

A glabrous shrub about 2 m high, the branches pale-grayish, somewhat shining, wrinkled when dry, slender, terete. Leaves greenish-olivaceous and somewhat shining when dry, firmly chartaceous to subcoriaceous, oblong-ovate to oblong-elliptic, 6 to 13 cm long, 3.5 to 6 cm wide, entire, apex distinctly acuminate, base equilateral or somewhat inaequilateral, subacute to rounded, in transmitted light distinctly and minutely pellucid-punctate and with scattered, elongated, larger, translucent dashes; lateral nerves 7 on each side of the midrib, very prominent on the lower surface, curved, anastomosing, the reticulations distinct, rather fine; petioles 3 to 5 mm in length. Flowers solitary, axillary, their pedicels 2 to 2.5 mm long. Sepals somewhat punctulate, elliptic, rounded, about 4 mm long. Staminalodes oblong, about 1.5 mm long and 0.7 mm wide, obtuse or truncate and slightly pubescent at the apex, the anthers oblong, 0.7 mm in length. Ovary glabrous. Young fruit red, oblong, obtuse, about 1.5 cm long.

LEYTE, Tigbao, near Tacloban, *Wenzel 1503*, June 3, 1915.

A species well characterized by its distinctly pellucid-punctulate, prominently nerved, entire leaves, and its solitary flowers.

CASEARIA CONFERTIFLORA sp. nov.

Frutex circiter 3 m altus, ramulis et floribus et subtus foliis molliter pubescentibus; foliis inaequilateralibus, ovatis ad late oblongo-ovatis, usque ad 11 cm longis, breviter obtuseque acuminatis, margine crenatis, basi late oblique subtruncatis, nervis

utrinque circiter 6; floribus numerosissimis, axillaribus, fasciculatis, dense confertis, breviter pedicellatis, circiter 4 mm longis; filamentis 1.5 ad 2 mm longis, glabris, staminoideis liberis, oblongis, sursum villosis; ovario pubescente.

A species closely allied to *Casearia cinerea* Turcz. and *C. grewiaefolia* Vent., differing especially in its much fewer nerved leaves. A shrub about 3 m high, the branchlets, lower surface of the leaves and the flowers rather densely and softly pubescent. Branches terete, glabrous, reddish-brown when dry, sparingly wrinkled and lenticellate, the branchlets densely subferruginous-to cinereous-pubescent. Leaves subcoriaceous, ovate to broadly oblong-ovate, 8 to 11 cm long, 4 to 5.5 cm wide, pale-brownish when dry, apex shortly and obtusely acuminate, margins prominently crenate, base broadly and obliquely truncate, both sides rounded or one side rounded and the other acute, prominently inequilateral, subfalcate, the upper surface glabrous except the sparingly pubescent midrib, the lower surface softly pubescent especially on the midrib and lateral nerves; lateral nerves about 6 on each side of the midrib, prominent, curved-ascending, obscurely anastomosing, the reticulations lax; petioles rather densely pubescent, 3 to 5 mm long. Flowers yellowish, about 4 mm long, very numerous, crowded in subglobose, dense, axillary fascicles, 30 to 50 in a fascicle, their pedicels densely pubescent, 3 to 4 mm long. Perianth-segments 5, elliptic-oblong, densely pubescent, obtuse. Stamens 10; filaments 1.5 to 2 mm long, glabrous; anthers oblong-ovate, 1 mm long; staminodes oblong, obtuse, 1.5 mm long, free, glabrous below, villous in the upper one-half. Ovary ovoid, pubescent; style very short; stigma capitate.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27442 *Ramos*, in dry thickets at low altitudes, locally known to the Ilocanos as *boyboyoc*.

This species is manifestly very closely allied to *Casearia cinerea* Turcz., differing especially in its distinctly fewer nerved leaves and its very numerous, densely crowded flowers.

HOMALIUM Jacquin

HOMALIUM MULTIFLORUM sp. nov. § *Blackwellia*.

Species *H. loheri* affinis, differt foliis minoribus, usque ad 8 cm longis, nervis paucioribus, utrinque circiter 6, bracteis oblongo-ovatis, circiter 2 mm longis.

A tree about 10 m high, the inflorescence prominently ciliate-pubescent with spreading pale or cinereous hairs, otherwise glabrous. Branches terete, reddish-brown, often somewhat glaucous, obscurely lenticellate. Leaves coriaceous or subcoria-

ceous, elliptic, shining, 6 to 8 cm long, 3 to 4.5 cm wide, subequally narrowed to the acute base and to the acute or obscurely acuminate apex, the margins distantly crenate-serrate; lateral nerves about 6 on each side of the midrib, prominent on the lower surface, curved, anastomosing, the reticulations distinct; petioles 5 to 7 mm long. Inflorescences terminal and axillary, the racemes forming large, leafy panicles, the individual racemes or branches mostly simple, up to 12 cm long, all parts more or less pubescent with spreading hairs. Flowers very numerous, 5-merous, about 6 mm in diameter, white, somewhat fascicled along the racemes, their pedicels jointed to the calyx, about 2.5 mm long, the subtending bracts oblong-ovate, acute or acuminate, pubescent, 2 mm long. Calyx-tube narrowly funnel-shaped, 2 mm long. Sepals 5, narrowly oblong, ciliate, 2 mm long, about 0.5 mm wide. Petals 5, narrowly oblong-obovate to somewhat spatulate, ciliate, about 3 mm long. Stamens 1 opposite each petal, the filaments about 2 mm long, sparingly ciliate in the lower one-half. Ovary pubescent; styles 3 or 4, about 1.5 mm long, ciliate.

LUZON, Benguet Subprovince, Pakdal, *For. Bur.* 25155 *Garcia* (type), March 11, 1916, along small streams at an altitude of 1,500 meters; Trinidad, on limestone formation, *For. Bur.* 15933 *Bacani*, December 30, 1908, distributed as *H. loheri* Merr.

Very closely allied to *Homalium loheri* Merr., from which it is readily distinguished by its smaller, fewer nerved leaves.

HOMALIUM PLATYPHYLLUM sp. nov. § *Myriantheia*.

Arbor circiter 10 m alta, inflorescentiis exceptis glabra; foliis ellipticis, coriaceis, nitidis, usque ad 20 cm longis et 11 cm latis, integris, apice breviter abrupte obtuseque acuminatis, basi rotundatis, nervis utrinque circiter 9, perspicuis; inflorescentiis dense cinereo-pubescentibus, laxis, multifloris, usque ad 20 cm longis, ramis elongatis; floribus 8-meris, petalis subspatulatis, circiter 3 mm longis, quam sepalis longioribus; staminibus 16.

A tree about 10 m high, glabrous except the rather densely cinereous-pubescent ample inflorescence. Branches terete, brownish. Leaves elliptic, coriaceous, brownish or brownish-olivaceous and shining when dry, about 20 cm long and 11 cm wide, entire, base rounded, apex very shortly and obtusely acuminate; lateral nerves about 9 on each side of the midrib, prominent, reddish-brown on the lower surface when dry, curved-anastomosing, the reticulations slender, distinct; petioles stout, about 1 cm long. Inflorescence ample, paniculate, up to 20 cm in length, the ultimate branches 10 to 15 cm long, all parts

rather densely cinereous-pubescent. Pedicels 1 to 2 mm long. Calyx-tube obconic, about 2 mm long, the lobes 8, linear, about 2 mm long, pubescent. Petals 8, somewhat spatulate, obtuse, cinereous-pubescent, ciliate on the margins, about 3 mm long. Stamens 16, two opposite each petal, their filaments glabrous, about 2 mm long. Ovary and style pubescent, the style-arms 4, about 1 mm long.

LEYTE, Tigbao, near Tacloban, *Wenzel 1525*, July 15, 1915, the flowers green.

A species manifestly allied to *Homalium luzoniense* F.-Vill., but with much larger, entire, and somewhat fewer nerved leaves.

HOMALIUM VILLOSUM sp. nov. § *Myriantheia*.

Arbor circiter 15 m alta subtus foliis et ramulis junioribus et inflorescentiis dense molliter villosis; foliis subcoriaceis, ellipticis, usque ad 8 cm longis, breviter obtuseque acuminatis, basi subacutis, nervis utrinque circiter 6, perspicuis; inflorescentiis axillaribus terminalibusque, paniculatis, ramis elongatis, bracteis elliptico-ovatis, 3 ad 4 mm longis, membranaceis, villosis; floribus 6-meris, petalis sepalisque subaequalibus, villosis, circiter 2 mm longis, oblanceolatis; staminibus 18.

A tree about 15 m high, the branchlets, inflorescence, and lower surface of the leaves densely and softly villous with pale hairs. Branches terete, brownish, glabrous. Leaves elliptic, subcoriaceous, 5 to 8 cm long, 2.5 to 5 cm wide, pale when dry, the upper surface shining, glabrous except the puberulent midrib, apex shortly blunt-acuminate, base acute, margins distantly crenulate, the teeth in young leaves crowned with a tuft of hairs; lateral nerves about 6 on each side of the midrib, prominent, anastomosing, curved; petioles densely villous, 2 to 3 mm long. Panicles terminal and axillary, the branches numerous, elongated, densely many-flowered, up to 10 cm long, the flowers 6-merous, scattered along the rachis, not fascicled, the villous pedicels 2 to 2.5 mm long, the bracts prominently ciliate, elliptic to ovate-elliptic, obtuse, 3 to 4 mm long. Sepals 6, prominently ciliate, oblanceolate, acute or subacute, about 2 mm long. Petals similar to the sepals. Stamens three opposite each petal, their filaments about 1.4 mm long, sparingly ciliate at the base. Ovary villous; styles 5 or 6, about 1 mm long, sparingly ciliate.

SAMAR, near Catbalogan, *For. Bur. 22748 Lasquety*, August 2, 1914, on forested ridges, altitude about 200 meters, locally known as *batu-batu*.

This specimen was originally determined as *Homalium loheri* Merr., but belongs in a different section of the genus than this species. It falls in the group with *Homalium villarianum* Vid., but is distinguished from

it and from the other Philippine species of the section *Myrianthecia* by its indumentum. In its general appearance and its indumentum it resembles *H. barandae* Vid., but the latter belongs in the section *Blackwellia*.

BEGONIACEAE

BEGONIA Linnaeus

BEGONIA CASTILLOI sp. nov. § *Diploclinium*.

Herba parva, parcellissime et longe ciliatis, repens, caulibus usque ad 10 cm longis stipulis multis brunneis oblongo-lanceolatis acuminatis instructis; foliis suborbicularibus, aequilateralibus vel leviter inaequilateralibus, late rotundatis, basi cordatis, 3 ad 5 cm longis, margine integris vel irregulariter denticulatis, ciliatis; inflorescentiis tenuibus, paucifloris, 10 ad 12 cm longis; capsulis circiter 1 cm longis, 1 ad 1.4 cm latis, inaequaliter 3-alatis, suborbicularibus vel apice subtruncatis.

A small herb, the stems up to 10 cm long, creeping, covered with numerous, brown, oblong to lanceolate, slenderly acuminate stipules which are up to 1 cm in length and above usually prominently long-ciliate. Leaves membranaceous, olivaceous-brownish when dry, suborbicular, 3 to 5 cm in diameter, equilateral or somewhat inequilateral, apex broadly rounded, base prominently cordate, the lobes broad, rounded, equal or subequal, 9-nerved, the upper surface glabrous, the lower glabrous or with very few hairs on the nerves, the margins entire or denticulate, sparingly ciliate with long brown hairs; petioles slender, 2.5 to 5 cm long, the younger ones ciliate with long, slender, brown hairs. Inflorescences slender, few-flowered, 10 to 12 cm long, glabrous or nearly so. Capsules unequally 3-winged, about 1 cm long, 1 to 1.5 cm wide, suborbicular, or the upper side of the broad wing truncate, this wing 7 to 9 mm wide, the other two about 2 mm wide.

LUZON, Cagayan Province, Callao, near Peña Blanca, *Bur. Sci.* 22723 *Castillo*, April 23, 1915, on cliffs along the river, altitude about 100 meters.

The general alliance of this species is with *Begonia nigritarum* Steud., to which, however, it is not closely allied. Its distinguishing characters are its small, suborbicular, equilateral or nearly equilateral leaves.

BEGONIA TAYABENSIS sp. nov. § *Diploclinium*.

Herba subglabra, caulibus circiter 1 cm diametro, stipulis deciduis; foliis longe petiolatis, perspicue peltatis, suboblique ovatis ad oblongo-ovatis, usque ad 20 cm longis, basi rotundatis, apice subacutis vel obtusis, margine subintegris, subtus valde reticulatis; inflorescentiis longissime pedunculatis, 25 ad 35 cm longis, dichotomis, laxis, paucifloris; floribus ♂ circiter 2 cm

diametro; capsulis circiter 1 cm longis et 1.8 cm latis, inaequilateraliter 3-alatis.

A subglabrous herb, the stems creeping, reddish-brown when dry, about 1 cm in diameter, glabrous; stipules deciduous, broadly ovate, acuminate, sparingly ferruginous-ciliate, about 1 cm long. Leaves prominently peltate, the petiole inserted 2 to 4 cm from the base of the leaf, membranaceous, somewhat oblique, ovate to oblong-ovate, 15 to 20 cm long, 10 to 12 cm wide, base broadly rounded, apex acute or somewhat obtuse, margins subentire, not at all lobed, with a fringe of scattered, tooth-like, short cilia, both surfaces with widely scattered, short hairs, ultimately glabrous or nearly so; basal nerves radiate, about 9, prominent, the reticulations very prominent on the lower surface; petioles 12 to 15 cm long, glabrous or with very few, widely scattered, short hairs. Inflorescences 25 to 35 cm long, dichotomous, few-flowered, sparingly ciliate with short, pale, spreading, scattered hairs, the flower-bearing part about 10 cm long. Staminate flowers white or slightly pink, about 2 cm in diameter, the sepals elliptic-ovate, rounded. Capsules about 1 cm long and 1.8 cm wide, base rounded, apex subtruncate, one wing very much larger than the other two and about 1 cm in width, the other two 3 to 4 mm wide.

LUZON, Tayabas Province, Umiray River, *Bur. Sci.* 29054 Ramos & Edaña, June 3, 1917, on ledges and steep slopes in forests along the river.

This strongly characterized species is one of the few known representatives of the section *Diploclinium* with peltate leaves. It is readily distinguished from our peltate-leaved species, *Begonia hernandioides* Merr., *B. rufipila* Merr., and *B. ELMERI* Merr. [*B. peltata* Elm. Leaflet. Philip. Bot. 7 (1915) 2556, non A. DC., nec Hassk., nec Otto & Dietr.] by being nearly glabrous, the few, widely scattered hairs on the leaves and inflorescences scarcely exceeding 1 mm in length.

BEGONIA APAYAOENSIS sp. nov. § *Petermannia*.

Species *B. brevipes* Merr. similis, differt floribus fructibusque multo majoribus. Herba erecta, ramosa, usque ad 45 cm alta, perspicue ferrugineo-pubescentibus; foliis inaequilateraliter obovatis, in siccitate brunneis, brevissime petiolatis, usque ad 9 cm longis, acuminatis, basi angustatis, oblique cordatis, margine grosse et irregulariter dentato-lobatis et denticulatis; inflorescentiis terminalibus, 3 ad 5 cm longis, paucifloris; floribus ♀ 5-meris, sepalis late ovatis, obtusis, 13 mm longis; sepalis ♂ 2, ♀ similis; capsulis circiter 2 cm longis et latis, apice truncatis, deorsum angustatis et subacutis, aequaliter 3-alatis.

An erect branched herb about 45 cm high, the lower parts of the stems terete, somewhat decumbent and rooting, dark-brown,

terete, 3 to 4 mm in diameter, ferruginous-hirsute, the younger branchlets rather densely ferruginous-hirsute as are the short petioles and nerves on the lower surface of the leaves. Leaves membranaceous, brown when dry, the lower surface paler than the upper, in general obovate, inequilateral, 7 to 9 cm long, 3.5 to 5.5 cm wide, apex acuminate, base narrowed and obliquely cordate, the wider lobe rounded the other acute, the margins irregularly and coarsely dentate-lobed and denticulate; lateral nerves 4 or 5 on each side of the midrib, prominent; petioles 4 to 10 mm long; stipules membranaceous, 1 cm long or less. Inflorescences terminal, 3 to 5 cm long, few-flowered, the basal flower pistillate, the others staminate, the bracts membranaceous, oblong, acuminate, nearly 1 cm long. Pistillate flowers 5-merous, the sepals broadly ovate, obtuse, about 13 mm long. Staminate flowers white, the sepals 2, similar to those of the pistillate flowers, the stamens numerous, crowded on an elongated axis about 5 mm in length. Capsules equally 3-winged, about 2 cm long and wide, apex truncate, narrowed below to the subacute base, the wings submembranaceous.

LUZON, Apayao Subprovince, Mount Sulu, *Bur. Sci.* 28403 *Fénix*, May 22, 1917, on rocky shaded slopes, altitude about 1,000 meters.

This species resembles *Begonia brevipes* to which it is perhaps most closely allied. It is distinguished especially by its somewhat larger size, denser indumentum, and very much larger flowers and capsules.

BEGONIA BINUANGENSIS sp. nov.

Species *B. wenzelii* Merr. affinis, differt foliis majoribus, usque ad 8 cm longis, petiolis longioribus, capsulis turbinatis, 1.5 cm longis et 2 cm latis. Herba scandens, ramosa, glabra, internodiis 1.5 ad 3.5 cm longis, ramis teretibus, circiter 4 mm diametro; foliis membranaceis, oblongis ad oblongo-lanceolatis, basi rotundatis vel obtusis, apice acuminatis, margine irregulariter serrato-dentatis; sepalis ♂ orbicularibus, circiter 1 cm diametro; capsulis inaequaliter 3-alatis, apice truncatis, deorsum angustatis.

A scandent, glabrous, branched herb, rooting at some of the nodes, the stems and main branches terete, about 4 mm thick, brown, the branchlets more slender, the internodes 1.5 to 3 cm long. Leaves when dry membranaceous, olivaceous, somewhat shining, oblong to oblong-lanceolate, 5 to 8 cm long, 2 to 3 cm wide, somewhat inequilateral, base rounded or obtuse, narrowed above to the acuminate apex, margins irregularly serrate-dentate, the basal nerves 5 or 7, slender, ascending; petioles 1 to 3 cm long. Inflorescences terminal or in the uppermost axils, 3 to 4 cm long, few-flowered. Staminate flowers white, the sepals 2,

orbicular, about 1 cm in diameter. Capsules turbinate, somewhat unequally 3-winged, about 1.5 cm long and 2 cm wide, the apex truncate or subtruncate, narrowed below to the subacute base.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28813 Ramos & Edaña, May 11, 1917, climbing on tree trunks in damp forests near the summit of the mountain, altitude apparently about 1,000 meters.

This characteristic species, belonging in the group with *Begonia aequata* A. Gray, is most closely allied to *Begonia wenzelii* Merr., from which it is readily distinguished by its larger, differently shaped, longer petioled leaves and distinctly larger capsules.

BEGONIA CAUDATA sp. nov.

Herba scandens, glabra, usque ad 3 m longa; foliis in siccitate membranaceis, longissime petiolatis, subolivaceis, nitidis, ovatis ad subellipticis vel oblongo-ellipticis, usque ad 20 cm longis, basi inaequilateraliter cordatis, apice tenuiter caudato-acuminatis, margine obscure undulatis et distanter denticulatis; inflorescentiis 40 ad 50 cm longis, axillaribus, longe pedunculatis, dichotomis, laxis; floribus ♂ circiter 25 mm diametro; capsulis 2 cm longis et 3 cm latis, alis valde inaequalibus, 2 circiter 4 mm latis, ala tertia membranacea, circiter 2 cm lata.

A glabrous scandent herb climbing on tree trunks to a height of 3 m, entirely glabrous, the stems 5 to 6 mm in diameter when dry, the internodes 4 to 6 cm long and with numerous roots. Leaves membranaceous, subolivaceous and shining when dry, ovate to subelliptic or oblong-elliptic, 14 to 20 cm long, 8 to 9 cm wide, base somewhat inequilateral, prominently cordate, palmately 7- or 9-nerved, apex rather abruptly and slenderly caudate-acuminate, the acumen 1 to 2 cm long, margins slightly undulate or nearly entire, sometimes with widely scattered, small, obscure teeth, the lateral nerves above the base usually two on each side of the midrib; petioles stout, 10 to 17 cm long. Inflorescences axillary, the peduncles stout, glabrous, up to 40 cm in length, the cymes dichotomous, lax, 15 cm wide or more. Staminate flowers pink, the sepals suborbicular, about 13 mm long, rounded. Capsules about 2 cm long, very unequally 3-winged, one wing membranaceous, about 2 cm wide, the other two about 4 mm wide.

LUZON, Apayao Subprovince, Mount Sulu, *Bur. Sci.* 28414 Fénix, May 22, 1917, on rocky slopes in damp forests, altitude apparently above 800 meters.

This most characteristic species is readily recognized by its habit, its long-petioled, subentire, caudate-acuminate leaves, and its very long inflorescences. It apparently belongs in the same group as *Begonia oxyperma* A. DC., but is entirely different from that species in its vegetative

characters, and is equally distinct from the scandent *Begonia megacarpa* Merr.

CORNACEAE

MASTIXIA Blume

MASTIXIA TETRAPETALA sp. nov. § *Tetramastixia*.

Arbor parva, inflorescentiis exceptis glabra; foliis numerosis, confertis, alternis, oblongis ad oblanceolatis, coriaceis, usque ad 8 cm longis, pallide olivaceis, nitidis, apice obtusis ad leviter obtuseque acuminatis, basi cuneatis, nervis utrinque 6 ad 7, distinctis; paniculis terminalibus, circiter 2 cm longis, leviter pubescentibus; floribus 4-meris, circiter 6 mm diametro, petalis late ovatis, subacutis, glabris, 3 mm longis, calycis lobis latis, subacutis, glabris, circiter 1 mm longis.

A small tree 3 to 4 m high *fide* Ramos, glabrous except the very youngest growing parts and the inflorescences. Branches rather stout, brownish, rugose, glabrous, terete, the very young branchlets and young petioles sparingly appressed cinereous-pubescent. Leaves alternate, crowded, sometimes subopposite, coriaceous, oblong to oblanceolate, 5 ad 8 cm long, 2 to 3 cm wide, pale-olivaceous when dry, slightly shining, glabrous, the apex obtuse to shortly and obtusely acuminate, base cuneate, margins often revolute; lateral nerves 6 or 7 on each side of the midrib, distinct, the reticulations obscure; petioles 8 to 14 mm long. Panicles terminal, sparingly appressed-pubescent, about 2 cm long, branched from the base. Flowers 4-merous, rather numerous, greenish-yellow, about 6 mm in diameter. Calyx-tube stout, glabrous or very slightly pubescent, about 2 mm long and thick, the limb somewhat spreading, the teeth 4, broadly triangular, acute, about 1 mm long and wide. Petals suborbicular-ovate, subacute, 3 mm long and wide. Filaments 2.3 mm long; anthers broadly ovoid. Ovary projecting slightly above the calyx-tube, the style stout, angled, about 1 mm long. Bracteoles triangular-ovate, acute, 1 mm long, pubescent.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28575 (type), 28628 *Ramos & Edaño*, May, 1917, in forests near the summit of the mountain, altitude apparently about 1,000 meters.

This species is readily distinguished among the few Philippine forms by its relatively narrow, crowded, alternate, leaves and its 4-merous flowers. It does not appear to be very closely allied to any previously described form. *Bur. Sci.* 29088 *Ramos & Edaño*, from the same locality, may be referable to this species, but it has subopposite larger leaves and much larger inflorescences; the flowers are very immature. *Mastixia premnoides* (Elm.) Hallier f. (*Vitex premnoides* Elm.), which has 4-merous flowers, is entirely different in its vegetative and floral characters.

MASTIXIA SUBCAUDATA sp. nov. § *Tetramastixia*.

Arbor parva novellis et inflorescentiis exceptis glabra; foliis stricte alternis, chartaceis ad subcoriaceis, oblongo-obovatis, usque ad 6 cm longis, apice perspicue subcaudato-acuminatis, basi cuneatis, nervis utrinque 4 ad 6, tenuibus; inflorescentiis 2 ad 3 cm longis, adpresse cinereo-pubescentibus; floribus 4-meris, circiter 3 mm longis, calycibus haud dentatis, extus glabris vel parcissime pubescentibus; petalis glabris.

A small tree, the very youngest parts and the inflorescences appressed cinereous-pubescent, otherwise glabrous. Branches terete, rather pale when dry. Leaves chartaceous to subcoriaceous, oblong-obovate, 5 to 6 cm long, 2 to 2.5 cm wide, the apex prominently subcaudate-acuminate, the acumen blunt and up to 1 cm in length, base cuneate, when dry pale-olivaceous, somewhat shining, the lower surface paler than the upper; lateral nerves 4 to 6 on each side of the midrib, slender, curved, the reticulations indistinct; petioles 7 to 10 mm long, when young slightly pubescent, becoming glabrous. Panicles terminal, 2 to 3 cm long, appressed cinereous-pubescent with short hairs, branched at or from near the base. Flowers numerous, yellowish, about 3 mm long, 4-merous, the pedicels very short, the bracteoles ovate, acute, pubescent, 1 mm long or less. Calyx about 2 mm long, slightly pubescent, the limb narrow, undulate, somewhat spreading, entire or very obscurely toothed. Petals broadly ovate, obtuse, glabrous, 1.5 mm long. Anthers suborbicular, 1 mm long. Top of the ovary sulcate, the style stout, angled, 0.8 mm long.

LUZON, Sorsogon Province, Mount Lalao, *Bur. Sci.* 23353 Ramos, August 23, 1915, on the forested summit of the mountain, altitude not indicated.

The above specimen was originally determined as *Mastixia philippinensis* Wang., a species common and widely distributed in the Philippines. It differs constantly, however, in its 4-merous flowers, and besides has smaller, somewhat differently shaped leaves, entire or subentire calyx-limb, and glabrous petals.

MASTIXIA PREMNOIDES (Elm.) Hallier f. Beihefte Bot. Centralbl. 34² (1916) 41.

Vitex premnoides Elm. Leaf. Philip. Bot. 8 (1915) 2874.

The type of this species is *Elmer 11644*, from Mount Apo, Mindanao. The species is also represented by the following specimens from the Lanao District, Mindanao, which had been long since written up by me, but not published, as a distinct species of *Mastixia*: *Clemens 683*, in flower, and without number, in fruit, March and February, 1907, *For. Bur.* 25208, 25224 *Alvarez*, March, 1916. The species belongs in the section *Tetramastixia*.

ARALIACEAE

BOERLAGIODENDRON Harms

BOERLAGIODENDRON YATESII sp. nov.

Frutex glaber; foliis palmatim 5- ad 7-foliolatis, foliolis coriaceis, oblongis ad oblongo-ellipticis, 8 ad 18 cm longis, omnibus petiolulatis, acuminatis, basi acutis, margine irregulariter serratis, dentibus mucronatis; inflorescentiis terminalibus, subsessilibus, umbellatis, radiis primariis 5 vel 7, usque ad 3 cm longis, dichotomis vel trichotomis; floribus in capitulis globosis subconfertis, 4-meris, capitulis circiter 1 cm diametro.

An erect glabrous shrub, the branches terete, brownish, 8 to 10 mm in diameter. Leaves alternate, palmately 5- to 7-foliolate, their petioles 13 to 20 cm long, the basal crests 2 or 3, coriaceous, glabrous, not at all pectinate; leaflets coriaceous, oblong to oblong-elliptic, 8 to 18 cm long, 4.5 to 7 cm wide, apex rather prominently acuminate, base acute, in the outer leaflets inequilateral, margins very irregularly serrate, the teeth minute to rather coarse or even slightly sinuate, mucronate; lateral nerves 6 to 10 on each side of the midrib, distinct; petiolules 0.5 to 2.5 cm long. Inflorescence terminal, umbellate, subsessile, the primary branches 5 to 7, usually about 3 cm long, these trichotomous or dichotomous, the secondary lateral branches 2 to 2.5 cm long, the central branch very short and bearing a head of sterile flowers. Heads at the tips of the lateral branches globose, about 1 cm in diameter, each composed of from 10 to 15 pedicelled flowers, the pedicels in young fruit 2 to 3 mm long, the subtending bracteoles elliptic-ovate, rounded, about 3 mm long, their margins ciliate. Very young fruits subellipsoid, about 4 mm long, with 4 obscure, rounded angles.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci.* 25418 Yates, December 12, 1916, in the mossy forest near the summit of the mountain.

A very characteristic species, readily distinguished by its palmately 5- to 7-foliolate leaves, and its comparatively small, coriaceous leaflets. It is perhaps most closely allied to *Boerlagiodendron heterophyllum* Merr.

BOERLAGIODENDRON FENICIS sp. nov.

Frutex circiter 2.5 m altus, inflorescentiis exceptis glaber; foliis circiter 25 cm longis, in ambitu suborbicularibus, 5-lobatis, membranaceis, lobis oblongis, brevissime et abrupte acuminatis, margine distanter denticulatis; petiolis circiter 30 cm longis in dimidio inferiore cristis obliquis pectinatis distantibus instructis; inflorescentiis circiter 6 cm longis, furfuraceis, radiis primariis circiter 15, tenuibus; fructibus sessilibus, ovoideis, 3-sulcatis, 3-angulatis, 3-locellatis, circiter 6 mm longis.

An erect shrub about 2.5 m high, glabrous except the inflorescence, the branches terete, wrinkled, about 1 cm in diameter. Leaves membranaceous or somewhat chartaceous, suborbicular in outline, about 25 cm long, deeply 5-lobed, the base subtruncate, 7-nerved, the lobes oblong, 5.5 to 7 cm wide, extending one-half to two-thirds to the base, the sinuses rounded, the tips shortly and abruptly apiculate, the margins distantly denticulate, not at all lyrate-lobed, both surfaces shining when dry, the upper sub-olivaceous, the lower slightly paler; petioles about 30 cm long, the lower half with prominent, scattered, oblique crests about 2 mm wide, their margins pectinate, the laciniae slender, 1 to 1.5 mm long, the lower crests surrounding the petioles, the upper ones reduced in length. Inflorescences terminal, umbellate, the peduncles about 1.5 cm long, all parts more or less furfuraceous, the primary branches about 15, slender, up to 5 cm in length; each branch bears a pair of ovate, about 3 mm long bracts about 2 cm above the base subtending a short-peduncled sterile head and often an additional long-peduncled fertile one, the sterile heads dense, 4 to 7 mm in diameter, their peduncles 1 cm long or less, the peduncles of the fertile heads 2 to 2.5 cm long and bibracteate at about the middle. Fertile heads in fruit 10 to 12 mm in diameter, the fruits crowded, sessile, ovoid, longitudinally 3-sulcate, 3-angled, 3-celled, about 6 mm long.

LUZON, Apayao Subprovince, Guiniri, *Bur. Sci.* 28186 *Fénix*, May 12, 1917, on rocky slopes near streams.

The alliance of this species is apparently with *Boerlagiodendron luzonense* Merr., from which it is readily distinguished by its thinner leaves, the lobes denticulate but not at all lyrate-lobed, the numerous scattered crests, 3-celled fruits, and other characters.

BOERLAGIODENDRON TAYABENSE sp. nov.

Frutex glaber, ramis teretibus, circiter 1 cm crassis; foliis usque ad 28 cm longis, chartaceis, 3-lobatis, basi subtruncatis ad late cordatis, lobis oblongis ad oblongo-obovatis, margine distanter apiculato-serrulatis; petiolis 18 ad 22 cm longis, infra perspicue cristatis, cristulis perspicue pectinatis, laciniiis filiformibus, usque ad 1 cm longis; inflorescentiis pedunculatis, confertis, radiis primariis circiter 4 cm longis, parce furfuraceis; capitulis circiter 1 cm diametro.

An erect, apparently simple shrub, glabrous except the inflorescence. Branches wrinkled, terete, about 1 cm in diameter. Leaves 22 to 28 cm long, up to 30 cm in width across the lateral lobes, chartaceous, brownish or olivaceous-brownish when dry, shining, deeply 3-lobed, the base subtruncate to shallowly cordate, 9-nerved, margins distantly apiculate-serrulate, the lateral

lobes somewhat spreading, oblong-ovate, shortly and abruptly acuminate, about 8 cm wide, the central lobe oblong-obovate, about 20 cm long and as wide as the lateral ones, the sinuses rounded, 3 to 4 cm wide at this distance above the base of the lobes; petioles 18 to 22 cm long, the lower part with numerous, spirally arranged crests, the crests prominently pectinate, the laciniae slender, filiform, up to 1 cm in length, similar but smaller crests scattered along the petiole in the lower one-half or two-thirds, the upper crests reduced to few laciniae. Umbels terminal, peduncled, the peduncle about 3 cm long, glabrous. Primary branches of the inflorescence about 15, crowded, about 4 cm long, sparingly furfuraceous, the subtending bracts lanceolate to oblong-lanceolate, about 1.5 cm long. Heads dense, about 1 cm in diameter.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28752 Ramos & Edaña, May, 1917, without data.

This species in many respects resembles *Boerlagiodendron pectinatum* Merr., from which it is readily distinguished by its thinner, 3-lobed leaves which are not acute at the base; its longer petioles with the pectinate crests scattered along the lower one-half to two-thirds; its much longer bracts; and larger heads. From the species with 3-lobed leaves it is at once distinguishable by its prominently pectinate crests.

EBENACEAE

DIOSPYROS Linnaeus

DIOSPYROS VELASCOI sp. nov.

Arbor circiter 5 m alta, ramulis foliis junioribus subtus ad costa nervisque calycibus et fructibus pilis longis ferrugineis vestitis; foliis oblongis ad oblongo-ovatis, usque ad 16 cm longis, breviter petiolatis, basi late rotundatis, apice acute acuminatis, nervis utrinque circiter 8, subtus valde prominentibus, anastomosantibus; fructibus axillaribus, solitariis, sessilibus, ovoideis, junioribus circiter 12 mm longis, in siccitate brunneis, nitidis, acutis, pilis longis sparsis vestitis, ut videtur 1-locellatis, monospermis.

A small tree about 5 m high, the young branchlets, younger leaves on the midrib and lateral nerves, petioles, calyces, and young fruits ciliate-pubescent with long ferruginous hairs, the older parts glabrous or nearly so. Older branches terete, smooth, glabrous, sparingly lenticelate, slender. Leaves ovate to oblong-ovate, chartaceous, brittle when dry, brown, shining, the lower surface paler than the upper, 8 to 18 cm long, 2.5 to 7.5 cm wide, base broadly rounded, apex acutely acuminate; lateral nerves

about 8 on each side of the midrib, very prominent on the lower surface, curved-ascending, anastomosing, the reticulations lax; petioles 4 mm long or less. Flowers not seen. Fruits axillary, solitary, sessile, the calyx accrescent, ferruginous-pilose, the lobes 4, ovate-lanceolate, acuminate, about 8 mm long and 5 mm wide. Young fruits ovoid, brown when dry, acute or apiculate, sparingly covered with long, rather weak, brown, subappressed or somewhat spreading hairs, apparently 1-celled and 1-seeded.

LUZON, Province of Cagayan, Patlao, Camalaniugan, *For. Bur.* 23278 Velasco, October 18, 1914, on slopes, altitude about 100 meters.

A species well characterized by its solitary, axillary, sessile, pointed fruits, and especially by the long hairs on the young fruits, calyces, and younger vegetative parts. It is closely allied to *Diospyros eriantha* Champ. of southern China and Formosa, but differs in its larger more numerous nerved leaves which are rounded at the base.

DIOSPYROS TAYABENSIS sp. nov.

Arbor, ramulis junioribus et inflorescentiis dense subferrugineo-pubescentibus; foliis ellipticis ad oblongo-ellipticis, in siccitate brunneis, nitidis, usque ad 16 cm longis, chartaceis ad subcoriaceis, acuminatis, subtus leviter pubescentibus, basi rotundatis vel leviter decurrento-acuminatis, subtus utrinque glandulis 1 ad 3 distinctis instructis, nervis lateralibus utrinque 10 ad 12, perspicuis, arcuato-anastamosantibus; floribus ♂ axillaribus, fasciculatis, circiter 1.5 cm longis, uniformiter dense ferrugineo-pubescentibus, calycis lobis anguste oblongis, 6 mm longis et 2 mm latis; staminibus 10, antheris lineari-lanceolatis, acuminatis, 3 mm longis.

A tree, 20 meters high *vide* Ramos, the branches and branchlets terete, dark-brown, smooth, the former glabrous, the latter uniformly and densely ferruginous-pubescent with short hairs. Leaves elliptic to oblong-elliptic, chartaceous to subcoriaceous, brown and shining when dry, the lower surface a little paler than the upper, 10 to 16 cm long, 4.5 to 7.5 cm wide, the apex with a broad, obtuse, short acumen, the base rounded and usually somewhat decurrent-acuminate, beneath with from 1 to 3, black, rather conspicuous glands on each side of the midrib, the upper surface glabrous, the lower sparingly ferruginous-pubescent especially on the midrib, nerves, and reticulations; lateral nerves 10 to 12 on each side of the midrib, prominent, spreading, somewhat curved, arched-anastomosing, the reticulations lax; petioles rather stout, pubescent, brown, 5 to 8 mm long. Staminate flowers axillary, fascicled, numerous, greenish-white, crowded, about 1.5 cm long, all parts of the inflorescence

uniformly ferruginous-pubescent. Calyx-tube turbinate, about 2 mm long, the lobes 5, narrowly oblong, pubescent, 6 mm long, 2 mm wide. Corolla-tube about 9 mm long, pubescent externally, glabrous within, inflated below, narrowed above, the lobes ovate, obtuse, 5 mm long. Stamens 10, their filaments glabrous, 2 mm long; anthers linear-lanceolate, slenderly acuminate, glabrous, 3 mm long. Rudimentary ovary ferruginous-villous.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28489 Ramos & Edaña, May 21, 1917, on forested ridges at low or medium altitudes.

This species greatly resembles *Diospyros pilosanthera* Blanco to which it is apparently most closely allied. It is readily distinguished by its indumentum.

SAPOTACEAE

BASSIA Koenig

BASSIA CAGAYANENSIS sp. nov.

Arbor circiter 15 m alta, floribus exceptis glabra; foliis oblongis ad oblongo-lanceolatis, subcoriaceis, usque ad 20 cm longis, perspicue acuminatis, basi subacutis, interdum leviter inaequilateralibus, nervis utrinque circiter 15, distinctis, reticulis haud perspicuis; petiolis 2.5 ad 4 cm longis; fructibus oblongis, circiter 2.5 cm longis, glabris, sepalis persistentibus, ovatis, circiter 8 mm longis, dense adpresseque pubescentibus.

A tree about 15 m high, glabrous except the flowers and the very tips of the branchlets. Branches grayish-brown, terete. Leaves oblong to oblong-lanceolate, subcoriaceous, pale and shining when dry, 13 to 20 cm long, 4 to 7 cm wide, narrowed upward to the rather prominently acuminate apex, the base subacute and often slightly inequilateral; lateral nerves about 15 on each side of the midrib, distinct, anastomosing, the reticulations not prominent; petioles 2.5 to 4 cm long. Fruits axillary, solitary or fascicled, oblong, olivaceous when dry, about 2.5 cm long and 1 cm thick, tipped by the slender style, their pedicels about 1.5 cm long. Sepals 4, persistent, ovate, coriaceous, appressed-pubescent with pale-brownish hairs, acute or slightly acuminate, about 8 mm long.

LUZON, Cagayan Province, Buyon, *F'or. Bur.* 26883 Bernardo, January 17, 1917, in dense forests, altitude about 15 meters, the fruits edible; locally known as *gasatan*.

This species is distinguished among the comparatively few Philippine representatives of the genus by its oblong to oblong-lanceolate, acuminate, comparatively long-petioled leaves.

MYRSINACEAE

ARDISIA Swartz

ARDISIA NIGROMACULATA sp. nov. § *Akosmos*.

Frutex glaber, circiter 3 m alta; foliis numerosis, integris, oblongo-ellipticis ad oblongo-obovatis, utrinque maculis numerosis nigris conspicuis instructis, chartaceis vel subcoriaceis, usque ad 8 cm longis, acuminatis, basi acutis, nervis primariis utrinque circiter 10, tenuibus; inflorescentiis axillaribus, bipinnatim paniculatis, multifloris, pedunculatis, foliis subaequantibus; floribus 5-meris, calycis circiter 2.5 mm diametro, glandulosus, lobis ovatis, rotundatis, margine leviter ciliatis, circiter 0.7 mm longis, petalis perspicue sed parce nigro-glandulosus, circiter 3.5 mm longis.

A glabrous shrub about 3 m high, the branches rather stout, brown, 5 to 7 mm in diameter, the petiolar scars large, prominent and rather crowded on the younger parts. Leaves numerous, rather crowded, oblong-elliptic to oblong-obovate, chartaceous to subcoriaceous, pale olivaceous-brown when dry, shining, 5 to 8 cm long, 2.5 to 4 cm wide, subequally narrowed to the acute base and to the acuminate apex, the margins entire, both surfaces with numerous, conspicuous, black or nearly black maculae and minutely glandular-punctate; primary lateral nerves about 10 on each side of the midrib, slender, scarcely more prominent than are the secondary nerves and reticulations; petioles 1 to 1.5 cm long. Inflorescences axillary and from the axils of fallen leaves, bipinnately paniculate, peduncled, about as long as the leaves, the primary branches 2.5 cm long or less. Flowers numerous, racemosely arranged on the primary branches, 5-merous, white, in full anthesis 8 mm in diameter, their pedicels 2 mm long or less, the buds ovoid, acute, the styles not projecting. Calyx 2.5 mm in diameter, the lobes broadly ovate, rounded, margins minutely ciliate, rather prominently glandular. Corolla-lobes subelliptic, 3.5 mm long, obtuse, each with from 5 to 11 very prominent, nearly black glands. Anthers oblong-ovate, acute, 2 mm long, the filaments distinct, short, the connective obscurely glandular on the back. Ovary ovoid; style 2 mm long, not projecting beyond the corolla in bud.

Luzon, Tayabas Province, Mount Binuang, *Bur. Sci.* 28478 Ramos & Edaño, May 7, 1917, in the mossy forest, altitude apparently about 1,000 meters. A specimen with immature flowers and somewhat larger, less conspicuously maculate leaves, *Bur. Sci.* 28659 Ramos & Edaño, from the same locality, apparently represents the same species.

This species is manifestly a representative of the section *Akosmos* and is strongly characterized by its conspicuously maculate leaves, in this point simulating some of our species of *Discocalyx*.

ARDISIA RIVULARIS sp. nov. § *Tinus*.

Species *A. boissieri* et *A. salicifoliae* affinis, differt foliis distincte angustioribus. Frutex circiter 2 m altus, glaber; foliis coriaceis, lanceolatis ad oblanceolatis, usque ad 7 cm longis et 10 ad 18 mm latis, utrinque angustatis, acutis, nervis inconspicuis; umbellis 2- ad 7-floris, floribus circiter 1.5 cm diametro, calycis lobis punctatis, margine leviter ciliatis exceptis glabris, antheris haud rugosis, dorso obscure glanduloso.

A glabrous shrub about 2 m high, the branches and branchlets brownish, terete. Leaves numerous, rather crowded, lanceolate to oblanceolate, 5 to 7 cm long, 10 to 18 mm wide, subequally narrowed and acute at both ends, coriaceous, pale-brownish or subolivaceous when dry, shining, of about the same color on both surfaces, obscurely glandular, the midrib prominent, the lateral nerves very slender and obscure; petioles about 5 mm long. Umbels in the upper axils, rather numerous, solitary, 2- to 7-flowered, or sometimes the peduncle bearing but a single flower, the peduncles 1 to 2 cm long, the pedicels usually about 1 cm in length. Flowers pink, about 1.5 cm in diameter when expanded. Calyx glandular, glabrous except the slightly ciliate margins of the lobes, the lobes extending one-half to the base, ovate, rounded, about 1.5 mm long. Corolla-lobes elliptic, acute, glandular, about 7 mm long and 4 mm wide. Anthers 4.5 mm long, not rugose, obscurely glandular on the back, acute or acuminate. Fruits globose, 5 to 6 mm in diameter.

LUZON, Tayabas Province, Umiray, *Bur. Sci.* 29020 (type), 28956 *Ramos & Edaño*, June 3, 1917, along the Umiray River in forests at low altitudes.

This species, judging from the debris attached to the specimens, and its narrow leaves grows on river banks subject to sudden inundation, having the stenophyllous leaves characteristic of a number of totally unrelated species that grow in similar habitats. Its alliance is manifestly with *Ardisia boissieri* A. DC. and *A. salicifolia* A. DC., but it seems to be sufficiently distinct from both.

LOGANIACEAE

FAGRAEA Thunberg

FAGRAEA CURRANII sp. nov.

Species *F. auriculatae* Jack affinis, differt nervis lateralibus obsoletis vel subobsoletis. Frutex scandens, glaber; foliis crassissime coriaceis, usque ad 25 cm longis, anguste obovatis ad oblongo-obovatis, rotundatis, basi angustatis, in siccitate utrin-

que densissime verruculoso-rugosis, brunneis vel atro-brunneis, nitidis; floribus magnis, circiter 10 cm longis, subcampanulatis.

A scandent shrub attaining a height of 30 meters according to Curran and a diameter of 18 cm, entirely glabrous. Branches stout, about 1 cm in diameter when dry, wrinkled, olivaceous to blackish-brown, shining. Leaves very thickly coriaceous, brown to black-brown on both surfaces when dry, shining, densely verruculose-rugose, oblong-obovate to narrowly obovate, 12 to 25 cm long, 6 to 8 cm wide, apex rounded, gradually narrowed below the middle to the decurrent-acuminate base, the midrib very prominent, the lateral nerves obsolete or nearly so; petioles stout, 2 to 4 cm long, the thick, inflated, basal portion about 1.5 cm in diameter. Flowers white, two or three at the apex of each branchlet, their pedicels very stout, about 1.5 cm long, black when dry, the subtending bracts oblong, obtuse, thickly coriaceous 1.5 cm long. Calyx ovoid, about 3 cm long, the lobes very thickly coriaceous, subelliptic, rounded, about 2.5 cm long, the bracteoles ovate to oblong-ovate, obtuse, about 1.5 cm long. Corolla somewhat campanulate, the tube up to 5 cm in length, widened above, the lobes very thickly coriaceous, brittle when dry, obovate, rounded, 4 to 5 cm long; anthers thick, about 8 mm long.

LUZON, Laguna Province, Mount Banahao, *For. Bur.* 8045 Curran & Merrill, November 6, 1907 (type), altitude about 100 meters; Mount Maquiling, *For. Bur.* 26897 Mabesa, September 8, 1917, altitude 200 to 300 meters; Cagayan Province, Mount Ababaca, *For. Bur.* 17217 Curran, March, 1909 (sterile). POLILLO, *Bur. Sci.* 10430 McGregor, flowers only.

This species, originally named *Fagraea curranii* in 1908, was not then published, but was placed under *Fagraea auriculata* Jack to which it is closely allied, but it differs from the latter species in a number of characters, notably in the obsolete or subobsolete lateral veins of its leaves.

FAGRAEA MACGREGORII sp. nov.

Ut videtur frutex scandens, *F. longiflorae* Merr. affinis, differt foliis oblongo-obovatis, basi longe decurrentibus, calycibus sub fructu quam fructibus brevioribus, haud accrescentibus.

Apparently a vine, probably pseudo-parasitic, the branches stout. Leaves coriaceous, rather pale when dry, oblong-obovate, up to 70 cm in length and 25 cm in width, acute or slightly acuminate, base gradually narrowed, decurrent along the 6 to 8 cm long petiole; lateral nerves 10 to 12 on each side of the very stout midrib, prominent on the lower surface, reticulations obsolete. Flowers unknown. Fruits crowded at the apices of the branches, about 15 in a rather close, dense head, the subtending bracts ovate, acuminate, about 3 cm long. Fruit, when fresh,

bluish-green, when dry oblong-cylindric, apiculate, about 4 cm long, 1.5 to 2 cm in diameter, somewhat exserted from the calyx, the calyx-lobes ovate, acute, about 1.5 cm long.

LUZON, Ifugao Subprovince, Mount Polis, *Bur. Sci.* 17938 McGregor, February 15, 1913.

A species somewhat resembling and manifestly closely allied to *Fagraea longiflora* Merr., from Mount Banajao, Luzon. It differs, however, in its somewhat exserted fruits and in its vegetative characters, the leaves of the two being entirely different in shape.

APOCYNACEAE

ALYXIA Banks

ALYXIA REVOLUTA sp. nov.

Frutex scandens, glaber, ramis crassis, quadrangulatis; foliis quaternatis, anguste oblongis, crassissime coriaceis, usque ad 18 cm longis, obtusis, basi acutis et plus minusve decurrentibus, margine valde revolutis, supra olivaceis, nitidis, subtus glaucis; nervis lateralibus numerosis, supra obscureis, subtus obsolete; petiolo 3 ad 4 cm longo; infructescentiis axillaribus, solitariis, ramosis, 3 ad 4 cm longis; fructibus ellipsoideis, circiter 1.4 cm longis, apiculatis, vel dispermis et in medio constrictis.

A scandent glabrous shrub, the branches stout, distinctly 4-angled, up to 1 cm in diameter, the ultimate parts 4 to 5 mm in diameter, the internodes 4 to 8 cm long. Leaves 4-nate, very thickly coriaceous, narrowly oblong, 13 to 18 cm long, 3.5 to 5 cm wide, obtuse, base acute and usually somewhat decurrent, the margins very prominently revolute, the midrib very prominent, the upper surface olivaceous, shining, the lower glaucous; lateral nerves numerous, slender, obscure on the upper surface, obsolete on the lower; petioles very stout, 3 to 4 cm long. Cymes axillary, solitary, their peduncles 1 cm long or less, the branches usually 3, short, the bracteoles persistent. Fruits ellipsoid, when fully mature black or dark-purple, the immature ones yellowish-brown when dry, about 1.4 cm long, somewhat wrinkled, stipitate, apiculate, 1-seeded, or sometimes constricted in the middle and 2-seeded.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci.* 25515 Yates, December 12, 1914, in the mossy forest, altitude at least 800 meters.

A most characteristic species, readily distinguished by its narrowly oblong, very thickly coriaceous, stiff leaves which are glaucous beneath, the nerves here obsolete, but especially by the very strongly revolute margins. Its alliance is with *Alyxia sibuyanensis* Elm.

ALYXIA GLABRA sp. nov.

Frutex scandens, glaber, ramis ramulisque teretibus; foliis quaternatis, oblongo-ellipticis, subcoriaceis, olivaceis, nitidis usque ad 12 cm longis, basi acutis, apice breviter abrupte obtuseque acuminatis, nervis utrinque valde numerosis, tenuibus, confertis; inflorescentiis axillaribus, fasciculatis, brevibus, umbellatis, glabris, umbellis 3- ad 5-floris; floribus circiter 14 mm longis, breviter pedicellatis.

A scandent, entirely glabrous shrub, the branches and branchlets terete, the former pale, the latter dark-brown and about 2 mm in diameter, the internodes 6 to 17 cm long. Leaves quaternate, olivaceous, of the same color on both surfaces and shining when dry, subcoriaceous, oblong-elliptic, 8 to 12 cm long, 3 to 5 cm wide, base acute, apex rather abruptly acuminate, the acumen short, blunt; lateral nerves very slender, not prominent, very numerous, crowded, the primary ones up to 1.5 mm apart; petioles about 1 cm long. Inflorescences axillary, fascicled, umbellate, each umbel 3- to 5-flowered, the peduncles 5 to 6 mm long, the pedicels about 3 mm in length; bracts very broadly ovate, obtuse, 1.5 mm long. Calyx-tube very short, the lobes broadly ovate, obtuse, 2 mm long and wide. Corolla white, the tube cylindric, about 11 mm long, the lobes broadly elliptic-ovate, obtuse, 3 to 3.5 mm long.

LUZON, Tayabas Province, Infanta-Siniloan trail, *Bur. Sci.* 29207 Ramos & Edaño (type), June 14, 1917, in damp forests; Umiray, *Bur. Sci.* 28967 Ramos & Edaño, June 1, 1917, in forests along the river.

This species resembles *Alyxia monticola* C. B. Rob., the flowers of which are unknown, in many respects but is apparently not very closely allied to it; Robinson's species has the nerves at least twice as far apart as in the present one. The entirely glabrous, simply umbellate inflorescences are characteristic, and at once distinguish *Alyxia glabra* Merr. from *A. monilifera* Vid.

ALYXIA LANCEOLATA sp. nov.

Frutex scandens, partibus junioribus et inflorescentiis parvis obscureque puberulis exceptis glaber, ramis ramulisque teretibus; foliis quaternatis, lanceolatis, chartaceis ad subcoriaceis, in siccitate pallidis, nitidis, usque ad 7 cm longis, apice perspicue tenuiter et obtuse acuminatis, basi acutis, nervis lateralibus obsoletis vel subobsoletis; inflorescentiis circiter 2 cm longis, unbellatis 3-5-floris; floribus circiter 1 cm longis, corollae tubo 6 ad 7 mm longo.

A scandent shrub, entirely glabrous except the obscurely puberulent younger branchlets, petioles, and inflorescences. Branches

and branchlets terete, the former pale, the latter smooth, reddish-brown, slender, about 1 mm in diameter, the internodes 2.5 to 6 cm long. Leaves quarternate, chartaceous to subcoriaceous, lanceolate, 4 to 7 cm long, 1 to 2 cm wide, narrowed below to the acute base and above to the slenderly but obtusely acuminate apex, the upper surface subolivaceous when dry, shining, the lower much paler, the midrib prominent but the lateral nerves obsolete or subobsolete; petioles 2.5 to 5 mm long. Inflorescences axillary, solitary, peduncled, umbellate, about 2 cm long, each with 3 to 5 pedicelled flowers at the apex of the peduncle, the pedicels 2 to 3 mm long, the bracteoles oblong-ovate, subacute, 1 mm long. Calyx-tube very short, the lobes ovate-lanceolate, acuminate, 2 mm long. Corolla-tube cylindric, 6 to 7 mm long, the lobes oblong-ovate, somewhat acuminate, 3 mm long.

LUZON, Tayabas Province, Infanta-Siniloan trail, *Bur. Sci.* 29209 Ramos & Edaño, June 14, 1917, in damp forests. *Bur. Sci.* 28627 Ramos & Edaño from Mount Binuang, May, 1917, probably represents the same species, but the flowers are very young and the leaves are uniformly dark-brown on both surfaces; the difference in color in the dried specimens is probably due to a difference of method in drying them.

The species is a very characteristic one and is distinguished by its lanceolate, prominently acuminate, practically nerveless leaves and its simple umbellate inflorescences.

ALYXIA LAXIFLORA sp. nov.

Species *A. luzoniensis* affinis, differt inflorescentiis tenuiter pedunculatis, laxis, paucifloris, 3 ad 6 cm longis. Frutex scandens, glaber, ramis teretibus, ramulis tenuibus, obscure angulatis, internodiis elongatis, usque ad 6 cm longis; foliis ternatis, chartaceis, oblongis, ad oblongo-ellipticis, olivaceis vel brunneo-olivaceis, usque ad 6 cm longis, basi acutis, apice late et obtuse subrostrato-acuminatis, nervis utrinque numerosis, tenuibus, obscuris; inflorescentiis axillaribus et terminalibus, laxis, paucifloris, longe pedunculatis, 3 ad 6 cm longis; floribus circiter 1 cm longis.

A scandent glabrous shrub, the stems terete, 3 to 4 mm in diameter, the branchlets dark-brown, smooth, very slender, 1 to 2 mm in diameter, the older ones terete, the younger ones somewhat 3-angled, the internodes 4.5 to 6 cm long. Leaves ternate, chartaceous, olivaceous or dark brownish-olivaceous, of about the same color on both surfaces and shining when dry, oblong to elliptic-oblong, 4 to 6 cm long, 1.5 to 3 cm wide, subequally narrowed to the acute base and to the subrostrate-acuminate apex, the acumen broad, blunt; lateral nerves very slender, obscure, 35 or more on each side of the midrib, the

primary ones no more distinct than are the secondary ones; petioles 3 to 4 mm long. Inflorescences axillary and terminal, lax, few-flowered, 3 to 6 cm long, solitary or fascicled, glabrous, dark-brown when dry, the peduncles 2 to 3 cm long. Flowers (young) greenish-yellow, their pedicels up to 4 mm in length, usually 5 to 7 on each inflorescence, the bracts ovate, obtuse, about 1 mm long. Calyx about 2.5 mm long, glabrous, the lobes oblong-ovate, obtuse, 1 mm long. Corolla-tube about 7 mm long, narrowed below, the buds acuminate, the lobes ovate-lanceolate, about 3 mm long, somewhat acuminate. Anthers about 1 mm long. Ovary ovoid, glabrous.

LUZON, Apayao Subprovince, Mount Sulu, *Bur. Sci.* 28871 *Fénix*, May 22, 1917, in the mossy forest, apparently above an altitude of 800 meters.

The alliance of this species is manifestly with *Alyxia luzoniensis* Merr., which it closely resembles in most characters except its very lax, long-peduncled, few-flowered inflorescences.

KOPSIA Blume

KOPSIA LAXINERVIA sp. nov.

Frutex circiter 3 m altus, inflorescentiis exceptis glaber; foliis oblongis, membranaceis, usque ad 22 cm longis, subolivaceis, nitidis, basi acutis, apice breviter obtuseque acuminatis; nervis primariis utrinque 10 ad 12, laxis, distantibus, patulis, anastomosantibus, subtus distinctis; fructibus oblongo-ovoideis, circiter 2 cm longis.

An erect shrub, about 3 m high, entirely glabrous except the inflorescences. Branches terete or somewhat compressed, the branchlets sulcate. Leaves membranaceous, olivaceous or pale brownish-olivaceous and shining when dry, the lower surface slightly paler than the upper, oblong, 12 to 22 cm long, 5.5 to 7 cm wide, base acute, apex shortly and broadly blunt-acuminate; lateral nerves 10 to 12 on each side of the midrib, distinct, spreading, anastomosing, lax, the primary reticulations lax, distinct; petioles about 5 mm long. Infructescences terminal, peduncled, 5 to 7 cm long, the younger branchlets and persistent bracts somewhat ferruginous-pubescent. Fruits oblong-ovoid, dark-brown or nearly black when dry, somewhat wrinkled, obtuse, about 2 cm long and 1 cm in diameter.

LUZON, Apayao Subprovince, Guiniri, *Bur. Sci.* 28232 *Fénix*, May 12, 1917, in thickets near streams.

This species is distinguished from *Kopsia longiflora* Merr., to which it is manifestly allied, by its leaves having much fewer and more laxly arranged nerves than in that species.

CONVOLVULACEAE

ERYCIBE Roxburgh

ERYCIBE SARGENTII sp. nov.

Frutex alte scandens, inflorescentiis plus minusve castaneo-pubescentibus exceptis glaber; foliis coriaceis, oblongis, usque ad 18 cm longis, obtuse acuminatis, basi rotundatis ad acutis, in siccitate utrinque concoloribus, nitidis, uniformiter brunneis vel purpureo-brunneis nervis utrinque 6 ad 8, distantibus, distinctis, anastomosantibus, reticulis laxis; paniculis axillaribus terminalibusque, axillaribus circiter 5 cm longis, terminalibus usque ad 12 cm longis et 5 cm latis, multifloris; sepalis coriaceis, orbicularibus, margine leviter ciliatis; corolla circiter 12 mm longa, lobis obcordatis, circiter 8 mm longis et 12 mm latis.

A scandent shrub apparently of large size, entirely glabrous except the inflorescences. Branches terete, smooth, very pale, the younger branchlets sometimes brown or dark-brown, never angled. Leaves coriaceous, oblong, 10 to 18 cm long, 3 to 8 cm wide, smooth and shining, of the same color on both surfaces, and uniformly brownish or purplish-brown when dry, the apex shortly and obtusely acuminate, the base rounded to acute; lateral nerves 6 to 8 on each side of the midrib, distinct, somewhat curved, anastomosing, the reticulations lax, not prominent; petioles stout, 1 to 2 cm long. Panicles axillary and terminal, when young sparingly pubescent with dark purplish-brown, short hairs, ultimately glabrous, the whole inflorescence uniformly dark-brown when dry, the axillary panicles about 5 cm long, the terminal ones up to 12 cm in length and 5 cm in diameter, rather densely many-flowered. Flowers white or pale-yellowish, fragrant, about 12 mm long, their pedicels 3 to 4 mm long, sparingly pubescent, ultimately glabrous. Sepals orbicular, coriaceous, 3 to 3.5 mm in diameter, margins somewhat ciliate, otherwise glabrous. Exposed parts of the corolla in bud densely purplish-brown pubescent, the central pubescent part in flower ovate-lanceolate, 4 to 5 mm long; corolla tube 4 to 5 mm long; the lobes in anthesis obcordate, about 12 mm wide and 8 mm long. Anthers ovoid-lanceolate, acuminate, 2.5 mm long. Fruits ellipsoid, glabrous, brown when dry, 1.5 to 2 cm long.

LUZON, Cagayan Province, Peñablanca, *Adduru 18*, May 4, 1917: Pangasinan Province, Umingan, *Eur. Sci. 17696 Otanes*, May 6, 1914: Bataan Province, Mount Mariveles, *Williams 593* (type), 798, February and March, 1904: Zambales Province, San Antonio, *Madarang s. n.*, April 29, 1914;

without definite locality, but probably from Zambales Province, *Cuming* 1071.

This characteristic species is apparently allied to *Erycibe laevigata* Wall. The specimens are uniformly brown or purplish-brown when dry, giving the species a distinctly characteristic appearance. The terminal panicles are sometimes supplied with greatly reduced leaves. The species is dedicated to Doctor C. S. Sargent, Director of the Arnold Arboretum, for whom the Adduru collection was made.

IPOMOEA Linnaeus

IPOMOEA DIVERSIFOLIA R. Br. Prodr. (1810) 487; Benth. Fl. Austral. 4 (1867) 416; Bailey Queensland Flora 4 (1901) 1058.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27589 Ramos, February 26, 1917, in grasslands at low altitudes.

This identification has been made entirely from the descriptions cited, with which the specimens apparently agree perfectly. The species is known otherwise only from the islands in the Gulf of Carpentaria, Australia. In the Philippine form the ovaries are 3-celled, the flowers about 5 cm long, violet and white according to Ramos, solitary. The leaves closely approximate those of *Ipomoea coptica* (Linn.) Roth (*I. dissecta* Willd.), but the flowers are very much larger than in the latter species.

VERBENACEAE

CALLICARPA Linnaeus

CALLICARPA PLATYPHYLLA sp. nov.

Arbor circiter 8 m alta; foliis subcoriaceis, magnis, usque ad 50 cm longis et 20 cm latis, integris, tenuiter subcaudato-acuminatis, basi acutis, supra glabris, olivaceis, subtus pallidis, nitidis, densissime implexo-puberulis, indumento haud stellato, nervis utrinque circiter 12, cum reticulis valde prominentibus; cymis dichotomis, pedunculatis, circiter 7 cm longis, stellato-tomentosis; calycis truncatis, glabris, 3 cm diametro.

A tree about 8 m high, the branches 1 cm in diameter or less, glabrous, somewhat 4-angled, the branchlets densely puberulent with pale, dirty-brown indumentum. Leaves subcoriaceous, oblong-elliptic to obovate-elliptic, entire, slenderly subcaudate-acuminate, base acute, 35 to 50 cm long, 18 to 20 cm wide, the upper surface glabrous, olivaceous, shining, the lower very densely covered with minute, matted, pale, puberulent hairs, the indumentum not stellate, the whole lower surface pale-brownish, shining, the individual hairs not evident under an ordinary lens; lateral nerves about 12 on each side of the midrib, very prominent on the lower surface as are the subparallel primary reticulations, curved, anastomosing; petioles stout, densely puberulent, angled, 4 to 5 cm long. Cymes axillary, peduncled, rather densely stellate-pubescent with pale hairs, dichotomous, about 7

cm long and 9 cm wide, the bracts linear-lanceolate, 4 to 5 mm long, the bracteoles numerous, similar to the bracts but about 1 mm long. Calyx truncate, cup-shaped, 3 mm in diameter, glabrous or nearly so. Fruits globose, about 3.5 mm in diameter.

LUZON, Cagayan Province, Pamplona, *For. Bur.* 26967 *Velasco*, August 9, 1917, in forests, altitude about 50 meters.

A most remarkable species, well characterized by its very large, entire, slenderly acuminate leaves which are glabrous above and densely matted-puberulent on the lower surface with a pale-brownish, shining, non-stellate indumentum; glands, if present, are entirely obscured by the indumentum.

VITEX Linnaeus

VITEX CELEBICA Koord. Meded. Lands Plantent. 19 (1898) 560, 645.

MINDANAO, Cotabato District, *For. Bur.* 6543 *Hutchinson*, March, 1907, *For. Bur.* 15420 *Pray*, March, 1910; Zamboanga District, Siag River, *For. Bur.* 13383 *Foxworthy, DeMesa, & Villamil*, May 29, 1912; Butuan Subprovince, Amparo, *For. Bur.* 20746 *Rafael & Ponce*, October 10, 1913; Davao District, Mount Apo, *Elmer* 11602, September, 1909, distributed as *V. pentaphylla* Merr.

A species previously known only from Celebes, our Philippine material agreeing closely with the description and with Celebes specimens in all essential characters. In Cotabato it is known as *calipapa-aso*, *molave-aso*, *calipapa*, and *calipapa-madam*; and in Zamboanga as *limpapa* and *himulauin*.

SOLANACEAE

SOLANUM Linnaeus

SOLANUM LUZONIENSE sp. nov.

Frutex erectus, ramosus, 0.5 ad 1 m altus, plus minusve pallide stellato-tomentosus, ramis teretibus aculeis sparsis rectis circiter 2 mm longis armatis; foliis membranaceis, oblongis, integris, in siccitate subolivaceis, acuminatis, basi acutis, plerumque obscure inaequilateralibus, nervis utrinque circiter 5, tenuibus, curvatis, anastomosantibus; cymis extra-axillaribus terminalibusque, circiter 3 cm longis, breviter pedunculatis, stellato-tomentosis; floribus extus stellato-tomentosis, circiter 8 mm longis, violaceis; fructibus globosis, glabris, carnosus, inermis, coccineis, circiter 6 mm diametro.

An erect, branched, sparingly aculeate, more or less stellate-tomentose shrub or undershrub 0.5 to 1 m high, the branches terete, reddish-brown, sparingly cinereous-stellate-tomentose, with scattered, straight, sharp spines about 2 mm in length, the young branchlets rather densely stellate-tomentose. Leaves alternate, membranaceous, subolivaceous when dry, slightly shining, the lower surface paler than the upper and more pubescent, oblong, entire or obscurely undulate, acuminate, base usually

slightly inequilateral, acute, the upper surface sparingly stellate-pubescent on the midrib and nerves or ultimately glabrous, the lower surface with more numerous stellate hairs, rarely largely confined to the midrib and nerves, more commonly scattered over the entire surface; lateral nerves slender, not prominent, curved, anastomosing, about 5 on each side of midrib; petioles rather densely stellate-tomentose with cinereous hairs, 1 to 2 cm long, unarmed. Cymes extra-axillary and terminal, about 3 cm long, peduncled, rather few-flowered, stellate-tomentose. Flowers violet, about 8 mm long, their pedicels up to 5 mm in length. Calyx somewhat campanulate, sparingly or rather densely stellate-tomentose, about 3 mm long, the lobes oblong-ovate, acute or subobtusate, about 1.5 mm long. Corolla sparingly stellate-tomentose externally, the tube short, the lobes oblong-ovate to ovate-lanceolate, somewhat acuminate, about 6 mm long. Anthers lanceolate, somewhat narrowed upward, obtuse, 4 mm long. Fruit globose, glabrous, smooth, fleshy, red when fresh, about 6 mm in diameter; seeds few, flattened, about 3 mm in diameter.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26487 Ramos & Edaño, August 3, 1916, along small streams in open places at low altitudes.

The alliance of this species is apparently with *Solanum retrorsum* Elm., from which, among numerous other characters, it is distinguished by its indumentum and especially by its short, scattered, straight, spreading spines. I refer here also the following specimens: LUZON, Pangasinan Province, Bautista, *Merrill s. n.*, July, 1903; Umingan, *Bur. Sci.* 17710 Otanes, April 17, 1914.

Var. **GLABRUM** var. nov.

A typo differt omnibus partibus glabris.

LUZON, Pampanga Province, Calumpit, *Merrill* 4237 (type), September, 1905; Tarlac Province, Gerona, *Guerrero s. n.*, April, 1906.

ACANTHACEAE

HEMIGRAPHIS Nees

HEMIGRAPHIS VIRIDIS sp. nov.

Caule herbaceo, erecto, usque ad 50 cm alto, ramis tetragonis vel sulcatis, minute strigosis; foliis subaequalibus, lanceolatis ad anguste lanceolatis, in siccitate viridis, nitidis, usque ad 9 cm longis, margine undulatis, basi obtusis, sursum angustatis et longissime obtuse acuminatis, cystolithis subtus nullis, supra numerosis, magnis, jam oculo nudo distinctis, nervis utrinque circiter 10, subtus strigosis; spicis circiter 3, pedunculatis, 2.5

ad 5 cm longis; bracteis numerosis, imbricatis, in siccitate viridis, ovatis ad ovato-ellipticis, 1 ad 1.5 cm longis, membranaceis, acutis ad obtusis, margine perspicue ciliatis, bracteolis nullis; floribus circiter 13 mm longis, calycis lobis linearis, tenuiter acuminatis, 8 ad 9 mm longis, ciliatis.

An erect, sparingly branched herb attaining a height of 50 cm, branched only in the upper part, the stems terete below, about 2 mm in diameter, dull-greenish, densely covered with short cystoliths, the branches sulcate or 4-angled, appressed-strigose. Leaves of each pair subequal, lanceolate, chartaceous, green on both surfaces, shining and brittle when dry, 6 to 9 cm long, 1 to 2 cm wide, margins somewhat undulate, base abruptly rounded or obtuse, gradually narrowed upward to the slender but obtusely acuminate apex, the upper surface with numerous cystoliths distinctly visible to the naked eye, these wanting on the lower surface but the midrib and lateral nerves here appressed-strigose; lateral nerves about 10 on each side of the midrib, distant, distinct, prominently anastomosing; petioles 2 to 8 mm long. Spikes 3 to 5, peduncled, 2.5 to 5 mm long. Bracts numerous, imbricate, foliaceous, green when dry, ovate to elliptic-ovate, 10 to 15 mm long, 6 to 9 mm wide, shortly stalked, base rounded to subacute, apex acute to obtuse, the margins prominently ciliate with long white hairs; bracteoles none. Flowers white, about 13 mm long. Calyx-lobes free nearly to the base, linear, 8 to 9 mm long, about 1 mm wide, narrowed upward to the slenderly acuminate apex, prominently ciliate, the tip with about three, long, slender, white hairs. Capsules 8 mm long and 2 mm in diameter, slightly narrowed below, sparingly pubescent in the upper part.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27587 Ramos, February 27, 1917, in forests at low altitudes, with the Ilocano name *caribuso*.

A species manifestly belonging in the group with *Hemigraphis cumingiana* F.-Vill. and *H. strigosa* F.-Vill., but it is readily distinguished by its vegetative characters.

HEMIGRAPHIS HIRSUTISSIMA sp. nov.

Herba prostrata, e radices sublignosa, ramis adscendentibus, primariis usque ad 30 cm longis, ramis et foliis et bracteis prominente hirsutis; foliis ellipticis ad oblongis, usque ad 3 cm longis, subcoriaceis, rigidis, sordide olivaceis, utrinque acutis vel apice obtusis, supra pustulatis, cystolithis nullis, margine obscurissime irregulariter crenatis vel integris, nervis utrinque 3 vel 4, obscuris; spicis confertis, ovoideis, 1.5 ad 2 cm longis; bracteis oblongis ad oblongo-ellipticis, obtusis vel subacutis, 10 ad 12 mm longis, prominente ciliato-hirsutis; bracteolis filiformibus 3

mm longis, prominente ciliatis, 3 mm longis; floribus 13 mm longis, calycis lobis 5, linearis, ciliatis, tenuiter acuminatis, circiter 6 mm longis.

A prostrate herb from a thickened woody root, the primary branches up to 30 cm long, rooting at the lower nodes, the branchlets and ends of the primary branches erect or ascending, all parts except the corolla prominently hirsute with stiff, pale or pale-yellowish hairs, those on the upper surface of the leaves from thickened bases, the branches terete or very obscurely 4-angled. Leaves of each pair somewhat unequal, elliptic to oblong, subcoriaceous, dull-olivaceous, 1.5 to 3 cm long, 7 to 13 mm wide, acute at both ends or the apex obtuse, margins entire to obscurely and irregularly crenate, both surfaces prominently hirsute, the upper surface pustulate, the cystoliths not evident; lateral nerves 3 or 4 on each side of the midrib, obscure; petioles densely hirsute, 2 to 3 mm long. Spikes sessile or shortly peduncled, dense, ovoid, 1.5 to 2 cm long; bracts imbricate, oblong to oblong-elliptic, obtuse to subacute, prominently hirsute on both surfaces, 10 to 12 mm long; bracteoles filiform, prominently ciliate, 3 mm long. Calyx-tube about 2 mm long, the lobes linear, prominently ciliate, 6 mm long, slenderly acuminate, one slightly longer than the other four. Corolla 13 mm long, externally sparingly pubescent with short hairs.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27258 Ramos, March 16, 1917, on rocks along streams, flowers white.

A species well characterized by its comparatively small, rather densely hirsute, obscurely nerved leaves which are pustulate on the upper surface; its dense, ovoid spikes; prominently hirsute bracts; and filiform bracteoles.

HEMIGRAPHIS PAUCIFLORA sp. nov.

Herba erecta, simplex vel parce ramosa, usque ad 30 cm alta, partibus junioribus et foliis et bracteis albido-hirsutis; foliis in paribus subaequalibus, anguste oblongis, membranaceis vel chartaceis, olivaceis, utrinque acutis vel apice obtusis, margine leviter crenatis, usque ad 4.5 cm longis, nervis utrinque circiter 4, obscuris, utrinque hirsutis, pagina superiore cystolithis distinctis inspersis; specieis solitariis, terminalibus, 1 ad 2 cm longis, paucifloris; floribus violaceis, 17 mm longis; bracteis foliaceis, oblongis, hirsutis, 8 ad 14 mm longis, obtusis.

An erect, slender, simple or sparingly branched herb 20 to 30 cm high, rather prominently white-hirsute, the stems below terete, glabrous or slightly scabrid, the younger parts sulcate or somewhat angled, hirsute. Leaves of each pair subequal, narrowly oblong, 3 to 4.5 cm long, 10 to 13 mm wide, olivaceous

or greenish-olivaceous, slightly shining, the lower surface somewhat paler than the upper, the upper surface with distinct cystoliths and scattered, stiff white hairs, the lower surface more prominently hirsute than the upper, acute at both ends, or the apex somewhat obtuse, margins distinctly crenate; lateral nerves about 4 on each side of the midrib, slender, obscure; petioles hirsute, 5 to 8 mm long. Spikes terminal, solitary, 1 to 2 cm long, including the few flowers. Bracts somewhat imbricate, few, foliaceous, hirsute, oblong, obtuse, 8 to 14 mm long, olivaceous; bracteoles filiform, hirsute, about 3 mm long. Calyx tube 2 mm long, the lobes 5, linear-lanceolate, slenderly acuminate, prominently ciliate, one about 6 mm long, the other four 4 mm long. Corolla slightly pubescent externally, 17 mm long.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27543 Ramos, March 9, 1917, along streams in forests at low altitudes.

The alliance of this species is manifestly with *Hemigraphis hirsutissima* Merr., from which it differs in its strictly erect stems; longer leaves and petioles; the leaves not pustulate on the upper surface, but with distinct cystoliths; its few-flowered spikes; and distinctly larger flowers.

JUSTICIA Linnaeus

JUSTICIA DISPAR sp. nov. § *Calophanoides*.

Planta ut videtur erecta, suffruticosa, ramosa, subglabra, ramis ramulisque teretibus; foliis in paribus valde inaequalibus, oblongo-ovatis, firmiter chartaceis, acuminatis, basi acutis vel acuminatis, majoribus usque ad 6 cm longis, minoribus 1 ad 2 cm longis, utrinque cystolithis instructis; floribus axillaribus, sessilibus, solitariis vel binis, 1.2 cm longis, bracteis (foliis floralibus) oblongo-spatulatis, 6 mm longis; calycibus segmentis 5, lanceolatis, tenuiter acuminatis, minute adpresse hispidis.

Apparently erect, much branched, suffrutescent or the stems distinctly woody, the branches and branchlets slender, terete, the branches glabrous, the branchlets black when dry, sparsely pubescent, often distinctly zig-zag. Leaves opposite, those of each pair very unequal in size, the larger ones 4 to 6 cm long and 2 to 3 cm wide, the smaller ones 1 to 2 cm long, 1 cm wide or less, acuminate, glabrous, firmly chartaceous, dark-olivaceous when dry, base acute or acuminate, the cystoliths evident on both surfaces; lateral nerves of the larger leaves 4 to 5 on each side of the midrib, slender, their petioles 5 mm long or less. Flowers axillary, solitary or in pairs, white, about 1.2 mm long, each subtended by a bract-like, oblong-spatulate, petiolate, 6 mm long leaf. Calyx-segments 5, lanceolate, slenderly acuminate, 5.5

mm long, about 1.1 mm wide, slightly pubescent. Corolla-tube 5 mm long, lobes 6 mm long, the broader one broadly obovate, 5 mm wide, broadly 3-lobed, the lobes rounded, about 1.2 mm long, the narrower lobe about 1.4 mm wide above, slightly retuse. Stamens 2; anther cells one above the other, about 1 mm long. Ovary oblong, glabrous; style glabrous, 6 mm long. Capsule nearly 1 cm long, glabrous.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26499 Ramos & Edaña, September 5, 1916, on dry slopes, altitude about 100 meters.

The alliance of this species appears to be with *Justicia quadrifaria* Wall., from which it is immediately distinguishable by its solitary or paired flowers and its very unequal leaves. Among the Philippine species so far described it is nearest to *Justicia loheri* C. B. Clarke, but that species has linear leaves and differs in numerous other characters.

LEPIDAGATHIS Willdenow

LEPIDAGATHIS MICROPHYLLA sp. nov.

Herba suberecta e radices incrassatis, circiter 20 cm alta, ramis haud 1 mm diametro, teretibus, junioribus 4-angulatis, minutissime cinereo-puberulis; foliis ovatis, haud 1 cm longis, coriaceis, acutis vel leviter acuminatis, integris, subtus puberulis, nervis utrinque 3 vel 4, prominentibus; spicis 1 ad 2 cm longis, falcatis, densis; bracteis imbricatis, lineari-lanceolatis, cinereo-pubescentibus, acuminatis, circiter 7 mm longis, haud lanato-ciliatis ut in *L. cinereae*; floribus 5 mm longis, calycis lobis valde inaequalibus.

A suberect, slender herb about 20 cm high, from somewhat thickened woody roots, the branches terete, less than 1 mm in diameter, minutely puberulent, the younger branches distinctly 4-angled. Leaves ovate, coriaceous, olivaceous, 5 to 9 mm long, 3 to 7 mm wide, entire, acute to slightly acuminate, base rounded or obtuse, the upper surface glabrous or very slightly pubescent, the lower puberulent; lateral nerves 3 or 4 on each side of the midrib, prominent; petioles 1.5 mm long or less. Spikes 1 to 2 cm long, dense, falcate. Bracts linear-lanceolate, acuminate, 7 mm long, 0.8 mm wide, minutely cinereous-pubescent. Upper calyx lobe lanceolate, 6 mm long, 1.2 mm wide, the two lower ones 5.5 mm long and 0.8 mm wide, the two lateral ones 5 mm long and 0.5 mm wide, all pubescent. Corolla reddish, 7 mm long. Anthers 1 mm long. Ovary glabrous.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27518 Ramos, March 10, 1917, on dry open hills at low altitudes.

This species somewhat resembles a greatly dwarfed specimen of *Lepidagathis cinerea* Merr., to which it is distantly allied. It is distinguished

by its small size; in being herbaceous; in its ovate, much shorter leaves; and in its narrow, merely pubescent and not lanate-ciliate bracts.

CUCURBITACEAE

TRICHOSANTHES Linnaeus

TRICHOSANTHES BRACTEATA (Lam.) Voigt Hort. Calc. (1845) 58.

Modecca ? bracteata Lam. Encycl. 4 (1798) 410.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27415 Ramos, March, 1917; Cavite Province, Alfonso, *Bur. Sci.* 22505 Ramos & Deroy, May, 1915.

The two specimens cited above apparently represent forms of this somewhat polymorphous species, which other than F.-Villar's previously unverified record of *Trichosanthes palmata* Roxb., a synonym, has not been reported from the Philippines. The identification has been made wholly from the published descriptions; both specimens present only male flowers.

India and Ceylon to Java, Sumatra, Borneo, and Timor.

ALSOMITRA M. Roemer

ALSOMITRA PUBESCENS sp. nov.

Scandens, omnibus partibus sordide breviter pubescentibus; foliis 3-foliolatis, foliolis ovatis ad elliptico-ovatis, membranaceis, obscure olivaceis, usque ad 14 cm longis, integris, vel lateralibus ad basi lobato-auriculatis; paniculis axillaribus, diffusis, multifloris, usque ad 20 cm longis, floribus ♂ circiter 6 mm diametro.

Scandent, all parts more or less pubescent with short, dirty-brown hairs, those on the stems and branches minutely capitate-glandular. Leaves 3-foliolate, the petioles usually about 3 cm long, the petiolules about 1 cm in length; leaflets ovate to ovate-elliptic, membranaceous, when dry dark-olivaceous, dull, entire, acuminate, base usually acute, 8 to 14 cm long, 4 to 7 cm wide, the terminal one usually larger than the lateral ones, the latter often with a short, oblong lobe on the margin near the base; lateral nerves about 6 on each side of the midrib, distinct, tendrils slender, forked, up to 20 cm in length. Panicles axillary, slender, peduncled, up to 20 cm long, many-flowered, the bracts and bracteoles linear. Staminate flowers rotate, about 6 mm in diameter, their pedicels up to 1 cm in length, slender. Sepals oblong, apiculate, 1.5 mm long, somewhat gibbous at the base, sparingly pubescent. Petals elliptic, rounded or apiculate, minutely pubescent with short scattered hairs, about 3 mm long. Stamens 5, the filaments free, nearly 1 mm long. Pistillate flowers and fruits not seen.

LUZON, Laguna Province, Mount Maquiling, trail to Dampalit Falls, *For. Bur.* 26346 Mabesa (type), January 23, 1917, in thickets, altitude 30 to 50 meters, flowers yellow; *Baker* 4471, January, 1917, "a large vine."

The alliance of this species is manifestly with *Alsomitra integrifoliola* (Cogn.) Hayata, which it rather closely resembles in appearance. It is easily distinguished by its 3-foliolate leaves and its indumentum.

ILOCANIA genus novum

(*Plagiospermeae*, *Cucumerineae*)

Flores monoici, fasciculati. Masculi: Calycis tubus campanulatus, limbus 5-dentatus, lobi anguste lanceolati, erecti. Corolla campanulata, infra medium 5-lobata, lobi ovati, obtusi. Stamina 3, libera, tubo calycis inserta, filamentis brevis; antherae bilocularis, loculis longitudinaliter triplicatis, connectivo angusto, ultra loculos non producto. Pollen globosum, laeve. Pistillodium nullum. Flores ♀: Corolla maris. Staminodia 3, linearia. Ovarium globosum vel ovoideum, 3-loculare; ovula in loculis 3 vel 4, horizontalia; stylus erectus, trifidus, stigmatibus crassis, furcatis. Fructus globosis vel ovoideis, laevis, baccatis, parvis, indehiscens, circiter 12-spermus. Semina haud compressa, marginata, tumida, corrugata.—Herba scandens, annua, tenuis, glabra; foliis anguste pedato-lobatis, lobis 5 vel 7 linearis ad anguste oblanceolatis, apiculatis, margine obscure denticulatis, chartaceis vel membranaceis; cirrhis bifidis; floribus parvis, flavido-viridis; fructibus parvis, laevis.

ILOCANIA PEDATA sp. nov.

Herba scandens, glabra vel floribus extus parvis pubescentibus, ramis longitudinaliter sulcatis, tenuibus; foliis in ambitu late ovatis, cordatis, profunde 5- vel 7-lobatis, lobis usque ad 7 cm longis, exterioribus minoribus; petiolo leviter aculeato-denticulato; floribus 5-meris, axillaribus, fasciculatis, breviter pedicellatis, circiter 10 mm longis, campanulatis; fructibus globosis vel ovoideis, circiter 1.5 cm diametro; seminibus circiter 5 mm longis.

A glabrous, monoecious, slender, apparently annual vine, the branches about 1.5 mm in diameter, smooth, sulcate. Leaves broadly ovate in outline, cordate, pedately divided into 5 or 7 narrow lobes which extend almost to the base, the lobes chartaceous or membranaceous, dark-olivaceous, linear to narrowly oblanceolate, 5 to 7 cm long, 2 to 7 mm wide, usually narrowed at both ends, sinuses acute to rounded, tips apiculate-acuminate, margins distantly denticulate, the upper surface, in mature leaves, with numerous, rather prominent, scabrid, minute white spots; petioles usually somewhat aculeate-denticulate, about 3 cm long. Tendrils bifid, slender, at least 10 cm long. Flowers axillary, fascicled, greenish-yellow, campanulate, about 10 mm

long, usually one pistillate and two to four staminate ones in a fascicle, but one or two developing at one time; pedicels 2 to 4 mm long. Staminate flowers: Calyx about 4 mm long, campanulate, the lobes 5, narrowly lanceolate, about 2.5 long. Corolla lobes ovate, obtuse, slightly pubescent, about 6 mm long, 5-nerved. Stamens 3, in mature bud entirely free, the filaments short, the anthers about 3 mm long, sigmoid, 2-celled. Pistillate flowers similar to the staminate ones. Staminodes 3, linear, 2 to 3 mm long. Ovary globose, 3-celled; ovules usually 4 in each cell, horizontal. Style about 2 mm long, the arms 3, about 3 mm long; stigmas stout, dichotomous. Fruit globose or ovoid, baccate, smooth, about 1.5 cm in diameter. Seeds about 12, about 5 mm long, margined, not compressed, prominently swollen at right angles to the margin in the upper one-half, flattened below, rugose.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27552 27490 Ramos, February, 1917, borders of clearings at low altitudes, locally known as *parparya*.

This species is readily recognized by its very narrowly lobed leaves, and in its vegetative characters it is radically different from any other form known to me. I cannot place it in any described genus, although, except in its ovule characters, it conforms closely with the American-African genus *Cayaponia* in most respects. However its ovules, while few in number, are horizontal, hence placing it in the *Pleiospermae*. The stamens, entirely free in mature buds, but appearing as if united in dried flowers, are those of the *Cucumerineae*, and it apparently comes in the group with *Sicania* and *Physedra*, yet is very different from both of these genera.

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THE PHILIPPINE JOURNAL OF SCIENCE

C. BOTANY

VOL. XIII

MARCH, 1918

No. 2

NEW SPECIES OF BORNEAN PLANTS

By E. D. MERRILL¹

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila)

In the past two years I have published three papers on the Bornean flora,² the present one being essentially like those already issued. These papers have been the necessary preliminary ones in preparation for the publication of my "Bibliographic Enumeration of Bornean Plants" the manuscript of which is now completed, and which is to be published by the Sarawak Museum. No new species are described in the enumeration, but only those species are included that have been described from or credited to Borneo.

The present paper consists of the descriptions of sixty-one new or presumably new species in the families *Magnoliaceae*, *Connaraceae*, *Leguminosae*, *Rutaceae*, *Meliaceae*, *Euphorbiaceae*, *Sterculiaceae*, *Dilleniaceae*, *Passifloraceae*, *Flacourtiaceae*, *Myrtaceae*, *Araliaceae*, *Clethraceae*, *Myrsinaceae*, *Oleaceae*, *Gentianaceae*, *Asclepiadaceae*, and *Rubiaceae*.

MAGNOLIACEAE

ILLICIAM Linnaeus

ILLICIAM STAPFII sp. nov.

Illicium sp. Stapf in Trans. Linn. Soc. Bot. 4 (1894) 128, cum descr.

To Stapf's diagnosis I add the following data from our recently collected material: Leaves up to 17 cm long and 9 cm

¹ Professor of botany, University of the Philippines.

² Merrill, E. D., Notes on the Flora of Borneo, *Philip. Journ. Sci.* 11 (1916) Bot. 49-100: Contributions to our knowledge of the flora of Borneo, *Journ. Str. Branch Roy. As. Soc.* 76 (1917) 75-117: *Alabastra Borneensia*, *op. cit.* 77 (1917) 189-247.

wide, subopposite or subverticillate. Flowers dull-red. Sepals of fully mature flowers up to 12 mm in length, the petals about as long as but broader than the sepals. Fruiting pedicels up to 8 cm in length, the carpels as many as 11, of which two or three are usually aborted, the individual carpels about 12 mm long, lanceolate, acuminate, spreading.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Mrs. Clemens 10995, 11081, 10949*, November 22 and December 1 and 3, 1915, a shrub or small tree 2 to 6 m high.

The specimens agree with Stapf's diagnosis based on *Haviland 1272* from Kinataki, Mount Kinabalu, and I have no doubt that they represent the same species. Stapf considered that the species was perhaps most closely allied to *Illicium cambodianum* Hance, which Finet & Gagnepain place as a variety of *Illicium griffithii* Hook. f. & Th. My specimens of *Illicium cambodianum* Hance differ remarkably from this Bornean form in their smaller, very obscurely and fewer-nerved leaves.

CONNARACEAE

CONNARUS Linnaeus

CONNARUS AGAMAE sp. nov.

Arbor fide Agama, partibus junioribus minute subferrugineo-pubescent, ramis ramulisque crassis, teretibus; foliis 3-foliolatis, foliolis subcoriaceis, oblongis ad oblongo-ellipticis, usque ad 23 cm longis, basi rotundatis, apice acuminatis, supra pallidis, nitidis, subtus ad costa nervisque minute puberulis, nervis utrinque 13 ad 15, subtus prominentibus; paniculis axillaribus terminalibusque, sub fructu usque ad 35 cm longis; folliculis inaequilateraliter obovoideis, leviter compressis, crasse carinatis, 5 ad 6 cm longis, apice lateraliter breviter rostratis, basi cuneatis, extus glabris, brunneis, nitidis, oblique striatis, intus densissime simpliciter tomentosis.

A tree fide Agama, the older parts glabrous, the branchlets, inflorescences, and lower surface of the leaflets minutely subferruginous-puberulent. Branches and branchlets terete, stout, the former about 8 mm in diameter, glabrous, brownish, sparingly lenticellate, the latter subferruginous-puberulent. Leaves 3-foliolate, or the uppermost ones 1-foliolate, the petiole and rachis up to 17 cm in length; leaflets oblong to oblong-elliptic, subcoriaceous, 17 to 23 cm long, 7 to 10 cm wide, somewhat acuminate, base rounded, the upper surface pale, shining, glabrous, the lower minutely puberulent especially along the midrib and lateral nerves; lateral nerves 13 to 15 on each side of the midrib, prominent, somewhat curved, anastomosing, the reticulations slender, rather distinct; petiolules stout, rugose, puberulent, or ultimately glabrous. Panicles axillary and terminal, in fruit

up to 35 cm in length, the lower branches often subtended by 1-foliolate leaves, the branches up to 20 cm in length, more or less ferruginous-puberulent, or in age nearly glabrous. Follicles, including the stalk, 5 to 6 cm long, inequilaterally obovoid, somewhat compressed, about 3 cm wide, the sutures rather stoutly keeled, one side nearly straight or but slightly curved, the other very prominently curved, the apex broadly rounded and laterally subrostrate with a stout short beak, narrowed below to the stout, 1 to 1.5 cm long pseudostalk, the pericarp brown, shining, diagonally striate and glabrous externally, almost woody in texture, inside very densely tomentose with somewhat fulvous, simple, shining, short hairs. Aril 2-lobed, the lobes suborbicular, about 8 mm long, the seed very immature.

BRITISH NORTH BORNEO, Tawao, *Agama* 422, July 14, 1917, on ridges, the fruit greenish-red.

This species is strongly characterized by its 3-foliolate leaves, many-nerved, rather large leaflets, and its large, inequilaterally obovoid, laterally beaked follicles, which are densely tomentose within with simple hairs, but glabrous and shining outside. It is probably as closely allied to *Connarus grandis* Jack as to other species.

CONNARUS BORNEENSIS sp. nov.

Frutex scandens, inflorescentiis amplis, minute ferrugineo-pubescentibus; foliis 3- vel 5-foliolatis, foliolis oblongo-ovatis, utrinque glabris, acutis vel leviter acuminatis, basi obtusis ad subrotundatis, in siccitate brunneis, nitidis, subcoriaceis, usque ad 13 cm longis, nervis utrinque 4 vel 5, perspicuis, curvato-adscendentibus; paniculis axillaribus terminalibusque, usque ad 25 cm longis, multifloris; floribus circiter 5 mm longis, sepalis anguste oblongis, obtusis, pubescentibus, petalis oblanceolatis, nigropunctatis, glabris, quam sepalis duplo longioribus; folliculis circiter 3 cm longis, oblique obovoideis, leviter compressis, stipitatis, in siccitate brunneis, nitidis, apice late rotundatis, lateraliter breviter acuteque rostratis, basi cuneatis, junioribus extus parvissime pubescentibus glabrescentibus, intus pilis paucis simplicibus adpressis instructis.

A scandent shrub, glabrous except the minutely pubescent or puberulent inflorescences, the indumentum ferruginous or subferruginous. Branches terete, brownish, sparingly lenticellate, the young branchlets usually slightly pubescent. Leaves 3- or 5-foliolate, about 20 cm long, the rachis and petiole glabrous; leaflets oblong-ovate, subcoriaceous, usually brown when dry, shining, 8 to 13 cm long, 4 to 5 cm wide, apex acute to slightly acuminate, base obtuse to somewhat rounded; lateral nerves 4 or 5 on each side of the midrib, rather prominent, curved-ascend-

ing, anastomosing, the reticulations fine, close, not prominent; petiolules about 5 mm long. Panicles axillary and terminal, up to 25 cm in length, the lower branches up to 20 cm long, more or less ferruginous-puberulent or pubescent, or the indumentum dark-brown, the bracts and bracteoles 1 mm long or less. Flowers about 5 mm long, their pedicels 1 mm long or less. Sepals narrowly oblong, pubescent, obtuse, about 2.6 mm long, sparingly black glandular-punctate. Petals twice as long as the sepals, glabrous, oblanceolate, obtuse, about 1.4 mm wide above, distinctly black glandular-punctate. Longer filaments 5 mm, the shorter ones less than 1 mm in length. Ovary ovoid, pubescent; style about 2 mm long. Follicles obliquely obovoid, slightly compressed, including the stipe about 3 cm long, 1.5 mm wide, the apex broadly rounded, with a short, lateral, acute beak, the base gradually narrowed, cuneate, the stipe about 6 mm long, the pericarp coriaceous, brown and shining when dry, obliquely and finely striate, when young sparingly pubescent outside, soon becoming glabrous, inside sparingly hirsute with widely scattered, appressed, simple hairs.

SARAWAK, Mount Santubong, *Native collector 2361* (type) *Bur. Sci.*, without locality *Native collector 240 Bur. Sci.*; BRITISH NORTH BORNEO, Sandakan, *Villamil 191*, March 22, 1916.

This species may be distinguished by its glabrous petals, which are twice as long as the sepals; its ample paniculate inflorescences; and its follicles, which are sparingly hirsute inside with widely scattered, appressed, simple hairs.

CONNARUS DENSIFLORUS sp. nov.

Frutex vel arbor, ramulis junioribus et inflorescentiis dense subferrugineo-pubescent, ramis glabris, verruculoso-lenticellatis; foliis circiter 13 cm longis, 5-foliolatis, foliolis crasse coriaceis, ellipticis, usque ad 8 cm longis, pallide brunneis, nitidis, acuminatis, basi subrotundatis, nervis utrinque 5 vel 6, tenuibus, obscuris; inflorescentiis terminalibus, circiter 20 cm longis, e basi ramosis, ramis valde elongatis; floribus numerosis, in ramulis ultimis dense confertis, circiter 5.5 mm longis, petalis quam sepalis quadruplo longioribus, anguste lanceolatis, utrinque puberulis.

A shrub or tree, possibly scandent, the very young branchlets and the inflorescences rather densely subferruginous-pubescent or puberulent with short, simple hairs. Branches terete, brownish, about 5 mm in diameter, rather prominently verruculose-lenticellate, glabrous. Leaves about 13 cm long, the rachis and petiole 6 to 7 cm long, glabrous. Leaflets thickly coriaceous, subelliptic, pale-brownish when dry, shining, 6 to 8 cm long,

4 to 5 cm wide, apex distinctly acuminate, base subrounded; lateral nerves 5 or 6 on each side of the midrib, slender, indistinct, as are the reticulations, curved, anastomosing; petiolules up to 8 mm in length. Panicles terminal, branched from the base, the branches up to 20 cm in length, densely many-flowered, the flowers crowded on the ultimate branchlets, their pedicels 1 mm long or less, ebracteolate. Sepals pubescent, obtuse, narrowly oblong, about 1.5 mm long. Petals rather densely pale or subfulvous-puberulent on both surfaces, narrowly lanceolate, about 6 mm long and 1.4 mm wide. Longer filaments 5 mm long, the shorter ones 1.2 mm in length. Ovary ovoid, the style 2 mm in length, both densely fulvous-pubescent.

SARAWAK, Retuh, Sadong, *Native collector 2550 Bur. Sci.*

This species is well characterized by its 5-foliolate, entirely glabrous leaves, thickly coriaceous, obscurely nerved leaflets, and densely flowered inflorescences, which are terminal and branched from the base. The leaflets somewhat resemble those of *Connarus pachyphyllus* Merr., but the nerves are obscure, while the inflorescence is entirely different from the infructescence of the latter species.

CONNARUS PACHYPHYLLUS sp. nov.

Arbor, ut videtur glabra, ramis perspicue verruculoso-lenticellatis; foliis 3-foliolatis, foliolis crassissime coriaceis, ellipticis ad oblongo-ellipticis, usque ad 11 cm longis, in siccitate brunneis vel olivaceo-brunneis, nitidis, basi rotundatis vel leviter cordatis, apice latissime et obtuse breviter acuminatis, nervis utrinque circiter 9, haud prominentibus; infructescentiis depauperatocymosis vel paniculatis, lateralibus, folliculis exceptis circiter 2.5 cm longis; folliculis leviter inaequilateralibus, longe stipitatis, leviter compressis, 3.5 ad 4 cm longis, subellipsoideis, apice rotundatis, basi acuminatis, extus irregulariter rugosis, glabris, nitidis, intus glabris.

A tree, *fide* Foxworthy, apparently glabrous throughout (inflorescences not seen). Branches terete, grayish-brown, glabrous, prominently verruculose-lenticellate. Leaves about 20 cm long, 3-foliolate, the petiole and rachis about 8 cm long, brownish, rugose, shining. Leaflets very thickly coriaceous, elliptic to oblong-elliptic, 9 to 11 cm long, 5 to 6 cm wide, base broadly rounded to subcordate, apex shortly and obtusely acuminate, margins recurved, when dry brownish or brownish-olivaceous, prominently shining, the upper surface smooth; lateral nerves about 9 on each side of the midrib, rather distinct but not prominent, anastomosing, the reticulations rather lax; petiolules 6 to 8 mm long, rugose, glabrous. Infructescences lateral, a depauperate cyme or panicle, the rachis and branches 2.5 cm

long or less. Follicles stipitate, up to 4 cm in length, about 2.2 cm wide, somewhat compressed, slightly inequilateral, stipitate, subellipsoid, the apex rounded, laterally and obscurely beaked, base acuminate, the pseudostalk about 1 cm long, the pericarp externally irregularly rugose when dry, brownish, shining, entirely glabrous outside and within. Seeds large, somewhat compressed, 2 to 2.5 cm long, smooth, dark-brown, shining, the aril bilobed, the lobes broadly ovoid, rounded, up to 1.5 cm long, radiately rugose, the margins undulate.

SARAWAK, Lundu, *Foxworthy 35*, May 10, 1908, the fruit yellow when fresh, the seed black, and the aril yellow; local name (Dyak) *bua tumut*.

This species is strongly characterized by its 3-foliolate leaves, its very thickly coriaceous, glabrous leaflets, and its very depauperate lateral inflorescences. It is not closely allied to any other species known to me; the follicles are entirely glabrous without and within.

CONNARUS PLUMOSO-STELLATUS sp. nov.

Frutex ut videtur scandens, ramulis et petiolis et subtus foliis et inflorescentiis densissime ferrugineo-tomentosis, indumento stellato-plumosus; foliis 14 ad 27 cm longis, 5- vel 7-foliolatis, foliolis oblongis, coriaceis, usque ad 11 cm longis, tenuiter acuminatis, basi acutis, nervis utrinque 5 ad 7, perspicuis; paniculis terminalibus axillaribusque, usque ad 30 cm longis; petalis anguste oblanceolatis, utrinque glabris, 6.5 ad 8 mm longis.

A shrub, apparently scandent, the branchlets, petioles, and rachis, lower surface of the leaflets, and the inflorescences very densely ferruginous-pubescent with characteristic stellate-plumose hairs. Branches and branchlets terete, brown. Leaves 14 to 27 cm long, 5- or 7-foliolate; leaflets mostly oblong, coriaceous, 7 to 11 cm long, 2 to 4 cm wide, the upper surface brown, glabrous, shining, the lower densely tomentose, the apex slenderly acuminate, base acute; lateral nerves 5 to 7 on each side of the midrib, rather prominent, curved-ascending, anastomosing, the reticulations rather lax, distinct on the lower surface; petioles densely tomentose, 3 mm long or less. Panicles axillary and terminal, up to 30 cm in length, the primary branches up to 10 cm in length, the bracts and bracteoles linear, curved, about 5 mm long, densely tomentose. Flowers yellow. Sepals linear-oblong, 4 to 5 mm long, densely stellate-pubescent. Petals narrowly oblanceolate, 6.5 to 8 mm long, glandular-punctate, glabrous, obtuse or subacute. Five longer filaments 3 to 4 mm long, the five alternating ones 1 to 2 mm in length. Ovary ovoid, very densely stellate-plumose-pubescent, the hairs up to 1.5 mm in length.

SARAWAK, Matang Road near Kuching, *Native collector 1062, 725* (type), the latter collected May 31, 1901; Samatan, *Foxworthy 157*, in swampy places, May 20, 1908, with the Dyak name *guid malam*.

This species is readily recognizable by its very dense and characteristic, ferruginous, stellate-plumose indumentum. From Blume's entirely inadequate description it might be *Tricholobus ferrugineus* Blume Mus. 1 (1850) 237, which King considers to be the same as *Connarus ferrugineus* Jack, a species entirely different from the present one, but which Schellenberg,³ who has examined Blume's type specimen, states is identical with *Connarus hebephyllus* King. It seems, on the whole, to be closely allied to the Sumatran *Tricholobus fulvus* Blume, and may prove to be identical with Blume's species; however, Blume's specific name is invalid in *Connarus*, so that I have not hesitated in describing the present species under a different specific name.

LEGUMINOSAE

CRUDIA Schreber

CRUDIA RETICULATA sp. nov.

Arbor circiter 7 m alta, glabra, ramulis tenuibus; foliis 2-vel 3-foliolatis, foliolis chartaceis, oblongis, usque ad 23 cm longis, in siccitate pallide brunneis, basi rotundatis ad subacutis, apice tenuiter caudato-acuminatis, nervis lateralibus utrinque circiter 10, supra plus minusve impressis, subtus cum reticulis laxis valde prominulis, arcuato-anastomosantibus; leguminis inaequilateralibus, oblongo-falcatis, usque ad 10 cm longis et 3 cm latis, obtusis, valvis crasse coriaceis, laxe reticulatis.

A tree about 7 m high, entirely glabrous (flowers unknown), the branches and branchlets terete, brownish, the latter slender. Leaves 2- or 3-foliolate, the petiole and rachis 2 to 4 cm long, the latter slightly projecting above the ultimate petiolule; leaflets in general oblong, chartaceous, pale-brownish and shining when dry, 15 to 23 cm long, 5 to 6 cm wide, the apex slenderly caudate-acuminate, the acumen blunt, up to 3.5 cm in length, base rounded to subacute; primary lateral nerves about 10 on each side of the midrib, on the upper surface with the midrib and arcuate marginal nerves somewhat impressed, on the lower surface with the lax reticulations very prominent, arched-anastomosing 5 to 10 mm from the edge of the leaf; petiolules brown, rugose, 5 mm long or less; stipules linear-lanceolate, acuminate, about 7 mm long. Pods oblong, somewhat inequilaterally falcate, obtuse, 8 to 10 cm long, about 3 cm wide, one suture nearly straight, the other curved, the valves glabrous, laxly reticulate, coriaceous, brown and often slightly glaucous when

³ Beitr. Vergleich. Anat. Connar. (1910) 75.

dry; seeds 1 or 2, compressed, brown, 3 to 3.5 cm long, about 2 cm wide.

BRITISH NORTH BORNEO, Sapagaya River, Sandakan District, *Villamil 393*, September, 1917, in level lands, altitude about 10 meters.

This strongly characterized species is well marked by its few, rather large, prominently and laxly reticulate, slenderly caudate-acuminate leaflets; its laxly reticulate valves; and in being entirely glabrous throughout. It differs radically from *Crudia havilandi* Prain, to which it is apparently most closely allied, in its fewer, much larger, more numerous nerved leaflets.

RUTACEAE

MELICOPE Forster

MELICOPE UNIFOLIOLATA sp. nov.

Frutex vel arbor, partibus junioribus inflorescentiisque exceptis glabra; foliis 1-foliolatis, foliolis chartaceis, olivaceis vel brunneis, nitidis, oblongo-ellipticis, usque ad 15 cm longis, acuminatis ad rotundatis, basi cuneatis, nervis primariis utrinque circiter 13, distinctis, anastomosantibus; inflorescentiis axillaribus terminalibusque, paucifloris, pedunculatis, 3 ad 6 cm longis; petalis oblongo-ovatis, 2.5 mm longis, acutis vel leviter acuminatis, parce pubescentibus.

A shrub or tree, glabrous except the tips of the branchlets and the inflorescences. Branches pale when dry, glabrous, compressed. Leaves all 1-foliolate, the leaflets chartaceous, olivaceous or brown when dry, shining on both surfaces, 10 to 15 cm long, 4 to 7 cm wide, mostly oblong-elliptic, the lower surface distinctly glandular-puncticulate, the apex broadly acuminate and apiculate to broadly rounded, the base cuneate; primary lateral nerves about 13 on each side of the midrib, distinct, anastomosing, the reticulations irregular, distinct; petioles 1 to 2 cm long. Cymes axillary and terminal, 3 to 6 cm long, few-flowered, sparingly fulvous- to cinereous-pubescent, the primary branches few, 1 cm long or less, each bearing from three to six subumbellately arranged flowers at their apices, the pedicels up to 4 mm in length. Calyx-lobes pubescent, ovate, obtuse, 0.4 mm long or less. Petals sparingly pubescent, oblong-ovate, acute or slightly acuminate, about 2.5 mm long. Ovary glabrous. Stamens 8, the filaments equal.

SARAWAK, *Hose 539, 556* (type), Miri River, January, 1895.

This is one of the few known representatives of the genus with 1-foliolate leaves and is manifestly allied to *Melicope helferi* Hook. f. of the Andaman Islands, from which it is distinguished, among other characters, by its differently shaped, more numerous nerved leaflets and pubescent inflorescences and tips of the young branchlets.

MELIACEAE

DYSOXYLUM Blume

DYSOXYLUM KINABALUENSE sp. nov. § *Eudysoxylum*.

Arbor glabra, circiter 10 m alta; foliis alternis, circiter 40 cm longis, foliolis omnibus alternis, utrinque circiter 4, distantibus, oblongis, chartaceis ad subcoriaceis, usque ad 15 cm longis, in siccitate minute verruculosus, tenuiter acuminatis, basi acutis, plerumque plus minusve inaequilateralibus, nervis utrinque circiter 10; inflorescentiis axillaribus, simplicibus, racemiformibus, circiter 10 cm longis, paucifloris; floribus 4-meris, circiter 6 mm longis, calycis brevibus, subcupulatis, 4-dentatis, petalis extus puberulis, liberis, tubo libero, extus puberulo, ovario minute puberulo.

A glabrous tree about 10 m high, the branches slender, the ultimate branchlets 3 mm in diameter or less. Leaves alternate, about 40 cm long, the leaflets all alternate, distant, about 4 on each side of the rachis, chartaceous to subcoriaceous, oblong, 12 to 15 cm long, 3.5 to 5 cm wide, apex slenderly acuminate, base acute, usually distinctly inequilateral, when dry subolivaceous, or somewhat brownish beneath, slightly shining or dull, minutely but not densely verruculose; lateral nerves rather slender, about 10 on each side of the midrib, curved, obscurely anastomosing, the reticulations nearly obsolete; petiolules 5 to 8 mm long. Inflorescences axillary, solitary, racemiform, about 10 cm long, few-flowered, the rachis castaneous when dry, minutely and obscurely puberulent, the very short, few-flowered branchlets 3 mm long or less. Flowers cream-colored, 4-merous, about 6 mm long, their pedicels very short. Calyx slightly cup-shaped, dark-brown when dry, obscurely puberulent, the teeth 4, short, triangular-ovate, subacute. Petals 4, free, narrowly oblong, 5.5 mm long, slightly puberulent. Staminal-tube cylindric, 5 mm long, shallowly 8-toothed, slightly puberulent externally, glabrous within. Anthers 8. Ovary and style minutely cinereous-puberulent, 4.5 mm long. Disk glabrous, 2 mm long, cylindric, obscurely crenate.

BRITISH NORTH BORNEO, Mount Kinabalu, Gurulau Spur, *Mrs. Clemens 10803*, November 27, 1917, in forests.

The alliance of this species is manifestly with the Philippine *Dysoxylum palawanense* Merr. and *D. panayense* Merr. from both of which it differs in numerous details. It is distinctly closer to the latter than to the former.

Probably referable here is *Clemens 10820*, same locality and date, in fruit. The fruits are bright-orange when fresh, when dry castaneous, glabrous, shining, obovoid, about 4.5 cm long.

WALSURA Roxburgh

WALSURA GLABRA sp. nov.

Arbor glabra, foliis plerumque 3-foliolatis interdum basi foliolis binis depauperatis additis 5-foliolatis, foliolis majoribus oblongo-ellipticis, utrinque acuminatis, chartaceis, nitidis, usque ad 15 cm longis; paniculis usque ad 5 cm longis, paucifloris, floribus 5-meris, sepalis obovatis, imbricatis, liberis, staminibus 10, intus infra antheris barbatis, basi leviter connatis, apice bilacinatis; ovario hirsuto.

A glabrous tree, the branches grayish, terete, somewhat wrinkled. Leaves mostly 3-foliolate, sometimes by the addition of a pair of depauperate basal leaflets 5-foliolate, up to 20 cm long, the larger leaflets in general oblong-elliptic, acuminate and subequally narrowed at both ends, chartaceous, rather pale when dry, shining on both surfaces; lateral nerves about 9 on each side of the midrib, curved, anastomosing, distinct; petiolules 1.5 to 2.5 cm long. Panicles up to 5 cm in length, few-flowered. Flowers pale-yellow, 5-merous. Sepals obovate, rounded, free, imbricate, 1.5 to 2 mm long, so strongly narrowed below as to be almost clawed, glabrous. Petals oblong-elliptic, 4 mm long, glabrous. Stamens 10, united for the lower 0.5 mm, flattened, bearded on the inside below the insertion of the anther, cleft at the apex into two narrowly lanceolate, acuminate, 1 mm long lobes. Ovary densely hirsute; style very short; stigma capitate.

SARAWAK, Siol, *Native collector 2438 Bur. Sci.*, February-June, 1914.

By definition this characteristic species might almost as well be placed in the American-African genus *Trichilia* as in the Indo-Malayan genus *Walsura*, but in the absence of fruits I have placed it in the latter genus. It is well characterized by its usually 3-foliolate but sometimes 5-foliolate leaves, the basal pair of leaflets, when present, being very greatly reduced in size, and in its free, broadly obovate, imbricate, almost clawed sepals.

AGLAIA Loureiro

AGLAIA CLEMENTIS sp. nov. § *Hearnia*.

Arbor, inflorescentiis perspicue stellato-pubescentibus, indumento castaneo; foliis circiter 30 cm longis, alternis, foliolis 9, oblongis ad anguste oblongo-obovatis, subcoriaceis, usque ad 13 cm longis, breviter acuminatis, basi rotundatis ad obtusis, supra pallidis, glabris, subtus brunneis, ad costa nervisque perspicue stellato-lepidotis, nervis utrinque circiter 25, perspicuis, subtus prominulis; paniculis axillaribus foliis subaequantibus vel paullo brevioribus, multifloris, ramis inferioribus usque ad 12 cm longis; floribus racemose dispositis, 5-meris, breviter pedicellatis, calycis extus dense castaneo-stellato-pubescentibus, breviter 5-lobatis,

lobis obtusis; petalis liberis, circiter 1.5 mm longis, tubo turbinate, libero.

A large tree according to Mrs. Clemens, the branchlets and petioles densely and minutely castaneous-lepidote or subfurfuraceous, the ultimate branchlets 4 mm in diameter or less. Leaves alternate, about 30 cm long; leaflets 9, opposite, firmly chartaceous to subcoriaceous, oblong to narrowly oblong-obovate, 8 to 13 cm long, 3.5 to 4.5 cm wide, the upper surface pale when dry, glabrous, the lower brownish with the costa and nerves conspicuously stellate-lepidote, the indumentum castaneous, with scattered hairs on the epidermis, apex shortly acuminate, base rounded to obtuse; lateral nerves about 25 on each side of the midrib, prominent on the lower surface, the reticulations obscure; petiolules densely and minutely castaneous-lepidote, 5 mm long or less. Panicles axillary, usually about as long as the leaves, peduncled, pyramidal, the lower branches up to 12 cm in length, all parts rather densely stellate-pubescent with short, castaneous hairs. Flowers numerous, brownish-yellow, racemously arranged on the ultimate branches, somewhat crowded, their pedicels 1 to 2 mm long. Calyx 2 mm in diameter (spread), stellate-pubescent, shortly 5-lobed, the lobes broadly ovate, obtuse, extending less than one-half to the base. Petals 5, free, glabrous, subelliptic, about 1.5 mm long. Staminal-tube turbinate, free, 0.8 mm high, the margins obscurely crenulate. Anthers 5, inserted on the margin of the tube. Rudimentary ovary minutely pubescent.

BRITISH NORTH BORNEO, Mount Kinabalu, Minitindok Gorge, *Mrs. Clemens 10484*, November 19, 1915, near the river.

This species is apparently not closely allied to any of the Malayan species of this section previously described, although somewhat resembling some forms of the Philippine *Aglaia harmsiana* Perk. Its true alliance is apparently with *Aglaia elliptica* Blume.

AGLAIA HETEROPHYLLA sp. nov. § *Hearnia*.

Species ut videtur *H. sarawakanae* affinis. Ramulis et inflorescentiis minutissime et dense cupreo-lepidotis; foliis alternis, 12 ad 18 cm longis, foliolis 2 ad 5, chartaceis, oblongo-ovatis ad oblongo-lanceolatis, usque ad 12 cm longis, apice subcaudato-acuminatis, basi acutis, supra glabris, in siccitate griseis, nitidis, costa supra impressa, subtus parcissime lepidotis, nervis lateralibus utrinque 10 ad 12, tenuibus; inflorescentiis paniculatis, axillaribus, 8 ad 12 cm longis, pedunculatis, ramis paucis, patulis, paucifloris; floribus racemose dispositis, laxis, 5-meris, calycis stellato-tomentosis, lobis ovatis, subacutis; petalis liberis, subellipticis, 1.2 mm longis.

A tree, the branches rugose, glabrous, the branchlets densely cupreous-lepidote with minute appressed scales, the ultimate branches about 2 mm in diameter. Leaves alternate, 12 to 18 cm long, the rachis and petioles very minutely subcupreous-lepidote; leaflets 2 to 5, oblong-ovate to oblong-lanceolate, firmly chartaceous, 8 to 12 cm long, 2.5 to 5 cm wide, the upper surface grayish, somewhat shining, glabrous, the lower somewhat brownish, very sparingly lepidote near the midrib and nerves, the base acute, the apex slenderly subcaudate-acuminate; lateral nerves 10 to 12 on each side of the midrib, anastomosing, slender, the midrib impressed on the upper surface, prominent beneath; petiolules 5 mm long or less. Panicles axillary, 8 to 12 cm long, peduncled, lax, few-flowered, the branches spreading, the lower ones up to 6 cm in length. Flowers 5-merous, laxly and racemously arranged on the ultimate branchlets, their pedicels 1 to 1.5 mm long. Calyx 5-lobed, stellate-pubescent, the lobes ovate, subacute, extending two-thirds to the base. Petals 5, free, subelliptic, about 1.2 mm long. Staminal tube turbinate, glabrous, 1 mm long, margins crenulate. Anthers 5, inserted on the margin of the tube.

SARAWAK, Baram District, Mount Treken, *Hose 555*, July, 1895, altitude about 330 meters.

This species is apparently as closely allied to *Aglaia saravakana* (A. DC.) as to any other described form, but has more numerous, differently shaped, smaller leaflets, while the sepals are distinctly united for the lower one-third. In facies the species resembles the Philippine *Aglaia luzoniensis* (Vid.) Merr. & Rolfe, but is not closely allied to this form, which normally has 1-foliolate leaves.

AGLAIA MOULTONII sp. nov. § *Hearnia*.

Arbor, ramis et foliis glabris, paniculis magnis, minute ferrugineo-stellato-tomentosis; foliis alternis 25 ad 30 cm longis, foliolis circiter 12, oppositis et alternis, lanceolatis, coriaceis usque ad 15 cm longis, in siccitate atro-brunneis vel olivaceo-brunneis, nitidis, apice tenuiter acuminatis, basi obtusis, plerumque distincte inaequilateralibus, nervis utrinque 12 ad 14, subtus distinctis, prominulis, curvatis, vix anastomosantibus; paniculis amplis, quam foliis multo longioribus, axillaribus, usque ad 40 cm longis, pedunculatis, pyramidatis, multifloris; floribus in ramulis ultimis racemose dispositis, confertis, breviter pedicellatis, 5-meris; calycis dense stellato-pubescentibus, breviter 5-lobatis, lobis acutis; petalis liberis; tubo turbinato, vix 0.5 mm longo.

A tree, the branches and leaves entirely glabrous, the inflorescences minutely, and on the younger parts rather densely,

ferruginous-pubescent with short, stellately arranged hairs. Branches smooth, terete, olivaceous-brownish, the ultimate ones 3 mm in diameter. Leaves rather distant, alternate, 25 to 30 cm long; leaflets about 12, alternate and opposite, lanceolate, coriaceous, dark-brown or olivaceous-brown and shining when dry, 11 to 15 cm long, 2.5 to 4 cm wide, apex slenderly acuminate, base obtuse and usually distinctly inequilateral, one side of the lamina extending below the other on the petiolule; lateral nerves 12 to 14 on each side of the midrib, obscure on the upper surface, prominent beneath, curved, scarcely anastomosing, the reticulations distinct or indistinct; petiolules 5 to 9 mm long. Panicles axillary, exceeding the leaves, up to 40 cm in length, shortly peduncled, pyramidal, very many flowered, the lower branches up to 15 cm in length, the older parts nearly glabrous, the younger parts rather densely but minutely stellate-pubescent with ferruginous hairs. Flowers racemose, small, densely arranged on the ultimate branchlets, their pedicels short. Calyx densely stellate-pubescent, 5-lobed, the lobes less than one-half the length of the calyx, acute. Petals 5, free, suborbicular to elliptic-ovate, 1 mm long or less. Staminal tube free, turbinate, 0.5 mm long, crenulate. Anthers 5, attached on the margin of the tube.

SARAWAK, Amproh River, *Native collector 2138 Bur. Sci.*, February-June, 1914.

This species, dedicated to Captain J. C. Moulton, formerly director of the Sarawak Museum, is well characterized in the section *Hearnia* by its glabrous branches and leaves and its very large densely and many flowered panicles. It does not appear to be very closely allied to any previously described species.

AGLAIA MATTHEWSII sp. nov. § *Euaglaia*.

Arbor circiter 5 m alta, ramulis junioribus et inflorescentiis minute ferrugineo-stellato-pubescentibus, ramis teretibus, glabris; foliis omnibus 1-foliolatis, foliolis chartaceis, oblongis, usque ad 15 cm longis, nitidis, apice prominente sed obtuse acuminatis, basi acutis, nervis utrinque circiter 15; paniculis axillaribus, foliis subaequantibus, pauciramosis, ramis patulis, inferioribus usque ad 7 cm longis; floribus subsessilibus vel brevissime pedicellatis, in ramulis ultimis spicatim vel racemose dispositis, interdum subglomeratis, 5-meris; petalis liberis, oblongis ad oblongo-obovatis, circiter 1.8 mm longis.

A tree about 5 m high, the very young branchlets and inflorescences minutely ferruginous-pubescent with short, stellate hairs, otherwise glabrous or nearly so. Branches terete, glabrous, grayish. Leaves all 1-foliolate, the leaflets in general oblong, 10 to 15 cm long, 3 to 5.5 cm wide, subequally narrowed to the

acute base and to the rather prominently but obtusely acuminate apex, the acumen 1.5 cm long or less, pale-olivaceous and shining when dry, glabrous, or the lower surface in young leaves with very few, widely scattered, stellate hairs; midrib projecting on both surfaces; lateral nerves about 15 on each side of the midrib, prominent, curved, obscurely anastomosing, the reticulations close, slender; petioles 1 to 1.5 cm long, jointed at or above the middle, glabrous. Panicles axillary, about as long as the leaves, lax, pyramidal, branched from near the base, the primary branches few, spreading, the lower ones up to 7 cm in length, densely ferruginous-stellate-pubescent with short hairs, the secondary branches when present usually less than 1 cm long, the flowers subsessile or very shortly pedicelled, pale-yellow, 5-merous, subspicately or subracemously arranged, sometimes subglomerate. Calyx-lobes elliptic, rounded, densely and minutely stellate-pubescent, 0.8 mm long. Petals free, glabrous, oblong to oblong-obovate, 1.8 mm long. Staminal-tube obovoid, about 1.2 mm in diameter, contracted to the 0.5 mm orifice, not at all toothed. Stamens 5, included. Ovary minutely pubescent.

BRITISH NORTH BORNEO, Marutai watershed near Tawau, *Villamil* 568, May 28, 1917, on forested slopes at low altitudes.

This species, dedicated to Mr. D. M. Matthews, conservator of forests, British North Borneo, falls in the group of the very few species having unifoliolate leaves, such as *A. luzoniensis* (Vid.) Merr. & Rolfe (*Aglaia monophylla* Perk.) of the Philippines and Celebes, from which *Aglaia unifoliolata* Koord. cannot be distinguished, *A. simplicifolia* Harms of New Guinea (an invalid name), and *Aglaia simplicifolia* (Bedd.) Harms (*Beddomea simplicifolia* Bedd.) of India, from all of which it is distinguished by numerous characters. From the Bornean *Aglaia submonophylla* Miq. it is distinguished by its constantly 1-foliolate leaves, its much longer inflorescences, and by its indumentum not being all lepidote.

EUPHORBIACEAE

CLEISTANTHUS Hooker f.

CLEISTANTHUS OLIGOPHLEBIUS sp. nov. § *Stipulati*.

Species *C. paxii* Jabl. affinis, differt omnibus partibus (floribus et frutibus exceptis) glabra, nervis lateralibus utrinque 3 vel 4, valde obliquis. Frutex vel arbor, ramis ramulisque tenuibus, glabris; foliis oblongis ad oblongo-ovatis, chartaceis vel subcoriaceis, usque ad 9 cm longis, basi acutis ad subrotundatis, apice acuminatis, nervis utrinque 3 vel 4, subtus valde perspicuis, curvato-adscendentibus; fructibus sessilibus, 3-lobatis circiter 12 mm diametro, parcissime adpresse hirsutis glabrescentibus.

A shrub or small tree, glabrous except the flower and fruits. Branches and branchlets slender, terete or subterete, the former

reddish-brown, the latter pale-brownish. Leaves oblong to oblong-ovate, chartaceous to subcoriaceous, rather pale and shining when dry, 7 to 9 cm long, 3 to 3.5 cm wide, base acute to somewhat rounded, apex rather prominently acuminate, the acumen up to 1 cm in length, obtuse; lateral nerves 3 or 4 on each side of the midrib, very prominent on the lower surface, curved-ascending, all or most of them leaving the midrib below its middle, the uppermost pair extending to the apex, the reticulations not prominent; petioles rugose, about 5 mm long; stipules coriaceous, persistent, about 2.5 mm long. Flowers fascicled, axillary, apparently sessile. Fruits sessile, 3-lobed, about 12 mm in diameter, pale-brownish and shining when dry, apparently glabrous or nearly so at full maturity, but the apical portion of those examined appressed-hirsute; styles appressed-hirsute; persistent calyx lobes lanceolate, about 2.5 mm long, appressed-pubescent externally.

BRITISH NORTH BORNEO, Marutai watershed near Tawau, *Villamil 339*, June 4, 1917.

This species is strongly characterized by its few-nerved leaves, the nerves strongly curved-ascending, mostly leaving the midrib in its lower one-half, the upper pair reaching the apex of the leaf. It is most closely allied to *Cleistanthus paxii* Jabl. among the described species of the genus.

MALLOTUS Loureiro

MALLOTUS WOODII sp. nov. § *Axenfeldia*.

Frutex 3 ad 4 m altus, foliis subtus ad costa parcissime ciliatis, inflorescentiis ♀ hirsutis, ceteroquin glabris; foliis alternis, oblongo-ovatis ad oblongo-ellipticis, eglandulosis, usque ad 25 cm longis, subcoriaceis, integris, basi rotundatis, apice tenuiter caudato-acuminatis, penninerviis, nervis utrinque 9 ad 11, subtus prominentibus; inflorescentiis ♀ oppositifoliis, stricte racemosis, paucifloris, circiter 7 cm longis; sepalis lanceolatis, hirsutis, 5 mm longis; ovario dense hirsuto atque pilis capitatis longe stipitatis dense oblecto.

A shrub 3 to 4 m high, glabrous except the sparingly ciliate costa on the lower surface of the leaves and the hirsute inflorescences. Branches terete, pale-olivaceous, smooth, about 3 mm in diameter. Leaves all alternate, oblong-ovate to oblong-elliptic, entire, subcoriaceous, 20 to 25 cm long, 8 to 11 cm wide, base rounded, apex slenderly caudate-acuminate, the acumen about 2 cm long, the upper surface grayish, shining, smooth, eglandular, the lower surface also eglandular, in very young leaves slightly furfuraceous-pilose; lateral nerves 9 to 11 on each side of the midrib, prominent on the lower surface, pinnately ar-

ranged, curved, anastomosing, the primary reticulations very lax, distinct, subparallel; petioles 5 to 6 cm long; stipules lanceolate, acuminate, puberulent, about 7 mm long. Pistillate racemes simple, leaf-opposed, about 7 cm long, few-flowered, rather densely hirsute with stiff, pale-yellowish, more or less deciduous hairs, the pedicels about 1 cm long, the subtending bracteoles ovate, obtuse, 2 mm long or less. Sepals lanceolate, acuminate, hirsute, 5 mm long. Ovary ovoid, densely hirsute and also densely covered with long-stipitate glandular-capitate, hair-like papillae 2 to 2.5 mm in length; styles stout, 8 mm long, densely papillate.

BRITISH NORTH BORNEO, Marutai, near Tawau, *D. D. Wood* 451, June 6, 1917, back of the mangrove swamp.

A strongly characterized species apparently as closely allied to *Mallotus calvus* Pax & K. Hoffm. as to any other species, but with fewer-nerved leaves, few-flowered racemes, much larger pistillate flowers, and hirsute and also densely long-stipitate, glandular-capitate ovaries. The leaf-opposed simple racemes are characteristic.

MALLOTUS AFFINIS sp. nov. § *Axenfeldia*.

Arbor circiter 12 m alta, subtus foliis ad costa nervisque parce ciliato-villosis, inflorescentiis plus minusve tomentosis; foliis omnibus alternis, oblongo-ellipticis ad oblongo-obovatis, subcoriaceis, usque ad 13 cm longis, abrupte acuminatis et minute apiculatis, integerrimis, basi minute biauriculatis et perspicue biglandulosis, subtus dense glandulosis, glandulis immersis; nervis utrinque circiter 10, subtus prominentibus, reticulis primariis prominentibus, parallelis; infructescentiis axillaribus, 6 ad 9 cm longis, simpliciter racemosis; capsulis dicoccis, circiter 1 cm diametro, densissime pallide stellato-tomentosis et dense echinatis.

A tree about 12 m high, the branches terete, brownish-olivaceous, glabrous, smooth, the young branchlets slightly pubescent, the indumentum mostly of short simple hairs with a few stellate ones intermixed. Leaves all alternate, oblong-elliptic to oblong-obovate, entire, 8 to 13 cm long, 3.5 to 5.5 cm wide, rather prominently acuminate, the acumen stout, 1 cm long or less and minutely apiculate, base narrowed, minutely biauriculate and distinctly 2-glandular, the glands impressed on the upper surface, the upper surface grayish, shining, smooth, eglandular, the lower paler, rather densely glandular, the glands immersed; lateral nerves about 10 on each side of the midrib, very prominent on the lower surface, curved, anastomosing, the reticulations prominent, parallel; petioles 3 to 5 cm long, thickened at their apices; stipules acicular, 3 to 5 mm long. Infructescences axillary, simply racemose, 6 to 9 cm long, sparingly pubescent,

the pedicels thickened, densely cinereous-tomentose, 3 to 5 mm long, the bracteoles acicular from a broadened base, about 3 mm long, two or three subtending each pedicel. Fruits about 1 cm in diameter, each composed of two cocci, pale-brownish when dry, globose, densely and minutely tomentose, and densely covered with stiff, slender, glabrous spine-like processes 3 to 5 mm in length.

BRITISH NORTH BORNEO, Marutai watershed at Tawau, *Villamil* 370, May 28, 1917, on damp slopes at low altitudes.

This species is very closely allied to the Philippine *Mallotus auriculatus* Merr., from which it is distinguished by its thicker, entire, rather more numerous nerved leaves, which are rather densely glandular beneath; in having but a single pair of basal glands; and in its densely tomentose cocci, which are much more densely spiny, the spines distinctly longer than in the Philippine form.

MALLOTUS CAUDATUS sp. nov. § *Axenfeldia*.

Frutex circiter 3 m altus, ramulis junioribus et inflorescentiis parce et decidue tomentosus, ramis elenticellatis, ramulis angulato-striatis; foliis oppositis, leviter inaequimagnis, membranaceis vel subchartaceis, oblongis ad late oblongo-oblongeolatis, subolivaceis, nitidis, usque ad 25 cm longis, supra glabris, subtus parce glandulosis, basi obtusis, leviter cordatis, bimaculato-glandulosis, apice tenuiter caudato-acuminatis, nervis utrinque 6 ad 9, subtus valde prominentibus, reticulis laxis; infructescentiis usque ad 13 cm longis, simpliciter racemosis; fructibus junioribus subglobosis, breviter pedicellatis, circiter 1 cm diametro, granuloso-glandulosis, densissime puberulis, molliter echinatis.

A shrub about 3 m high, nearly glabrous (fruits excepted), the younger branchlets and the inflorescences sparingly and deciduously tomentose. Branches terete, pale-brownish, glabrous, not at all lenticellate, the branchlets angular-striate, pale reddish-brown. Leaves opposite, those of each pair slightly unequal in size, membranaceous to subchartaceous, pale-olivaceous, shining, oblong to broadly oblong-oblongeolate, entire, 15 to 25 cm long, 5 to 7 cm wide, the upper surface smooth, glabrous, not at all glandular, the lower with widely scattered, distinct, orange-yellow to brown, granulate glands, the apex slenderly caudate-acuminate, the acumen up to 3 cm in length, the base obtuse, distinctly but minutely cordate, and with two distinct glands on the upper surface; lateral nerves 6 to 9 on each side of the midrib, very prominent on the lower surface, curved-ascending, anastomosing, the primary reticulations lax, subparallel, prominent; petioles 2 to 6 cm long, glabrous. Infructescences sim-

ply racemose, leaf-opposed and in the uppermost axils, up to 13 cm long. Capsules (somewhat immature) subglobose, about 1 cm in diameter, composed of three cocci, outside granulose-glandular, the orange-yellow glands more or less obscured by the very dense, cinereous, stellate-puberulent indumentum, densely and softly echinate, the processes about 3 mm long.

BRITISH NORTH BORNEO Marauti watershed, near Tawau, *Villamil* 376, June 1, 1917, in forests at low altitudes. Locally known as *limpasoh-suluk*.

The alliance of this species is manifestly with the Javan *Mallotus glaberrimus* Muell.-Arg., which has also been reported from Borneo. It differs in its elenticellate branches, caudate-acuminate, entire leaves, which have no marginal glands in the upper part, and fewer lateral nerves.

STERCULIACEAE

TARRIETIA Blume

TARRIETIA BORNEENSIS sp. nov.

Arbor circiter 30 m alta, partibus junioribus exceptis glabra; foliis unifoliolatis, ellipticis ad oblongo-ellipticis, coriaceis, breviter obtuse acuminatis, basi acutis ad subrotundatis, usque ad 14 cm longis, glabris, nitidis, supra dense et minute foveolatis, nervis utrinque circiter 12, distinctis; fructibus glabris, circiter 1.5 cm longis, alae inaequilateraliter oblongo-obovatae, subfalcatae, apice rotundatae, usque ad 7 cm longae et 3 cm latae.

A tree about 30 m high, the trunk about 60 cm in diameter, glabrous except the very young parts. Branches brownish, terete, glabrous, the growing branchlets minutely and densely subferruginous-puberulent-lepidote as are the very young petioles. Leaves simple, elliptic to oblong-elliptic, brown, of about the same color on both surfaces, shining when dry, coriaceous, 9 to 14 cm long, 4 to 6 cm wide, glabrous, the upper surface minutely and densely foveolate, apex shortly and bluntly acuminate, base rounded to acute; lateral nerves about 12 on each side of the midrib, spreading, slightly curved, prominent; petioles 2 to 3 cm long. Peduncles in fruit up to 6 cm long, axillary, solitary, each bearing about three umbellately disposed fruits. Fruits oblong-ovoid, about 1.5 cm long, glabrous, the wings coriaceous, brown, shining, reticulate, glabrous, inequilaterally oblong-obovate, subfalcate, rounded at the apex, up to 7 cm long and 3 cm wide.

BRITISH NORTH BORNEO, near Sandakan, *Villamil* 3, August 14, 1915, on forested slopes, altitude 40 to 70 meters.

This characteristic species is manifestly allied to *Tarrietia simplicifolia* Mast. of the Malay Peninsula, the few known species of the genus with simple leaves being *Tarrietia kunstleri* King and *T. simplicifolia* Mast. of

the Malay Peninsula, and *T. sylvatica* (Vid.) Merr. of the Philippines. It is readily distinguished from *T. simplicifolia* Mast. by its much fewer-nerved leaves, from *T. kunstleri* King by its glabrous fruits, and from *T. sylvatica* Merr. by its leaves not being densely lepidote beneath.

DILLENACEAE

SAURAUIA Willdenow

SAURAUIA ACUMINATA sp. nov.

Frutex: circiter 2 m altus, ramis et petiolis et foliis supra ad costa et margine et subtus perspicue tenuiter curvato-patule setosis; foliis chartaceis, oblongis, tenuiter acute acuminatis, basi obtusis ad leviter cordatis, usque ad 28 cm longis, nervis utrinque circiter 20, subtus valde perspicuis; inflorescentiis caulinis, cymosis, fasciculatis, circiter 5 cm longis; floribus numerosis, bracteis linearibus, 5 ad 9 mm longis, setosis; sepalis leviter inaequalibus, 6 ad 7 mm longis, extus setosis, oblongo-ovatis ad oblongo-ellipticis, exterioribus acutis, interioribus obtusis; fructibus ovoideis, glabris; stylis 3, infra connatis.

A shrub about 2 m high, the branches, branchlets, petioles, inflorescences, midrib on the upper surface, margins, and lower surface of the leaves conspicuously setose with slender, curved, spreading setae up to 5 mm in length, most of these parts also pubescent, the setae brownish to purplish-brown when dry, pink to deep-brown when fresh. Leaves chartaceous, oblong, narrowed to both ends, 20 to 28 cm long, 7 to 9 cm wide, apex slenderly and sharply acuminate, base narrowed, obtuse to obscurely cordate, the upper surface grayish, somewhat shining, smooth and glabrous except the setose midrib, the margins setose, the lower surface conspicuously setose on the midrib, nerves, and reticulations, and also somewhat pubescent; lateral nerves about 20 on each side of the midrib, prominent on the lower surface, curved, anastomosing, the reticulations subparallel, distinct; petioles 1.5 to 2 cm long. Cymes cauline, fascicled on densely setose tubercles, about 5 cm long, densely setose and pubescent, rather many-flowered, the bracts linear, setose, 5 to 9 mm long, the pedicels 4 to 7 cm long. Sepals oblong-ovate to oblong-elliptic, 6 to 7 mm long, the outer two acute, densely setose on the back, the inner ones slightly longer, obtuse, setose on the exposed portions, but glabrous on the parts covered by the imbricate outer sepals. Young fruit ovoid, glabrous; styles 3, the arms about 2 mm long, united for the lower 1.5 mm.

BRITISH NORTH BORNEO, Pinayas River, *Villamil 220*, October 2, 1916, in forests along the river, altitude about 15 meters.

This species, like *Saurauia myrmecoidea* Merr., is apparently allied to *Saurauia horrida* Hook. f., from which it is easily distinguished by its midrib being setose on the upper surface and by its cauline fascicled cymes (attachment of the inflorescences not indicated in Hooker's diagnosis, but presumably axillary). The more numerous lateral nerves, glabrous upper surface of the leaves, other than the midrib, and the cauline cymes distinguish it from *S. myrmecoidea* Merr.

SAURAUIA BORNEENSIS sp. nov.

Frutex circiter 2.5 m altus, ramulis junioribus petiolisque densissime cinnamomeo-lanato-tomentosis atque setis paucis curvato-adpressis instructis; foliis late oblongo-oblanceolatis, usque ad 40 cm longis, chartaceis ad subcoriaceis, supra brunneis, laevis, glabris, subtus pallidioribus et plus minusve decidue cinnamomeo-lanatis, apice acutis, deorsum gradatim angustatis, basi obtusis, margine cornuto-serratis, nervis utrinque circiter 20, perspicuis; floribus axillaribus, paucis, fasciculatis, pedicellatis, sepalis leviter inaequalibus, extus leviter pubescentibus; ovario pubescens; stylis 3, liberis.

A shrub about 2.5 m high, the branchlets and petioles densely covered with a cinnamomeous lanate-tomentose indumentum and with few, scattered, curved-appressed setae, the lower surface of the leaves also cinnamomeous-lanate, the indumentum conspicuous along the midrib and nerves, somewhat deciduous. Leaves broadly oblong-oblanceolate, chartaceous to subcoriaceous, 30 to 40 cm long, 8 to 12 cm wide, the upper surface smooth, glabrous, brown, shining, the lower paler, the apex acuminate, gradually narrowed from above the middle to the narrow, obtuse base, the margins serrate; primary lateral nerves about 20 on each side of the midrib, prominent, spreading, curved, anastomosing, the reticulations slender, not prominent, rather lax; petioles 4 to 5 cm long. Flowers white, axillary, fascicled, few, their pedicels pubescent, 1 cm long or less. Sepals pubescent, unequal, mostly rounded or obtuse, two elliptic, 3.5 mm long, three broadly ovate, about 4 mm long. Corolla-lobes oblong-elliptic, somewhat retuse, 4.5 mm long. Ovary globose, somewhat pubescent; styles 3, free, about 3 mm long.

BRITISH NORTH BORNEO, Kalabakan, *Villamil* 222, September 26, 1916, in forests, altitude about 4 meters.

This characteristic species is readily distinguished by its cinnamomeous-lanate indumentum, which on the branchlets and petioles is intermixed with curved-appressed, slender setae; its elongated, broadly oblong-oblanceolate leaves, which are gradually narrowed below the middle to the narrow but obtuse base; and its axillary fascicled flowers. I know of no species that is closely allied to it.

SAURAUIA HETEROSEPALA sp. nov.

Frutex, ramulis junioribus plus minusve adpresse squamulosis; foliis oblongis ad oblongo-obovatis, usque ad 24 cm longis, acuminatis, basi acutis, junioribus subtus ad costa nervisque parcissime adpresse squamulosis, vetustioribus glabris, laevis, nitidis, olivaceis, margine minute incurvato-serrulatis, nervis utrinque 10 ad 13, perspicuis; floribus e axillis defoliatis et caulinis, superioribus solitariis, tenuiter pedunculatis, ebracteolatis, inferioribus depauperato-cymosis, bracteolatis; sepalis glabris, binis exterioribus latissime orbiculato-ovatis, rotundatis, circiter 8 mm longis et latis, interioribus contorto-imbricatis, distincte longioribus; ovario glabro, stylis 3, infra connatis.

A shrub, ultimately glabrous or nearly so, the young branchlets with few, scattered, irregular, ovate to suborbicular, appressed, pale-brownish scales, with similar ones on the midrib and nerves of the younger leaves and on the peduncles, the older leaves glabrous. Leaves oblong to oblong-obovate, 10 to 24 cm long, 4 to 9 cm wide, base acute, apex acuminate, margins minutely incurved-serrate, olivaceous and shining on both surfaces when dry, chartaceous; lateral nerves 10 to 13 on each side of the midrib, prominent, the reticulations slender, close, subparallel; petioles 1 to 2 cm long, sparingly scaly. Flowers in the axils of fallen leaves and from the branches and trunks, the upper ones solitary, ebracteolate, the lower ones in depauperate, few-flowered cymes, the pedicels up to 2.5 cm long. Sepals distinctly unequal, all glabrous, rounded, the outer two broadly orbicular-ovate, about 8 mm long and wide, the inner three twisted-imbricate, about 10 mm long and 9 mm wide. Ovary glabrous; styles united for the lower 3 mm, the arms 3, about 4 mm in length. Bracts on the lower inflorescences oblong-lanceolate to oblanceolate, acute to acuminate, glabrous, 5 to 8 mm long.

BRITISH NORTH BORNEO, Mount Kinabalu, Khota Balud to Kibayo, *Mrs. Clemens* 9812, October 28, 1915, the fruit green.

The alliance of this species is apparently with the Javan *Saurauia leprosa* Korth., from which it is readily distinguished by its inflorescences and floral characters.

SAURAUIA HOSEI sp. nov.

Frutex vel arbor parva; foliis oblongis, usque ad 43 cm longis, chartaceis, olivaceo-brunneis, acuminatis, basi rotundatis, margine spinulosis, nervis utrinque circiter 14, subtus prominentibus, curvatis, anastomosantibus, supra glabris, subtus ad costa et nervis et reticulis parce setosis atque pubescentibus, setis tenui-

bus, patulis vel subpatulis. Inflorescentiis caulinis, fasciculatis, depauperato-cymosis, 2 ad 3 cm longis, pedunculatis, dense hirsutis atque setis numerosis tenuibus patulis instructis; sepalis oblongis ad oblongo-lanceolatis, subacutis, extus setosis, circiter 5 mm longis, interioribus angustioribus; ovario glabro; stylis 3, infra connatis.

A shrub or small tree, the cauline inflorescences, petioles, and midrib, nerves, and reticulations on the lower surface of the leaves subferruginous-hirsute or pubescent and with numerous, slender, usually spreading, setae. Leaves chartaceous, brownish-olivaceous or olivaceous, somewhat shining, the lower surface very slightly paler than the upper, oblong, up to 43 cm long and 15 cm wide, rather slenderly acuminate, base narrowed, rounded, margins spinulose, the slender curved setae terminating the short teeth, the upper surface smooth and glabrous; lateral nerves about 14 on each side of the midrib, prominent beneath, curved, anastomosing, the reticulations distinct; petioles 3 to 3.5 cm long, their slender setae up to 5 mm in length. Cymes fascicled on the trunk, from densely setose tubercles, the individual cymes 2 to 3 cm long, few-flowered, all parts densely subferruginous-setose and hirsute, the pedicels 1 to 1.4 cm long, the bracts few, narrowly lanceolate, densely setose, about 2 mm long. Sepals about 5 mm long, oblong to oblong-lanceolate, acute or subacute, the outer three about 2 mm wide, setose, the inner ones narrower, the innermost glabrous or nearly so. Ovary glabrous. Styles united for the lower 1.5 mm, the arms 3, about 2 mm long.

SARAWAK, Baram District, Mount Trekan, *Hose 552*, July, 1895, altitude about 300 meters.

This species is not closely allied to any previously described Bornean form, and is well characterized by its large leaves, which are glabrous above and setose and pubescent on the midrib, nerves, and reticulations beneath; and by its cauline, fascicled, ferruginous-hirsute and setose cymes.

SAURAUIA KINABALUENSIS sp. nov.

Arbor circiter 10 m alta, partibus junioribus dense setoso-pubescentibus; foliis oblongo-obovatis, membranaceis, usque ad 26 cm longis, breviter acuminatis, basi acutis vel obtusis et distincte inaequilateralibus, utrinque setis sparsis debilis brevibus instructis, margine curvato-serratis, nervis utrinque circiter 12, distinctis; cymis caulinis, fasciculatis, paucifloris, circiter 8 cm longis, breviter setosis, bracteis paucis, lanceolatis ad oblongo-lanceolatis, 4 ad 6 mm longis; floribus circiter 2.5 cm diametro, sepalis inaequalibus, exterioribus crassis, extus leviter brevissime setosis, circiter 10 mm longis, interioribus petaloideis, obovatis,

rotundatis, glabris, 11 ad 12 mm longis. Ovario glabro; stylis 5, infra connatis.

A tree about 10 m high, the young branchlets and very young leaves (when 5 cm long or less) very densely pubescent-setose, the indumentum brownish, none of the setae more than 1 mm long, slender, weak, more or less spreading, sometimes appressed. Leaves membranaceous, olivaceous, shining, oblong-obovate, about 25 cm long, 9 to 11 cm wide, shortly acuminate, base acute or obtuse and distinctly inequilateral, margins incurved-serrate, both surfaces with widely scattered, short, curved, weak, pale, slender setae 1 mm long or less; lateral nerves about 12 on each side of the midrib, prominent, curved, anastomosing. Cymes few-flowered, about 8 cm long, fascicled on tubercles which are scattered along the trunks, the rachis and branches more or less setose or furfuraceous-setose, each cyme bearing 2 or 3 flowers, the pedicels slender, the bracts few, lanceolate to oblong-lanceolate, usually acuminate, toothed, shortly setose. Flowers pink, fragrant, about 2.5 cm in diameter. Sepals unequal, the outer three thicker than the inner ones, orbicular-ovate, about 10 mm long, sparingly short-setose outside, the two inner ones thinner, petaloid, glabrous, obovate, rounded, 11 to 12 mm long. Corolla-lobes deeply and somewhat inequilaterally retuse, about 10 cm long. Ovary glabrous. Styles united for the lower 2 mm, the arms 5, about 5 mm long.

BRITISH NORTH BORNEO, Mount Kinabalu, Minitindok Gorge, *Mrs. Clemens* 10458, November 19, 1915, in forests near the river.

This species is especially characterized by its short weak setae; its fascicled, cauline, depauperate-cymose, 8 cm long, few-flowered inflorescences; and its rather large flowers.

SAURAUIA LONGIPETIOLATA sp. nov.

Frutex, partibus junioribus parce adpresse setosis exceptis glaber. Foliis oblongis ad oblongo-ellipticis, coriaceis, usque ad 30 cm longis, laevis, supra olivaceo-brunneis, subtus pallide brunneis, basi perspicue lateque cordatis, longe petiolatis, margine serrulato-dentatis, nervis utrinque circiter 15, perspicuis; floribus axillaribus, fasciculatis, tenuiter pedicellatis, calycis parce pubescentibus, laevis; fructibus leviter pubescentibus; stylis 3, liberis.

A shrub, glabrous except the younger parts, which are sparingly appressed-setose. Leaves oblong to oblong-elliptic, 20 to 30 cm long, 9 to 12 cm wide, base broadly and prominently cordate, margins mostly dentate, sometimes dentate-serrate, smooth, somewhat shining, the upper surface brownish-olivaceous, the lower surface pale-brownish; lateral nerves about 15 on each side

of the midrib, prominent on the lower surface, spreading, curved, anastomosing, the reticulations distinct; petioles up to 8 cm in length. Flowers axillary, fascicled, their pedicels slender, 8 to 14 mm long, sparingly furfuraceous, each usually with a single, linear-lanceolate, 1 to 2 mm long bracteole. Sepals 5, elliptic, obtuse to subacute, 4 to 4.5 mm long, smooth, sparingly pubescent. Fruit ovoid-globose, about 4 mm long, somewhat pubescent; styles 3, free to the base, 4 mm long; seeds numerous, about 1 mm long, brown, closely reticulate.

BRITISH NORTH BORNEO, Minitindok Gorge, Mount Kinabalu, *Mrs. Clemens* 10496, November 19, 1915, the fruit dull-white.

This species is readily distinguished among its congeners by its long-petioled, glabrous, cordate leaves, its fascicled flowers, three free styles, and somewhat pubescent ovaries and fruits.

SAURAUIA MATTHEWSII sp. nov.

Frutex vel arbor, ramulis plus minusve adpresse squamoso-setosis, squamae lanceolatae; foliis chartaceis, oblongo-lanceolatis ad oblongo-oblancoelatis, tenuiter acuminatis, margine curvato-setosis, deorsum angustatis, basi cuneatis, usque ad 28 cm longis, supra glabris, laevis, nitidis, vel costa parcissime adpresse lanceolato-squamosis, subtus ad costa nervisque leviter hirsutis atque cum reticulis setis subpatulis leviter ciliatis instructis; nervis utrinque 11 ad 13, perspicuis; floribus axillaribus, solitariis vel binis, pedicellatis; sepalis inaequalibus, circiter 7 mm longis, exterioribus extus densissime pallide setosis, setis tenuibus, leviter ciliatis; ovario glabro; stylis 3, alte connatis.

A shrub or small tree, the branchlets more or less appressed-scaly with lanceolate, pale, acuminate, sparingly ciliate, rather stout scales up to 4 mm in length, and also somewhat pubescent. Leaves chartaceous, grayish or somewhat brownish when dry, oblong-lanceolate to oblong-oblancoelate, 23 to 28 cm long, 6 to 8 cm wide, the upper surface smooth, glabrous, or the midrib with few, closely appressed, lanceolate, stiff scales, the lower surface somewhat hirsute on the midrib and lateral nerves, and with numerous, spreading, somewhat curved, 1 to 3 mm long setae on the midrib, nerves, and reticulations, the setae sparingly ciliate, the apex slenderly and sharply caudate-acuminate, below gradually narrowed to the cuneate base, margins ciliate-setose with curved-spreading setae; lateral nerves 11 to 13 on each side of the midrib, prominent on the lower surface, curved-ascending, anastomosing, the reticulations distinct, subparallel; petioles 1 to 1.5 cm long, appressed setose-scaly and pubescent. Flowers axillary, solitary or in pairs, their pedicels 10 to 12 mm

long, very densely setose with slender, somewhat appressed, pale, slenderly acuminate, sparingly ciliate setae up to 2.5 mm in length, the bracts usually two, narrow, 5 mm long or less, densely setose. Sepals about 7 mm long, elliptic to oblong-elliptic, obtuse, the outer ones very densely setose with setae similar to those on the pedicels, the inner ones narrower, setose only on the exposed parts, their margins thin, glabrous. Ovary ovoid, glabrous; style arms 3, about 3 mm long, wholly united for the lower 3 mm.

BRITISH NORTH BORNEO, probably from the Tawau River region, *Villamil* 386, July 13, 1917.

This species is readily recognized by its diverse indumentum, consisting of pubescence, appressed lanceolate scales, and spreading, pale, sparingly ciliate setae; its axillary, solitary or paired flowers; and its very densely setose pedicels and sepals. It is perhaps most closely allied to the Sumatran *Saurauia setigera* Korth. It is named in honor of Mr. D. M. Matthews, conservator of forests, British North Borneo.

SAURAUIA MYRMECOIDEA sp. nov.

Frutex, ramulis et foliis utrinque et inflorescentiis perspicue tenuiter curvato-patule setosis, setis usque ad 5 mm longis; foliis chartaceis, oblongo-ellipticis ad oblongo-obovatis, usque ad 30 cm longis, acuminatis, basi acutis ad obtusis, margine irregulariter dentatis et perspicue curvato-setosis, breviter petiolatis, nervis utrinque 10 ad 15, valde perspicuis; cymis axillaribus, 2 ad 3.5 cm longis, fasciculatis vel subfasciculatis, laxis, bracteis subfiliformibus, 5 ad 9 mm longis, setosis; sepalis ellipticis ad oblongo-ellipticis, 5.5 mm longis, obtusis, extus perspicue setosis; ovario glabro, stylis 3, infra leviter connatis.

A shrub, all parts conspicuously setose with slender, curved, spreading, pale-brownish bristles up to 5 mm in length. Branches setose, the young branchlets densely so. Leaves chartaceous, olivaceous or brownish-olivaceous above, much paler beneath, oblong-elliptic to oblong-obovate, 20 to 30 cm long, 8 to 11 cm wide, acuminate, base acute to obtuse, the margins irregularly dentate, conspicuously setose-ciliate; lateral nerves 10 to 15 on each side of the midrib, impressed on the upper surface, prominent beneath, ascending, curved, anastomosing, the reticulations subparallel, prominent; the upper surface with scattered setae, the lower with similar but more numerous setae confined to the midrib, nerves, and reticulations; petioles densely setose, 1 to 1.5 cm long. Cymes axillary, subfascicled, 2 to 3.5 cm long, prominently setose, rather few-flowered, the bracts subfiliform, setose, 5 to 9 mm long, the pedicels 8 to 10 mm long. Sepals

subequal, elliptic to oblong-elliptic, setose, obtuse, 5.5 mm long. Corolla lobes oblong, about 6 mm long, scarcely retuse. Ovary glabrous; styles 3, about 3 mm long, slightly united below.

SARAWAK, Selungo, Lio-Matu, and Mount Merinjak, *Native collector* 2838 (type), 2797, 2579 *Bur. Sci.*, November, 1914, flowers white.

This species is remarkable for its numerous, slender, curved setae, which occur on both surfaces of the leaves, branches, petioles, inflorescences, and calyces, as well as by its subfiliform bracts. It is apparently allied to *Saurauia horrida* Hook. f., which, among other characters, differs in having the leaves glabrous on the upper surface. Two of the three specimens present runways or homes of ants constructed of a black brittle substance and débris, extending along both sides of the midrib on the lower surface of the leaves, whence the specific name.

SAURAUIA OBLANCEOLATA sp. nov.

Frutex erectus, partibus junioribus exceptis glaber; foliis oblanceolatis, chartaceis vel subcoriaceis, usque ad 35 cm longis, basi attenuatis, apice breviter acuminatis, margine callososerratis, utrinque glabris, laevis, nervis utrinque circiter 20, perspicuis; floribus axillaribus, fasciculatis, tenuiter pedicellatis; sepalis subaequalibus, ovatis ad elliptico-ovatis, 4.5 ad 5 mm longis, rotundatis, parvissime pubescentibus; fructibus junioribus globosis, leviter pubescentibus; stylis 3, liberis.

An erect shrub, the older parts entirely glabrous, the growing tips of the branchlets sparingly appressed-setose, the very young leaves (when but 1 to 2 cm long) very densely and uniformly appressed-setose on both surfaces. Leaves oblanceolate, chartaceous to subcoriaceous, 20 to 35 cm long, 4 to 8 cm wide, smooth and glabrous on both surfaces, the upper surface dark-brown, the lower pale-brown when dry, shining on both surfaces, gradually narrowed to the attenuate base, the apex somewhat rostrate-acuminate, the margins callose-serrate; lateral nerves about 20 on each side of the midrib, prominent, curved-ascending, anastomosing, the reticulations lax, distinct; petioles about 2 cm long. Flowers axillary, fascicled, their pedicels slender, up to 1.5 cm long, glabrous or slightly pubescent, each with two or three, small, oblong-elliptic, obtuse, 1 to 1.5 mm long bracts below the middle. Sepals subequal, ovate to elliptic-ovate, rounded, 4.5 to 5 mm long, slightly pubescent. Young fruits globose, sparingly pubescent. Styles 3, free, 4 mm long.

BRITISH NORTH BORNEO, Khota Balud to Kibayo, Mount Kinabalu, *Mrs. Clemens* 9784, October 28, 1915, "flowers and fruits white."

This species is well characterized by its oblanceolate, entirely glabrous, elongated leaves, and its fascicled flowers. It does not appear to be especially closely allied to any previously described form.

SAURAUIA PLATYPHYLLA sp. nov.

Frutex, ramulis junioribus dense, patule, tenuiter setosis, setae usque ad 1 cm longae; foliis elliptico-obovatis, coriaceis, usque ad 40 cm longis et 20 cm latis, supra ad costa, subtus ad costa nervisque setis paucis longis patulis tenuibus instructis, apice breviter acuminatis, basi acutis, margine perspicue attenuato-serratis, nervis utrinque circiter 30, patulis, curvatis, utrinque valde prominentibus; floribus caulinis, dense fasciculatis, tenuiter pedicellatis, e tuberculis dense setosis; sepalis subaequalibus, binis exterioribus breviter acuminatis, interioribus rotundatis, obovatis, omnibus glabris; fructibus glabris; stylis 3, liberis.

A shrub, the young branchlets densely covered with spreading, slender, curved, attenuate, pale-brownish setae up to 1 cm in length, with similar scattered setae on the midrib on both surfaces, the nerves beneath, and the petioles. Branches thickened. Leaves elliptic-obovate, coriaceous, up to 40 cm long and 20 cm wide, brownish-olivaceous on the upper surface, paler beneath, the apex shortly acuminate, the base acute, margins conspicuously serrate, the teeth mostly attenuate into slender curved setae; lateral nerves about 30 on each side of the midrib, spreading, curved, arched-anastomosing near the margin, very prominent on both surfaces, the reticulations prominent, subparallel; petioles stout, setose, about 3 cm long. Flowers fascicled, cauline, from densely setose tubercles, usually crowded, their pedicels 2.5 to 3.5 cm long, with short, scattered, curved setae and usually with two or three oblong-lanceolate, glabrous, 2.5 to 4.5 mm long bracts below the middle. Sepals subequal, glabrous, about 7 mm long, the exterior two shortly acuminate, subelliptic, the interior three obovate, rounded. Fruits glabrous, globose; styles 3, free, at least 2 mm in length.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, Mrs. Clemens 9999, November 2, 1915, "a small *Saurauia* near streams with green cauline fruits."

This species is remarkable for its unusually large leaves, its slender, spreading, curved, attenuate setae, and its cauline fascicled inflorescences; by these characters it is readily distinguished from its congeners. It does not appear to be closely allied to any previously described form.

SAURAUIA WINKLERI sp. nov.

Frutex vel arbor parva, partibus junioribus exceptis glabris, ramulis teretibus, laevis, atro-brunneis, junioribus squamis paucis adpressis lanceolatis instructis; foliis membranaceis ad chartaceis, oblongis, usque ad 14 cm longis, glabris, in siccitate supra castaneis, subtus pallidis, apice tenuiter acute acuminatis, basi

acutis, margine incurvato-spinuloso-serratis; nervis utrinque circiter 12, distinctis; inflorescentiis axillaribus, cymosis, tenuiter pedunculatis, paucifloris, partibus junioribus leviter pubescentibus; bracteis foliaceis, lanceolatis, acuminatis, ad 12 mm longis; sepalis inaequalibus, extus leviter pubescentibus, rotundatis, exterioribus ellipticis, circiter 5 mm longis, interioribus late ovatis, circiter 5.5 mm longis et 5 mm latis; ovario pubescente; stylis 3, liberis.

A shrub or small tree, nearly glabrous, or the younger parts of the inflorescences sparingly brown-pubescent. Branches and branchlets castaneous when dry, smooth, terete, the latter with few, widely scattered, closely appressed, lanceolate scales. Leaves 6 to 14 cm long, 3 to 4.5 cm wide, membranaceous to chartaceous, in general oblong, subequally narrowed to the acute base and to the slenderly and sharply subcaudate-acuminate apex, entirely glabrous except for the very few, widely scattered, appressed, lanceolate scales on the midrib on both surfaces, the upper surface castaneous when dry, the lower cinereous, the margins spinulose-serrate, the tips of the small teeth incurved; lateral nerves about 12 on each side of the midrib, distinct, brown in contrast to the pale lower surface, anastomosing, the reticulations not prominent; petioles 1.5 to 3 cm long. Inflorescences axillary, solitary, long-peduncled, cymose, few-flowered, the peduncles slender, up to 6 cm in length, glabrous, the young pedicels sparingly pubescent; bracts lanceolate, acuminate, foliaceous, sparingly toothed, equally narrowed at both ends, up to 12 mm long and 3 mm wide; pedicels 10 to 12 mm long. Sepals unequal, externally sparingly pubescent, all rounded, the outer two elliptic, 5 mm long and 3 mm wide, the inner three broadly ovate, 5 to 6 mm long, 5 mm wide. Corolla-tube about 2 mm long, the lobes 6 mm long, retuse. Stamens 20. Ovary ovoid, pubescent; styles 3, free, 4 mm long.

SOUTH-EAST BORNEO, Hayoep, *Winkler 2451*, June 14, 1908.

This species is apparently allied to *Saurauia nigrescens* Korth., but it has smaller leaves, which are slenderly and sharply subcaudate-acuminate; and lanceolate, acuminate, entirely glabrous bracts; while the ovary is distinctly pubescent.

PASSIFLORACEAE

ADENIA Forskal

ADENIA QUADRIFIDA sp. nov. § *Microblepharis*.

Species *A. cordifoliae* (Blume) Engl. similis, differt floribus omnibus 4-meris, foliis chartaceis, utrinque concoloribus, laevis, haud rugosis.

A glabrous scandent plant, the branches slender, pale or brownish when dry, obscurely striate. Leaves ovate to oblong, entire, pale-olivaceous, shining, of about the same color on both surfaces, chartaceous, 4 to 6.5 cm long, 3 to 4.5 cm wide, base broadly rounded and distinctly cordate, beneath with a pair of distinct auricle-like glands, narrowed upward, the apex obtuse to obtusely acuminate and usually minutely apiculate; lateral nerves pinnately arranged, 4 or 5 on each side of the midrib, curved, anastomosing, slender but distinct, the reticulations lax; petioles 1 cm long or less. Inflorescences 4 to 7 cm in length, few- to many-flowered, dichotomous, peduncled, the tendrils from the apices of the peduncles between the two primary branches. Flowers yellow, about 1 cm long, their pedicels slender, 1 to 2 cm in length, the bracteoles minute, the perianth narrowly oblong-ovoid, acute at both ends, the sepals 4, oblong-ovate, obtuse, about 1.5 mm long, the petals linear-oblong, 1.5 mm long, thin, inserted at the apex of the perianth-tube. Stamens 4; anthers narrowly oblong, 4 to 4.5 mm long. Fruits red when mature, oblong-ovoid, narrowed at both ends, base and apex acute, 7 to 9 cm long, apparently pendulous, 3-valved, apparently terete, the valves thickly coriaceous, hard and stiff when dry, reddish-brown, smooth and shining. Seeds ellipsoid, compressed, prominently and densely subfoveolate, 8 to 9 mm long.

BRITISH NORTH BORNEO, Mount Kalawat, *Mrs. Clemens 11138*, December 10, 1915 (type); Mount Kinabalu, Kiau, *Mrs. Clemens 10091*, November 27, 1915.

This species much resembles the Javan *Adenia cordifolia* (Blume) Engl. as figured and described by Blume, *Rumphia*, 1 (1835) 167, *t.* 49, from which it is at once distinguished by its 4-merous, not 5-merous flowers.

ADENIA CLEMENTIS sp. nov. § *Microblepharis*.

Frutex scandens, glaber; foliis chartaceis, oblongis, usque ad 10 cm longis, subolivaceis, nitidis, utrinque subaequaliter angustatis, integris, tenuiter acuminatis, basi acutis, perspicue auriculato-glandulosis, nervis utrinque 4, distinctis; inflorescentiis axillaribus, cymosis, pedunculatis, paucifloris, 4 ad 6 cm longis; floribus 5-meris, anguste oblongo-ovoideis, 8 ad 9 mm longis, utrinque subacutis; fructibus ovoideo-ellipsoideis, teretibus, circiter 5 cm longis, apice subrotundatis, basi subacutis vel subrotundatis.

A scandent glabrous shrub, the branches terete, pale or brownish, slightly striate when dry. Leaves oblong, chartaceous, subolivaceous to somewhat pale when dry, of about the same color on both surfaces or somewhat paler beneath, shining, 7 to 10 cm long, 2.5 to 6 cm wide, subequally narrowed to the

acute base and to the slenderly acuminate apex, entire, the acumen acute, 1 to 1.5 cm long, the base with a pair of elongated, auricle-like glands, the margins of the glands recurved; lateral nerves 4 on each side of the midrib, distinct, curved, anastomosing, the reticulations rather close, fine, evident on both surfaces; petioles 1 to 1.5 cm long. Inflorescences axillary, cymose, peduncled, 4 to 6 cm long, few-flowered, dichotomously branched, usually tendriferous. Flowers 5-merous, 8 to 9 mm long, yellowish, narrowly oblong-ovoid, subequally narrowed to the usually acute base and apex. Calyx-lobes 5, three oblong-ovate, 2.5 mm long, 1.5 mm wide, two alternating ones narrowly oblong. Petals 5, thin, oblong, 3 mm long, 1.2 mm wide, inserted at the apex of the perianth-tube. Stamens 5; anthers subsessile, narrowly oblong, acuminate, 5 mm long. Fruits ovoid-ellipsoid, yellow, about 5 cm long and 5 cm in diameter, terete, apex usually rounded, base subacute to somewhat rounded, 3-valved, the valves firm, about 3 mm thick, when dry pale and shining.

BRITISH NORTH BORNEO, Kiau, Mrs. Clemens 10166 (type), 10223, November 25, 1917.

The present species is manifestly closely allied to *Adenia longipedunculata* Merr., from which it is especially distinguished by its smaller leaves, and shorter, few-flowered inflorescences.

ADENIA LONGIPEDUNCULATA sp. nov. § *Microblepharis*.

Frutex scandens, glaber, ramis in siccitate flavidis, leviter striatis; foliis chartaceis, ellipticis, integris, usque ad 16 cm longis et 10 cm latis, abrupte acuminatis, basi obtusis vel subacutis, perspicue auriculato-glandulosis, pallidis, utrinque concoloribus, nitidis, nervis utrinque 4, perspicuis, curvatis, tenuiter anastomosantibus; inflorescentiis axillaribus, longe pedunculatis, dichotomis, multifloris, foliis subaequantibus; floribus 5-meris, anguste oblongo-ovoideis, utrinque angustatis, acutis vel obtusis.

A scandent shrub, glabrous throughout, the branches when dry distinctly yellowish, about 5 mm in diameter, slightly striate, terete. Leaves elliptic, chartaceous to firmly chartaceous, pale, of the same color on both surfaces, shining when dry, 14 to 16 cm long, 9 to 10 cm wide, entire, apex abruptly acuminate, the acumen blunt, 1 cm long or less, base obtuse to subacute with a pair of prominent auricle-like glands; lateral nerves 4 on each side of the midrib, projecting on both surfaces, prominent, curved, slenderly anastomosing, the reticulations rather close, distinct; petioles about 3 cm long. Inflorescences axillary, as long as the leaves, rather densely many-flowered, the peduncles up to 13 cm in length, the cymes 5 to 8 cm in diameter, dictio-

tomous. Flowers pale-yellowish, in mature bud narrowly oblong-ovoid, acute or obtuse at both ends, about 8 mm long, 5-merous, their pedicels 5 mm long or less, the bracteoles ovate, acute, about 1 mm long. Calyx-segments oblong-ovate, obtuse, up to 2.5 mm in length. Petals thin, attached at the top of the perianth-tube, oblong, obtuse, 2 to 2.5 mm long. Stamens 5. the anthers subsessile, narrowly oblong, acuminate, 6 mm long.

BRITISH NORTH BORNEO, Sandakan, *Agama* 437, August 31, 1917, on the inner edge of swamps along the Sapagaya River at about sea level.

This species is allied to *Adenia acuminata* (Blume) King, from which it is especially distinguished by its more numerously nerved leaves. The leaves are distinctly larger than are those of the Javan *Adenia macrophylla* (Blume) Koord.

FLACOURTIACEAE

RYPAROSA Blume

RYPAROSA OLIGOPHLEBIA sp. nov.

Arbor circiter 5 m alta, subglabra; foliis oblongo-obovatis ad oblongo-oblongeolatis, usque ad 17 cm longis, chartaceis, breviter et abrupte acuminatis, basi acutis, subtus pallidis, nervis utrinque 2 vel 3, curvato-adscendentibus, subtus prominulis; infructescentiis lateralibus, usque ad 7 cm longis; fructibus ovoideis ad subellipsoideis, circiter 3.5 cm longis, glabris, in siccitate minute verruculosis; seminibus circiter 6.

A tree about 5 m high, nearly glabrous, the very young branchlets sparingly appressed-pubescent, inflorescences and flowers not seen. Branches terete, reddish-brown, glabrous. Leaves chartaceous, oblong-obovate to oblong-oblongeolate, 10 to 17 cm long, 4 to 6 cm wide, the apex abruptly and rather shortly obtuse-acuminate, base acute, the upper surface more or less olivaceous when dry, the lower pale-grayish; lateral nerves 2 or 3 on each side of the midrib, the nerves curved-ascending, very prominent on the lower surface, obscurely anastomosing, the reticulations rather lax; petioles 1.5 to 2 cm long. Infructescences lateral, up to 7 cm in length, each bearing from 3 to 5 fruits. Fruits ovoid to subellipsoid, brown when dry, glabrous, the pericarp minutely verruculose, irregularly and coarsely wrinkled, about 3.5 cm long, 2.5 to 3 cm wide, apex subacute. Seeds usually 6.

BRITISH NORTH BORNEO, Kalabakan, *Villamil* 263, September 21, 1916, in forested valleys and on gentle slopes, altitude about 30 meters.

This species is strongly characterized by its few-nerved leaves. In its 6-seeded fruits it approaches *Ryparosa kunstleri* King of the Malay Peninsula, but is not otherwise closely allied to that species; most of the species, so far as the fruits are known, have but one- or two-seeded fruits.

MYRTACEAE

EUGENIA Linnaeus

EUGENIA CLEISTOCALYX nom. nov.

Jambosa nitida Korth. in Nederl. Kruidk. Arch. 1 (1847) 202, non

Eugenia nitida Benth., nec Duthie.

Cleistocalyx nitidus Blume Mus. Bot. Lugd.-Bat. 1 (1849) 84, f. 56.

Eugenia nervosa Miq. Fl. Ind. Bat. 1¹ (1855) 442, non Lour.

BRITISH NORTH BORNEO, *Villamil* 406, July 13, 1917, on river banks, local name *alag-alag-sulu*.

The type was from Borneo, and Miquel also credits the species to Sumatra; from Loureiro's description it has nothing to do with *Eugenia nervosa* Lour., where it was placed by Miquel. The species is also the type of Blume's genus *Cleistocalyx*, and it is worthy of note that so far as striking differential characters are concerned, in this case the peculiar, calyprate, circumscissily deciduous calyx-limb, *Cleistocalyx* is much more sharply differentiated from *Eugenia* than are *Jambosa* and *Syzygium*, and hence has stronger claims to generic recognition than either of these groups.

EUGENIA ALCINAE Merr. in Philip. Journ. Sci. 10 (1915) Bot. 216.

BRITISH NORTH BORNEO, Tawau, *Villamil* 371, May 28, 1917, on the banks of the Sempang Tiga River, at low altitudes; Jesselton, *Yates* 71, October 8, 1917.

Both specimens are an excellent match for the type, which was from northern Palawan.

EUGENIA VILLAMILII sp. nov. § *Syzygium*.

Arbor parva, glabra, ramis ramulisque laevis, pallide-brunneis, teretibus, ramulis circiter 2.5 mm diametro; foliis oppositis, oblongis, chartaceis, utrinque subaequaliter angustatis, usque ad 20 cm longis, supra olivaceis, subtus pallidioribus, utrinque nitidis, epunctatis, apice tenuiter acuminatis, basi acutis, nervis primariis utrinque circiter 20, tenuibus, secundariis reticulisque obscuris, laxis; inflorescentiis terminalibus, circiter 5 cm longis, corymbosis, e basi ramosis, plerumque trichotomis; floribus parvis, alabastro obovoideo-obcuneao, circiter 4 mm longo, in ramulis ultimis subcapitatim dispositis, petalis omnibus connatis, calyptratim deciduis.

A small tree, glabrous throughout, the branches and branchlets terete, slender, smooth, pale-brownish. Leaves opposite, chartaceous, oblong, about 20 cm long, 5 to 6 cm wide, subequally narrowed to the acute base and to the slenderly acuminate apex, the acumen 1 to 1.5 cm long, blunt, both surfaces shining, the upper olivaceous, the lower paler, epunctate; midrib impressed on the upper surface, prominent beneath; primary lateral nerves slender, slightly or scarcely raised on the lower surface, spreading, anastomosing close to the margin with the marginal nerves,

about 20 on each side of the midrib, the secondary nerves and reticulations lax, indistinct; petioles 1 to 1.5 cm long. Inflorescence terminal, corymbose, branched from the base, about 5 cm long, 5 to 6 cm wide across the top, the branches mostly trichotomous, pale-olivaceous, shining, subterete. Flowers numerous, crowded at the tips of the ultimate branchlets, 5 to 7 on each branchlet, sessile, the buds obovoid-obcuneate, about 4 mm long, the calyx terete, brown and slightly rugose when dry, the throat about 2.5 mm in diameter, the limb truncate, produced about 1.8 mm above the ovary. Petals wholly united into a deciduous calyptra about 2.5 mm in diameter. Filaments numerous, 3 to 5 mm long.

BRITISH NORTH BORNEO, Kalabakan watershed, in forests along the Pinajos River, *Villamil 229*, October 3, 1916, altitude about 4 meters.

The striking characters of this species are its oblong, chartaceous, epunctate, slenderly nerved leaves, terete branchlets, and terminal corymbose inflorescences which are branched from the base.

ARALIACEAE

SCHEFFLERA Forster

SCHEFFLERA BIPALMATIFOLIA sp. nov.

Frutex glabra, vel inflorescentiis leviter furfuraceis; foliis longissime petiolatis, bipalmatis, radiis primariis 6 vel 7, petiolis primariis usque ad 18 cm longis, quisque 3- ad 5-foliolatis, foliolis longe petiolulatis, oblongo-ovatis ad oblongo-ellipticis, tenuiter acuminatis, integris, chartaceis, nervis utrinque 8 ad 10; inflorescentiis terminalibus, breviter pedunculatis, ramis confertis, usque ad 30 cm longis; floribus fasciculatis, numerosis, subsessilibus, 5-meris; fructibus subellipsoideis, sulcatis, 4 mm longis, 5-locellatis.

A glabrous shrub, or the inflorescences somewhat furfuraceous. Leaves long-petioled, bipalmately compound, the primary divisions 6 or 7, their partial petioles up to 18 cm in length, each bearing from 3 to 5 palmately arranged leaflets; leaflets chartaceous, greenish-olivaceous, shining, entire, oblong-ovate to oblong-elliptic, 15 to 25 cm long, 7 to 11 cm wide, slenderly acuminate, base rounded to subacute; lateral nerves 8 to 10 on each side of the midrib, prominent; petiolules 2 to 6 cm long. Inflorescences terminal, shortly peduncled, the rachis slightly prolonged, the simple branches crowded, each subtended by a lanceolate, acuminate, somewhat furfuraceous bract up to 2.5 cm long, the individual branches in anthesis up to 30 cm long, longer and glabrous in fruit, the flowers very numerous, crowded

in distinct fascicles along the entire length of the primary branches, subsessile, 6 to 10 in a fascicle. Pedicels very short. Calyx turbinate, truncate, about 1.5 mm long. Petals 5, valvate, triangular-ovate, acute, 1.7 mm long. Stamens 5; filaments 4 mm long. Ovary 5-celled. Fruits elliptic-ovoid, 4 mm long, longitudinally 5-sulcate, 5-celled.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, Mrs. Clemens 10072 (type), 10060, November 2 and 6, 1916, fruits orange-red; growing near streams.

This species is remarkable for its vegetative and inflorescence characters. It is in the group with *Schefflera heterophylla* (Seem.) Harms, of the Malay Peninsula and Java, but the inflorescences of the two species are entirely different.

SCHEFFLERA BORNEENSIS sp. nov.

Frutex, inflorescentiis leviter pubescentibus exceptis glaber; foliis 5-foliolatis, longe petiolatis, foliolis ellipticis ad elliptico-ovatis, chartaceis ad coriaceis, integris, in siccitate pallidis vel brunneis, nitidis, utrinque concoloribus, usque ad 20 cm longis, subabrupte caudato-acuminatis, basi acutis ad rotundatis, nervis utrinque 5 ad 7, subtus perspicuis, curvatis, reticulis utrinque distinctis; inflorescentiis terminalibus, leviter pubescentibus, rhachibus 2 ad 3 cm longis, ramis primariis numerosis, adscendentibus vel patulis, 7 ad 20 cm longis; floribus 5-meris, breviter pedicellatis, umbellis in ramis primariis racemose dispositis, brevissime pedunculatis.

A shrub, glabrous except the inflorescence, which is sparingly pubescent with weak, cinereous, simple hairs. Leaves 5-foliate, their petioles 10 to 20 cm long, inflated and clasping at the base; leaflets elliptic to elliptic-ovate, chartaceous to coriaceous, entire, pale to brownish and shining when dry, of the same color on both surfaces, 12 to 20 cm long, 6 to 12 cm wide, apex rather abruptly caudate-acuminate, the acumen about 2 cm long, the base acute to rounded; lateral nerves 5 to 7 on each side of the midrib, distant, curved, anastomosing, prominent on the lower surface, the reticulations distinct on both surfaces; petiolules 1.5 to 5 cm long. Inflorescences terminal, the rachis 2 to 3 cm long, often stout, sparingly pubescent, bearing from 6 to 12 spreading to ascending primary branches, each branch subtended by a lanceolate, acuminate, membranaceous bract up to 1.5 cm in length, the branches 8 to 12 cm long, sparingly pubescent. Umbels about 10-flowered, racemosely arranged along the primary branches, their peduncles about 1 mm long, the subtending bracts lanceolate, acuminate, 2 mm long. Pedicels about 2 mm long. Flowers 5-merous. Calyx turbinate.

Petals 5, broadly ovate, acute, 1.5 mm long, valvate. Filaments 3 mm long. Fruit subellipsoid, 5 mm long, deeply 5-sulcate, 5-celled, crowned by the stellately arranged sessile globose stigmas.

SARAWAK, vicinity of Kuching, *Native collector* 798 (type), 797, 1875 *Bur. Sci.*, July and August, 1911, Rock Road, near Kuching. Perhaps referable here are also *Native collector* 1275, 1717 *Bur. Sci.*, but the former is very imperfect, and the latter has longer primary branches of the inflorescence, and distinctly longer peduncled umbels.

The alliance of this species is apparently with *Schefflera gracilis* (Blume) Vig., from which it is easily distinguished by its larger, caudate-acuminate leaflets.

SCHEFFLERA CALYPTRATA sp. nov.

Frutex, inflorescentiis junioribus furfuraceis exceptis glaber; foliis 3-foliolatis, breviter crasseque petiolatis, foliolis coriaceis, rigidis, oblongis, nitidis, laevis, usque ad 22 cm longis, acuminatis, basi obtusis ad subacutis, nervis utrinque 10 ad 12; paniculis terminalibus, ramis paucis, usque ad 14 cm longis; umbellis in ramis primariis racemose dispositis, paucifloris, floribus plerumque 6-meris, breviter pedicellatis, calycis turbinatis vel infundibuliformibus, truncatis, petalis omnibus connatis, calyptratim deciduis.

A shrub, glabrous except the inflorescences, which in anthesis are distinctly furfuraceous. Branches rugose when dry. Leaves 3-foliolate, their petioles stout, 2 cm long or less, the hard, cylindric, often somewhat curved, sheathing stipules exceeding the petioles. Leaflets thickly coriaceous, rigid, oblong, smooth and shining, 11 to 22 cm long, 5 to 9 cm wide, apex rather abruptly and sharply acuminate, base obtuse to subacute, brownish-olivaceous when dry, the lower surface paler than the upper; lateral nerves 10 to 12 on each side of the midrib, somewhat curved, not prominent, the reticulations obsolete or subobsolete; petiolules stout, about 3.5 cm long. Panicles terminal, furfuraceous, shortly peduncled, branched from near the base, each panicle with but two or three branches, these up to 14 cm in length. Flowers in few-flowered, racemosely disposed umbels, the peduncles opposite, verticillate or alternate, up to 1.5 cm long, 5 to 8 flowers in an umbel, their pedicels glabrous, 4 to 5 mm long, rather stout. Calyx turbinate, truncate, about 2.5 mm long. Petals wholly united into an ovoid, rounded calyptra up to 4 mm in length, which is circumscissily deciduous. Anthers usually 6, oblong, obtuse, 3 mm long. Ovary 6- or 7-celled.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, *Mrs. Clemens* 10180, November 1, 1915.

With the specimen is a detached fruiting branch about 30 cm in length,

which is dark-brown and entirely glabrous. The fruits are ovoid-ellipsoid, somewhat sulcate, brown, about 6 mm in diameter, 6- or 7-seeded.

The species is well characterized by its thick, rigid leaflets, which are three in number and with stout petiolules; its unusually stout, short petioles; its elongated rigid stipules; and its petals wholly connate into a deciduous calyptra, the latter character an anomalous one in the genus.

SCHEFFLERA PACHYPHLEBIA sp. nov.

Frutex vel arbor parva, glabra; foliis 6-foliolatis, stipulis coriaceis, oblongis amplexicaulibus, usque ad 2.5 cm longis, ramis saepe incrassatis; foliolis coriaceis, ellipticis, usque ad 10 cm longis, brevissime acuminatis, basi acutis, nitidis, margine revolutis, integris vel versus apicem parciissime serratis, nervis utrinque circiter 6, subtus cum reticulis elevatis valde prominentibus; inflorescentiis terminalibus, umbellis racemose dispositis, pedunculatis; floribus plerumque 5- vel 6-meris; fructibus purpureis, in siccitate atro-brunneis, circiter 6 mm diametro, sulcatis, locellis usque ad 7, seminibus plerumque 4 vel 5.

A shrub or small tree, entirely glabrous, the branchlets often thickened. Leaves 6-foliolate, their petioles about 4 cm long, the stipules oblong, coriaceous, obtuse, up to 2.5 cm long, clasping the stems; leaflets elliptic, coriaceous, usually dark-colored when dry, 7 to 10 cm long, 4 to 5 cm wide, base acute to rounded, apex shortly acuminate, margins revolute, entire or somewhat serrate near the apex, shining when dry, the lower surface sometimes slightly glaucous; petiolules 1.5 to 2 cm long; lateral nerves about 6 on each side of the midrib, very prominent on the lower surface as are the raised primary reticulations. Inflorescence terminal, consisting of from one to several partial inflorescences up to 10 cm in length, these partial inflorescences of racemosely disposed umbels. Umbels alternate, opposite, or verticillate, their peduncles 1 to 1.5 cm long, each 6- to 12-flowered, the pedicels about 5 mm long. Flowers mostly 5- or 6-merous. Calyx turbinate, truncate, about 3 mm long. Petals free, valvate, oblong-ovate, acute, 3.5 mm long. Filaments about 4 mm long. Fruit dark-purple when ripe, dark-brown when dry, ovoid, about 6 mm long, sulcate, 5- to 7-celled, usually 5- or 4-seeded.

BRITISH NORTH BORNEO, Mount Kinabalu, Paka Cave, *Mrs. Clemens 10592* (type), November 12, 1915, *Haslam*, August, 1916.

This species is characterized by its prominently nerved, coriaceous, reticulate leaflets, and its greatly produced, coriaceous stipules.

SCHEFFLERA TETRANDRA sp. nov.

Frutex vel arbor parva, inflorescentiis parce stellato-pubescentibus; foliis plerumque 5-foliolatis, foliolis chartaceis ad coriaceis, oblongo-ellipticis ad oblongo-lanceolatis, in siccitate brunneis vel

pallidis, integris, basi acutis, apice tenuiter subcaudato-acuminatis, usque ad 14 cm longis, nervis primariis utrinque circiter 8, quam secundariis vix magis distinctioribus; inflorescentiis terminalibus, rhachibus haud productis, ramis primariis 5 ad 7, adscendentibus, 20 ad 40 cm longis; umbellulis paucifloris, breviter pedunculatis, racemose dispositis; floribus plerumque 4-meris, parvis.

A shrub or a small tree, glabrous except the sparingly stellate-pubescent inflorescences. Leaves palmately 5-foliolate, their petioles 5 to 13 cm long, inflated and clasping at the base; leaflets oblong-elliptic to oblong-lanceolate, chartaceous to coriaceous, entire, pale to brownish when dry, of about the same color on both surfaces, shining, base acute, apex slenderly caudate-acuminate, 8 to 14 cm long, 3 to 4.5 cm wide; primary lateral nerves about 8 on each side of the midrib, distinct but scarcely more prominent than are the secondary nerves, more or less ascending and anastomosing with the extended basal pair of nerves forming a somewhat arched marginal pair extending nearly or quite to the apex, the reticulations distinct on both surfaces. Inflorescences terminal, the rachis not or but very slightly produced, the primary branches 5 to 7, 20 to 40 cm in length, each subtended by an oblong-ovate, acuminate, pale, coriaceous, somewhat pubescent bract 1.5 to 2 cm in length, the younger parts of the inflorescences stellate-pubescent with cinereous hairs, the older parts glabrous or nearly so. Umbels racemosely arranged on the primary branches, numerous, 5- to 10-flowered, their peduncles 2 to 10 mm long, or the uppermost ones sometimes sessile, the subtending bracts lanceolate, acuminate, 5 mm long or less. Pedicels usually about 2 mm long. Flowers mostly 4-merous, sometimes 5-merous, the petals about 2 mm long, wholly connate into a deciduous calyptra. Fruits 3 to 4 mm long, 4-, rarely 5-angled and sulcate, 4-, rarely 5-celled.

SARAWAK, near Sandakan, *Native collector* 183, 184, 185, 426, 799, 801, 505, 1763, 2707 *Bur. Sci.*; Lundu, *Foxworthy* 71, May, 1908 (type), with the native name *raka*.

The alliance of this species is apparently with *Schefflera subulata* (Miq.) Vig. but it has distinctly smaller, more numerous leaflets, longer racemes, and usually 4-merous flowers. It is apparently common in Sarawak.

CLETHRACEAE

CLETHRA Linnaeus

CLETHRA PACHYPHYLLA sp. nov.

Arbor parva, ramulis et inflorescentiis dense ferrugineo-villosis; foliis oblongis ad anguste oblongo-obovatis, crasse coriaceis,

usque ad 6 cm longis, acute acuminatis, basi cuneatis, margine irregulariter serrulatis, nervis utrinque 9 ad 12, valde prominentibus, subtus dense ferrugineo-pubescentibus, vetustioribus pallidis et minute puberulis; racemis usque ad 5 cm longis, floribus brevissime pedicellatis, bracteis lineari-lanceolatis, usque ad 8 mm longis.

A small tree, the branchlets and inflorescences densely ferruginous-villous, the branches rugose, brownish, glabrous. Leaves oblong to narrowly oblong-obovate, shortly and sharply acuminate, base cuneate, margins subentire to minutely and irregularly denticulate, thickly coriaceous, 5 to 6 cm long, 1.5 to 2 cm wide, the upper surface dark-brown, glabrous, and somewhat shining when dry, the midrib impressed, the lower surface densely ferruginous-pubescent, with intermixed villous hairs on the midrib and nerves, the older ones pale on the lower surface and minutely puberulent; lateral nerves 9 to 12 on each side of the midrib, very prominent, anastomosing; petioles pubescent, about 1 cm long. Racemes up to 5 cm in length, densely ferruginous-villous, the flowers somewhat crowded, shortly pedicelled, the bracts linear-lanceolate, thick, pubescent, up to 8 mm in length. Sepals oblong-ovate, acute to somewhat acuminate, ferruginous-pubescent, about 4 mm long. Petals (in bud) obovate, glabrous, about 3 mm long.

BRITISH NORTH BORNEO, Mount Kinabalu, Paka Cave to Lobang, Mrs. Clemens 10692, November 15, 1915.

The alliance of this species is manifestly with *Clethra luzonica* Merr., which it resembles in many characters. It is distinguished by its fewer-nerved, sharply acuminate, narrower leaves, which are much more pubescent than in the Philippine species, and in its villous branchlets and inflorescences. *Clethra pulgarensis* Elm., of Palawan, has very differently shaped, much broader leaves, which are not sharply acuminate.

CLETHRA CLEMENTIS sp. nov.

Arbor parva, plus minusve stellato-tomentosis; foliis oblongis ad oblongo-lanceolatis, usque ad 11 cm longis, chartaceis, acute acuminatis, basi acutis, margine subintegris ad irregulariter serrulatis, subtus parce stellato-tomentosis, nervis utrinque 10 ad 12, distinctis; paniculis stellato-pubescentibus, ramis 10 ad 20 cm longis; floribus numerosis, petalis obovatis, 3 mm longis, bracteis lineari-lanceolatis, 5 ad 7 mm longis, deciduis; capsulis depresso-globosis, 2.5 ad 3 mm diametro.

A small tree attaining a height of nearly 10 m, or in some habitats a shrub 1.5 to 2 m high, the younger parts stellate-pubescent, the indumentum usually ferruginous and often dense, the older branches glabrous. Leaves oblong to oblong-lanceolate,

chartaceous, 6 to 11 cm long, 1.5 to 3.5 cm wide, subequally narrowed upward to the acutely acuminate apex and below to the acute base, the margins subentire to irregularly serrulate, the upper surface brownish-olivaceous, glabrous or with scattered stellate hairs along the midrib and nerves when young, the lower surface paler, sparingly stellate-pubescent; lateral nerves 10 to 12 on each side of the midrib, distinct; petioles pubescent, 1 cm long or less. Panicles ferruginous- to subcinereous-pubescent, the indumentum dense, short, stellate, the branches often slender, 10 to 20 cm in length, the buds on young branches crowded and subtended by the conspicuous bracts, in anthesis somewhat scattered, their pedicels up to 3 mm in length and persistent after the flower falls, the bracts deciduous, linear-lanceolate, densely pubescent, 5 to 7 mm long. Flowers white or greenish-white, numerous. Sepals ovate to oblong-ovate, 2 to 2.5 mm long, somewhat acuminate, densely pubescent. Petals obovate, glabrous, 3 mm long. Ovary pubescent; style 2 mm long. Fruit depressed-globose, 2.5 to 3 mm in diameter.

BRITISH NORTH BORNEO, Mount Kinabalu, Kibayo to Keung, *Mrs. Clemens* 9859, 9826, October 29, 1915; Mount Kalawat, *Mrs. Clemens* 11148 (type), December 10, 1915, common.

It is suspected that this is the form reported from Borneo by Stapf and by Miss Gibbs as *Clethra canescens* Reinw., but it is remarkably distinct from Reinwardt's species as I understand it, and as interpreted by J. J. Smith from Javan and Celebes material; Reinwardt's type was from Celebes, and no satisfactory description of it was published until 1914.⁴ *Koorders* 19280 from Celebes unquestionably represents Reinwardt's species, and represents a species from which I am now of the opinion that *Clethra williamsii* C. B. Rob. of Mindanao cannot be distinguished. It has coriaceous leaves, with from 17 to 20 pairs of lateral nerves, while the form above described has at most chartaceous leaves with but 10 to 12 pairs of lateral nerves. *Clethra clementis* Merr. is distinctly more closely allied to the Philippine *C. lancifolia* Turcz., than to *C. canescens* Reinw.

MYRSINACEAE

MAESA Forskal

MAESA SUBCAUDATA sp. nov.

Frutex glaber, ramis ramulisque teretibus, elenticellatis; foliis oblongo-ellipticis ad oblongo-obovatis, usque ad 20 cm longis, membranaceis, basi acutis vel decurrento-acuminatis, apice tenuiter subcaudato-acuminatis, margine perspicue subrepandodentatis, nervis utrinque 10 ad 12, perspicuis, subtus minutissime subrubiginoso-puncticulatis, obscure reticulatis, lineis ner-

⁴J. J. Smith in *Koorders & Valetton Bijdr. Boomsoort. Java Meded. Dept. Lanbouw* 18 (1914) 87.

villiformibus destitutis; racemis axillaribus, solitariis vel binis, usque ad 2.5 cm longis, paucifloris; floribus 5-meris, urceolatis, circiter 4 mm longis, calycis perspicue lineatis, lobis ovatis, obtusis, glabris, integris; petalis $\frac{3}{2}$ connatis, lineatis, lobis circiter 1 mm longis, obtusis ad subacutis.

A glabrous shrub, the branches and branchlets elenticellate, terete, brownish. Leaves oblong-elliptic to oblong-obovate, membranaceous, rather pale when dry, slightly shining, 15 to 20 cm long, 6.5 to 9 cm wide, base acute to decurrent-acuminate, apex slenderly subcaudate-acuminate, the acumen acute, about 1.5 cm long, the margins rather prominently subrepand-dentate, the lower surface very minutely subrubiginous-punctulate; lateral nerves 10 to 12 on each side of the midrib, prominent, somewhat ascending, the reticulations inconspicuous; petioles about 1.5 cm long. Racemes axillary, simple, solitary or in pairs, up to 2.5 cm long, few-flowered. Flowers 5-merous, about 4 mm long, the pedicels 3 mm long, the bracteoles 2, oblong, less than 1 mm long. Calyx-tube and lobes prominently lineate, the lobes ovate, obtuse, entire, 1.3 to 1.5 mm long. Corolla prominently lineate, the tube about 2 mm long, the lobes broadly ovate, obtuse to subacute, about 1 mm long. Stamens attached at about the middle of the tube, the filaments about as long as the anthers.

BRITISH NORTH BORNEO, *Villamil* 234, June, 1917.

This species is strongly characterized by being entirely glabrous; by its rather large, membranaceous, rather prominently subrepand-dentate, subcaudate-acuminate, rather many-nerved leaves, which are minutely subrubiginous-punctulate; and its short, few-flowered, simple racemes, the flowers being 5-merous and prominently lineate. It is perhaps as closely allied to *Maesa laevigata* Scheff. as to any other known species.

MAESA CLEMENTIS sp. nov.

Frutex, ramulis junioribus inflorescentiisque parcissime puberulis exceptis glaber, ramis ramulisque in siccitate brunneis, teretibus, parce lenticellatis; foliis oblongo-ovatis ad oblongis, usque ad 11 cm longis, membranaceis ad chartaceis, pallide olivaceis, basi rotundatis ad subacutis, apice distincte acuminatis, nervis utrinque circiter 8, perspicuis, subtus haud punctulatis, lineis nervilliformibus manifestis auctis, margine distanter subrostrato- vel apiculato-dentatis; inflorescentiis axillaribus, depauperato-paniculatis, petiolo subaequantibus; floribus 5-meris, circiter 3 mm longis, calycis lobis lineatis, ovatis, acuminatis, 1 mm longis, margine minutissime ciliatis; petalis usque ad $\frac{3}{2}$ connatis, lobes lineatis, orbiculari-reniformibus, rotundatis; filamentis quam antheris 3- vel 4-plo longioribus.

A shrub, glabrous except the very slightly puberulent branch-

lets and inflorescences. Branches and branchlets brown when dry, slender, terete, more or less lenticellate, slightly striate. Leaves membranaceous to chartaceous, oblong-ovate to oblong, 7 to 11 cm long, 2.5 to 5 cm wide, pale-olivaceous and shining when dry, the base rounded to acute, the apex distinctly acuminate, the margins distantly dentate with short, stout, blunt, subrostrate or apiculate teeth, the basal parts entire or nearly so; lateral nerves about 8 on each side of the midrib, prominent, curved, scarcely anastomosing, the nerves and their ultimate branches ending in marginal teeth, the reticulations indistinct, the lower surface with numerous, manifest, nerve-like lines; petioles 0.8 to 1.3 cm long. Inflorescences axillary, about as long as the petioles, depauperate-paniculate, rather few-flowered. Flowers white or cream-colored, 5-merous, about 3 mm long, their pedicels 2 mm long, the bracteole subtending the pedicels oblong, acuminate, less than 1 mm long, the two prophyllae subtending the flower similar to the bracteoles but slightly smaller. Calyx distinctly lineate, the lobes ovate, acuminate, about 1 mm long, their margins very minutely ciliate. Petals connate for about two-thirds their length, the tube not lineate, the lobes subreniform-ovate, rounded, lineate, about 0.8 mm long and 1.5 mm wide. Filaments attached near the base of the tube, three to four times as long as the anthers.

BRITISH NORTH BORNEO, Mount Kinabalu, Minitindok and Lobang Gorges, and Kiau, *Mrs. Clemens 10494* (type), 10102, 10462, November 19 and 29, 1915.

The alliance of this species is with *Maesa montana* A. DC., from which it differs notably in its differently shaped, shortly acuminate leaves, and numerous other characters.

MAESA CONFERTA sp. nov.

Species ut videtur *M. japonicae* affinis. Frutex glaberrimus, ramis nitidis, griseis vel brunneis; foliis submembranaceis vel chartaceis, oblongo-ovatis ad oblongo-lanceolatis, usque ad 17 cm longis, nitidis, epunctulatis, basi subacutis, apice tenuiter acuminatis, margine distanter apiculato-dentatis vel subintegris, nervis utrinque 5 vel 6, curvato-adscendentibus, perspicuis, anastomosantibus; infructescentiis axillaribus, quam petiolis brevioribus, fructibus valde confertis, ovoideis, circiter 5 mm longis, perspicue longitudinaliter striato-lineatis; calycis lobis 5, ovatis, obtusis ad subacutis, lineatis, glabris, integris, circiter 1.5 mm longis.

An entirely glabrous shrub, the branches terete, grayish to brownish, shining, elenticellate. Leaves submembranaceous to chartaceous, pale-olivaceous and shining when dry, not punctu-

late, oblong-ovate to oblong-lanceolate, 12 to 17 cm long, 4 to 6.5 cm wide, base subacute, the apex slenderly acuminate, the acumen subacute, up to 2 cm in length, the margins very distantly apiculate-dentate, the teeth always short, sometimes obsolete and the margins entire or nearly so; lateral nerves 5 or 6 on each side of the midrib, rather prominent, curved-ascending, anastomosing, the reticulations lax, indistinct; petioles about 1 cm long. Infructescences axillary, shorter than the petioles, of solitary or paired, simple racemes, the rachis 5 mm long or less. Fruits ovoid, brown, about 5 mm long, prominently striate-lineate, their pedicels 2 mm long or less, the bracteoles minute, 0.4 mm long or less. Persistent calyx-teeth 5, ovate, obtuse to subacute, entire, glabrous, prominently lineate, 1.5 mm long. Seeds numerous, sharply angled, quadrangular, about 1 mm in diameter.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, *Mrs. Clemens* 9969 (type), 9968, November 29, 1917, "fruit greenish-brown, pale-striped."

While the flowers of this species are unknown, I feel rather confident that its alliance is with *Maesa japonica* (Thunb.) Moritzi, which it resembles in its vegetative characters and especially in its fruits. It is well characterized by its very short infructescences, which are distinctly shorter than the petioles, and its crowded fruits.

ARDISIA Swartz

ARDISIA MOULTONII sp. nov. § *Tinopsis*.

Frutex vel arbor, ramis griseis, teretibus, glabris, ramulis junioribus et inflorescentiis dense brunneo- vel castaneo-furfuraceis; foliis oblongis, coriaceis, nitidis, epunctatis, integris, usque ad 20 cm longis, basi acutis, apice acuminatis, nervis primariis utrinque circiter 35, distinctis vel indistinctis; inflorescentiis terminalibus, usque ad 12 cm longis, tripinnatim paniculatis, floribus in ramulis ultimis subumbellatim dispositis, confertis, breviter et crasse pedicellatis, calycis tubo obconico, 3 ad 4 mm longo, lobis late ovatis, valde imbricatis, acutis vel acuminatis, circiter 6 mm longis, coriaceis, obscure punctatis, margine ciliatis.

A shrub or tree, glabrous except the distinctly and rather densely brownish- to castaneous-lepidote branchlets and inflorescences, the leaves often minutely lepidote. Branches terete, grayish. Leaves alternate, oblong, coriaceous, somewhat shining, brownish-olivaceous, of about the same color on both surfaces, epunctate, 12 to 20 cm long, 2.5 to 7 cm wide, subequally narrowed to the acute base and the somewhat acuminate apex, entire, the midrib somewhat impressed on the upper surface, very prominent on the lower surface; lateral nerves about 25

on each side of the midrib, distinct or indistinct, sometimes obscure, spreading, curved, anastomosing, the reticulations usually very obscure; petioles about 1 cm long. Inflorescences terminal, tripinnately paniculate, up to 12 cm in length, the branches racemously arranged, alternate, the lower ones subtended by reduced leaves and up to 5 cm in length, the flowers umbellately arranged at the tips of the ultimate branchlets, crowded, 5 to 7 in an umbel, subsessile or pedicellate, the pedicels stout, up to 4 mm in length, the subtending bracteoles lanceolate, 3 to 5 mm in length, the bracts similar but larger. Calyx-tube obconic, 3 to 4 mm long, the lobes broadly ovate to suborbicular-ovate, acute to somewhat acuminate, undulate, coriaceous, obscurely punctate, the margins somewhat ciliate, about 6 mm long, very prominently imbricate, the outer basal part often distinctly rounded-auricled. Petals ovate, subcoriaceous, about 6 mm long, somewhat acuminate, scarcely punctate. Anthers acuminate, 3 mm long. Ovary glabrous; style 4 to 5 mm long, included in bud.

SARAWAK, Siol, and other localities, *Native collector 156, 372, 673 (type), 1631, 2350 Bur. Sci.*, the type collected June 1, 1911.

The alliance of this species is apparently with *Ardisia lanceolata* Roxb. and *A. nitidula* Mez. It is well characterized by its crowded, umbellately arranged, subsessile to shortly pedicelled flowers; its distinctly elongated calyx-tube; and its prominently imbricate sepals. It is dedicated to Captain J. C. Moulton, formerly director of the SARAWAK Museum, under whose supervision extensive botanical collections were made for the Bureau of Science.

ARDISIA SARAWAKENSIS sp. nov. § *Tinopsis*.

Arbor 6 ad 7 m alta, glabra; foliis alternis, coriaceis, oblongis, circiter 20 cm longis, in siccitate purpureo-brunneis, nitidis, minute undulatis, apice obtusis, basi acutis, utrinque perspicue punctatis, nervis primariis utrinque circiter 25, patulis, anastomosantibus, subtus prominulis, reticulis laxis; paniculis terminalibus, pedunculatis, circiter 10 cm longis, pyramidatis, bipinnatim paniculatis, floribus in ramulis primariis subumbellatim dispositis; sepalis elliptico-ovatis, acutis vel obtusis, perspicue glandulosis, margine leviter ciliatis, circiter 3 mm longis, imbricatis; petalis ovato-lanceolatis, acuminatis, 6 mm longis, supra parce punctatis, infra densissime puncticulatis.

A tree, 6 to 7 m high, entirely glabrous. Branches terete, purplish-brown, rugose. Leaves alternate, oblong, coriaceous, purplish-brown when dry, shining, about 20 cm long, 4 to 5.5 cm wide, entire, subequally narrowed to the obtuse apex and the acute base, both surfaces conspicuously punctate-glandular,

the glands distinctly visible to the naked eye; primary lateral nerves about 25 on each side of the midrib, spreading, anastomosing, distinct on the lower surface, the reticulations lax; petioles stout, about 5 mm long. Panicles terminal, pyramidal, peduncled, about 10 cm long, bipinnate, the flowers subumbellately arranged at the tips of the primary branches, the branches alternate, the lower ones 3 cm long or less. Flowers pink, 6 to 12 in each umbel, their pedicels 7 to 9 mm long. Sepals elliptic-ovate, acute or obtuse, about 3 mm long, prominently glandular, margins sparingly ciliate, distinctly imbricate in the basal parts, nearly free. Petals ovate-lanceolate, acuminate, about 6 mm long and 3 mm wide, the upper part with few, scattered, large glands, the median portion of the lower half densely punctate-glandular with small glands. Anthers oblong-lanceolate, acuminate, about 4 mm long, the connectives not glandular. Ovary ovoid, glabrous; style 4.5 mm long, not exerted in bud.

SARAWAK, Mount Poe, *Foxworthy 201*, May 24, 1908, altitude about 1,300 meters.

This species falls in the group with *Ardisia lanceolata* Roxb., but is not closely allied to that species. It is well characterized by its purplish-brown, oblong, obscurely undulate, prominently punctate, short-petioled, obtuse leaves.

ARDISIA PYGMAEA sp. nov. § *Bladhia*.

Suffrutex usque ad 20 cm altus, glaber, caulibus simplicibus, erectis vel infra decumbens; foliis confertis, obovatis ad oblongo-obovatis, integris, usque ad 13 cm longis, chartaceis ad subcoriaceis, apice rotundatis, basi acutis vel subacutis, breviter petiolatis, nervis utrinque 12 ad 15, distinctis; inflorescentiis in axillis superioribus, usque ad 8 cm longis, simpliciter racemosis; calycis lobis ovatis, acuminatis, perspicue glandulosis, margine ciliatis, circiter 1.5 mm longis; fructibus globosis, glabris, circiter 6 mm diametro.

A dwarfed, erect, simple undershrub about 20 cm high, the stems erect or decumbent below, woody, up to 5 mm in diameter, dark-brown. Leaves crowded toward the apices of the stems, olivaceous, chartaceous to subcoriaceous, obovate to oblong-obovate, 8 to 13 cm long, 4 to 5.5 cm wide, glabrous, epunctate or with but few glands, apex broadly rounded, narrowed below to the acute or subacute base, the margins entire; lateral nerves 12 to 15 on each side of the midrib, distinct; petioles 4 to 7 mm long. Racemes simple, erect, up to 8 cm long, in the upper axils, glabrous. Pedicels 3 to 4 mm long, recurved, the subtending bracteoles ovate to oblong-ovate, prominently glandular, up

to 2.5 mm in length. Calyx about 5 mm in diameter, the lobes ovate, acuminate, about 1.5 mm long, prominently glandular, margins ciliate. Fruits globose, glabrous, about 6 mm in diameter, the styles slender, 3 to 4 mm long.

SARAWAK, *Native collector* 672, 424, 1448, 1178 (type) *Bur. Sci.*, one of the specimens from Matang Road, July 25, 1911, the others not localized.

This very characteristic species is somewhat anomalous in the section *Bladhia* in its racemose inflorescences, entire leaves, and in being glabrous throughout. It does not appear to be closely allied to any previously described species of the genus.

ARDISIA LUCIDA sp. nov. § *Pimelandra*.

Arbor circiter 8 m alta, novellis minutissime ferrugineo-tomentosis exceptis glabra; foliis oblongis, chartaceis, nitidis, usque ad 13 cm longis, alternis, supra subolivaceis, subtus pallide brunneis, utrinque subaequaliter angustatis, acuminatis, integris, epunctatis, nervis utrinque circiter 14, curvatis, anastomosantibus, supra plerumque impressis, subtus prominulis; inflorescentiis axillaribus, circiter 2 cm longis, bipinnatim paniculatis, e basi ramosis, floribus umbellatim dispositis; calycis lobis oblongis, acutis, 1.2 mm longis, leviter furfuraceis, margine minute ciliatis, eglandulosis.

A tree about 8 m high, glabrous except the minutely ferruginous-tomentose growing tips of the branchlets. Branches terete, brownish, smooth. Leaves alternate, chartaceous, shining on both surfaces, the upper surface subolivaceous, the lower pale-brownish, epunctate, oblong, 9 to 13 cm long, 2.5 to 5 cm wide, subequally narrowed to the acute or somewhat acuminate base and the distinctly acuminate apex; primary lateral nerves about 14 on each side of the midrib, usually impressed on the upper surface, prominent on the lower surface, curved, anastomosing, the reticulations close, not prominent; petioles 9 to 13 mm long. Panicles bipinnate, branched from the base, axillary, about 2 cm long, solitary, lax, few-flowered, the flowers umbellately disposed, the pedicels, in fruit, about 5 mm long. Calyx slightly furfuraceous, about 4 mm in diameter, the lobes oblong, acute, about 1.2 mm long, eglandular, margins slightly ciliate. Fruits globose, glabrous, about 5 mm in diameter.

BRITISH NORTH BORNEO, Mount Kinabalu, Lobang and Minitindok Gorges, *Mrs. Clemens* 10435 (type), 10331, November 15 and 19, 1915.

This species, a characteristic one of the section *Pimelandra*, falls in the group with, and is most closely allied to, *Ardisia brachybotrys* Lauterb. & K. Schum. of New Guinea, from which it may be distinguished by its differently shaped, smaller leaves, its eglandular sepals, and its smooth, not tuberculate fruits.

ARDISIA DOLICHOSEPALA sp. nov. § *Crispardisia*.

Frutex glaber, vel ramulis et inflorescentiis parcissime pubescens; foliis alternis, oblong ad oblongo-lanceolatis, membranaceis, olivaceis, nitidis, usque ad 21 cm longis, utrinque subaequaliter angustatis, acuminatis, nigro-punctatis, margine irregulariter crenatis, nervis utrinque circiter 15, tenuibus; inflorescentiis subsessilibus vel pedunculatis, paucifloris, umbellatis; floribus 5-, rariter 6-meris, circiter 8 mm longis, sepalis membranaceis, lanceolatis, obtusis, 7 ad 8 mm longis, perspicue punctatis; petalis perspicue punctatis, oblongo-ovatis, sepalis aequilongis.

A glabrous shrub or the very young branchlets and inflorescences very slightly pubescent. Branches terete, brownish, rugose. Leaves alternate, membranaceous, olivaceous, shining, oblong to oblong-lanceolate, 12 to 21 cm long, 3 to 4.5 cm wide, subequally narrowed to the acute base and the blunt-acuminate apex, the margins irregularly crenate, conspicuously black-punctate; lateral nerves about 15 on each side of the midrib, slender, anastomosing, the reticulations very lax, indistinct; petioles 1 to 1.5 cm long. Umbels simple, in the upper axils, subsessile or pedunculate, the peduncles up to 3 cm in length, the pedicels about 1 cm long, ten or fewer flowers in each umbel. Flowers pink, about 8 mm long, the bracteoles oblong, glandular, up to 3 mm in length. Sepals membranaceous, lanceolate, obtuse, conspicuously glandular-punctate, 7 to 8 mm long, 1.6 to 2 mm wide, nearly glabrous, the margins sometimes with a few short hairs. Petals as long as the sepals, oblong-ovate, acuminate, conspicuously glandular-punctate, about 4 mm wide. Anthers oblong-ovate, subobtuse, 4 mm long, the connectives glandular. Ovary ovoid, glabrous; style slender, 7 mm long. Fruits red, brown when dry, subglobose, about 6 mm in diameter.

BRITISH NORTH BORNEO, Mount Kinabalu, Gurulau Spur, Minitindok Gorge, and Kiau, *Mrs. Clemens 10819* (type), *10486*, s. n., November 17 and 27, 1915.

The alliance of this species is with *Ardisia petocalyx* Scheff., from which it is distinguished by its vegetative and inflorescence characters. The flowers are occasionally 6-merous, but normally 5-merous. The sinuses of the crenulations bear the characteristic glands of the subgenus, the leaf-margin otherwise bearing a rather close row of black glands similar to those that are scattered over other parts of the leaf.

ARDISIA OBSCURINERVIA sp. nov. § *Tinus*.

Arbor, partibus junioribus minute furfuraceo-lepidotis exceptis glabra; foliis alternis, coriaceis, oblongis, usque ad 17 cm longis, in siccitate olivaceo-brunneis, opacis vel leviter nitidis, utrinque subaequaliter angustatis, basi acutis, apice leviter obtuse

acuminatis, epunctatis, nervis lateralibus valde obscuris, interdum obsoletis; inflorescentiis e axillis foliis reductis, paniculam foliaceam formans; floribus umbellatim dispositis; sepalis orbiculari-ovatis, 3 mm longis, imbricatis, obscure glandulosis vel eglandulosis, margine ciliatis; petalis elliptico-ovatis, 4 ad 5 mm longis, obtusis, epunctatis.

A tree, glabrous except the minutely furfuraceous-lepidote younger parts, the indumentum subferruginous, deciduous. Branches terete, grayish, glabrous. Leaves alternate, coriaceous, oblong, 12 to 17 cm long, 4 to 4.5 cm wide, those subtending the inflorescences greatly reduced and 3 to 5 cm in length, subequally narrowed to the acute base and the blunt-acuminate apex, brownish-olivaceous and dull or slightly shining when dry, of the same color on both surfaces, entire, epunctate, the midrib impressed on the upper surface, prominent beneath, the lateral nerves very slender, obscure, sometimes obsolete; petioles stout, rugose, pale, about 8 mm long. Inflorescences from the axils of reduced leaves toward the apices of the branches, forming a somewhat leafy panicle, all lateral, the individual inflorescences bipinnate, the flowers umbellately arranged at the tips of the branches, 5 to 7 flowers in a panicle, their pedicels 5 mm long or less, subtended by oblong bracteoles, the primary branches 1 cm long or less, subtended by oblong-lanceolate bracts up to 8 mm in length. Sepals 3 mm long, imbricate, orbicular-ovate, rounded, obscurely glandular, margins ciliate. Petals elliptic-ovate, 4 to 5 mm long, 3 mm wide, obtuse, glabrous, epunctate. Ovary depressed-globose, glabrous; style 5 mm long, included. Anthers oblong-ovate, acuminate, 3 mm long, the connectives not or very obscurely glandular.

SARAWAK, Lundu, *Foxworthy 34*, May 10, 1908, with the local name *gimá*.

The alliance of this species is apparently with *Ardisia pendula* Mez, from which it is distinguished, among numerous other characters, by its shorter petioles, epunctate leaves, erect or spreading, not pendulous inflorescences, and smaller flowers.

ARDISIA LANCIFOLIA sp. nov. § *Acrardisia*.

Frutex, ramulis junioribus dense cupreo-lepidotis, foliis subтус parce sed distincte lepidotis; foliis lanceolatis ad oblongo-lanceolatis, chartaceis, olivaceis, nitidis, usque ad 11 cm longis, integris, basi acutis, apice tenuiter acuminatis, epunctatis vel punctis paucis instructis, nervis utrinque circiter 10, tenuibus, anastomosantibus; inflorescentiis terminalibus, paucifloris, 2 ad 3 cm longis, floribus subumbellatim dispositis; calycis lobis oblongo-ovatis, obtusis, perspicue parce punctatis, margine ciliatis, cir-

citer 1 mm longis; petalis oblongo-ovatis, 3.5 mm longis, acuminatis, epunctatis vel cum glandulis 1 vel 2 instructis.

A shrub, the young branchlets and the inflorescences rather densely cupreous-lepidote, the leaves distinctly but sparingly lepidote on the lower surface. Branches terete, glabrous, brownish, slender. Leaves alternate, chartaceous, usually olivaceous when dry, shining, lanceolate to oblong-lanceolate, 5.5 to 11 cm long, 1.5 to 2.5 cm wide, entire, the base acute, apex slenderly but bluntly acuminate, eglandular or with few glands, the lower surface with scattered, brown or cupreous, minute scales; lateral nerves about 10 on each side of the midrib, slender, distinct, anastomosing; petioles 5 to 10 mm long. Inflorescence terminal, paniculate, few-flowered, more or less cupreous-lepidote, the flowers subumbellately arranged on the ultimate branchlets, usually but two or three to a branchlet, their pedicels 5 to 7 mm long. Calyx 3 mm in diameter, the lobes oblong-ovate, obtuse, ciliate on the margins, each lobe with 2 to 5 conspicuous glands. Petals oblong-ovate, acuminate, 3.5 mm long, eglandular or with one or two glands. Anthers oblong-lanceolate, acuminate, 2.5 mm long, the connectives slightly glandular. Ovary glabrous; style 2 to 2.5 mm long.

BRITISH NORTH BORNEO, Mount Kinabalu, Kemberanga and Gurulau Spur, *Mrs. Clemens 10518* (type), *10827*, November 15 and 27, 1915.

This is allied to both *Ardisia kinabaluensis* Merr. and *A. lepidotula* Merr., differing from the former conspicuously in its fewer-nerved leaves, and from the latter in its distinct nerves, widely scattered lepidote scales on the lower surface of the leaves, and other characters.

ARDISIA KINABALUENSIS sp. nov. § *Acrardisia*.

Frutex, partibus junioribus minute cupreo-lepidulotis; foliis alternis, olivaceis vel brunneo-olivaceis, nitidis, oblongis ad oblongo-ellipticis, usque ad 9 cm longis, obtuse acuminatis, basi acutis, utrinque punctis multis instructis, nervis utrinque circiter 18, tenuibus, distinctis; inflorescentiis terminalibus, circiter 4 cm longis, bipinnatim paniculatis, paucifloris, floribus in ramulis ultimis umbellatim dispositis; floribus circiter 1 cm diametro, calycis lobis oblongo-ovatis, obtusis, circiter 1 mm longis, parce punctatis, margine minute ciliatis; petalis 5 mm longis, oblongo-ovatis, acuminatis, parce glanduloso-punctatis.

A shrub, the very young parts distinctly but minutely cupreous-lepidote, the older parts entirely glabrous. Branches terete, brownish or reddish-brown, glabrous. Leaves alternate, subcoriaceous, olivaceous to brownish, shining, oblong to oblong-elliptic, 5 to 9 cm long, 2 to 4 cm wide, base acute, apex blunt-acuminate, margins entire, both surfaces with numerous, black

or dark-colored glands, these often visible to the naked eye; lateral nerves about 18 on each side of the midrib, slender, distinct on both surfaces; petioles 2 to 3 mm long. Panicles bipinnate, terminal, few-flowered, about 4 cm long, the flowers umbellately arranged at the tips of the ultimate branchlets, their pedicels up to 7 mm in length. Flowers (spread) about 1 cm in diameter. Calyx about 3 mm in diameter, the lobes oblong-ovate, obtuse, sparingly glandular, 1 mm long, their margins minutely ciliate. Petals 5 mm long, oblong-ovate, acuminate, sparingly glandular-punctate. Anthers oblong-lanceolate, acuminate, 3 mm long, the connectives not glandular. Ovary glabrous; style 3.5 mm long, not exerted in bud.

BRITISH NORTH BORNEO, Mount Kinabalu, Kemberanga, and Paka Cave to Low's Peak, ascending to an altitude of 3,350 meters, *Mrs. Clemens 10517* (type), *10663, 10663a*, November 12 to 15, 1915, *Haslam*, August, 1916.

This species is manifestly allied to the Philippine *Ardisia scabrida* Mez, from which it is distinguished, among other characters, by its thicker leaves, and obtuse, distinctly ciliate sepals.

ARDISIA LEPIDOTULA sp. nov. § *Acrardisia*.

Frutex circiter 1.5 m altus, ramulis et inflorescentiis et subtus foliis junioribus dense ferrugineo- ad cupreo-lepidotulis; foliis oblongis, petiolatis, chartaceis ad subcoriaceis, integris, usque ad 8 cm longis, brunneis vel olivaceis, basi acutis, apice distincte sed obtuse acuminatis, utrinque minutissime puncticulatis, nervis primariis utrinque circiter 12, tenuibus, indistinctis, interdum subobsoletis; inflorescentiis terminalibus, 2 ad 4 cm longis, paucifloris, tripinnatim paniculatis, floribus parvis, in ramulis ultimis umbellatim dispositis; sepalis oblongo-ovatis, obtusis, circiter 1 mm longis, glandulosis, margine leviter ciliatis; petalis parce glandulosis, circiter 3 mm longis.

A shrub about 1.5 m high, the young branchlets, lower surface of the younger leaves, and the inflorescences densely and minutely ferruginous- to cupreous-lepidulote, the very old leaves glabrous or nearly so. Branches terete, grayish-brown, rugose, glabrous. Leaves alternate, chartaceous to subcoriaceous, oblong, 4 to 8 cm long, 1.5 to 2.5 cm wide, entire, brownish or olivaceous and more or less shining when dry, base acute, apex distinctly but bluntly acuminate, the midrib usually impressed on the upper surface, prominent on the lower surface, both surfaces very minutely and obscurely punctulate; primary lateral nerves about 12 on each side of the midrib, very slender, usually obscure, often nearly obsolete; petioles about 5 mm long, ultimately glabrous, when young densely cupreous-lepidote. Panicles termi-

nal, 2 to 4 cm long, bipinnately paniculate, few-flowered, densely cupreous-lepidote, the primary branches few, 1 cm long or less, the flowers umbellately arranged on the ultimate branchlets, their pedicels 3 mm long or less. Sepals oblong, obtuse, about 1 mm long, not at all imbricate, margins minutely ciliate, glandular-punctate. Petals glabrous, oblong-ovate, subacute, sparingly glandular, about 3 mm long. Styles not at all exerted.

SARAWAK, Mount Poe, *Foxworthy 375, 386* (type), June 3, 1908, near the summit, altitude about 1,700 meters; Mount Santubong, *Native collector 2227 Bur. Sci.*

In the group of comparatively few species to which this form pertains, it is well characterized by its small inflorescences but more especially by its ferruginous to cupreous lepidote indumentum.

ARDISIA HOSEI sp. nov. § *Acrardisia*.

Arbor glabra, ramis ramulisque teretibus; foliis oblongis ad oblongo-lanceolatis, chartaceis, olivaceis, usque ad 20 cm longis, acuminatis, basi acutis, utrinque perspicue glandulosis, nervis primariis utrinque 15 ad 18, tenuibus; inflorescentiis terminalibus, pedunculatis, 10 ad 12 cm longis, bipinnatim paniculatis, paucifloris; floribus magnis, apertis circiter 2.5 cm diametro, racemose dispositis, pedicellis 1 ad 1.3 cm longis; sepalis sub anthesin apertis, haud imbricatis, oblongo-obovatis ad obovato-ellipticis, obtusis, glabris, perspicue nigro-punctatis, in alabastro valde imbricato; petalis circiter 1.2 mm longis, obtusis, glanduloso-punctatis, oblongo-ellipticis.

A glabrous tree, the branches and branchlets terete, reddish-brown, sparingly glandular-punctate. Leaves alternate, chartaceous, olivaceous, slightly shining, oblong to oblong-lanceolate, 13 to 20 cm long, 4 to 5 cm wide, base acute, apex somewhat acuminate, the acumen blunt, both surfaces conspicuously and rather densely glandular-punctate, the glands all alike in size, margins entire; primary lateral nerves 15 to 18 on each side of the midrib, slender, sometimes scarcely more prominent than are the secondary nerves; petioles 1 to 1.8 cm long. Panicles terminal, bipinnate, few-flowered, peduncled, 10 to 12 cm long, the flowers racemously arranged on the ultimate branches, the pedicels 1 to 1.3 cm long. Flowers unusually large for the genus, when spread about 2.5 cm in diameter. Sepals in bud strongly imbricate, in anthesis spreading, not at all imbricate, oblong-obovate to elliptic-obovate, entirely glabrous, conspicuously black-glandular, rounded or obtuse. Corolla-lobes nearly free, about 12 mm long, 5 mm wide, obtuse, glandular, oblong-elliptic. Fila-

ments about 3 mm long; anthers oblong-lanceolate, subcaudate-acuminate, 5 to 6 mm long, the connectives sparingly glandular.

SARAWAK, Baram District, Marudi, *Hose 585*, April, 1905.

This species is well characterized by its unusually large flowers, in the characters of these differing entirely from *Ardisia polyactis* Mez, to which it is apparently most closely allied; in vegetative characters it closely approximates Mez's species.

OLEACEAE

LINOCIERA Swartz

LINOCIERA MACROBOTRYS sp. nov.

Frutex glaber, ramulis laevis, teretibus, rubro-brunneis; foliis coriaceis, oblongis, subolivaceis, utrinque subconcoloribus, nitidis, usque ad 6 cm longis, subtus minute puncticulatis, utrinque acutis vel apice obscure acuminatis, nervis utrinque circiter 6, tenuibus, obscuris, interdum obsoletis vel subobsoletis, subtus leviter impressis, reticulis obsoletis; inflorescentiis usque ad 15 cm longis, amplis, multifloris, laxis, ramis inferioribus usque ad 9 cm longis quadripinnatim paniculatis; floribus tenuiter pedicellatis, 4-meris, circiter 4 mm longis, petalis basi leviter connatis, oblongis, obtusis.

A shrub 2 m high *fide* Foxworthy, entirely glabrous in all parts, the branches terete, smooth, reddish-brown, sometimes slightly glaucous. Leaves coriaceous, oblong, 5 to 6 cm long, 2 to 2.5 cm wide, subequally narrowed to the acute base and apex, or the apex slightly acuminate, margins usually recurved, entire, when dry subolivaceous to brownish-olivaceous, of about the same color and shining on both surfaces, the lower surface minutely puncticulate, the midrib impressed on the upper surface, somewhat prominent on the lower surface; lateral nerves very slender, obscure, sometimes obsolete or nearly so, about 6 on each side of the midrib, not anastomosing, the reticulations obsolete, often very slightly impressed on the lower surface; petioles about 5 mm long. Panicles terminal and lateral, ample, 4-pinnately paniculate, up to 15 cm in length, branched from near the base, the lower branches up to 9 cm in length, lax, many-flowered, the bracts deciduous, about 3 mm long, the rachis and branches reddish-brown when dry. Flowers yellowish, brown when dry, 4-merous, about 2 mm long, their pedicels 2 to 3 mm in length. Calyx-teeth triangular-ovate, acute, 0.5 mm long. Petals somewhat united, oblong, obtuse. Anthers 1.2 mm long, the connectives very broad.

SARAWAK, Mount Poe, *Foxworthy 369* (type), 290, June 3, 1908 in forests on the upper slopes of the mountain, altitude 1,500 to 1,700 meters, with the Dyak name *barungian batu*.

The striking characters of this species are its small, coriaceous, very obscurely nerved, non-reticulate leaves, and its unusually large panicles. It does not seem to be closely allied to any other described Malayan species.

LINOCIERA OLIGANTHA sp. nov.

Arbor glabra, vel bracteolis calycibusque parçissime pubescentibus, ramis ramulisque pallidis, teretibus; foliis oblongis, chartaceis ad subcoriaceis, usque ad 15 cm longis, in siccitate laevis, pallidis, nitidis, apice acuminatis, basi acutis, nervis utrinque circiter 8, tenuibus, supra saepe obsolete vel subobsoletis, subtus leviter prominulis, reticulis obsolete vel subobsoletis; inflorescentiis axillaribus, spiciformibus, solitariis vel binis, usque ad 1.5 cm longis, paucifloris; floribus circiter 5.5 mm longis, 4-meris, petalis involutis.

A tree, glabrous throughout or the bracteoles and calyces very obscurely pubescent. Branches and branchlets terete, slender, smooth, pale. Leaves opposite, oblong, chartaceous to subcoriaceous, eglandular, smooth, pale, and shining when dry, 10 to 15 cm long, 3.5 to 5 cm wide, subequally narrowed to the acute base and to the prominently but blunt-acuminate apex, the midrib impressed on the upper surface, somewhat prominent on the lower surface; lateral nerves about 8 on each side of the midrib, slender, not prominent, often obsolete or subobsolete on the upper surface, slightly projecting on the lower surface, obscurely anastomosing, the reticulations lax, indistinct, often obsolete or nearly so; petioles pale, stout, 4 mm long or less. Inflorescences spike-like, simple, axillary, solitary or in pairs, few-flowered, 5 to 15 mm long, all parts except the pale bracteoles dark-brown when dry, the bracteoles ovate, 1.2 mm long, usually slightly pubescent. Flowers opposite, subsessile, 5 to 5.5 mm long, 4-merous. Calyx-lobes broadly ovate, rounded, 0.4 mm long, often obscurely pubescent. Petals 4.5 mm long, slightly united at the base, oblong, involute, obtuse, glabrous. Filaments very short; anthers elliptic, about 1 mm long. Ovary glabrous.

BRITISH NORTH BORNEO, *Villamil 385* (type), June, 1917. I am also disposed to refer to this species *Hose 554* from Mount Trekan, Baram District, Sarawak, July, 1895, which closely resembles the type, differing in its even shorter inflorescences and more distinctly nerved leaves.

The alliance of this species is manifestly with *Linociera montana* (Blume) DC. of Java, from which it is distinguished, among other characters, by its slender lateral nerves being distinctly raised on the lower surface of the leaves.

LINOCIERA VERRUCULOSA sp. nov.

Arbor circiter 10 m alta, ramulis et inflorescentiis plus minusve subferrugineo-pubescent; foliis subcoriaceis, oblongis, usque ad 24 cm longis, breviter et abrupte subapiculato-acuminatis, basi acutis, in siccitate brunneis, nitidis, laevis, eglandulosis; nervis lateralibus utrinque 10 ad 12, supra impressis, subtus prominulis, anastomosantibus, reticulis laxissimis; paniculis lateralibus, 6 ad 8 cm longis, pubescentibus, bi- vel tripinnatis, floribus in ramulis subspicatis dispositis, 4-meris, calycis ovoideis, 1.2 mm longis; fructibus ellipsoideis, in siccitate atro-brunneis, junioribus circiter 1.3 cm longis, perspicue verrucosis.

A tree about 10 m high, the branchlets and inflorescences more or less ferruginous- or subferruginous-pubescent. Branches grayish, smooth, terete, the branchlets pale-brownish. Leaves oblong, subcoriaceous, 20 to 24 cm long, 7 to 8 cm wide, brown and shining when dry, somewhat paler on the lower surface than the upper, smooth, eglandular, the base acute, the apex abruptly and broadly subapiculate, the midrib and nerves impressed on the upper surface, prominent on the lower surface, the nerves 10 to 12 on each side of the midrib, prominent, anastomosing, the reticulations very lax; petioles 1 to 1.2 cm long. Panicles lateral, 6 to 8 cm long, peduncled or branched from near the base, bi- or tripinnate, the flowers subspicately crowded on the ultimate branchlets, 4-merous, subsessile or very shortly pedicelled, the bracts pubescent, 1.5 mm long or less. Calyx ovoid, about 1.2 mm long, the lobes ovate, obtuse, pubescent, 0.8 mm long. Corolla not seen. Fruits (immature) when dry blackish-brown, ellipsoid, about 1.3 cm long, very prominently verrucose, their pedicels about 2 mm long, much thicker than long.

BRITISH NORTH BORNEO, in forests along the Kalabakan River, *Villamil* 224, September 26, 1916, altitude about 3 meters.

This species is strikingly characterized by its prominently verrucose fruits, all other species of the genus known to me having smooth fruits. In vegetative characters it closely resembles *Linociera callophylla* (Blume) Knobl., as I have interpreted the latter from the short and imperfect description, and is also similar to "IV, A, 120" in cultivation in the Botanic Garden at Buitenzorg, Java, from Sumatra; the latter bears an unpublished name of Scheffer's, and Boldingh⁵ has erroneously referred it to *Chionanthus ramiflora* Roxb., with which it has little in common. It is suspected that this specimen will prove to be the same as *Linociera callophylla* Knobl.

⁵ Cat. Herb. Hort. Bogor. (1914) 152.

GENTIANACEAE

GENTIANA Linnaeus

GENTIANA CLEMENTIS sp. nov.

Species *G. atkinsonii* Burkill valde affinis, differt foliis paullo minoribus, floribus paullo brevioribus, corollae lobis haud reticulatis, acutis.

A caespitose, perennial, glabrous plant 10 cm high or less, from stout, elongated, perpendicular roots, the basal leaves rosulate, the flowering branches up to 6 cm in length, spreading or ascending, several from each plant, leafless or with but one pair of leaves in addition to those subtending the flowers. Basal leaves 3 to 5 cm long, 4 to 6 mm wide, coriaceous, shining, sessile, lanceolate, acuminate, the midrib prominent, those on the flowering branches similar to the cauline ones but smaller. Flowers pale-purplish, sessile or subsessile, 2 to 4 at the apex of each branch, subtended by a whorl of 2 to 4 bract-like leaves. Calyx-tube 6 to 8 mm long, narrowed below, the teeth lanceolate, acuminate, 3 to 4 mm long. Corolla about 2.3 cm long, the lobes oblong-ovate, acute, 5 mm long, the tube narrowed below, plicate, the alternating small lobes triangular-acute, about 1 mm long. Stamens about as long as the corolla-tube; style recurved, 3 mm long.

BRITISH NORTH BORNEO, Mount Kinabalu, Paka Cave to Low's Peak and Paka Cave to Lobang, Mrs. Clemens 10703 (type), 10650, November 13 and 15, 1915, in wet ground, associated with *Potentilla*, altitude 2,400 to 4,000 meters.

This is the third representative of the genus to be found in Borneo, the other two being known only from Mount Kinabalu, and both of them represented in Mrs. Clemens's collection. It is a distinct Asiatic type and is very closely allied to *Gentiana atkinsonii* Burkill, a species known only from Loh Fau Mountain, Kwangtung Province, China, of which I have a topotype (Merrill 10326). It so strongly resembles Burkill's species that had the specimens described above been collected on Loh Fau Mountain it is very probable that botanists generally would have referred them to *Gentiana atkinsonii* Burkill as a somewhat reduced form. The Kinabalu specimens differ from Burkill's specimens in the small size of the plants, the shorter flowering branches, smaller leaves, and somewhat smaller flowers.

ASCLEPIADACEAE

CEROPEGIA Linnaeus

CEROPEGIA BORNEENSIS sp. nov.

Herba scandens, glabra, ramulis teretibus; foliis membranaceis, oblongis ad oblongo-ovatis, usque ad 10 cm longis, acutis vel acute-acuminatis, basi rotundatis vel subtruncatis, nervis utrin-

que 4 vel 5, distantibus; cymis axillaribus, tenuiter pedunculatis, paucifloris; floribus 5 ad 7 cm longis, curvatis, corollae tubo infra leviter inflato deinde constricto, lobis lanceolatis, acuminatis, circiter 2 cm longis, supra cohaerentibus.

A scandent, rather slender, herbaceous plant, the stems terete, twining. Leaves opposite, membranaceous, generally oblong, sometimes oblong-ovate, rather pale and shining when dry, the apex acute to acutely acuminate, base rounded to subtruncate, the lateral nerves 4 or 5 on each side of the midrib, curved, distant, rather distinct; petioles 1.5 to 2.5 cm long. Cymes axillary, few-flowered, their peduncles 5 to 7 cm long. Flowers 5 to 7 cm long, white or yellowish-white and purplish, the pedicels 2 to 3 cm in length. Sepals narrowly lanceolate, acuminate, glabrous, 3 mm long. Corolla-tube pubescent within, somewhat inflated at the base, then constricted, somewhat curved, again inflated above the constriction, the lobes lanceolate, acuminate, about 2 cm long, cohering by their apices. Follicles slender, terete, about 25 cm long, curved.

BRITISH NORTH BORNEO, Khota Balud to Kibayo, trail to Mount Kinabalu, Mrs. Clemens 9810 (type), *Topping 1490*, October 28, 1915, in thickets along the trail.

The genus *Ceropegia* is poorly represented in Malaya, this being the first one to be reported from Borneo. The flowers are much larger than are those of the Philippine *Ceropegia cumingiana* Decne. or of the Javan *C. curviflora* Hassk.

RUBIACEAE

XANTHOPHYTUM Blume

XANTHOPHYTUM INVOLUCRATUM sp. nov.

Frutex erectus, foliis junioribus subtus dense adpresse subferrugineo-pilosus; foliis chartaceis vel submembranaceis, oblongis ad oblongo-oblancoelatis, usque ad 18 cm longis, utrinque acuminatis, longe petiolatis, nervis utrinque circiter 15, perspicuis; stipulis latissime ovatis, acuminatis, usque ad 1.8 cm longis; inflorescentiis subcapitatis, axillaribus, pedunculatis, bracteis bracteolisque magnis numerosis involucriformibus instructis.

An erect shrub, the younger leaves densely appressed pilose beneath, the indumentum subferruginous, shining, the sparse indumentum on the older parts ferruginous to castaneous, the branches and branchlets somewhat 4-angled. Leaves chartaceous to submembranaceous, oblong to oblanceolate, 13 to 18 cm long, 3.5 to 6 cm wide, subequally narrowed to the acuminate base and apex, olivaceous, the upper surface smooth, glabrous, the lower somewhat pubescent on the midrib, nerves, and reticula-

tions; lateral nerves about 15 on each side of the midrib, distinct, dark-brown in contrast to the paler surface; petioles 3 to 6 cm long; stipules very broadly ovate, subpersistent, up to 1.8 cm long and 1.4 cm wide, striate. Inflorescences axillary, solitary, peduncled, subcapitate, in fruit up to 1.5 cm in diameter without the bracts, the peduncles about 1.5 cm long; bracts subtending the heads ovate, up to 15 mm long and 10 mm wide, somewhat pubescent, the bracteoles in general elliptic, up to 5 mm long and 2.5 mm wide. Fruits subglobose, about 3 mm in diameter, somewhat ferruginous- or castaneous-hirsute, their pedicels up to 3 mm in length.

SARAWAK, Sadong, Mount Merinjak, *Native collector 2591 Bur. Sci.*, February-June, 1914.

This species, not radically different from *Xanthophytum fruticosum* Blume in vegetative characters, is well characterized by its large stipules and its peduncled, solitary, subcapitate, involucrate inflorescences.

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C. BOTANY

VOL. XIII

MAY, 1918

No. 3

NOTES ON THE FLORA OF LOH FAU MOUNTAIN, KWANGTUNG PROVINCE, CHINA

By E. D. MERRILL¹

*(From the Botanical Section of the Biological Laboratory, Bureau of Science,
Manila)*

In 1916 I spent the period from October 13 to November 9 in prosecuting field work in botany in Kwangtung Province, working chiefly in the immediate vicinity of Canton, with a few days' trip to Loh Fau Mountain (Lofaushan). The trip was made possible through the interest of Doctor Walter T. Swingle, of the United States Department of Agriculture, and one of its objects was to encourage the authorities at the Canton Christian College to undertake the formation of a local herbarium and to initiate some work in a botanical exploration of Kwangtung Province in connection with the course in agriculture that was being developed in that institution. The idea of developing botanical work in the Canton Christian College was encouraged for the reason that through such work we could reasonably expect to secure in the future not only botanical material from the less-explored parts of Kwangtung Province, but also seeds and living plants of valuable economic species.

Mr. G. Weidman Groff, of the Canton Christian College, was deeply interested in the project but, on account of his pending departure for the United States on leave, the matter of developing the work devolved on Mr. C. O. Levine, who had recently accepted an appointment in the college. With such information as I could impart to Mr. Levine in the short time that I was in Canton as a basis for the work, he took up the project with great enthusiasm, and as one result has had collected and sub-

¹ Professor of botany, University of the Philippines.

mitted to me for identification more than 1,800 numbers of plants in slightly more than one year. The local herbarium established as a result of my visit is rapidly expanding and bids fair to prove a most valuable adjunct to the work of the college.

Through the continued interest of Doctor Swingle it was possible for me to repeat the trip in 1917, utilizing for the purpose my annual leave, as I had done in 1916. As a result of the two trips I have been able to spend the periods from October 13 to November 9, and from August 9 to August 27 in prosecuting field work in botany in Kwangtung Province. The work has resulted not only in the accumulation of considerable collections of botanical material, but the collections have yielded representatives of about seventy-five species not previously recorded from Kwangtung Province, including about thirty that are presumably new to science.

In a previous paper ² based on collections made by me in 1916 I recorded about twenty-three species as new to the Kwangtung flora, describing six as new. The present paper is in the nature of a continuation of the first one, but is based chiefly on the collections made by me on Loh Fau Mountain (Lofaushan), August 9 to 27, 1917, supplemented by material secured by Mr. Levine in the same locality and collected at the same time, and includes some material secured by Mr. Levine at other localities in Kwangtung Province.

Loh Fau Mountain was selected as the base for field work not only because it is one of the highest mountains in Kwangtung Province, and because a botanical exploration of the region promised to yield considerable of interest, but also because of the fact that various American and European residents of Canton had established there a summer camp. By utilizing the facilities provided by this camp, the matter of prosecuting field work was greatly simplified. Moreover, the location of the camp at an altitude of approximately 1,000 meters rendered it possible for us to explore the more interesting floristic regions, which are located chiefly in the deep forested ravines at higher altitudes, with a minimum loss of time and effort. Most of our field work was prosecuted on the upper parts of the mountain, but trips were made to the base at So Liu Koon and at Wa Shau T'oi, as in the vicinity of the monasteries at these two places considerable low-altitude forested areas still exist. In the period from August 9, the date of our arrival at the camp, to August

² Merrill, E. D., Notes on the flora of Kwangtung Province, China, *Philip. Journ. Sci.* 12 (1917) *Bot.* 99-116.

28, the date of our departure on the return trip to Canton, I made a collection aggregating 544 numbers, independent of the extensive collections made by Mr. Levine in the same period.

Among the results of eighteen days' actual field work has been the accrediting of representatives of the following genera to the Kwangtung flora, none of them having previously been recorded from that Province: *Coniogramme*, *Hypolepis*, *Botrychium*, *Polytoca*, *Agrostis*, *Herminium*, *Skimmia*, *Tristylidium*, *Epilobium*, and *Brandisia*; the list may be increased by the addition of *Alnus*, of which sterile specimens, not in condition for further identification, were secured. A total of fifty-three species is here recorded from Kwangtung Province for the first time, including twenty-four that I have described as new.

The results secured indicate, as might be expected, that although about 2,575 different species of *Pteridophyta* and *Spermatophyta* are now known from Kwangtung Province, extensive additions to the known flora are to be expected as the result of intensive field work in any of the lesser known areas, especially in the mountainous regions. Loh Fau Mountain is indicated by Messrs. Dunn and Tutcher³ as one of the areas that is botanically explored, yet the short period that I was able to utilize in field work there in 1917, and the few days spent there in the previous year, have yielded material on which a relatively large number of species have been recorded as additions to the known flora of the province. A glance at the map accompanying their publication will at once reveal the fact that the greater part of Kwangtung Province has scarcely been visited, much less explored, by any botanist or collector. The work carried on by Mr. Levine so far, chiefly at low altitudes in the immediate vicinity of Canton, and in a region well-known botanically, continues to yield additions to the known flora. While it is true that continued field work in Kwangtung Province will yield material that will to a large degree duplicate collections already made, still such collections are necessary to give us an adequate conception of the characters of the flora, the range of the species, their relative abundance, their range of variation, their native names, and their economic uses. Southern China may justly be classed with those parts of the world that are very inadequately explored, and it will take intensive work over a period of many years before we are in a position properly to judge the extent of its flora. At the present time we can hardly state that more than a good start has been made in this direction. It is scarcely

³ Fl. Kwangtung and Hongkong, *Kew Bull. Add. Series* 10 (1912) 1-370.

to be expected that the Chinese themselves have the necessary interest and training to accomplish much in working up the botany of China, and for the present, at least, such work as is done must of necessity be largely accomplished by the foreign residents. The local resident who has an interest in the study of the natural sciences is as a rule infinitely better located to secure productive results than is the casual visitor or explorer who has but a limited amount of time to devote to field work; here as in other subtropical and tropical countries field work must be carried on in all months of the year, and in this respect the local resident always has the advantage of position. It is greatly to be desired that the botanical work on the flora of Kwangtung be continued and that botanical exploration be extended to the more remote and inaccessible parts of the province.

POLYPODIACEAE

ATHYRIUM Roth

ATHYRIUM WICHURAE (Mett.) comb. nov.

Asplenium wichurae Mett. in Ann. Mus. Bot. Lugd.-Bat. 2 (1866) 237.

Diplazium wichurae Diels in Engl. & Prantl Nat. Pflanzenfam. 1⁴ (1899) 226.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 10988, Levine 1481, August 16, 1917, on damp shaded banks in deep ravines, altitude 1,000 to 1,100 meters.

This species, previously known from Japan, China, and Formosa, has not before been reported from Kwangtung Province. Except in its creeping rhizomes it closely resembles *Athyrium bulbiferum* (Brack.) (*Diplazium bulbiferum* Brack.; *Athyrium pinnatum* Copel., non *Allantodia pinnata* Blanco). I follow Copeland in treating *Diplazium* as congeneric with *Athyrium*, as in examining a large series of specimens it becomes evident that the two genera cannot be retained as distinct on account of the very numerous intermediate forms; it is sufficiently difficult always to distinguish between *Athyrium* and *Asplenium*, yet the number of intergrades between the latter are few in comparison with those between *Athyrium* and *Diplazium*.

The synonymy of the following Formosan species is here adjusted:

ATHYRIUM TENUISSIMUM (Hayata) comb. nov.

Nephrolepis tenuissima Hayata Ic. Pl. Form. 4 (1914) 202, f. 137.

Athyrium obtusifolium Rosenst. in Hedwigia 56 (1915) 335.

FORMOSA, Arisan, Ito 66, October, 1910, Faurie 364, May, 1914 (cotype of *Athyrium obtusifolium* Rosenst.).

This species is manifestly an *Athyrium* with dryopteroid sori and is closely allied to *Athyrium macrocarpum* (Blume) Milde. The species as described by Hayata (*Nephrolepis tenuissima* Hayata) is identical with *Athyrium obtusifolium* Rosenst., but Hayata's name being the older is here

adopted under its proper genus; Hayata's type was also from Arisan. It may be mentioned here that *Lycopodium fauriei* Rosenst. (1915) is identical with *Lycopodium tereticaule* Hayata (1914).

CONIOGRAMME Fée

CONIOGRAMME FRAXINEA (Don) Diels in Engl. & Prantl Nat. Pflanzenfam. 1⁴ (1899) 262.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 10866, Levine 1485, August 25, 1917, in thickets, slopes of damp shaded ravines, altitude about 1,000 meters; abundant locally.

Japan to Madagascar, tropical Australia, and Polynesia; not previously recorded from Kwangtung Province.

HYPOLEPIS Bernhardt

HYPOLEPIS PUNCTATA (Thunb.) Mett. in Kuhn Fil. Afr. (1868) 120.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Levine 1466, August 15, 1917, scattered in damp forested ravines, altitude about 1,000 meters.

This widely distributed species does not appear to be recorded from Kwangtung Province; it is placed by C. Christensen in the genus *Dryopteris*, as *D. punctata* (Thunb.) C. Chr.

LOXOGRAMME Presl

LOXOGRAMME FAURIEI Copel. in Philip. Journ. Sci. 11 (1916) Bot. 45, t. 1, f. 5.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 10341, 10740, October 28, 1916, August 18, 1917, on wet cliffs and boulders in damp shaded ravines, altitude 1,000 to 1,050 meters.

This form is probably included by Dunn & Tutcher in *Gymnogramme lanceolata* Hook.=*Loxogramme lanceolata* (Sw.) Presl, a species of the Mascarene Islands and one that does not extend to China. For the Indo-Malayan form commonly identified as *Loxogramme lanceolata*, Copeland has proposed the name *Loxogramme malayana* Copel. The Kwangtung specimens have distinctly long-stipitate fronds and certainly represent the Formosan species described by Copeland as *Loxogramme fauriei*, and are not referable to *Loxogramme malayana* Copel.

Loxogramme linearis Copel. in Philip. Journ. Sci. 11 (1916) Bot. 45, t. 2, f. 8 is identical with *Loxogramme remote-frondigerum* Hayata Ic. Pl. Formos. 5 (1915) 323 (*Polypodium remote-frondigerum* Hayata l. c. f. 135, A-B) and should be reduced to the latter.

PLAGIOGYRIA Mettenius

PLAGIOGYRIA CHRISTII Copel. in Philip. Journ. Sci. 1 (1906) Suppl. 153.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 10669, August 17, 1917, in damp shaded ravines along small streams, altitude about 1,100 meters; rare.

The specimen is an excellent match for the type of Copeland's species, the pinnae being rather more distant than in the Philippine specimens.

Previously known only from the mountains of Mindoro and Mindanao in the Philippines.

PLAGIOGYRIA ADNATA (Blume) Bedd. Ferns Brit. Ind. (1865) t. 51.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 11114*. August 12, 1917, in damp shaded ravines, altitude about 1,000 meters.

The specimens have distinctly 4-angled stipes and conform well with Malayan and Philippine specimens of this species. From Copeland's description it cannot be the same as *Plagiogyria tenuifolia* Copel. (*Lomaria matthewii* Christ), the only representative of the genus previously reported from Kwangtung Province.

POLYPODIUM Linnaeus

POLYPODIUM OLIGOLEPIDUM Baker in Gard. Chron. II 14 (1880) 494; Takeda in Notes Bot. Gard. Edinb. 8 (1915) 276, cum descr.!

Polypodium kawakamii Hayata in Bot. Mag. Tokyo 23 (1909) 77, Ic. Pl. Formos. 5 (1915) 318, f. 130.

Polypodium arisanense Rosenst. in Hedwigia 56 (1915) 347.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10221, 10684, Levine 1486*, October, 1916, and August, 1917, on ledges and boulders in damp shaded ravines, altitude 900 to 1,050 meters.

This form was included by Dunn and Tutcher in *Polypodium lineare* Thunb., and has been indicated by Christ as a variety of Thunberg's species; it is certainly distinct from *Polypodium lineare* Thunb. The Kwangtung specimens agree perfectly with the original description of Hayata's species, with his additional data and figure, and with Formosan specimens from Arisan, *Kawakami!*, *Shimada & Ito 19!*, *Faurie 472!*, the latter a cotype of *Polypodium arisanense* Rosenst.

POLYPODIUM HANCOCKII Baker in Journ. Bot. 23 (1885) 106.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10956*, August 24, 1917, on forested slopes of damp ravines, altitude about 1,000 meters; very rare, but three specimens seen.

This species has previously been reported only from Formosa, the Kwangtung specimens agreeing with the description and with Formosan material. I do not agree with Takeda's disposition of the species, who places it as a synonym of *Polypodium pteropus* Blume.

PTERIS Linnaeus

PTERIS FAURIEI Hieron. in Hedwigia 55 (1914) 345.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10158, 10664*, October, 1916, and August, 1917, on talus slopes in damp ravines, altitude 900 to 1,050 meters; Teng Woo Mountain, *Levine & Groff 50*, November 18, 1916.

This species is one of the numerous ones segregated by Hieronymus from the collective *Pteris quadriaurita* Retz., and was probably included by Dunn & Tutcher in *Pteris biaurita* Linn., from which it is very distinct. Hieronymus based his species on material from Formosa, Oshima, and Amoy.

OPHIOGLOSSACEAE

BOTRYCHIUM Swartz

BOTRYCHIUM TERNATUM (Thunb.) Sw. in Schrad. Journ. 1800 ' (1801) 111.

Kwangtung Province, Loh Fau Mountain (Lofaushan) *Merrill 11018*, August 16, 1917, in meadows in front of the ruined monastery at Put Wan Tsz, altitude about 1,100 meters; very rare.

Japan to the Himalayan region; no representative of the genus has been previously reported from Kwangtung Province.

GRAMINEAE

ANDROPOGON Linnaeus

ANDROPOGON FRAGILIS R. Br. Prodr. (1810) 202.

Kwangtung Province, White Cloud Mountain, near Canton, *Levine 1145*, August 30, 1917.

This is the typical form of the species and conforms entirely with Banks and Solander's specimen, on which the species was based, a fragment of which has been kindly communicated to me by Mr. J. H. Maiden, director of the Botanic Garden, Sydney.

Var. **SINENSIS** Rendle in Journ. Linn. Soc. Bot. 36 (1904) 372.

Kwangtung Province, White Cloud Mountain, near Canton, *Levine 1140*, August 28, 1917.

This form, which I at first considered to represent a distinct species, approximates the type in all characters except in the sessile spikelet being densely villous on the back in the lower one-half, the first glume of the empty spikelet being glabrous in the type. The Philippine material referred to *Andropogon fragilis* R. Br., with the exception of a single specimen, and New Guinea material collected by *King*, differs from the type not only in its smaller spikelets but also in having the rachis-joints and pedicels of the sterile spikelets entirely glabrous, and will have to be distinguished at least as a variety.

POLYTOCA R. Brown

POLYTOCA HETEROCLITA (Roxb.) Merr. in Philip. Journ. Sci. 10 (1915) Bot. 288.

Coix heteroclita Roxb. Fl. Ind. ed. 2, 3 (1832) 572.

Polytoca bracteata R. Br. in Benn. Pl. Jav. Rar. (1838) 20, t. 5.

Kwangtung Province, Wa Shau T'oi, at the base of Loh Fau Mountain (Lofaushan), *Merrill 10887*, *Levine 1571*, August 20, 1917, on open grassy slopes, altitude about 140 meters.

India to Burma, Tonkin, Java, and Mindanao; no representative of the genus has hitherto been reported from China.

PASPALUM Linnaeus

PASPALUM LONGIFOLIUM Roxb. Fl. Ind. 1 (1820) 283.

Kwangtung Province, Wa Shau T'oi, at the base of Loh Fau Mountain (Lofaushan), *Merrill 10792*, August 20, 1917, on open grassy slopes, altitude about 150 meters.

This form has usually four spikes, with the spikelets in several rows on each partial inflorescence. It is unquestionably referable to Roxburgh's species as currently interpreted. India to Malaya, but not previously reported from China.

OPLISMENUS Beauvois

OPLISMENUS UNDULATIFOLIUS (Ard.) Beauv. Agrost. (1812) 54.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10841*, August 24, 1917, on ledges along streams in deep ravines, altitude about 900 meters.

This species, which extends from southern Europe to Japan southward to tropical Africa and Australia, has not previously been reported from southern China.

GARNOTIA Brongniart

GARNOTIA STRICTA Brongn. Bot. Duperry's Voy. (1829) 133, t. 21.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10313*, 11080, October, 1916, and August, 1917, on ledges in torrent beds, altitude about 1,000 meters.

The specimens come well within the range of variation of this widely distributed species as interpreted by Hooker f. Fl. Brit. Ind. 7 (1897) 243. It has not previously been reported from China.

GARNOTIA BARBULATA (Nees) comb. nov.

Miquelia barbulate Nees in Nov. Act. Acad. Nat. Cur. 19 (1843) Suppl. 1:178.

Garnotia patula Munro ex Benth. Fl. Hongk. (1861) 416.

Berghausia patula Munro in Proc. Amer. Acad. 4 (1860) 262.

Kwangtung Province, Teng Woo Mountain, *Levine & Groff 68*, November 18, 1916.

This species, for which the oldest specific name is here adopted, is known only from southern China.

GARNOTIA CILIATA sp. nov.

Herba annua, 25 ad 40 cm alta, vaginis et foliis et spiculis perspicue longe molliter ciliatis; culmis erectis e basi decumbentis, 1 ad 1.5 mm diametro, glabris, nodis leviter ciliato-barbatis; foliis flaccidis, anguste lanceolatis, usque ad 11 cm longis et 9 mm latis, planis, acuminatis, utrinque parce sed molliter et perspicue ciliatis; inflorescentiis usque ad 13 cm longis, ramis strictis (junioribus), inferioribus usque ad 6 cm longis; spiculis lanceolatis, acuminatis, glumis vacuis aequalibus, anguste lanceolatis, tenuiter acuminatis, 3-nerviis, parce ciliatis, gluma fertilis obscurissime 1-nervia, 5 mm longa, apice tenuiter aristata.

An erect, simple, annual grass, 25 to 40 cm high, the culms decumbent at the base and sometimes rooting at the lower nodes, gregarious but scarcely caespitose, the culms glabrous, 1 to 1.5 mm in diameter, the nodes sparingly bearded with few, long,

soft hairs. Leaves flaccid, plane, narrowly lanceolate, 8 to 11 cm long, 5 to 8 mm wide, acuminate, conspicuously ciliate on both surfaces with scattered, soft, spreading, 2 to 3 mm long hairs usually from papillate bases; sheaths with hairs similar to those on the leaves, longer than the internodes, the upper ones somewhat inflated; ligules less than 0.5 mm long, densely and minutely ciliate. Panicles up to 13 cm in length, when young more or less inclosed in the uppermost sheath, the branches strict, ascending, the lower ones up to 6 cm in length. Spikelets narrowly lanceolate, about 6 mm long, usually one sessile and one pedicelled at each node, the rachis and branchlets angular, scabrid. Empty glumes two, narrowly lanceolate, acuminate, 6 mm long and about 1 mm wide, 3-nerved, very slenderly acuminate, sparingly ciliate with long, soft hairs. Flowering glume hyaline, lanceolate, 5 mm long, very faintly 1-nerved, slightly cleft at the apex, the awn slender, straight when wet, sometimes slightly bent when dry, up to 1 cm in length.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10701*, August 25, 1917, on thin earth over boulders along streams, altitude 900 to 1,000 meters.

This species is somewhat allied to *Garnotia stricta* Brongn. but is readily distinguished by its prominently ciliate leaves, sheaths, and more sparingly ciliate empty glumes, the hairs being very slender, white or pale, spreading, 2 to 3 mm in length, and usually from papillate bases. It occurs only in a very special habitat, on thin soil associated with mosses covering large boulders and ledges which are not subject to overflow in times of flood. It must be a short-lived plant, as on August 25, 1917, it was conspicuous on boulders at our camp site, the plants a few days previous to this date presenting no inflorescences; in October, 1916, the old dried remains of the same species was observed in the same locality, but no specimens were then prepared as the spikelets had all fallen and the plants were all withered and dry.

AGROSTIS Linnaeus

AGROSTIS ELMERI Merr. in Govt. Lab. Publ. (Philip.) 29 (1905) 7.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10924*, August 16, 1917, in the wet sandy bottoms of drained pools, altitude about 1,000 meters; a few plants observed in a single restricted area.

The genus is new to Kwangtung Province, and I can see no reason for considering the specimen cited above as representing other than a rather slender form of *Agrostis elmeri* Merr., a species previously known only from the higher mountains of the Philippines. The spikelets are distinctly jointed *below* the empty glumes, but Mr. Hitchcock, of the United States Department of Agriculture, calls my attention to the fact that this character is not uncommon in *Agrostis*, occurring even in the common *Agrostis alba* Linn. The spikelets of this form are but about one-half as large as are those of *Agrostis hugoniana* Rendle, to which *Agrostis elmeri* Merr. is apparently allied.

CYPERACEAE

KYLINGA Rottboell

KYLINGA ODORATA Vahl, var. **CYLINDRICA** (Nees) Kükenth. ex Mer. in Journ. Str. Branch Roy. As. Soc. 76 (1917) 80.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10655*, *Levine 1395*, August 16 and 25, 1917, scattered on open grassy slopes, altitude 1,100 meters.

This form, which is widely distributed in the tropics of the Old World, has previously been reported from China only from Yunnan Province.

ELEOCHARIS R. Brown

ELEOCHARIS TETRAQUETRA Nees in Wight Contrib. (1834) 113.

Kwangtung Province, Loh Fau Mountain (Lofaushan), at Wa Shau T'oi, *Merrill 10809*, *Levine 1410*, August 20, 1917, among grasses in swampy places, altitude about 150 meters.

This species, which extends from India to Japan southward to tropical Australia, has been reported from several parts of China, but not previously from Kwangtung Province.

FIMBRISTYLIS Vahl

FIMBRISTYLIS HOOKERIANA Boeck. in Linnaea 37 (1871) 22; Clarke in Hook. f. Fl. Brit. Ind. 6 (1893) 641.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10750*, August 12, 1917, on thin soil over boulders and ledges on open slopes, altitude about 1,100 meters. The same species is represented by *Levine 1202*, from Chat Sing Kong, Honam Island, near Canton.

India and Cochinchina (*Pierre!*); not previously reported from China.

FIMBRISTYLIS ANNUA (All.) R. & S. Syst. 2 (1817) 95, var. **TOMENTOSA** (Vahl) Kükenth. in herb.

Honam Island, on the grounds of the Canton Christian College, *Levine 1185*, July 25, 1917.

This pubescent form of *Fimbristylis annua* R. & S. (*F. diphylla* Vahl) agrees with Philippine material determined by Kükenth. as the above variety.

CAREX Linnaeus

CAREX BAMBUSETORUM sp. nov. § *Mitratae*, *Eumitratae*.

Species *C. rhynchachaenio* affinis, differt scapis longioribus, utriculis minoribus, glabris, acheniis multo minoribus, 2 mm longis.

Rather densely tufted, the base clothed with the filiform remnants of old sheaths. Leaves plane, scabrid, numerous, 20 to 30 cm long, 3 to 4.5 mm wide, pale, shining, tapering upward to the long and slenderly acuminate apex. Scapes slender, about 13 cm long, each bearing about three pistillate spikelets and a terminal staminate one, the bracts slender, 12 to 22 mm long, sheathing in the lower 4 to 9 mm. Pistillate spikelets 1 to 1.4 cm long, lax, 3 to 4 mm in diameter, their pedicels slender, at

least 1 cm long, the glumes ovate-lanceolate to lanceolate, slenderly acuminate by the excurrent midrib, pale, 2 to 3 mm long. Utricles about 3 mm long, prominently ribbed, glabrous or nearly so, somewhat flask-shaped, prominently beaked. Achenes 3-angled, 2 mm long, rather prominently beaked, narrowed below and above, the beak thick, cylindric, truncate, about 0.3 mm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10985*, August 12, 1917, on dry banks in ravines, in dense bamboo thickets, altitude about 1,000 meters; very rare.

I was at first disposed to refer this to *Carex rhynchachaenium* Clarke, of Luzon, which it closely resembles and to which it is closely allied. It differs constantly from our full series of Philippine specimens in the characters indicated in the diagnosis and is, I believe, specifically distinct.

CAREX DONIANA Spreng. Syst. 3 (1826) 825.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10971*, *Levine 1494*, August 13, 1917, in swampy places in the shade of coarse grasses and sedges, altitude about 1,050 meters; rare.

Although the spikelets are at most 1.5 cm long, I believe that this form is referable to Sprengel's species, which extends from India to Japan. Kükenthal does not recognize this form as specifically distinct, but treats it as a variety of *Carex japonica* Thunb.

CAREX TEINOGYNA Boott Illustr. Carex 1 (1858) 60, t. 158; Kükenth. in Engl. Pflanzenreich 38 (1909) 602, f. 102 F-H.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10178*, October 28, 1916, on moss-covered boulders in shaded stream beds in ravines, locally very abundant, altitude about 1,100 meters.

The specimen cited above was referred by me to the allied *Carex brunnea* Thunb., but Mr. Tutcher has called my attention to the fact that it is not the same as Thunberg's species and suggested its identity with Boott's species. I have not seen the original description, but the specimen conforms with Kükenthal's description and figure, and with Khasia specimens collected by C. B. Clarke. The species occurs in India, with a variety in Japan, but has not previously been reported from China. The plants were very abundant and conspicuous in October, 1916, but none were in evidence as late as August 27 the following year; they probably develop very rapidly after the close of the rainy season.

ARACEAE

AGLAONEMA Schott

AGLAONEMA MODESTUM Schott ex Engl. in DC. Monog. Phan. 2 (1879) 442, Pflanzenreich 64 (1915) 29, f. 13, Arac. Exsic. no. 74, 258.

Aglaonema acutispathum N. E. Br. in Gard. Chron. 24 (1885) 39.

Kwangtung Province, near Canton, *Levine 1167*, May 1, 1917.

The specimen is of considerable interest from the standpoint of the history of this species. It agrees perfectly with the descriptions and figures of Schott's species. The type (*Gaudichaud*) was supposed to have been collected in Luzon, but although the regions that Gaudichaud visited in the Archipelago are now all thoroughly well known botanically, this species

has never been detected; the probabilities are very great that Gaudichaud's specimen came from Macao, where he also botanized, and not from the Philippines. Doctor Gagnepain informs me that he was unable to locate Gaudichaud's specimen in the Paris herbarium. It is to be noted that in the original description of the species Engler states "*patria ignota*." The type of *Aglaonema acutispathum* N. E. Br. was a specimen purchased in Hongkong by Dr. Knaggs, and was thought to have come from the vicinity of Canton; however, Brown¹¹ states that there is another specimen in the Kew Herbarium labelled as having been brought from Shanghai by Dr. Knaggs; he also states that it was cultivated in southern China, the basis of this being *Hance 11459*. At any rate, the species must now definitely be credited to Kwangtung Province, at least as a cultivated plant, and excluded from the Philippine list.

DIOSCOREACEAE

DIOSCOREA Linnaeus

DIOSCOREA PENTAPHYLLA Linn. Sp. Pl. (1753) 1032.

Kwangtung Province, Loh Fau Mountain (Lofaushan), at Wa Shau T'oi, *Merrill 10886*, August 20, 1917, in thickets, altitude about 160 meters; a sterile specimen; White Cloud Mountain, near Canton, *Levine 1687*, September, 1917.

This species is widely distributed in tropical Asia and Malaya but has not previously been reported from Kwangtung Province.

LILIACEAE

PELIOSANTHES Andrews

PELIOSANTHES STENOPHYLLA sp. nov.

Foliis numerosissimis, anguste lanceolatis, usque ad 27 cm longis, 5 ad 10 mm latis, utrinque attenuatis, nervis 7 vel 9, nervulis transversalibus obsoletis; inflorescentiis usque ad 15 cm longis, floribus cernuis, pallide purpureis, circiter 7 mm longis, pedicellis binis vel trinis, 10 ad 12 mm longis, articulatis; bracteis scariosis, lanceolatis, acuminatis, inferioribus usque ad 2 cm longis, superioribus minoribus.

Rootstock 5 mm in diameter or less, woody, covered with the scarious basal portions of old leaves. Leaves numerous, up to 30 or more on each plant, narrowly lanceolate to linear-lanceolate, chartaceous, attenuate at both ends, the blades 13 to 27 cm long, 5 to 10 mm wide, acuminate, sometimes slightly falcate, the longitudinal veins 7 or 9, the transverse veinlets obsolete, the very young leaves with broad, pale, scarious, deciduous margins, these scarious margins more or less persistent on the lower parts of the petioles and imbricately surrounding the short stem, the petioles up to 7 cm in length. Scapes solitary, erect, rather many-flowered, up to 15 cm in length, the flowers

¹¹ Journ. Linn. Soc. Bot. 36 (1903) 185.

pale-purple, nodding, somewhat campanulate, fascicled, usually two or three from the axil of each bract, their pedicels slender, 10 to 12 mm long, jointed in the middle, the bracts scarious, lanceolate, acuminate, the lower ones up to 2 cm in length, the upper ones gradually shorter. Perianth-segments lanceolate, acuminate, about 6 mm long, 2 to 2.5 mm wide. Anthers about 3 mm long, subsessile. Ovules 2 in each cell.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10757* (type), *Levine 1613*, August 16, 1917, widely scattered in damp shaded ravines, altitude 900 to 1,000 meters.

This species is well characterized by its very numerous and unusually narrow leaves, differing from all of the described species in the latter character. It is entirely different from the only other species known from Kwangtung Province, *Peliosanthes macrostegia* Hance, the type of which was also from Loh Fau Mountain.

ORCHIDACEAE

HERMINIUM Linnaeus

HERMINIUM ANGUSTIFOLIUM (Lindl.) Benth. ex Hook. f. *Fl. Brit. Ind.* 6 (1890) 129.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 11121*, *Levine 1479*, August 15, 1917, widely scattered on open grassy slopes, altitude 100 to 1,150 meters.

This genus has not previously been reported from Kwangtung Province. The species extends from India to China and Formosa, the Philippines, Java, and Timor.

PIPERACEAE

PEPEROMIA Ruiz & Pavon

PEPEROMIA REFLEXA A. Dietr. *Sp. Pl.* 1 (1831) 180, forma **CAPENSIS** Miq. *Syst. Pip.* (1843) 169.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10846*, August 24, 1917, on ledges among mosses in damp ravines, altitude about 900 meters.

Peperomia reflexa A. Dietr. has previously been reported from China, but not from Kwangtung Province; it is widely distributed in the tropics of the Old World.

MORACEAE

FICUS Linnaeus

FICUS RECTINERVIA sp. nov. § *Eusyce*.

Frutex ut videtur parvus, ramulis junioribus hirsutis, ramis ramulisque cicatricibus multis notatis, internodiis brevissimis; foliis brevissime petiolatis, subcoriaceis, lanceolatis ad lineari-lanceolatis, usque ad 10 cm longis, glabris, laevis, nitidis, integris, apice tenuiter acuminatis, basi obtusis et minute cordatis, margine revolutis, nervis utrinque circiter 20, patulis, rectis, dis-

tinctis; receptaculis ovoideis ad leviter obovoideis, glabris, usque ad 15 mm longis, tenuiter pedunculatis.

An erect shrub, apparently of small size, glabrous except the distinctly hirsute branchlets. Branches and branchlets dark reddish-brown, rugose, marked with numerous, rather densely arranged, petiolar scars, the internodes very short. Leaves lanceolate to linear-lanceolate, subcoriaceous, smooth, shining, olivaceous, brownish or somewhat greenish when dry, the lower surface paler than the upper and distinctly punctulate, the apex slenderly acuminate, base obtuse and distinctly although minutely cordate, the margins recurved; lateral nerves spreading at nearly right angles from the midrib, about 20 on each side, straight, distinct, anastomosing directly with the somewhat arched, longitudinal, submarginal nerves; petioles pubescent, 2 to 3 mm long; stipules lanceolate, acuminate, up to 4 mm in length. Receptacles few, axillary, ovoid to somewhat obovoid, about 15 mm long, somewhat narrowed below into a short pseudostalk above the bracts, glabrous, the peduncles up to 12 mm in length, sparingly pubescent, the three bracts at the apex of the peduncle broadly triangular-ovate, acute, about 1 mm long. Staminate flowers numerous but only in the upper part of the receptacle, their pedicels 1 to 3 mm in length, the perianth-segments 3, lanceolate, acuminate, brown, about 1 mm long. Stamens 2, rarely 3, the anthers as long as the perianth-segments. Gall flowers very numerous, their perianth-segments lanceolate, acuminate, brown, 2 mm long. Ovary ovoid to obovoid, 1.2 mm in diameter; style very short. Fertile female flowers not seen.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Levine 331*, February 18, 1916, with no further data.

The alliance of this species is manifestly with *Ficus pyriformis* Hook. & Arn., and *F. stenophylla* Hemsl., being much closer to the latter than to the former. It may be distinguished from Hemsley's species by its larger, longer-peduncled receptacles, and its very differently nerved leaves, which are distinctly but minutely cordate at the base; the distinct lateral nerves are much more numerous than in *Ficus stenophylla* Hemsl. and leave the midrib at nearly right angles.

URTICACEAE

PILEA Lindley

PILEA SWINGLEI sp. nov.

Planta dioica, erecta, simplex vel parce ramosa, glabra, circiter 20 cm alta; foliis in paribus leviter inaequalibus, membranaceis, ovatis, usque ad 4 cm longis, basi rotundatis, 3-nerviis, apice acutis vel leviter acuminatis, margine grosse serratis, dentibus

utrinque circiter 6, utrinque cystolithis linearibus irregulariter dispositis instructis; inflorescentiis ♀ axillaribus, tenuibus, petiolo subaequantibus, floribus in capitulis paucis distantibus 2 ad 5 mm diametro dispositis.

An erect, simple or sparingly branched, succulent, glabrous, dioecious herb about 20 cm high, the stipules, if any, caducous. Stems weak when dry, slender. Leaves opposite, those of each pair slightly unequal, ovate, membranaceous, greenish-olivaceous, shining, 2.5 to 4 cm long, 1.5 to 2.5 cm wide, base rounded, 3-nerved, apex acute or somewhat acuminate, margins coarsely serrate, about 6 prominent teeth on each side, the lateral nerves reaching to about the upper three-fourths of the leaf, both surfaces with numerous, linear, irregularly disposed cystoliths; petioles slender, 1 to 2.5 cm long, that of the smaller leaf shorter than the one of the larger leaf in each pair. Pistillate inflorescences axillary, slender, about as long as the petioles, each bearing one or two, rarely three, heads of flowers and fruits 2 to 5 mm in diameter, the flowers not at all scorpioid in arrangement. Pedicels about 1 mm long. Large perianth segment about 1 mm long, the other two minute. Achene subelliptic, compressed, subacute, about 0.8 mm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 11036* (type), *10771*, *Levine 1806*, at the bases of very wet cliffs in damp shaded ravines, and under overhanging boulders on open slopes, altitude 900 to 1,100 meters, August 12 to 17, 1917.

This species somewhat resembles some forms of *Pilea pumila* A. Gray, but differs totally from that species in its entirely different, non-scorpioid inflorescences. The capitate arrangement of the flowers is characteristic.

LAURACEAE

NEOLITSEA Merrill

NEOLITSEA PULCHELLA (Meissn.) comb. nov.

Litsea pulchella Meissn. in DC. Prodr. 15¹ (1864) 224.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10239*, in flower, October 28, 1916, *Merrill 10840*, *Levine 1319*, in fruit, August 23, 1917, in damp forested ravines, altitude about 1,000 meters.

The type of Meissner's species was from Hongkong, and from his description it is evident that he saw no staminate flowers. In our material the fertile stamens are six in number, and accordingly the species is transferred to *Neolitsea*.

NEOLITSEA SUBCAUDATA sp. nov.

Arbor circiter 5 m alta, glabra; foliis alternis, chartaceis ad subcoriaceis, oblongis ad lanceolatis, nitidis, apice tenuiter subcaudato-acuminatis, basi acutis, 3-nervis, utrinque nec profunde

sed dense subfoveolatis, usque ad 9 cm longis, subtus pallidis vel glaucescentibus; fructibus axillaribus, fasciculatis, pedicellatis, subellipsoideis, circiter 8 mm longis.

A tree about 5 m high, entirely glabrous except the imbricate axillary bud-scales (flowers not seen). Branches and branchlets terete, slender, brownish to nearly black when dry. Leaves alternate, not at all pseudo-verticillate, chartaceous to subcoriaceous, oblong to lanceolate, 5.5 to 9 cm long, 1.5 to 3.5 cm wide, pale to olivaceous when dry, shining, the lower surface usually glaucous, both surfaces densely and shallowly subfoveolate, the base acute, prominently 3-nerved, not at all 3-plinerved, the lateral nerves extending nearly to the tip, the apex slenderly subcaudate-acuminate, the acumen 1 to 1.5 cm long; petioles 1 cm long or less. Flowers not seen. Fruits axillary, fascicled, numerous, their pedicels somewhat thickened upward, up to 1 cm in length, the immature fruits subellipsoid, about 8 mm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 11016* (type), *Levine 1351*, widely scattered in damp forested ravines, altitude 800 to 1,100 meters.

This species is well characterized by its alternate, shallowly and densely foveolate, 3-nerved (not 3-plinerved), subcaudate-acuminate leaves, which are glaucous on the lower surface. In aspect it somewhat resembles *Neolitsea pulchella* Merr. but is distinguished by being entirely glabrous (except the pubescent bud-scales), in its 3-nerved, not 3-plinerved, subcaudate-acuminate leaves, and in their strictly alternate, not pseudo-verticillate, arrangement.

NEOLITSEA ? LEVINEI sp. nov.

Arbor circiter 6 m alta, ramulis et petiolis dense brunneo-pubescentibus; foliis verticillatis, coriaceis, oblongo-lanceolatis ad oblongo-oblancheolatis, usque ad 20 cm longis, nitidis, basi acutis, perspicue 3-plinerviis, nervis primariis supra basin utrinque 1, prominentibus, apice perspicue acuminatis, supra laevis, nitidis, subtus albido-glaucescentibus; fructibus e axillis defoliatis, racemose dispositis, ellipsoideis, circiter 1.5 cm longis.

A tree about 6 m high, glabrous or nearly so except for the densely brown-pubescent branchlets and petioles, the branches and branchlets terete. Leaves verticillately crowded at the tips of the branchlets, 4 or 5 in a whorl, coriaceous, oblong-lanceolate to oblong-oblancheolate, 15 to 20 cm long, 4.5 to 7 cm wide, base acute, prominently 3-plinerved, the lateral nerves leaving the midrib about 1 cm above the base, arched-anastomosing with the other pair of lateral nerves in the upper three-fourths of the leaf, the only other pair of lateral nerves leaving the midrib in the upper two-thirds to three-fourths, the reticulations lax,

subparallel, prominent, the apex prominently acuminate, the upper surface smooth, glabrous, shining, pale-greenish to brownish-olivaceous, the lower white-glaucous in contrast to the brown midrib, nerves, and reticulations; petioles about 1.5 cm long. Infructescences lateral, 4 cm long or less, sparingly pubescent, the rachis rugose, 1 to 1.5 cm long, the fruits racemosely disposed, their pedicels somewhat thickened, about 1 cm long. Fruits ellipsoid, somewhat rugose, about 1.5 cm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 11071* (type), *Levine 1332*, August 24, 1917, in damp forested ravines, altitude 800 to 1,000 meters.

I am by no means certain that this species belongs in the genus *Neolitsea*, a point that can definitely be determined only when flowers are available. It approaches *Neolitsea* in the verticillate arrangement of its leaves and in their being prominently 3-plinerved, but this character is found in other allied genera that are distinguished otherwise only by certain floral characters. The leaves are unusually large for *Neolitsea*, and the species may ultimately be found to belong in *Lindera* or in *Actinodaphne*.

ROSACEAE

RUBUS Linnaeus

RUBUS BUERGERI Miq. Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 86; Focke in Bibl. Bot. 7 (1910) 114, f. 53.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill s. n.* August, 1917, on open grassy slopes about boulders, altitude about 900 meters.

This species is widely distributed in Japan, and is reported from Yunnan by Focke. The Loh Fau specimen agrees closely with the description, with Focke's figure, and with authentically named Japanese material.

RUBUS FIMBRIIFERUS Focke in Bibl. Bot. 7 (1910) 80.

Kwangtung Province, Teng Woo Mountain, *Levine & Groff 143*, November 18, 1916.

The type of this species was a specimen from the Hongkong Herbarium collected on the West River, Kwangtung Province. It is not included by Dunn & Tutchter in their Flora of Kwangtung and Hongkong, and agrees with none of the species admitted by them.

LEGUMINOSAE

MILLETTIA Wight & Arnott

MILLETTIA DUNNII sp. nov.

Frutex suberectus, ramis elongatis, arcuatis, inflorescentiis et subtus foliis exceptis glaber; ramis brunneis, teretibus, perspicue lenticellatis; foliis usque ad 35 cm longis, foliolis 11 ad 15, chartaceis, estipellatis, oblongis, usque ad 12 cm longis, breviter acuminate, basi acutis ad obtusis, supra glabris, olivaceis vel olivaceo-brunneis, nitidis, subtus pallidioribus, pubescentibus, nervis

utrinque circiter 12, perspicuis; inflorescentiis racemosis, sub fructu foliis subaequantibus; leguminis crassis, ovoideis (1-spermis) vel oblongis (2-spermis), glabris, acuminatis, 3 ad 6 cm longis, circiter 2.5 cm latis, valvis in vivo subcarnosis, in siccitate crasse coriaceis, dense et perspicue lenticellato-verruculosis.

A suberect shrub with elongated, arcuate branches up to 4 m in length, apparently ultimately scandent, glabrous except the inflorescences and the leaves. Branches terete, brownish, lenticellate, glabrous. Leaves up to 35 cm in length, the petiole and rachis glabrous, reddish-brown or dark-brown. Leaflets estipellate, oblong, chartaceous, 8 to 12 cm long, 3 to 4.5 cm wide, apex shortly acuminate, base acute to obtuse, the upper surface glabrous, shining, olivaceous or brownish-olivaceous, the lower surface paler, rather densely pubescent with short, cinereous hairs; lateral nerves about 12 on each side of the midrib, impressed on the upper surface, prominent beneath, curved, obscurely anastomosing; petiolules dark-brown, rugose, 5 mm long or less; stipels none. Racemes in fruit about as long as the leaves, sparingly pubescent, lenticellate. Pods somewhat fleshy when fresh, ovoid to oblong in outline (ovoid when 1-seeded, oblong when 2-seeded), 3 to 6 cm long, about 2.5 cm wide, acuminate, base rounded, when fresh nearly as thick as wide, when dry distinctly compressed, the valves when dry thickly coriaceous and very prominently and densely verrucose-lenticellate, glabrous, tardily dehiscent. Seeds (somewhat immature) about 1.5 cm in diameter.

Kwangtung Province, Loh Fau Mountain (Lofaushan), in thickets near So Liu Koon, altitude about 200 meters, *Merrill 10861* (type), *Levine 1371*, August 13, 1917, locally known as *ue tang tsai*.

I was at first disposed to refer these specimens to *Millettia oosperma* Dunn, to which the species is perhaps most closely allied, but they differ radically from Dunn's species in their more numerous leaflets (never 2-jugate), and shorter, glabrous pods. The species is dedicated to Mr. S. T. Dunn, late director of the Hongkong Botanic Garden and author of a recent revision of the genus *Millettia*.

ALBIZZIA Durazzini

ALBIZZIA CORNICULATA (Lour.) comb. nov.

Mimosa corniculata Lour. Fl. Cochinch. (1790) 651.

Albizzia milletii Benth. in Hook. Lond. Journ. Bot. 3 (1846) 89.

Caesalpinia lebbekkoides DC. Prodr. 2 (1825) 483.

Kwangtung Province, Loh Fau Mountain at Wa Shau T'oi, *Merrill 11004*; vicinity of Canton, *Levine 774, 1158, 1578*.

Loureiro's type was from the vicinity of Canton, and his description applies unmistakably to the form commonly known as *Albizzia milletii*

Benth., for which *Mimosa corniculata* Lour. supplies the oldest valid specific name. The corniculate pulvinus subtending the petioles, from which Loureiro took his specific name, is very characteristic of the species.

GLEDITSCHIA Scopoli

GLEDITSCHIA FERA (Lour.) comb. nov.

Mimosa fera Lour. Fl. Cochinch. (1790) 652.

Kwangtung Province, Honam Island, near Canton, *Levine 1289, 1852*, September and November, 1917, with the Cantonese name *tai yip ying*.

These specimens, one of which I provisionally referred to *Gleditschia australis* Hemsl., and the other to *G. macracantha* Desf., are both in fruit, and both manifestly represent the same species. They agree closely with Loureiro's description, and I have no doubt that they present his species; however he gives the Chinese name as *tsáo kiě*. The pods are about 20 cm long and 3 to 3.5 cm wide, straight or slightly curved, agreeing in length with Loureiro's description, but being about twice as long as are those of *G. australis* Hemsl. I suspect that it is the Kwangtung form that has been referred to *Gleditschia macracantha* Desf., but Desfontaine's description is so very short and imperfect that it is impossible to determine from it alone what the true characters of his species are. Hemsley states that *G. macracantha* Desf. has nearly quadrate flat seeds; the specimens cited above have the seeds of *Gleditschia australis* Hemsl. The Cochinchina form placed here by Loureiro may be the one referred by Gagnepain to *G. australis* Hemsl.

RUTACEAE

SKIMMIA Thunberg

SKIMMIA JAPONICA Thunb. Nov. Gen. (1781-1801) 58.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 11056, Levine 1361*, August 11, 1917, in thickets, damp ravines, altitude about 1,100 meters.

This species extends from Japan to India southward to Formosa and northern Luzon, occurring at high altitudes in the south. The genus is new to Kwangtung Province.

FAGARA Linnaeus

FAGARA CHINENSIS sp. nov.

Frutex scandens, inflorescentiis axillaribus leviter pubescentibus exceptis glaber, ramulis ramulisque inermis, rhachis canaliculato-angulatis, subtus spinis paucis, recurvis armatis; foliis circiter 15 cm longis, foliolis 7, oppositis vel suboppositis, lanceolatis ad ovato-lanceolatis, coriaceis, tenuiter sed obtuse acumina-tis, basi acutis, integris, usque ad 7 cm longis, nervis primariis utrinque 7 ad 9, distinctis; paniculis axillaribus, anguste pyra-midatis, circiter 4 cm longis; fructibus sessilibus, rugosis, subellipsoideis, circiter 5.5 mm longis, apice leviter oblique rostratis.

A scandent shrub, attaining a length of at least 5 m, glabrous except the sparingly pubescent inflorescences. Branches and

branchlets terete, unarmed, the former grayish, rugose, the latter smooth, nearly black. Leaves alternate, about 15 cm long, the rachis canaliculate, somewhat angled, armed on the lower side with few, scattered, rather stout, recurved, 1 to 1.5 mm long spines. Leaflets 7, coriaceous, lanceolate to ovate-lanceolate, entire, opposite or subopposite, 3.5 to 7 cm long, 1.2 to 2.6 cm wide, shining, olivaceous-brownish when dry, the glands not prominent, narrowed below to the acute and sometimes slightly inequilateral base, and above to the slenderly but obtusely acuminate apex; lateral nerves 7 to 9 on each side of the midrib, distinct on the lower surface, anastomosing, the reticulations lax; petiolules 2.5 to 4 mm long. Panicles axillary, narrowly pyramidal, about 4 cm long, sparingly pubescent, the primary branches about 5 mm long. Cocci subelliptic, brown and rugose when dry, about 5.5 mm long, keeled but scarcely compressed, obliquely beaked at the apex, 1-seeded, sessile, but one or two developing from each ovary.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10660*, August 13, 1917, in thickets near Paak Wan Moon, altitude about 900 meters.

This species is apparently represented by *Cavalerie 950* from Kouy-tchéou, which has been identified with *Zanthoxylum oxyphyllum* Edgw., but to which species I do not consider that it can possibly be referred. It is well characterized by its few leaflets, which are entire and slenderly acuminate; its unarmed branches and branchlets; and its short, axillary, very narrow panicles.

POLYGALACEAE

EPIRIXANTHES Blume

EPIRIXANTHES APHYLLA (Griff.) comb. nov.

Salomonina aphylla Griff. in Proc. Linn. Soc. 1 (1844) 221, Trans. Linn. Soc. 14 (1845) 112.

Kwangtung Province, Loh Fau Mountain (Lofaushan), at So Liu Koon, *Merrill 10898*, August 13, 1917, in damp forests along trails, altitude about 180 meters.

I have transferred this species to *Epirixanthes* Blume, as I consider this group to be generically distinct from *Salomonina*.

EUPHORBIACEAE

BRIDELIA Loureiro

BRIDELIA MONOICA (Lour.) comb. nov.

Clutia monoica Lour. Fl. Cochinch. (1790) 638.

Cleistanthus monoicus Muell.-Arg. in DC. Prodr. 15² (1866) 508; Jabl. in Engl. Pflanzenreich 65 (1915) 53.

Bridelia loureiri Hook. & Arn. Bot. Beechy's Voy. (1841) 211.

Kaluhaburunghos monoecus O. Kuntze Rev. Gen. Pl. 2 (1891) 607.

Bridelia tomentosa Blume Bijdr. (1825) 597; Jabl. in Engl. Pflanzenreich 65 (1915) 58, cum syn.

Kwangtung Province, Canton and vicinity, Merrill 9859, Levine 429, 1232, Levine & Groff 88.

This species is common in thickets in the vicinity of Canton. Jablonszky places *Cleistanthus monoicus* (Lour.) Muell.-Arg. among the *species omnino dubiae*, but there is no doubt in my mind as to the correctness of the present interpretation. Loureiro's type was from Canton, and his description in all essentials, except for the description of the fruit, applies word for word to this common species. The only differences are in his description of the leaves as glabrous (they are glabrous above and sparingly pubescent beneath) and in characterizing the fruit as a 3-celled, 1-seeded capsule; the fruit is a small drupe. This discrepancy is explained by the certainty that Loureiro saw no fruits, but made the description of them conform to the generic description of *Clusia* as quoted by him. *Bridelia monoica* (Lour.) Merr. is the only species known from southern China that conforms at all to Loureiro's description. No *Cleistanthus* is known from China.

AQUIFOLIACEAE

ILEX Linnaeus

ILEX TUTCHERI sp. nov. § *Aquifolium*, *Sideroxyloides*.

Frutex 2 ad 4 m altus, glaberrimus; foliis obovatis ad oblongo-obovatis, crassissime coriaceis, usque ad 5.5 cm longis, apice rotundatis, interdum retusis, margine integris, revolutis, basi cuneatis, costa supra impressa, subtus prominula, nervis lateralibus obsoletis, supra olivaceis vel brunneo-olivaceis, nitidis, subtus brunneis, minutissime et densissime punctulatis; fructibus axillaribus, fasciculatis, tenuiter pedicellatis, globosis vel subglobosis, estriatis, 4 ad 5 mm diametro, 6- vel 7-locellatis, calycis lobis 6, rotundatis.

An entirely glabrous shrub, 2 to 4 m high, the branches terete, dark-grayish, somewhat rugose, the branchlets reddish-brown, somewhat angled. Leaves rather densely crowded, obovate to oblong-obovate, thickly coriaceous, 2.5 to 5.5 cm long, 1.2 to 2.5 cm wide, apex rounded, sometimes slightly retuse, base cuneate, margins entire, recurved, the upper surface olivaceous or brownish-olivaceous, shining, the lower surface brownish, densely and very minutely punctulate, the midrib impressed on the upper surface, prominent on the lower surface, the lateral nerves and reticulations obsolete; petioles 2 to 8 mm long. Fruits numerous, axillary and in the axils of fallen leaves, usually about 3 in a fascicle, globose or subglobose, when fresh fleshy, purplish, smooth, when dry dark-brown, smooth or slightly rugose, not

striate, the apex prominently papillate, 4 to 5 mm in diameter, 6- or 7-celled. Persistent calyx coriaceous, 3.5 to 4 mm in diameter, the lobes 6, broadly rounded, short; pedicels 6 to 10 mm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10377* (type), 10244, October 28, 1916, on open exposed slopes and in damp forested ravines, altitude 900 to 1,000 meters.

The above-cited specimens were originally determined by me, from the description, as representing *Ilex memecylifolia* Champ., but Mr. W. J. Tutcher, director of the Botanic Garden, Hongkong, to whom the species is dedicated, has called my attention to the fact that the present form differs radically from Champion's species in its vegetative characters and especially in its 6-merous calyces with short, rounded lobes. Its alliance is apparently with *Ilex championii* Loesen. and *I. memecylifolia* Champ., but it is abundantly distinct from both.

ILEX LOHFAUENSIS sp. nov.

Species *I. hanceanae* affinis, differt foliis multo minoribus, apice semper perspicue retusis, nervis lateralibus subobsoletis, floribus omnibus fasciculatis vel solitariis.

A shrub, 3 to 4 m high, the branchlets distinctly cinereous-pubescent with soft, short, spreading hairs. Branches brownish, terete, smooth, glabrous. Leaves numerous, oblong-obovate, brown and shining when dry, 1 to 2 cm long, 5 to 9 mm wide, apex obtuse and prominently retuse, base cuneate to decurrent-acuminate, margins entire, the midrib somewhat prominent on the upper surface and often slightly pubescent, distinctly prominent on the lower surface, glabrous; lateral nerves very slender, 5 to 8 on each side of the midrib, always obscure, often obsolete or nearly so; petioles 1 to 2 mm long, puberulent. Flowers axillary, solitary or fascicled but never more than two or three in an axil, white, 4-merous, about 4 mm in diameter, their pedicels pubescent, 2 mm long or less. Calyx about 2 mm in diameter, shallowly 4-lobed, the lobes broadly rounded, pubescent. Petals united into a distinct tube, the lobes broadly ovate, obtuse to rounded, spreading, about 1.6 mm long. Filaments 0.5 mm long, the anthers about as long as the filaments. Ovary ovoid. Young fruit ovoid, glabrous, smooth, about 2.5 mm in diameter.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10678* (type), August 16, 1917, *Levine 1455*, from the same plant, in thickets, damp shaded ravines, altitude about 1,000 meters.

I was at first disposed to refer these specimens to *Ilex hanceana* Maxim., but as they differ so constantly in their smaller and always prominently retuse leaves, I believe that they represent a distinct but allied species. The species is certainly distinct from the Philippine *Ilex etcheri* Merr., which Loesener thinks is a synonym of *Ilex hanceana* Maxim.

VITACEAE

CISSUS Linnaeus

CISSUS ASSAMICA (Laws.) Craib in Kew Bull. (1911) 30; Gagnep. Not. Syst. 1 (1911) 353.

Vitis assamica Laws. in Hook. f. Fl. Brit. Ind. 1 (1875) 648.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 10682, Levine 1465, August 17, 1917, in thickets, damp ravines, altitude about 900 meters.

This species extends from India (Assam and Sikkim) to Siam, but has not previously been reported from China. It is very similar to *Cissus adnata* Roxb., but is easily distinguished, among other characters, by its more or less appressed hairs being attached by the middle, not by the base. The Chinese specimens cited above have distinctly pubescent inflorescences, but the leaves are practically glabrous, except for a few scattered hairs on the lower surface; the disk and ovary are entirely glabrous. By the key given by Dunn & Tutcher this falls under *Vitis repens* Wight & Arn. and has perhaps been included by these authors under Lamarck's species; it is, however, abundantly distinct from *Cissus repens* Lam.

COLUMELLA Loureiro

COLUMELLA TENUIFOLIA (Heyne) Merr. in Philip. Journ. Sci. 11 (1916) Bot. 134.

Cissus tenuifolia Heyne in Wall. Cat. (1831) no. 6022; Planch. in DC. Monog. Phan. 5 (1887) 563.

Cayratia tenuifolia Gagnep. in Not. Syst. 1 (1911) 348.

Macao, Callery 93! Kwangtung Province, Levine 1000, originally identified by me as *Columella japonica*. Formosa, Arisan, Faurie 512, June, 1914.

This has been included in *Cissus japonica* Willd., but is certainly specifically distinct. India to southern China and the Philippines.

COLUMELLA JAPONICA (Thunb.) comb. nov.

Vitis japonica Thunb. Fl. Jap. (1784) 104.

Cissus japonica Willd. Sp. Pl. 1 (1797) 659.

Cayratia japonica Gagnep. in Not. Syst. 1 (1911) 349.

Kwangtung Province, Loh Fau Mountain, Merrill 11119, Levine 1355, August, 1917, in thickets, altitude about 1,000 meters.

Japan to Indo-China; the Philippine specimen referred by Gagnepain to this species I consider to represent *Columella corniculata* (Benth.) Merr.

PARTHENOCISSUS Planchon

It has been conclusively shown that *Psedera* Neck. Elem. 1 (1790) 158, and *Quinaria* Rafin. Medic. Fl. 2 (1830) 122, are synonyms of *Parthenocissus* Planch. in DC. Monog. Phan. 5 (1889) 447, and that following strictly the rules of priority *Psedera* Neck. is the oldest generic name for this group. *Quinaria* of Rafinesque is preoccupied by the different *Quinaria* Lour. Fl. Cochinch. (1790) 272; Loureiro's name, however, is a synonym of *Clausena*. However, as *Parthenocissus* Planch. is the retained name adopted by the

last International Botanical Congress,⁶ Planchon's generic designation should be the one to be retained. Gagnepain⁶ has clearly shown that *Landukia* Planch. is not generically distinct from *Parthenocissus*. *Landukia* Planch. has page priority over *Parthenocissus* Planch., and hence has claims to recognition as the valid generic name, for the group under discussion, among those botanists who accept the generic lists of *nomina conservanda* adopted by the last two International Botanical Congresses. That *Landukia* should be included in the next list of *nomina rejicenda* is evident, and I prefer to make no new combinations under this generic name at the present time. The proper specific name for a common Chinese species, however, needs adjustment, as there is no reason whatever for discarding Blume's very descriptive name for the plant now known as *Parthenocissus landuk* Gagnep. *Ampelopsis heterophylla* Sieb. & Zucc. was published many years after Blume's binomial, and of course does not invalidate Blume's specific name.

PARTHENOCISSUS HETEROPHYLLA (Blume) Merr. in Philip. Journ. Sci. 11 (1916) Bot. 129.

Ampelopsis heterophylla Blume Bijdr. (1825) 194.

Cissus landuk Hassk. in Flora 25 (1842) Beibl. 2:39.

Vitis landuk Miq. Ann. Mus. Bot. Lugd.-Bat. 1 (1863) 90.

Landukia landuk Planch. in DC. Monog. Phan. 5 (1887) 447.

Parthenocissus landuk Gagnep. in Bull. Soc. Hist. Nat. Autun 24 (1911) 15, et in Sargent Pl. Wils. 1 (1911) 102.

Kwangtung Province, near Canton, *Levine* 1271, August, 1917; Loh Fau Mountain, *Merrill* 10715, August, 1917; Chekiang Province, *Meyer* 1613. Hainan, *Hongkong Herbarium* 413. Probably referable here is *Merrill* 11132 from plants cultivated on a compound wall at Sheklung, Kwangtung Province, which differs from other specimens cited in having 3- and 5-foliate leaves.

STERCULIACEAE

PTEROSPERMUM Schreber

PTEROSPERMUM LEVINEI sp. nov.

Arbor circiter 13 m alta partibus junioribus et subtus foliis dense subferrugineo- ad subalbido-tomentosis. Ramis teretibus, glabris, tenuibus; foliis oblongis, chartaceis, leviter inaequilateralibus, integris, 8 ad 14 cm longis, 4 ad 5.5 cm latis, supra brunneo-olivaceis, nitidis, glabris, acuminatis, basi leviter oblique truncatis vel subcordatis, subtus densissime tomentosis, nervis utrinque circiter 8, distinctis; petiolis circiter 8 mm longis; stipulis ovatis ad oblongo-ovatis, integris, inaequilateralibus, acutis ad acuminatis, utrinque minute albido-tomentosis, circiter 5 mm longis, deciduis; fructibus ellipsoideis ad oblongo-ellipsoideis, teretibus, 4.5 ad 5 cm longis, brunneis, apice minute et breviter acuminatis, basi stipitatis, stipite circiter 8 mm longo

⁶ Act. III^{me} Congr. Internat. Bot. Brux. 1 (1910) 114.

⁶ Bull. Soc. Hist. Nat. Autun 24 (1911) 10.

et 5 mm diametro, extus dense et minutissime ferrugineo-stellato-tomentosis.

Kwangtung Province, Sum Sun, Nam Hoi, at the base of a hill, *Levine 1173*, September 7, 1917.

The alliance of this species is manifestly with *Pterospermum jackianum* Wall., to which I first referred the specimen. It differs from Penang material representing Wallich's species, and from the descriptions in a number of details, notably in its entirely different stipules.

The only species reported from China proper are the entirely different *Pterospermum proteus* Burkill and *P. heterophyllum* Hance; *Pterospermum formosanum* Mats., judging from the single sterile specimen I have seen, must be very closely allied to or identical with the Philippine *P. niveum* Vid.

DILLENiaceae

TETRACERA Linnaeus

TETRACERA LEVINEI sp. nov.

Frutex scandens, subglaber; foliis oblongis, rigidis, laevis vel sublaevis, usque ad 13 cm longis, in siccitate pallidis, nitidis, basi acutis, apice acutis, obtusis, vel obscurissime acuminatis, nervis utrinque circiter 15, perspicuis; paniculis axillaribus terminalibusque, usque ad 12 cm longis; fructibus circiter 7 mm longis, glabris, 1-spermis, sepalis utrinque glabris.

A scandent shrub, subglabrous, the inflorescences somewhat appressed-strigose. Branches brownish, somewhat wrinkled, smooth or minutely scabrid. Leaves subcoriaceous, rigid, brittle, oblong, pale and shining when dry, smooth or nearly so, 11 to 13 cm long, 4 to 5 cm wide, base acute, apex acute, somewhat obtuse, or even slightly acuminate, the margins minutely denticulate in the upper one-half; lateral nerves about 15 on each side of the midrib, prominent. Panicles terminal and in the upper axils, up to 12 cm in length. Fruits 1-seeded, ovoid, glabrous, shining, somewhat apiculate, about 7 mm long, the aril orange-yellow. Sepals glabrous on both surfaces.

Kwangtung Province, White Cloud Mountain, near Canton, *Levine 1794*, near small streams, October 22, 1917.

This species is manifestly allied to *Tetracera scandens* (Linn.) Merr. (*T. sarmentosa* Vahl), which is common in Kwangtung Province, from which it differs in its smooth or nearly smooth, not scabrid leaves, and more numerous lateral nerves. The synonyms *Lcontoglossum scabrum* Hance, *Actaea aspera* Lour., *Trachytella actaea* DC., and *Calligonum asperum* Lour., based on Kwangtung and Cochinchina specimens, appear to be correctly referred to *Tetracera sarmentosa* Vahl = *T. scandens* (Linn.) Merr. The latter species is represented by *Hongkong Herbarium 1415*, from Hongkong, and *Merrill 10724* and *Levine 1418* from the base of Loh Fau Mountain, Kwangtung Province.

THEACEAE

TRISTYLUM Turczaninow

TRISTYLUM OCHNACEUM (DC.) comb. nov.

Cleyra ochracea DC. in Mém. Soc. Phys. Genève. 1 (1822) 412, Prodr. 1 (1824) 524.

Eurya ochracea Szysz. in Engl. & Prantl Nat. Pflanzenfam. 3^e (1893) 189.

Kwangtung Province, Loh Fau Mountain (Lofaushan) Merrill 10243, 10686, October, 1916, August, 1917, Levine 1453, August, 1917, on exposed open slopes, altitude about 1,000 meters.

This species extends from Japan to Formosa and the central Himalayan region, but has not previously been reported from Kwangtung Province. My number 10243 was originally referred, with doubt, to *Adinandra millettii* Benth., but Mr. Tutchter has called my attention to the fact that the specimen is properly referable to *Cleyra ochracea* DC.; all the specimens are in fruit and agree very closely with authentic Japanese material received from the Leiden Herbarium.

This species has been confused by some authors with the entirely different *Ternstroemia japonica* Thunb. Szyszylowicz has reduced *Cleyra* DC. (non Thunb.) to *Eurya* Thunb., which does not appear to me to be the proper disposition of it; I consider it to be more closely allied to *Adinandra* Jack. *Cleyra* DC., non Thunb., nec Adans., is invalid, and I propose to adopt *Tristylum* Turcz. as the proper valid generic name for this group.

TERNSTROEMIA Mutis

TERNSTROEMIA KWANGTUNGENSIS sp. nov.

Arbor 4 ad 5 m alta, glabra, ramis ramulisque crassis, rugosis; foliis crassime coriaceis, late ellipticis ad elliptico-ovatis, usque ad 9 cm longis, breviter obtuseque acuminatis, basi decurrento-acuminatis, in siccitate supra atro-brunneis, nitidis, subtus brunneis, opacis, nervis utrinque circiter 7, indistinctis, petiolis crassis, 1.5 ad 2.3 cm longis; fructibus depresso-globosis, circiter 1.3 cm diametro (immaturis), sepalis persistentibus, coriaceis, elliptico-ovatis, circiter 8 mm longis.

A tree, 4 to 5 m high, entirely glabrous. Branches and branchlets thickened, rugose, brownish or somewhat reddish-brown, 5 to 7 mm in diameter, the petiolar scars rather prominent. Leaves thickly coriaceous, broadly elliptic to elliptic-ovate, 7 to 9 cm long, 4 to 5 cm wide, the apex shortly and obtusely acuminate, base decurrent-acuminate, the upper surface blackish-brown when dry, prominently shining, the lower surface brown, dull; lateral nerves about 7 on each side of the midrib, slender, indistinct; petioles stout, black when dry, 1.5 to 2.3 cm long. Fruits axillary, solitary, depressed-globose, about 1.3 cm in diameter (immature), dark-brown when dry, the pedicels stout, 1 cm long or less. Persistent sepals coriaceous, elliptic-ovate, about 8 mm long, rounded, scarcely fimbriate.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 11013, August 29, 1917, in damp forested gorges, altitude about 1,000 meters.

This species is closely allied to *Ternstroemia japonica* Thunb., from which it is distinguished by its larger, broader, differently shaped leaves, its distinctly longer petioles, shorter pedicels, and depressed-globose fruits. It is clearly not the same as *Cleyra fragrans* Champ. and *C. dubia* Champ., which were described from Hongkong material, and which are apparently properly reduced as synonyms of *Ternstroemia japonica* Thunb.

THEA Linnaeus

THEA FURFURACEA sp. nov.

Arbor parva, bracteis et fructibus exceptis glabra; foliis oblongis, coriaceis, usque ad 12 cm longis, utrinque subaequaliter angustatis, basi acutis, apice acuminatis, margine glanduloso-denticulatis, in siccitate subolivaceis vel viridi-olivaceis, nitidis, subtus pallidioribus, glandulosis, breviter petiolatis, nervis utrinque 8 ad 10, supra impressis, subtus perspicuis, anastomosantibus; fructibus terminalibus, globosis vel depresso-globosis, breviter et crasse pedicellatis, circiter 1 cm diametro (immaturis), extus densissime furfuraceis atque pilis paucis deciduis instructis.

A small tree, usually about 3 m high, entirely glabrous except the bracts and fruits (flowers not seen). Branches terete, smooth, pale-brownish, the branchlets occasionally somewhat compressed. Leaves oblong, coriaceous, 7 to 12 cm long, 2.5 to 4 cm wide, subequally narrowed to the acute base and to the rather slenderly but blunt-acuminate apex, the margins glandular-denticulate throughout, the upper surface pale-olivaceous or greenish-olivaceous when dry, shining, the lower surface paler, glandular, shining; lateral nerves 8 to 10 on each side of the midrib, somewhat impressed on the upper surface, rather prominent on the lower surface, anastomosing, the lax reticulations distinct; petioles about 3 mm long, brown. Fruits terminal, globose or depressed-globose, about 1 cm in diameter (immature), externally densely covered with pale-brownish, furfuraceous, appressed scales and with few, somewhat tufted, deciduous, pale hairs, 3-celled, with three seeds in each cell; pedicels short, stout, 4 mm long or less, densely covered with the persistent, imbricate bases of the bracts, the outer bracts broadly ovate to somewhat reniform, obtuse to subacute, somewhat pubescent on the margins and in the median part of the back, the innermost up to 1 cm in length and somewhat cucullate.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 10681 (type), Levine 1516, August 17, 1917, in damp forested gorges, altitude about 1,000 meters.

This species is well characterized by its densely furfuraceous fruits.

SCHIMA Reinwardt

SCHIMA CONFERTIFLORA sp. nov.

Arbor (vel interdum frutex, 1 ad 3 m altus) usque ad 10 m alta, novellis floribusque exceptis glabra; foliis coriaceis, in siccitate brunneis ad brunneo-olivaceis, oblongo-ovatis ad oblongo-ellipticis, usque ad 9 cm longis, breviter obtuseque acuminatis, basi acutis, margine distincte crenato-serratis, nervis utrinque 8 ad 10, tenuibus; floribus numerosis, axillaribus et ad apicem ramulorum dense subracemoso-confertis, breviter pedunculatis; sepalis orbicularibus, extus glabris, margine perspicue ciliatis; fructibus depresso-globosis, circiter 1.2 cm diametro, breviter crasseque pedunculatis.

A tree attaining a height of 10 m, or when growing on exposed slopes a shrub 1 to 3 m high, glabrous except the flowers and the growing tips of the branchlets. Branches dark-brown, rugose, rather stout, terete, the terminal bud-scales densely appressed-pubescent with pale shining hairs. Leaves numerous, crowded, thickly coriaceous, oblong-ovate to oblong-elliptic, 4.5 to 9 cm long, 2 to 3.3 cm wide, base acute, apex shortly and obtusely acuminate, margins distinctly crenate-serrate, when dry brown to brownish-olivaceous, shining; lateral nerves slender, not prominent, 8 to 10 on each side of the midrib, anastomosing, the reticulations indistinct; petioles 1 to 1.5 cm long. Flowers numerous, white, in the uppermost axils and racemosely crowded at the tips of the branchlets, about 3 cm in diameter, their pedicels glabrous, about 1 cm long, stout, brown when dry. Sepals suborbicular, rounded, coriaceous, about 5 mm in diameter, glabrous externally, internally densely appressed-pubescent, the margins densely and prominently ciliate with pale hairs. Petals obovate, glabrous except the sparingly ciliate margins. Ovary ovoid, densely pubescent at the base, glabrous above; style stout, about 7 mm long. Fruit globose or depressed-globose, woody, about 1.2 cm in diameter, brown when dry, sparingly appressed-pubescent, ultimately glabrous, at first splitting into two or three valves, ultimately into five, the persistent sepals very coriaceous, glabrous, the pedicels stout, about 1 cm long, the mature fruits in the axils of fallen leaves; seeds somewhat reniform, rounded at both ends, about 7 mm long and 4.5 mm wide, somewhat rugose.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10690* (type), August 16, 1917, on open exposed ridges, altitude 950 meters, *Merrill 11052*, August 11, 1917, in damp forested ravines, altitude about 900 meters, *Merrill 10156* and *Levine 601, 1513*, October 28, 1916, August 10, 1917, in fruit, and in flower, on open slopes, altitude about 900 meters.

This form differs so radically from the typical Malayan *Schima noronhae* Reinw., and from the Chinese and Formosan form that has been referred to Reinwardt's species, that I am constrained to consider it a distinct species. From typical Javan *Schima noronhae* Reinw. it is readily distinguished by its smaller leaves, which are not slenderly acuminate; crowded, shortly pedicelled flowers; smaller fruits; and numerous other characters. From the Chinese form that has been referred to Reinwardt's species, but which I consider should be retained as a distinct species under the name *Schima superba* Garden. & Champ., it differs in its smaller leaves which are not slenderly and sharply acuminate; distinctly smaller fruits; and shorter-peduncled, more numerous, densely crowded flowers.

OENOTHERACEAE

EPILOBIUM Linnaeus

EPILOBIUM PHILIPPINENSE C. B. Rob. in Philip. Journ. Sci. 5 (1910) Bot. 369.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10658*, *Levine 1467*, August 16, 1917, on rubbish of fallen walls at the ruined monastery Put Wan T'sz, altitude about 1,100 meters.

The genus is new to Kwangtung Province. The specimens are more robust than the Philippine form, with somewhat shorter fruits and slightly smaller seeds, but in other characters closely approximates Robinson's type. It is very probable that as species are interpreted in this genus by Haussknecht and by Lévillé, these authors would consider the Chinese form specifically distinct from the Philippine one; it is not improbable that this Chinese form has already been described under some other specific names, but as distinctions are drawn by Lévillé it is practically impossible to gain a clear conception of many of his species from the descriptions alone, the same being true also of many of Haussknecht's species.

MELASTOMATACEAE

BLASTUS Loureiro

BLASTUS PAUCIFLORUS (Benth.) comb. nov.

Allomorphia pauciflora Benth. in Hook. Lond. Journ. Bot. 1 (1842) 485; Hemsl. in Journ. Linn. Soc. Bot. 23 (1887) 301; Cogn. in DC. Monog. Phan. 7 (1891) 465; Dunn & Tutch. in Kew Bull. Add. Series 10 (1912) 107 (Fl. Hongk. Kwangtung).

Oxyspora ? *pauciflora* Benth. Fl. Hongk. (1861) 116.

Blastus hindsii Hance in Journ. Linn. Soc. Bot. 13 (1873) 103.

Hongkong, Victoria Peak, comm. *W. J. Tutch.:* Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10743*, *Levine 1462*, about ledges in thickets, in damp ravines, altitude about 950 meters, August 16, 1917.

An examination of the flowers of this species shows that it belongs in the genus *Blastus*, and it is accordingly so placed. *Blastus cochinchinensis* Lour. is distinguished, among other characters, by its short, axillary inflorescences. Lévillé has described several species of *Blastus* with terminal inflorescences, some of which, judging from his wholly inadequate diagnoses, must be very close to the present species.

ARALIACEAE

DENDROPANAX Decaisne & Planchon

DENDROPANAX ACUMINATISSIMUM sp. nov.

Frutex glaber, 3 ad 4 m altus; foliis lanceolatis ad anguste lanceolatis, usque ad 11 cm longis, tenuiter caudato-acuminatis, basi acutis, integris, nervis utrinque 10 ad 12, tenuibus, indistinctis, anastomosantibus; umbellis terminalibus, solitariis vel trinis, breviter pedunculatis, subpaucifloris; floribus 5-meris, circiter 5.5 mm longis.

A slender, erect, glabrous shrub, 3 to 4 m high, the branches and branchlets terete, somewhat brownish, the latter smooth. Leaves scattered, lanceolate to narrowly lanceolate, firmly chartaceous to subcoriaceous, rather pale-olivaceous when dry, 7 to 11 cm long, 1 to 2 cm wide, entire, base acute, narrowed above into the slenderly caudate-acuminate apex; lateral nerves 10 to 13 on each side of the midrib, slender, spreading-ascending, anastomosing, indistinct; petioles 1 to 3.5 cm long. Umbels terminal, solitary or in threes, about 2 cm in diameter in anthesis, their peduncles 5 to 10 mm long, 10- to 15-flowered, the bracteoles linear, 2 to 8 mm long, deciduous, the pedicels about 6 mm long. Calyx green, cup-shaped, about 3 mm long, its margin 5-denticulate. Petals 5, white, ovate to oblong-ovate, 2.5 mm long. Filaments about 2 mm long. Ovary 5-celled; style stout, furrowed, somewhat narrowed upward, about 1.3 mm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10817* (type), *Levine 1315*, August 24, 1917, from the same plant.

This species occurs on steep forested slopes of damp ravines, altitude 800 to 1,000 meters, and is very rare, as only a few specimens were observed in several weeks' work on Loh Fau Mountain. It is well characterized by its very narrow, lanceolate, slenderly acuminate leaves which are not at all 3-nerved or 3-plinerved at the base. *Dendropanax japonicum* Seem. is abundant on open slopes on Loh Fau Mountain, while what I take to be *D. proteum* Benth. also occurs in similar habitats.

ERICACEAE

VACCINIUM Linnaeus

VACCINIUM HANCOCKIAE sp. nov.

Frutex 2 ad 3 m altus, glaber; foliis coriaceis, oblongo-ovatis ad oblongo-lanceolatis, in siccitate brunneo-olivaceis, nitidis, usque ad 5 cm longis, acuminatis, basi acutis, margine cartilagineis, distanter serrulatis, nervis utrinque circiter 5, tenuibus, anastomosantibus; racemis in axillis superioribus, circiter 2 cm longis, bracteolis oblongo-ovatis, circiter 1 mm longis; floribus subcylindraceis, circiter 7 mm longis, sursum leviter angustatis; calycis

lobis lanceolatis, tenuiter acuminatis, subpatulis, circiter 1.5 mm longis.

A shrub 2 to 3 m high, entirely glabrous except the top of the ovary, the filaments, and the inside of the corollas. Branches terete, reddish-brown to grayish-brown, crowded, the internodes short. Leaves numerous, coriaceous, oblong-ovate to oblong-lanceolate, 2 to 5 cm long, 8 to 16 mm wide, brownish-olivaceous when dry, not glandular, shining, the lower surface slightly paler than the upper, narrowed below to the acute base and above to the rather slenderly acuminate apex, the margins cartilaginous, distantly serrulate; lateral nerves about 5 on each side of the midrib, slender, distinct on the lower surface, curved-ascending, anastomosing, the reticulations distinct; petioles about 3 mm long. Racemes in the uppermost axils, about 2 cm long, 6- to 10-flowered, the pedicels spreading or recurved, about 3 mm long, the minute bracteoles oblong-ovate, acuminate, about 1 mm long. Calyx-tube turbinate, black or somewhat glaucous when dry, the lobes lanceolate, slenderly acuminate, about 1.5 mm long, somewhat spreading. Corolla white, glabrous externally, slightly pubescent inside, subcylindric, slightly narrowed above, about 6 mm long and 2 mm in diameter, the lobes subovate, obtuse, 0.8 mm long, recurved. Top of the ovary hirsute. Stamens 10; filaments thickened and villous below, filiform and glabrous above, about 3.5 mm long; anthers slender, narrow, 2 to 2.8 mm long, the spurs 1.2 to 2 mm long. Style glabrous, rather stout, 6 mm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10705*, (type), *Levine 1355*, August 25, 1917, on open grassy slopes 600 to 900 meters, rare.

This species somewhat resembles *Vaccinium carlesii* Dunn, but is entirely different in its floral characters. It is the third species of the genus to be found in Kwangtung Province, the other two, *Vaccinium bracteatum* Thunb. and *V. iteophyllum* Hance, being common on Loh Fau Mountain. It is dedicated to Miss A. Hancock, of the New Zealand Presbyterian Mission at Canton, in commemoration of her interest in the flora of Kwangtung Province, and in appreciation of her coolness in extricating herself, Mr. Levine, and the author in a serious encounter with Chinese robbers on Loh Fau Mountain on August 22, 1917.

RHODODENDRON Linnaeus

RHODODENDRON LEVINEI sp. nov.

Arbor 3 ad 4 m alta, ramulis et petiolis et foliis junioribus pilis longis tenuibus ferrugineis ornatis; foliis subcoriaceis, oblongo-ellipticis ad ellipticis, usque ad 10 cm longis, apice late rotundatis, interdum brevissime apiculatis, basi acutis ad rotundatis, margine revolutis, supra brunneo-olivaceis, subtus brun-

neis vel glaucescentibus, eleganter glanduloso-lepidotis, nervis utrinque circiter 8, distinctis; fructibus circiter 1.8 cm longis, oblongo-ovoideis, brunneis, glandulosis; sepalis persistentibus, subovatis, circiter 1.2 cm longis.

A tree 3 to 4 m high, the young branchlets, petioles, and young leaves prominently ciliate with long, spreading, brown or ferruginous, slender hairs 3 to 5 mm in length. Branches terete, smooth, reddish-brown, glabrous. Leaves crowded at the apices of the branchlets, subcoriaceous, oblong-elliptic to elliptic, 5 to 10 cm long, 3 to 5 cm wide, the apex broadly rounded, sometimes shortly apiculate, the base acute or subacute, the younger ones with scattered, slender, elongated hairs on both surfaces and on the margins, the older ones glabrous or nearly so, the upper surface shining, brownish-olivaceous when dry, the reticulations impressed, the lower surface of about the same color as the upper or glaucous, with numerous, scattered, brown, shining lepidote glands; primary lateral nerves about 8 on each side of the midrib, slender, distinct, anastomosing; petioles 1 to 1.5 cm long. Flowers not seen. Fruits umbellately arranged at the tips of the branchlets, usually 3 to 5 on each branchlet, their pedicels about 2 cm in length, glabrous or nearly so, the capsules brown when dry, glandular, oblong-ovoid, about 1.8 cm long and 1 cm in diameter, the subpersistent style at least 2.5 cm long; sepals persistent, subovate, obtuse, about 1.2 cm long, reticulate, glandular, glabrous, chartaceous.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10952* (type), *Levine 1830*, from the same plant, August 24, 1917, in a deep forested ravine in the "Perfect Pool gorge" growing out over a small stream, altitude about 950 meters.

This species must be exceedingly rare, as only a single plant was observed during our exploration of the numerous gorges on the upper slopes of Loh Fau Mountain. It is strikingly characterized by its indumentum; its subelliptic leaves which are broadly rounded at the apices and prominently lepidote-glandular beneath; and its persistent, reticulate sepals. It is dedicated to Mr. C. O. Levine, of the Canton Christian College.

CLETHRACEAE

CLETHRA Linnaeus

CLETHRA FABRI Hance in Journ. Bot. 21 (1883) 130.

Clethra canescens Hemsl. in Journ. Linn. Soc. Bot. 26 (1881) 33;
Dunn & Tutchner in Kew Bull. Add. Series 10 (1912) 155, non Reinw.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10742*, August 21, 1917, about boulders on open grassy slopes, altitude about 1,100 meters, rare.

The type of *Clethra fabri* Hance was from Loh Fau Mountain. Hance's

species was reduced by Hemsley to the Malayan *Clethra canescens* Reinw., the type of which was from Celebes. Comparison of the Chinese material with a Celebes specimen, presumably representing Reinwardt's species, shows that the two are unmistakably distinct. The Chinese form is also specifically distinct from the Philippine *Clethra lancifolia* Turcz., erroneously placed by Hemsley as a synonym of *Clethra canescens* Reinw. *Clethra fabri* Hance can readily be distinguished *C. canescens* Reinw. by its much fewer-nerved leaves, and from *C. lancifolia* Turcz. by its distinctly larger flowers.

VERBENACEÆ

CALLICARPA Linnaeus

CALLICARPA OLIGANTHA sp. nov.

Frutex 2 ad 3 m altus, subglaber, ramulis junioribus parcissime et decidue stellato-pubescentibus; foliis brevissime petiolatis, anguste lanceolatis, usque ad 12 cm longis et 1.5 cm latis, chartaceis, utrinque subaequaliter angustatis, acuminatis, basi cuneatis, margine in $\frac{3}{4}$ superiore parte distincte serrulatis, supra glabris, subtus glandulosis, glabris, vel junioribus parcissime stellato-pubescentibus, nervis utrinque 7 ad 9, curvato-adscendentibus, tenuibus; cymis axillaribus depauperatis, 2- vel 3-floris, brevissime pedunculatis, pedicellis glabris, circiter 4 mm longis; fructibus globosis, 3 ad 3.5 mm diametro, glabris, calycis persistentibus, glabris, truncatis.

A slender shrub, 2 to 3 m high, in age glabrous or nearly so, the young branchlets sparingly stellate-pubescent. Branches slender, terete, smooth, glabrous, grayish. Leaves narrowly lanceolate, chartaceous, 6 to 12 cm long, 0.8 to 1.5 cm wide, narrowed at both ends, the upper surface glabrous, smooth, eglandular, brownish-olivaceous, shining, the lower surface slightly paler, distinctly pitted-glandular, glabrous, or when young sparingly stellate-pubescent near the midrib, the base cuneate, the apex rather slenderly but bluntly acuminate, the margins in the upper two-thirds distinctly serrulate; lateral nerves 7 to 9 on each side of the midrib, slender, curved-ascending, anastomosing, the reticulations slender, not prominent; petioles 2 mm long or less. Cymes axillary, few, subsessile or shortly peduncled, depauperate, 2- or 3-flowered, the peduncles 2 mm long or less, the pedicels not exceeding 4 mm in length, glabrous. Fruits globose or subglobose, dark-brown when dry, 3 to 3.5 mm in diameter, glabrous, the persistent calyx truncate, glabrous.

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 11060, August 23, 1917, in thickets along small streams, altitude about 900 meters; rare, but a single plant seen.

The alliance of this species is manifestly with the form commonly

known as *Callicarpa purpurea* Juss., but which should be known as *C. dichotoma* (Lour.) Raeusch. It differs in its relatively much narrower leaves, and depauperate, subsessile, very few-flowered cymes.

CALLICARPA DICHOTOMA (Lour.) Raeusch. Nomencl. ed. 3 (1817) 37.

Porphyra dichotoma Lour. Fl. Cochinch. (1790) 70.

Callicarpa purpurea Juss. in Ann. Mus. Paris 7 (1806) 69.

Kwangtung Province, Teng Woo Mountain Levine 743, Levine & Groff 114, November, 1916 and June, 1917.

The type of *Porphyra dichotoma* Lour. was from the vicinity of Canton, and the specimens cited above agree perfectly with the original description and are practically topotypes. There is no valid reason for displacing Loureiro's specific name by the more recent *Callicarpa purpurea* Juss.

✓ **CALLICARPA LONGILOBA** nom. nov.

Callicarpa tomentosa Hook. & Arn. Bot. Beechey's Voy. (1841) 205;

Benth. Fl. Hongk. (1861) 269; Forbes & Hemsl. in Journ. Linn.

Soc. Bot. 26 (1890) 255; Dunn & Tutchter Fl. Kwangtung & Hong-

kong (1912) 202; ? Willd. Enum. Hort. Berol. (1809) 158; ?

Schauer in DC. Prodr. 11 (1857) 647, non Murr.

This strongly characterized species is readily distinguished by its slender, elongated calyx-teeth; and, there being no tenable name for it, I propose to call it *Callicarpa longiloba*. *Callicarpa tomentosa* Willd. was based on a specimen the origin of which was unknown, and it may not be the same as *Callicarpa tomentosa* as interpreted by modern authors; there is little in the description that would indicate that Willdenow's species is the same as the Chinese form commonly referred to *Callicarpa tomentosa* Willd. Whatever the status of the form Willdenow originally described, the name is invalidated by *Callicarpa tomentosa* (Linn.) Murr. (1798) based on *Tomex tomentosa* Linn. (1753), it being the valid name of the Indian species commonly known as *Callicarpa lanata* Linn. Specimens examined are as follows: Kwangtung Province, Loh Fau Mountain (Lo-faushan) Merrill 10312, 10677, Levine 1517; Formosa, Kanehira.

GESNERACEAE

DIDYMOCARPUS Wallich

✓ **DIDYMOCARPUS SWINGLEI** sp. nov.

Herba acaulescens; foliis omnibus radicalibus, succulentis, fragilibus, in siccitate membranaceis, olivaceis, utrinque parce pubescentibus, oblongo-obovatis, usque ad 15 cm longis, apice rotundatis, basi decurrento-acuminatis, saepe inaequilateralibus, margine undulato-dentatis, nervis utrinque 5 vel 6; scapis pendulis, usque ad 20 cm longis, pubescentibus, plerumque trichotome ramosis, pedicellis 4 ad 8 cm longis, bracteis parvis, oblongis, circiter 4 mm longis; calycis lobis lanceolatis, pubescentibus, liberis, 7 mm longis; corolla campanulata, 3 ad 3.5 cm longa, purpureo-azurea; capsulis circiter 2 cm longis, pubescentibus.

An acaulescent succulent herb, the leaves all radical, subrosulate, when fresh thick, fleshy, brittle, when dry membranaceous, olivaceous, in general oblong-obovate, apex rounded, base decurrent-acuminate and usually distinctly inequilateral, both surfaces rather sparingly pubescent with short hairs, the margins somewhat undulate-dentate; lateral nerves 5 or 6 on each side of the midrib, rather distinct; petioles up to 4 cm in length. Scapes several, usually trichotomously branched, slender, each several-flowered, distinctly pubescent, pendulous, up to 20 cm in length; bracts small, oblong, pubescent, about 4 mm long; pedicels slender, rather densely pubescent, 4 to 8 cm long. Flowers campanulate, blue-purple, 3 to 3.5 cm long. Calyx-lobes lanceolate, free to the base, pubescent, about 7 mm long. Corolla-tube terete, not gibbous, gradually widened upward, 3 to 3.5 cm long, the limb somewhat bilabiate, the five lobes all subequal, rounded. Stamens 2 only; filaments glabrous; anthers about 3.5 mm wide and 1.5 mm long, united. Ovary and style pubescent; stigma liguliform, entire, about 2 mm long, oblique, as persistent on immature fruits often slightly reflexed. Capsules linear-lanceolate, pubescent, about 2 cm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10692* (type), *Levine 1538*, August 16, 1917, gregarious on very damp cliffs in deep, shaded ravines; altitude about 1,000 meters.

This species is apparently confined to its peculiar habitat, and was observed in but a few restricted places, although where found it was gregarious and abundant. It grows on perpendicular cliffs, and its inflorescences are pendulous; when occurring in mass and in full anthesis, it is strikingly ornamental. It does not conform with the descriptions of any of the known Chinese species of *Chirita* or *Didymocarpus*, and might with almost equal propriety be placed in *Chirita* as in *Didymocarpus*. I have placed it in the latter genus as the liguliform stigma is not at all lobed.

SCROPHULARIACEAE

BRANDISIA Hooker f. & Thomson

BRANDISIA SWINGLEI sp. nov.

Suffrutex erectus, circiter 1 m altus, ramulis et subtus foliis et floribusque dense cinereo-pubescentibus, indumento stellato; foliis oppositis, oblongo-ovatis, membranaceis, usque ad 8 cm longis, acutis vel leviter acuminatis, basi rotundatis, margine denticulatis vel subintegris, supra in siccitate nigrescentibus, subglabris, subtus pallidis; floribus axillaribus, solitariis vel binis, pedicellatis, circiter 2.3 cm longis, flavidis.

A suffrutescent erect plant, about 1 m high, the younger parts

and lower surface of the leaves densely and softly stellate-pubescent with pale-gray indumentum, the hairs elongated, somewhat matted, rather woolly, the older branches terete, smooth, glabrous. Leaves opposite, membranaceous, oblong-ovate, 4.5 to 8 cm long, 2 to 4 cm wide, base rounded, apex acute to rather slenderly acuminate, margins usually denticulate, sometimes nearly entire, the upper surface blackish when dry, shining, ultimately glabrous, the lower pale-grayish; lateral nerves about 5 on each side of the midrib, anastomosing, conspicuous; petioles about 5 mm long. Flowers yellow, axillary, solitary or in pairs, their pedicels 5 to 7 mm long, the filiform bracteoles nearly as long as the pedicels. Calyx about 13 mm long, externally densely and softly gray-tomentose, inside densely appressed-hirsute, the lobes 5, oblong-lanceolate, acuminate, 5 mm long. Corolla yellow, externally cinereous-tomentose, about 23 mm long, the two lobes of the upper lip oblong-obovate, about 9 mm long, the three of the lower lip suborbicular, about 6 mm long. Anthers suborbicular, 2.5 mm in diameter, their margins very prominently bearded, cohering. Ovary densely tomentose. Capsule oblong-ovoid, somewhat cinereous-tomentose, about 1 cm long, 2-celled, first loculicidally dehiscing into two valves, ultimately splitting again through the placentae into four valves. Seeds numerous, thin, compressed, linear-oblong, often slightly falcate, about 4 mm long, 1 mm wide, the testa expanded into a thin wing surrounding the very narrow seed proper.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10851*, August 22, 1917, in thickets along small streams, altitude about 950 meters; very rare, a single plant observed.

This species is allied to *Brandisia hancei* Hook. f., of which no description has ever been published. My conception of Hooker's species is gained from an examination of Yunnan material, *Henry 9013*, *Delavay 1934*, *4626*. In these specimens the leaves are smaller than in *B. swinglei* Merr., much thicker, often cordate at the base, while the dense indumentum is ferruginous, and its stellate character is very evident; the calyx is broader, and its lobes are very different in shape in the Yunnan material. The genus is new to Kwangtung Province, the known forms now being *Brandisia discolor* Hook, f. & Th., *B. hancei* Hook. f., *B. racemosa* Hemsl., *B. souliei* Bonati, *B. laetevirens* Rehder, and *B. glabrescens* Rehder.

LINDERNIA Allioni

LINDERNIA PYXIDARIA All. Misc. Taur. 3 (1755) 178.

Vandellia pyxidaria Maxim. in Bull. Acad. Pétersb. 20 (1875) 449.

Kwangtung Province, Sheklung, *Merrill 11130*, August 28, 1917, on muddy river banks.

Not previously reported from Kwangtung Province: Central Europe to Japan, southward to Malaya and Polynesia.

RUBIACEAE

MYCETIA Blume

MYCETIA CORIACEA (Dunn) comb. nov.

Adenosacme coriacea Dunn in Kew Bull. Add. Series 10 (1912) 130
(Fl. Hongkong & Kwangtung).

Kwangtung Province, Loh Fau Mountain (Lofaushan), Merrill 10386, 10867, Levine 597, 1490, November, 1916 and August, 1917, a characteristic undershrub along small streams, in thickets, altitude 900 to 1,100 meters. The specimens agree with Dunn's authentic material in the Hongkong Herbarium, but I have adopted the generic designation *Mycetia* in place of *Adenosacme*, as the former is the older name.

HEDYOTIS Linnaeus

HEDYOTIS ACUMINATISSIMA sp. nov.

Herba erecta, glabra, ramosa, usque ad 75 cm alta, basi sublig-nosa, caulis infra teretibus, supra cum ramis 4-angulatis; foliis lanceolatis, chartaceis, scaberulis, usque ad 7 cm longis, basi acutis vel decurrento-acuminatis, apice tenuiter acuminatis, nervis utrinque 3, adscendentibus, perspicuis, supra impressis, subtus prominulis; stipulis ovatis, circiter 2 mm longis, denticulatis, apice plerumque 3-laciniatis; cymis axillaribus terminalibusque, circiter 4 cm longis, laxis; floribus albidis, corollae laciniis lanceolatis, recurvatis, 5 mm longis, intus villosis, tubo circiter 1.8 mm longo.

An erect, branched, glabrous herb attaining a height of 75 cm, the lower part of the stem terete, 3 to 4 mm in diameter, the internodes 4 to 7 cm long, unbranched in the lower 20 to 40 cm, the upper parts of the stem and the branches rather sharply 4-angled, the branches 20 to 30 cm in length. Leaves opposite, lanceolate, chartaceous, somewhat scaberulous, greenish or yellowish-green when dry, 4 to 7 cm long, 1 to 1.5 cm wide, the base acute or decurrent-acuminate, the apex slenderly and sharply acuminate; lateral nerves 3 on each side of the midrib, ascending, impressed on the upper surface, prominent beneath, anastomosing, the reticulations few, lax; petioles about 5 mm long; stipules ovate, about 2 mm long, their margins denticulate, the apex usually cleft into three lacinae. Cymes terminal and axillary, about 4 cm long, rather lax, few-flowered, the bracteoles lanceolate, 1 to 1.5 mm long, the pedicels 2 to 4 mm in length. Calyx-tube terete, ovoid, about 2 mm long, the lobes oblong-ovate, acute, 1 mm long. Corolla white, the tube about 1.8 mm long, the lobes 4, lanceolate, recurved, densely villous inside, about 5 mm long. Style 8 mm long.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10763* (type), *10826*, August 12 and 17, 1917, on wet grassy slopes and in damp forested ravines, altitude 1,000 to 1,100 meters, rare.

This species is well characterized by its habit, its older and somewhat woody stems being terete, the younger parts and branches being rather sharply 4-angled; its lanceolate, slenderly acuminate, slightly scaberulous, few-nerved leaves; and its rather lax cymes, the corolla lobes being about three times as long as the corolla-tube. This species is probably as closely allied to *Hedyotis acutangula* Champ. as to any other; but it is abundantly distinct from Champion's species, which is by far the commonest representative of the genus found on Loh Fau Mountain.

MORINDA Linnaeus

MORINDA PARVIFOLIA Bartl. in DC. Prodr. 4 (1830) 449; Merr. in Philip. Journ. Sci. 3 (1908) Bot. 438.

Kwangtung Province, Canton and vicinity, *Levine 782, 961, 1675*: Hongkong, *Mrs. Clemens 4270*, *Curran*: Formosa, *Kawakami 1624*.

This form has been included in the rather polymorphous *Morinda umbellata* Linn., but I consider it to be specifically distinct. The specimens cited closely match Bartling's type, a fragment of which is before me, as well as Cuming's material on which *Morinda cumingiana* Vid. (*Lucinaea cumingiana* Vid.) was based. The species is otherwise known only from northern Luzon and the Batan and Babuyan Islands.

TARENNA Gaertner

TARENNA ATTENUATA (Voigt) Hutch. in Sargent Pl. Wils. 3 (1916) 411.

Stylocoryne attenuata Voigt Hort. Suburb. Calcut. (1845) 377.

Webera attenuata Hook. f. Fl. Brit. Ind. 3 (1880) 104; Dunn & Tutch. Fl. Kwangtung & Hongkong (1912) 130.

Stylocoryne webera Benth. Fl. Hongk. (1861) 156, non A. Rich.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill s. n.*, August 20, 1917, on forested slopes in ravines, altitude about 1,000 meters.

The specimen agrees closely with the descriptions and with *Hongkong Herbarium 1715*, from Hongkong, and *Henry 89* from Formosa. The generic name *Webera* is untenable under all rules of botanical nomenclature, hence the adoption of the generic designation *Tarenna*.

TARENNA MOLLISSIMA (Hook. & Arn.) comb. nov.

Webera mollissima Benth. ex Hance in Journ. Linn. Soc. Bot. 13 (1873) 105; Dunn & Tutch. Fl. Kwangtung & Hongkong (1912) 130.

Stylocoryne mollissima Walp. Repert. 2 (1843) 517; Benth. in Kew Journ. Bot. 4 (1852) 195, Fl. Hongk. (1861) 156.

Cupia mollissima Hook. & Arn. Bot. Beechy's Voy. (1841) 192. Kwangtung Province, *Mell 52*.

UNCARIA Schreber

UNCARIA RHYNCHOPHYLLA (Miq.) Jackson in Index Kewensis (1895) 1145; Haviland in Journ. Linn. Soc. Bot. 33 (1897) 89.

Nauclea rhynchophylla Miq. Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 108.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10831*,

Levine 1324, August 24, 1917, from the same plant; in forested ravines, altitude about 1,000 meters, a single plant seen.

This species was originally described from sterile Japanese material, and as a *Nauclea*, not as an *Uncaria*; the first publication of the binomial *Uncaria rhynchophylla* seems to be that in *Index Kewensis*. The specimens cited above agree closely with Japanese material, *Wichura 1280*, with *Dunn 2794* from Fokien Province, China; with the original description; and with the more ample one given by Haviland. The species has not previously been reported from China.

COMPOSITAE

CARPESIUM Linnaeus

CARPESIUM CERNUUM Linn. Sp. Pl. (1753) 859.

Kwangtung Province, White Cloud Mountain, near Canton, *Levine 1782*, October, 1917: Swatow, *Dalziel*, October 1899.

The specimens are by no means typical of the Linnean species, and a critical revision of the genus may show that they are referable to some other species. *Carpesium cernuum* Linn. extends from Europe to Japan and northeastern Australia; it occurs on the mountains of northern Luzon, but has not been reported from the Malay Archipelago. The species is new to Kwangtung Province.

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NEW OR NOTEWORTHY PHILIPPINE PLANTS, XIV

By E. D. MERRILL

*(From the Botanical Section of the Biological Laboratory, Bureau of
Science, Manila, P. I.)*

Separate from

THE PHILIPPINE JOURNAL OF SCIENCE

Published by the Bureau of Science of the Philippine Government,
Manila, P. I.

VOL. XIII, No. 5, SEC. C, BOTANY, SEPTEMBER, 1918

MANILA
BUREAU OF PRINTING
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C. BOTANY

VOL. XIII

SEPTEMBER, 1918

No. 5

NEW OR NOTEWORTHY PHILIPPINE PLANTS, XIV

By E. D. MERRILL¹

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

The last number of this series was published early in the present year.² The present paper contains the descriptions of one new genus of the *Araliaceae* and of eighty-four new species distributed in twenty-six families. In addition to these proposed new species a few forms previously described from extra-Philippine material are for the first time credited to the Archipelago, and a few changes in nomenclature are proposed. The present paper is, therefore, essentially similar to the preceding ones of the series.

PANDANACEAE

PANDANUS Linnaeus

PANDANUS SUBACAULIS sp. nov. § *Keura*.

Frutex humile, subacaule; foliis circiter 70 cm longis et 5 cm latis, acutis vel breviter lobatis, lobis usque ad 1.5 cm longis; pedunculis terminalibus; syncarpiis solitariis, globosis, circiter 8 cm diametro; drupis numerosis, circiter 3 cm longis, 5- vel 6-locellatis, apice sulcatis; stigmatibus 2 ad 3 mm diametro, leviter obliquis in centro valde depresso.

A low shrub, practically acaulescent, the trunk, entirely covered by the imbricate leaf-bases, 20 cm in length or less. Leaves numerous, about 70 cm long and 5 cm wide, the margins armed with numerous, antrorse, conspicuous teeth about 2 mm in length, with similar ones on the midrib beneath and along the two

¹ Professor of botany, University of the Philippines.

² Philip. Journ. Sci. 13 (1918) Bot. 1-66.

lateral nerves on the upper surface toward the apex, the apex acute in very young leaves, in mature ones cleft into two short lobes, the lobes oblong-ovate, acute or acuminate, up to 1.5 cm long, their margins toothed. Syncarps solitary, terminal, globose, about 8 cm in diameter, the peduncles about 10 cm long, apparently pendulous. Drupes numerous, crowded, about 3 cm long, 1 to 2 cm wide, narrowed below, 5- or 6-celled, angular, the apical part cleft between the loculi, the individual terminal parts of the loculi 5 to 10 mm long, angular, narrowed upward; stigmas somewhat oblique, 2 to 3 mm in diameter, prominently depressed in the center.

CATANDUANES, on forested slopes along the Santo Domingo River, *Bur. Sci.* 30489 Ramos, December 5, 1917.

A species well characterized by being nearly acaulescent, in habit closely approximating *Pandanus brachypodus* Martelli, but with solitary syncarps and entirely different drupes.

PANDANUS PHILIPPINENSIS sp. nov. § *Keura*.

Arbor circiter 10 m alta; foliis usque ad 2.2 m longis, circiter 9 cm latis, sursum angustatis, acuminatis; syncarpiis circiter 6, spicatum dispositis, confertis, subglobosis ad subellipsoideis, circiter 11 cm longis; drupis numerosis, confertis, circiter 3.5 cm longis, plerumque circiter 1.5 cm diametro, angulatis, 5- ad 8-locellatis, partibus $\frac{1}{4}$ superioribus liberis, subpyramidalis, extremitate truncatis, circiter 1 cm diametro, loculorum apices pyramidales, 5 ad 7 mm longis, sulcis distinctis separati; stigmatibus obliquis.

A tree about 10 m high. Leaves coriaceous, about 2.2 m long and 9 cm wide, the margins toothed throughout, the midrib on the lower surface with scattered teeth in the upper part of the leaf, the lateral veins here distinct, one on each side of the midrib, unarmed. Syncarps usually 6, arranged in a dense spike, subglobose to subellipsoid. Drupes numerous, crowded, about 3.5 cm long, mostly about 1.5 cm in diameter, 5- to 8-celled, angular, narrowed below, the upper one-fourth free, narrowed upward, the apex truncate and about 1 cm in diameter, the apices of the loculi pyramidal, 5 to 7 mm long, the sulci between them distinct, narrow; stigmas oblique, about 1.5 mm in diameter.

LUZON, Nueva Vizcaya Province, Campote, *Bur. Sci.* 11289 McGregor, March, 1912, on forested hillsides.

This species is well characterized by its crowded, spicately arranged syncarps, and the narrowly pyramidal free apices of the loculi of the drupes. In vegetative characters it is suggestive of *Pandanus exaltatus* Blanco, but is totally different from that species in its numerous syncarps, and in the details of the individual drupes.

PANDANUS OCCULTUS sp. nov. § *Keura*.

Caulis prostratis, parce ramosis, usque ad 3 m longis; foliis usque ad 2.2 m longis, circiter 4 cm latis, superne leviter angustatis, acuminatis; syncarpiis solitariis, erectis, breviter pedunculatis, ellipsoideis, circiter 20 cm longis; drupis numerosis, 4 ad 4.5 cm longis, deorsum gradatim angustatis, 1.5 ad 2.5 cm latis, superne haud angustatis, apice truncatis; loculis circiter 5, apices pentagonis, 5 ad 8 mm diametro, angulatis, leviter pyramidatis, sulcis distinctis separatis; stigmatibus obliquis.

Trunk prostrate, sparingly branched, 3 to 4 cm in diameter, up to 3 m in length, the tips ascending about 0.5 m. Leaves very numerous, greatly elongated, coriaceous, about 2.2 m long and 4 cm wide, gradually narrowed upward, acuminate, the margins rather coarsely toothed especially in the lower part, the teeth less conspicuous and usually appressed above the middle, the midrib beneath with few, small, scattered teeth in the upper part of the leaf, and the two lateral nerves on the upper surface with corresponding teeth. Syncarps solitary, erect, short-peduncled, very dark-green when fresh, ellipsoid, hidden in the terminal crown of leaves and nearly covered with the numerous, imbricate, dead bracts, its length about 20 cm, its diameter about 11 cm. Drupes numerous, densely crowded, 4 to 4.5 cm long, 1.5 to 2.5 cm wide, the apex broad, truncate, gradually narrowed below, compressed or angular, usually 5-celled, the tips of the loculi 5-angled, 5 to 8 mm in diameter, somewhat pyramidal, distinctly separated by narrow and not very deep sulci, the stigmas solitary, oblique, pointed.

PALAWAN, Taytay, *Merrill 9361*, May 7, 1913, in level forests, dry at this season but swampy in the rainy season, slightly above sea level.

This species is prominently characterized by its habit, being prostrate with ascending branches; its greatly elongated leaves; and its solitary, erect, ellipsoid syncarps, which are hidden in the terminal crown of leaves and nearly covered with the dead bracts. The plants were common in one restricted area, and were very familiar to me for several weeks before I discovered that a few of them were fruiting.

PANDANUS ACLADUS sp. nov. § *Vinsonia*.

Arbor 5 ad 6 m alta, simplex; foliis usque ad 2 m longis et 10 cm latis, crasse coriaceis, supra gradatim angustatis; infructescentiis pendulis, syncarpiis circiter 9, oblongo-ellipsoideis vel oblongo-ovoideis, circiter 18 cm longis et 10 cm latis; drupis numerosis, obovoideis, angulatis, 3.5 ad 5 cm longis, 2 ad 2.5 cm diametro, 9- ad 15-locellatis, apice truncatis et leviter sulcatis, stigmatibus vix obliquis, 1 ad 1.5 mm diametro.

A tree 5 to 6 m high, unbranched. Leaves up to 2 m in

length, about 10 cm wide, thickly coriaceous, the marginal teeth below coarse, spreading, above finer and ascending, the midrib on the lower surface in the upper part with small antrorse teeth. Infructescences terminal, pendulous, the rachis 2 to 3 cm in diameter, the heads about 9, oblong-ellipsoid or oblong-ovoid, about 18 cm long and 10 cm in diameter. Drupes numerous, obovoid, angular, 3.5 to 5 cm long, 2 to 2.5 cm wide, 9- to 15-celled, the apical parts with rounded shoulders, the tip truncate and 1 to 1.5 cm in diameter, shallowly sulcate between the tips of the loculi, the latter irregularly conical, 2 mm long or less and at most 4 mm in diameter at their bases. Stigmas scarcely oblique, rounded or reniform, 1 to 1.5 mm in diameter, usually depressed in the center.

CATANDUANES, *Bur. Sci.* 30462 Ramos, December 10, 1917, in damp forests.

This species is remarkable for its habit, being tall and unbranched, and for its pendulous spikelike racemes of numerous syncarps. It belongs in the same group as *Pandanus radicans* Blanco and *P. botryoides* Martelli, from both of which it is readily distinguished by its more numerous syncarps, larger drupes, and much more numerous stigmas and loculi.

PANDANUS BILIRANENSIS sp. nov. § *Vinsonia*.

Arbor circiter 7 m alta; foliis circiter 2.5 m longis et 6 cm latis, acuminatis; syncarpiis solitariis, globosis, ut videtur circiter 20 cm diametro; drupis numerosis, circiter 7 cm longis, plerumque circiter 3 cm diametro, 5- vel 6-locellatis, 5- vel 6-angulatis, in $\frac{3}{4}$ inferiore parte angustatis, apice subpyramidatis, late rostratis, extremitate 5 ad 8 mm diametro, planis vel leviter concavis; stigmatibus 5 vel 6, planis, confluentibus.

A tree about 7 m high. Leaves about 2.5 cm long and 6 cm wide, coriaceous, narrowed upward to the acuminate apex, the margins toothed throughout, the teeth much more prominent in the lower 50 cm than above, the midrib near the tip minutely toothed on the lower surface. Syncarps solitary, globose, apparently pendulous, and about 20 cm in diameter. Drupes large, numerous, about 7 cm long, mostly about 3 cm in diameter, 5- or 6-angled, 5- or 6-celled, narrowed below from the upper three-fourths, the upper one-fourth subpyramidal, broadly rostrate, the tip plane or slightly concave, 5 to 8 mm in diameter, the stigmas 5 or 6, confluent, plane, quite covering the tip of the syncarp.

BILIRAN, *Bur. Sci.* 18895 McGregor, June 20, 1914, in forests, altitude about 300 meters.

In the form and aspect of the drupes, except in their broadly rostrate apices and plane, confluent stigmas covering the truncate tips, this species is suggestive of *Pandanus dubius* Spreng., but it does not belong in the

section *Hombronia*. It does not appear to be closely allied to any previously described species.

FREYCINETIA Gaudichaud

FREYCINETIA ACUTIFOLIA sp. nov. § *Oligostigma*.

Foliis subcoriaceis, anguste oblongis, usque ad 35 cm longis et 6.5 cm latis, apice acutis vel obscure acuminatis, basi plus minusve angustatis; syncarpiis 6, anguste cylindraceis, 8 ad 11 cm longis, circiter 1.5 cm diametro; fructibus superne angustatis, partibus superioribus perspicue 4- vel 5-angulatis et sulcatis; stigmatibus 2, rariter 3.

Scandent, the branches about 12 mm in diameter. Leaves narrowly oblong, 30 to 35 cm long, 4.5 to 6.5 cm wide, above rather abruptly narrowed to the acute or slightly acuminate tip, the base narrowed, the clasping part 2 to 2.5 cm wide, margins below conspicuously toothed, in the median parts smooth or with scattered small teeth, toward the apex again toothed, the midrib beneath with small scattered teeth. Syncarps 6, cylindric, 8 to 11 cm long, about 1.5 cm in diameter, the peduncles 5 to 6 cm long, very scabrous above, below nearly smooth except along the edges. Fruits numerous, the upper one-half or more entirely free, narrowed upward, conspicuously 4- or 5-angled and sulcate, the truncate tip about 1 mm in diameter; stigmas 2, rarely 3.

CATANDUANES, back of Calolbong, *Bur. Sci.* 30319 Ramos, December 10, 1917, in forests along small streams at low altitudes.

This characteristic species is manifestly allied to *Freycinetia oblongifolia* Merr., from which it is at once distinguished by its longer leaves, longer and narrower syncarps, and much narrower fruits.

FREYCINETIA PLATYPHYLLA sp. nov. § *Oligostigma*.

Foliis chartaceis, oblongis ad oblongo-ellipticis, usque ad 20 cm longis et 8 cm latis, perspicue tessellatis, abrupte et brevissime acuminatis, deorsum valde angustatis, margine, basi et acumine exceptis, laevis; syncarpiis 4, cylindraceis, junioribus circiter 1.5 cm longis et 6 mm diametro; stigmatibus 2.

Scandent, the branches about 5 mm in diameter. Leaves thinly chartaceous, oblong to oblong-elliptic, 15 to 20 cm long, 5.5 to 8 cm wide, pale-olivaceous, prominently tessellate, nerves about 20 on each side of the midrib, slender, distinct, the apex abruptly and shortly acuminate, the acumen 7 mm long or less, finely toothed, margins otherwise unarmed except at the very base, the blade conspicuously narrowed below and but about 1 cm wide where it sheathes the stem. Very young syncarps 4, cylindric, about 1.5 cm long and 6 mm in diameter, their pedicels densely spinulose; bracts red, membranaceous, oblong, acute or somewhat acuminate, up to 6 cm in length. Stigmas 2.

SAMAR, Catubig River at Pinpisakan, *Bur. Sci.* 24349 Ramos, March 21, 1916, in forests near the river.

A species most closely allied to *Freycinetia oblongifolia* Merr., but strongly characterized by its unusually broad, thinly chartaceous, prominently tessellate leaves.

FREYCINETIA BOTULIFORMIS sp. nov. § *Pleio stigma*.

Foliis circiter 70 cm longis et 3.5 cm latis, sensim angustatis, tenuiter et longe acuminatis, basi haud angustatis, auriculis 2 ad 3 cm longis, omnino adnatis, laminae marginibus dentibus brevibus praeditis, in parte media laevibus; syncarpiis 3, ut videtur carnosus, siccitate cylindraceis, botuliformibus, 17 ad 20 cm longis, 2.5 cm latis; fructibus confertis, alte connatis, numerosissimis, circiter 3 mm diametro, apice subplanis vel paullo elevatis, haud angulatis; stigmatibus 7 vel 8.

Scandent, the branches stout, 1 to 1.5 cm in diameter. Leaves about 70 cm long and 3.5 cm wide, gradually narrowed upward to the slenderly acuminate apex, the base not narrowed, the basal auricles adnate throughout, narrow, 2 to 3 cm long, toothed toward their apices, the margins below membranaceous, deciduous; leaf margins below toothed, in the median part entire, and near the tip finely toothed, the midrib beneath with small teeth in the lower part, glabrous above. Syncarps 3, cylindric, dense, 17 to 20 cm long and 2.5 cm in diameter when dry, their peduncles smooth, stout, about 3 cm long from a 5 to 6 cm long common peduncle. Fruits very numerous, connate nearly to their apices, about 3 mm in diameter, apparently fleshy, the free apices nearly plane or slightly elevated, not at all angular, the stigmatic portion elliptic, about 2 mm long; stigmas 7 or 8.

LUZON, Sorsogon Province, Mount Lalao, *Bur. Sci.* 23363 Ramos, September, 1915, in damp forests.

This species is well characterized by its elongated leaves and its sausage-shaped, elongated syncarps, the individual fruits being united except at the very tips, the free portion being slightly elevated and not at all angular. In its elongated syncarps it differs radically from the species to which it is allied, such as *F. scabripes* Warb., *F. batanensis* Martelli, and *F. banahaensis* Elm.

FREYCINETIA BULUSANENSIS sp. nov. § *Pleio stigma*.

Species *F. williamsii* affinis, differt foliis longioribus et angustioribus, longissime et tenuissime attenuatis, pro ratio subferociter serratis.

Scandent, slender, branched, the branches brownish, about 3 mm in diameter, the internodes 3 to 8 mm long. Leaves rather stiff, 20 to 29 cm long, 5 mm wide, very gradually narrowed upward to the long and slender acuminate apex, the margins and midrib on the lower surface toothed throughout, the teeth

toward the base rather conspicuous. Syncarps 3, globose, 2.5 cm in diameter, their peduncles glabrous, 1.5 cm long. Fruits numerous, flask-shaped, about 9 mm long, narrowed upward, the upper part somewhat angular. Stigmas 4 or 5.

LUZON, Sorsogon Province, Mount Bulusan, *Bur. Sci.* 23686 Ramos, September, 1915.

A species manifestly allied to *Freycinetia williamsii* Merr., but distinguished by the characters indicated in the diagnosis. In the typical form of *Freycinetia williamsii* the leaves are not at all toothed.

FREYCINETIA APAYAOENSIS sp. nov. § *Pleiotigma*.

Foliis numerosis, anguste ensiformibus, usque ad 70 cm longis et 1.5 cm latis, superne sensim longe attenuato-acuminatis, vix tessellatis, coriaceis, auriculis apice liberis; syncarpiis 4, cylindraceis, 6 ad 8 cm longis, circiter 2 cm diametro, pedicellis scabris; fructibus numerosis, liberis, superne subpyramidatis, 4- ad 6-angulatis et sulcatis, sursum angustatis, apice circiter 1 mm diametro; stigmatibus 4 ad 6.

Scandent, attaining a length of 12 m, the stems, when dry, about 1 cm in diameter. Leaves numerous, narrowly ensiform, 60 to 70 cm long, about 1.5 cm wide, coriaceous, scarcely tessellate, gradually narrowed upward to the very slenderly acuminate apex, somewhat narrowed below, the base above the sheathing parts about 1 cm wide, margins below sharply toothed, in the median parts unarmed or sometimes with a few scattered teeth, the long slender tip finely toothed on the margins and midrib, the latter usually unarmed in the lower part of the leaf; auricle chartaceous, rather brittle, adnate to the leaf-margin except at the tip, here 3 to 4 mm wide, subtruncate to somewhat ovate and toothed on the upper side. Syncarps 4, cylindric, 6 to 8 cm long, about 2 cm in diameter, their pedicels scabrous, about 3 cm long. Fruits numerous, free, the upper parts subpyramidal, narrowed upward, conspicuously 4- to 6-angled and sulcate, the tip about 1 mm in diameter; stigmas 4 to 6.

LUZON, Apayao Subprovince, Ngagan, *Bur. Sci.* 28034 *Fénix*, May 9, 1917, in forests.

This species belongs in the group with *Freycinetia scabripes* Warb. and *F. atocensis* Martelli, but among other characters is readily distinguished from both by its conspicuously 4- to 6-angled and sulcate fruits which are narrowly pyramidal above.

MARANTACEAE

PHACELOPHRYNIUM K. Schumann

PHACELOPHRYNIUM CYLINDRICUM sp. nov.

Foliis longe petiolatis, chartaceis, oblongo-ellipticis, acuminatis, usque ad 30 cm longis; inflorescentiis pedunculatis, spicis

3, cylindræis, sessilibus, 4 ad 6 cm longis, circiter 8 mm diametro; bracteis numerosis, imbricatis, dense spiraliter dispositis, circiter 1 cm longis, acutis vel leviter acuminatis, sursum plus minusve villosis, bracteis florentes bicarinatis, circiter 8 mm longis; floribus circiter 9 mm longis.

An herb, about 1 m high, tufted, the petioles nearly 1 m long, the leaves chartaceous, oblong-elliptic, acuminate, 25 to 30 cm long, 9 to 11 cm wide. Inflorescences from the sheaths 10 to 12 cm below the base of the leaf, each composed of three, dense, cylindric spikes fascicled at the tip of the common 3 to 4 cm long peduncle, the individual spikes 4 to 6 cm long, about 8 mm in diameter, composed of numerous, imbricate, spirally arranged bracts; bracts about 1 cm long and 5 mm wide, oblong-elliptic, acute or somewhat acuminate, more or less villous above, green, each subtending an inner (floral) bract, which in turn encloses two bracteoles and two flowers, this floral bract about 8 mm long, flattened on the back, the margins inflexed, the keels conspicuously 2-keeled or 2-winged; bracteoles membranaceous, oblong, 5 mm long. Flowers white, about 9 mm long. Ovary densely villous. Sepals oblong-lanceolate, acuminate, about 7 mm long, rather densely 7-nerved, slightly villous toward the tip. Corolla-tube about 4 mm long, the lobes oblong, obtuse, 5 to 6 mm long, 2 to 2.5 mm wide. Staminode one only, oblong-elliptic, rounded, 3 mm long. Cucullate stamen obovate, 3 mm long, callus one 4 mm long, 2 mm wide, plane, somewhat inequilateral, fertile one narrowly oblong, 2 mm long, 1 mm wide.

CATANDUANES, Mount Mariguison, *Bur. Sci. 30503* Ramos, November 23, 1917, in damp forests.

This species is strikingly characterized by its 3-partite, peduncled inflorescences springing from the sheaths, the individual spikes dense, cylindric, sessile, composed of numerous, imbricate, spirally arranged bracts. It is anomalous in *Phacelophrynium* in its spirally arranged bracts; each of which, however, subtends an inner floral bract, which in turn contains two flowers. In its floral characters it conforms to the genus.

URTICACEAE

LAPORTEA Gaudichaud

LAPORTEA PENDULA sp. nov.

Frutex, inflorescentiis et foliis exceptis glaber; foliis longe petiolatis, oblongo-ovatis, usque ad 35 cm longis, basi rotundatis, apice acuminatis, supra glabris, subtus pallidioribus et plus minusve hirsutis, nervis utrinque circiter 10, perspicuis; inflorescentiis laxis, axillaribus, pendulis, longissime pedunculatis, usque ad 75 cm longis, partibus junioribus et receptaculis pilis

numerosis urentibus instructis; floribus flabellatim dispositis, receptaculis concavis, accrescentibus, usque ad 9 mm diametro.

A shrub, glabrous except the lower surface of the leaves and the inflorescences. Branches thickened, rugose, the ultimate ones about 1 cm thick when dry. Leaves chartaceous, brittle, oblong-ovate, 30 to 35 cm long, about 13 cm wide, base rounded, the apex acuminate, the upper surface olivaceous, rather dull, densely punctulate, glabrous, the lower surface somewhat paler than the upper and more or less hirsute with rather numerous, scattered, short, stinging hairs; lateral nerves about 10 on each side of the midrib, prominent on the lower surface, the reticulations lax, prominent; petioles 8 to 10 cm long; stipules oblong-ovate, chartaceous to subcoriaceous, densely punctulate, 2.5 to 3 cm long. Inflorescences axillary, lax, pendulous, long-peduncled, up to 75 cm in length, the younger parts and the receptacles rather densely covered with short stinging hairs. Receptacles obovoid to somewhat reniform, blue when fresh, accrescent and attaining a diameter of 9 mm, concave, the pistillate flowers borne in a single row along the margin, inflexed, about 10 in each receptacle. Achenes about 4.5 mm long, tipped with the reflexed, 2 mm long, lanceolate, acuminate style.

CATANDUANES, Mount Mariguidon, *Bur. Sci.* 30229 Ramos, along small streams in damp forests, altitude about 200 meters, November 21, 1917.

This striking species is well characterized by its greatly elongated, pendulous, lax inflorescences which attain a length of 75 cm. In this character it differs from all other species of the genus known to me.

ELATOSTEMA Forster

ELATOSTEMA CATANDUANENSE sp. nov.

Herba, infra prostrata, ramis paucis, erectis vel adscendentibus, usque ad 20 cm longis, tenuibus, brevissime adpresse hirsutis; foliis oblongo-lanceolatis ad oblongo-oblancheolatis, leviter falcatis, usque ad 2 cm longis, acuminatis, basi valde inaequalateralibus, auriculatis, dentibus utrinque 2 vel 3, perspicuis; receptaculis axillaribus, omnibus sessilibus, bracteis exterioribus chartaceis, latissime obovatis, truncatis vel leviter retusis, circiter 4 mm longis, leviter corniculatis, interioribus obovatis et valde retusis ad lineari-lanceolatis et ciliatis, perianthii segmentis 4.

A sparingly branched, slender herb, prostrate below, the branches ascending or erect, up to 20 cm in length, appressed-hirsute with short, appressed hairs. Leaves chartaceous, olivaceous-brown when dry, dull or slightly shining, without cystoliths, narrowly oblong-lanceolate to narrowly oblong-oblancheolate, 1.5

to 2 cm long, 3 to 5 mm wide, somewhat falcate, acuminate, the base very inequilateral, one side with a rounded auricle, the other acute, the margins with 2 or 3 very conspicuous teeth on each side in the upper one-half, entire below, both surfaces minutely punctulate, the lower paler than the upper and appressed-hirsute with short hairs on the midrib beneath; lateral nerves 4 or 5 on each side of the midrib, distinct on the lower surface, anastomosing, the reticulations rather lax; stipules lanceolate, falcate, acuminate, often irregularly cleft near the apex, membranaceous, 4 to 8 mm long. Receptacles all axillary, solitary, sessile, mostly pistillate, occasionally a staminate one on the same plant with the pistillate ones. Outer bracts very broadly obovate, about 4 mm wide and long, much thicker than the inner ones, brown, truncate, slightly corniculate, glabrous; the next inner ones thinner, obovate, prominently retuse; the innermost ones linear-lanceolate, ciliate. Staminate perianth segments 4, 2 mm long, two slightly corniculate; anthers 4. Pistillate segments 4, 0.5 mm long, oblong, obtuse. Achene 0.8 mm long.

CATANDUANES, Santo Domingo River, on stones along small streams in forests at low altitudes, *Bur. Sci.* 30555 Ramos, December 5, 1917.

This is perhaps as near *Elatostema gracilifolium* Merr. as any other species, but is radically different from it in habit; its shorter, fewer-toothed leaves which have no cystoliths; and in the details of its inflorescences.

FAGACEAE

QUERCUS Linnaeus

QUERCUS RIZALENSIS sp. nov. § *Cyclobalanus*.

Arbor parva, cupulis exceptis glabra, ramulis atro-brunneis vel nigrescentibus; foliis coriaceis, integris, ellipticis ad elliptico-ovatis, usque ad 6 cm longis, utrinque acuminatis, subtus pallidis vel glaucescentibus, nervis utrinque circiter 6, tenuibus, distinctis; fructibus paucis, in spicis brevibus dispositis; cupulis circiter 1.3 cm diametro, cinereo-puberulis, lamellis 5 ad 7, denticulatis; glans conico-ovoideis, glabris vel junioribus leviter pubescentibus, circiter 1.4 cm longis et latis.

A small tree, glabrous except the cups (inflorescences not seen), the branches terete, dark-colored, the branchlets dark blackish-brown, glabrous. Leaves numerous, elliptic to elliptico-ovate, coriaceous, 4.5 to 6 cm long, 2 to 3 cm wide, subequally narrowed to the acuminate base and to the acuminate apex, the apical acumen narrow, hardly caudate, and less than 1 cm long, the upper surface smooth, pale to brownish-olivaceous, the lower pale or somewhat glaucous; lateral nerves about 6 on each side of the midrib, slender, distinct, very obscurely anastomosing

close to the margin, the reticulations slender, obscure; petioles 3 to 5 mm long. Spikes short, mostly less than 2 cm long, glabrous, each with few fruits. Cups shallow, cinereous-puberulent, about 1.3 cm in diameter, the lamellae 5 to 7, the lower ones distant, the upper close, denticulate. Glans conical-ovoid, brown, glabrous, shining, apiculate, about 1.4 cm long and wide, the younger ones more or less pubescent.

LUZON, Rizal Province, Mount Lumutan, *Bur. Sci.* 29587 Ramos & Edaña, in the summit forests, altitude apparently about 1,000 meters. The same species is also represented by *Bur. Sci.* 9445 Robinson from a similar altitude on Mount Binuang, Tayabas Province, Luzon.

The alliance of this species is manifestly with *Quercus philippinensis* A. DC., from which it is distinguished by its smaller, not caudate-acuminate leaves and smaller fruits. Its fruits are much smaller than are those of *Quercus minahassae* Koord., another allied species.

LORANTHACEAE

LORANTHUS Linnaeus

LORANTHUS CONFERTIFLORUS sp. nov. § *Heteranthus*.

Frutex parasiticus inflorescentiis exceptis glaber; ramis 4-angulatis, ramulis acutissime tetragonis, internodiis elongatis; foliis oppositis, coriaceis, olivaceis, nitidis, oblongis ad late oblongo-lanceolatis, acuminatis, basi rotundatis, usque ad 13 cm longis, nervis utrinque circiter 9, vix prominentibus; inflorescentiis axillaribus, solitariis, usque ad 3 cm longis; floribus 6-meris, cylindraceis, omnibus sessilibus, in triadibus subsessilibus vel breviter pedunculatis dispositis, secundis, rhachibus dense puberulis.

A parasitic shrub, glabrous except the densely puberulent rachis and bracts of the inflorescences. Branches stout, brownish, distinctly 4-angled, the older ones becoming nearly terete, the angles represented by raised lines, the younger branchlets very sharply 4-angled, the internodes 3 to 9 cm long. Leaves opposite, coriaceous, olivaceous and of the same color on both surfaces, shining when dry, oblong to broadly oblong-lanceolate, 8 to 13 cm long, 3 to 5 cm wide, narrowed upward to the rather prominently acuminate apex, base rounded; lateral nerves not prominent, distant, irregular, about 9 on each side of the midrib, the reticulations lax, obscure; petioles about 1 cm long. Inflorescences axillary, solitary, about 3 cm long, the flowers all secund, very densely arranged along one side of the densely puberulent rachis, all sessile in triads, the triads racemously arranged on very short peduncles. Flowers red, 6-merous, about 23 mm long, the buds very slightly enlarged at the base and again above

the very slight constriction, cylindric, the bracts 3, forming a small involucre at the apex of the short peduncle, one bract subtending each flower, ovate, obtuse to subacute, about 3 mm long, densely puberulent. Calyx subcylindric, oblong, about 3 mm long, the limb slightly pubescent, somewhat spreading, irregularly lobed. Petals free to the base, or the basal margins slightly cohering, the petals linear, about 20 mm long, the reflexed part above the insertion of the anthers narrowly oblong, 3 to 3.5 mm long, slightly puberulent on the back. Anthers linear, continuous, 2 to 2.5 mm long.

LEYTE, Tigbao, near Tacloban, *Wenzel 1249*, May 25, 1915, a parasitic shrub about 2 m high.

A very characteristic species readily recognized by its elongated internodes, prominently 4-angled stems and branchlets, and its very dense, solitary inflorescences, the flowers all secund, all sessile in triads, the triads with very short peduncles racemosely arranged along the densely puberulent rachis.

LORANTHUS CRASSILIMBUS sp. nov. § *Heteranthus*.

Frutex parasiticus, glaber, ramis ramulisque teretibus, crassis, internodiis brevibus; foliis oppositis, petiolatis, crasse coriaceis, oblongis, usque ad 13 cm longis, obtusis, basi acutis, nervis reticulisque obsoletis; inflorescentiis axillaribus, solitariis, circiter 3 cm longis; floribus circiter 2.8 mm longis, 6-meris, solitariis vel in diadibus vel triadibus racemose dispositis; petalis liberis.

A parasitic glabrous shrub, the branches and branchlets terete, stout, brown when dry, the latter smooth, about 5 mm in diameter, the internodes 1.5 to 3 cm long. Leaves opposite, very thickly coriaceous, oblong, 12 to 13 cm long, 4.5 to 5 cm wide, the upper surface greenish-olivaceous when dry, the lower brown, smooth, slightly shining, apex obtuse, base acute or somewhat decurrent-acuminate, midrib very prominent, the lateral nerves and reticulations obsolete, or the former faintly visible on the upper surface; petioles stout, 1.5 to 2 cm long. Inflorescences axillary, solitary, the rachis about 3 cm long, the flowers racemosely arranged, more or less secund, solitary, in pairs, or in triads, their peduncles about 4 mm long, the flowers subtended by a whorl of ovate, acuminate, coriaceous, 4 mm long bracts. Calyx cylindric, about 4 mm long, slightly contracted below the thin limb, the limb about 1 mm long, irregularly lacerate-toothed. Petals 6, linear, free, the unopened flowers somewhat angular, not inflated, the petals about 24 mm long and 2 mm wide below, narrowed upward, the reflexed part above the insertion of the stamen narrowly oblong, acute or somewhat acuminate, 6 mm long.

Anthers linear-oblong, 3 mm long, subsessile. Bracteoles subtending the calyces ovate, acuminate, about 2 mm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26409 Ramos & Edaño, August 15, 1916, on trees in forests, altitude about 300 meters, the flowers red and yellow.

This very characteristic species is readily distinguishable by its very thickly coriaceous leaves, the veins and reticulations obsolete, or the former faintly visible on the upper surface. It does not appear to be closely allied to any previously described Philippine form.

LORANTHUS EDANOII sp. nov. § *Heteranthus*.

Frutex parasiticus, glaber, ramis ramulisque teretibus, internodiis elongatis; foliis oppositis, sessilibus, crasse coriaceis, oblongo-ovatis, usque ad 16 cm longis, apice obtusis vel obtuse acuminatis, basi obtusis, in siccitate minute verruculosus, brunneo-olivaceis, nervis primariis utrinque circiter 5, subobscuris, curvato-adscendentibus, secundariis obsoletis; inflorescentiis axillaribus et secus internodiis seriatim dispositis, breviter pedunculatis, 6-floris; floribus omnibus sessilibus, 5-meris, cylindraceis, circiter 16 mm longis, petalis liberis.

A parasitic glabrous shrub, or the inflorescences very obscurely ferruginous-puberulent. Branches and branchlets terete, dark-brown, smooth, or the older branches lenticellate, the internodes 7 to 11 cm in length. Leaves opposite, sessile, thickly coriaceous, dull, brownish-olivaceous, of the same color on both surfaces and minutely verruculose when dry, often slightly inequilateral, oblong-ovate, 11 to 16 cm long, 5.5 to 6 cm long, apex obtuse to obscurely blunt-acuminate, base obtuse; lateral nerves about 5 on each side of the midrib, curved-ascending, not prominent, evanescent or obscurely anastomosing, the secondary nerves and reticulations obsolete. Inflorescences axillary and seriatly arranged along one side of the internodes, all peduncled and 6-flowered. Peduncles about 5 mm long. Flowers red, 5-merous, all sessile, and each subtended by a reniform-ovate, rounded bracteole, about 2 mm long and 2.5 mm wide. Calyx cylindric, slightly curved, 3.5 mm long, the limb truncate, produced about 1 mm. Petals 5, linear, free, about 13 mm long, 1 mm wide, glabrous, the portion above the insertion of the stamen thickened, narrowly oblong-obovate, obtuse, 3 mm long. Anthers oblong, continuous with the filament, 1.2 mm long, the filament as long as the anther.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26241 Ramos & Edaño, August 8, 1916, on trees at low altitudes.

A very characteristic species, in vegetative characters approaching *Loranthus cuernosensis* Elm. and *L. seriatus* Merr. It is readily dis-

tinguished by its peduncled, 6-flowered inflorescences, which are in the axils and also seriatly arranged along one side of the internodes.

LORANTHUS SAMARENSIS sp. nov. § *Heteranthus*.

Frutex parasiticus, glaber, ramulis teretibus; foliis oppositis, sessilibus, ovatis, usque ad 18 cm longis, crasse coriaceis, in siccitate brunneis, utrinque minute verruculosi, apice obtuse acuminatis, basi rotundatis vel leviter cordatis, nervis utrinque 5 vel 6, arcuato-anastomosantibus, subdistinctis; inflorescentiis secundum internodiis plus minusve confertis, fasciculis 4-floris, sessilibus vel brevissime pedunculatis; floribus teretibus, circiter 2.4 cm longis, 5-meris, petalis liberis.

A parasitic glabrous shrub, the branches and branchlets terete, reddish-brown, smooth. Leaves opposite, sessile, thickly coriaceous, brown when dry, of the same color on both surfaces, minutely verruculose, ovate, 9 to 18 cm long, 7 to 11 cm wide, often slightly inequilateral, apex obtusely acuminate, base rounded, sometimes slightly cordate; lateral nerves 5 or 6 on each side of the midrib, rather distinct, stout, curved, anastomosing, the secondary ones and the reticulations obsolete. Flowers terete, cylindric, 5-merous, all sessile, about 2.4 cm long, in 4-flowered fascicles, the fascicles sessile or on very short peduncles (peduncles 2 mm long or less), densely crowded along one side of the internodes, each flower subtended by a broad, rounded bracteole 1.5 to 2 mm in length. Calyx cylindric, somewhat thickened upward, about 4 mm long, the limb produced about 1 mm, truncate, minutely ciliate. Petals 5, linear, free, 2 cm long, about 2 mm wide, the part above the insertion of the stamen about 7 mm long, thickened, acute. Anthers oblong, 3 mm long, continuous with the 2 mm long filament.

SAMAR, Catubig River, *Bur. Sci.* 24265 Ramos, February 7, 1916.

A species manifestly allied to *Loranthus cuernosensis* Elm. and to *L. edanoi* Merr., differing from the former in its flowers being densely crowded in 4-flowered sessile or shortly peduncled fascicles on the internodes, not axillary, and from the latter in its leaves being rounded or somewhat cordate at the base; its 4-flowered, not 6-flowered fascicles; the peduncles, when present, much shorter; and its longer flowers.

LORANTHUS PACHYCLADUS sp. nov. § *Dendrophthoe*.

Frutex parasiticus, glaber, ramis ut videtur plus minusve carnosus, in siccitate teretibus, laevis, nitidis, brunneo-olivaceis, circiter 1 cm diametro; foliis ternatis vel subternatis, oblongis ad oblongo-ellipticis, coriaceis, usque ad 10 cm longis, nitidis, supra olivaceis, subtus pallidis, apice obtusis, basi cuneatis, nervis utrinque circiter 6, valde obscuris vel subobsoletis; inflorescentiis axillaribus terminalibusque, circiter 10 cm longis, pedunculatis,

umbellatis, ramis primariis 4 vel 5, 1 ad 1.5 cm longis; floribus in ramulis primariis in triadibus dispositis, lateralibus breviter pedicellatis, 6-meris, teretibus, infra leviter inflatis, circiter 5 cm longis, segmentis crassis, linearis, tubo circiter 6 mm longo.

A parasitic glabrous shrub, the branches stout, apparently fleshy when fresh, terete, smooth, shining, brownish-olivaceous when dry, about 1 cm in diameter, the branchlets longitudinally striate. Leaves ternate or subternate, oblong to oblong-elliptic, coriaceous, 8 to 10 cm long, 3 to 4 cm wide, shining, smooth, the upper surface somewhat olivaceous, the lower paler, apex obtuse, base cuneate; lateral nerves about 6 on each side of the midrib, slender, obscure, often obsolete or nearly so; petioles 2 to 2.5 cm long. Inflorescences terminal and in the uppermost axils, peduncled, umbellate, the peduncles about 3 cm long, the primary branches 4 or 5, 1 to 1.5 cm long, each bearing at its apex a triad consisting of one central sessile flower and two lateral short-pedicelled ones, each subtended by a broadly ovate, obtuse, 2.5 mm long bract, the lateral pedicels 4 to 5 mm long. Flowers greenish-yellow, 6-merous, about 5 mm long. Calyx cylindric, 6 mm long, the limb truncate, produced about 1.5 mm. Corolla inflated in the lower 1 cm, terete, the lobes 6, united for the lower 6 to 7 mm, the free parts abruptly narrowed, linear, thickened, the reflexed part above the insertion of the filament about 10 mm long and 2 mm wide, thickened, prominently bicarinate inside by the extended margins, obtuse, slightly widened upward, linear. Filaments 4 to 5 mm long, the anthers continuous, linear, 7 to 8 mm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27323 Ramos, March 10, 1917, on trees in forests at low and medium altitudes.

A remarkable species, well characterized by its rather long-peduncled, lax, umbellate inflorescences, the primary rays few in number, each bearing a single terminal triad of one sessile and two shortly pedicelled, 6-merous flowers, which are about 5 cm in length. It belongs in the group that Van Tieghem characterized as *Stemmatophyllum*, but is not at all closely allied to the other species belonging here, such as *Loranthus haenkeanus* Presl, *L. curranii* Merr., etc.

LORANTHUS AMPLIFOLIUS sp. nov. § *Lepeostegeres*.

Frutex parasiticus, glaber, ramis teretibus, ramulis leviter compressis; foliis oppositis, ovatis ad late ovatis, usque ad 16 cm longis, coriaceis, obtusis, basi late acutis vel subtruncatis, nervis utrinque 8 ad 10; capitulis axillaribus, sessilibus, 15- ad 20-floris, bracteis coriaceis, exterioribus reniformibus, circiter 1 cm longis et 2 cm latis, interioribus obovatis, bracteolis lineari-oblongis vel oblongis; floribus sessilibus, 6-meris, circiter 21 mm longis.

A parasitic glabrous shrub, the branches terete, the branchlets somewhat compressed, dull-brownish, smooth, the internodes 5 to 10 cm long. Leaves opposite, coriaceous, dull-brownish when dry, ovate to broadly ovate, 11 to 16 cm long, 8 to 13 cm wide, obtuse, base broadly acute to subtruncate; lateral nerves 8 to 10 on each side of the midrib, distinct, the secondary ones and the reticulations obsolete or nearly so; petioles stout, about 1 cm long. Heads axillary, 15- to 20-flowered, the bracts coriaceous, the outer ones reniform, 1 cm long and 2 cm wide, the inner ones obovate, the bracteoles linear-oblong to oblong, somewhat keeled, about 11 mm long, obtuse. Calyx 4 mm long, cylindric, the limb inflated, membranaceous, produced about 1.5 mm. Corolla-tube inflated below, the lobes six, united for the lower 5 mm, the free portions 2 mm wide below, narrowed upward, the reflexed part above the insertion of the stamens oblong, obtuse, 5 mm long. Anthers linear, acuminate, sessile, 4 mm long.

SAMAR, Catbalogan, *Bur. Sci. 17448 Ramos*, April 22, 1914, on trees in damp forests at low altitudes, the inflorescence reddish, but the corollas green and yellow.

A species readily distinguished among all the Philippine representatives of the section *Lepeostegeres* by its very broad leaves.

LORANTHUS OVATIBRACTEUS sp. nov. § *Macrosolen*.

Frutex parasiticus, glaber, ramulis ramulisque teretibus; foliis oppositis, breviter petiolatis, oblongo-ovatis, coriaceis, usque ad 15 cm longis, obtusis, basi acutis vel leviter decurrento-acuminatis, in siccitate supra brunneo-olivaceis, subtus pallidis, nervis utrinque 6 ad 8, obscuris; capitulis axillaribus 12- ad 15-floris, sessilibus, bracteis ovatis, leviter carinatis, circiter 13 mm longis, bracteolis ellipticis ad oblongo-ellipticis, carinatis, 7 ad 11 mm longis; floribus in triadibus sessilibus dispositis, 6-meris, circiter 21 mm longis.

A parasitic, glabrous shrub, the branches and branchlets terete, the former pale- the latter dark-brown, smooth, the internodes 2 to 5 cm long. Leaves opposite, oblong-ovate, coriaceous, shining, 12 to 15 cm long, 5.5 to 7.5 cm wide, narrowed upward to the obtuse apex and below to the acute or somewhat decurrent-acuminate base, the upper surface dark brownish-olivaceous, the lower surface pale-brownish; lateral nerves 6 to 8 on each side of the midrib, slender, very obscure, often evanescent, the secondary nerves and reticulations obsolete; petioles 5 to 8 mm long. Heads axillary, sessile, 12- to 15-flowered, the outer four bracts ovate, coriaceous, acute, more or less keeled, about 13 mm long, the bracteoles subtending the triads elliptic to oblong-

elliptic, keeled, 7 to 11 mm long, 3.5 to 6 mm wide. Flowers 6-merous, red, sessile, each triad subtended by a bracteole. Calyx cylindric, somewhat thickened upward, 3 mm long, the limb produced about 1 mm, somewhat spreading, thin, more or less crenate-lacerate. Corolla in bud about 18 mm long, cylindric, somewhat enlarged in the median portion, the lobes wholly united for the lower 5 mm, the free parts 1.5 mm wide below, narrowed upward, the part above the insertion of the anther linear, reflexed, 3.5 mm long, acute. Anther linear, subsessile, 2.5 mm long.

SAMAR, Caminiwan on the Catubig River, *Bur. Sci.* 24135 Ramos, February 8, 1916, at low altitudes.

A species of the section *Macrosolen* not very closely allied to the others of this group known from the Philippines. The elliptic to oblong-elliptic, carinate bracteoles, one bracteole subtending each triad of sessile flowers, are characteristic.

LORANTHUS SPRAGUEI nom. nov.

Loranthus pubiflorus Merr. in Philip. Journ. Sci. 7 (1912) Bot. 263, non Sprague.

Mr. T. A. Sprague of the Royal Gardens, Kew, England, has kindly called my attention to the fact that *Loranthus pubiflorus* Merr. is a name pre-occupied by the African *L. pubiflorus* Sprague, the latter published a few months before the Philippine one, and I accordingly propose the above new name for the Philippine form described by me.

LORANTHUS PALAWANENSIS nom. nov.

Loranthus fragilis Merr. in Philip. Journ. Sci. 9 (1914) Bot. 278, non Sprague.

Loranthus fragilis Sprague was published in 1910 for an African species, and accordingly the Philippine form described by me in 1914 under the same specific name is here called *Loranthus palawanensis* Merr.

ELYTRANTHE Blume

ELYTRANTHE ACUÑAE sp. nov.

Frutex parasiticus, glaber, ramis ramulisque teretibus; foliis oppositis, coriaceis, in siccitate pallide brunneo-olivaceis, nitidis, ovatis ad oblongo-ovatis, usque ad 18 cm longis, acuminatis, basi rotundatis, nervis utrinque circiter 8, distantibus, subtus subprominentibus; racemis axillaribus, brevibus, paucifloris, bracteolis usque ad $\frac{1}{2}$ connatis; floribus 6-meris, curvatis, circiter 5 cm longis.

A parasitic glabrous shrub, the branches and branchlets pale-brownish, terete, smooth, the internodes 3.5 to 11 cm long. Leaves opposite, coriaceous, ovate to oblong-ovate, about 18 cm long, 8 to 9 cm wide, apex prominently acuminate, base rounded, when dry pale-brownish-olivaceous, shining; lateral nerves about

8 on each side of the midrib, rather prominent on the lower surface, curved, obscurely or scarcely anastomosing, the secondary ones and reticulations obsolete; petioles 3 to 5 mm long. Racemes axillary, solitary, the peduncle and axis 1.5 cm long or less. Flowers 6-merous, about 5 mm long, curved, red, their pedicels 2 to 3 mm long; bracts elliptic-ovate, 3.5 mm long; bracteoles united to the middle, about 2 mm long and 3 mm wide, the lobes triangular, acute. Calyx 4 mm long, somewhat urceolate, the limb produced about 1 mm. Corolla-tube about 3 cm long, somewhat enlarged upward, the lobes about 12 mm long, spatulate, much narrowed below, then broadened for a short distance, the limb 2.8 mm wide in the middle. Anthers linear, 2.3 mm long, continuous with the 8 mm long filament.

MINDANAO, Lanao District, Titunod, *For. Bur.* 23386 *Acuña*, December 12, 1914, in forests along Libas Creek at low altitudes.

This species is readily recognized among the few Philippine species of *Elytranthe* by its large leaves and long flowers. It is not closely allied to any previously described form from the Philippines, but seems to be allied to the extra-Philippine *Elytranthe formosa* G. Don.

ARISTOLOCHIACEAE

ARISTOLOCHIA Linnaeus

ARISTOLOCHIA FOVEOLATA sp. nov.

Frutex scandens; foliis subcoriaceis, ovato-lanceolatis, usque ad 12 cm longis, nitidis, sursum gradatim angustatis, apice acutis vel acuminatis, basi profunde cordatis, lobis rotundatis, subtus dense foveolato-reticulatis et minutissime puberulis; fructibus axillaribus, solitariis, cylindraceis ad anguste obovodeis, circiter 3.5 cm longis.

A scandent shrub, glabrous except for the minutely puberulent lower surfaces of the leaves. Branches nearly black when dry, the older ones very prominently lenticellate. Leaves subcoriaceous, rather pale when dry, shining, ovate-lanceolate, about 12 cm long, 4 to 5 cm wide across the base, gradually narrowed upward to the acute or acuminate apex, the base deeply cordate, the sinus narrow, rounded, the lobes broadly rounded and often overlapping, the upper surface distinctly reticulate, the lower densely foveolate-reticulate; basal nerves 7 or 9, the inner pair nearly reaching the apex, the lower one or two pairs extending into the basal lobes; petioles 3.5 to 4 cm long. Capsules cylindric to narrowly obovoid, glabrous, dark-colored when dry, axillary, solitary, pendulous, about 3.5 cm long, 1.5 cm in diameter, the apex rounded, base attenuate.

CATANDUANES, in forests along small streams back of Calolbong, *Bur. Sci.* 30370 Ramos, December 9, 1917.

This species is well characterized by its subcoriaceous leaves, which are densely foveolate and minutely puberulent on the lower surface and deeply cordate at the base, the sinuses being narrow and the broad rounded lobes usually overlapping. It belongs in the same general group as *Aristolochia tagala* Cham., but is not closely allied to that species or to any other known to me.

MYRISTICACEAE

MYRISTICA Linnaeus

MYRISTICA MINDORENSIS sp. nov.

Species *M. cumingiae* Warb. valde affinis, differt foliis minoribus, usque ad 13 cm longis, 4 cm latis, nervis lateralibus paucioribus, circiter 7 utrinque, floribus paullo majoribus.

A tree about 14 m high, glabrous except the inflorescence and the terminal buds. Branches reddish-brown, terete, rugose when dry, the lenticels few. Leaves oblong-lanceolate, firmly membranaceous or subcoriaceous, brown and somewhat shining when dry and of about the same color on both surfaces, 7 to 13 cm long, 2 to 4 cm wide, widest at about the middle, about equally narrowed at both ends, the base acute, the apex acuminate; nerves 7 on each side of the midrib, curved-ascending, prominent beneath, obscurely anastomosing, the reticulations subobsolete; petioles 1 to 1.4 cm long, rather slender. Staminate inflorescence axillary, the flowers fasciculate on short, stout, solitary, unbranched, or sometimes shortly forked, axillary, pubescent tubercles, 3 to 4 mm long and nearly as thick, each bearing from two to five flowers; pedicels about 2.5 mm long, pubescent, with a large, broad, 3 mm wide, and about 2 mm long, bracteole immediately below the flower. Staminate flowers oblong-ovoid, 5 to 6 mm long, 3-merous, pubescent outside, the lobes oblong-ovate, about 2.5 mm long, obtuse or acute. Anthers about 10, entirely united into a cylindric column about 3 mm long, 1 mm in diameter, the stipe about as thick as the anther-column, 1 mm long. Pistillate flowers and fruits unknown.

MINDORO, Cauayan, *For. Bur.* 3698 Merritt, March, 1906.

A species manifestly closely allied to *Myristica cumingii* Warb. but with quite different vegetative characters.

MYRISTICA DISCOLOR sp. nov.

Species *M. simiarum* A. DC. affinis, differt foliis subtus pallidis, floribus ♂ duplo majoribus, circiter 7 mm longis.

A tree, glabrous except the inflorescence. Branches terete, wrinkled, brownish when dry, slender, the branchlets nearly

black. Leaves oblong, chartaceous to thinly coriaceous, 10 to 15 cm long, 3.5 to 6 cm wide, the apex acute or somewhat blunt-acuminate, the base slightly decurrent-acuminate, the upper surface dark-colored when dry, slightly shining, minutely pustulate, the lower surface pale, glaucescent or sometimes nearly white, slightly pustulate, sometimes minutely and sparingly pubescent with very short scattered hairs; lateral nerves about 10 on each side of the midrib, slender, prominent on the lower surface, dark-colored in contrast to the pale lower surface of the leaf, looped-anastomosing, the reticulations lax; petioles 2 cm long. Staminate inflorescence axillary, solitary, 2 to 2.5 cm long, the rachis glabrous or nearly so, bearing 3 or 4, stout, short, cylindric, thickened branches, these branches about 1 cm long, 2 mm thick, more or less ferruginous-pubescent, covered with the prominent scars of fallen pedicels, flower-bearing only at the apex. Male flowers 7 mm long, about 2.3 mm in diameter, their pedicels 2 mm long, with an ovate, pubescent, black-punctate, 1 mm long bracteole at the apex. Calyx externally appressed-ferruginous-pubescent, the buds cylindric, the lobes 3, ovate, thick, subacute or obtuse, somewhat recurved in anthesis, 3 mm long, the tube and lobes minutely black-punctate. United anthers cylindric, 3 to 3.5 mm long, their united filaments 1.5 to 2 mm long, slightly appressed-hirsute. Female flowers and fruits unknown.

LUZON, Laguna Province, Mount Maquiling, *For. Bur. 13155 Curran*, November or December, 1911, altitude not stated.

A very characteristic species manifestly allied to *Myristica simiarum* A. DC., the type of which was also from Laguna Province (Calauan). It is well characterized by its 3- or 4-branched staminate inflorescences, the branches thickened, cylindric, and covered with pedicel-scars, and its characteristic leaves, which are dark-colored above and very pale beneath. The minutely pustulate leaves and the black-punctate flowers are also characteristic. Its staminate flowers are twice as large as are those of its closest ally, *Myristica simiarum* A. DC.

MYRISTICA NITIDA sp. nov.

Arbor, inflorescentiis fructibusque exceptis glabra; foliis lanceolatis vel oblongo-lanceolatis, usque ad 18 cm longis, apice longe acute acuminatis, basi acutis, supra valde nitidis subtus paullo pallidioribus nitidisque; nervis lateralibus circiter 10 utrinque; fructibus oblongis vel ellipsoideis, circiter 6 cm longis, minute brunneo-tomentosis.

A tree, glabrous except the fruit and apparently the inflorescence, the latter not seen. Branches terete, wrinkled when dry, dark-colored or brownish, the branchlets light-brown. Leaves lanceolate or oblong-lanceolate, chartaceous to thinly coriaceous,

10 to 18 cm long, 2.5 to 5 cm wide, narrowed above to the slenderly acuminate apex and below to the acute base, the upper surface very strongly shining, brownish or pale-olivaceous, the lower surface somewhat paler, usually brownish, shining but less so than the upper surface; lateral nerves about 10 on each side of the midrib, rather slender, faintly anastomosing, not much more prominent than are the alternating secondary nerves, the reticulations lax, obscure; petioles rather slender, 1 to 1.5 cm long. Inflorescence and flowers unknown. Fruits axillary, solitary, oblong to ellipsoid, about 6 cm long, mature ones 3 cm thick and equally rounded at both ends, immature ones somewhat narrower, sometimes inequilateral; pericarp brittle, densely covered with a very short, pale-brown indumentum which rubs off at maturity.

LUZON, Nueva Ecija Province, *For. Bur. 22199 Alvarez*, December, 1910.

Possibly as closely allied to *Myristica cumingii* Warb. as to any other species, but very different from that form. It is well characterized by its very strongly shining, entirely glabrous, and slenderly acuminate leaves.

MYRISTICA PALAWANENSIS sp. nov.

Arbor parva, usque ad 8 m alta; foliis coriaceis, oblongis ad oblongo-ellipticis, usque ad 40 cm longis, obtusis vel breviter obtuse acuminatis, basi acutis vel rotundatis, nervis utrinque circiter 24, supra glabris, subtus dense ferrugineo- vel pallide ferrugineo-pubescentibus; inflorescentiis ♂ brevibus, densissime ferrugineo-pubescentibus, circiter 4 cm longis, bracteis lineari-lanceolatis, circiter 2 cm longis, bracteolis nullis; floribus ♂ circiter 5 mm longis; fructibus ellipsoideis vel ellipsoideo-ovoideis, 3 cm longis, extus dense ferrugineo-pubescentibus.

A small tree 5 to 8 m high, the branchlets, inflorescence, and lower surfaces of the leaves uniformly and densely ferruginous-pubescent with persistent hairs, the leaves, in age, often pale on the lower surface. Branches terete, glabrous, rugose when dry. Leaves oblong to oblong-elliptic, coriaceous, 25 to 40 cm long, 8 to 19 cm wide, obtuse or the apex shortly, broadly, and obtusely acuminate, the base acute to rounded, the upper surface olivaceous, glabrous, somewhat shining when dry, the lower surface densely ferruginous- or pale ferruginous-pubescent; lateral nerves about 24 on each side of the midrib, very prominent, reticulations obscured by the indumentum on the lower surface, faint on the upper surface; petioles stout, 2 to 3 cm long, when young pubescent, becoming glabrous. Male inflorescence in the uppermost axils, forming a subterminal densely ferruginous, sparingly branched inflorescence about 4 cm long. Flowers brown, densely crowded, racemosely disposed, the primary branches (racemes) subtended by very thick, coriaceous,

pubescent, linear-lanceolate, 2 cm long bracts, the bracteoles absent. Flowers 5 to 6 mm long, their lobes broadly ovate, obtuse, 3 mm long, the pedicels about 3 mm long. Anthers 3 mm long. Fruit ellipsoid to ovoid-ellipsoid, 3 cm long, nearly 2 cm in diameter, the pericarp somewhat wrinkled when dry, densely and uniformly ferruginous-pubescent with very short hairs, crustaceous, 2 mm thick or less.

PALAWAN, Taytay, Merrill 9253 (type), 9353, May, 1913; Dawara, For. Bur. 7437 Manalo, March, 1907, in forests at low altitudes.

A species manifestly closely allied to *Myristica guateriifolia* A. DC. and to *M. cookii* Warb., differing from the former in its larger leaves, more numerous nerves, and smaller fruits; and from the latter in its paler indumentum, and smaller and fewer-nerved leaves.

GYMNACRANTHERA Warburg

GYMNACRANTHERA MACROBOTRYS sp. nov.

Arbor circiter 30 m alta, inflorescentiis exceptis glabra; foliis oblongis vel anguste oblongo-ellipticis, acuminatis, basi acutis, usque ad 20 cm longis, nervis utrinque 12 ad 15, distinctis; paniculis axillaribus, adpresse ferrugineo-pubescentibus, circiter 8 cm longis; floribus ♂ 4 ad 4.5 mm longis, lobis 3 ad 5; antheris circiter 9, lanceolatis, 2 mm longis.

A tree about 30 m high, glabrous except the inflorescence, the branches terete, grayish to reddish-brown, lenticellate, the terminal buds lanceolate, ferruginous-pubescent. Leaves oblong to narrowly oblong-elliptic, firmly chartaceous, 15 to 20 cm long, 4.5 to 7 cm wide, subequally narrowed at both ends, the apex acuminate, base acute, the upper surface smooth and shining, the lower paler, slightly glaucous; lateral nerves 12 to 15 on each side of the midrib, distinct, the reticulations rather lax, very fine, not at all prominent; petioles about 1 cm long. Panicles axillary, solitary, 6 to 9 cm long, appressed-ferruginous-pubescent, branched from the base, the branches rather distant, the lower ones 2.5 to 4 cm long, many flowered. Male flowers 4 to 4.5 mm long, externally appressed-ferruginous-pubescent, ebracteolate, internally shortly pubescent, the perianth 3- to 5-lobed, the lobes ovate, acute or obtuse, about 2 mm long. Stamens about 9, lanceolate, acuminate, about 2 mm long, on the stout, 0.3 mm long filament.

LEYTE, near Dagami, Phil. Pl. 1171 Ramos, August 9, 1912, in forests.

A species well characterized by its large staminate flowers, these being larger than in any previously known species of the genus. In this character *Gymnacranthera macrobotrys* is allied to *G. murtoni* Warb., of the Malay Peninsula and Borneo, but otherwise does not seem to be closely allied. From the common *Gymnacranthera paniculata* Warb. of the

Philippines it differs, among other characters, in its decidedly larger, broader, more numerous nerved leaves.

HORSFIELDIA Willdenow

HORSFIELDIA CONFERTIFLORA sp. nov.

Arbor circiter 25 m alta, inflorescentiis exceptis glabra; ramis ramulisque teretibus, lenticellatis; foliis chartaceis vel subcoriaceis, oblongis, usque ad 25 cm longis, breviter acuminatis, nervis utrinque circiter 18, subtus perspicuis; inflorescentiis ♂ e axillis defoliatis, paniculatis, usque ad 13 cm longis, plus minusve ferrugineo-pubescentibus; floribus pedicellatis, 3-, rariter 4-meris, circiter 1.7 mm diametro, in ramulis ultimis dense confertis.

A tree reaching a height of about 25 m, glabrous except the inflorescence. Branches terete, stout, brownish and striate when dry, lenticellate, the branchlets also terete, glabrous. Leaves firmly chartaceous or subcoriaceous, oblong, 17 to 25 cm long, 4.5 to 8 cm wide, slightly shining and usually more or less brownish when dry, the apex shortly acuminate, the base acute or obtuse; nerves about 18 on each side of the midrib, prominent beneath, anastomosing, the reticulations obsolete or nearly so, very lax; petioles about 1 cm long. Staminate inflorescence from the axils of fallen leaves, paniculate, pyramidal, 10 to 13 cm long, the lower branches spreading, often 5 cm long, the upper few gradually shorter, the rachis, branches and especially the ultimate branchlets more or less ferruginous-pubescent, the flowers densely crowded on the ultimate branchlets, their pedicels less than 1 mm long. Buds globose, less than 2 mm in diameter. Mature flowers 1.5 to 1.8 mm long, 3-, rarely 4-merous, the lobes broadly ovate, acute, about 1 mm long, quite glabrous. Stamens about 14, the anthers entirely united into a sessile, globose or depressed-globose mass about 1 mm in diameter. Immature fruits oblong, about 2 mm long, glabrous.

LUZON, Bataan Province, Lamao River, *For. Bur.* 2487 Borden, January, 1905 (sterile), *For. Bur.* 7509 Curran, September, 1907: Rizal Province, Bosoboso, *For. Bur.* 3183 Ahern's collector, July, 1905 (type): Tayabas Province, Mount Banahao, *For. Bur.* 8049 Curran & Merritt, November, 1907.

I am disposed to place this species in the section *Pyrhrosa*, allied to *H. kingii*, *H. amygdalina*, and *H. glabra*. It strongly resembles, however, *H. irya* and allied species, but the anthers seem to be entirely united, and the flowers are never 2-merous. This is the form previously identified by me as *Horsfieldia ardistifolia* Warb.,³ the determination having been made

³ Philip. Journ. Sci. 1 (1906) Suppl. 55.

from a single sterile specimen. It is not at all closely allied to that species, although resembling it in vegetative characters.

HORSFIELDIA MEGACARPA sp. nov.

Arbor alta, glabra (floribus ignotis); foliis crasse coriaceis, circiter 18 cm longis, oblongis, obscure et obtuse acuminatis, basi subacutis ad subrotundatis, supra verruculosus, in siccitate nitidis, fragilis, nervis utrinque circiter 18, subtus valde perspicuis; infructescentiis brevibus, crassis, circiter 4 cm longis; fructibus globosis, vel globoso-ellipsoideis, circiter 4 cm diametro, pericarpio crassissimo.

A tall tree, quite glabrous (inflorescence and flowers not seen), or the very young growing parts ferruginous-puberulent. Branches stout, brown, terete, lenticellate. Leaves oblong, thickly coriaceous, brittle when dry, about 18 cm long, 7 to 8 cm wide, apparently recurved or falcate, obscurely blunt-acuminate, base subacute to subrounded, when dry brown on both surfaces, the upper surface strongly shining, distinctly verruculose with minute scattered projections; lateral nerves about 18 on each side of the midrib, prominent, anastomosing, the reticulations lax, faint, obscure; petioles stout, about 1 cm long. Inflorescence and flowers unknown. Infructescence from the branches below the leaves, short, stout, simple, about 4 cm long, each bearing 3 or 4 fruits. Immature fruits globose to ellipsoid-globose, about 4 cm in diameter, the line of dehiscence evident, the pericarp brittle, very thick (about 1 cm).

LUZON, Laguna Province, Dahican River, *Bur. Sci.* 16527 Ramos, September 18, 1912, in forests.

A strongly marked species, characterized by its short infructescence and especially by its unusually large, globose fruits, which have a very thick (1 cm) brittle pericarp.

HORSFIELDIA OBLONGATA sp. nov.

Arbor alta, glabra; foliis chartaceis, oblongis ad anguste oblongo-obovatis, usque ad 20 cm longis, acuminatis, basi acutis, in siccitate brunneis vel olivaceo-brunneis, nitidis, nervis utrinque 9 ad 13; infructescentiis e axillis defoliatis, usque ad 20 cm longis; fructibus oblongo-ovoideis vel anguste oblongo-ovoideis, 4 cm longis, deorsum 2 cm diametro, sursum angustatis, apice obtusis.

A tall tree, apparently entirely glabrous (flowers not seen). Branches terete, brown, much wrinkled when dry, the branchlets slender. Leaves oblong to narrowly oblong-obovate, 11 to 20 cm long, 4 to 6 cm wide, chartaceous or submembranaceous, the apex acuminate, base acute, when dry brown or brown-olivaceous, shining, lower surface very slightly paler than the

upper; lateral nerves 9 to 11 on each side of the midrib, rather distant, distinct, curved upward, faintly anastomosing, the reticulations lax, slender, not prominent; petioles 1 to 1.5 cm long. Infructescence from the axils of fallen leaves on the branches below the leaves, slender, sparingly branched, up to 20 cm long. Fruits few, oblong-ovoid or narrowly oblong-ovoid, 4 cm long, 2 cm in diameter in the lower part, narrowed upward to the blunt apex, the base somewhat rounded and produced slightly as a short stout pseudostalk. Pericarp thickly coriaceous, about 1.5 mm thick when dry, the lines of dehiscence evident. Aril not at all laciniate.

LUZON, Tayabas Province, Mount Pular, *Phil. Pl. 1393* Ramos, Jan. 17, 1913, in forests.

A species in vegetative characters somewhat resembling *Horsfieldia merrillii* Warb., well characterized, however, by its peculiarly shaped, oblong-ovoid fruits which are gradually narrowed upward to the blunt apex.

KNEMA Loureiro

KNEMA PARVIFOLIA sp. nov.

Arbor circiter 15 m alta, partibus junioribus inflorescentiisque ferrugineo-puberulis; foliis chartaceis, oblongis, elliptico-oblongis vel oblongo-lanceolatis, supra nitidis, subtus pallidioribus, acuminatis, basi acutis, 5 ad 10 cm longis, nervis utrinque 9 ad 13, subtus perspicuis; floribus ♂ parvis, vix 3 mm longis, paucis, e tuberculis axillaribus vel e axillis defoliatis, disco stamineo glabro, margine antheris 8 vel 9 breviter stipitatis coronato.

A tree about 15 m high, the trunk reaching a diameter of 35 cm. Branches dark-brown, terete, striate when dry, somewhat shining, glabrous, the slender branchlets minutely and densely ferruginous-puberulent as are the petioles and inflorescences. Leaves chartaceous, oblong, elliptic-oblong, or oblong-lanceolate, entire, 5 to 10 cm long, 1.8 to 2.8 cm wide, the upper surface shining, glabrous, the lower pale when dry, dull, with scattered, small, brown, sublepidote, glandular dots, especially on the midrib and nerves, the base acute, the apex acuminate, acumen rather short, blunt; primary nerves 9 to 13 on each side of the midrib, prominent beneath, anastomosing, the secondary nerves and reticulations rather close, fine; petioles 6 to 9 mm long. Staminate flowers on short, pubescent, rather stout tubercles, these tubercles about 4 mm long, marked with scars of fallen pedicels, each bearing from 2 to 5 long-pedicelled flowers, the tubercles solitary in the axils of leaves or of fallen leaves; pedicels slender, rusty-puberulent, 8 to 10 mm long, with

a small, deciduous, oblong, obtuse, 1 mm long bracteole at the upper one-fourth or one-third. Staminate flowers small, not exceeding 3 mm in length, the buds ferruginous-puberulent outside, glabrous within, subglobose or somewhat 3-angled, 3-, rarely 4-merous, the calyx-segments thick, ovate, 3 mm long or less, acute. Staminal-disk stipitate, glabrous, the stipe less than 1 mm long, bearing on the margins of the disk 8 or 9, radiately disposed, 0.5 mm long anthers. Pistillate flowers and fruits unknown.

LUZON, Albay Province, Manito, *For. Bur.* 10573 Curran, June, 1908, on forested ridges, altitude about 30 meters.

A species apparently not closely allied to the other Philippine representatives of the genus, well characterized by its unusually small staminate flowers and by its small leaves.

KNEMA ALVAREZII sp. nov.

Arbor 12 ad 15 m alta, partibus junioribus fructibusque densissime ferrugineo-tomentosis; foliis lanceolatis vel oblongo-lanceolatis, 8 ad 12 cm longis, coriaceis, acuminatis, basi acutis vel obtusis, supra glabris, nitidis, subtus pallidis, nervis utrinque 12 ad 15; floribus ♂ axillaribus, parvis, 3-meris, extus densissime ferrugineo-tomentosis, disco stamineo glabro, breviter stipitato, staminibus 6; fructibus junioribus ellipsoideis, 1.5 ad 2 cm longis, dense ferrugineo-tomentosis.

A tree 12 to 15 m high, the young branchlets and leaves very densely ferruginous-tomentose as are the buds and young fruits. Branches grayish-brown, striate, glabrous. Leaves lanceolate to oblong-lanceolate, coriaceous, 8 to 12 cm long, 2 to 3 cm wide, entire, rather slenderly acuminate, base acute or obtuse, the upper surface glabrous, shining, the lower surface pale, puberulent, ultimately becoming nearly glabrous; petioles when young ferruginous-tomentose, later puberulent, 8 to 15 mm long; nerves 12 to 15 on each side of the midrib, prominent, anastomosing, the reticulations not prominent. Male flowers on short, axillary, solitary tubercles, the whole inflorescence ferruginous-tomentose, 1 cm long or less. Pedicels short. Flowers crowded, in bud globose or ovoid, the perianth-segments 3, ovate, about 3 mm long, the bracteoles ovate, deciduous, 2 mm long. Staminal-disk shortly stipitate, glabrous, bearing on the margins 6 radiately spreading anthers about 0.5 mm long. Fruit (immature) ellipsoid, 1.5 to 2 cm long, densely ferruginous-tomentose.

LUZON, Nueva Ecija Province, Mount Macasandal, *For. Bur.* 22395, 22397 Alvarez, February 10, 1911, in forests, altitude about 850 meters.

A species manifestly allied to *Knema heterophylla* Warb., differing in its smaller, fewer-nerved, apparently always entire leaves, the younger

parts and fruits densely ferruginous-tomentose. From *Knema parviflora* Merr. it is distinguished by its different indumentum, short-pedicelled male flowers, and fewer anthers.

MELIACEAE

AGLAIA Loureiro

AGLAIA RIZALENSIS sp. nov. § *Hearnia*.

Species *A. luzoniensis* affinis differt foliolis lanceolatis ad oblongo-lanceolatis, usque ad 10 cm longis et 2.5 cm latis. Arbor parva, novellis et inflorescentiis dense cupreo-lepidotis; foliis 1-foliolatis, foliolis subcoriaceis, rigidis, acuminatis, subtus par-cissime lepidotis, nervis utrinque 10 ad 12, tenuibus; paniculis axillaribus, brevibus, paucifloris, 2 ad 4 cm longis; floribus parvis, 5-meris, racemose dispositis, petalis liberis, extus par-cissime lepidotis.

A small tree, about 4 m high, the younger parts and the inflorescences densely cupreous-lepidote. Branches terete, grayish-brown, somewhat wrinkled, glabrous, the branchlets densely lepidote as are the very young leaves. Leaves simple, alternate, the petiole 1 to 1.5 cm long, more or less lepidote, the leaflet lanceolate to oblong-lanceolate, subcoriaceous, olivaceous when dry, dull or slightly shining, 6 to 10 cm long, 1.5 to 2.5 cm wide, subequally narrowed to the acute base and the acuminate apex, the upper surface glabrous, the lower sparingly lepidote especially along the midrib; lateral nerves slender, 10 to 12 on each side of the midrib, indistinct, obsolete or nearly so on the upper surface, the reticulations obsolete. Panicles axillary, few-flowered, 2 to 4 cm long, densely cupreous-lepidote, usually branched from the base, the lower branches 1.5 cm long or less; flowers yellowish, racemosely arranged on the branches, their pedicels 1 to 2.5 mm long. Calyx densely lepidote, the teeth 5, short, acute to obtuse. Petals 5, orbicular, 1 to 1.2 mm in diameter, externally slightly lepidote. Staminal tube free, broad, about 1 mm high. Anthers 5, inserted at the apex of the tube just within the rim. Ovary pubescent.

LUZON, Rizal Province, Mount Lumutan, *Bur. Sci.* 29640 Ramos & Edaña, April 22, 1917.

This species is manifestly allied to *Aglaiia luzoniensis* (Vid.) Merr. & Rolfe, one of the few species of the genus with unifoliolate leaves. It is readily distinguished by its much narrower, differently shaped leaves. It is distinguished from *Aglaiia brevipetiolata* Merr. by its much longer petioles and differently shaped leaves. I now have before me a cotype of the Celebesian *Aglaiia unifoliolata* Koord., and am able to confirm its identity with the Philippine *Aglaiia monophylla* Perk.; both are identical with *Beddomea luzoniensis* Vid., the basis of *Aglaiia luzoniensis* Merr. &

Rolfe. This very characteristic species is common and widely distributed in the Philippines and, like numerous other strongly marked and characteristic types, is otherwise known only from Celebes and New Guinea.

AGLAIA PYRIFORMIS sp. nov. § *Hearnia*.

Arbor parva, partibus junioribus dense cupreo-lepidotis; foliis alternis, circiter 20 cm longis, foliolis 7, oblongis, coriaceis, usque ad 10 cm longis, acutis vel brevissime acuminatis, basi acutis ad obtusis, subaequilateralibus, utrinque minute puncticulatis, subtus ad costa et nervis cupreo-lepidotis, nervis lateralibus utrinque 8 vel 9, perspicuis, curvatis, evanescentibus vel obscure anastomosantibus, reticulis obsoletis; paniculis axillaribus, usque ad 18 cm longis, angustis; floribus 5-meris, racemose dispositis, circiter 3 mm diametro; fructibus anguste obovoideis, usque ad 2.5 cm longis, extus dense minuteque cupreo-lepidotis.

A tree about 5 m high, the younger branches, petioles, petioles, midrib and lateral nerves on the lower surface of the leaflets, panicles, and fruits densely cupreous-lepidote. Leaves alternate, about 20 cm long; leaflets 7, oblong, coriaceous, minutely puncticulate on both surfaces, rather pale when dry, shining, 5 to 10 cm long, 2.5 to 4 cm wide, subequally narrowed to the acute or obscurely acuminate apex and to the acute or somewhat obtuse base, the midrib very prominent on the lower surface; lateral nerves 8 or 9 pairs, prominent, curved, evanescent or obscurely anastomosing, the reticulations obsolete; petiolules 1 cm long or less. Panicles axillary, up to 20 cm long, narrow, the lower branches 3 cm long or less, the flowers racemously arranged on the ultimate branchlets, rather few. Flowers pink, 5-merous, their pedicels stout, 2 mm long or less. Calyx 2 mm long, ovoid, the lobes lepidote, obtuse, coriaceous. Petals 5, free, about 2 mm long, oblong-elliptic, rounded. Staminal-tube turbinate, free, 1 mm long, about 1.5 mm in diameter, truncate. Anthers 5 or 6, inserted on the edge of the tube, inflexed, 0.8 mm long. Fruits narrowly obovoid, dark-brown when dry, rounded, gradually narrowed below, up to 2.5 cm long, externally very densely and minutely cupreous-lepidote.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26604 Ramos & Edaño, September 9, 1916, in forests, altitude about 300 meters.

A most characteristic species, distinguishable by its indumentum; its coriaceous puncticulate leaflets; the prominent evanescent nerves; the obsolete reticulations; and its dark-brown, pyriform fruits.

AGLAIA PUNCTICULATA sp. nov. § *Hearnia*.

Frutex circiter 2 m altus, partibus junioribus foliolis subtus ad costa nervis et paniculis dense cupreo-lepidotis; foliis circiter

30 cm longis, foliolis longe petiolatis, oblongis, usque ad 13 cm longis, coriaceis, utrinque punctulatis, breviter acute acuminatis, basi acutis ad obtusis, nervis utrinque circiter 10, curvatis, perspicuis, evanescentibus, reticulis obsoletis; paniculis axillaribus, circiter 20 cm longis, anguste pyramidatis; floribus numerosis, graciliter pedicellatis, racemose dispositis, 5-meris, 1.5 mm diametro.

A shrub, said by the collector to be about 2 m high, the younger branches, petioles, petiolules, costa and nerves on the lower surface, and inflorescences densely cupreous-lepidote. Leaves alternate, about 30 cm long; leaflets 7, oblong, rather pale when dry, coriaceous, both surfaces minutely punctulate, 10 to 13 cm long, 2.5 to 5.5 cm wide, apex shortly acuminate, base acute to obtuse; lateral nerves 10 on each side of the midrib, prominent, curved, evanescent, the reticulations obsolete; petiolules 2 to 2.5 cm long. Panicles axillary, narrowly pyramidal, about 20 cm long, the lower branches up to 7 cm in length. Flowers numerous, 5-merous, racemosely disposed on the ultimate branchlets, 1.5 mm in diameter, their pedicels about 2 mm long, slender. Sepals orbicular-obovate, 1 mm in diameter, rounded, stellate-lepidote. Petals 5, free, 1.5 mm long, rounded. Staminal-tube turbinate, 1 mm in diameter, truncate, 0.6 mm long. Anthers 5, 0.6 mm long, inserted on the edge of the tube.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26306 Ramos & Edaño, August 21, 1916, in forests, altitude about 400 meters, locally known as *amponayan*.

This species in its indumentum, its oblong, coriaceous, punctulate leaves, and its evanescent nerves, the reticulations obsolete, strongly resembles *Aglaia pyriformis* Merr., and is manifestly allied to it. It differs from *Aglaia pyriformis* in its larger leaves; larger leaflets, which have much longer petiolules; its longer panicle branches; and especially in its more numerous, much smaller, slenderly pedicelled flowers.

AGLAIA ROBINSONII sp. nov. § *Hearnia*?

Frutex 3 ad 4 m altus, partibus junioribus petiolis infructescentiis et fructibus densissime cupreo-stellato-tomentosis; foliis alternis, 12 ad 25 cm longis, foliolis 7 ad 10, oppositis vel alternis, lanceolatis, chartaceis vel subcoriaceis, usque ad 7 cm longis, acuminatis, basi acutis, leviter inaequilateralibus, subtus ad costa densissime cupreo-tomentosis, ceteroquin glabra, nervis utrinque 7 ad 10, tenuibus, curvatis, anastomosantibus; infructescentiis axillaribus, brevibus, 1 ad 2 cm longis; fructibus ellipsoideis, 1.5 cm longis, densissime cupreo-tomentosis.

A shrub 3 to 4 m high, the branchlets, petioles, petiolules, midribs on the lower surface of the leaflets, very short infructes-

cences and fruits densely and uniformly stellate-tomentose with short, more or less spreading, cupreous hairs. Leaves alternate, 12 to 25 cm long; leaflets 7 to 10, alternate or opposite, lanceolate, subolivaceous or brownish-olivaceous when dry, somewhat shining, 4 to 7 cm long, 1 to 2 cm wide, subequally narrowed to the acute, somewhat inequilateral base and to the acuminate apex, chartaceous or subcoriaceous, glabrous except the midrib on the lower surface; lateral nerves 7 to 10 on each side of the midrib, slender, curved, anastomosing; petiolules 2 to 3 mm long, densely pubescent. Infructescences axillary, solitary, all parts densely cupreous-pubescent, the rather stout rachis 1 to 1.5 cm long, the infructescence reduced to a simple raceme. Fruits ellipsoid, 1.5 cm long, few, very densely cupreous-pubescent.

LUZON, Tayabas Province, Infanta, Mount Binuang, *Bur. Sci.* 9438 Robinson, August 28, 1909, in mossy forests, altitude 900 meters, *Bur. Sci.* 28634 Ramos & Edaño, May, 1917; Mount Dingalan, *Bur. Sci.* 26562 Ramos & Edaño (type), August 25, 1916, locally known to the Balugos as *ma-raampiit*.

A species well characterized by its lanceolate, small leaflets, its dense cupreous indumentum, and especially by its very short infructescences, which, including the ellipsoid fruits, scarcely exceed 2 cm in length.

AGLAIA TAYABENSIS sp. nov. § *Hearnia*.

Species *A. harmsianae* affinis differt foliolis multo majoribus, usque ad 29 cm longis et 11 cm latis. Arbor, partibus junioribus et inflorescentiis dense subcastaneo-stellato-tomentosis; foliis usque ad 65 cm longis, alternis, foliolis 7, oblongo-ellipticis, chartaceis, breviter acuminatis, basi obtusis ad subcordatis, utrinque ad costa stellato-tomentosis, nervis utrinque 15 ad 20; paniculis axillaribus, pyramidatis, pedunculatis, folia subaequantibus; floribus 5-meris, parvis, calycis extus stellato-tomentosis.

A tree about 8 m high, the young branchlets, petioles, inflorescences, and midrib on both surfaces of the leaflets densely subcastaneous-stellate-tomentose. Branches terete, brown, about 7 mm in diameter, tomentose. Leaves alternate, about 65 cm long. Leaflets 7, the lateral ones opposite, oblong-elliptic, chartaceous, brownish-olivaceous when dry, 25 to 29 cm long, 9.5 to 11 cm wide, the upper surface glabrous except for the stellate-tomentose midrib, the lower stellate-tomentose on the midrib and to a less degree on the lateral nerves, the base obtuse to rounded or subcordate, the apex shortly and abruptly acuminate; lateral nerves 15 to 20 on each side of the midrib, distinct, anastomosing, the reticulations lax, indistinct;

petiolules stout, densely stellate-tomentose. Panicles axillary, about as long as the leaves, densely stellate-tomentose, the indumentum subcastaneous, peduncled, the branches few, scattered, spreading, the lower ones up to 16 cm in length. Flowers rather densely crowded on the ultimate branchlets, 5-merous, in bud about 1 mm in diameter, the calyx externally stellate-tomentose, the lobes 1 mm long or less.

LUZON, Tayabas Province, Mount Tulaog, *Bur. Sci.* 29133 Ramos & Edaño, May 24, 1917, in forests near streams.

The alliance of this species is unmistakably with *Aglaia harmsiana* Perk., from which it differs chiefly in its very much larger leaflets.

AGLAIA GRANDIFOLIOLA sp. nov. § *Euaglaia*.

Arbor parva, partibus junioribus et inflorescentiis dense et pallide lepidotis, costa subtus parcissime lepidotis; foliis alternis, circiter 60 cm longis, foliolis circiter 5, oblongo-ellipticis, membranaceis, nitidis, acuminatis, usque ad 30 cm longis; paniculis axillaribus, paucifloris, 5 ad 6 cm longis; floribus magnis, 5-meris, circiter 5 mm longis; antheris 8, oblongis, 2 mm longis.

A small tree, 7 m high *vide* Ramos, the younger parts densely lepidote, the scales appressed, pale, small. Branches terete, brownish, smooth, about 5 mm in diameter, ultimately glabrous. Leaves alternate, about 60 cm long, the petioles and rachis rather densely pale-lepidote, the midrib on the lower surface of the leaflets sparingly lepidote. Leaflets about 5, membranaceous, brownish-olivaceous when dry, shining, oblong-elliptic, 20 to 30 cm long, 8 to 10 cm wide, base rounded to acute, that of the lateral ones inequilateral, apex slenderly acuminate; lateral nerves about 10 on each side of the midrib, prominent, curved, distant, anastomosing, the reticulations lax, indistinct. Panicles axillary, few-flowered, 5 to 6 cm long, densely pale-lepidote, the branches few, the lower ones 1.5 cm long or less, spreading. Flowers yellow, distinctly large for the genus, about 5 mm long, their pedicels short, stout, densely lepidote. Calyx about 3 mm long and wide, the lobes broadly ovate, obtuse, about 1.5 mm long, externally lepidote. Petals 5, free, obovate, glabrous, 5 to 5.5 mm long, apex rounded, base narrowed. Staminal-tube obovoid, 4 mm long, the anthers 8, oblong, 2 mm long, included.

LUZON, Tayabas Province, Umiray River, *Bur. Sci.* 28981 Ramos & Edaño, June 3, 1917, in forests along the river.

A strongly marked species, well characterized by its few, unusually large leaflets, which are entirely glabrous except for the sparingly lepidote midrib; its very short, few-flowered panicles; and its unusually large flowers.

AGLAIA LANCILIMBA sp. nov. § *Euaglaia*.

Arbor circiter 10 m alta, ramulis inflorescentiisque densissime cupreo-lepidotis; foliis circiter 25 cm longis, rhachibus petiolulisque dense cupreo-lepidotis; foliolis 11 ad 17, lanceolatis, acuminatis, usque ad 9 cm longis, in siccitate pallidis, nitidis, supra minutissime puncticulatis, in costa utrinque perspicue cupreo-lepidotis, nervis utrinque 10 ad 14, tenuibus, obscuris, reticulis obsoletis; paniculis folia subaequantibus, anguste pyramidatis, multifloris; floribus 5-meris, racemose dispositis, 2.5 ad 3 mm longis.

A tree about 10 m high, the branches and branchlets, inflorescences, petioles, rachises, and petiolules, and the midrib on both surfaces of the leaflets conspicuously and densely cupreous-lepidote. Ultimate branches terete, cupreous, nearly smooth, about 6 mm in diameter. Leaves numerous, crowded near the apices of the branchlets, about 25 cm long, the rachis, petioles and petiolules densely and conspicuously cupreous-lepidote; leaflets 11 to 17, lanceolate, chartaceous, pale when dry, somewhat shining, apex slenderly acuminate, base somewhat inequilateral, acute, 7 to 9 cm long, 1.2 to 2 cm wide, the upper surface minutely puncticulate-pitted, the lower paler than the upper, conspicuously cupreous-lepidote on and along the midrib on both surfaces, with few, widely scattered scales on the epidermis; lateral nerves 10 to 14 on each side of the midrib, very slender, obscure, not anastomosing, the reticulations obsolete; petiolules 6 to 9 mm long. Panicles in the uppermost axils, narrowly pyramidal, nearly as long as the leaves, peduncled, all parts densely cupreous-lepidote, the lower branches up to 12 cm in length, the upper shorter. Flowers 5-merous, racemosely disposed on the ultimate branchlets, their pedicels 1.5 to 2.5 mm long. Sepals 5, suborbicular, densely cupreous-lepidote, about 1 mm in diameter. Petals 5, free, glabrous, about 3 mm long, oblong-elliptic to oblong-obovate, rounded, concave. Staminal-tube oblong-obovoid, 2.2 mm long, slightly crenate. Anthers 5 or 6, oblong, 1 mm long, inserted at about the middle of the tube, included.

LUZON, Camarines Province, Paracale, *For. Bur. 26509 De Mesa & Magistrado*, August 2, 1916, on low hills, altitude about 20 meters, locally known as *ibaiba*.

This very characteristic species is well marked by its dense, cupreous, lepidote indumentum and its narrow, pale leaves. It somewhat resembles *Aglaia lanceolata* Merr. and *A. curranii* Merr., being most closely allied to the former. It is distinguished from both by its much larger flowers.

AGLAIA MIRANDAE sp. nov. § *Euaglaia*.

Species *A. stenophyllae* Merr. affinis, differt foliolis multo brevioribus latioribusque, usque ad 12 cm longis et 4 cm latis, breviter obtuseque acuminatis, nervis minus numerosis, 10 ad 12 utrinque, inflorescentiis dense multifloris, e basi ramosis.

A small tree about 7 m high, the branchlets, petioles, inflorescences, and some other parts of the plant rather densely ferruginous-pubescent with short stellate hairs. Branches grayish, rather slender, ultimately glabrous. Leaves alternate, about 30 cm long, the petiole and rachis ferruginous-stellate-pubescent; leaflets alternate, or the uppermost ones opposite, usually 9, subchartaceous, oblong to somewhat oblong-obovate, 6 to 12 cm long, 2.5 to 4 cm wide, pale and shining when dry, the apex obscurely blunt-acuminate, the base acute to rounded, often more or less inequilateral; nerves 10 to 12 on each side of the midrib, slender, not anastomosing, the reticulations nearly obsolete, the midrib on the lower surface ferruginous-stellate-pubescent as are the 2 mm long petiolules. Panicles axillary, 2 to 5 cm long, pyramidal, branched from the base, densely many-flowered, the flowers yellowish, racemously arranged on the ultimate branchlets, 5-merous, their pedicels about 1 mm long. Calyx stellate-pubescent, the lobes ovate, obtuse, 0.5 mm long. Petals 5, free, glabrous, elliptic, rounded, about 1 mm long. Staminal-tube depressed-globose, glabrous, free, truncate, about 0.6 mm long, the anthers 5, included.

BASILAN, near Sangal, *For. Bur.* 18970 *Miranda*, October 1, 1912, in forests, altitude about 100 meters.

A species manifestly allied to *Aglaiia stenophylla* Merr. of Samar, differing radically however in its very differently shaped, fewer-nerved leaflets. In its very abbreviated panicles it strongly resembles that species, but here differs in the panicles being very densely many-flowered and branched from the base.

AGLAIA MYRIANTHA sp. nov. § *Euaglaia*. *

Arbor parva, partibus junioribus, petiolis, petiolulis et inflorescentiis dense pallide stellato-tomentosis; foliis alternis, circiter 45 cm longis, foliolis circiter 15, lanceolatis ad oblongo-lanceolatis, tenuiter acuminatis, basi valde inaequilateralibus, usque ad 11 cm long, in siccitate pallidis, nitidis, nervis utrinque circiter 12, tenuibus, distinctis; paniculis axillaribus, folia subaequantibus, pedunculatis, multifloris; floribus numerosis, sessilibus, in ramulis ultimis glomeratim dispositis, 5-meris, sepalis extus stellato-tomentosis, circiter 1 mm longis.

A small tree, the younger parts, petioles, rachis, petiolules, midrib on the lower surface of the leaflets, and the ample inflorescences densely and uniformly stellate-tomentose with short, pale-brownish or grayish-brown hairs. Branches thickened, the ultimate ones at least 8 mm in diameter. Leaves crowded toward the apices of the branchlets, about 45 cm long; leaflets opposite and alternate, pale-brownish when dry, slightly shining, of the same color on both surfaces, subcoriaceous, lanceolate to oblong-lanceolate, 8 to 11 cm long, 2.5 to 3 cm wide, slenderly acuminate, base strongly inequilateral, acute, or acute on one side and somewhat rounded on the other, the lowermost ones shorter than the others; the midrib beneath, and sometimes also on the upper surface, stellate-tomentose; lateral nerves slender, somewhat curved, obscurely anastomosing, about 12 on each side of the midrib, the reticulations obscure; petiolules 5 to 8 mm long. Panicles axillary, as long as the leaves, peduncled, the lower branches up to 20 cm long, the branchlets densely flowered, the flowers somewhat glomerate on the spike-like ultimate branchlets. Flowers 5-merous, minute, very numerous, the sepals ovate, pubescent, about 1 mm long. Petals 5, free, when young orbicular-ovate, about 1 mm in diameter.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26593 Ramos & Edaña, August 27, 1913, in forests, altitude about 160 meters, locally known as *sarorongnan*.

A species not closely allied to any other known to me, well characterized by its long leaves and panicles, narrow, pale, very inequilateral leaflets, and very numerous, sessile glomerate flowers on the spike-like ultimate branchlets.

AGLAIA ELAEAGNOIDEA (Juss.) Benth. *Fl. Austral.* 1 (1863) 383; *C. DC. Monog. Phan.* 1 (1878) 611.

PALAWAN, *For. Bur.* 3823 Curran, March, 1906, from flat forests back of the beach, *Phil. Pl.* 1275 Merrill, *Bur. Sci.* 21535 Escritor. JOLO, *For. Bur.* 22524 Klemme, August, 1912, in level open forests near the sea. BASILAN *For. Bur.* 13260 Foxworthy, DeMesa, & Villamil, June, 1912 (sterile), along the seashore, *Bur. Sci.* 16089 Reillo, *For. Bur.* 18853 Miranda, August, 1912, back of the mangrove. MALAMAUI, *Bur. Sci.* 16376 Reillo, *For. Bur.* 18880 Miranda. SIBUTU, *For. Bur.* 20818 Ferraris & Stadtmiller. BALABAC, *Weber s. n.*

The specimens are rather characteristic, and appear to be decidedly uniform in essential characters; they agree closely with specimens from the Malay Archipelago and from Queensland. Its habitat is apparently characteristic.

The species is new to the Philippines, although I have previously described a variety from the Batanes Islands. I am now of the opinion that this northern form is specifically distinct, and herewith raise it to specific rank.

AGLAIA PALLENS (Merr.) comb. nov.

Aglaia elaeagnoidea Benth. var. *pallens* Merr. in Philip. Journ. Sci. 3 (1908) Bot. 413.

BATANES ISLANDS, Batan, *Bur. Sci.* 3331 *Fénix*, June, 1907; *For. Bur.* 19365 *Agudo*, May, 1909, locally known as *alui*. BABUYAN ISLANDS, Camiguin, *Bur. Sci.* 4122 *Fénix*, July, 1907.

This species differs from *Aglaia elaeagnoidea* Benth. especially in its much smaller leaves.

CHISOCHETON Blume**CHISOCHETON (DASYCOLEUM) PARVIFOLIOLUS** sp. nov.

Arbor parva, inflorescentiis exceptis glabra; foliis usque ad 25 cm longis, foliolis usque ad 14, oppositis, coriaceis, oblongis, usque ad 10 cm longis, obtuse acuminatis, in siccitate pallidis, nervis utrinque 10 ad 12, subtus valde perspicuis, subpatulis; infructescentiis axillaribus, longe pedunculatis, folia subaequantibus, puberulis; fructibus glöbosis vel depresso-globosis, 1.5 ad 2 cm diametro, pericarpio puberulo.

A small tree, glabrous except the more or less cinereous-puberulent inflorescence and younger parts. Branches terete, rather stout, the ultimate ones 5 to 7 mm in diameter, wrinkled when dry, grayish. Leaves alternate, up to 25 cm in length, the leaflets usually about 7 pairs, opposite, coriaceous, oblong, pale when dry, 7 to 10 cm long, 2.5 to 3.5 cm wide, somewhat inequilateral, apex obtusely acuminate, base distinctly inequilateral, rounded on both sides; lateral nerves 10 to 12 on each side of the midrib, spreading, very prominent; petiolules 2 to 3 mm long. Infructescences axillary, long-peduncled, about as long as the leaves, narrowly pyramidal, fruit bearing only in the upper one-third, the primary branches at most 3 cm long, spreading. Fruits globose or depressed-globose, pale-brownish when dry, 1.5 to 2 cm in diameter, puberulent, smooth, indehiscent, usually containing two seeds.

LUZON, Ilocos Sur Province, Tineg, Lagayan, *For. Bur.* 25467 *Paraiso*, March 20, 1915, on slopes, altitude about 300 meters, locally known as *palatangan*.

A species closely allied to *Chisocheton philippinus* Harms., from which it is distinguished by its much smaller, very prominently nerved leaflets.

DYSOXYLUM Blume**DYSOXYLUM HEXANDRUM** sp. nov. § *Eudysoxylum*.

Arbor, inflorescentiis exceptis glabra; foliis alternis, 30 ad 80 cm longis, foliolis alternis vel superioribus suboppositis, chartaceis, olivaceis, in siccitate utrinque minutissime verruculosus, oblongis ad oblongo-ovatis vel oblongo-ellipticis, plerumque cir-

citer 20 cm longis, acuminatis, nervis utrinque 9 ad 12, perspicuis; inflorescentiis axillaribus, depauperato-paniculatis, 12 ad 20 cm longis, ramis paucis; floribus 4-meris, circiter 1 cm longis, petalis extus pubescentibus, liberis; antheris 6; ovario pubescente.

A tree, at least 6 m high, probably higher, glabrous except the inflorescences. Branches grayish to brownish, the ultimate ones 5 to 10 mm in diameter. Leaves alternate, distant, 30 to 80 cm long; leaflets alternate, or the upper ones subopposite, chartaceous, olivaceous and rather dull when dry, both surfaces minutely verruculose, oblong to oblong-ovate or oblong-elliptic, 15 to 30 cm long (mostly about 20 cm), 6 to 11 cm wide; lateral nerves 9 to 12 on each side of the midrib, prominent, somewhat curved, obscurely anastomosing, the reticulations nearly obsolete. Panicles axillary, cinereous-pubescent, sparingly branched, 12 to 20 cm long, the lower branches 6 cm long or less. Flowers white, 4-merous, their pedicels 2 to 4 mm long. Calyx somewhat pubescent, 3 mm in diameter, shallow, somewhat 4-angled, obscurely 4-toothed. Petals 4, narrowly oblong, obtuse, pubescent externally, 10 mm long, 2.5 to 2.8 mm wide, free. Staminal-tube cylindric, glabrous on both surfaces, 9 mm long, crenulate. Anthers 6, about 1 mm long, included, inserted near the top of the tube. Disk cylindric, glabrous, crenulate, 3 to 3.5 mm long. Ovary ovoid, pubescent; style pubescent, about 7 mm long. Fruit obovoid, reddish-yellow, brown when dry, rather hard, 6 to 7 cm long, 5 to 6 cm in diameter.

CATANDUANES, *Bur. Sci.* 30214 (type), 30272 Ramos, November, 1917, in forests. SAMAR, Catubig River, *Bur. Sci.* 24392 Ramos, February, 1916, with the Visayan name *dalaganan*.

This species greatly resembles *Dysoxylum platyphyllum* Merr. in its vegetative and inflorescence characters, but is readily distinguished by its petals being pubescent outside and glabrous within; its entirely glabrous staminal tube; its six anthers; and its minutely and uniformly verruculose leaflets.

DYSOXYLUM ILOCANUM sp. nov. § *Eudysoxylum*.

Arbor parva, ramulis et foliis et inflorescentiis plus minusve griseo-puberulis vel pubescentibus; foliis alternis, circiter 25 cm longis, foliolis 6 vel 8, oppositis, oblongo-ellipticis vel subellipticis, usque ad 10 cm longis, subcoriaceis, in siccitate pallidis, basi rotundatis, leviter inaequilateralibus, apice obtusis ad obscure acuminatis, nervis lateralibus utrinque circiter 14, subtus valde perspicuis; inflorescentiis axillaribus, solitariis, 5 ad 7 cm longis, racemosis vel depauperato-paniculatis; floribus 4-meris, circiter 7 mm longis, petalis liberis, ovario pubescente.

A small tree, rather prominently grayish-puberulent or pubes-

cent. Branches terete, the ultimate ones about 5 mm in diameter, pale-brownish, pubescent, the branchlets very densely and uniformly grayish-pubescent with short hairs, a similar indumentum on the petioles, petiolules, and inflorescences. Leaves alternate, about 25 cm long, the leaflets opposite, 3 or 4 pairs, pale when dry, oblong-elliptic to subelliptic, subcoriaceous, mostly 8 to 10 cm long and 4 to 5.5 cm wide, base somewhat inequilateral, rounded, apex obtuse to obscurely acuminate, the upper surface glabrous except for the pubescent midrib, the midrib and lateral nerves on the lower surface sparingly pilose with spreading hairs; lateral nerves somewhat impressed on the upper surface, very prominent on the lower surface, about 14 on each side of the midrib, slightly curved, obscurely anastomosing, the reticulations subobsolete. Inflorescences axillary, solitary, pubescent, 5 to 7 cm long, simple, racemose or the nodes somewhat projecting and forming a very depauperate, raceme-like panicle. Flowers about 7 mm long, 4-merous, somewhat crowded at the nodes, their pedicels about 1 mm long. Calyx-lobes ovate, acute to obtuse, about 1.5 mm long, free nearly to the base, slightly pubescent. Petals 4, oblong, obtuse, free, 7 mm long, 3 mm wide, externally very obscurely pubescent. Staminal-tube cylindric, 6 mm long, glabrous, free, obscurely crenate; anthers 8, 1 mm long, included. Disk cup-shaped, 2 mm long and wide, margins slightly undulate, glabrous outside, somewhat pubescent inside. Ovary pubescent; style pubescent in the lower one-half, glabrous above, including the ovary about 6 mm long.

LUZON, Ilocos Norte Province, Dilumut, Pasaquin, *For. Bur.* 25091 *Paraiso*, February 18, 1916, on slopes, altitude about 300 meters, locally known as *aducag*.

A characteristic species belonging in the group with *Dysoxylum vrieseanum* C. DC. It is most closely allied to *Dysoxylum wenzelii* Merr., of Leyte, but is readily distinguishable by its more numerously nerved leaves and different indumentum.

DYSOXYLUM PANAYENSE sp. nov. § *Eudysoxylum*.

Arbor circiter 13 m alta, ramulis junioribus et inflorescentiis dense minuteque cupreo-puberulis; foliis alternis, usque ad 45 cm longis, petiolis et costa et petiolulis in siccitate purpureo-brunneis; foliolis alternis vel suboppositis, circiter 8, oblongis, subcoriaceis, in siccitate olivaceis, fragilis, utrinque dense verruculosus, usque ad 14 cm longis, base inaequilateralibus, decurrento-acuminatis, apice tenuiter subcaudato-acuminatis, nervis utrinque circiter 12; inflorescentiis axillaribus, spiciformis, usque ad 18 cm longis; floribus fasciculatis, 4-meris, breviter

pedicellatis, circiter 7 mm longis, petalis extus puberulis, liberis; disco cylindrico, crenato, glabro; ovario pubescente, 3-loculare.

A tree about 13 m high, glabrous except the minutely but densely cupreous-puberulent branchlets, younger parts, and inflorescences. Branches pale-brownish, about 8 mm in diameter. Leaves alternate, up to 45 cm in length, the petioles, rachis, petiolules, and midribs of the leaflets purplish-brown when dry; leaflets about 8, alternate or subopposite, oblong, subcoriaceous, brittle when dry, olivaceous, both surfaces densely and minutely verruculose, 10 to 14 cm long, 4 to 5 cm wide, base prominently inequilateral, decurrent-acuminate, apex rather slenderly subcaudate-acuminate; lateral nerves about 12 on each side of the midrib, distinct, slightly curved, not anastomosing, the reticulations obsolete. Inflorescences axillary, solitary, up to 18 cm long, spikelike, the rachis brownish-purple when dry. Flowers 4-merous, white, about 7 mm long, somewhat crowded on the very slightly produced nodes, their pedicels stout, 1 to 1.5 mm long. Calyx slightly pubescent, broadly and shallowly 4-toothed, about 2 mm in diameter. Petals oblong, free, 7 mm long, 2 mm wide, externally puberulent. Staminal-tube cylindric, free, glabrous, crenate, 6 mm long; anthers 8, about 0.9 mm long. Disk cylindric, crenate, glabrous, 2 mm long. Ovary narrowly ovoid, pubescent, 3-celled; style about 5 mm long.

PANAY, Capiz Province, *For. Bur.* 23951 *Hirro*, February 13, 1915, in dipterocarp forests near streams at an altitude of about 400 meters, locally known as *bakic*.

A species manifestly closely allied to *Dysoxylum palawanense* Merr., which it greatly resembles. It is readily distinguished, however, by its brownish-purple branchlets, petioles, petiolules, midribs, and inflorescences, its somewhat caudate-acuminate leaflets, and its cylindric, crenate disk.

VAVAEA Benth

This genus, long considered to be a typical Polynesian one, is apparently as well or even better represented in the Malayan region than in Polynesia. At least one species is widely distributed in the Malay Archipelago, represented by numerous collections, as yet unidentified, in the Buitenzorg herbarium. In Java is also found *Vavaea bantamensis* (Koord. & Val.) Koord. & Merr., originally described, from fruiting specimens, as a species of *Vitex*, while at least eight species are represented in our Philippine collections. The previously described species are *Vavaea amicorum* Benth., *V. harveyi* Seem., and *V. megaphylla* C. H. Wright, of Fiji and the Friendly Islands; *V. papuana* F. M. Bailey, of New Guinea; *V. chalmersii* C. DC., of New Guinea; *V. pauciflora* Volk., of the Caroline Islands; *V. bantamensis* Koord. & Merr., of Java; and *V. surigaoensis* Elm. and *V. ardisioides* Elm., of Mindanao. At least in the Philippines, the species do not appear to be sharply defined, as in some cases specimens are found presenting intermediate characters between rather distinct types.

VAVAEA AMICORUM Benth. in Hook. Lond. Journ. Bot. 2 (1843) 212; A. Gray Bot. Wilkes U. S. Explor. Exped. (1854) 44, t. 16, f. B.

LUZON, Zambales Province, *For. Bur.* 6503 Aguilar, Hallier s. n.: Nueva Ecija Province, *For. Bur.* 22354 Alvarez, *Bur. Sci.* 12316 Foxworthy: Batangas Province, *For. Bur.* 7680 Merritt & Curran. MINDORO, *For. Bur.* 9811 Merritt. NEGROS, *For. Bur.* 22892 Vergara & Cardona. SAMAR, *For. Bur.* 22688 Oro, *Bur. Sci.* 17574 Ramos. BASILAN, *Bur. Sci.* 16312 Reillo, *For. Bur.* 9524 Hutchinson. JOLO, *For. Bur.* 22532 Klemme. PALAWAN, Elmer 12970, as *Vavaea harveyi* Seem.

My conception of *Vavaea amicum* Benth. is based on the descriptions and Gray's figure cited above. The Philippine specimens, some of which have been referred to *Vavaea harveyi* Seem., appear to me to agree much better with the characters of Bentham's species than with Seemann's.

VAVAEA SURIGAOENSIS Elm. Leaf. Philip. Bot. 8 (1915) 2768.

In addition to the two specimens cited by Mr. Elmer in the original description, I refer here the following:

LUZON, Tayabas Province, *Bur. Sci.* 20846 Escritor, *Bur. Sci.* 13208 Foxworthy & Ramos, *Bur. Sci.* 19414, 19470 Ramos. SAMAR, *Bur. Sci.* 17482 Ramos. MINDANAO, Surigao Province, Placer, Ahern 405.

The species is very closely allied to both *Vavaea harveyi* Seem. and *V. amicum* Benth. and is by no means always easy to distinguish from the latter as interpreted above.

VAVAEA ARDISIOIDES Elm. Leaf. Philip. Bot. 8 (1915) 2767.

This is very similar to *Vavaea amicum* Benth., but with much smaller leaves.

VAVAEA RETUSA sp. nov.

Arbor circiter 15 m alta, partibus junioribus et inflorescentiis exceptis glabra; foliis obovatis, perspicue retusis, basi angustatis, acutis, usque ad 12 cm longis, nervis utrinque 8 ad 10, rectis, distinctis; inflorescentiis axillaribus, solitariis, pedunculatis, circiter 4 cm longis, fructibus parcissime pilosis.

A tree about 15 m high. Branches terete, brownish or grayish, wrinkled when dry, glabrous, the branchlets rather prominently pubescent with subappressed olivaceous-brownish hairs, a similar indumentum on the petioles and inflorescence. Leaves chartaceous, obovate, pale when dry, shining, glabrous, or the midrib sparingly pubescent, 6 to 12 cm long, 5 to 7.5 cm wide, base broadly rounded and prominently retuse, gradually narrowed from about the upper one-third to the acute base; lateral nerves 8 to 10 on each side of the midrib, straight, slightly ascending, distinct; petioles about 8 mm long. Cymes axillary, solitary, in fruit about 4 cm long, pubescent, each bearing few fruits, the branches few, short. Persistent calyx pubescent externally, the teeth broad, acute. Fruits subglobose, purplish when fresh, brownish when dry, about 8 mm in diameter, externally very sparingly pubescent.

NEGROS, Malabunhao, near San Carlos, *For. Bur. 23402 Contreras*, July 15, 1914, in rocky soil in the hills, altitude about 200 meters, locally known as *saguibunon*.

This species is characterized especially by its strongly obovate, broadly rounded, and very prominently retuse leaves. It is manifestly very closely allied to *Vavaea amicorum* Benth. and *V. harveyi* Seem.

VAVAEA PILOSA sp. nov.

Arbor parva, partibus junioribus et inflorescentiis et foliis praesertim subtus ad costa nervisque perspicue subferrugineo ciliato-pilosis; foliis firme chartaceis, in siccitate pallidis, obovatis ad oblong-obovatis, usque ad 20 cm longis, apice acutis, breviter acuminatis, vel subrotundatis, basi angustatis, cuneatis, nervis utrinque circiter 15, curvatis, perspicuis; inflorescentiis dense pubescentibus, axillaribus, numerosis, longe pedunculatis, circiter 10 cm longis; floribus 8 ad 10 mm longis, petalis puberulis, filamentis dense pilosis.

A small tree, apparently deciduous, the inflorescences usually appearing with the young leaves, the younger parts, inflorescences, and the leaves beneath prominently ciliate-pilose with spreading subferruginous hairs. Branches terete, brownish, glabrous, the branchlets marked with prominent petiolar scars, densely pubescent. Leaves crowded at the apices of the branchlets, obovate to oblong-obovate, 11 to 20 cm long, 5 to 9 cm wide, firmly chartaceous, pale when dry, shining, the apex acute, somewhat acuminate, or sometimes rounded or obtuse, base gradually narrowed, cuneate, the midrib on the upper surface rather densely pubescent, otherwise glabrous, or the nerves with few scattered hairs, the lower surface rather softly and densely pubescent with spreading hairs especially on the midrib and lateral nerves; lateral nerves about 15 on each side of the midrib, prominent, somewhat curved, anastomosing; petioles densely pubescent, 1 to 1.5 cm long. Cymes numerous, solitary, in the upper axils, about 10 cm long, densely pubescent, long-peduncled, the flower-bearing portion usually less than 3 cm long, the branches few, somewhat spreading, the inflorescences rarely exceeding 5 cm in diameter. Flowers white or yellowish-white, 4- and 5-merous. Calyx densely pubescent, about 4 mm long, the lobes 4 or 5, acute, 1 to 2 mm long. Petals 4 or 5, oblong, obtuse, puberulent externally, 8 to 10 mm long. Staminal-tube 1.5 to 2 mm long, glabrous externally; stamens 10 or 12, alternate ones slightly shorter than the others, the free parts of the filaments densely pubescent, about 2 mm long; anthers ovoid, about 0.5 mm long. Ovary ovoid, pubescent, 3-, sometimes 4-celled; style rather stout, about 4 mm long. Fruit subovoid,

brownish when dry, about 8 mm long, externally very slightly pubescent.

LUZON, Rizal Province, Bosoboso, Montalban, and Tanay, *For. Bur.* 3094 (type), 3391 Ahern's collector, Merrill 2652, 2329, *Bur. Sci.* 2135 Ramos, Loher 6172: Bulacan Province, Angat, *Bur. Sci.* 22302 Ramos. Apparently referable here are *Phil. Pl.* 1589 Ramos, from Camarines Province; Merrill 9647, from Benguet Subprovince; *For. Bur.* 20189 Aguilar, from Tayabas Province; and *For. Bur.* 14872 Darling, from Nueva Vizcaya Province, Luzon.

A species not strikingly different from *Vavaca amicorum* Benth., distinguished, however, by its prominent indumentum, which is composed of subferruginous, spreading, ciliate-pilose hairs.

VAVAEA HETEROPHYLLA sp. nov.

Arbor circiter 12 m alta, partibus junioribus et inflorescentiis exceptis glabra; foliis confertis, majoribus obovatis, usque ad 15 cm longis, apice latissime rotundatis, nervis utrinque circiter 8, minoribus oblongis ad obovatis, 2 ad 6 cm longis, omnibus breviter petiolatis; inflorescentiis in axillis superioribus, longe pedunculatis, cymosis, circiter 10 cm longis; petalis 1 cm longis; filamentis plerumque 12, intus densissime villosis, tubo glabro, 2 mm longo.

A tree about 12 m high, the younger parts and inflorescences more or less pubescent. Branches reddish-brown, rugose, 6 to 8 mm in diameter, glabrous, the branchlets somewhat cinereous-pubescent. Leaves crowded at the apices of the branchlets, very diverse in size, the larger ones broadly obovate, 8 to 15 cm long with about 8 pairs of primary nerves, apex broadly rounded, gradually narrowed below to the acute or subacute base, the smaller ones oblong to obovate, 2 to 6 cm long, all chartaceous, pale to brownish when dry, glabrous or the younger ones somewhat pubescent along the midrib on both surfaces, the lower surface somewhat punctulate; petioles pubescent, 4 mm long or less. Cymes in the uppermost axils, long-peduncled, 9 to 11 cm long, more or less pubescent, many-flowered, each cyme about 4 cm in diameter. Flowers pinkish-white, fragrant. Calyx pubescent, about 4 mm in diameter, usually 5-angled or toothed. Petals 5, oblong, puberulent, about 10 mm long, 3 to 4 mm wide. Staminal-tube glabrous, about 2 mm high, the filaments usually 12, 2.5 to 3 mm long, the alternate ones slightly shorter than the others, densely villous inside. Ovary and style pubescent, the latter 5 to 5.5 mm long; stigma capitate.

LUZON, Camarines Province, Paracale, Casalongan, *For. Bur.* 27062 *Magistrado*, May 12, 1917, on forested slopes, altitude about 20 meters, with the local name *pinganpingan*.

This species is well characterized by its short-petioled, chartaceous

leaves, which are truncately rounded at the apex and which vary exceedingly in size and somewhat in shape. It is apparently most closely allied to *Vavaca pachyphylla* Merr., but its leaves are entirely different in texture and have much shorter petioles than is the case with the latter species.

VAVAEA PACHYPHYLLA sp. nov.

Frutex vel arbor parva, ramis incrassatis, partibus junioribus et inflorescentiis plus minusve adpresse fulvo-pubescentibus; foliis crasse coriaceis, obovatis, usque ad 13 cm longis, apice latissime rotundatis, basi acutis, nitidis, nervis utrinque 7 vel 8, perspicuis, subtus ad costa nervisque pubescentibus; cymis sub fructu longe pedunculatis, parvis, 2.5 ad 3.5 cm diametro, fructibus glabris, ovoideis, circiter 1 cm longis.

A shrub or small tree (2 to 3 m high *vide* Ramos), the branches stout, brown, about 1 cm in diameter, the branchlets 5 to 7 mm in diameter, or sometimes as thick as the branches, often marked with numerous petiolar scars, glabrous except the growing tip which is rather densely pubescent with pale-fulvous appressed hairs. Leaves thickly coriaceous, rather pale when dry, obovate to broadly obovate, 9 to 13 cm long, 6 to 9 cm wide, shining, the apex broadly rounded, the base narrowed, acute, the upper surface smooth, glabrous except for the pubescent midrib, the lower surface distinctly reticulate, the veinlets raised, appressed-pubescent on the midrib and lateral nerves; nerves 7 or 8 on each side of the midrib, very prominent, curved, anastomosing; petioles stout, pubescent, 1 to 1.5 cm long. Fruiting peduncles axillary, solitary, 8 to 10 cm long, sparingly pubescent, the cymes 2.5 to 3.5 cm long and wide, the bracts subtending the primary branches oblong, pubescent, up to 1 cm in length. Primary branches few, stout, somewhat pubescent. Fruits ovoid, glabrous, about 1 cm long, the persistent calyx appressed-pubescent with pale-fulvous hairs.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28816 Ramos & Edaño, May 11, 1917, in the mossy forest, altitude apparently about 1,000 meters. I refer here without hesitation *Bur. Sci.* 28757 Ramos & Edaño, from the same locality, a specimen with juvenile, yet thickly coriaceous, leaves 5 to 6 cm in length, and rather densely pubescent inflorescences with very young flowers.

The species is a most characteristic one and is readily distinguishable by its very thickly coriaceous, obovate leaves which are broadly rounded at their apices.

BURSERACEAE

CANARIUM Linnaeus

CANARIUM MICROPHYLLUM sp. nov. § *Choriandra*.

Arbor parva, plus minusve puberulis vel pubescentibus; foliis usque ad 17 cm longis, foliolis circiter 11, parvis, oblongo-ovatis,

chartaceis, integris, usque ad 5 cm longis, apice tenuiter subcaudato-acuminatis, basi acutis, inaequilateralibus, nervis utrinque circiter 8, perspicuis; inflorescentiis ♂ axillaribus, circiter 6 cm longis, racemosis, floribus ad nodis fasciculatis; calycis parce cinereo-pubescentibus, 3 mm longis, 3-lobatis; staminibus 6, liberis; disco villosa.

A small tree, 5 m high *fide* Ramos, the branchlets, inflorescences, and parts of the leaves puberulent, the tips of the branchlets also rather densely villous. Branches glabrous, terete, brownish, the ultimate ones 3 to 4 mm in diameter. Leaves alternate, about 17 cm long, the rachis and petiole puberulent as are the midribs on both surfaces and nerves beneath; leaflets usually 11, oblong-ovate, chartaceous, brownish-olivaceous, shining, 4 to 5 cm long, 1.5 to 2 cm wide, inequilateral, entire, the apex slenderly subcaudate-acuminate, the acumen blunt, base acute; primary nerves about 8 on each side of the midrib, prominent, curved, anastomosing; petiolules 3 to 5 mm long; stipules none. Inflorescences in the uppermost axils, about 6 cm long, slender, somewhat pubescent, the flowers fascicled at the nodes in the upper part, their pedicels 1 to 1.5 mm long, pubescent. Calyx about 5 mm long, the lobes 3, broadly ovate, obtuse, slightly pubescent. Stamens 6, inserted outside of the villous disk, free.

CATANDUANES, *Bur. Sci.* 30351 Ramos, December 10, 1917, in forests back of Calolbong at low altitudes.

This species is well characterized by its unusually small, entire, slenderly subcaudate-acuminate leaflets, these being distinctly smaller than are those of any other described Philippine species. It is closely allied to *Canarium euryphyllum* Perk., differing in its indumentum and in its smaller leaves; *Canarium euryphyllum* Perk. is entirely glabrous.

SANTIRIA Blume

SANTIRIA ELLIPTIFOLIA sp. nov.

Arbor glabra, circiter 20 m alta; foliis alternis, usque ad 35 cm longis, foliolis 9 ad 13, subcoriaceis, ellipticis ad oblongo-ellipticis, olivaceis, nitidis, usque ad 16 cm longis, apice obtusis ad latissime et breviter acuminatis, basi rotundatis vel truncatis, saepe plus minusve inaequilateralibus, nervis utrinque circiter 11, patulis, curvatis, distinctis; paniculis axillaribus, solitariis, circiter 20 cm longis, e basi ramosis, amplis, multifloris; floribus parvis, petalis ovatis, circiter 2.8 mm longis.

A glabrous tree about 20 m high, the ultimate branches terete, brownish, lenticellate, about 8 mm in diameter. Leaves alternate, up to 35 cm in length, the rachis dark reddish-brown; leaflets 9 to 11, opposite, subcoriaceous, elliptic to oblong-elliptic, entire, 9 to 16 cm long, 4.5 to 7 cm wide, olivaceous when dry,

shining, the apex obtuse to broadly and shortly acuminate, base rounded to truncate, often inequilateral; primary nerves about 11 on each side of the midrib, slender but distinct, spreading, curved, anastomosing, the reticulations distinct on the lower surface; petiolules 2 to 2.5 cm long. Panicles axillary, solitary, branched at or from near the base, up to 20 cm long, the primary branches up to 10 cm in length. Flowers numerous, greenish-yellow, fragrant, the buds obovoid. Calyx with three very short rounded teeth. Petals ovate, about 2.8 mm long and 2 mm wide. Stamens 6, their filaments about 1 mm long, inserted outside of the conspicuous disk which is about 1.5 mm in diameter and 6-angled.

LUZON, Camarines Province, Paracale, *For. Bur. 27097 Alambra*, March 22, 1918, in dipterocarp forests, altitude about 50 meters.

Among the Philippine species this form is well characterized by its elliptic to oblong-elliptic leaflets and its ample inflorescences.

CELASTRACEAE

MICROTROPIS Wallich

MICROTROPIS PHILIPPINENSIS sp. nov.

Frutex glaber, ramis teretibus, ramulis leviter compressis et obscure sulcatis ad distincte 4-angulatis; foliis chartaceis, oblongo-ellipticis, usque ad 11 cm longis, in siccitate pallidis, nitidis, utrinque subaequaliter angustatis, acuminatis, nervis primariis utrinque 6 ad 8, distantibus, arcuato-anastomosantibus; cymis axillaribus, ut videtur paucifloris, breviter pedunculatis; fructibus oblongo-ovoideis, circiter 1.5 cm longis, acuminatis, sepalis 5, persistentibus reniformibus, 2.5 ad 3 mm latis.

A glabrous shrub, the branches terete, the branchlets somewhat compressed and obscurely sulcate to distinctly 4-angled, reddish-brown. Leaves opposite, chartaceous, pale when dry, shining, in general oblong-elliptic, acuminate and subequally narrowed at both ends, 8 to 11 cm long, 3 to 5 cm wide; primary lateral nerves 6 to 8 on each side of the midrib, distant, lax, rather distinct on the lower surface, arched-anastomosing, the reticulations lax; petioles 8 to 10 mm long. Cymes axillary, few-flowered, shortly peduncled, usually dichotomously branched, the two primary branches each bearing a single fruit, the peduncles 5 cm long or less, the branches somewhat shorter than the peduncles. Persistent sepals 5, reniform, rounded or retuse, about 2 mm long, 2.5 to 3 mm wide. Fruits reddish-yellow when fresh, when dry dark reddish-brown, oblong-ovoid, prominently acuminate, about 1.5 cm long, 5 to 8 mm in diameter.

CATANDUANES, Mount Mariguidon, *Bur. Sci.* 30580 Ramos, November 30, 1917, on forested slopes.

This is the third species of the genus to be found in the Philippines, and is most closely allied to *Microtropis platyphylla* Merr., from which it is distinguished by its smaller, differently shaped, and fewer-nerved leaves; and by its short-peduncled, few-flowered cymes.

VITACEAE

LEEA Linnaeus

LEEA PAPILLOSA sp. nov.

Frutex circiter 2 m altus, ramis et petiolis et rhachibus et inflorescentiis perspicue firmiter papillois, papillis rigidis, simplicibus vel furcatis, usque ad 2 mm longis; foliis tripinnatis, usque ad 60 cm longis, foliolis chartaceis ad subcoriaceis, oblongis, usque ad 18 cm longis, subabrupte caudato-acuminatis, margine perspicue serratis; infructescentiis amplis, laxis, diffusis, usque ad 25 cm longis, pedunculatis; fructibus globosis, glabris, in siccitate nigris, plus minusve rugosis, circiter 8 mm diametro, calycis lobis 5, subpersistentibus.

A shrub about 2 m high, the branches, branchlets, petioles, rachises and secondary rachises of the leaves, and the inflorescences conspicuously papillate, the papillae numerous, stiff, rigid, simple or forked, up to 2 mm long, all these parts dark-brown when dry, the ultimate branches about 5 mm in diameter. Leaves tripinnate, up to 60 cm long, the primary pinnae few, usually 4 or 5, the lower ones up to 35 cm in length. Leaflets in general oblong, firmly chartaceous to subcoriaceous, 9 to 18 cm long, 4 to 6 cm wide, glabrous except the midrib beneath, which is usually supplied with scattered tufts of short hairs and with small papillae, rather pale-olivaceous, shining, the apex rather abruptly caudate-acuminate, the acumen slender, blunt, 1.5 to 2 cm long, the base usually rounded; lateral nerves 8 to 12 on each side of the midrib, prominent, anastomosing, the reticulations prominent. Infructescences diffuse, lax, up to 25 cm in length, their peduncles about 5 cm long, all parts papillate with processes similar to those on the petioles and branches. Fruits globose, glabrous, black and somewhat rugose when dry, about 8 mm in diameter, the subpersistent calyx-lobes 5.

CATANDUANES, *Bur. Sci.* 20338 Ramos, December 8, 1917, along small streams in forests back of Calolbong at low altitudes.

This species is remarkable for the numerous, short, simple or forked, stiff, rigid papillae or papilla-like protuberances on the branches, branchlets, leaves, and inflorescences, in this particular character differing from all other described species of the genus known to me.

STERCULIACEAE

FIRMIANA Marsigli

FIRMIANA SIMPLEX (Linn.) W. F. Wight in U. S. Dept. Agr. Bur. Pl. Ind. Bull. 142 (1909) 67.

Hibiscus simplex Linn. Sp. Pl. ed. 2 (1763) 977.

Sterculia platanifolia Linn. f. Suppl. (1781) 423.

LUZON, Pangasinan Province, Mount San Isidro, Labrador, *Bur. Sci.* 29858 *Fénix*, November 6, 1917, in forests, altitude about 400 meters, locally known as *bitnong*.

The specimen is in flower and presents immature leaves, which are glabrous and considerably smaller than are those on our Chinese material. The tree is manifestly deciduous, the new leaves appearing with the flowers. I can see no reason, in the absence of more complete material, and especially mature leaves and fruits, for distinguishing this Philippine form from this well-known Chinese and Japanese species. In floral characters it conforms very closely with material from southern China.

DILLENIACEAE

SAURAUIA Willdenow

SAURAUIA OLIGOPHLEBIA sp. nov.

Frutex, ramulis, petiolis, et pedicellis dense adpresse paleaceis; foliis chartaceis, oblongis, usque ad 8 cm longis, supra brunneo-olivaceis, nitidis, ad costa nervisque breviter adpresse setosis, subtus pallidioribus, apice breviter acuminatis, basi acutis ad obtusis, margine denticulato-setosis, nervis utrinque 5 vel 6; floribus axillaribus, solitariis, breviter pedicellatis, ebracteatis, circiter 2 cm diametro, sepalis ovato-ellipticis, exterioribus acutis, dense subpatule setosis, interioribus subpetaloideis, obtusis; ovario glabro; stylis 3, liberis.

A shrub about 1 m high, the branchlets, petioles, and pedicels rather densely appressed-paleaceous with oblong, obtuse to acuminate, 0.5 to 1.2 mm long, thick scales, with similar ones on the midrib and nerves on both surfaces of the leaves. Leaves oblong, chartaceous, 5 to 8 cm long, 2 to 3.5 cm wide, the upper surface brownish-olivaceous, shining, the lower paler, here also with scales on the reticulations, the apex shortly acuminate, base acute to obtuse, margins denticulate-setose; lateral nerves 5 or 6 on each side of the midrib, prominent, the reticulations distinct; petioles 0.5 to 1 cm long. Flowers axillary, solitary, white, ebracteate, about 2 cm in diameter, their pedicels 5 to 8 mm long. Sepals ovate-elliptic, about 8 mm long, the outer two densely setose on the back, acute, the inner three more or less petaloid, thinner, rounded, setose only on the exposed parts, the setae somewhat spreading, thick, lanceolate, acuminate, up to

3 mm in length. Petals irregularly retuse. Stamens 20. Ovary globose, glabrous; styles 3, free, about 4 mm long.

CATANDUANES, *Bur. Sci.* 30323 Ramos, December 10, 1917, in forests back of Calolbong.

This species apparently belongs in the group with *Saurauia oligantha* Merr. and *S. sparsiflora* Elm., differing from both in numerous characters, notably in its much larger flowers and densely setose sepals.

THEACEAE

TERNSTROEMIA Mutis

TERNSTROEMIA MEGACARPA sp. nov.

Arbor glabra, circiter 12 m alta; foliis crasse coriaceis, in siccitate brunneis, oblongo-ellipticis ad obovato-oblongis, usque ad 30 cm longis et 11 cm latis, apice breviter obtuseque acuminatis, basi cuneatis, nervis utrinque circiter 15, sat distinctis; floribus axillaribus, longe pedicellatis, pedicellis 4 ad 10 cm longis; fructibus ovoideis, circiter 6 cm longis; seminibus oblongis, utrinque obtusis, circiter 3 cm longis.

A glabrous tree about 12 m high. Branches terete, grayish-brown, wrinkled when dry. Leaves thickly coriaceous, brown when dry, slightly shining, oblong-elliptic to obovate-oblong, 16 to 30 cm long, 7 to 11 cm wide, apex broadly and shortly blunt-acuminate, base narrowed, cuneate, the lower surface somewhat verruculose, not black-punctulate or glandular; lateral nerves about 15 on each side of the midrib, rather distinct; petioles stout, about 2 cm long. Flowers axillary, dioecious, solitary, long-pedicelled, the pedicels rather stout, 4 to 10 cm long. Calyx lobes orbicular, thickly coriaceous, about 1 cm in diameter. Stamens indefinite, crowded, the anthers about 1.5 cm long. Fruit ovoid or ellipsoid-ovoid, about 6 cm long and 4 cm in diameter, brown when dry, the pericarp brittle-coriaceous, glabrous. Seeds oblong, rounded at both ends, crimson when fresh, about 3 cm long.

MINDANAO, Lanao District, Camp Keithley, *Mrs. Clemens s. n.* (type) and 959, collected in March, June, July, and September, 1907.

This species is distinguished from *Ternstroemia philippinensis* Merr. by its larger, more prominently nerved leaves which are not black-glandular or punctulate on the lower surface, and its long-peduncled flowers and fruits. Its alliance with the extra-Philippine species appears to be with *Ternstroemia penangiana* Choisy, to which it is not closely allied, and *T. robinsonii* Merr., of Amboina.

EURYA Thunberg

EURYA PACHYPHYLLA sp. nov.

Arbor parva, 4 ad 5 m alta, glabra; foliis coriaceis, ellipticis ad oblongo-ellipticis, brunneo-olivaceis, nitidis, usque ad 5 cm

longis, nervis cum venularum reti utrinque distinctis, basi acutis, apice breviter acuminatis, acuminis retusis; petiolo 4 ad 5 mm longo; floribus axillaribus, solitariis vel binis, breviter pedicellatis, sepalis omnino glabris; stylis 3, paene liberis.

A small glabrous tree 4 to 5 m high, the branches and branchlets terete, smooth, reddish-brown, the ultimate branchlets slender, 1 mm in diameter or less, the internodes mostly about 1 cm long. Leaves coriaceous, elliptic to oblong-elliptic, 4 to 5 cm long, 2 to 3 cm wide, subequally narrowed to the acute base and to the shortly acuminate apex, the apex retuse, margins minutely crenulate-serrulate, the nerves and reticulations distinct on both surfaces, the primary lateral nerves 7 to 9 on each side of the midrib, scarcely more prominent than are the secondary nerves and primary reticulations, freely anastomosing; petioles 4 to 5 mm long. Flowers axillary, solitary or in pairs, their pedicels 2 mm long or less. Sepals glabrous, orbicular to subreniform, retuse, the outer ones about 2 mm, the inner 3 mm in diameter. Fruits globose, 5 mm in diameter; styles 3, nearly free, about 1 mm long.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26525 Ramos & Edaña (type), September 10, 1916, in forests, altitude about 200 meters: Camarines Province, Mount Calinigan, *For. Bur.* 21699 Miranda, April 24, 1914, in forests, altitude about 700 meters.

A species in the general alliance with *Eurya japonica* Thunb., but distinguished by many characters, notably in its thicker, prominently and rather densely reticulate leaves. Among the Philippine species it is most closely allied to *Eurya coriacea* Merr., from which it is distinguished by its shorter petioles and much smaller, entirely glabrous sepals.

EURYA PACHYRHACHIS sp. nov.

Arbor parva, circiter 5 m alta, glabra, ramis et ramulis crassis, internodiis brevibus, circiter 5 mm longis; foliis crasse coriaceis, ellipticis ad ovato-ellipticis, olivaceis vel brunneo-olivaceis, nitidis, usque ad 6 cm longis, aequilateralibus, basi obtusis, apice breviter acuminatis, acuminis retusis, margine minute crenulato-serrulatis, nervis utrinque 7 ad 9, tenuibus, distinctis, anastomosantibus; petiolo 3 ad 5 mm longo; inflorescentiis axillaribus et e axillis defoliatis, rhachibus crassis, 2 ad 4 mm longis, cicatris multis instructis, ad apice 1- vel 2-floris; floribus brevissime pedicellatis, sepalis margine minute ciliatis; stylis 3, usque ad $\frac{1}{2}$ connatis.

A small tree, about 5 m high, entirely glabrous except the minutely ciliate margins of the sepals. Branches and branchlets dark-gray, rather stout, the ultimate branchlets 2 to 3 mm in diameter, the internodes short, usually 5 mm long or less.

Leaves thickly coriaceous, elliptic to ovate-elliptic, 3.5 to 6 cm long, 2.3 to 3 cm wide, shining, olivaceous or brownish-olivaceous, base obtuse to rounded, apex shortly acuminate, the acumen retuse, margins minutely crenulate-serrulate; lateral nerves 7 to 9 on each side of the midrib, slender, distinct, anastomosing, the reticulations distinct; petioles 3 to 5 mm long. Racemes axillary, and in the axils of fallen leaves, solitary, the rachis stout, 2 to 4 mm long, marked with numerous scars of fallen pedicels, each bearing at one time one or two flowers at the apex, subsessile or the pedicels 1 to 1.5 mm long. Sepals orbicular to reniform, the inner ones up to 2 mm long and 3.5 mm wide, their margins ciliate. Ovary ovoid, glabrous; styles 3, about 2 mm long, united for one-half their length.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26579 Ramos & Edaño, September 9, 1916, in forests, altitude about 200 meters.

A species resembling *Eurya coriacea* Merr., but with shorter petioles and an entirely different inflorescence. The short, stout, scarred rachis of the axillary racemes is characteristic.

DIPTEROCARPACEAE

VATICA Linnaeus

VATICA PACHYPHYLLA sp. nov.

Arbor circiter 20 m alta; foliis crasse coriaceis, ellipticis ad oblongo-ellipticis, glabris, olivaceis, nitidis, usque ad 14 cm longis et 8 cm latis, apice acuminatis, basi subacutis ad rotundatis, nervis primariis utrinque circiter 12, subtus prominulis; paniculis terminalibus, anguste pyramidatis, usque ad 18 cm longis, densissime stellato-furfuraceis, indumento luteo; floribus numerosis; petalis oblongis, circiter 11 mm longis; antheris 15; ovario glabro; stylis circiter 0.7 mm longis, glabris, stigmatibus obscurissime 3-lobato.

A tree about 20 m high, glabrous except the younger parts. Branches terete, brownish, wrinkled when dry, about 5 mm in diameter, glabrous or nearly so, the branchlets densely ferruginous-furfuraceous. Leaves thickly coriaceous, elliptic to oblong-elliptic, 11 to 14 cm long, 5 to 8 cm wide, the apex rather prominently acuminate, base acute to rounded, when dry olivaceous, shining, the very young ones more or less stellate-puberulent, the indumentum caducous, the leaves soon entirely glabrous; lateral nerves about 12 on each side of the midrib, prominent, curved, the reticulations not conspicuous; petioles 1.5 to 2 cm long, when young densely and minutely furfuraceous, in age glabrous or nearly so. Panicles terminal, pyramidal, up to 18 cm in length, the lower branches up to 9 cm in length, all parts

densely stellate-furfuraceous, the indumentum usually lemon-yellow, on the younger parts shading to pale-gray. Flowers numerous. Sepals oblong, obtuse, about 4 mm long and 1 to 1.5 mm wide, densely pale-gray puberulent. Petals narrowly oblong, about 11 mm long, 3 mm wide, densely puberulent. Stamens 15, the anthers less than 1 mm long. Ovary subglobose, glabrous; style 0.7 mm long or less, glabrous; stigma subcapitate, very obscurely 3-lobed.

LUZON, Camarines Province, Paracale, Cabcabin, *For. Bur.* 27102 *Alambra*, March 12, 1918, in dipterocarp forests of the yacal-lauan type, altitude about 40 meters, with the local name *hagachac na itim*.

This species is well characterized by its elliptic, thickly coriaceous leaves, from which it is readily distinguished from the other Philippine forms of the genus. The ferruginous indumentum of the young branchlets and the lemon-yellow to pale-gray indumentum of the inflorescences are characteristic.

THYMELAEACEAE

WIKSTROEMIA Endlicher

WIKSTROEMIA FENICIS sp. nov.

Frutex circiter 2 m altus, inflorescentiis parcissime pubescentibus exceptis glaber; foliis lanceolatis ad ovato-lanceolatis, chartaceis, usque ad 13 cm longis, olivaceis, utrinque nitidis, sursum angustatis, acuminatis, basi rotundatis ad subacutis, nervis primariis utrinque circiter 12, distinctis; inflorescentiis terminalibus; floribus sessilibus, confertis, 1 cm longis. Species *W. meyenianae* affinis, differt foliis crassioribus, nervis distinctioribus et magis numerosis, et floribus brevioribus.

A shrub about 2 m high, entirely glabrous except the very sparingly pubescent inflorescences. Branches terete, pale-brownish, the branchlets slender, brown or somewhat reddish-brown. Leaves chartaceous, olivaceous, shining, lanceolate to ovate-lanceolate, 10 to 13 cm long, 3 to 4.5 cm wide, gradually narrowed upward to the acuminate apex, base rounded to subacute; primary lateral nerves about 12 on each side of the midrib, distinct, raised on the lower surface, anastomosing, the reticulations distinct; petioles about 3 mm long. Inflorescences terminal, the racemes forming a somewhat leafy panicle, the leaves associated with the inflorescence greatly reduced, 2 to 3 cm long. Individual racemes 2 to 3 cm long, each bearing 7 to 10 sessile flowers crowded at the tip of the rachis. Flowers pale-green, 1 cm long, externally very slightly pubescent with widely scattered, short, appressed hairs, the perianth-lobes 4, elliptic, rounded, 2 mm long. Stamens 8, in two series. Ovary oblong-ovoid, sparingly pubescent at the tip; style 0.3 mm long.

LUZON, Pangasinan Province, Mount San Isidro, Labrador, *Bur. Sci.* 29843 *Fénix*, November 10, 1917, in damp forests, altitude about 400 meters.

This species resembles *Wikstroemia meyeniana* Warb. and is manifestly allied to it. It differs notably in its thicker, more-prominently and numerously nerved leaves and especially in its shorter flowers.

WIKSTROEMIA BRACHYANTHA sp. nov.

Frutex circiter 2 m altus, ramulis junioribus parce pubescentibus exceptis glaber; foliis lanceolatis ad oblongo-lanceolatis, usque ad 12 cm longis, chartaceis, in siccitate plerumque brunneis, nitidis, basi acutis, apice tenuiter acuminatis, nervis primariis utrinque 12 ad 15, distinctis, juxta marginem anastomosantibus; racemis terminalibus et in axillis superioribus, brevibus, paucifloris; floribus breviter pedicellatis, extus parcissime pubescentibus, circiter 6.5 mm longis.

A shrub about 2 m high, glabrous except the sparingly appressed-pubescent younger branchlets, the branches and branchlets terete, dark-brown to reddish-brown when dry. Leaves rather firmly chartaceous, usually brown or brownish when dry or the upper surface olivaceous-brownish, shining, the lower distinctly paler than the upper, lanceolate to oblong-lanceolate, rather distinctly variable even on the same branchlet, 8 to 12 cm long, 1.5 to 4 cm wide, the base acute, the apex slenderly acuminate; primary lateral nerves 12 to 15 on each side of the midrib, rather distinct and somewhat projecting on the lower surface, somewhat ascending, anastomosing close to the margin with the rather distinct marginal veins, the secondary veins often about as prominent as the primary ones; petioles about 3 mm long. Racemes terminal, or sometimes also in the upper axils, solitary, simple, the axis and peduncle 5 mm long or less, the former with rather numerous scars of fallen pedicels, each inflorescence presenting but 5 or 6 flowers at one time. Flowers green, about 6.5 mm long, externally very slightly pubescent, the lobes 4, subreniform, about 1 mm long and 1.5 mm wide, their pedicels 1 to 1.5 mm long. Stamens 8. Ovary elongated, villous at the tip. Glands 2, narrowly oblong, about 1 mm long. Fruit red, ellipsoid to somewhat obovoid, up to 1 cm long.

CATANDUANES, *Bur. Sci.* 30392 *Ramos* (type), December 2, 1917, in damp forests near streams at low altitudes. LUZON, Tayabas Province, Mount Cadig, *Bur. Sci.* 25449 *Yates*, December, 1916; Mount Pular, *Bur. Sci.* 19438 *Ramos*, January, 1913.

This species is well characterized by its relatively thick leaves, which are distinctly variable in shape, but prevailingly lanceolate; its distinct marginal veins; short inflorescences; and unusually short flowers. It is perhaps as closely allied to *Wikstroemia fenicis* Merr. as to any other species but has entirely different inflorescences and smaller flowers.

BEGONIACEAE

BEGONIA Linnaeus

BEGONIA EDANOII sp. nov. § *Diploclinium*.

Species *B. aquatae* affinis, differt capsulis multo majoribus, apice truncatis, basi late rotundatis, usque ad 1.8 cm longis et 1.5 cm latis; petiolo circiter 5 mm longo.

A slender, scandent, glabrous plant growing on tree trunks. Leaves inequilateral, oblong-ovate, membranaceous, olivaceous, and shining when dry, 4 to 5 cm long, 1.5 to 2 cm wide, base rounded or obtuse, not at all cordate, apex acuminate, somewhat falcate, margins rather coarsely and irregularly toothed; petioles about 5 mm long. Capsules axillary, usually in pairs, equally 3-winged, truncate at the apex, scarcely narrowed below, the base broadly rounded; up to 1.7 cm long and 1.5 cm wide; pedicels slender, about 1.5 cm long.

LUZON, Rizal Province, Mount Susong Dalaga, *Bur. Sci.* 29374 Ramos & Edaño, August 8, 1917, in damp forests.

This species belongs in the characteristic group of *Begonia aequata* A. Gray, the type of which was from Mount Maquiling, the other closely allied forms being *Begonia wenzelii* Merr., *B. lagunensis* Elm., and *B. elegans* Elm. It differs from *Begonia aequata* in its very much larger capsules, and from *B. lagunensis* Elm., to which it is also closely allied, in its very short petioles, and somewhat smaller, distinctly differently shaped capsules, which are not gradually narrowed below but which are abruptly rounded at the base.

MELASTOMATACEAE

MEMECYLON Linnaeus

MEMECYLON ELLIPTIFOLIUM sp. nov. § *Eumemecylon*.

Arbor circiter 12 m alta, glabra, ramulis teretibus; foliis ellipticis, sessilibus, coriaceis, usque ad 14 cm longis, utrinque rotundatis vel apice latissime et breviter acuminatis, nervis primariis tenuibus, indistinctis vel interdum subobsoletis, marginalibus nullis; inflorescentiis axillaribus, brevibus, 1 ad 1.5 cm longis, breviter pedunculatis; floribus confertis, calycis infundibuliformibus, 5 mm diametro.

A tree about 12 m high, glabrous throughout. Branches terete, smooth, grayish, the branchlets brownish, terete, about 2 mm in diameter. Leaves opposite, sessile, elliptic, thickly coriaceous, yellowish to yellowish-green or brown when dry, shining, brittle, 9 to 14 cm long, 5 to 6.5 cm wide, subequally rounded at both ends or the apex very broadly and shortly acuminate; primary lateral nerves about 20 on each side of the midrib, slender, indistinct, sometimes obsolete or nearly so, with

no marginal veins. Inflorescences axillary, solitary or fascicled, 1 to 1.5 cm long, cymose, their peduncles 4 mm long or less. Flowers white, crowded, comparatively large, the funnel-shaped calyces about 5 mm in diameter, the pedicels usually about 3 mm long.

LUZON, Camarines Province, Paracale, Calaburnay, *For. Bur.* 27060 *Magistrado*, July 24, 1917, on slopes, altitude about 100 meters, with the local name *calasgas*.

This species greatly resembles *Memecylon sessilifolium* Merr., but differs radically in its terete, not prominently 4-angled branches and branchlets. Its much more numerous lateral nerves, shorter, dense inflorescences, and its leaves not narrowed upward distinguish it from *Memecylon pachyphyllum* Merr. to which it is probably most closely allied.

EVERETTIA Merrill

EVERETTIA OCTODONTA sp. nov.

Species *E. pulcherrimae* similis, differt foliis laevis, glabris, calycibus 8-dentatis. Arbor, partibus junioribus plus minusve castaneo-pubescentibus exceptis glabra; foliis subcoriaceis, rigidis, in siccitate viridis, anguste oblongis, longe petiolatis, usque ad 13 cm longis, nervis primariis utrinque 20 ad 25, patulis, distinctis, haud prominulis, utrinque acutis vel apice leviter acuminatis; fructibus turbinatis, circiter 2 cm diametro, calycis dentibus 8, oblongis ad oblongo-ovatis, acuminatis, usque ad 8 mm longis.

A tree about 6 m high, entirely glabrous except the more or less castaneous-pubescent very young parts. Branches terete, glabrous, with few large lenticels. Leaves numerous, subcoriaceous, rigid, brittle, narrowly oblong, 10 to 13 cm long, 2.5 to 4 cm wide, subequally narrowed to the acute base and apex, or the apex somewhat acuminate, greenish or yellowish-green and very minutely verruculose when dry, the nerves not at all impressed or projecting; primary lateral nerves 20 to 25 on each side of the midrib, slender, spreading, anastomosing close to the margin with the slender, nearly straight marginal nerve, distinct, not projecting; petioles 3 to 4 cm long. Infructescence terminal, peduncled, the fruits few, turbinate, about 2 cm in diameter, base truncate-rounded, the tube scarcely constricted, the persistent teeth 8, coriaceous, oblong to oblong-ovate, acuminate, often somewhat recurved, up to 8 mm in length.

CATANDUANES, in forests at low altitudes along the Santo Domingo River, *Bur. Sci.* 30556 *Ramos*, December 3, 1917.

While in general appearance this species resembles *Everettia pulcherrima* Merr., the only other known species of the genus, it differs radically in that the nerves are not at all impressed or raised, while the calyx is prominently 8-toothed.

ARALIACEAE

ACANTHOPHORA genus novum

Calycis margo 5- vel 6-dentatus. Petala 5 vel 6, imbricata, acuta vel obtusa, basi lata affixa. Stamina 5 vel 6; filamenta filiformia; antherae ovoidae, in alabastro inflexae. Discus convexus. Ovarium 5- vel 6-loculare; styli 5 vel 6, erecti, a basi distincti; stigmata terminalia, parva. Fructus ovoideus, in siccitate obtuse 5- vel 6-angulatus.—Frutex alte scandens aculeis parvis armatus. Folia ampla, alterna, tripinnata. Umbellulae paniculatae. Pedicelli sub flore articulati. Flores hermaphroditi.

ACANTHOPHORA SCANDENS sp. nov.

Frutex scandens, ramis et paniculis et foliis ad petiolo rhachibusque primariis et secundariis et ad costa subtus spinis numerosis parvis recurvatis armatis; foliis amplis, tripinnatis, usque ad 1.5 m longis; foliolis numerosis, ovatis ad ovato-lanceolatis, acuminatis, submembranaceis, 7 ad 14 cm longis, basi rotundatis vel subcordatis, margine spinuloso-dentatis; paniculis terminalibus, amplis, usque ad 1 m longis; umbellulis numerosis, circiter 20-floris, pedunculatis; floribus 5- vel 6-meris, petalis imbricatis.

A scandent, sparingly branched, aculeate vine, sprawling over thickets, the stems about 2.5 cm in diameter, these, the petioles, primary and secondary leaf-rachises, petiolules, midribs of the leaflets beneath, and the inflorescences armed with short, stout, sharp, scattered but numerous, recurved spines, otherwise entirely glabrous. Leaves alternate, 1 to 1.5 cm long, triangular in outline, at least tripinnate, the lower primary pinnae long, the upper ones gradually shorter; petioles stout, aculeate, the lower 6 to 8 cm split on the upper side and with 1 cm wide wings (stipules) which surround the stem at the base, the lower ultimate divisions of the leaf odd-pinnate, the upper ones trifoliate. Leaflets ovate to elliptic-ovate or ovate-lanceolate, submembranaceous, 7 to 14 cm long, 3 to 5 cm wide, the apex strongly acuminate, the base broad, rounded or subcordate, the margins rather finely spinulose-denticulate, glabrous and somewhat shining, the midrib beneath and more rarely also on the upper surface with few, scattered, recurved spines; nerves 5 to 7 on each side of the midrib, rather prominent, anastomosing; petiolules 3 to 10 mm long. Panicles terminal, ample, pinnately compound, up to about 1 m in length, the branches alternate, opposite, or somewhat whorled, the primary ones up to 40 cm in length. Umbels numerous, racemosely arranged on the ultimate branchlets, each about 20-flowered, their peduncles 1 to

4 cm long, the subtending bracts lanceolate, acuminate, less than 1 cm long; pedicels slender, about 1 cm long, the bracteoles lanceolate, acuminate, 2 to 3 mm long. Calyx jointed with the pedicels, about 3 mm long, the teeth 5 or 6, short, acute. Petals 5 or 6, narrowly ovate, obtuse or acute, 1-nerved, attached by a broad base, the margins overlapping, about 3 mm long, the base about 1.5 mm wide. Stamens 5 or 6; filaments 4 mm long; anthers inflexed in bud, about 1 mm long. Ovary 5- or 6-celled; styles 5 or 6, erect, free or very slightly connate at the base, 0.5 to 0.7 mm long. Fruit ellipsoid or ovoid, 5- or 6-ridged, 5- or 6-celled, about 5 mm long, crowned by the radiately spreading styles.

MINDANAO, Lake Lanao, Camp Keithley, *Mrs. Clemens 752* (type), September–October, 1906, and again, without number, a year later: Davao District, Todaya, Mount Apo, *Elmer 11605*, September, 1909, known to the Bagobos as *simbar*. CATANDUANES, *Bur. Sci. 30211 Ramos*, November, 1917. LUZON, Laguna Province, San Antonio, *Bur. Sci. 23833 Ramos*, October, 1915.

Preliminary work was done on this peculiar species in 1906, and again in 1908, but on account of the rather fragmentary material then available it was impossible to determine the exact nature of the entire leaves and the inflorescences. Mr. Elmer later collected the same form on Mount Apo, and kindly submitted his copious material and notes for my examination, which have enabled me to complete my description regarding some details of the plant. Mr. Elmer's field note is as follows:

"Sprawling amongst thickets of dense growth in fertile moist soil of an open slope at 3250 feet. Stem terete, 1 inch thick, covered with thin brownish bark and provided with sharp spines, very sparingly branched, the upper leaf-bearing portion green but quite as thick as the parts below. Leaves alternate, one foot apart more or less, horizontally spreading or descending, all the stalks greenish-brown, provided with recurved hooks, especially along the lower side. Petiole a foot long or longer. Sheath 3 inches long, fully one-half inch deep, adnate to the upper portion of the peduncle and clasping the stem, smooth, turning brownish. Leaves proper 3 to 5 feet long, triangular in outline. Leaflets horizontally recurved, submembranaceous, the upper surface somewhat shining. Inflorescence spreading similar to the leaves but much shorter and terminating the stem; *simbar*."

The genus is well characterized by its habit, its very large decompound leaves, its ample terminal inflorescence, and its 5- or 6-merous flowers, the petals being imbricate, not valvate. It seems to me to be most closely allied to *Aralia*, although in habit, and more especially in its recurved spines, it recalls *Acanthopanax*; in *Acanthopanax*, however, the petals are valvate.

I strongly suspect that this form is identical with the Celebes material referred by Koorders⁴ to *Aralia ferox* Miq. I saw Koorders's specimens in the Buitenzorg Herbarium in January, 1914, but had no opportunity of

⁴ Meded. Lands Plantent. 19 (1899) 488; Syst. Verzeich. 2⁵ (1914) 99.

studying them critically or comparing them with Philippine material. Koorders states that the Celebes plant is a climber, attaining a height of 10 meters; the Javan *Aralia ferox* Miq. is an erect shrub. Thus we have another characteristic species added to the already long list of Philippine-Celebes forms, the list of genera and species having this special and restricted distribution being increased as collections from the two regions are studied and compared. It is now thoroughly established that the Celebes and Moluccan floras are distinctly more closely allied to the flora of the Philippines than is that of any other region, indicating clearly that land connections undoubtedly existed in previous geologic times between the Philippines and the islands to the south and southeast.

The species affords an excellent illustration of one marked line of distribution of species within the Philippines, and that is the extension of the Mindanao flora to the north, through Leyte, Samar, and along the eastern parts of Luzon. This distribution is probably limited by certain climatic conditions, chiefly the seasonal distribution of the rainfall throughout the year. Many parts of Mindanao have no sharply defined dry season, and the geographic distribution of the species characteristic of such regions to the north is limited to those regions having a similar seasonal distribution of the rainfall, such as Samar, Leyte, Catanduanes, and the eastern parts of Luzon generally. The San Antonio region in Luzon is a region that is continually wet, due to its proximity to the east coast range of mountains.

BOERLAGIODENDRON Harms

BOERLAGIODENDRON CATANDUANENSE sp. nov.

Frutex circiter 1 m altus, inflorescentiis exceptis glaber; foliis longe petiolatis, palmatim 7-foliolatis, foliolis longe petiolulatis, usque ad 20 cm longis, grosse lyrato-lobatis, utrinque acuminatis; inflorescentiis parcissime furfuraceis, radiis primariis circiter 10, dichotomis; floribus capitatis, sessilibus, 4-meris; fructibus ovoideis, 4-sulcatis vel 4-angulatis, 7 mm longis.

A shrub about 1 m high, entirely glabrous except the sparingly furfuraceous inflorescences. Ultimate branches pale-grayish, about 1 cm in diameter. Leaves palmately 7-foliolate, leaflets olivaceous, shining, 15 to 20 cm long, chartaceous to subcoriaceous, in general lanceolate, coarsely and irregularly lyrate-lobed, the lobes few, the larger ones broadly ovate to oblong-ovate, 2 to 3 cm long, apex and base acuminate, the apex slenderly so; petiolules mostly 3 to 4 cm long; petioles about 25 cm long, the basal crests few, short, coriaceous, recurved, not at all pectinate. Inflorescences sparingly furfuraceous, the primary branches about 10, these about 2 cm in length, each bearing two branches as long as the primary ones, these subtended by broadly ovate bracts 5 mm in length or less, the secondary branches with a pair of similar but smaller bracts at about their middle; each primary branch bears between the two secondary ones a sessile or shortly peduncled group of sterile

flowers, the flowers few-pedicelled. Flowers capitate, sessile, 4-merous, about 15' at the end of each secondary branch. Fruits ovoid, about 7 mm long, 4-celled, 4-sulcate or 4-angled, sessile.

CATANDUANES, *Bur. Sci. 30438* Ramos, November 18, 1917, on forested slopes, altitude about 350 meters.

The alliance of this species is with *Boerlagiodendron yatesii* Merr., of Luzon, and *B. heterophyllum* Merr., of Mindanao. It is well characterized by its compound leaves and differs from *B. yatesii* in its lyrate lobed, longer, petiolulate leaflets; and from *B. heterophyllum* in its smaller, long-petiolulate leaflets and in the basal crests of the petioles not being at all pectinate.

SCHEFFLERA Forster

SCHEFFLERA CATANDUANENSIS sp. nov. § *Cephaloschefflera*.

Frutex epiphyticus, glaber; foliis 9- ad 12-foliolatis, foliolis coriaceis, oblongis ad oblongo-obovatis, integris, usque ad 12 cm longis, nitidis, apice abrupte subcaudato-acuminatis, basi obtusis ad acutis, nervis primariis utrinque circiter 15, tenuibus; inflorescentiis glabris, ramis 20 ad 25 cm longis, crassis; capitulis racemose dispositis, breviter pedunculatis, ovoideis ad depressoglobosis, 1.5 ad 2 cm diametro; fructibus junioribus plerumque 6- vel 7-locellatis.

A shrub or tree, entirely glabrous. Ultimate branches up to 1 cm in diameter. Leaves 9- to 12-foliolate, their petioles 16 to 18 cm long, inflated and clasping at the base, the petiolules 2 to 3.5 cm long; leaflets coriaceous, dark-olivaceous and shining on the upper surface, the lower surface somewhat paler, oblong to oblong-obovate, entire, 8 to 12 cm long, 4 to 5.5 cm wide, the apex rather abruptly subcaudate-acuminate, the acumen 1 cm long or less, the base obtuse to acute; primary lateral nerves about 15 on each side of the midrib, slender, scarcely more prominent than are the secondary ones. Inflorescences reduced to one or few raceme-like branches 20 to 25 cm in length, each bearing from 8 to 10 dense heads in the upper one-half, the rachis and peduncle stout, 5 to 7 mm in diameter, the peduncles of the heads stout, 5 mm long or less. Heads dense, ovoid to depressed-globose, 1.5 to 2 cm in diameter, dark-brown when dry, composed of very many connate carpels, the apical part of each individual fruit conical or subconical; young fruits mostly 6- or 7-celled.

CATANDUANES, Mount Mariguion, *Bur. Sci. 20341* Ramos, November 26, 1917, epiphytic in dense damp forests, altitude about 400 meters.

This species is most closely allied to *Schefflera ovoidea* Merr., of Mindanao, from which it is readily distinguished by its much smaller leaflets, smaller heads, and fewer-celled fruits.

SCHEFFLERA ELLIPTIFOLIOLA sp. nov. § *Euschefflera*.

Frutex epiphyticus, inflorescentiis plus minusve pallide pubescentibus; foliis longe petiolatis, 9- ad 11-foliolatis, foliolis chartaceis ad subcoriaceis, ellipticis ad obovato-ellipticis, usque ad 13 cm longis, breviter abrupteque acuminatis, basi rotundatis, nervis utrinque circiter 12, tenuibus, utrinque distinctis. Paniculis amplis, multifloris, rhachibus productis, ramis primariis 15 ad 20, racemose dispositis, usque ad 20 cm longis; floribus 5-meris, umbellatis, umbellis in ramis primariis racemose dispositis; fructibus subellipsoideis, 3 ad 4 mm longis, 5-sulcatis, 5-locellatis.

An epiphytic shrub, glabrous except the more or less pale-pubescent inflorescences. Leaves 9- to 11-foliolate, their petioles 13 to 16 cm long, inflated and clasping at the base, the petiolules 3 to 5.5 cm long; leaflets elliptic to obovate-elliptic, chartaceous to subcoriaceous, entire, pale and shining when dry, 7 to 13 cm long, 4.5 to 7 cm wide, the apex shortly and abruptly acuminate, base rounded; primary lateral nerves about 12 on each side of the midrib, slender, distinct on both surfaces. Panicles terminal, ample, peduncled, the peduncle 4 to 10 cm long, with few to many bracts resembling the inflated petiolar bases, the rachis produced, in large panicles attaining a length of 20 cm, the younger parts more or less pale-pubescent, the indumentum deciduous on the older parts; primary branches racemosely disposed, 15 to 20 on each panicle, up to 20 cm in length. Flowers umbellate, the umbels racemosely disposed on the primary branches, the peduncles 5 to 8 mm long. Flowers 5-merous, small, 8 to 12 in each umbel, their pedicels, just after anthesis, 2 to 4 mm in length. Fruit subellipsoid, 3 to 4 mm long, 5-sulcate, 5-celled.

CATANDUANES, Mount Mariguison, *Bur. Sci.* 30511 (type), 30210 *Ramos*, November, 1917, epiphytic, in damp forests.

This species is especially well characterized by its ample inflorescences, the rachis being greatly prolonged, and the numerous primary racemosely disposed branches; and by the umbels being racemosely disposed on the primary branches.

SCHEFFLERA MYRIANTHELLA sp. nov. § *Euschefflera*.

Frutex epiphyticus, inflorescentiis distincte furfuraceis exceptis glaber; foliis 6- ad 8-foliolatis, foliolis obovatis, integris, usque ad 12 cm longis, breviter acuminatis, nitidis, nervis utrinque circiter 12, tenuibus; paniculis terminalibus, pedunculatis, amplis, quadripinnatim-paniculatis, rhachibus valde elongatis, ramis primariis racemose dispositis, usque ad 23 cm longis, ramis secundariis numerosis, 2.5 ad 3.5 cm longis; floribus sub-

capitato-umbellatis, umbellulis breviter pedunculatis, paucifloris, in ramis secundariis racemose dispositis; floribus 5-meris, brevissime pedicellatis vel subsessilibus, petalis 1.8 mm longis.

An epiphytic shrub, glabrous except the inflorescence. Leaves 6- to 8-foliolate, their petioles 6 to 8 cm long, inflated and clasping at the base, the petiolules 2.5 to 5 cm long; leaflets obovate, subcoriaceous, rather pale and prominently shining when dry, 7 to 12 cm long, 5 to 6 cm wide, entire, the apex rather abruptly and shortly acuminate, base acute; primary lateral nerves about 12 on each side of the midrib, slender, distinct. Panicles terminal, quadripinnate, peduncled, pale-furfuraceous, the indumentum more or less deciduous on the older parts, the peduncles up to 6 cm in length, the rachis and peduncle at least 20 cm in length; primary branches up to 23 cm long, numerous, racemously arranged, each subtended by an ovate to oblong-ovate, acuminate, 5 to 8 mm long bract; secondary branches numerous, slender, 2.5 to 3.5 cm long, racemously disposed on the primary ones; flowers small, 5-merous, capitate-umbellate, the umbels 5- to 8-flowered, numerous, shortly peduncled, racemously arranged, their peduncles about 2 mm long. Petals about 1.8 mm long. Flowers 5-merous, subsessile or the pedicels up to 0.5 mm in length.

LUZON, Laguna Province, San Antonio, *Bur. Sci.* 23824 Ramos, October 19, 1915, on trees in damp forests.

This species is well characterized by its ample, many-flowered, quadripinnately paniculate inflorescence; the elongated primary branches which are racemously arranged on the produced rachis; the numerous, short, slender, racemously arranged secondary branches; and the capitate-umbellate, few-flowered, racemously arranged, short-peduncled umbels.

MYRSINACEAE

MAESA Forskal

MAESA BRUNNEA sp. nov. § *Eumaesa*.

Frutex glaber; foliis chartaceis ad subcoriaceis, late ovatis ad oblongo-ovatis, usque ad 14 cm longis, apice breviter acuminatis, basi subtruncato-rotundatis ad subacutis, margine undulatis et distanter calloso-crenatis, utrinque lineis nervilliformibus praeditis, supra subolivaceis, subtus brunneis, nervis primariis utrinque 5 vel 6, conspicuis, reticulis obsoletis vel subobsoletis; infructescentiis axillaribus, depauperato-paniculatis, usque ad 4 cm longis; fructibus elliptico-ovoideis, circiter 5 mm longis, sepalis latissime ovatis, obtusis, obscurissime punctatis, margine minutissime ciliatis.

A glabrous shrub, the branches dark-brown, terete, lenticel-

late. Leaves broadly ovate to oblong-ovate, chartaceous to subcoriaceous, dull or slightly shining when dry, the upper surface subolivaceous, the lower brown, both surfaces supplied with slender, obscure, irregular, longitudinal, nerve-like lines, 9 to 14 cm long, 5 to 9 cm wide, the apex shortly and obtusely acuminate, base subtruncate-rounded to subacute, margins coarsely undulate, each undulation tipped with a thickened crenate callosity; lateral nerves 5 or 6 on each side of the midrib, prominent, curved, very obscurely anastomosing, the reticulations obsolete or nearly so; petioles 1.5 to 3 cm long. Infructescences axillary, solitary, depauperate-paniculate, 3 to 4 cm long, the branches few, spreading, 3 cm long or less. Fruits ellipsoid-ovoid, about 5 mm long, their pedicels about 3 mm long. Calyx-teeth broadly ovate, obtuse, about 1 mm long and 1.5 mm wide, very obscurely punctulate, not lineate, the margins very minutely and obscurely ciliate.

CATANDUANES, Mount Mariguidon, *Bur. Sci.* 30500 (type), 30308 Ramos, November and December, 1917, in forests.

This species manifestly belongs in the group with *Maesa denticulata* Mez, from which species it is distinguished by its thicker, larger leaves which are prominently undulate, brown beneath when dry, and by its obsolete or nearly obsolete reticulations. *Maesa platyphylla* Elm. is distinguished by its more numerously nerved, nearly entire leaves, while *M. megaphylla* Merr. has much larger, more numerously nerved, entire leaves and very much longer inflorescences.

EBENACEAE

DIOSPYROS Linnaeus

DIOSPYROS STREPTOSEPALA sp. nov.

Arbor parva, foliis subtus ad costa, ramulis, petiolis, et fructibus parce longissime ciliatis; foliis oblongo-ovatis ad ovato lanceolatis, usque ad 17 cm longis, basi late rotundatis, plerumque leviter cordatis, sursum angustatis, acuminatis, supra glabris, brunneo-olivaceis, subtus pallidis, nervis utrinque circiter 8, tenuibus, distinctis, reticulis laxis; fructibus ovoideis, circiter 2 cm longis, pericarpio fragile, extus perspicue longissime ciliato; seminibus 2, ovato-ellipticis, plano-convexis, circiter 1 cm longis, albumine aequabile; sepalis 4, persistentibus, circiter 1 cm longis, longe filiformiter caudatis.

A small tree, 5 m high *fide* Ramos, the leaves beneath especially near the midrib, the branchlets, and the petioles with few, widely scattered, slender, spreading, about 3 mm long hairs, these more numerous on the fruits. Branches dark-brown or nearly black, terete, glabrous, the branchlets slender. Leaves chartaceous, oblong-ovate to ovate-lanceolate, 9 to 17 cm long,

2.5 to 5 cm wide, the base broadly rounded and usually slightly cordate, narrowed upward to the rather slenderly acuminate apex, the upper surface brownish-olivaceous, somewhat shining, glabrous, the lower much paler; primary lateral nerves about 8 on each side of the midrib, slender, distinct, laxly anastomosing, the reticulations lax, distinct; petioles 5 mm long or less. Fruits solitary, in the uppermost axils, their pedicels long-ciliate, about 5 mm long, the mature fruits ovoid, apex rounded or obtuse, about 2 cm long, the pericarp thin, fragile when dry, dark-brown, with many, long, slender, ciliate hairs similar to those on the vegetative parts. Seeds 2, ovate-elliptic, plano-convex, about 1 cm long, distinctly narrowed upward, obtuse or apiculate, smooth, castaneous and shining when dry, the albumen uniform. Persistent sepals 4, up to 1 cm long, ciliate, long filiform-caudate from a somewhat broadened base.

CATANDUANES, Mount Mariguison, *Bur. Sci.* 30481 Ramos, November 25, 1917, in forests near the summit of the mountain, altitude apparently about 400 meters.

This species is strongly characterized by its indumentum of scattered, elongated, very slender hairs and especially by its very slender filiform-caudate, elongated sepals. It is not at all closely allied to any other species known to me.

SAPOTACEAE

BASSIA Koenig

BASSIA OBLONGIFOLIA sp. nov.

Arbor circiter 18 m alta, subtus foliis dense adpresseque puberulis; foliis coriaceis, oblongis, usque ad 20 cm longis, breviter obtuse acuminatis, basi acutis vel subacutis, in siccitate supra pallidis, nitidis, subtus subcupreis, nervis utrinque 22 ad 27, tenuibus, distinctis, patulis, leviter curvatis; floribus fasciculatis, in axillis defoliatis, pedicellis sursum incrassatis, 2 ad 2.5 cm longis; sepalis extus adpresse-pubescentibus, late ovatis, leviter acuminatis, circiter 7 mm longis, fructibus junioribus glabris.

A tree about 18 m high, the branches terete, glabrous, rugose, the branchlets up to 6 mm in diameter, somewhat pubescent. Leaves oblong, coriaceous, 15 to 20 cm long, 4.5 to 7 cm wide, the upper surface glabrous, pale and shining when dry, the lower subcupreous and rather densely appressed-puberulent, the apex shortly blunt-acuminate, base acute, the midrib impressed on the upper surface, very prominent on the lower surface; lateral nerves slender, distinct, spreading, slightly curved, parallel, 22 to 27 on each side of the midrib, anastomosing close to the edge of the leaf, the reticulations not prominent; petioles

3.5 to 5 cm long, when young slightly pubescent, soon becoming glabrous. Flowers fascicled in the axils of fallen leaves, their pedicels thickened upward, 2 to 2.5 cm long, appressed pubescent. Sepals 4, broadly ovate, somewhat acuminate, coriaceous, about 7 mm long and wide, pubescent externally. Very young fruits ovoid, glabrous; styles up to 1.7 cm long.

LUZON, Camarines Province, Paracale, Cabcabin, *For. Bur. 27101 Alambra*, March 12, 1918, in dipterocarp forests, altitude about 40 meters, with the local name *calacalachuche*.

This species is well characterized by its oblong leaves with numerous, slender but distinct, parallel primary nerves, by which characters it is readily distinguished from the other known Philippine representatives of the genus.

BASSIA MIRANDAE sp. nov.

Species *B. coriaceae* affinis differt foliis majoribus, usque ad 23 cm longis et 8.5 cm latis, sepalis duplo majoribus.

A tree about 18 m high, glabrous. Branches pale-brownish, somewhat rugose, the ultimate ones about 8 mm in diameter, the branchlets glabrous, smooth, somewhat sulcate. Leaves oblong-obovate, coriaceous, 16 to 23 cm long, 5.5 to 8.5 cm wide, glabrous, shining, rather pale when dry, the apex obtuse to rounded or somewhat acuminate, narrowed below to the acute base; primary nerves about 12 on each side of the midrib, curved, somewhat ascending, distinct, anastomosing, 1 to 2 cm apart, the reticulations lax; petioles 2 to 2.5 cm long. Fruits apparently few, in the axils of fallen leaves, their pedicels about 2.5 cm long, glabrous. Sepals 4, coriaceous, glabrous, broadly ovate, rounded, about 5 mm long, the outer two up to 8 mm in width. Fruit (immature) ovoid-ellipsoid, apiculate, 3 cm long, glabrous, very coarsely wrinkled when dry.

MINDANAO, Zamboanga District, *For. Bur. 24161 Miranda*, July 6, 1915, on forested ridges, Mount Kaladis, altitude about 100 meters.

This species is closely allied to *Bassia coriacea* Merr., of Luzon, which it greatly resembles. It is distinguished by its much larger leaves and sepals.

OLEACEAE

LINOCIERA Swartz

LINOCIERA REMOTINERVIA sp. nov.

Arbor glabra; foliis crassissime coriaceis, in siccitate pallidis, usque ad 15 cm longis, anguste oblongo-obovatis, apice plerumque rotundatis, basi acuminatis, margine recurvatis; nervis primariis utrinque circiter 5, distantibus, tenuibus, laxissime arcuato-anastomosantibus, reticulis obsoletis vel subobsoletis; in-

fructescentiis axillaribus, circiter 3 cm longis; fructibus ellipsoideis, circiter 1.4 cm longis.

A glabrous tree about 12 m high, the branchlets smooth, pale. Leaves very thickly coriaceous, narrowly oblong-obovate, 12 to 15 cm long, 3.5 to 5.5 cm wide, pale, of about the same color on both surfaces, smooth and shining when dry, the apex usually rounded, sometimes retuse, or at times shortly acuminate, base acuminate, margins recurved; midrib very prominent on the lower surface; lateral nerves about 5 on each side of the midrib, slender, distant, forked and laxly arched-anastomosing distant from the margin, the reticulations obsolete or nearly so; petioles 1.5 to 2 cm long. Infructescences axillary, about 3 cm long, peduncled, the fruits few, ellipsoid, olivaceous when dry, smooth, about 1.4 cm long.

LUZON, Pangasinan Province, Mount San Isidro, Labrador, *Bur. Sci.* 29933 *Fénix*, on open grassy slopes near the edge of the forest, altitude about 300 meters.

This species is well characterized by its very thickly coriaceous leaves and its few, distant, obscure, laxly arched-anastomosing nerves, the reticulations obsolete or nearly so.

CORNACEAE

MASTIXIA Blume

MASTIXIA PACHYPHYLLA sp. nov. § *Tetramastixia*.

Arbor glabra (floribus ignotis); foliis stricte oppositis, crasse coriaceis, oblongis ad oblongo-ellipticis vel anguste obovato-ellipticis, usque ad 14 cm longis, apice plerumque rotundatis, basi acutis, margine recurvatis, nervis utrinque 9 ad 11, distinctis; infructescentiis terminalibus, breviter pedunculatis, 6 ad 10 cm longis; fructibus ovoideis ad ellipsoideis, 2 ad 3 cm longis, sepalis 4, persistentibus, parvis.

A tree 6 to 8 m high, glabrous (flowers unknown). Leaves strictly opposite, thickly coriaceous, oblong to oblong-elliptic or narrowly obovate-elliptic, the apex usually rounded, the base acute, margins recurved, the upper surface smooth, greenish-olivaceous, shining, the lower paler; lateral nerves 9 to 11 on each side of the midrib; petioles stout, about 1.5 cm long. Infructescences 6 to 10 cm long, glabrous, somewhat peduncled, branched, the bracteoles ovate, acute, about 1.5 mm long. Fruits ovoid to ellipsoid, pale-brownish and smooth when dry, 2 to 3 cm long, the persistent calyx-lobes 4, small, indistinct.

CATANDUANES, Santo Domingo River, *Bur. Sci.* 30399 (type), 30413 *Ramos*, December 5, 1917, on forested slopes below an altitude of 100 meters.

This species of the section *Tetramastixia* is distinguished among the few Philippine forms by its relatively large and thickly coriaceous leaves. It is probably most closely allied to *Mastixia tetrapetala* Merr., but has much larger, more numerous nerved leaves than that species, which, moreover, are strictly alternate. It is less closely allied to *M. premnoides* (Elm.) Hallier f., of Mindanao.

GESNERIACEAE

CYRTANDRA R. Brown

CYRTANDRA ALVAREZII sp. nov.

Frutex, novellis densissime ferrugineo-lanosis; foliis oppositis, late oblanceolatis, usque ad 38 cm longis, breviter petiolatis, apice acutis vel obscure acuminatis, basi longe angustatis, margine irregulariter dentatis, supra olivaceis, glabris, subtus subdense ferrugineo-villosis, nervis utrinque circiter 18, curvato-adscendentibus, distinctis; fructibus numerosis, oblongo-ellipsoideis, glabris, circiter 1.5 cm longis, utrinque angustatis, brunneis, umbellatis, umbellis distincte pedunculatis.

A shrub, the branchlets and young leaves very densely lanate with shining, appressed, ferruginous hairs, the ultimate branches 5 to 8 mm in diameter. Leaves opposite, subcoriaceous, apparently in equal pairs, broadly oblong-oblanceolate, up to 38 cm long and 12 cm wide, apex acute or obscurely acuminate, gradually narrowed from the middle or upper two-thirds to the base, margins irregularly dentate, or serrate-dentate, the teeth usually tipped with tufts of hairs, the upper surface in maturity entirely glabrous, olivaceous, dull, the lower rather densely ferruginous-villous; lateral nerves about 18 on each side of the midrib, distinct, ascending, curved, the reticulations lax; petioles stout, 1 cm long or less. Infructescence axillary, solitary, umbellate, its peduncle stout, about 1 cm long, each bearing from 10 to 20 fruits, the individual fruits oblong-ellipsoid, about 1.5 cm long, brown, glabrous, narrowed at both ends, their pedicels slender, about 1 cm in length. The inflorescence is apparently subtended by a large bract or by bracts.

MINDANAO, Lanao District, Lanao-Cotabato trail, *For. Bur. 25214 Alvarez*, March 21, 1916, in dipterocarp forests, altitude about 1,000 meters.

A most characteristic species, distinguishable by its indumentum, its large, broadly oblong-oblanceolate leaves, and its umbellate fruits.

CYRTANDRA CASTANEA sp. nov. § *Dissimilis*.

Frutex circiter 1 m altus, partibus junioribus subtus foliis ad costa et nervis calycibusque dense castaneo-villosis; foliis alternis vel oppositis et dissimilis, subcoriaceous, oblongo-oblanceolatis, usque ad 15 cm longis, tenuiter acutissime acuminatis,

basi acutis, margine irregulariter undulato-serratis, nervis utrinque 6 vel 7, subtus valde perspicuis; floribus axillaribus, solitariis, breviter pedicellatis, circiter 4 cm longis, bracteis lineari-lanceolatis ad oblongo-lanceolatis, 6 ad 11 mm longis.

A shrub about 1 m high, apparently sparingly branched, the indumentum of characteristic, castaneous, subappressed, villous hairs. Branches terete, glabrous, pale-brownish, the young branchlets densely castaneous-villous. Leaves alternate or the upper ones opposite and dissimilar, oblong-ob lanceolate, subcoriaceous, 5 to 15 cm long, 1.8 to 4 cm wide, slenderly and acutely acuminate, base acute, margins irregularly sinuate-serrate, the upper surface dark-olivaceous, glabrous, the lower brownish-olivaceous, paler than the upper, the midrib, lateral nerves, and reticulations dark-brown, castaneous-villous, contrasting with the paler epidermis; petioles castaneous-villous, 0.7 to 1 cm long. Flowers axillary, solitary, about 4 cm long, their pedicels about 6 mm long, the subtending bracts linear-lanceolate to oblong-lanceolate, castaneous-villous like the calyx, 6 to 11 mm long. Calyx 1.5 cm long, the tube 7 mm long, narrow, the lobes usually 3 or 4, lanceolate, slenderly long-acuminate, as long as the tube, externally characteristically castaneous-villous. Corolla white when fresh, 4 cm long, densely ferruginous-villous. Disk about 2 mm long, glabrous, irregularly lobed. Ovary and style about 2 cm long, ferruginous- or castaneous-villous, the immature fruits lanceolate, 2.5 cm long, appressed castaneous-villous.

LUZON, Tayabas Province, Mount Dalindingan, *Bur. Sci.* 26606 Ramos & Edaña, August 25, 1916, on forested slopes, altitude about 120 meters.

This species in many characters resembles *Cyrtandra incisa* C. B. Clarke and *C. multifolia* Merr. and manifestly belongs in the same section with both. The upper leaves are opposite and dissimilar, the lower ones alternate. It is readily distinguished by its characteristic castaneous indumentum.

CYRTANDRA MULTIFOLIA sp. nov. *Dissimiles*.

Frutex ramosus, circiter 1 m altus, partibus junioribus ferrugineo-pilosus; foliis numerosis, oppositis, dissimilis, oblongo-lanceolatis, usque ad 9 cm longis, subcoriaceis, tenuiter acuminatis, basi acutis, margine distanter leviter undulato-serrulatis, nervis utrinque 7 vel 8; floribus axillaribus, solitariis vel binis, pedicellatis, circiter 4.5 cm longis, calycibus tubo 1 cm longo, laciniis 1 cm longis, caudato-acuminatis.

An erect much-branched shrub about 1 m high, the younger parts more or less densely covered with long, soft, weak, ferruginous hairs. Branches terete, brownish, glabrous, somewhat striate when dry, the internodes 1 to 2 cm long, the young

branchlets ferruginous-villous. Leaves opposite, numerous, oblong-lanceolate, those of each pair dissimilar in size, one usually about one-half as large as the other, subcoriaceous, 5 to 9 cm long, 1 to 2.5 cm wide, slenderly subcaudate-acuminate, base acute, margins distantly undulate-serrulate, the upper surface dark-olivaceous when dry, glabrous, the lower paler, brown, ferruginous-villous on the midrib and lateral nerves; lateral nerves 7 or 8 on each side of the midrib, prominent on the lower surface, the reticulations obsolete or nearly so; petioles ferruginous-villous, 5 to 8 mm long. Flowers axillary, solitary or in pairs, pink to white, about 4.5 cm long, their pedicels 1 to 1.5 cm long, sparingly villous, each subtended by a pair of leaflike bracts 0.7 to 2 cm long. Calyx 2 cm long, ferruginous-villous, the tube about 1 cm long, somewhat inflated, the lobes slenderly lanceolate, caudate-acuminate, about as long as the tube. Corolla 4.5 cm long, ferruginous-villous. Disk about 1.8 mm high. Ovary densely ferruginous-villous, including the style about 3 cm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26459 Ramos & Edaña, August 12, 1916, on forested slopes at an altitude between 300 and 400 meters.

The alliance of this species is manifestly with *Cyrtandra incisa* C. B. Clarke, from which it is distinguished by its much smaller, but slightly toothed leaves and its larger flowers.

CYRTANDRA MICROPHYLLA sp. nov.

Frutex circiter 1 m altus, ramosus, ramulis et petiolis et inflorescentiis leviter castaneo-ciliato-setosis, pilis adpressis; foliis oppositis, numerosis, oblongis ad late oblongo-oblongatis, usque ad 5 cm longis, firme chartaceis, acuminatis, basi acutis, undulato-serratis, glabris, in siccitate supra nigro-brunneis, subtus brunneis, nervis utrinque 4 vel 5, subtus prominentibus; inflorescentiis axillaribus, solitariis, tenuibus, usque ad 4 cm longis, umbellatim 1- ad 3-floris; calycis tubo 2 mm longo, dentibus lineari-lanceolatis, 4 mm longis.

A much-branched shrub about 1 m high, the branchlets, petioles, and inflorescences with scattered, appressed, rather stiff, castaneous, ciliate-setose hairs, otherwise glabrous. Branches terete, grayish-brown, the branchlets slender. Leaves very numerous, opposite, firmly chartaceous, oblong to broadly oblong-oblongate, those of each pair more or less unequal in size, 2.5 to 5 cm long, 0.8 to 1.5 cm wide, acuminate, base acute, margins distantly undulate-serrate, the upper surface blackish-brown when dry, the lower much paler, brownish; lateral nerves 4 or 5 on each side of the midrib, rather prominent on the lower sur-

face, dark-brown in contrast with the paler epidermis; petioles 5 to 8 mm long. Inflorescences axillary, solitary, very slender, 2 to 4 cm long, umbellately 1- to 3-flowered, the pedicels about 3 mm long; bracts linear-spatulate, about 6 mm long. Calyx glabrous, the tube cup-shaped, about 2 mm long, the lobes 5, linear-lanceolate, about 4 mm long. Ovary ovoid, glabrous; style 6 mm long. Corolla not seen.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26250 *Ramos & Edaño*, August 12, 1916, on forested slopes at an altitude between 300 and 400 meters.

The alliance of this species is manifestly with *Cyrtandra tenuipes* Merr., from which it differs especially in its relatively narrower leaves and in its calyx-tube being but about one-half as long as the slender calyx-lobes.

CYRTANDRA LONGIPES sp. nov.

Frutex scandens, plus minusve ferrugineo-villosis; foliis longissime petiolatis, in foliis majoribus petiolis usque ad 14 cm longis, oblongis, chartaceis, laevis, usque ad 20 cm longis et 9 cm latis, apice breviter et obtuse acuminatis, basi leviter inaequilateralibus, subacutis, margine superne undulato-crenatis, nervis utrinque circiter 8, curvatis, subtus prominulis, reticulis subobsoletis; inflorescentiis axillaribus, floribus in ramulis junioribus fasciculatis, in ramis vetustioribus in inflorescentiis ramosis elongatis usque ad 9 cm longis dispositis; floribus circiter 2 cm longis, calycis inflatis, 1.2 ad 1.4 cm longis, glabris, 5-lobatis, lobis oblongo-lanceolatis, acuminatis, circiter 6 mm longis.

A scandent shrub, the stems about 1 cm in diameter, usually root-bearing on one side, pale-brownish, terete, rather conspicuously ferruginous-villous, the indumentum more or less deciduous, the internodes about 10 cm long. Younger parts of the slender branchlets rather densely ferruginous-villous, the inflorescences slightly so. Leaves oblong, rather firmly chartaceous, 10 to 20 cm long, 4 to 9 cm wide, glabrous or nearly so, smooth, brittle when dry, the upper surface olivaceous, the lower pale, shining, the apex broadly and shortly blunt-acuminate, the base slightly inequilateral, subacute, the margins above undulate-crenate; petioles of the larger leaves 12 to 14 cm in length, glabrous or nearly so; lateral nerves about 8 on each side of the midrib, prominent on the lower surface, curved, with very few, widely scattered, slender, secondary veins, some of which scarcely anastomose. Inflorescences axillary, on the branchlets the flowers fascicled, on the stems arranged in branched inflorescences up to 9 cm in length; bracts narrowly oblong, acuminate, up to 1 cm in length; pedicels slender, 2 to 2.5 cm long. Flowers about

2 cm in length, glabrous or nearly so. Calyx somewhat inflated, 1.2 to 1.4 cm long, 5-lobed, the lobes oblong-lanceolate, acuminate, about 6 mm long.

CATANDUANES, *Bur. Sci.* 30353 Ramos, December 10, 1917, climbing on tree trunks in forests at low altitudes, near Calolbong.

This species, among numerous other distinctive characters, can readily be recognized by its very greatly elongated petioles.

CYRTANDRA TENUIPES nom. nov.

Cyrtandra longipedunculata Merr. in *Philip. Journ. Sci.* 10 (1915) Bot. 77, non Reehinger, 1908.

A new name is necessary for the Luzon form I described in 1915, as the specific name had already been utilized by Reehinger in 1908 for a Samoan species.

ASCLEPIADACEAE

DISCHIDIA R. Brown

DISCHIDIA LANCIFOLIA sp. nov.

Species *D. merrillii* affinis, differt foliis lanceolatis, usque ad 8 cm longis et 1 cm latis, tenuiter acuminatis, in siccitate utrinque rugosis sed haud reticulatis.

A slender glabrous vine, the branches terete, grayish, about 1 mm in diameter. Leaves lanceolate, apparently fleshy when fresh, when dry coriaceous, pale-greenish, somewhat shining, wrinkled on both surfaces but not reticulate, the lateral nerves obsolete, 5 to 8 cm long, 8 to 10 mm wide, narrowed below to the acute or somewhat obtuse base and above to the slenderly acuminate apex; petioles about 5 mm long. Peduncles axillary, solitary, 1 cm long or less, few-flowered, the flowers subumbellately arranged at the apex of the peduncle, reddish, about 7 mm long, their pedicels 2 to 3 mm in length. Corolla-tube somewhat inflated below, narrowed above, at the most 3 mm wide when flattened. Follicles slender, linear-lanceolate, acuminate, about 3 mm long and 3 mm in diameter.

CATANDUANES, back of Calolbong, *Bur. Sci.* 30374 Ramos, December 10, 1917, on tree trunks in damp forests at low altitudes.

A species well characterized by its lanceolate leaves, manifestly allied to *Dischidia merrillii* Schltr., but at once distinguished by the characters indicated in the diagnosis.

HOYA R. Brown.

HOYA PENTAPHLEBIA sp. nov. § *Euhoya*.

Species *H. fischerianae* Warb. affinis, differt foliis late ovatis ad ellipticis. Ramis teretibus; foliis crasse coriaceis, 8 ad 16 cm longis, 6 ad 9 cm latis, pallidis, nitidis, distincte acuminatis, basi rotundatis, perspicue 5-nerviis, nervis interioribus apicem

attingentibus, reticulis laxis, distinctis; petiolo crasso, 2 ad 5 cm longo; pedunculis 2 ad 5 cm longis, partibus superioribus in-crassatis, 3 ad 4 mm diametro; floribus numerosis, flavidis, 7 ad 8 mm diametro, petalis intus papillois, rhomboideis, leviter acuminatis; coronae lobis patulis, oblongo-ovatis, acutis, subplanis, 2 mm longis.

A scandent plant entirely glabrous except the papillose corolla lobes. Branches terete, brownish or grayish, smooth, up to 5 mm in diameter, sometimes with roots along one side of the internodes, the internodes up to 12 cm in length. Leaves thickly coriaceous, pale and shining when dry, broadly ovate to elliptic, 8 to 16 cm long, 6 to 9 cm wide, the apex broadly and rather prominently acuminate, base rounded, prominently 5-nerved, the interior pair of nerves reaching the apex, the reticulations very lax, distinct on both surfaces, the margins somewhat recurved; petioles stout, 2 to 5 cm long. Umbels axillary, solitary or fascicled many-flowered, about 4 cm in diameter, the peduncles 2 to 5 cm long, the thickened upper part of the rachis cylindric, 3 to 4 mm in diameter, marked with numerous scars, this rachis on older inflorescences up to 4 cm in length. Flowers yellowish, 7 to 8 mm in diameter, rotate, the buds prominently 5-angled, 4 mm in diameter. Sepals membranaceous, oblong-ovate, somewhat acuminate, 1.5 mm long. Corolla distinctly papillate within, the lobes rhomboid, somewhat acuminate, about 4 mm long and 3 mm wide. Staminal-column about 4 mm in diameter, the lobes spreading, oblong-ovate, acute, the upper surface nearly flat or slightly concave, the external apex not recurved, the internal one elevated, acute, short. Follicles about 12 cm long.

SAMAR, Cauayan Valley, *Bur. Sci. 17411 Ramos* (type), March 9, 1914, in damp forests. BILIRAN, *Bur. Sci. 18831 McGregor*, June 28, 1914.

The alliance of this species is manifestly with *Hoya fischeriana* Warb., to which it conforms closely in its floral characters. It is distinguished by its very differently shaped leaves.

HOYA PUBICALYX sp. nov. § *Euhoya*.

Frutex scandens, inflorescentiis exceptis glaber, ramis subteretibus, circiter 3 mm diametro; foliis carnosis, in siccitate coriaceis, oblongis ad oblongo-obovatis, usque ad 14 cm longis, pallidis, nitidis, basi obtusis, apice acuminatis, in siccitate verruculosus, pinnatinerviis, nervis utrinque circiter 6, utrinque valde obscuris; pedicellis tenuibus, leviter pubescentibus, circiter 3.5 cm longis; floribus rotatis, in siccitate brunneis, circiter 1.8 cm diametro, sepalis oblongis, subacutis, extus leviter pubescentibus,

4 mm longis; corollae lobis late triangularibus, acuminatis, circiter 6 mm longis, alte connatis, indus dense papillois, apice leviter reflexis; coronae lobis coriaceis, oblongo-ovatis, 5 mm longis, acuminatis vel acutis, patentibus, apice leviter retusis, subplanis.

A scandent shrub, entirely glabrous except the inflorescence, the branches subterete, rather pale when dry, about 3 mm in diameter, the internodes up to 20 cm in length. Leaves opposite, fleshy, when dry coriaceous, pale and shining on both surfaces and more or less wrinkled, oblong to oblong-obovate, 10 to 14 cm long, 3 to 5 cm wide, base obtuse, apex distinctly acuminate; lateral nerves pinnately arranged, indistinct, about 6 on each side of the midrib, ascending, scarcely more evident than are the lax, indistinct reticulations; petioles about 1 cm long. Umbels many-flowered, 8 to 9 cm in diameter, the thickened rachis about 4 mm in diameter above, the pedicels spreading, slender, about 3.5 cm long, sparingly appressed-pubescent. Flowers fragrant, about 1.8 cm in diameter, brown when dry. Calyx-segments oblong-ovate to ovate-lanceolate, acute or subacute, externally somewhat pubescent, about 4 mm long. Corolla-lobes broadly triangular, about 6 mm long and wide, spreading, rotate, externally glabrous, internally densely papillose, the acuminate apex somewhat recurved. Corona 10 to 12 mm in diameter, stellate, the lobes spreading, coriaceous, brown, shining, oblong-ovate to ovate-lanceolate, acuminate, about 5 mm long, the external tip slightly retuse, the internal one ascending, the upper surface plano-convex and somewhat keeled in the median portion.

LUZON, Tayabas Province, Mauban, *Bur. Sci.* 19484 Ramos & Edaña, January 24, 1913, on trees along streams in damp forests.

The alliance of this species is with *Hoya luzonica* Schltr., from which it is readily distinguished by its larger flowers, its pubescent pedicels and sepals, and its differently shaped, longer, acuminate, and slightly retuse corona-segments.

CUCURBITACEAE

TRICHOSANTHES Linnaeus

TRICHOSANTHES ELLIPSOIDEA sp. nov. § *Eutrichosanthes*.

Herbacea, scandens, glaberrima, caulis tenuibus. Foliis chartaceis, oblongo-ovatis, usque ad 14 cm longis, integris vel obscure repandis, apice acuminatis, basi profunde cordatis, supra albido-punctatis, subtus verruculosus, nervis reticulisque perspicuis; floribus ♀ axillaribus, solitariis, pedicellatis, ebracteolatis, tubo 6 ad 7 cm longo; calycis lobis lanceolatis, acuminatis, 6 ad 7 mm longis; petalis puberulis, obovatis, circiter 3 cm longis,

$\frac{1}{2}$ fimbriatis; fructibus junioribus ellipsoideis, seminibus compressis, oblongo-lanceolatis, circiter 1.3 cm longis.

A scandent, glabrous, slender, herbaceous plant, the branches terete, slightly sulcate. Leaves chartaceous, oblong-ovate, 11 to 14 cm long, about 7 cm wide, olivaceous, shining, the upper surface somewhat scabrid by the whitish-punctate dots, the lower verruculose, the apex rather slenderly acuminate, base deeply cordate, the sinus narrow, the basal lobes somewhat angular or repand, the margins otherwise entire or very obscurely undulate, the nerves and reticulations prominent; petioles about 3.5 cm long; tendrils up to at least 15 cm in length, glabrous. Pistillate flowers solitary, axillary, ebracteate, their pedicels 1.5 to 3 cm long, the tube slender, cylindric, including the ovarian part 6 to 7 cm long. Sepals lanceolate, acuminate, 6 to 7 mm long. Petals obovate, puberulent, about 3 cm long, white, split to the middle or beyond into numerous very slender fimbriae. Immature fruits ellipsoid, about 5 cm long, deeply wrinkled when dry, glabrous, castaneous when dry. Seeds oblong-lanceolate, compressed, about 1.3 cm long.

CATANDUANES, *Bur. Sci.* 30364 *Ramos*, November 27, 1917, border of forests near abacá (Manila hemp) plantations, slopes of Mount Mari-guidon.

This species is well characterized by its oblong-ovate, deeply cordate leaves, which are entire or slightly undulate, not at all lobed, and its ellipsoid fruits.

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By E. D. MERRILL and H. W. WADE

*(From the Botanical and Bacteriological Sections of the Biological
Laboratory, Bureau of Science, Manila)*

Separate from

THE PHILIPPINE JOURNAL OF SCIENCE

Published by the Bureau of Science of the Philippine Government
Manila, P. I.

VOLUME XIV, No. 1, JANUARY, 1919

MANILA
BUREAU OF PRINTING
1919

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THE VALIDITY OF THE NAME DISCOMYCES FOR THE GENUS OF FUNGI VARIOUSLY CALLED ACTINO- MYCES, STREPTOTHRIX, AND NOCARDIA

By E. D. MERRILL and H. W. WADE

(From the Botanical and Bacteriological Sections of the Biological Laboratory, Bureau of Science, Manila)

The nomenclature of the group of fungi the pathogenic members of which produce the various actinomycoses, so-called, has been the subject of a confusion that resulted from an unusual combination of circumstances. For some time it was a moot question whether the organisms were of bacterial or of fungous nature, in part because of erroneous conceptions of their morphology, which is complex and variable, and differs widely in different strains; even yet opinions differ as to whether or not the forms involved should be included in a single genus. One of the types, a saprophyte, *Streptothrix foersteri* Cohn, was for a time erroneously included in a genus of the higher bacteria, while the first pathogenic species described, *Actinomyces bovis* Harz, having been recognized as a fungus, was given a different generic name. The question was further complicated by the fact that both names had long before been employed for entirely different organisms. Since then some authors have held one invalid, some the other, and some have rejected both. Other names have been misapplied from time to time, while new ones have been proposed, the list now including a total of ten.

As is too frequently the case, the systematist and the pathologist have tended to ignore the work and the viewpoint of one another. Medical writers, who almost exclusively have been concerned with the study of these organisms and consequently the use of their names, have been very prone to choose these from the viewpoint of convenience and local custom rather than to recognize and adhere to the rules of nomenclature by which modern biologists are bound. On the other hand, botanists have overlooked or ignored—and they still do this—names and descriptions that have, in sincerity but without the formality customary with themselves, been published by medical writers. It is to consider the matter from both viewpoints in an effort to determine the actually correct designation that we have collaborated in a review of the vicissitudes of nomenclature that this group has undergone.

HISTORICAL

The phase of the confusion in which the characteristic of true branching in these organisms was not appreciated began in 1875, when Cohn(18) described, among others, two organisms that he made the types of new genera. One, which he named *Cladothrix dichotoma*, a colorless, filamentous plant found abundantly in water containing decomposing algæ, was characterized by a false branching that he compared to that of certain algæ; the other, which, apparently in ignorance of Corda's(19) previous use of the same generic name, he called *Streptothrix foersteri*, was a branching filamentous organism said to have been found first by Graefe and then by Foerster in concretions in the lachrymal canal of man and classified by Waldeyer as *Leptothrix buccalis*. Cohn did not accept this conclusion, the mode of branching suggesting the mycelium of fungi. It has been pointed out by Sauvageau and Radais(56) that the distinction between his *Cladothrix* and *Streptothrix* was so clear to Cohn that in the text he did not even compare them; furthermore, that his illustrations of them are quite distinct. They quote his diagnoses:

Cladothrix—n. g. filamenta leptothricoidea tenerrima, achroa, non articulata, stricta vel subundulata, *pseudo-dichotoma*.

Streptothrix—n. g. filamenta leptothricoidea tenerrima, achroa, non articulata vel anguste spiralia, *parce ramosa*.

In his summary, however, Cohn did not clearly differentiate them. According to Migula(44) he put them together among organisms showing false branching, although indicating uncertainty as to *Streptothrix* by an interrogation point:

Zellfäden durch falsche Astbildung verzweigt.

Fäden cylindrisch, farblos—*Cladothrix* Cohn.

Streptothrix?

Cohn's later understanding of the morphology of the latter is evident from Israel's article cited below. However, it is hardly to be suspected from this arrangement that, as is now generally recognized, the dividing line between the higher bacteria and the lower fungi separates these two genera.

Bollinger, in 1876, demonstrated the fungous nature of the granules, or "drusen," from the lumpy jaw of cattle. Attempts at cultivation and inoculation had been without result. In the following year(10) he published a description in which he stated that Harz, to whom he had submitted fresh material, had concluded that the ray fungus (Strahlenpilz) belonged to the mold fungi and that it was related to *Botrytis*, *Monosporium*, and *Polyactis*; the name *Actinomyces bovis* was proposed for it.

Rivolta,(53) in 1878, changed the generic name to *Discomyces*. After amplifying the descriptions of the granules (corpuscoli discoidi) that he had made in 1868 and 1875, he said in part:

E vero chi i corpuscoli discoidi compressi si risolvono in pennelli od in ventagli fatti di rami e ramoscelli, mar percio non si ponno dire *raggiati*. Questa parola in storia naturale ha un senso ben determinato. Il complesso dei dischi che ci rappresenta, se si vuole, un micelio, non ha la forma raggiata, e per conseguenza non si puo denominar raggiata o come venne detto *actinomyces*, e nemmeno si debbono indicare i danni o le lesioni che produce con la parola *actinomicosi*. Il solo nome conveniente, a mio avviso, sarebbe quello di *discomyces bovis*, e con la parola *sarcomicosi* si potrebbero indicare le lesioni che produce vel corpo del bue.

Harz(28) then published a separate description of the fungus, rejecting Rivolta's change.

Israel,(29) in 1878, used *Actinomyces*, but called attention to the similarity between the organism found in lesions in man and Cohn's *Streptothrix foersteri*, a resemblance which, he said, Cohn himself had confirmed. Perroncito,(49) although himself employing *Actinomyces*, quoted a communication from Professor Garovaglio, director of the Cryptogamic Laboratories of the University of Padua, in which its previous use by Meyen(42) was noted.

Rivolta(54) later declared that he was willing to accept *Actinomyces bovis*, but added that one could, nevertheless, form a group of pathogenic discomycetes containing: (1) *Actinomyces bovis* Harz; (2) *Discomyces pleuriticus canis familiaris* Rivolta; and (3) *Discomyces equi* Rivolta and Micellone. The second is now *Cladothrix canis* Rabe. (1898), and the third is known as a *Micrococcus* (*M. botryogenes* Rabe., *M. ascoformans* Johne, etc.). The first is, therefore, the only one of these organisms remaining in Rivolta's genus, as thus amplified by him, and is the type of the genus, both as originally published and as later amplified.

During this period systematists, who placed these organisms among the bacteria, denied the generic validity of Cohn's *Streptothrix*. Winter,(61) Zopf,(63) Schröter,(58) and Baumgarten(5) considered it to be a synonym of *Cladothrix*. Schröter included, in the same family, the genus *Actinomyces*, this being apparently the first recognition of Harz's organism in systematic classification. Baumgarten concluded that the ray fungi belonged among the pleomorphic higher bacteria in the genus *Cladothrix*. MacFadyean(39) agreed that the organisms of actinomycosis probably belonged to the Schizomycetes; he held that the occurrence of clublike elements in the granules was not of specific value because inconstantly formed.

Macé(37) also confused the genera, but in a new fashion. In 1888 he erroneously described for *Cladothrix dichotoma* a process of true branching and adopted(38) this generic name for the ray-fungus group. Sauvageau and Radais hold that he had never had the true *Cladothrix* under observation.

Affanassiew(1) at first called the organism of actinomycosis *Bacterium actinocladothrix*, but in the following year, 1889, Affanassiew and Schulz(2) gave the term *Actinocladothrix* generic rank. The only evidence that we have encountered of the use of this name by anyone else is the mention, without reference, of "*Actinocladothrix nocardii*," in an article by Haass.(27)

De Toni and Trevisan, in Saccardo's *Sylloge Fungorum*,(20) accepted these organisms as belonging to the Schizomycetaceæ. In the Cladothriceæ: "Sporae (arthrospora) in filamentis normalibus obvenientes. Filamenta pseudo-ramosa" they included *Sphaerotilus*, *Cladothrix*, and a genus that they called *Nocardia* Trevisan: "Filamenta evaginata. Arthrospora transformatione cocci singuli ortae." In this genus they included *Streptothrix* Cohn, non Corda; *Actinomyces* Harz, non Meyen; and *Discomyces* Rivolta, five species being defined. The description of these organisms as falsely branching was, of course, erroneous.

In 1890 Almquist(3) and Gasperini(23) described certain organisms that they identified as species of Cohn's *Streptothrix*. Kruse held that these species fell, with the organism of actinomycosis, into Zopf's *Cladothrix* group. Rossi-Doria (55) soon described six new species of *Streptothrix* from the air and classed *Actinomyces bovis* Harz, which he is said to have renamed *Streptothrix actinomyces*, with them. Kruse(31) later also employed *Streptothrix*, differentiating it from *Cladothrix*.

From cases of actinomycosis in man Bostroem(11) repeatedly cultivated an organism that differed distinctly from that cultivated by Israel. He concluded that it belonged to the *Cladothrix* group of the Schizomycetes and pointed out that it might be related to, or even identical with, *Streptothrix foersteri* Cohn.

Grüber,(26) in 1891, described as *Micromyces hofmanni* an organism that subsequent authors have included in the group under discussion.

Sauvageau and Radais's(56) discussion of the confusion of Cohn's *Cladothrix* and *Streptothrix* has been referred to. They believed that the two were distinct; that *Cladothrix*, the most differentiated of the Bacteriaceæ, was falsely branched; and that *Streptothrix*, a true though very low hyphomycetous fungus,

to which the organism of actinomycosis belonged, showed true branching. They concluded that the latter really belonged to *Oospora* Wallroth (1831), but that, whether or not this was correct, it was necessary to discard *Streptothrix* Cohn because of Corda's use of this name in 1839. De Toni and Trevisan's description of *Nocardia* as falsely branching was incorrect, for although Nocard⁽⁴⁷⁾ had originally so described his "Bacille de farcin," Metchinkoff had found that it was a true-branching organism. Kanthack⁽³⁰⁾ accepted *Oospora* and created the name *Oospora indica* for the parasite of Madura disease, having demonstrated the identity of actinomycosis and of certain mycetomas. Lehmann and Neumann,⁽³³⁾ in 1896, introduced *Mycobacterium* as a family name for a group that they considered intermediate between the Hyphomycetes and the Schizomycetes, but rather more closely related to the former, and at first adopted *Oospora* as the generic name for the organisms under discussion.

Gasperini,⁽²⁴⁾ in 1894, proposed the use of *Actinomyces* to include the whole group, discarding *Streptothrix*; he listed eighteen species. Berestnew,⁽⁶⁾ in 1897, accepted *Actinomyces* as valid and later⁽⁷⁾ called attention to Gasperini's publication, which apparently had been overlooked. Lachner-Sandoval,⁽³²⁾ in 1898, pointed out the invalidity of *Oospora* in this connection and also adopted *Actinomyces*. Levy⁽³⁴⁾ reviewed the question, concluding that all the described types were generically related and that *Actinomyces* was the proper designation for them. He did not note Rivolta's original application of *Discomyces*. Lehmann and Neumann, in the second (1899) edition of their work, substituted the family name Actinomycetes Lachner-Sandoval for their own *Mycobacterium*, the pathogenic forms placed in the genus *Oospora* now becoming *Actinomyces*. This broader application of the term to the entire group is not now widely accepted, though Mallory,⁽⁴⁰⁾ after Gasperini, employed it tentatively, and Babes⁽⁴⁾ and other German authors still use it.

Migula, in his earlier (1895) classification,⁽⁴³⁾ included these organisms among the higher bacteria, in his family Chlamydo-bacteriaceæ. He separated *Streptothrix* Cohn from *Cladothrix*, giving it a much modified diagnosis. In *Cladothrix* Cohn he included *C. bovis* (Harz) Migula (*Actinomyces bovis* Harz) and *C. foersteri* (Cohn) Schröter (*Streptothrix foersteri* Cohn), thus perpetuating the error of the earlier systematists. As already noted, Macé had adopted this generic name, although from a different viewpoint. Later⁽⁴⁵⁾ Migula modified this genus rad-

ically, removing those species that are now recognized to belong to the fungi.

Engler, in his Syllabus,(21) included Harz's organism in the genus *Sphaerotilus* as "*Sph. (Actinomyces) bovis*," thus adding a new name to the list of synonyms. He had not revised this grouping in the fifth (1907) edition.

Discomyces Rivolta was shown to be the correct designation for the genus by Blanchard(9) who, stimulated by Levy's and Berestnew's articles, reviewed the question of nomenclature. In adopting this term he had changed his earlier opinion, for he had previously(8) employed *Nocardia*. His argument is based on accepted principles and should carry conviction. Previous to this the term had been practically ignored. It is true that Sheube(57) cites Nocard and then Blanchard as having advocated this term for *Discomyces (Streptothrix) indica*, but we have been unable to find any publication by Nocard in which it is used; on the other hand, in the third (1903) edition of Nocard and le Clainche's *Maladies Microbiennes des Animaux*,(48) *Actinomyces* is used in connection with actinomycosis and *Streptothrix* with "farcin du boeuf." Gedoelst(25) evidently accepted Blanchard's decision, for he designated the genus *Discomyces* Rivolta 1878, and the organism of actinomycosis *Discomyces bovis* (Harz 1877) Rivolta 1878. Stitt(59) is apparently the only American authority who has adopted this name. Brumpt(12) in a discussion of the mycetomas, used *Discomyces* and still subscribes to it, for in discussing organisms presented in 1913 by Pinoy(51) to the Société de Pathologie exotique (Paris) as *Nocardia* he used the former rather than the latter term. Manson,(41) in subscribing to Brumpt's classification of the mycetomas, also used the same nomenclature. Castellani and Chalmers(13) employed *Discomyces* in 1910, although they later discarded it.

A new name was introduced by Lignières and Spitz,(35) who called a subtype of this group *Actinobacillus*. In a later article(36) they acknowledged the strict propriety of Blanchard's argument in regard to the application of *Discomyces* to the general group, although they continued to use *Streptothrix*.

During this period certain German authors had adopted *Actinomyces* and *Streptothrix* as separate genera. This is exemplified by Petrusky's(50) classification in which they are placed in a family which he terms Trichomycetes. Wright(62) believed that *Actinomyces* should be retained for the organism of actinomycosis, which he emphatically maintained should be differentiated generically from other organisms of the group. He

rejected de Toni and Trevisan's objection that Meyen had given the name to another organism as an unreasonably strict interpretation of the principles of botanical nomenclature. On the other hand, for the rest of the group he rejected *Streptothrix* and accepted *Nocardia*. This subdivision of the group has been adopted in several American bacteriological textbooks. However, Chester(16) adopted the first classification of Lehmann and Neumann, except that *Oospora* was replaced by *Streptothrix* Cohn. Clements(17) included these organisms among the Schizomycetes; he followed Migula's earlier classification, except that *Nocardia* was substituted for *Streptothrix* Cohn, emend. Mig.

Foulerton(22) argued that, since the other names that had been proposed had dropped out of use, only *Streptothrix* and *Actinomyces* remained to be considered. He chose the former because, although Corda had used it in 1834, it had become uncertain to what particular organism the term had been applied; further, a committee of the Pathological Society of London in 1899 had recommended the term "streptotricosis" as the appropriate clinical designation for the infection. Musgrave and Clegg(46) acknowledged that *Nocardia* was probably more strictly correct, but "chiefly because of usage, and therefore somewhat arbitrarily, tentatively accepted *Streptothrix* * * *." They suggested the possible advantage of substituting an entirely new name, *Carteria* (*Carterii*, sic!), evidently hoping that by this means further controversy might be eliminated.

Pinoy has divided the group into *Nocardia*, which is to include most of the species, and *Cohnistreptothrix*, said to be designed to replace Cohn's invalid *Streptothrix*. The article that contains his argument is probably one by Pinoy and Morax,(52) which is not available to us. According to Chalmers and Christopherson(15) the characteristics of this genus are preference for anaërobiosis, difficulty of cultivation, and nonproduction of arthrospores; in it they include Cohn's *Streptothrix foersteri* and Israel's *Actinomyces* from man (*Streptothrix israeli* Kruse, 1896).

Vuillemin,(60) as a result of the adoption by the 1910 meeting of the International Botanical Congress at Brussels of a program for the next congress that included the determination of the point of departure for the nomenclature of the Schizomycetes and the elaboration of lists of *nomina conservanda* for these organisms, has recently published a revised generic classification, which was intended to be submitted for consideration at the scheduled London (1915) meeting of the congress. In an appendix to this work he includes the family Microsiphones,

composed of genera to certain of which organisms such as the "bacillus" of tuberculosis and the "bacillus" of diphtheria are assigned. For the genus under discussion he adopts *Nocardia* Trevisan, which he recommends for inclusion in the list of *nomina conservanda*. He says, in effect, that systematic botany need not concern itself with the "medical genus" *Discomyces*, in which Rivolta combined, without mycological significance, the parasites of actinomycosis, botryomycosis, and canine pleurisy, nor with the genus *Cohnistreptothrix*, founded by Pinoy upon bacteriological grounds, and that *Nocardia* remains the valid name for the genus. As the Congress did not meet in 1915, Vuillemin's recommendations have not yet been acted upon.

Castellani and Chalmers have substituted, without discussion, *Nocardia* for *Discomyces* in the second edition of their work.⁽¹⁴⁾ They remark that there are many points in favor of Pinoy's subdivision of the genus, which probably would be soon generally accepted.

The most recent discussion of this question is in a study of actinomycotic mycetoma by Chalmers and Christopherson,⁽¹⁵⁾ who enumerate sixty-three species of *Nocardia* and eleven of *Cohnistreptothrix*. They argue the validity of *Nocardia* on the grounds: (1) that it is the oldest name against which no objections can be raised; (2) that it has been formally adopted by the Botanical Section of the First International Congress of Pathology;¹ (3) that there are objections to the other names in use. They eliminate *Discomyces*, because:

Discomyces was used by Rivolta in 1878 merely as a trivial name, and though it has not been applied to any other genus, still the word *Discomycetaceae* was introduced in 1836 by Fries for a large fungal group and has come into general use, and therefore has the double claim of priority and general use, and as its type genus should bear the name *Discomyces*, confusion is bound to arise if the same term is retained for the generic name of Bollinger's organism.

The value of these objections will not be discussed at this point.

SUMMARY

The source and present status of the various names that have been applied to the organisms of this group may be summarized as follows:

Cladothrix Cohn (1875). This name was used as generically

¹ This probably refers to the Congrès international de pathologie comparée, organized by the Société de pathologie comparée, the first and as yet only meeting of which was held at the Faculty of Medicine, University of Paris, in 1912.

valid over *Streptothrix* Cohn (1875) by Winter (1884) and other systematists, the distinction not being understood. The organism of actinomycosis was informally assigned to this genus by Bostroem, Baumgarten, and others, formally by Migula (1895). *Cladothrix* Cohn is a different type of organism and the name is, therefore, inapplicable.

Streptothrix Cohn (1875), non Corda (1839). This name was applied by Cohn to a true-branching organism but was placed in his classification as doubtfully synonymous with *Cladothrix*. The resemblance of the fungus of actinomycosis in man to it was noted by Israel (1878); the name was adopted in 1890 by Almquist and by Gasperini for nonpathogenic air organisms, and in 1891 it was adopted by Rossi-Doria for that of actinomycosis.

For a time this was probably the most widely used name for the group. At present it is frequently applied to the group minus the organism of actinomycosis. It is unquestionably invalid in either connection because previously applied by Corda (1839) to an organism distinct from those under consideration.

Actinomyces Harz (1877) non *Actinomyce* Meyen (1827). This name was applied by Harz to the fungus of "lumpy jaw" of cattle, by Gasperini (1894) to the entire group, replacing *Streptothrix*, and accepted in this application by Berestnew (1897), Lachner-Sandoval (1898), and others.

It is now used by many writers, particularly the German and the American, as a valid name for the organism of actinomycosis only; it is seldom used in the more general sense. As is shown below, this name is invalid because published in connection with an entirely different organism by Meyen (1827).

Bacterium Ehrenberg 1830. Affanassiew (1888) is said for a time to have called the organism of actinomycosis *Bacterium actinocladothrix*. This designation is manifestly inapplicable.

Actinocladothrix Affanassiew and Schultz (1889). This was proposed as a generic name by Affanassiew and Schultz in 1889 for the organism of actinomycosis. It did not receive the consideration to which, being of even date with the widely adopted *Nocardia*, it was certainly entitled.

Micromyces Grüber (1891). This name was applied by Grüber to an *Actinomyces*-like organism that he called *M. hofmanni*. This organism cannot be distinguished from the general group under consideration.

Oospora Wallroth (1833). This was adopted by Sauvageau and Radais (1892), who concluded that the group belonged to Wallroth's genus. Lehmann and Neumann (1896) adopted this view, but later abandoned it,* Lachner and Sandoval (1898)

having shown that *Oospora* Wallroth is an organism entirely different from those under discussion.

Sphaerotilus Kuetz. (1883). This name was adopted by Engler for the group including *Cladothrix* (*Streptothrix*) *foersteri* Cohn, with which he included *Actinomyces bovis* Harz. This disposition was undoubtedly due to the old misapprehension as to the distinction between *Cladothrix* and *Streptothrix*.

Actinobacillus Lignières and Spitz (1902). This name was applied by Lignières and Spitz to a supposed subtype of this group. The distinction has not been recognized, and by most authors the name is considered a synonym.

Carteria Musgrave and Clegg (1908). The adoption of this new name (as "*Carterii*") was tentatively suggested by Musgrave and Clegg as possibly advantageous for the purpose of avoiding further controversy, although they did not definitely advocate this highly informal procedure.

Nocardia Trevisan (1889). This name was adopted by de Toni and Trevisan to cover the entire group. Blanchard used it for a time in its original application and Wright (1894) adopted it for nonpathogenic strains only. As many other authors use it in one sense or another, of late it has gained much prestige. Vuillemin, and Chalmers and Christopherson have recently adopted it for the entire genus.

The validity of this name we deny on the grounds indicated in the discussion that follows.

Discomyces Rivolta (1878). This name was definitely substituted by Rivolta for *Actinomyces*, with the change of name of Bollinger's fungus to *Discomyces bovis*. It was practically ignored until Blanchard (1900) argued its priority over *Nocardia*. Subsequently Gedoelst, Brumpt, Manson, Stitt, and for a time Castellani and Chalmers, adopted it.

As indicated in the discussion this name is clearly valid over *Actinomyces* and all subsequent names.

DISCUSSION

Before considering the validity of *Discomyces* for this group over *Nocardia* and *Actinocladothrix*, it is necessary to emphasize the invalidity of two older terms that have gained general recognition.

Streptothrix Cohn (1875) is invalidated by *Streptothrix* Corda (1839). It has been argued that there is doubt as to what organism is referred to by Corda's name. This is apparently not the case for in recent years several new species have been described in Corda's genus. • *Streptothrix* Corda is unques-

tionably a valid, recognized genus, and *Streptothrix* Cohn must fall.

Actinomyces was used by Harz with but a very limited knowledge of the organism to which he applied it, evidently without suspecting its possible relationship to Cohn's *Streptothrix foersteri* and probably without being aware of Meyen's use of the name. Whether or not this newer application is valid, as most writers seem at least tacitly to agree, depends on the validity of its preëmption by Meyen. That it is valid is evident from the following transcription from the original publication:

Actinomyce

Sporidochia, cellulis hyalinis simplicibus enormiter et multipliciter ramificantibus sporis impletis, substantiae uniformi gelatinosa hyalina induta.

Actinomyce Horkelii

R. forma irregulari sphaeroidea, gelatinosa duritie ad basin augente usque ad consistentiam cartilaginosam, colore hyalino-subcoeruleo. Hab. in pinguedine et pleuris animalium aquae submersis, autumnno prope Coloniam Agrippinam.

Zum Schlusse wage ich noch, etwas über das beginnende Wachsthum dieses Pilzes zu sagen. Der Pilz ist nicht eine Krankheitsform eines Organismus, sondern er ist ein eigener Organismus, ein eigenes Leben unabhängig von seinem Mutterboden, aber dennoch von demselben beschränkt.

It is to be noted that Meyen used the name *Actinomyce*. While by some the use of this form might conceivably be argued not to invalidate *Actinomyces*, the derivation of the two is identical, and the argument cannot hold. *Actinomyce horkelii* Meyen is now an organism of uncertain status. Although it was described by Meyen as a fungus, the description apparently applies to one of the colonial Cyanophyceæ. The genus is not recognized in either mycological or algological literature. However, the description of both the genus and the species is indisputably valid, and in the present connection the question of its identity is unimportant. In being validly published, it invalidates the further use of the same name for another group of organisms in the plant kingdom.

From the foregoing it is evident that by the accepted principles of botanical nomenclature both of these names are preoccupied. To deny on this ground either of them and yet accept the other, as has been done, is inconsistent. Recommendation of "streptotricosis" by a committee of the Pathological Society of London cannot be accepted as competent to validate *Streptothrix*, nor can the adoption by the Botanical Section of the First International Congress of Pathology validate *Nocardia*. It is true

that through formal adoption by the proper bodies *nomina conservanda* are validated; however, neither of the societies mentioned has authority to do this in botany.

There remains to be considered, then, the name next applied to this genus. This was published by Rivolta, in 1878, when he proposed, definitely and distinctly, to substitute *Discomyces* for *Actinomyces*.² The reason for which he did this is an invalid one; he believed that *Actinomyces* was not properly descriptive of the organism and, unhampered by rules of nomenclature, adopted *Discomyces* as preferable in this respect. He was undoubtedly not aware of the fact that the former had been used before, but it is on this ground rather than that on which he advanced his new name that *Discomyces* is valid.

Vuillemin, and more recently Chalmers and Christopherson, in advocating *Nocardia* as the valid generic name, hold that Rivolta's use of *Discomyces* was trivial and without botanical significance. We do not agree with this argument, which is clearly refuted by Rivolta's original paper. Here he distinctly proposes *Discomyces bovis* as the name for the organism called *Actinomyces bovis* by Harz in a manner that must be acknowledged as valid from the viewpoint of botany, even though it is not in conventional form and was advocated on irrelevant, inadequate grounds. Therefore, it is in no sense a "medical genus," as Vuillemin asserts. The fact that subsequently Rivolta erroneously referred other organisms to this genus has no bearing on the case. His original application of it was to the organism of Bollinger and Harz alone, which is, therefore, the type of the genus. Nor does the fact that, to propitiate Harz, Rivolta later agreed to accept *Actinomyces* affect the question. As Blanchard pointed out, a name once introduced

² The definite manner in which this substitution was made has been generally ignored, possibly because of the inaccessibility of the original paper, it having been published in an Italian veterinary journal. The rarity of this publication is exemplified by the difficulty that we have had in consulting it. The 1878 volume of *Clinica Veterinaria* was found to be missing from the set of this periodical in the Surgeon-General's library in Washington, whereupon Mr. P. L. Ricker, of the United States Department of Agriculture, to whom we had applied, requested it from Mr. B. B. Woodward, librarian of the British Museum. He, not finding the publication in that library, forwarded the request to Mr. F. Bullock, of the Royal College of Veterinary Surgeons, through whose kindness a separate of Rivolta's article was forwarded to Washington, where photostat reproductions were made, one of which Mr. Ricker forwarded to us. To these gentleman we express our appreciation.

is no longer the property of its originator to withdraw or modify at will.

Finally, to argue, as do Chalmers and Christopherson, that Discomycetaceæ, a group name, invalidates *Discomyces* as a generic name in the connection in which Rivolta used it, on the ground that the type genus of Fries's Discomycetaceæ, published in 1836, should bear the designation *Discomyces*, indicates an erroneous conception of the principles of nomenclature and priority in technical names; a family name such as Discomycetaceæ cannot invalidate the generic name *Discomyces* any more than a generic name can invalidate a similar specific name. This generic name was new with Rivolta, and there is no valid objection to its adoption in taxonomy.

Nocardia is no longer to be considered. Both it and *Actinocladothrix* of Affanassiew and Schultz, the publication of which seems to have been completely ignored, were proposed eleven years later and fall as synonyms of *Discomyces* Rivolta (1878), which genus is typified by *Discomyces bovis* (Harz) Rivolta.

The question of division of the group is a different matter. It is our conception that the group, exhibiting as it does wide differences among the species, should be subdivided. However, neither the characters upon which separation was advocated by earlier writers (granule formation in tissues, club-ended filaments in the granules), nor those advanced by Pinoy (difficulty of cultivation, anaërobiosis, absence of arthrospores), seem to be convincing for generic distinction. Granules may be formed in animal lesions by a variety of these organisms, and club formation is a variable feature even in typical actinomycosis. Anaërobiosis and difficulty of cultivation are not generically distinctive botanically, nor so considered for other groups of microorganisms from the bacteriological viewpoint. Furthermore, these features characterize both the strains described by Israel and those studied by Wright. Should it appear desirable to divide the genus, this will probably be done on the basis of morphologic rather than metabolic differences.

REFERENCES

- (1) AFFANASSIEW. *St. Petersb. med. Wochenschr.* (1888), 13, 76 and 83. Cited by Blanchard (1910).
- (2) AFFANASSIEW and SCHULTZ. Third Congress of Russian Physicians, St. Petersburg, Subsection for Bacteriology. Ref.: *Centralbl. f. Bakt., etc.*, 1. Abt. (1889), 5, 683; also *Baumgarten's Jahresber.* (1889), 5, 398.
- (3) ALMQUIST, E. *Zeitschr. f. Hyg.* (1890), 8, 189.

- (4) BABES. In Kolle and Wassermann's Handbuch der pathogenen Mikroorganismen. 2d ed. Jena (1913), 5, 365.
- (5) BAUMGARTEN, P. Lehrbuch der pathogenischen Mykologie. Braunschweig (1886-1890), 2, 869.
- (6) BERESTNEW. Aktinomykose und ihre Erreger. (Diss.) Moskau (1897). Ref.: *Centralbl. f. Bakt.*, etc., 1. Abt. (1898), 24, 706.
- (7) IDEM. *Centralbl. f. Bakt.*, etc., 1. Abt. (1899), 26, 390.
- (8) BLANCHARD, R. In Bouchard's *Traité de Pathologie générale* (1895), 2, 649-932. Cited by Brumpt.
- (9) IDEM. *Arch. parasit.* (1900), 3, 193.
- (10) BOLLINGER, O. *Centralbl. f. d. med. Wiss.* (1877), 15, 481; and *Deutsche Zeitschr. f. Thiermed. u. vergl. Path.* (1877), 3, 324.
- (11) BOSTROEM. *Beit. z. path. Anat. u. z. allg. Path.* (1891), 9, 1.
- (12) BRUMPT, E. *Arch. parasit.* (1906), 10, 489.
- (13) CASTELLANI, A., and CHALMERS, A. J. *Manual of Tropical Medicine.* London (1910), 615.
- (14) IDEM. *Ibid.*, 2d ed. (1913), 812.
- (15) CHALMERS, A. J., and CHRISTOPHERSON, J. B. *Ann. Trop. Med. & Parasit.* (1916), 10, 223.
- (16) CHESTER, F. D. *A Manual of Determinative Bacteriology.* New York (1901), 360.
- (17) CLEMENTS, F. E. *The Genera of Fungi.* Minneapolis (1909), 7.
- (18) COHN, F. *Untersuchungen über Bakterien*, II, *Beit. z. Biol. d. Pflanzen*, Bd. I. Breslau (1875). Quoted by Migula and others.
- (19) CORDA, A. C. J. *Pracht-Flora europaeischer Schimmelbildungen.* Leipzig and Dresden (1839), 23. Cited by Saccardo, *Sylloge Fungorum* (1886), 4, 282, and others.
- (20) DE TONI, J. B., and TREVISAN, V. In Saccardo, P. A., *Sylloge Fungorum* (1889), 8, 927.
- (21) ENGLER, A. *Syllabus der Pflanzenfamilien.* 3d ed. Berlin (1903), 5.
- (22) FOULERTON, A. G. R. In Allbutt and Rolleston's *System of Medicine* (1906), 2, pt. 1, 302.
- (23) GASPERINI, G. *Ann. de microgr.* (1890), 2, 449. Ref.: *Centralbl. f. Bakt.*, etc., 1. Abt. (1891), 9, 59.
- (24) IDEM. *Proc. Eleventh Internat. Cong. of Med. Rome.* Ref.: *Centralbl. f. Bakt.*, etc., 1. Abt. (1894), 15, 683.
- (25) GEDOELST, W. *Les Champignons Parasites de l'Homme et des Animaux Domestiques.* Liège and Bruxelles (1902), 155.
- (26) GRÜBER, M. *Trans. VIIth Internat. Cong. of Hyg. and Demog.* London (1891); *Section II, Bacteriology* (1892), 2, 65. Also Ref.: *Münch. med. Wochenschr.* (1891), 37, 653.
- (27) HAASS, E. *Centralbl. f. Bakt.*, etc., 1. Abt. (1906), 40, 180.
- (28) HARZ, O. C. *Jahresber. d. k. Centr.-Thierarzneischule z. München* (1879), 125. Ref.: *Jahresber. d. gesam. med.* (1879), 1, 627.
- (29) ISRAEL, J. *Virch. Arch.* (1878), 74, 15.
- (30) KANTHACK, A. A. *Journ. Path. & Bact.* (1893), 1, 140.
- (31) KRUSE, W. In *Flugge's Mikroorganismen.* 3d ed. (1896), 48.
- (32) LACHNER-SANDOVAL. *Ueber Strahlenpilze. Eine bacteriologische-botanische Untersuchung.* (Diss.) Strasbourg (1898). Cited by Blanchard (1900), and others.

- (33) LEHMANN, K. B., and NEUMANN, R. O. *Atlas und Grundriss der Bakteriologie und Lehrbuch der speciellen bacteriologischen Diagnostik*. München, 1. Auf. (1896), Teil II.
- (34) LEVY, E. *Centralbl. f. Bakt., etc.*, 1. Abt. (1899), 26, 1.
- (35) LIGNIÈRES, J., and SPITZ, G. *Bull. Soc. centr. Méd. veter.* (1902), 487. Ref.: *Centralbl. f. Bakt., etc.* Ref. (1902), 32, 781.
- (36) IDEM. *Centralbl. f. Bakt., etc.* Orig. (1904), 35, 294, and 452.
- (37) MACÉ, E. *Compt. rend. Acad. Sci.* (1888), 106, 1622.
- (38) IDEM. *Traité pratique de Bactériologie*. Paris (1889). Cited by Sauvageau and Radais.
- (39) MACFADYEAN, J. *Brit. Med. Journ.* (1889), 1, 1339.
- (40) MALLORY, F. B. *Bost. Med. & Surg. Journ.* (1895), 132, 296.
- (41) MANSON, P. *Tropical Diseases*. 4th ed. New York (1907), 759.
- (42) MEYEN, J. *Linnaea* (1827), 2, 441.
- (43) MIGULA, W. In Engler and Prantl, *Die natürlichen Pflanzenfamilien*. Leipzig, Teil I, Abt. 1a, (1895), 1.
- (44) IDEM. *System der Bakterien*. Jena (1896), 1, 21 et seq.
- (45) IDEM. *Ibid.* (1900), 2, 1033.
- (46) MUSGRAVE, W. E., and CLEGG, M. T. *Philip. Journ. Sci., Sec. B* (1908), 3, 470.
- (47) NOCARD, E. *Ann. Inst. Past.* (1888), 2, 293.
- (48) NOCARD, E., and LE CLAINCHE, E. *Les Maladies microbiennes des Animaux*. 3d ed. Paris (1903), 2.
- (49) PERRONCITO, E. *Deutsche Zeitschr. f. Thiermed. u. vergl. Path.* (1879), 5, 33.
- (50) PETRUSKY. In Kolle and Wassermann's *Handbuch der pathogenen Mikroorganismen*. Jena (1903), 2, 832; and *ibid.*, 2d ed. (1913), 5, 267.
- (51) PINOY, E. *Bull. Inst. Past.* (1913), 11, 927 and 977.
- (52) PINOY and MORAX. *Bull. Soc. Ophthalmol. Paris* (1911), No. 3. Cited by Pinoy (1913).
- (53) RIVOLTA, S. *Clinica Veterinaria* (1878), 204 (Nos. 7, 8, and 9). Also abstracted and discussed by Bollinger in *Deutsche Zeitschr. f. Thiermed. u. vergl. Path.* (1879), 5, 110. Also quoted by Blanchard (1900).
- (54) IDEM. *Giornale Anat. Fisiol. e Patol.* (1884), 16. Cited by Blanchard (1900).
- (55) ROSSI-DORIA, T. *Ann. R. Univ. Roma* (1891), 1, 399. Ref.: *Baumgarten's Jahresb.* (1891), 7, 348.
- (56) SAUVAGEAU, C., and RADAIS, M. *Ann. Inst. Past.* (1892), 6, 242.
- (57) SCHEUBE, B. *Die Krankheiten der warmen Länder*. Jena (1900), 625.
- (58) SCHRÖTER. *Die Pilze*, Bd. III. In *Kryptogamenflora von Schlesien*. Bakterien (1886). Quoted by Migula (1896), 1, 30.
- (59) STITT, E. R. *Practical Bacteriology, Blood Work and Animal Parasitology*. 4th ed. Philadelphia (1918), 158.
- (60) VUILLEMIN, P. *Ann. Mycolog.* (1913), 11, 512.
- (61) WINTER, G. In Rabenhort's *Kryptogamen-Flora von Deutschland*, etc., *Die Pilze*. Leipzig (1884), 1, 1 Abt., 38.
- (62) WRIGHT, J. H. *Journ. Med. Res.* (1904), 13, 349.
- (63) ZOPF. *Die Bakterien*. 1. Aufl. (1884); 2. Aufl. (1885). Quoted by Migula (1896), 1, 26.

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NOTES ON THE FLORA OF SUMATRA

By E. D. MERRILL

*(From the Botanical Section of the Biological Laboratory,
Bureau of Science, Manila)*

Separate from

THE PHILIPPINE JOURNAL OF SCIENCE

Published by the Bureau of Science of the Philippine Government
Manila, P. I.

VOLUME XIV, No. 2, FEBRUARY, 1919

MANILA
BUREAU OF PRINTING
1919

THE PHILIPPINE BUREAU OF SCIENCE

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NOTES ON THE FLORA OF SUMATRA

By E. D. MERRILL

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila)

In the year 1860-61 Miquel¹ published a general summary of the Sumatran flora, enumerating all the species of Spermatophyta then known from the island and the neighboring smaller ones, especially Bangka. This work was based primarily on the collections of *Teysmann*, *Diepenhorst*, *Horsfield*, *Korthals*, *Jung-huhn*, *Zollinger*, and *Amman*, and includes 2,642 species, of which about 700 were described by Miquel as new. Since Miquel's publication was issued, comparatively little has been published on the Sumatran flora as such. Some large collections of plants have been made, notably that by *Beccari*, but with the exception of the recent collections of *Robinson* and *Kloss*, those made by other botanists since Miquel's time have not been thoroughly studied.

In 1884 Van Hasselt and Boerlage² published a small contribution to our knowledge of the Sumatran flora, this being based on the relatively unimportant botanical collections made by the Veth expedition in connection with its anthropological and zoölogical investigations. In this work about 170 species are enumerated, a large number of them cellular cryptogams. Of the spermatophytes but four are described as new, most of the others enumerated having already been recorded from Sumatra.

The Sumatran collections made by Dr. S. H. Koorders in 1890 have been enumerated by Mrs. Koorders,³ these totaling not more than 450 species in all groups, a considerable number of which have been determined only to the genus, and some only to the family. Of these species collected by Doctor Koorders

¹ Miquel, A. F. W., *Florae Indiae Batavae. Supplementum I. Prodromus Florae Sumatranæ* (1860-61) XX + 1-656, *t. 1-4*. German edition, *Sumatra, seine Pflanzenwelt und deren Erzeugnisse* (1862) XXIV + 1-656, *t. 1-4*.

² Van Hasselt, A. L. and Boerlage, J. G., *Bijdragen tot de kennis der flora van Midden-Sumatra*, in Veth, P. J. *Midden-Sumatra* 4 part 2¹ (1884) 1-49, *t. 1-8*.

³ Koorders-Schumacher, A., *Syst. Verzeich. Herb. Koord.* 2 (1910-11) 1-62.

in Atjeh and in central Sumatra, about 30 were described as new. A high percentage of the others enumerated had already been recorded from Sumatra by Miquel.

The most important recent publication on the Sumatran flora as such is that by Ridley and others on the botany of Mount Korinchi, based on the collections of Messrs. H. C. Robinson and C. Boden Kloss.⁴ In this publication 813 species are enumerated, of which 1 genus and 143 species are described as new. The percentage of novelties in this collection is certainly no less than can reasonably be expected from general collections made in any unexplored part of Sumatra where botanizing is largely confined to the forested areas. Among the previously described species enumerated by Ridley are naturally many that were already known from Sumatra, but there is also a considerable number originally described from other regions that had not previously been recorded from that island.

Sumatran species have been published from time to time in the extensive botanical periodical literature and in monographs of various natural groups. Including such species and those listed in the few publications wholly based on the Sumatran flora that have been issued since 1862, it is very doubtful if the list of species definitely known from Sumatra has been increased by more than 500 in all groups since the publication of Miquel's work. The list of Sumatran species known to-day would probably approximate about 3,000 in the spermatophytes alone, an indication of our lack of knowledge of the Sumatran flora as compared with other areas in the Malayan region, such as Java, with about 5,000 known species, Borneo with about 4,900 known species, and the Philippines with about 8,000 known species. On account of its large size, its varied climatic conditions, and its numerous high mountains, Sumatra can scarcely be less rich and varied in its flora than are the Malay Peninsula, Borneo, Java, and the Philippines; and from my present knowledge of the floras of these regions I should consider it very doubtful if we know more than one-third of the species that actually occur in Sumatra at the present time.

I have recently received for identification Sumatran collections aggregating about 500 numbers, made under the direction of Messrs. H. H. Bartlett and C. D. La Rue, chiefly in the vicinity of Asahan, East Coast. While the material represented in this collection for the most part represents rather common and widely

⁴ Results of an expedition to Korinchi Peak, Sumatra, Botany, *Journ. Fed. Malay States Museums* 8⁴ (1917) 1-145, t. 1-4.

distributed Malayan species, there are a few apparently undescribed forms, and a considerable number of known species previously not recorded from Sumatra. The collections were apparently made, for the most part, at low altitudes in the settled areas and in the second-growth forests; few species characteristic of the primary forests are represented. It is a well-known fact that collections made in any part of the Malayan region at low altitudes outside of the primary forest invariably present a high percentage of widely distributed species and hence those that are thoroughly well known. The endemic elements of any insular flora in Malaya—and the percentage of endemism is usually high in each of the larger islands of the Malay Archipelago—are for the most part confined to the primary forests. With our present state of knowledge of the Sumatran flora I have not considered it advisable to publish an enumeration of this collection, but have recorded some species, for the most part not previously credited to Sumatra, and also give below the descriptions of a few apparently undescribed species detected while studying the material.

URTICACEAE

DEBREGEASIA Gaudichaud

DEBREGEASIA LONGIFOLIA (Burm. f.) Wedd. in DC. Prodr. 16¹ (1869) 235.²⁴

Urtica longifolia Burm. f. Fl. Ind. (1768) 297.

Karoland, Kaban Djahe, *Bartlett & La Rue 81*, with the local name *tjeppira*.

India to Java and the Philippines.

OREOCNIDE Miquel

(*Villebrunea* Gaudichaud)

OREOCNIDE NIVEA sp. nov.

Frutex vel arbor parva, ramulis villosis; foliis chartaceis, ellipticis ad elliptico-obovatis, 12 ad 17 cm longis, supra olivaceis, subtus niveis et densissime tomentosis, apice acuminatis, margine serrato-dentatis, nervis utrinque circiter 12, perspicuis; inflorescentiis fasciculatis, capitulis longe pedunculatis, globosis, 5 mm diametro.

A shrub or small tree, the branchlets and petioles rather densely villous with pale brownish hairs. Leaves chartaceous, elliptic to elliptic-obovate, penninerved, 12 to 17 cm long, 6 to 8 cm wide, serrate-dentate except at the base, the upper surface olivaceous when dry, the midrib and nerves more or less pubescent, the epidermis with few, scattered, rather long, white

hairs, the lower surface white, densely tomentose, the pubescent midrib, nerves, and reticulations brownish, the base usually rounded, the apex shortly and sharply acuminate; lateral nerves about 12 on each side of the midrib, distinct, the petioles about 1.5 cm long; stipules lanceolate, acuminate, about 1 cm long. Inflorescences fascicled, axillary and from the axils of fallen leaves, the branches up to 2 cm long, simple, or bearing 2 or 3 heads, somewhat pubescent, the heads globose, about 5 mm in diameter. Achenes crowded, sessile, somewhat hispid, oblong-ovoid, narrowed upward, about 1.5 mm long.

SUMATRA, East Coast, Asahan, in mountain jungle at Linaboen, June 30, 1910, *Bartlett & La Rue 213*, with the local name *nderasi*.

This species is readily distinguished from all previously described forms of the genus by its leaves being white beneath in striking contrast to the dark-olivaceous upper surface.

OLACACEAE

ERYTHROPALUM Blume

ERYTHROPALUM SCANDENS Blume Bijdr. (1826) 921.

Karoland, Lau Bakal, *Bartlett & La Rue 170*, June 20, 1918.
India to Java and the Philippines.

LAURACEAE

LITSEA Lamarck

LITSEA UMBELLATA (Lour.) comb. nov.

Hexanthus umbellatus Lour. Fl. Cochinch. (1790) 196.

Litsea hexantha Juss. in Ann. Mus. Paris 6 (1805) 212.

Litsea amara Blume Bijdr. (1825) 563.

Karoland, Kampong Lingga, *Bartlett & La Rue 115*, June 5, 1918.

Loureiro's type is preserved in the herbarium of the British Museum, where it was examined by R. Brown, who thought it to represent the Australian species described by him as *Tetranthera ferruginea*. It is clear that Brown was in error in making this reduction, for Loureiro's species is apparently identical with the widely distributed Malayan one currently known as *Litsea amara* Blume, of which I have numerous specimens from Indo-China, the Malay Peninsula, and Java. The Australian species currently known as *Litsea ferruginea* (R. Br.) Benth. & Hook. f. needs a new name as the specific name is invalidated in *Litsea* by *L. furruginea* Blume; it should be known as *Litsea leefeana* (F. Muell.) (*Cylicodaphne leefeana* F. Muell.).

LITSEA PERAKENSIS Gamble in Kew Bull. (1910) 359, Journ. As. Soc. Beng. 75¹ (1912) 160.

Karoland, Kampong Lingga, *Bartlett & La Rue* 117, June 6, 1918.

Perak, Johore, Singapore.

LEGUMINOSAE

DESMODIUM Desvaux

DESMODIUM VIRGATUM Zoll. Nat. Geneesk. Archip. Ind. 3 (1846) 58; Prain in Journ. As. Soc. Beng. 66² (1897) 142.

Karoland, Bintang Mariah, *Bartlett & La Rue* 128, June 7, 1918, with the local name *gambir gambir*.

Chittagong, Burma, Perak, Java, and Luzon.

DESMODIUM ZONATUM Miq. Fl. Ind. Bat. 1¹ (1855) 250; Gagnep. in Not. Syst. 3 (1916) 297.

Karoland, Sarinambah, *Bartlett & La Rue* 145, June 8, 1918.

This species extends from Ceylon to the Philippines and New Guinea and in most recent literature appears as *Desmodium ormocarpoides* DC. The latter is, however, an entirely different species, as Gagnepain has shown.

DESMODIUM LASIOCARPUM (Beauv.) DC. Prodr. 2 (1825) 328.

Hedysarum lasiocarpum Beauv. Fl. Oware et Benin 1 (1804) 32, t. 18.

Desmodium latifolium DC. Prodr. 2 (1825) 328.

Karoland, Soesoek, *Bartlett & La Rue* 321, July 8, 1918, with the local name *gambir gambir*.

A common and widely distributed species in the tropics of the Old World.

MIMOSA Linnaeus

MIMOSA INVISA Mart. in Flora 20¹ (1837) Beibl. 121.

Asahan, Kampong Silau Meradja, *Bartlett & La Rue* 394, October 24, 1918, with the local name *si madoeridoeri*.

A native of Brazil, introduced here.

PITHECOLOBIUM Martius

PITHECOLOBIUM JIRINGA (Jack) Prain in Journ. As. Soc. Beng. 66¹ (1897) 267, in nota.

Mimosa jiringa Jack in Malay. Miscel. 1¹ (1820) 14.

Inga jiringa Jack op. cit. 2¹ (1822) 78.

Pithecolobium lobatum Benth. in Hook. Lond. Journ. Bot. 3 (1844) 208.

Asahan, Silau Meradja, *Bartlett & La Rue* 148, 417, June and October, 1918, with the local names *djering* and *djaring*.

The earlier names *Mimosa keoringa* Roxb. and *M. djiringa* Roxb., both proposed by Roxburgh in 1814, are *nomina nuda*, although Roxburgh published a description of the former in 1832. Jack's specific name should be adopted for this Malayan species which extends from Tenasserim to Java and Borneo, but which does not extend to the Philippines.

MELIACEAE

CIPADESSA Blume

CIPADESSA BACCIFERA (Roth) Miq. Ann. Mus. Bot. Lugd.-Bat. 4 (1868) 6.

Melia baccifera Roth Nov. Pl. Sp. (1821) 215.

Karoland, Bintang Mariah, *Bartlett & La Rue* 326, August 10, 1918, with the local name *koendoelen pamal*.

Ceylon to Java and the Philippines.

EUPHORBIACEAE

SUMBAVIOPSIS J. J. Smith

SUMBAVIOPSIS ALBICANS (Blume) J. J. Sm. in Meded. Dept. Landbouw 10 (1910) 357; Pax in Engl. Pflanzenreich 57 (1912) 14.

Adisca albicans Blume Bijdr. (1825) 611.

Karoland, Kampong Bintang Mariah, *Bartlett & La Rue* 131, June 7, 1918, with the local name *sempaling*.

A monotypic genus, the species now being known from Sumatra, Java, and Palawan.

CELASTRACEAE

PERROTTETIA Humbolt, Bonpland, and Kunth

PERROTTETIA ALPESTRIS (Blume) Loesen. in Engl. & Prantl Nat. Pflanzenfam. 3^e (1892) 220; Koord. & Val. in Ic. Bogor. 2 (1904) 137, t. 127.

Celastrus alpestris Blume Bijdr. (1826) 1145.

Karoland, Sinaboen, *Bartlett & La Rue* 218, June 30, 1918, in mountain jungle.

Java, Borneo, and the Philippines.

RHAMNACEAE

ZIZYPHUS Jussieu

ZIZYPHUS CALOPHYLLA Wall. in Roxb. Fl. Ind. 2 (1824) 366.

Asahan, Silau Meradja, *Bartlett & La Rue* 407, October 27, 1918, with the local name *si silan niboet*.

Penang, Malay Peninsula, Singapore, Bangka (*Zizyphus ornata* Miq.).

VITACEAE

LEEA Royen

LEEA INDICA (Burm. f.) comb. nov.

Staphylea indica Burm. f. Fl. Ind. (1768) 75, t. 23, f. 2.

Aquilicia sambucina Linn. Mant. 2 (1771) 211.

Leea sambucina Willd. Sp. Pl. 1 (1797) 1177.

Asahan, Boenoet, *Bartlett & La Rue* 48, May 17, 1918, with the local name *pubentjil*.

This species is widely distributed in the Indo-Malayan region, Burman's type apparently being a Javan specimen. It is currently known as *Leea sambucina* (Linn.) Willd., but Burman's name being the older should be adopted. The Linnean binomial is apparently typified by Burman's figure and description, *Staphylea indica* Burm. f. being cited by Linnaeus as a synonym of his species; there is no specimen in the Linnean herbarium.

MALVACEAE

HIBISCUS Linnaeus

HIBISCUS MACROPHYLLUS Roxb. Hort. Beng. (1814) 51, *nomen nudum*; DC. Prodr. 1 (1824) 455.

Karoland, Soesoe, *Bartlett & La Rue* 209, June 30, 1918, with the local name *anoek anoek*.

India, Penang, Perak, Java.

SIDA Linnaeus

SIDA CORYLIFOLIA* Wall. Cat. (1829) No. 1865, *nomen nudum*; Mast. in Hook. f. Fl. Brit. Ind. 1 (1874) 324.

Karoland, Kampong Lingga, *Bartlett & La Rue* 149, with the local name *oeboeng oeboeng*; Asahan, Kampong Silau Meradja, *Bartlett & La Rue* 339, with the local name *tamba loea*.

Burma, Indo-China, Hainan, Java, Madura, Boeton, Philippines; not recorded from the Malay Peninsula.

WISSADULA Medicus

WISSADULA PERIPLOCIFOLIA (Linn.) Thwaites Enum. Pl. Zeyl. (1859) 27.

Sida periplocifolia Linn. Sp. Pl. (1753) 684.

Asahan, Silau Meradja, *Bartlett & La Rue* 340, October 10, 1918, with the local name *boeloeng boeloeng pagar*.

A widely distributed tropical species not previously recorded from Sumatra.

STERCULIACEAE

FIRMIANA Marsigli

FIRMIANA COLORATA (Roxb.) R. Br. in Benn. Pl. Jav. Rar. (1844) 235.

Sterculia colorata Roxb. Pl. Coromandel 1 (1795) 26, t. 25.

Karoland, Kampong Goenoeng Merlawan, *Bartlett & La Rue* 206, June 28, 1918, with the local name *tjipa tjipa*.

India, Ceylon, and the Andaman Islands.

FLACOURTIACEAE

OSMELIA Thwaites

OSMELIA BARTLETTII sp. nov.

Frutex vel arbor, ramulis inflorescentiisque pubescens; foliis chartaceis oblongo-ellipticis, 7 ad 9 cm longis, glabris vel subtus ad costa nervisque leviter pubescentibus, acuminatis, nervis utrinque 4, curvatis, perspicuis; inflorescentiis paniculatis, ramis paucis, spiciformibus, elongatis; floribus 4-meris.

A shrub or tree, nearly glabrous except the pubescent younger parts and inflorescences. Branches terete, glabrous, grayish, the branchlets rather densely pubescent with subferrugineous hairs. Leaves chartaceous, oblong-elliptic, 7 to 9 cm long, 3.5 to 4.5 cm wide, entire, brownish-olivaceous when dry, the lower surface paler, base usually acute, sometimes obtuse, apex shortly acuminate, the upper surface entirely glabrous, the lower surface glabrous or obscurely pubescent on the midrib and nerves; lateral nerves usually 4 on each side of the midrib, distinct, prominently curved, not anastomosing, the reticulations slender, subparallel; petioles about 1 cm long, more or less pubescent. Panicles axillary, and terminating lateral leafy branchlets, the leaves on these branchlets much smaller than the normal ones, 2 to 3 cm long, the branches of the inflorescence few, simple, up to 10 cm in length, pubescent. Flowers subsessile, usually scattered, never glomerate, about 5 mm in diameter, 4-merous, their pedicels 1 mm long or less. Sepals 4, oblong-elliptic, obtuse, 3 mm long, slightly pubescent outside. Stamens 8, their filaments slightly pilose, equal, about 2 mm long, the alternating lobes united for the lower 0.8 mm, one lobe alternating with each filament, the free parts oblong-obovate, densely pilose, about 1 mm long; ovary oblong-elliptic, densely pubescent.

SUMATRA, East Coast, Asahan, in deep jungle at Bandar Poelo, *Bartlett & La Rue* 37, May 16, 1918.

This species is apparently most closely allied to *Osmelia main-gayi* King, of the Malay Peninsula, and possibly is represented by *Beccari* 928 from Sumatra mentioned by King in a note following his description. It is distinguished among all the hitherto described species of the genus by its few-nerved leaves. This small genus, for many years known only from Ceylon and the Philippines, is now represented by 7 or 8 species, the known range of the genus now being Ceylon, Sumatra, Malay Peninsula, Borneo, the Philippines, and Celebes.

MELASTOMATACEAE

MEMECYLON Linnaeus

MEMECYLON LARUEI sp. nov.

Frutex vel arbor parva, ramis teretibus, ramulis 4-angulatis et anguste 4-alatis; foliis coriaceis, lanceolatis, sessilibus vel subsessilibus, usque ad 20 cm longis et 5.5 cm latis, basi rotundatis, plerumque subcordatis, sursum angustatis, tenuiter acute acuminatis, nervis utrinque circiter 15, rectis, perspicuis, cum nervis marginalibus anastomosantibus; inflorescentiis axillari-bus, solitariis, paniculatis, longe pedunculatis, 10 ad 15 cm longis.

A glabrous shrub or small tree, the branches terete, about 3 mm in diameter, the branchlets sharply 4-angled and narrowly winged, the wings not appendiculate at the nodes, the internodes 4 to 5 cm long. Leaves coriaceous, lanceolate, sessile or subsessile, base rounded and usually slightly cordate, gradually narrowed upward to the long, slenderly acuminate apex, 14 to 20 cm long, 3 to 5.5 cm wide, usually shining, the midrib impressed on the upper surface, very prominent on the lower surface; primary lateral nerves about 15 on each side of the midrib, distinct on the lower surface, anastomosing with the equally prominent, slightly arched, marginal nerves, 2.5 to 5 mm from the edge of the leaf, reticulations obsolete. Inflorescences axillary, solitary, long-peduncled, paniculate, 10 to 15 cm long, the branches few, opposite, spreading, the lower ones up to 4 cm long, usually sulcate. Flowers subumbellately arranged at the tips of the branchlets, their pedicels about 3 mm long, each subtended by several, lanceolate, acuminate, 1 mm long bracteoles, the bracts subtending the branches similar to the bracteoles but twice as long. Calyx shallowly cup-shaped, 2.5 to 3 mm in diameter, somewhat 4-toothed. Petals obliquely and broadly ovate, about 2 mm long.

SUMATRA, East Coast, Asahan, in second-growth jungle at Lau Boeloeh, *Bartlett & La Rue* 236, July 1, 1918.

This species belongs in the group with *Memecylon appendiculatum* Blume, *M. paniculatum* Jack and *M. costatum* Miq. and perhaps is most closely allied to Jack's species, the type of which was from Sumatra. It is well characterized by its lanceolate leaves, which are more or less gradually narrowed upward from the lower one-third to the slenderly and sharply acuminate apex.

ERICACEAE

VACCINIUM Linnaeus

VACCINIUM HASSELTII Miq. Ann. Mus. Bot. Lugd.-Bat. 1 (1863-64) 40.

Near Balige Taba, *Bartlett & La Rue 497*, October 4, 1918.
Malay Peninsula, Singapore, Bangka.

CLETHRACEAE

CLETHRA Linnaeus

CLETHRA SUMATRANA J. J. Sm. in Ic. Bogor. 4 (1910) t. 319.

Near Balige Taba, *Bartlett & La Rue 496*, October 4, 1918.
The second collection of this endemic species.

. EBENACEAE

DIOSPYROS Linnaeus

DIOSPYROS WALLICHII King & Gamble in Journ. As. Soc. Beng. 74¹ (1905) 220.

Asahan, Silau Meradja, *Bartlett & La Rue 345*, October 11, 1918, with the local name *boea sahoepang*.

Widely distributed in the Malay Peninsula but hitherto not reported from elsewhere.

APOCYNACEAE

PARAMERIA Benth

PARAMERIA BARBATA (Blume) K. Schum. in Engl. & Prantl Nat. Pflanzenfam. 4² (1895) 162.

Parsonsia barbata Blume Bijdr. (1826) 1042.

Karoland, Kampong Singga Manik, *Bartlett & La Rue 155*, June 14, 1918.

Burma and Indo-China southward and eastward to Java, the Philippines, and the Moluccas; it is more commonly known as *Parameria glandulifera* Benth.

VERBENACEAE

PREMNA Linnaeus

PREMNA PYRAMIDATA Wall. Cat. (1829) No. 1779, *nomen nudum*; Schauer in DC. Prodr. 11 (1847) 633.

Asahan, Boenoet, *Bartlett & La Rue 46*, May 17, 1918.
Burma to the Malay Peninsula, Java, and Timor.

CLERODENDRON Linnaeus

CLERODENDRON PANICULATUM Linn. Mant. 1 (1767) 90.

Asahan, Silau Meradja, *Bartlett & La Rue 406*, with the local name *si panggil*.

Formosa, Hainan, Indo-China, Siam, and the Malay Peninsula. It is of interest to note that the allied Philippine species, *Clerodendron intermedium* Cham., is currently known to the Tagalogs by a similar name, *casopanguil*.

CALLICARPA Linnaeus

CALLICARPA BREVIPETIOLATA sp. nov.

Frutex vel arbor parva, ramulis et subtus foliis densissime stellato-tomentosis; foliis chartaceis, lanceolatis, brevissime petiolatis, usque ad 10 cm longis, basi abrupte lateque rotundatis et distincte cordatis, apice tenuiter acuminatis, margine dentatis, nervis utrinque 10 ad 12; cymis axillaribus, breviter pedunculatis, sub fructu confertis, subglobosis, 1 ad 2 cm diametro.

A shrub or a small tree, the branchlets and lower surface of the leaves very densely and uniformly stellate-tomentose, the indumentum pale brownish, eglandular, the branchlets terete, 1.5 to 2 mm in diameter. Leaves lanceolate, chartaceous, brittle when dry, 7 to 10 cm long, 1.5 to 2.5 cm wide, the upper surface brownish olivaceous, more or less pubescent with short simple hairs, the base abruptly and broadly rounded, distinctly cordate, narrowed upward to the slenderly acuminate apex, the margins rather finely dentate; lateral nerves 10 to 12 on each side of the midrib, not prominent; petioles densely stellate-tomentose, 1 to 2 mm long. Cymes axillary, solitary, stellate-tomentose, peduncled, the peduncles 5 to 10 mm long, in fruit dense, subglobose, 1 to 2 cm in diameter. Fruits very numerous, crowded, globose, 2 to 2.5 mm in diameter, black and rugose when dry, the calyces stellate-pubescent, shallow, about 2 mm in diameter, 4-toothed.

SUMATRA, East Coast, Karoland, Kampong Bintang Mariah, *Bartlett & La Rue 323*, August 10, 1918, with the local name *lae gappa gappa*.

The alliance of this species is manifestly with *Callicarpa rubella* Lindl., from which it is especially distinguished by its very dense stellate-tomentose indumentum, which completely covers the lower surfaces of the leaves.

RUBIACEAE

LASIANTHUS Jack

LASIANTHUS OBLONGUS King & Gamble in Journ. As. Soc. Beng. 73² (1904) 127.

Karoland, Sinaboen, Bartlett & La Rue 212, June 30, 1918.
Malay Peninsula.

LASIANTHUS RHINOCEROTIS Blume Bijdr. (1826) 996.

Karoland, Kampong Bintang Mariah, Bartlett & La Rue 325, August 10, 1918.

Malay Peninsula, Java.

TARENNA Gaertner

TARENNA MOLLIS (Wall.) Valetton in Engl. Bot. Jahrb. 44 (1910) 558, quoad syn. excl. spec. cit. *non Bl. Hb.*

Stylocoryna mollis Wall. Cat. (1848) No. 8454, *nomen nudum*.

Webera mollis Hook. f. Fl. Brit. Ind. 3 (1880) 104.

Asahan and Karoland, Kaban Djahe, Bartlett & La Rue 17, 89, May and June, 1918, with the local name *djaroem djaroem*.

Malay Peninsula. The Bornean specimens originally referred to this species by Valetton represent the allied *Tarenna winkleri* Valetton. *Webera sumatrana* Boerl.⁵ is probably referable to the genus *Pavetta*.

COMPOSITAE

BLUMEA De Candolle

BLUMEA PUBIGERA (Linn.) comb. nov.

Conyza pubigera Linn. Mant. 1 (1767) 113.

Blumea chinensis DC. Prodr. 5 (1836) 444, non *Conyza chinensis* Linn.

Conyza riparia Blume Bijdr. (1826) 699.

Blumea riparia DC. Prodr. 5 (1836) 444.

Asahan, Silau Meradja, Bartlett & La Rue 452, November 9, 1918.

The type of *Conyza pubigera* Linn. was a specimen grown at Upsala, the description conforming closely with the characters of this species currently known as *Blumea chinensis* DC. *Sonchus volubilis* Rumph.,⁶ cited by Linnaeus as a synonym of *Conyza pubigera*, is a good representation of the species under consideration. The type of *Conyza chinensis* Linn., the name-bringing synonym of *Blumea chinensis* DC., was a specimen from China, collected by Toren, and the short original description clearly does not apply to the species currently called *Blumea chinensis* DC. The species, as here interpreted, extends from southern China and Formosa to the Malay Peninsula, Sumatra, Java, Borneo, the Philippines, and the Moluccas.

⁵ In Veth Midden-Sumatra 4 pt. 2¹ (1884) 21, t. 2.

⁶ Herb. Amb. 5: 299, t. 103, f. 2.

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NEW OR NOTEWORTHY PHILIPPINE PLANTS, XV

By E. D. MERRILL

*(From the Botanical Section of the Biological Laboratory, Bureau of
Science, Manila, P. I.)*

Separate from

THE PHILIPPINE JOURNAL OF SCIENCE

Published by the Bureau of Science of the Philippine Government
Manila, P. I.

VOLUME XIV, No. 4, APRIL, 1919

MANILA
BUREAU OF PRINTING
1919

THE PHILIPPINE BUREAU OF SCIENCE

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NEW OR NOTEWORTHY PHILIPPINE PLANTS, XV

By E. D. MERRILL

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

This series of papers was commenced in 1904,¹ the present contribution being essentially like the preceding ones. In the series have been included the descriptions of new genera and species, notes on nomenclature and on obscure species, and records of known genera and species not previously reported from the Philippines. Fourteen genera and about one thousand one hundred fifty-five species, including those of the present paper, have been described as new.

The present paper consists chiefly of the descriptions of one hundred new or presumably new species, with the records of eighteen previously known ones not hitherto recorded from the Philippines. Nine genera are for the first time recorded as Philippine; namely, *Tripogon*, *Festuca* (introduced), *Cryptocoryne*, *Haematocarpus*, *Citriobatus*, *Erodium* (introduced), *Villaresia*, *Sloanea*, and *Cloëzia*. Of these *Citriobatus* and *Cloëzia* are of special interest from the standpoint of phytogeography. *Cloëzia* has hitherto been known only from New Caledonia, where it is represented by six species, the seventh species occurring in the mountains of northeastern Mindanao. *Citriobatus*

¹ Merrill, E. D. New or noteworthy Philippine plants, I, *Govt. Lab. Publ. (Philip.)* 6 (1904) 1-18; II, *op. cit.* 17 (1904) 1-47; III, *op. cit.* 29 (1905) 1-50; IV, *op. cit.* 35 (1905) 1-77; V, *Philip. Journ. Sci.* 1 (1906) *Suppl.* 169-246; VI, *op. cit.* 3 (1908) *Bot.* 219-267; VII, *op. cit.* 4 (1909) *Bot.* 247-330; VIII, *op. cit.* 5 (1910) *Bot.* 167-257; IX, *op. cit.* 7 (1912) *Bot.* 257-357; X, *op. cit.* 9 (1914) *Bot.* 261-337; XI, *op. cit.* 10 (1915) *Bot.* 1-84; XII, *op. cit.* 10 (1915) *Bot.* 287-349; XIII, *op. cit.* 13 (1918) *Bot.* 1-66; XIV, *op. cit.* 13 (1918) *Bot.* 263-333.

is an interesting Australian type, the genus being confined to Australia with the exception of the Javan *C. javanicus* Boerl. & Koord., which is now also recorded from Luzon. Another interesting Australian type, previously known only from Australia and Formosa, is *Ipomoea polymorpha* Roem. & Schultes, now recorded from two localities in northern Luzon.

PANDANACEAE

PANDANUS Linnaeus

PANDANUS PANAYENSIS sp. nov. § *Vinsonia*.

Erectus, circiter 5 m altus; foliis crassissime coriaceis, rigidis, circiter 2.5 m longis, 7 cm latis, basi leviter inflatis et 11 cm latis, apice angustatis, vix acuminatis, margine, basi et apice exceptis, dentibus rigidis armatis; infructescentiis pendulis, syncarpiis 4, ellipsoideis ad oblongis, racemose dispositis, 12 ad 20 cm longis, 8 ad 10 cm diametro; drupis numerosis, $\frac{1}{2}$ superioribus liberis, utrinque subaequaliter angustatis, obscure 5-angulatis, circiter 4 cm longis, 5- ad 10-locellatis, apice truncatis, 5 ad 8 mm diametro, inter loculis leviter sulcatis; stigmatibus planis, subreniformibus, circiter 1.5 mm diametro.

Erect, about 5 m high. Leaves very thickly coriaceous, rigid, about 2.5 m long, the base slightly inflated, about 11 cm wide, soon narrowed to about 7 cm and about this width for most of their length, apex narrowed, scarcely acuminate, the apical and basal margins unarmed, the margins otherwise with distinct, sharp, rigid teeth which gradually decrease in size upward, the midrib on the lower surface armed with short scattered teeth in the median and upper parts. Infructescences peduncled, pendulous, their peduncles up to 40 cm in length, 3-angled, about 1.5 cm in diameter. Syncarps 4, ellipsoid to oblong, 12 to 20 cm long, 8 to 10 cm in diameter, the peduncles of the lateral ones stout, very short, of the terminal one up to 8 cm in length. Drupes very numerous, the upper one-half free, subequally narrowed to both base and apex, about 4 cm long, 1.5 to 2 cm in diameter, somewhat 5-angled, usually 5- to 10-celled, the apex truncate, 5 to 8 mm in diameter, slightly sulcate between the loculi, the sulci about 1 mm deep. Stigmas plane, orbicular to somewhat reniform, about 1.5 mm in diameter.

PANAY, Capiz Province, Mount Macosolon, *Bur. Sci.* 30796 Ramos & Edaño, April 22, 1918, on forested slopes.

This species resembles *Pandanus philippinensis* Merr., from which it is distinguished especially by its differently shaped syncarps, the drupes of which are free in the upper one-half

and scarcely sulcate between the loculi. In *Pandanus philippinensis* the stigmas are distinctly oblique, while in the present species they are plane and not at all elongated, so that the two species scarcely belong in the same section of the genus.

PANDANUS CAMARINENSIS sp. nov.

Frutex erectus, circiter 2 m altus; foliis coriaceis, circiter 2.4 m longis et 5.5 cm latis, margine perspicue armatis, sursum angustatis et tenuiter caudato-acuminatis; syncarpiis solitariis, erectis, oblongo-cylindraceutis, circiter 30 cm longis et 13 cm diametro; drupis numerosis, obovoideis, circiter 5 cm longis et 2.5 ad 3 cm diametro, angulatis, plerumque 7-locellatis, apice truncatis, laevis, stigmatibus planis, haud productis.

An erect shrub, about 2 m high, the leaves about 2.4 cm long and 3.5 cm wide, gradually narrowed upward to the slenderly caudate-acuminate apex, the margins armed with rather prominent antrorse teeth. Syncarps solitary, erect, at maturity nearly enclosed by the leaflike bracts, oblong-cylindric, about 30 cm long and 13 cm in diameter. Drupes numerous, obovoid, somewhat angled by mutual pressure, narrowed below, usually 7-celled, about 5 cm long, 2.3 to 3 cm in diameter, the upper 1 cm free, very slightly narrowed, the apex truncate, flat, smooth, about 2 cm in diameter. Stigmas usually 7, obscure, not at all projecting.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33635 Ramos & Edaño, December 21, 1918, in damp forests at low altitudes.

This species is closely allied to *Pandanus esculentus* Martelli from which it is distinguished chiefly by its much larger, differently shaped syncarps.

GRAMINEAE

ANDROPOGON Linnaeus

ANDROPOGON PHILIPPINENSIS sp. nov. § *Isozygi*, *Arthrolepis*.

Culmis erectis, tenuibus, usque ad 80 cm longis; foliis usque ad 20 cm longis et 4 mm latis, leviter scabridis; racemis longe exsertis, solitariis multifloris, 7 ad 10 cm longis, vagina vix inflata; spiculis sessilibus lanceolatis, 9 mm longis, gluma II aristata, IV longe aristata, arista circiter 3 cm longa; spiculis pedicellatis ♂, circiter 8 mm longis, haud aristatis.

An erect, rather slender, glabrous, apparently tufted grass, 60 to 80 cm high, unbranched, the culms 1 to 1.5 mm in diameter. Leaves up to 20 cm long, about 4 mm wide, slightly scabrid, very slenderly acuminate; nodes glabrous; ligule bearded. Raceme solitary, long-exserted, many flowered, 7 to 10 cm long,

the uppermost sheath scarcely inflated, the rachis rather fragile, its joints about 4 mm long, deeply sulcate on one side, the margins prominently white-bearded, obliquely cucullate at their tips. Spikelets green or green and purple, the sessile ones perfect, lanceolate, about 9 mm long; first glume firm, lanceolate, acuminate, 9 mm long, 2-keeled, the margins inflexed; second glume thinner, 7 mm long, acuminate, keeled above and with a slender, 10 to 12 mm long, apical awn; third glume hyaline, oblong, 5 mm long; fourth glume hyaline, 4 mm long, cleft, about 1 mm wide, the awn geniculate, about 3 cm long. Pedicelled spikelets lanceolate, acuminate, about 8 mm long, not awned, their pedicels 3 to 3.5 mm long, sulcate, margins bearded; first glume lanceolate, acuminate, 2-keeled, usually 7-nerved, the inflexed margins ciliate in the upper part; second glume as long as the first one, hyaline, 1-nerved; third and fourth glumes shorter and narrower, the latter subtending a staminate flower.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32946 (type), 32755 Ramos, July, 1918, growing on open, dry, rocky slopes at low altitudes.

This species is well characterized by its solitary, long-exserted racemes and is distinctly anomalous in the section *Arthrolepis* by this character and also by its sulcate rachis-joints and pedicels; the second glume of the sessile spikelet is long-awned and hence the present species cannot be placed in any of the other subgenera of the series *Isozygi*. The sessile spikelets are all alike throughout the entire length of the raceme, hence it cannot be placed in any of the subgenera of the series *Heterozygi*. So far as I am able to determine it is most closely allied to *Andropogon longipes* Hack., of British India, from which it is readily distinguished by its solitary racemes as well as by its floral characters.

ANDROPOGON GRYLLUS Linn. var. PHILIPPINENSIS var. nov.

Glaberrima, circiter 75 cm alta; foliis 15 ad 27 cm longis, 5 mm latis; paniculis oblongis 12 ad 15 cm longis, purpureis, rachibus ramulisque laevis; spiculis lanceolatis, ♀ circiter 6 mm longis, callo 1.5 mm longo, fulvo-barbato, gluma II breviter aristata, arista 2 ad 3.5 mm longa, ♂ lineari-lanceolatis, 5 ad 6 mm longis, vacuis, gluma II acuminata, vix aristata.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 30964 Ramos & Edaña, April 10, 1918, on boulders and ledges in stream beds, observed only in this habitat.

Andropogon gryllus Linn. extends from southern Europe to Australia and was recorded from the Philippines by F.-Villar, Novis. App. (1883) 316, as *Chrysopogon gryllus* Trin. The typi-

cal form of the species certainly does not occur in the Archipelago, nor can I refer the specimens cited above to any of the described varieties of it. It is apparently most closely allied to the Australian *Andropogon gryllus* Linn. subsp. *genuinus* Hack., var. *pallidus* (R. Br.) Benth., but has distinctly smaller spikelets than this variety, while the pedicellate spikelets are empty and not awned.

ANDROPOGON SANGUINEUS (Retz.) Merr. in Philip. Journ. Sci. 12 (1917) Bot. 101.

Rottboellia sanguinea Retz. Obs. 3 (1783) 25.

Thelepogon sanguineus Spreng. Syst. 1 (1825) 299.

Andropogon pseudograya Steud. Syn. 1 (1855) 365.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32777 Ramos, August 5, 1918, on open grassy slopes at low altitudes.

Southern China, India, Ceylon, and Madagascar.

FESTUCA Linnaeus

FESTUCA MYUROS Linn. Sp. Pl. (1753) 74; Hook. f. Fl. Brit. Ind. 7 (1897) 356.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31913 Santos, April 25, 1918, in open grassy places, altitude about 2,300 meters.

A grass of wide distribution in the North Temperate Zone, a native of Europe or Asia, now also abundant in North America; undoubtedly a recently introduced plant in Benguet.

TRIPOGON Roth

TRIPOGON CHINENSIS (Franch.) Hack. in Bull. Herb. Boiss. II 3 (1903) 503.

Nardurus filiformis Steud. var. *chinensis* Franch. in Nouv. Arch. Hist. Nat. Paris. II 7 (1894) 149.

LUZON, Ilocos Norte Province, Mount Nagapatan, *Bur. Sci.* 33237 Ramos, August 8, 1918, on dry, open, rocky slopes.

This genus is new to the Philippines, the specimen cited above agreeing perfectly with the descriptions and with a series of specimens from Chili Province, collected by Mrs. Clemens. It is reported from as far south as Formosa.

CYPERACEAE

MARISCUS Gaertner

MARISCUS NIVEUS (Murr.) comb. nov.

Schoenus niveus Murr. in Linn. Syst. Veg. ed. 13 (1774) 81.

Scirpus glomeratus Linn. Sp. Pl. (1753) 52, excl. syn. Gronov., non

Mariscus glomeratus Barton.

Schoenus coloratus Linn. var. β Linn. Sp. Pl. ed. 2 (1762) 64.

Cyperus kyllingiaeoides Vahl Enum. 2 (1806) 312.

Mariscus dregeanus Kunth Enum. 2 (1837) 120; C. B. Clarke in Hook. f. Fl. Brit. Ind. 6 (1893) 620.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32826 Ramos, July 24, 1918, on rocky open slopes at low altitudes, abundant.

This species has previously not been reported from the Philippines. India to tropical Africa, the Malay Peninsula, Singapore, and Borneo.

ELEOCHARIS R. Brown

ELEOCHARIS SPIRALIS (Rottb.) Steud. Syn. 2 (1855) 81; C. B. Clarke in Hook. f. Fl. Brit. Ind. 6 (1893) 627.

Scirpus spiralis Rottb. Descr. Ic. (1773) 45, t. 15, f. l.

LUZON, in swamps between Manila and Caloocan, *Merrill* 9788, December, 1914.

India to Ceylon, Burma, Indo-China and ? Mauritius. Not previously reported from the Philippines. It is to be noted that R. Brown does not make the actual combination, *Eleocharis spiralis*, Prodr. (1810) 224, but merely indicates that *Scirpus spiralis* Rottb. belongs in the genus *Eleocharis*.

ARACEAE

CRYPTOCORYNE Fischer

CRYPTOCORYNE APONOGETIFOLIA sp. nov.

Herba glabra, aquatica, demersa; foliis membranaceis, anguste oblongo-lanceolatis, perspicue bullatis, utrinque angustatis, basi acutis vel obtusis, apice acutis et apiculatis, 25 ad 35 cm longis, 3 ad 5 cm latis; petiolo usque ad 30 cm longo; spathis anguste cylindraceis, haud contortis, circiter 25 cm longis, lamina glabra, lanceolata, caudato-acuminata, 6 cm longa, deorsum 1 cm lata.

An entirely glabrous submerged herb from short, rather stout, nearly erect rhizomes about 1 cm in diameter. Leaves membranaceous, narrowly oblong-lanceolate, conspicuously bullate, the midrib very prominent, subequally narrowed to the acute or obtuse base and to the acute and slightly apiculate apex, 25 to 35 cm long, 3 to 5 cm wide; lateral nerves slender, ascending, 5 or 6 on each side of the midrib; petioles up to 30 cm long. Peduncles 4 to 7 cm long. Spathe cylindric, not twisted, slender, including the limb about 25 cm long, slightly inflated at the base, not at all contracted below the limb, the limb lanceolate, glabrous, caudate-acuminate, 6 cm long, about 1 cm wide in the lower part. Carpels usually 6, the slender stipe of the staminate inflorescence about 6 mm long; staminal

inflorescence oblong, about 4 to 5 mm long, the sterile tip 1.2 mm in length.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31119 Ramos & Edaña, April 14, 1918, in shallow water of streams, the spathes pinkish white. To this species I also tentatively refer a sterile specimen from Negros, *For. Bur.* 19411 Curran, June, 1910.

This species is manifestly allied to *Cryptocoryne ciliata* Fisch. from which it is readily distinguished by its membranaceous, conspicuously bullate leaves, which resemble those of some species of *Aponogeton*; and by its much narrower, differently shaped, caudate-acuminate limb of the spathe, which is entirely glabrous.

CRYPTOCORYNE PYGMAEA sp. nov.

Herba glabra, depauperata; foliis membranaceis, oblongis ad oblongo-ovatis, 1.5 ad 4 cm longis, acutis, basi perspicue auriculato-cordatis, nervis utrinque 2, tenuis; spathis circiter 3.5 cm longis, inflatis, tubo oblongo, supra contracto; lamina tubo aequantibus, lanceolatis, caudato-acuminatis, planis, haud contortis.

An entirely glabrous dwarfed plant from short stout rhizomes. Leaves membranaceous, oblong to oblong-ovate, 1.5 to 4 cm long, 1 to 1.5 cm wide, the apex acute, base conspicuously auriculate-cordate; lateral nerves very slender, ascending, about 2 on each side of the midrib; petioles in young plants shorter than the leaves, in mature plants up to 5 cm long, slender, sheathing at the base. Peduncles in anthesis 8 mm long or less, in fruit up to 3 cm long. Spathe greenish white, about 3.5 cm long, the tube and limb of equal length; tube somewhat inflated, oblong, contracted at the apex; limb lanceolate, caudate-acuminate, about 6 mm wide at the base, 1.8 cm long, dark-purple on the inner surface. Carpels usually 6; stigma obtuse; staminate inflorescence ovate, 3 mm long, its sterile tip oblong, 2 mm in length, the slender stipe 6 to 7 mm long.

MINDANAO, Zamboanga District, Sax River, Merrill 8174, December 6, 1911 (type); *Copeland s. n.*, in fruit. This species grows in the crevices of ledges, in stream beds, in very damp shaded ravines, in situations subject to overflow, at an altitude of about 300 meters.

This species is manifestly very closely allied to the Bornean *Cryptocoryne auriculata* Engl. but is smaller in size, with much slenderer, longer, less conspicuously sheathing petioles and fewer nerves; while the tube of the spathe equals the limb in length and is conspicuously contracted at the apex.

URTICACEAE

ELATOSTEMA Forster

ELATOSTEMA PANAYENSE sp. nov.

Herba erecta, 15 ad 40 cm alta, ramis subadpresse hirsutis; foliis inaequilateralibus, oblongo-obovatis, 2.5 ad 7 cm longis, subsessilibus, superne perspicue dentatis, subtus ad costa nervisque perspicue adpresse hirsutis; inflorescentiis ♂ 1 ad 1.5 cm diametro, longe pedunculatis, bracteis exterioribus late ovatis, circiter 7 mm longis, perspicue corniculatis; inflorescentiis ♀ sessilibus vel brevissime pedunculatis, confertis, circiter 8 mm diametro; floribus, 4-meris.

An erect, simple or sparingly branched herb, 15 to 40 cm high, the basal parts of the stems often prostrate and rooting, the stems and branches subappressed-hirsute. Leaves membranaceous and olivaceous when dry, inequilateral, oblong-obovate, 2.5 to 7 cm long, 1.5 to 4 cm wide, sessile or subsessile, the apex rounded to acute, the terminal tooth usually acute, the broader side with 8 to 10, prominent, acute teeth, the narrower side usually with about 5 similar teeth, the margins in the lower one-half entire, base auriculate-rounded on the broader side, acute on the narrower side, somewhat obliquely cordate, the upper surface with numerous, conspicuous, irregularly arranged cystoliths, sometimes with a few long hairs, more often glabrous, the lower surface appressed-hirsute on the conspicuous nerves and reticulations, the cystoliths obscure or obsolete; petioles 2 mm long or less, appressed-hirsute; stipules membranaceous, oblong, glabrous, about 5 mm long. Staminate inflorescences in full anthesis 1 to 1.5 cm in diameter, their pedicels slender, glabrous, 1 to 1.5 cm long; outer bracts very broadly ovate, about 7 mm long, 6 mm wide, conspicuously corniculate, the apical projection 1.5 to 2.5 mm long, the margins ciliate, the inner bracts oblong-obovate, apiculate, 2.3 mm wide; bracteoles spatulate, membranaceous, 4 to 5 mm long, 1 to 1.5 mm wide, ciliate. Staminate flowers 4-merous, very numerous, their pedicels 4 to 5 mm long. Sepals elliptic to elliptic-ovate, 2 to 2.3 mm long, with a few long white hairs near the apex, two of them minutely cucullate and obscurely apiculate. Pistillate inflorescences axillary, sessile, or subsessile, densely many-flowered, up to 8 mm in diameter, the bracteoles spatulate, ciliate, about 3 mm long.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32396 (type), 31032, 31082, 31083, 31084, 30921, 30924, 30925 Ramos & Edaña, April and May, 1918, in damp forests along streams.

This species belongs in the group with *Elatostema obovatifolia* Wedd. and in many characters is similar to *Elatostema elmeri* nom. nov. (*E. pictum* Elm., non Hallier f.), from which it is easily distinguished by its appressed-hirsute branches, nerves, and reticulations on the lower surface of the leaves; *Elatostema elmeri* is glabrous.

ELATOSTEMA MACGREGORII sp. nov.

Herba prostrata, usque ad 16 cm longa, ramis et subtus foliis ad costa nervisque perspicue hirsutis; foliis subsessilibus, obovatis ad oblongo-obovatis, 6 to 12 mm longis, inaequilateralibus basi leviter oblique cordatis, dentibus in partibus superioribus 4 vel 5, conspicuis; inflorescentiis ♂ tenuiter pedunculatis, bracteis exterioribus late ovatis, corniculatis, ♀ sessilibus, bracteolis perspicue ciliatis; floribus, 4-meris.

A slender, prostrate or somewhat ascending, simple or sparingly branched herb, the stems 16 cm long or less, the latter with scattered, ascending or somewhat spreading, hirsute hairs. Leaves green when dry, sessile or subsessile, obovate to oblong-obovate, inequilateral, 6 to 12 mm long, 5 to 8 mm wide, the apex obtuse to subacute, the apical part with 4 or 5 conspicuous, usually rounded teeth, the margins in the lower two-thirds to three-fourths entire, base rounded-auriculate on the broader side, obtuse on the narrower side, somewhat obliquely cordate, the upper surface glabrous and with scattered cystoliths, the lower surface somewhat appressed-hirsute on the midrib and nerves, the latter 2, rarely 3, on each side of the midrib, the cystoliths obsolete; stipules membranaceous, oblong, glabrous, about 2 mm long. Staminate receptacles axillary, solitary, 4 to 5 mm in diameter, their peduncles slender, glabrous, 1 to 2 cm long; outer bracts broadly ovate, about 4 mm long and wide, the apex rounded or retuse, prominently keeled and corniculate, the apiculus about 1.2 mm long, glabrous or nearly so, the inner bracts oblong-ovate, somewhat ciliate; bracteoles spatulate, sparingly ciliate, 3 mm long. Flowers 4-merous, shortly pedicelled. Sepals oblong to oblong-elliptic, 1.5 mm long, two slightly cucullate and minutely apiculate, usually with a few long ciliate hairs above. Pistillate inflorescences sessile, densely many-flowered, about 4 mm in diameter, the bracteoles linear-lanceolate, about 2 mm long, prominently ciliate. Flowers minute, shortly stalked. Achenes 0.8 mm long.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32396 (type), 32407, 32438, 32538 *McGregor*, May 24 and June 14, 1918, in damp forests, altitude 800 to 1,300 meters.

This species is very similar in appearance to *Elatostema filicaule* C. B. Rob., from which it is easily distinguished by its hirsute stems and the hirsute midrib and nerves on the lower surface of the leaves.

ELATOSTEMA ZAMBOANGENSE sp. nov.

Herba erecta, ramis et petiolis et pedunculis dense pallide pubescentibus; foliis plerumque oblongo-ovatis, 7 ad 13 cm longis, in siccitate viridibus, chartaceis ad subcoriaceis, valde inaequilateralibus, utrinque cystolithis numerosis perspicuis instructis, apice acuminatis, margine sursum grosse dentatis; receptaculis ♂ axillaribus, solitariis, pedunculatis, 1 ad 1.5 cm diametro, pedunculo usque ad 2 cm longo, bracteis exterioribus pubescentibus, late rotundatis, bracteolis sepalisque glabris.

An erect, simple herb, attaining a height of 35 cm, the stems, very short petioles, and peduncles rather densely pubescent with short, somewhat appressed, pale hairs. Leaves variable, green when dry, chartaceous to subcoriaceous, very inequilateral, mostly oblong-ovate, 7 to 13 cm long, 3 to 5.5 cm wide, both surfaces with very short, numerous, irregularly disposed, elongated cystoliths, distinctly visible to the naked eye, the apex somewhat acuminate, base broadly rounded on one side, narrowly rounded on the other and laterally cordate, margins entire near the base, rather coarsely toothed above, the teeth broadly triangular; lateral nerves above the basal ones 3 or 4 on each side of the midrib, very prominent on the lower surface, the reticulations lax, prominent; stipules linear-lanceolate, acuminate, 1 to 1.2 cm long. Staminate receptacles axillary, solitary, 1 to 1.5 cm in diameter, their peduncles up to 2 cm long; outer bracts pubescent, apparently reniform and more or less grown together, broadly rounded, about 1 cm wide, somewhat pubescent externally and with numerous, very densely disposed cystoliths; bracteoles narrowly oblong, membranaceous, 4 mm long, glabrous. Staminate flowers very numerous, their pedicels 3 to 4 mm long, glabrous. Sepals 4, membranaceous, glabrous, oblong, two of them distinctly cucullate and more or less corniculate, 2 to 2.5 mm long.

MINDANAO, Zamboanga District, Sax River, back of San Ramon, *Merrill 8228*, November 27, 1911, in a damp, shaded ravine, altitude about 200 meters.

Among the Philippine species with peduncled staminate receptacles this species is apparently most closely allied to *Elatostema carinoi* W. R. Shaw, but is readily distinguished by its pubescent stems and its much elongated pubescent peduncles.

ELATOSTEMA ACUMATISSIMUM sp. nov.

Herba erecta, circiter 50 cm alta, ramulis junioribus pubescentibus, foliis subtus ad costa nervisque parce pilosis; foliis lanceolatis ad anguste lanceolatis, membranaceis, 9 ad 16 cm longis, leviter falcatis, apice tenuiter caudato-acuminatis, margine grosse dentatis, dentibus numerosis, plerumque leviter acuminatis; receptaculis ♂ axillaribus, solitariis, sessilibus, subglobosis, bracteis exterioribus late ovatis ad reniformi-ovatis, 9 mm latis, leviter carinatis, haud corniculatis; bracteolis spatulatis, hirsutis.

An erect, usually unbranched herb, about 50 cm high, the tips of the branches slightly pubescent, the leaves with scattered, rather weak, spreading, pale hairs on the lower surface, the nerves and reticulations beneath dark brown in contrast with the greenish epidermis. Leaves lanceolate to narrowly lanceolate, membranaceous, 9 to 16 cm long, 2 to 3.5 cm wide, olivaceous when dry, somewhat falcate, the upper surface with numerous, irregularly disposed, somewhat elongated cystoliths, these obsolete on the lower surface, the apex slenderly caudate-acuminate, the base slightly inequilateral, both sides of the lamina acute to obtuse, the margins very coarsely toothed, the teeth usually 20 or more on each side, somewhat ovate, their tips usually somewhat acuminate and often incurved, those of the acumen extending at least half way to the midrib; lateral nerves above the basal ones, about 10 on each side of the midrib, very prominent on the lower surface, the reticulations lax, prominent. Staminate receptacles sessile, axillary, solitary, subglobose, about 9 mm in diameter; outer bracts broadly ovate to reniform-ovate, about 9 mm wide, somewhat hirsute, more or less keeled, but scarcely corniculate, the inner bracts oblong, hirsute, keeled, about 4 mm long; bracteoles spatulate, hirsute, as long as the inner bracts. Staminate flowers numerous, pedicelled, the sepals oblong-elliptic, about 2 mm long, their apices prominently ciliate with long white hairs.

LUZON, Tayabas Province, Umiray, *Bur. Sci.* 29015 Ramos & Edaña, June 2, 1917, in damp forests along the river at low altitudes.

The alliance of this species is with *Elatostema angustatum* C. B. Rob. and *Elatostema contiguum* C. B. Rob., but more especially with the latter from which it is especially distinguished by its much larger and more prominently toothed, caudate-acuminate leaves.

ELATOSTEMA ROBINSONII sp. nov.

Herba glabra, erecta, ramosa, 15 ad 30 cm alta; foliis numerosis, chartaceis, viridibus, oblongo-ovatis ad oblongo-ellipticis, sessilibus, 7 ad 15 mm longis, utrinque cystolithis numerosis instructis, acutis, basi 3-plinerviis, inaequilateralibus, margine in $\frac{1}{2}$ inferiore parte integris, superne dentatis, dentibus paucis; inflorescentiis ♂ axillaribus, solitariis, in siccitate flavido-viridibus, brevissime pedicellatis, 5 mm diametro; bracteis exterioribus late ovatis, carinatis, vix corniculatis, vel admodum obscure corniculatis.

An erect, much-branched, glabrous herb, 15 to 30 cm high, the stems apparently succulent when fresh, hard when dry, and about 4 mm in diameter, somewhat sulcate; lower branches up to 20 cm in length, yellowish green when dry. Leaves numerous, chartaceous, green when dry, oblong-ovate to oblong-elliptic, sessile, 7 to 15 mm long, 4 to 7 mm wide, green when dry, both surfaces with numerous, large, irregularly disposed cystoliths, apex acute, base inequilateral, 3-plinerved, one side rounded or obtuse, the other acute, the margins entire in the lower one-half, above with 3 or 4 teeth on one side and 3 to 5 on the other, the teeth distinct, blunt, usually less than 1 mm long; stipules linear-lanceolate, 2 to 2.5 mm long. Staminate receptacles axillary, solitary, numerous, yellowish green when dry, very shortly pedicellate, turbinate, about 5 mm in diameter, with as many as 14 flowers, but few developing at one time; pedicels about 1 mm long; outer two bracts very broadly obovate, densely longitudinally striate, broadly rounded, 3.5 to 4 mm long, keeled, firm, sometimes very slightly corniculate; bracteoles membranaceous, oblong-obovate, about 3 mm long, somewhat thickened in the median part. Pedicels in anthesis 2 mm long. Sepals 4, membranaceous, oblong to elliptic-oblong, 2 mm long, two distinctly corniculate at their apices, the other two acute.

LUZON, Ifugao Subprovince, Mount Polis, *Bur. Sci.* 19727 *McGregor*, January 30, 1913, altitude not indicated.

This species apparently belongs in the group with *Elatostema benguetense* C. B. Rob., but is entirely different from that and all other species known to me; the yellowish-green color of the branchlets and staminate receptacles is very characteristic. The late C. B. Robinson has indicated on the sheet "*Elatostema* sp. nov. = Vidal 3857."

ELATOSTEMA PILOSUM sp. nov.

Herba erecta, sublignosa, ramosa, saltem 40 cm alta, ramulis densissime pilosis, subtus foliis ad costa nervisque perspicue

longe pilosis; foliis oblongis, chartaceis, 1 ad 1.5 cm longis, utrinque angustatis, apice leviter acuminatis, basi inaequilateralibus, margine deorsum integris, superne utrinque 2- vel 3-dentatis; inflorescentiis ♂ axillaribus, solitariis, sessilibus, circiter 4 mm diametro; bracteis exterioribus oblongo-ovatis, acutis, pilosis, haud carinatis; bracteolis linearis, ciliatis.

An erect, woody, much-branched plant, at least 40 cm high, the branchlets densely cinereous-pilose with long spreading hairs, the leaves conspicuously pilose beneath on the midrib and nerves. Old stems about 5 mm in diameter, sparingly pilose with weak hairs. Leaves oblong, chartaceous, 1 to 1.5 cm long, 4 to 7 mm wide, narrowed to the inequilateral base and to the somewhat acuminate apex, the upper surface dark brownish-olivaceous when dry, with numerous irregularly scattered short cystoliths, the margin in the lower two-thirds entire, in the upper one-third usually with two teeth on the narrower side and three on the broader side, base inequilateral, one side of the lamina longer than the other, acute to obtuse, the narrower side acute; stipules linear-lanceolate, about 1.2 mm long. Staminate heads solitary, axillary, sessile, about 4 mm in diameter, the flowers in each head up to 20; outer two bracts oblong-ovate, acute, pilose, 2 mm long, not keeled or corniculate; bracteoles linear, ciliate, membranaceous, 1.5 mm long; pedicels ciliate, as long as the bracteoles. Sepals oblong, membranaceous, ciliate, 1.3 mm long, acute or obtuse, not keeled or corniculate.

LUZON, Nueva Vizcaya Province, near Imugan, *Bur. Sci.* 20060 McGregor, December 29, 1912.

In habit and general appearance this species is similar to *Elatostema halconense* C. B. Rob., from which it differs especially in the dense indumentum on the branchlets, the midrib and nerves beneath being pilose with long spreading hairs, and its distinctly smaller, less prominently toothed leaves.

ELATOSTEMA SUBORBICULARE sp. nov.

Herba prostrata, ramosa, usque ad 15 cm longa, ramulis leviter adpresse hirsutis; foliis orbicularis ad orbiculari-ovatis, inaequilateralibus, 5 ad 13 mm longis, apice rotundatis vel obtusis, basi valde inaequilateralibus, margine superne utrinque paucidentatis; receptaculis ♂ axillaribus, solitariis, sessilibus, circiter 5 mm diametro, bracteis exterioribus obovatis, leviter hirsutis, perspicue carinatis, vix corniculatis, interioribus cum bracteolis oblongo-spatulatis et cum sepalis plus minusve hirsutis vel ciliatis.

An apparently prostrate, more or less branched herb, the main

stems at least 15 cm long, the branches 1.5 to 5 cm long, slender, sparingly appressed hirsute. Leaves suborbicular to orbicular-ovovate, inequilateral, 5 to 13 mm long, brownish when dry, the apex rounded or obtuse, base strongly inequilateral and shallowly laterally cordate, entire below, the upper two-thirds on the broader side with about 4 rounded teeth, the narrower side in the upper one-third with 2 or 3 similar teeth, upper surface with irregularly scattered, distinct, elongated cystoliths, these obsolete on the lower surface; stipules oblong-elliptic, membranaceous, glabrous, usually obtuse to acute, 3 mm long. Staminate receptacles axillary, solitary, sessile, about 5 mm in diameter; bracts broadly obovate, about 5 mm long, sparingly hirsute, prominently keeled, scarcely corniculate, the apex broadly rounded, the inner ones thinner, somewhat hirsute, truncate, keeled, as long as the outer ones, about one-half as wide; bracteoles membranaceous, hirsute, oblong-spatulate, narrowly oblong-ovovate, 4 mm long, obtuse; sepals oblong-elliptic, membranaceous, about 2 mm long, two acute, two distinctly corniculate, all sparingly ciliate at their apices. Pistillate receptacles axillary, solitary, 5 mm in diameter.

LUZON, Ifugao Subprovince, Mount Polis, *Bur. Sci.* 19729 *McGregor*, February 14, 1913.

The alliance of this species is with *Elatostema obovatum* Wedd., from which it is especially distinguished by its smaller, suborbicular leaves, which have much fewer teeth.

ELATOSTEMA DIVERSILIMBUM sp. nov.

Herba erecta, usque ad 30 cm alta, e basi decumbente, simplex vel leviter ramosa, caulis adpresse hirsutis; foliis valde variabilis, 1 ad 9 cm longis, 1 ad 4 cm latis, inaequilateralibus, plerumque obovatis ad oblongo-obovatis, glabris, cystolithis utrinque numerosis, apice acuminatis, basi 3-plinerviis, leviter inaequilateraliter cordatis, margine grosse dentato-serratis; receptaculis axillaribus, solitariis, sessilibus, 8 ad 10 diametro, bracteis exterioribus rotundatis vel reniformibus, glabris, haud corniculatis, bracteolis membranaceis, leviter ciliatis, spatulatis, 3 ad 4 mm longis; sepalis 2 ad 2.5 mm longis, 2 distincte corniculatis.

An erect or ascending herb from a decumbent base, up to 30 cm long, simple or sparingly branched, the stems succulent, when dry brownish, more or less hirsute. Leaves chartaceous, greenish-olivaceous when dry, exceedingly variable, strongly inequilateral, 1 to 9 cm long, 1 to 4 cm wide, the smaller ones on young plants and on the few branchlets, mostly obovate to oblong-ovovate, distinctly acuminate, base somewhat narrowed, obtuse

and laterally cordate, the margins coarsely dentate-serrate, the teeth on the broader side 8 to 10, on the narrower side 4 to 6; nerves and reticulations prominent on the lower surface, the latter lax, brownish, the base 3-plinerved. Pistillate and staminate receptacles axillary, solitary, sessile, 8 to 10 mm in diameter. Outer bracts rounded to reniform, glabrous, not at all corniculate, the inner ones obovate to oblong-obovate; bracteoles spatulate, membranaceous, 3 to 4 mm long, slightly ciliate above. Sepals of the staminate flowers membranaceous, 2 to 2.5 mm long, two of them distinctly corniculate.

MINDANAO, Zamboanga District, mountains back of Zamboanga, *Merrill 9127*, December 6, 1911, in damp shaded ravines along small streams on banks and ledges, altitude 200 to 400 meters.

This species is most strikingly characterized by its very diverse leaves, which vary enormously in size, even on the same plant; in the larger specimens they are as much as 9 cm long and 4 cm wide, but on some of the smaller specimens and on the branches they are very much smaller, sometimes not more than 1 cm long and wide. The general alliance of the species appears to be with *Elatostema carinoi* W. R. Shaw.

ELATOSTEMA APPENDICULATUM sp. nov.

Herba erecta e basi decumbente, usque ad 30 cm alta, ramis et subtus foliis ad costa nervisque hirsutis; foliis membranaceis, inaequilateralibus, leviter falcatis, oblongis, 6 ad 11 cm longis, acutis, basi inaequilateralibus, 3-plinerviis, margine grosse dentato-serratis, pagina superiore cystolithis multis instructis, in siccitate olivaceis, nervis reticulisque subtus brunneis, valde perspicuis; receptaculis ♂ axillaribus, solitariis, sessilibus, subglobosis, 6 ad 8 mm diametro, bracteis exterioribus orbicularibus, leviter ciliatis, 8 mm diametro, longe corniculatis, bracteolis membranaceis, oblongis ad oblanceolatis, perspicue longe ciliatis, dorso longe tenuiter appendiculato; sepalis 2 ad 2.5 mm longis, sursum ciliato-hirsutis, 2 distincte corniculatis.

An erect unbranched herb, 25 to 30 cm high, the stems and the leaves beneath on the nerves and reticulations conspicuously hirsute with spreading, pale or brown hairs. Leaves membranaceous, olivaceous or greenish-olivaceous when dry, somewhat falcate, oblong, inequilateral, 6 to 11 cm long, 2 to 3 cm wide, the prominent nerves and lax reticulations on the lower surface dark brown in contrast to the greenish epidermis, the apex acute, base inequilateral, rounded on one side, acute on the other, 3-plinerved, the margins in the lower one-fourth entire, otherwise

rather coarsely dentate-serrate, usually 10 to 12 teeth on each side, the upper surface glabrous, with numerous, irregularly disposed, elongated cystoliths; petioles 2 mm long or less; stipules lanceolate, about 8 mm long. Staminate receptacles axillary, solitary, sessile, globose, 6 to 8 mm in diameter, the two external bracts orbicular, somewhat ciliate, broadly rounded, prominently corniculate, the appendage 2 to 3 mm long; bracteoles variable, oblong to oblanceolate, membranaceous, 4 to 5 mm long, prominently ciliate with long white hairs and with a very slender, ciliate, 2 to 3 mm long appendage from the back at or above the middle. Sepals of the staminate flowers 4, membranaceous, ciliate above, 2 to 2.5 mm long, two of them distinctly corniculate.

LUZON, Tayabas Province, Mount Tuloag, *Bur. Sci.* 29129 Ramos & Edaño, May 25, 1917, along small streams in damp forests at low altitudes.

The alliance of this species is not entirely clear, although, with the exception of the indumentum and its bract and floral characters, it resembles *Elatostema carinoi* W. R. Shaw. It is readily distinguished by its laxly reticulate leaves, the nerves and reticulations being dark brown in contrast to the green epidermis, and distinctly ciliate, as well as by its peculiarly appendaged bracteoles.

ELATOSTEMATOIDES C. B. Robinson

ELATOSTEMATOIDES SAMARENSE sp. nov.

Planta erecta, saltem 50 cm alta, sublignosa; foliis chartaceis vel subcoriaceis, inaequilateraliter oblongo-ovatis, circiter 15 cm longis et 6 cm latis, apice tenuiter acuminatis, margine distanter grosse dentatis, inferne plerumque integris vel subintegris, subtus ad nervis et nervulis perspicue molliter pilosis; cymis ♂ sessilibus, circiter 1.5 cm diametro, floribus numerosis, confertis, perianthii segmentis 5, bracteolis oblongo-lanceolatis, pubescentibus.

An erect, apparently unbranched, woody plant, at least 50 cm high, the stems nearly glabrous below, above more or less pilose with rather long spreading hairs. Leaves chartaceous or subcoriaceous, inequilateral, oblong-ovate, about 15 cm long and 6 cm wide, dark brown when dry, the upper surface with numerous, irregularly disposed, short cystoliths, the lower surface softly pilose with rather long spreading hairs on the nerves and reticulations, apex slenderly acuminate, base narrowed, inequilateral, rounded on the broader side, acute or somewhat rounded on the narrower side, the more prominent nerve on the narrower side leaving the midrib well above the base, margins distantly

and rather coarsely toothed, at least in the upper part, below often entire or nearly so, nerves prominent, arched, anastomosing, the primary ones above the basal pair 3 or 4 on each side of the midrib. Staminate cymes axillary, sessile, about 1.5 cm in diameter, the flowers numerous, crowded, the subtending bracteoles oblong-lanceolate, 1.5 to 2 mm long, pubescent; pedicels pubescent, about 1.5 mm long. Perianth segments of the staminate flowers 5, oblong to oblong-elliptic, 2 mm long, somewhat ciliate, some of them distinctly corniculate or keeled-corniculate at the apex.

SAMAR, Yabong, *Bur. Sci.* 17468 Ramos, March 16, 1914, in damp forests near small streams at low altitudes.

The alliance of this is manifestly with *Elatostematoides manillense* C. B. Rob., from which it is especially distinguished by its prominently pilose midrib, nerves, and reticulations on the lower surface of the leaves.

BOEHMERIA Jacquin

BOEHMERIA ZOLLINGERIANA Wedd. in Ann. Sci. Nat. Bot. IV 1 (1854) 201, DC. Prodr. 16¹ (1869) 208.

LUZON, Ilocos Norte Province, Mount Nagapatan, *Bur. Sci.* 33129 Ramos, August, 1918; Bangui, *Bur. Sci.* 27478 Ramos, March, 1917; Pangasinan Province, Umingan, *Bur. Sci.* 18322 Otones, May, 1914, in ravines and on open slopes, ascending to an altitude of 550 meters.

Weddell's species was based on a Javan specimen. It has been also recorded from Formosa by C. H. Wright,² who, however, identified the Formosan material from the description alone. The Philippine specimens agree closely with our rather full series of Formosan ones.

ARISTOLOCHIACEAE

ARISTOLOCHIA Tournefort

ARISTOLOCHIA MEMBRANACEA sp. nov. § *Diplolobus*.

Frutex parvus, ut videtur erectus, ramulis 1 ad 2 mm diametro; foliis membranaceis, oblongis ad oblongo-lanceolatis, 8 ad 15 cm longis, acuminatis, basi cordatis, lobis rotundatis, utrinque ad costa nervisque leviter pubescentibus, nervis utrinque 8 ad 10, tenuibus; inflorescentiis axillaribus, paucifloris; floribus circiter 3 cm longis, leviter pubescentibus; capsulis obovoideis, 1 cm longis, glabris.

² Journ. Linn. Soc. Bot. 26 (1899) 488.

Slender, apparently erect, the branchlets somewhat zigzag, 1 to 2 mm in diameter, pubescent with short spreading hairs. Leaves membranaceous, oblong to oblong-lanceolate, 8 to 15 cm long, 3 to 5 cm wide, mostly equilateral, base broadly rounded and prominently cordate, the sinus up to 1 cm wide and deep, rounded, narrowed upward to the acuminate apex, olivaceous and shining when dry, both surfaces sparingly pubescent on the midrib and nerves; basal nerves usually two pairs, not however sharply distinguished from the lateral nerves, all of the nerves rather slender, distinct, curved, anastomosing, up to 10 on each side of the midrib; petioles 3 to 5 mm long, somewhat pubescent. Inflorescences axillary, about as long as the petioles, somewhat pubescent, few-flowered, but one flower developing at a time; bracts oblong to spatulate, 3 to 5 mm long. Flowers about 3 cm long, pubescent externally with scattered spreading hairs, the ovarian part of the tube about 4 mm long, the globose part about 4 mm long, somewhat curved above the globose part, the tube about 10 mm long, the short lobe broadly ovate, rounded, about 4 mm long, the long one about 15 mm in length, acute or acuminate. Stamens apparently 8. Column with 6 flattened lobes. Capsule glabrous, obovoid, about 1 cm long. Seeds triangular in outline, 3 mm long, concavo-convex; convex surface distinctly papillate.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33338 Ramos, August 22, 1918, on dry slopes and ridges, altitude about 350 meters.

This species is allied to *Aristolochia sericea* Blanco (*A. imbricata* Mast.) from which it is distinguished especially by its prominently cordate, thinner, less pubescent leaves, its much less pubescent flowers, and its glabrous capsules.

CARYOPHYLLACEAE

STELLARIA Linnaeus

STELLARIA MEDIA (Linn.) Cyr. Char. Comm. (1784) 36; Edgw. & Hook. f. in Hook. f. Fl. Brit. Ind. 1 (1784) 230.

Alsine media Linn. Sp. Pl. (1753) 272.

LUZON, Benguet Subprovince, Baguio, *Merrill* 9699, May, 1914; Pauai, *Bur. Sci.* 31861 Santos, May 4, 1914, altitude 1,500 to 2,300 meters.

A universally distributed weed in the north temperate regions, a native of Asia; unquestionably a recently introduced plant in Benguet.

MENISPERMACEAE

HAEMATOCARPUS Miers

HAEMATOCARPUS SUBPELTATUS sp. nov.

Frutex scandens, glaber; foliis coriaceis, basi rotundatis et leviter peltatis, oblongis ad oblongo-ellipticis, 9 ad 14 cm longis, apice tenuiter acuminatis; inflorescentiis ♂ axillaribus, racemosis vel depauperato-paniculatis, 3 ad 8 cm longis; floribus circiter 8 mm diametro, sepalis plerumque 12, lineolatis, exterioribus minoribus; petalis 6, quam sepalis interioribus minoribus, basi inflexo-auriculatis.

A scandent woody vine, glabrous except the very slightly pubescent sepals, the branches up to 4 mm in diameter. Leaves coriaceous, oblong to oblong-elliptic, pale and shining when dry, 9 to 14 cm long, 3.5 to 5.5 cm wide, base rounded and slightly peltate, the petiole inserted 1 to 2 mm from the margin, the apex rather slenderly acuminate; basal nerves 2 on each side of the midrib, nearly as prominent as the midrib and extending nearly to the apex, the secondary nerves slender, spreading at nearly right angles and with the reticulations distinct on both surfaces; petioles about 2 cm long. Staminate inflorescences axillary, solitary, racemose or depauperate-paniculate, 3 to 8 cm long. Staminate flowers yellow, about 6 mm in diameter, their pedicels 2 to 5 mm long. Outer 2 or 3 sepals less than 1 mm long, broadly ovate, the next three sepals ovate, obtuse, about 1.2 mm long, the inner six elliptic, rounded, 3 to 3.5 mm long, all of the sepals prominently lineolate, their margins slightly ciliate. Petals 6, somewhat thicker than the sepals, broadly elliptic to elliptic-obovate, rounded, 2.5 to 3 mm long, base inflexed-auriculate, stamens 6, free, their filaments 1 mm long; anthers broadly ovate, acuminate, 1 to 1.2 mm long, the connectives broad, produced.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33750 Ramos & Edaño, December 22, 1918, in forests along streams at low altitudes.

This is the first representative of this small genus to be found in the Philippines; its alliance is with *Haematocarpus comptus* Miers, from which it is distinguished by its much shorter racemose, axillary inflorescences, and its smaller leaves which are rounded and slightly peltate at the base.

ANNONACEAE

ARTABOTRYS R. Brown

ARTABOTRYS MONOGYNUS sp. nov.

Frutex scandens, inflorescentiis exceptis glaber; foliis subcoriaceis, oblongo-ellipticis, nitidis, usque ad 18 cm longis, obtuse

acuminatis, basi acutis, nervis utrinque circiter 12, patulis, distinctis, anastomosantibus; inflorescentiis usque ad 5 cm longis, paucifloris; petalis omnibus aequalibus, linearis, basi inflatis, circiter 1.6 cm longis, pubescentibus; carpellis solitariis, glabris.

A scandent shrub, glabrous except the inflorescence. Branches and branchlets terete, smooth, dark reddish-brown when dry. Leaves subcoriaceous, rather pale when dry, of the same color and shining on both surfaces, oblong-elliptic, 15 to 18 cm long, 5 to 5.7 cm wide, subequally narrowed to the acute base and to the shortly blunt-acuminate apex; lateral nerves about 12 on each side of the midrib, spreading, distinct, anastomosing, the primary reticulations lax; petioles dark-colored and rugose when dry, 5 to 8 mm long. Inflorescences leaf-opposed, up to 5 cm long including the flowers, few-flowered, stout, the peduncle 3 to 4 mm in diameter, sparingly pubescent, ultimately glabrous, strongly hooked, slightly compressed. Flowers white, their pedicels usually about 1 cm long, thickened upward, slightly pubescent. Sepals broadly ovate, thickly coriaceous, black when dry, prominently acuminate, about 3.5 mm long, very slightly pubescent with widely scattered hairs. Petals all similar, the inflated basal portions broadly ovate, 3.5 to 5 mm in diameter, rather densely pubescent, the linear limb up to 16 mm long, about 1.5 mm wide, somewhat pubescent, blunt. Stamens numerous, nearly 2 mm long. Carpel solitary, broadly ovoid, narrowed upward, glabrous, somewhat angled, 1-celled, 2-ovuled. Fruit ellipsoid, brown, about 2 cm long.

LUZON, Zambales Province, Mount Canayayan, near Castillejos, *Bur. Sci.* 26826 *Edaño*, December, 1916, in forests, altitude about 50 meters.

A species manifestly in the alliance with *Artabotrys suarcolens* Blume, but with larger leaves. It is readily distinguished from all described species by its solitary carpels.

ARTABOTRYS CAGAYANENSIS sp. nov.

Frutex scandens, floribus exceptis glaber; foliis oblongis ad oblongo-oblancoelatis, usque ad 20 cm longis, subcoriaceis, in siccate pallidis, basi acutis, apice distincte acuminatis, nervis utrinque 12 ad 14, distinctis; floribus solitariis, flavidis, circiter 5 cm diametro, petalis utrinque dense pubescentibus, interioribus obovatis, circiter 2.5 cm longis et 1.5 cm latis, exterioribus ovatis ad elliptico-ovatis, 3 cm longis et 2 cm latis, obtusis; carpellis circiter 14, pubescentibus, 2 mm longis.

A scandent shrub, glabrous except the flowers. Branches terete, rugose, brownish or reddish-brown. Leaves oblong to

oblong-oblongeolate, subcoriaceous, rather pale and shining when dry, 16 to 20 cm long, 3.5 to 7 cm wide, base acute, apex distinctly acuminate, the acumen 1 cm long or less, blunt; lateral nerves 12 to 14 on each side of the midrib, distinct, curved, anastomosing, the reticulations slender; petioles reddish-brown, about 8 mm long. Hooks rather stout, strongly recurved, about 2 cm to the bend, glabrous. Flowers yellow, solitary, about 5 cm in diameter, their pedicels densely pubescent, 2 to 2.5 cm long. Sepals coriaceous, narrowly ovate, obtuse, densely pubescent, about 11 mm long and 8 mm wide. Petals spreading above the united portions, the flowers about 5 cm in diameter, coriaceous, rather densely pubescent on both surfaces, the outer ones ovate to elliptic-ovate, obtuse, about 3 cm long and 2 cm wide, the inner ones obovate, about 2.5 cm long and 1.5 cm wide, obtuse or obtusely acuminate, the inflated base formed by the united lower parts of the petals about 8 mm in diameter. Stamens indefinite, 2 mm long. Carpels about 14, oblong, about 2 mm long, pubescent.

LUZON, Cagayan Province, Peñablanca, *Adduru 136*, May 28, 1917, *Bur. Sci. 22719 Castillo*, April 24, 1915, on forested slopes at low altitudes.

A species well characterized among the Philippine forms by its unusually large flowers and broad petals.

GONIOTHALAMUS Hooker f. and Thomson

GONIOTHALAMUS LANCIFOLIUS sp. nov.

Arbor circiter 7 m alta, novellis et floribus exceptis glabra; foliis lanceolatis, chartaceis, usque ad 33 cm longis et 5 cm latis, nitidissimis, acuminatis, basi acutis, nervis utrinque 25 ad 30, distinctis; floribus axillaribus et caulinis, solitariis, tenuiter pedunculatis, petalis exterioribus ovato-lanceolatis ad oblongo-lanceolatis, 7 ad 8 cm longis, acuminatis, extus ad basi dense fulvo-pubescentibus, interioribus circiter 1.2 cm longis, densissime pallide pubescentibus.

A tree, about 7 m high, entirely glabrous except the growing tips of the branchlets and parts of the flowers. Branches terete, pale brownish, glabrous. Leaves chartaceous, lanceolate, 19 to 33 cm long, 3 to 4 cm wide, the upper surface greenish olivaceous, very strongly shining, the lower somewhat brownish, the apex slenderly acuminate, base acute; primary lateral nerves 25 to 30 on each side of the midrib, slender, distinct, anastomosing, the reticulations lax; petioles about 8 mm long. Flowers 7 to 8 cm long, greenish-yellow, dark-brown when dry, odorless, solitary, axillary and from tubercles on the trunk, their pedicels 2.5 to 3

cm long, often appressed fulvous-pubescent at the base. Calyx about 1 cm in diameter, somewhat pubescent, the lobes short. Outer three petals ovate-lanceolate to oblong-lanceolate, 7 to 8 cm long, 2.5 to 3.5 cm wide, narrowed upward to the acuminate apex, glabrous except for the densely fulvous-pubescent basal portion outside; inner three petals about 1.2 mm long, conniving over the stamens, densely pale-pubescent externally.

LUZON, Pangasinan Province, Mount San Isidro, Labrador, *Bur. Sci.* 29992 *Fénix*, November 4, 1917, in forests near the summit, altitude about 400 meters.

This species belongs in the group with *Goniothalamus malayanus* Hook. f. & Th., but is well characterized by its elongated, narrow, strongly shining leaves, and its large, solitary, axillary and cauline flowers.

GONIOTHALAMUS LONGISTYLUS sp. nov.

Arbor parva, floribus exceptis glabra; foliis oblongis, in siccitae olivaceis, usque ad 16 cm longis, acuminatis, basi acutis, nervis utrinque 9 ad 11, patulis, tenuibus; inflorescentiis truncifloris, floribus pedicellatis, fasciculatis, circiter 4 cm longis, petalis exterioribus glabris, oblongo-ovatis, acuminatis, interioribus late ovatis, 2 cm longis, extus leviter, intus densissime pubescentibus; carpellis numerosis, oblongis, pubescentibus, 2 mm longis, stylis valde elongatis, falcatis, acuminatis, 4 ad 4.5 mm longis.

A small tree, glabrous except the flowers and the slightly pubescent fruits. Branches and branchlets slender, terete, black when dry. Leaves oblong, olivaceous, chartaceous, 13 to 16 cm long, 3.5 to 4.5 cm wide, shining, of the same color on both surfaces, subequally narrowed to the acuminate apex and to the acute base; lateral nerves slender, 9 to 11 on each side of the midrib, spreading, anastomosing, the reticulations lax; petioles black when dry, about 1 cm long. Flowers black when dry, reddish-pink, fasciated on small tubercles on the trunk, about 4 cm long, their pedicels about 2 cm in length. Sepals glabrous, broadly ovate, obtuse, obscurely reticulate, about 8 mm long. Outer three petals submembranaceous, glabrous, oblong-ovate, prominently acuminate, about 4 cm long and 2 cm wide, narrowed upward; inner three petals thickly coriaceous, scarcely clawed, cohering, broadly ovate, acuminate, about 2 cm long and 1.3 cm wide, outside sparingly pubescent, inside very densely so. Stamens indefinite, about 2 mm long, the connectives rounded. Carpels many, oblong, pubescent, 2 mm long; styles simple, cylindrical, falcate, 4 to 4.5 mm long, glabrous, acuminate. Fruits eight or more on each peduncle, the peduncles up to 6 cm in

length, the fruits oblong or oblong-obovoid, 4 to 4.5 cm long, 2 to 2.5 cm in diameter, obtuse, base acute, glabrous, black or dark-brown when dry, 1- or 2-seeded.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26639 Ramos & Edaña, August 24, 1916, on forested slopes.

This strongly marked species is not closely allied to any other known Philippine form. It is readily recognized by its cauline, fascicled flowers and its greatly elongated, falcate styles.

MITREPHORA Hooker f. and Thomson

MITREPHORA CAGAYANENSIS sp. nov.

Frutex vel arbor parva (4 m alta fide Castillo), plus minusve ferrugineo-pubescentibus; foliis chartaceis, oblongo-ovatis ad oblongo-ellipticis, usque ad 17 cm longis, basi acutis, apice obtuse acuminatis, nervis utrinque circiter 13, distinctis; floribus paucis, circiter 5 cm diametro, petalis exterioribus lanceolatis, acuminatis, patulis, leviter pubescentibus, circiter 3 cm longis, interioribus circiter 9 mm longis, longe unguiculatis, lamina latissime hastato-ovata, circiter 4 mm longa, intus densissime ciliato-hirsuta.

A shrub or small tree, 4 m high according to Castillo, the branchlets, inflorescences, and lower surface of the leaves on the midrib and nerves more or less ferruginous-pubescent or brownish-pubescent with short hairs. Branches slender, terete, glabrous, rugose when dry, brownish-gray. Leaves chartaceous, oblong-ovate to oblong-elliptic, olivaceous and somewhat shining when dry, 12 to 17 cm long, 5 to 9 cm wide, base acute, apex obtusely acuminate, the upper surface glabrous except the pubescent midrib; lateral nerves about 13 on each side of the midrib, distinct, curved; petioles pubescent, stout, 5 mm long or less. Inflorescences leaf-opposed, short, few-flowered, but a single flower developing at one time, ferruginous-pubescent, the simple axis 5 mm long or less, the pedicels shorter. Bracts ovate, densely pubescent, prominently acuminate, about 6 mm long. Flowers yellow, about 5 cm in diameter. Sepals similar to the bracts in size, shape, and appearance. Outer petals spreading, lanceolate, acuminate, dark-brown or nearly black when dry, appressed-pubescent on both surfaces with rather scattered hairs, the hairs much fewer on the inside, about 3 cm long and 8 mm wide. Inner petals erect, arched, about 9 mm long, their claws about 6 mm long and 1.2 mm wide, glabrous or slightly ciliate, the limbs broadly ovate-hastate, 3 to 4 mm long, 4 to 5 mm wide, externally pubescent with short hairs, inside densely ciliate with dark-brown hairs, acute, base lobed. Stamens inde-

finite, about 1 mm long. Carpels about 8, oblong, appressed-hirsute, about 1 mm long; ovules about 4.

LUZON, Cagayan Province, near Tuguegarao, *Bur. Sci.* 22733 *Castillo*, April 15, 1915, in thickets at low altitudes; Peñablanca, *Addura* 143, sterile, June, 1917.

This species is well characterized by its lanceolate, elongated exterior petals and its long-clawed interior ones, the limbs of the latter being broadly ovate-hastate.

OXYMITRA Hooker f. and Thomson

OXYMITRA MULTINERVIA sp. nov.

Frutex scandens, partibus vetustioribus glaber vel subglaber; foliis ellipticis ad oblongo-ellipticis, subcoriaceis, in siccitate brunneis, nitidis, usque ad 20 cm longis, utrinque late rotundatis vel apice leviter retusis; nervis utrinque circiter 22, subtus valde prominulis; fructibus ellipsoideis ad obovoideis, 1 ad 1.5 cm longis, glabris.

A scandent shrub, in age nearly glabrous. Branches terete, brownish, nearly smooth, glabrous, the branchlets sparingly pubescent. Leaves elliptic to oblong-elliptic, subcoriaceous, brown when dry, shining, the lower surface a little paler than the upper, not at all glaucous, 13 to 20 cm long, 8 to 12 cm wide, broadly rounded at both base and apex, the lower surface very sparingly pubescent along the midrib and nerves; lateral nerves about 22 on each side of the midrib, very prominent on the lower surface, the reticulations subparallel, distinct; petioles 1 to 1.5 cm long. Fruits dark-brown when dry, glabrous, hard, ellipsoid to obovoid, 1 to 1.5 cm long, their pedicels 8 to 12 mm in length.

CATANDUANES, on forested slopes back of Calolbong, *Bur. Sci.* 30456 *Ramos*, December 10, 1917.

This species somewhat resembles *Oxymitra longiflora* Merr. and the very closely allied and perhaps identical *O. obtusifolia* Elm., but is readily distinguished by its much more numerous lateral nerves.

OXYMITRA PLATYPHYLLA sp. nov.

Frutex scandens partibus junioribus parce ferrugineo-pubescentibus; foliis obovatis ad ellipticis, usque ad 20 longis et 12 cm latis, basi cordatis, interdum leviter inaequilateralibus, apice late rotundatis, truncatis, vel obscure brevissime apiculatis, nervis utrinque circiter 13, subtus valde prominentibus, supra, costa exceptis, glabris, subtus ad costa nervisque leviter pubescentibus; fructibus numerosis, pedicellatis, subglabris, ovoideo-globosis, circiter 8 mm diametro, obscure apiculatis.

A scandent shrub, the younger parts, petioles, and leaves on the costa above and on the costa, nerves, and reticulations beneath more or less ferruginous-pubescent. Branches terete, slender, very dark-brown, somewhat rugose. Leaves obovate to elliptic, subcoriaceous, 14 to 20 cm long, 8 to 12 cm wide, base broadly rounded, distinctly cordate, sometimes slightly inequilateral, apex rounded, truncate, or shortly and obscurely apiculate, the upper surface olivaceous, shining, glabrous except the midrib, the lower surface brown, at times slightly glaucous; lateral nerves about 13 on each side of the midrib, very prominent on the lower surface, straight or slightly curved, anastomosing near the margins, the primary reticulations subparallel, prominent; petioles stout, about 4 mm long, more or less pubescent, ultimately nearly glabrous. Infructescences axillary, the peduncles 2.5 to 3 cm long, dark-brown, ultimately glabrous, each bearing 20 to 25 subglobose to ovoid-globose fruits, the infructescences rather dense, globose, about 3 cm in diameter; fruits red when mature, acid, about 8 mm in diameter, sparingly pubescent, apiculate, dark-brown when dry, their pedicels about 8 mm long.

LUZON, Laguna Province, Mount Maquiling, along Molauin River, *For. Bur. 26360 Mabesa*, in forests, altitude 400 to 500 meters.

The alliance of this species is with *Oxymitra obtusifolia* Elm. and *O. longiflora* Merr., from which it is distinguished by its much broader leaves and nearly globose fruits.

PAPUALTHIA Diels

PAPUALTHIA HETEROPETALA sp. nov.

Frutex erectus, ramulis floribusque exceptis glaber; foliis oblongis ad oblongo-lanceolatis, usque ad 11 cm longis, chartaceis, acutis vel acuminatis, basi angustatis, leviter inaequilateralibus et minute oblique cordatis, nervis utrinque 10, perspicuis; floribus extra-axillaribus, solitariis vel fasciculatis, pedicellis circiter 12 mm longis; sepalis ovatis, acuminatis, 4 ad 5 mm longis; petalis infra connatis, 3 ovatis, 8 mm longis, sursum angustatis, acuminatis, 3 oblongis, 9 ad 10 mm longis, plerumque acutis; carpellis circiter 5.

An erect shrub, glabrous, except the young branchlets and flowers, the branches slender, terete, nearly black when dry, sparingly lenticellate. Leaves oblong to oblong-lanceolate, chartaceous, pale and shining when dry, 7 to 11 cm long, 2 to 4 cm wide, apex usually acuminate, sometimes acute, base narrowed and slightly inequilateral, usually minutely and obliquely cordate;

lateral nerves about 10 on each side of the midrib, slender, prominent, anastomosing, the reticulations lax, distinct; petioles black when dry, about 2 mm long. Flowers yellowish, extra-axillary, solitary or few in a fascicle, but one flower developing at a time, their pedicels slender, about 12 mm long, appressed-pubescent, supplied with one or two, oblong, 2 mm long bracts below the middle. Sepals ovate, sparingly ferruginous-pubescent, 3 mm wide, 4 to 5 mm long, prominently acuminate. Petals united for the lower 2 to 3 mm, very unequal, three of the lobes ovate, about 5 mm long and 3 mm wide, much narrowed above to the acuminate apex, the three alternating lobes oblong, 6 to 7 mm long, 2 to 2.5 mm wide, sparingly appressed-pubescent outside, slightly narrowed upward, usually acute. Stamens indefinite, about 1.4 mm long. Carpels about 5, oblong, 1 mm long, appressed-pubescent; ovules apparently 3; stigma capitate.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32853 Ramos, July 26, 1918, in dry forests at low altitudes.

In vegetative characters this species is very similar to *Papualthia lanceolata* Merr., but differs radically in its floral characters, notably in the ovate, very prominently acuminate sepals and the very unequal petals, three of which are ovate and prominently acuminate, the three alternating ones oblong, longer, narrower, and usually acute.

PHAEANTHUS Hooker f. and Thomson

PHAEANTHUS PUBESCENS sp. nov.

Arbor parva, ramulis cinereo-pubescentibus, novellis ferrugineo-pubescentibus; foliis lanceolatis ad oblongo-lanceolatis, chartaceis, usque ad 18 cm longis, plus minusve acuminatis, basi acutis, nervis utrinque circiter 10, curvato-adscendentibus, supra in siccitate atro-brunneis, nitidis, glabris, subtus perspicue pubescentibus; fructibus oblongo-ovoideis, nigris, glabris, circiter 1.7 cm longis.

A tree, about 5 m high, more or less pubescent, the younger parts densely so. Branches terete, brownish, rugose, glabrous, the branchlets rather prominently cinereous-pubescent, the very young parts densely ferruginous-pubescent. Leaves lanceolate to oblong-lanceolate, chartaceous, 10 to 18 cm long, 2 to 5 cm wide, narrowed upward to the usually blunt-acuminate apex, the base acute, upper surface glabrous, blackish-brown when dry, shining, the lower somewhat paler, rather prominently cinereous-pubescent, the midrib densely so; lateral nerves about 10 on each side of the midrib, slender, curved-ascending, distinct; petioles pubescent, 3 to 6 mm long. Fruits oblong-ovoid,

glabrous, smooth, black when dry, about 1.7 cm long, apex very obscurely rostrate, the pedicels black when dry, 2 to 2.5 cm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27333 Ramos, March 10, 1917, in forests near streams.

This species is manifestly allied to *Phaeanthus ebracteolatus* Merr.; it is distinguished especially by its indumentum.

PHAEANTHUS VILLOSUS sp. nov.

Frutex erectus, perspicue et molliter villosus; foliis chartaceis, oblongis, usque ad 22 cm longis, tenuiter caudato-acuminatis, supra glabris, subtus villosis, nervis utrinque circiter 20, perspicuis; pedicellis villosis, 7 ad 9 cm longis; floribus solitariis, circiter 4.5 cm longis, petalis interioribus caudato-acuminatis.

A shrub, the branches, lower surface of the leaves and the pedicels softly and densely villous. Leaves chartaceous, oblong, 16 to 22 cm long, 6 to 8 cm wide, the apex slenderly caudate-acuminate, base acute to somewhat rounded, the upper surface glabrous, shining, the lower surface densely and softly villous on the midrib and nerves; lateral nerves about 20 on each side of the midrib, distinct; petioles densely villous, 7 to 10 mm long. Flowers yellow, extra-axillary, solitary, their densely villous pedicels 8 to 9 cm long. Sepals and the three outer petals minute, pubescent, triangular-ovate, about 1 mm long. Inner petals coriaceous-fleshy, oblong-elliptic, about 4.5 cm long, to 2.3 cm wide, somewhat pubescent outside and with slender longitudinal nerves, base somewhat narrowed, apex subcaudate-acuminate. Anthers numerous, oblong, about 3 mm long, the connectives oblique, somewhat concave. Carpels numerous, oblong, about 3 mm long, somewhat pubescent; style club-shaped, pubescent, about 1.5 mm long.

PANAY, Capiz Province, Mount Macosolon, *Bur. Sci.* 30775 Ramos & Edaña, April 23, 1918, along small streams in damp forests.

This species is well characterized by its rather dense soft indumentum, which is found on most parts of the plant. It is most closely allied to *Phaeanthus pubescens* Merr., from which it differs essentially in its much more numerous lateral nerves.

POLYALTHIA Blume

POLYALTHIA DOLICHOPHYLLA sp. nov. § *Eupolyalthia*.

Frutex subglaber; foliis brevissime petiolatis, chartaceis, oblanceolatis ad oblongo-oblanceolatis, usque ad 50 cm longis, 11 ad 18 cm latis, basi perspicue cordatis, subamplexicaulibus,

nervis utrinque circiter 18, valde perspicuis; floribus axillaribus, pedicellatis, circiter 4 cm longis; calycis lobis 1.5 ad 2 cm longis; petalis crasse coriaceis, exterioribus circiter 1.5 cm latis, interioribus angustioribus, infra contractis, basi leviter inflatis; carpellis anguste oblongis, pubescentibus, ovulis 2, superpositis.

A shrub, 2 to 3 m high, glabrous except the petioles and the midribs on the lower surface toward the base. Leaves chartaceous, oblanceolate to oblong-oblanceolate, about 50 cm long, 11 to 18 cm wide, the upper surface grayish when dry, shining, the lower surface brownish, apex somewhat acuminate, narrowed below the middle to the abruptly rounded and prominently cordate base, the base 5 to 8 cm wide, the basal lobes somewhat amplexicaul; lateral nerves about 18 on each side of the midrib, very prominent on the lower surface, curved, arched, anastomosing; petioles very stout, 8 to 10 mm long, pubescent. Flowers yellow or reddish-yellow, axillary, solitary, at maturity about 4 cm long, their pedicels up to 1.5 cm long, each with an ovate, acuminate, basal bracteole about 1 mm long. Calyx-lobes ovate to oblong-ovate, acute or obtuse, chartaceous, 1.5 to 2 cm long. Petals about 3.5 cm long, thickly coriaceous, glabrous, the outer three about 1.5 cm wide, the inner three about 1 cm wide, acute or obtuse and distinctly narrowed below the middle and above the slightly inflated base. Stamens indefinite, the anthers oblong, 2.8 mm long. Carpels numerous, narrowly oblong, pubescent, the stigmas densely pilose; ovules 2, superposed.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 30983 (type), 36873 *Ramos & Edaño*, April and May, 1918, along small streams in forests.

This remarkable species is prominently characterized by its unusually large leaves which are narrowed below to the abruptly rounded and prominently cordate, somewhat amplexicaul base; the petioles are unusually short, some of the leaves being subsessile. It has no close alliance among the Malayan species known to me.

PSEUDUVARIA Miquel

PSEUDUVARIA GRANDIFLORA sp. nov.

Arbor circiter 5 m alta, plus minusve cinereo-pubescentibus, novellis dense ferrugineo-pubescentibus; foliis oblongis, usque ad 20 cm longis, obtuse acuminatis, basi acutis ad subrotundatis, nervis utrinque 8 ad 11, curvato-adscendentibus, perspicuis; floribus axillaribus, numerosis, fasciculatis, longe pedicellatis, circiter 1.5 cm longis.

A tree, about 5 m high, the branches dark grayish-brown,

rugose, glabrous, the branchlets rather densely cinereous-pubescent, the young tips ferruginous-pubescent. Leaves chartaceous, oblong, 13 to 20 cm long, 4 to 5.5 cm wide, pale-olivaceous and somewhat shining on the upper surface when dry, the midrib pubescent, the lower surface paler, pubescent on the midrib and lateral nerves, base acute, apex blunt-acuminate; lateral nerves 8 to 11 on each side of the midrib, curved-ascending, prominent, anastomosing; petioles pubescent, 5 to 7 mm long. Flowers numerous, axillary, fascicled, about 1.5 cm long, usually two or three in each fascicle, their pedicels pubescent, 1.5 to 2.5 cm long. Sepals reniform, rounded, pubescent, about 1.8 mm long and 2 mm wide. Outer three petals suborbicular-ovate, pubescent, rounded, 3.5 to 4 mm long; inner three petals arched, the claw about 9 mm long, pubescent externally, glabrous within, the limb rhomboid, about 10 mm wide, pubescent externally and on the margins, glabrous within. Stamens very numerous, about 1 mm long. Female flowers unknown.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27514 Ramos, March 9, 1917, in damp forests at low altitudes, Ilocano name *apnit*.

This species is readily distinguished from the only other known Philippine species, *Pseuduvaria philippinensis* Merr., by its very much larger flowers.

UVARIA Linnaeus

UVARIA PANAYENSIS sp. nov.

Frutex scandens, floribus dense griseo-puberulis exceptis glaber vel subglaber; foliis oblongis, chartaceis ad subcoriaceis, usque ad 28 cm longis, tenuiter acuminatis, basi cordatis, nervis utrinque circiter 15, perspicuis; floribus pallidis, circiter 4.5 cm diametro; sepalis reniformibus; petalis coriaceis, utrinque dense cinereo-puberulis, late ovatis, 2.5 cm longis; carpellis lineari-oblongis, glabris, pauciovulatis.

A scandent shrub, nearly glabrous except the densely grayish-puberulent flowers. Branches glabrous, the branchlets with very few, scattered, ferruginous, scarcely stellate hairs. Leaves oblong, firmly chartaceous or subcoriaceous, 25 to 28 cm long, 8 to 9 cm wide, entirely glabrous, grayish on both surfaces when dry, the apex slenderly and sharply acuminate, base rounded and distinctly cordate; lateral nerves prominent, curved, anastomosing, about 15 on each side of the midrib, the reticulations lax; petioles 5 mm long or less, black when dry. Flowers about 4.5 cm in diameter, apparently pale or yellowish, their pedicels about 3 cm long, glabrous or with very few, short, ferruginous,

obscurely stellate hairs, each with a broadly ovate, ferruginous-pubescent, 3 to 4 mm long bract at or below the middle. Sepals reniform, coriaceous, about 6 mm long, 9 mm wide, externally cinereous-pubescent. Petals coriaceous, densely cinereous-pubescent on both surfaces, the outer three broadly ovate, obtuse, about 2.5 cm long, 2 cm wide, the inner three somewhat smaller. Anthers very numerous, linear-oblong, 3.5 to 4 mm long, the connectives rounded-truncate, not oblique, very slightly produced. Carpels many, linear-oblong, glabrous, including the stigma 3 mm long; ovules few.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31367 Ramos & Edaña, May 22, 1918, in forests along small streams.

This species is manifestly allied to *Uvaria leytenensis* (Elm.) Merr., from which it is readily distinguished by its distinctly cordate leaves and its cinereous-puberulent flowers.

UVARIA MACGREGORII sp. nov.

Frutex scandens, inflorescentiis exceptis glaber; foliis chartaceis, oblongo-ovatis et ovato-ellipticis, usque ad 12 cm longis, griseo-olivaceis, apice obtusis, basi rotundatis et plerumque leviter cordatis, nervis tenuibus, utrinque circiter 10; floribus circiter 2 cm diametro, rubro-brunneis; sepalis margine ferrugineo-pubescentibus; petalis late ovatis, circiter 1 cm longis, margine ferrugineo-pubescentibus ceteroquin glabris; carpellis anguste oblongis, glabris.

A scandent shrub, glabrous except the axillary buds on the young branchlets, and parts of the inflorescences. Leaves firmly chartaceous, oblong-ovate to ovate-elliptic, 8 to 12 cm long, 3.5 to 6 cm wide, glabrous on both surfaces, grayish-olivaceous when dry, slightly shining, somewhat narrowed upward to the obtuse apex, base broadly rounded and usually slightly cordate; lateral nerves slender, not prominent, about 10 on each side of the midrib, anastomosing; petioles 5 mm long, black when dry, glabrous. Flowers dark reddish-brown, about 2 cm in diameter (somewhat immature) in short, usually 2-flowered, leaf-opposed inflorescences, the peduncles 3 mm long or less, the pedicels 5 to 10 mm long, rugose when dry, the subtending bracts oblong, 3 to 4 mm long, the bracts and pedicels with few, scattered, ferruginous hairs, the latter soon becoming glabrous. Sepals broadly ovate to reniform, about 4 mm long, rounded or subacute, coriaceous, rugose when dry, their margins ferruginous-pubescent. Petals broadly ovate about 1 cm long, obtuse to subacute, densely ferruginous-pubescent on the margins and toward the tip, otherwise glabrous. Anthers numerous, narrowly oblong, 1.5 mm long, the connectives oblique, slightly produced. Carpels numerous,

narrowly oblong, glabrous, 1.5 mm long; ovules usually 4; styles 0.5 mm long.

PANAY, Antique Province, Batbatan Island, opposite Culasi, *Bur. Sci.* 32249 McGregor, June 29, 1918, fairly common in thickets at low altitudes.

This species rather closely resembles *Cuming* 1607 from Misamis Province, Mindanao, which has been referred to *Uvaria ovalifolia* Blume but which apparently is not referable to Blume's species. Among the other characters the present species differs from *Uvaria ovalifolia* in its somewhat smaller, fewer-nerved leaves; in being nearly glabrous; and in its entirely glabrous carpels. It is well characterized by its sepals and petals being nearly glabrous except for their densely ferruginous-pubescent margins and apices.

LAURACEAE

CRYPTOCARYA R. Brown

CRYPTOCARYA RAMOSII sp. nov.

Arbor parva, ramulis inflorescentiisque exceptis glabra; foliis oblongis ad oblongo-lanceolatis, subcoriaceis, 6 ad 11 cm longis, acuminatis, basi acutis, nervis utrinque 7 vel 8, perspicuis, reticulis ultimis confertis, utrinque obscure foveolatis; fructibus ellipsoideis, 1.5 cm longis, nigris, nitidis, glabris, laevis, 1.5 cm longis.

A tree, 5 to 6 m high, glabrous, except the young branchlets and inflorescences which are ferruginous-pubescent. Branches reddish-brown, lenticellate. Leaves oblong to oblong-lanceolate, subcoriaceous, usually pale when dry, shining, 6 to 11 cm long, 1.5 to 4 cm wide, narrowed upward to the acuminate apex, base acute; lateral nerves usually 7 or 8 on each side of the midrib, rather prominent on the lower surface, pinnately arranged, curved, anastomosing, the ultimate reticulations very close, both surfaces very shallowly and minutely foveolate; petioles 5 to 8 mm long. Panicles in the uppermost axils, narrow, rather few-flowered, 6 to 8 cm long, the branches rather few, short, not exceeding 1.5 cm in length. Flowers subsessile, ferruginous-pubescent, about 4 mm long, the tube about 2 mm long. Perianth-lobes elliptic-ovate, as long as the tube. Fruit ellipsoid, black and shining when dry, 1.5 cm long, glabrous, smooth.

LUZON, Ilocos Norte Province, between Banguì and Claveria, *Bur. Sci.* 33071 Ramos, August 30, 1918, in forests at low altitudes.

The description of the flowers is from *Bur. Sci.* 33346 Ramos,

from Mount Palimlim, this specimen differing slightly from the type in its relatively somewhat shorter and slightly fewer-nerved leaves. The alliance of this species is manifestly with *Cryptocarya vidalii* Merr., from which it is easily distinguished by its much smaller fruits.

CRYPTOCARYA EUPHLEBIA sp. nov.

Arbor parva, ramulis et petiolis et inflorescentiis dense castaneo-pubescentibus; foliis oblongis ad oblongo-ellipticis, subcoriaceis, usque ad 10 cm longis, costa excepta glabris, olivaceis, nitidis, apice breviter acuminatis, basi acutis ad subrotundatis, utrinque, praesertim subtus, minute et dense foveolatis; nervis utrinque 6 ad 8, supra impressis, subtus valde primumilis, subadscendentibus, vix anastomosantibus; paniculis axillaribus terminalibusque sub fructu usque ad 10 cm longis; fructibus in siccitate nigris, depresso-globosis, laevis, glabris, 10 ad 12 mm diametro.

A small tree, the branchlets, petioles, and inflorescences densely and finely castaneous-pubescent. Branches terete, glabrous, lenticellate, smooth, brownish. Leaves subcoriaceous, oblong to oblong-elliptic, 6 to 10 cm long, 2.5 to 5 cm wide, olivaceous, shining, glabrous except for the somewhat pubescent midrib, the apex abruptly and distinctly acuminate, base acute to somewhat rounded, both surfaces, but especially the lower one, densely and shallowly foveolate; lateral nerves 6 to 8 on each side of the midrib, impressed on the upper surface, very prominent on the lower surface, somewhat ascending, slightly curved, not or but very obscurely anastomosing; petioles 8 to 10 mm long. Panicles axillary and terminal, in fruit up to 10 cm long. Fruits black, glabrous, smooth, shining, depressed-globose, 10 to 12 mm in diameter.

CATANDUANES, *Bur. Sci.* 20576 Ramos, November 20, 1917, on the forested slopes of Mount Mariguidon.

This species is well characterized by its shallowly and densely foveolate, glabrous, conspicuously nerved leaves and its depressed-globose fruits. In the latter character it differs especially from *Cryptocarya oblongata* Merr. It seems to be most closely allied to *Cryptocarya zamboanguensis* Merr. and *C. intermedia* Elm.

CRYPTOCARYA ELLIPTIFOLIA sp. nov.

Arbor parva, inflorescentiis exceptis glabra; foliis ellipticis ad elliptico-ovatis, chartaceis, subolivaceis, nitidis, usque ad 20 cm longis, apice perspicue et obtuse acuminatis, basi leviter decurrento-acuminatis, nervis utrinque 5, distantibus, distinctis, cur-

vatis, vix elevatis; paniculis sub fructu axillaribus, circiter 7 cm longis; fructibus globosis, circiter 1.5 cm diametro, in siccitate nigris, nitidis, glabris, leviter longitudinaliter striatis.

A small tree, 6 m high *fide* Ramos, entirely glabrous except the inflorescences, which are apparently somewhat pubescent. Branches and branchlets smooth, terete, slender, smooth, brownish-olivaceous. Leaves elliptic-ovate to elliptic, chartaceous, sub-olivaceous, shining, 15 to 20 cm long, 7 to 9 cm wide, not at all foveolate, the apex prominently and obtusely acuminate, the acumen about 1.5 cm long, stout, the base somewhat decurrent-acuminate; lateral nerves 5 on each side of the midrib, prominent but scarcely projecting, somewhat curved, reticulations slender, distinct, rather close; petioles 1 to 2 cm long. Panicles in fruit axillary, about 7 cm long, the branchlets sparingly pubescent. Fruits globose, black when dry, shining, faintly ridged longitudinally, glabrous, about 1.5 cm in diameter.

CATANDUANES, *Bur. Sci.* 30330 Ramos, December 9, 1917, in forests along small streams back of Calolbong.

A species well characterized by its rather large, conspicuously acuminate leaves; lateral panicles; and rather large, globose, somewhat ridged, glabrous fruits.

CRYPTOCARYA DENSIFLORA Blume Bijdr. (1825) 556; Koord. & Val. Bijdr. Boom. Java 10 (1904) 213.

PANAY, Jamindan and Mount Macosolon, *Bur. Sci.* 31317, 33435 Ramos & Edaña, April and May, 1918 (leaves not glaucous beneath). NEGROS, *For. Bur.* 23666 Hinolan, March, 1915. MINDANAO, Lanao, *Mrs. Clemens* 1001, *s. n.*, April and July, 1907.

This species has previously been reported from Java, where it is common and widely distributed, and from the Malay Peninsula. The Philippine material cited above closely matches a series of specimens from Java and the Malay Peninsula, and also conforms to the descriptions of Blume's species. The specimens collected by Mrs. Clemens were described by me in 1908 as a new species of *Beilschmiedia*, but the description was fortunately never published. *Cryptocarya laevigata* Elm., the type of which is a specimen with very immature fruits, is scarcely to be distinguished from Blume's species.

NEOLITSEA Merrill

NEOLITSEA LANCEOLATA sp. nov.

Arbor circiter 6 m alta, ramulis junioribus et petiolis dense adpresse pubescentibus, ramis glabris, teretibus, ramulis et foliis verticillatis; foliis lanceolatis, chartaceis ad subcoriaceis, in siccitate brunneis, nitidis, usque ad 7 cm longis et 1.5 cm latis, basi

acutis, apice tenuiter acuminatis, junioribus ad costa villosis, vetustioribus glaberrimis, penninerviis, nervis primariis utrinque circiter 10; fructibus axillaribus, fasciculatis, parvis, glabris, pedicellis adpresse pallide villosis, circiter 5 mm longis.

A tree, about 6 m high, the young branchlets and petioles densely pale or pale-ferruginous appressed-pubescent. Branches glabrous, terete, the branchlets verticillate, 3 to 6 at a node. Leaves verticillate, chartaceous to subcoriaceous, brownish when dry, lanceolate, 5 to 7 cm long, 1 to 1.5 cm wide, narrowed below to the acute base and above to the slenderly acuminate apex, shining, smooth, the older ones entirely glabrous, the younger ones pale appressed-villous along the midrib on both surfaces; nerves all pinnately arranged, the primary ones about 10 on each side of the midrib, slender, curved, somewhat ascending, obscurely anastomosing, the reticulations not prominent, the ultimate ones close and very obscurely foveolate; petioles 5 to 8 mm long, rather densely pubescent. Fruits fascicled on the ultimate branches below the leaves, 3 to 6 in a fascicle, the pedicels rather stout, somewhat thickened upward, pale appressed-pubescent, the persistent calyx-tube somewhat funnel-shaped, truncate, glabrous, about 5 mm in diameter.

CATANDUANES, Mount Mariguidon, *Bur. Sci.* 30231 Ramos, November 27, 1917, in forests near the summit of the mountain.

This species is well characterized by its verticillate branchlets and its small, lanceolate, penninerved leaves. It does not appear to be very closely allied to any of the previously described species of the genus.

NEOLITSEA PAUCINERVIA sp. nov.

Species *N. zeylanicae* affinis. Arbor circiter 7 m alta, ramis et foliis glabris, ramulis dense pubescentibus; foliis alternis, oblongo-lanceolatis, subcoriaceis, in siccitate brunneis, nitidis, usque ad 8 cm longis et 3 cm latis, tenuiter acuminatis, basi acutis, 3-plinerviis, nervis lateralibus utrinque circiter 3, distinctis, curvato-anastomosantibus, adscendentibus, obscure anastomosantibus; fructibus axillaribus, ovoideis vel subglobosis, in siccitate nigris, rugosis, nitidis, circiter 5 mm diametro, calycis lobis 4, lanceolatis, acuminatis, villosis, pedicellis nigris, decidue villosis.

A tree, about 7 m high, the branches smooth, terete, glabrous, the branchlets and petioles densely pubescent with short hairs. Leaves alternate, rather more numerous near the tips of the branchlets and here sometimes pseudo-verticillate, oblong-lanceolate, subcoriaceous, brownish and shining when dry, both sur-

faces densely and shallowly foveolate, not at all glaucous, entirely glabrous, 7 to 8 cm long, 2 to 3 cm wide, narrowed below to the acute base and above to the slenderly acuminate apex, the base 3-plinerved, the lateral basal nerves leaving the midrib about 5 mm above the base of the leaf and extending to or beyond the middle, the lateral ones above the base 2 or 3, slender, distinct, curved-ascending, obscurely anastomosing; petioles 5 to 8 mm long. Fruits axillary and in the axils of fallen leaves, fascicled, 5 to 12 in a fascicle, ovoid to subglobose, about 5 mm in diameter, black and shining when dry, somewhat wrinkled. Pedicels about 5 mm long, black, covered with a brownish, more or less deciduous, appressed, villous indumentum, the persistent calyx-lobes lanceolate, acuminate, villous, about 2 mm long.

LUZON, Sorsogon Province, Mount Kililibong, *Bur. Sci.* 23316 Ramos, August 17, 1915, in the mossy forest.

This species, among the Philippine forms, is probably as closely allied to *Neolitsea villosa* Merr. as any, but differs in its few-nerved, glabrous, not glaucous leaves. Its true alliance seems to be with *N. zeylanica* Merr., from which it is distinguished by its nonglaucous leaves and its villous pedicels. It also closely resembles some forms of the Javan *N. cassiaefolia* Merr.

SAXIFRAGACEAE

POLYOSMA Blume

POLYOSMA VILLOSA sp. nov.

Frutex, subtus foliis et ramis et inflorescentiis dense molliter villosus; foliis verticillatis, 4-natis, oblongis ad oblongo-ellipticis, chartaceis ad subcoriaceis, 7 ad 10 cm longis, apice acutis, margine distanter dentatis; nervis utrinque 12 ad 15, patulis, distinctis; petiolo 1.5 ad 2 cm longo; racemis axillaribus, 5 cm longis, paucifloris; fructibus ellipsoideis, 8 mm longis, plus minusve pubescentibus, bracteolis subaequalibus, circiter 1 mm longis.

A shrub, the branches, branchlets, petioles, inflorescences, and the lower surface of the leaves, especially on the midrib and nerves, densely and softly villous. Leaves verticillate, usually 4 at each node, oblong to oblong-elliptic, chartaceous to subcoriaceous, 7 to 10 cm long, 2.5 to 4 cm wide, dark-olivaceous and shining when dry, the base rounded to acute, apex acute, sometimes with a very short mucro, the margins conspicuously villous, coarsely and distantly toothed, the upper surface more or less pubescent on the midrib and nerves; lateral nerves 12 to 15 on each side of the midrib, spreading at right angles, distinct, anas-

tomosing, the reticulations lax. Petioles 1.5 to 2 cm long. Racemes axillary, solitary, about 5 cm long, few-flowered, pubescent. Fruits ellipsoid, about 8 mm long, somewhat pubescent, their pedicels about 3 mm long, the subtending bracteoles subequal, oblong-ovate, pubescent, about 1 mm long. Persistent calyx lobes ovate, acute, 1 mm long.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33340 *Ramos*, August 21, 1918, on forested slopes, altitude about 900 meters.

This species apparently belongs in the group with *Polyosma verticillata* Merr., from which it is specially distinguished by its dense indumentum and its lateral, not terminal, few-flowered racemes.

POLYOSMA LONGIPETIOLATA sp. nov.

Frutex, partibus junioribus inflorescentiisque exceptis glaber; foliis verticillatis, 4- vel 5-natis, oblongo-ellipticis ad anguste oblongo-obovatis, coriaceis, in siccitate nigris, 8 ad 13 cm longis, integris, basi acutis, apice breviter lateque acuminatis, nervis utrinque 8 ad 11, distinctis; petiolo usque ad 6 cm longo; racemis terminalibus, usque ad 20 cm longis; fructibus anguste ellipsoideis, 8 mm longis, bracteolis valde inaequalibus, interioribus quam lateralibus duplo longioribus, 3 ad 5 mm longis.

A shrub, about 5 m high, glabrous except the very young parts and the inflorescences. Branches terete, dark reddish-brown, smooth, glabrous, the branchlets more or less angled, the younger ones appressed-pubescent with very short hairs. Leaves verticillate, 4 or 5 at each node, oblong-elliptic to narrowly oblong-obovate, coriaceous, glabrous, the upper surface nearly black when dry, the lower surface dark-brown, 8 to 13 cm long, 2.5 to 5 cm wide, entire, base acute, apex very shortly and broadly acuminate, the acumen obtuse and with a blunt apiculus; lateral nerves 8 to 11 on each side of the midrib, spreading, distinct, anastomosing. Petioles unusually long, up to 6 cm in length, when young pubescent, soon becoming glabrous. Racemes terminal, in fruit up to 20 cm long, more or less pubescent; pedicels 3 to 5 mm long. Fruits narrowly ellipsoid, about 8 mm long, slightly pubescent, the subtending bracteoles very unequal, pubescent, linear-oblong, the middle one 3 to 4 mm long, at least twice as long as the two lateral ones. Persistent calyx-lobes triangular-ovate, acute, 1 mm long.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33259 *Ramos*, August 20, 1918, on forested slopes, altitude about 1,000 meters.

Among those species with verticillate leaves *Polyosma longipetiolata* is strikingly characterized by its glabrous branches; unusually long-petioled, glabrous, entire leaves; and its very unequal bracteoles.

PITTOSPORACEAE

CITRIOBATUS A. Cunningham

CITRIOBATUS JAVANICUS Boerl. & Koord. in Ic. Bogor. 1 (1901) t. 77.

LUZON, Batangas Province, Mount San Pedro, *Bur. Sci.* 22343 Ramos, August 20, 1914, in thickets at low altitudes.

With the exception of this one species the small genus *Citriobatus* is confined to Australia. The Philippine specimens were distributed unidentified, as without flowers I could not determine the group to which they belonged. I am now, however, able to name the material by a direct comparison with a series of five specimens from Java, including duplicates of three numbers of Koorders's collection on which the species was based. The Philippine specimens agree with the Javan ones in all respects.

PITTOSPORUM Banks

PITTOSPORUM PSEUDOSTIPITATUM sp. nov.

Frutex glaber, ramulis tenuibus; foliis verticillatis, 3- vel 4-natis, anguste lanceolatis, 4 ad 6 cm longis, utrinque angustatis, apice tenuiter acuminatis, nervis tenuibus; fructibus terminalibus, fasciculatis, tenuiter pedunculatis, obovoideis, 2-valvis, basi tenuiter stipitatis, stipite circiter 4 mm longo, partibus seminiferis 6 ad 7 mm longis, 6 mm diametro.

A glabrous shrub, about 3 m high, the branches and branchlets slender, terete. Leaves verticillate, usually 3 or 4 at a node, coriaceous, narrowly lanceolate, 4 to 6 cm long, 6 to 13 mm wide, narrowed below to the acute or acuminate base and above to the very slenderly acuminate apex, the tip with a distinct cartilaginous mucro, the upper surface olivaceous to black when dry, shining; lateral nerves slender, scarcely more distinct than are the reticulations; petioles about 5 mm long. Fruits fascicled at the tips of the branchlets, 2 to 4 in a fascicle, their pedicels slender, about 1 cm long, the capsule obovoid, black when dry, 2-valved, the lower part narrowed into a distinct pseudostalk, the thickened portion of the capsule 6 to 7 mm long, about 6 mm in diameter, the entire capsule, including the pseudostalk, about 1 cm long.

LUZON, Ilocos Norte Province, Mount Nagapatan, *Bur. Sci.* 33127 Ramos, August 8, 1918, on dry slopes, altitude about 700 meters.

This species is readily distinguished by its narrowly lanceolate, very sharply acuminate and cartilaginous-mucronate leaves as well as by its terminal, fascicled fruits, these being obovoid and much narrowed below the middle to form a very distinct pseudostalk.

PITTOSPORUM ACUMINATISSIMUM sp. nov.

Frutex epiphyticus vel pseudo-epiphyticus, glaber, ramulis tenuibus; foliis chartaceis, oblongis ad oblongo-ellipticis, nitidis, tenuiter acute acuminatis, usque ad 8 cm longis, nervis utrinque 7 ad 9, tenuibus; inflorescentiis solitariis, lateralibus et terminalibus, brevibus, 3-floris; floribus circiter 12 mm longis, ovario dense villosus; fructibus leviter compressis, 2-valvis, ellipsoideis, circiter 23 cm longis, valvis crasse carnosu-coriaceis, in siccitate rugosis.

An epiphytic or pseudoepiphytic shrub, entirely glabrous except the densely pubescent ovaries, the ultimate branches slender, 2 to 3 mm in diameter. Leaves chartaceous, oblong to oblong-elliptic, brownish-olivaceous when dry, 5 to 8 cm long, 2 to 4 cm wide, the apex sharply and slenderly acuminate, base acute; lateral nerves 7 to 9 on each side of the midrib, slender as are the reticulations; petioles 2 to 3 cm long, slender. Inflorescences usually solitary, lateral, rarely terminal, usually 3-flowered, their peduncles 5 mm long or less, the pedicels 5 to 10 mm long. Calyx shallowly cup-shaped, about 4 mm in diameter, the lobes broadly ovate, obtuse, 1.5 to 1.8 mm long. Petals 5, narrowly oblong, 11 mm long, 3.5 mm wide, obtuse. Filaments 4 to 4.5 mm long. Ovary oblong-ovoid, densely villous; style glabrous, 1.5 mm long. Capsules ellipsoid, somewhat compressed, 2-valved, about 2.3 cm long, 1.8 cm wide, the valves thick, fleshy-coriaceous, rugose when dry.

PANAY, Capiz Province, Mount Macosolon, *Bur. Sci.* 30745 *Ramos & Edaño*, April 21, 1918, on trees in forests.

This form has the same habit as *Pittosporum resiniferum* Hemsl. and is manifestly closely allied to that species. It differs in its smaller leaves and its usually solitary, lax, few-flowered inflorescences; in Hemsley's species the flowers are borne in dense fascicles, while in the present species they are in depauperate, 3-flowered, usually solitary cymes.

PITTOSPORUM GLABERRIMUM sp. nov.

Frutex glaberrimus, ramulis tenuibus; foliis verticillatis, 3-vel 4-natis, oblongo-lanceolatis, utrinque angustatis, acutis vel leviter acuminatis, nervis utrinque 6 vel 7, tenuibus, distinctis;

capsulis terminalibus, solitariis, ellipsoideis vel obovoideis, 2-valvis, 2.5 cm longis, pedicellis 1 cm longis.

An entirely glabrous shrub, about 3 m high, the ultimate branchlets slender, terete, about 1.5 mm in diameter. Leaves verticillate, usually 3 or 4 at a node, oblong-lanceolate, shining subcoriaceous, those of each whorl more or less unequal, 3 to 6 cm long, 1 to 2 cm wide, subequally narrowed below to the acute base and above to the acute or slightly acuminate apex; lateral nerves slender, distinct, 6 or 7 on each side of the midrib, anastomosing, the reticulations lax; petioles 3 to 5 mm long. Capsules terminal, solitary, ellipsoid to somewhat obovoid, 2-valved, about 2.5 cm long, 1.5 to 2 cm in diameter, black when dry, orange-yellow when fresh, their pedicels about 1 cm long.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33309 Ramos, August 21, 1918, on forested slopes, altitude about 1,000 meters.

The alliance of this species is apparently with *Pittosporum odoratum* Merr., from which it is at once distinguishable by its solitary terminal fruits.

ROSACEAE

PHOTINIA Lindley

PHOTINIA SERRULATA Lindl. in Trans. Linn. Soc. 13 (1821) 103 (excl. syn. *Crataegus glabra* Thunb.); Hemsl. in Journ. Linn. Soc. Bot. 33 (1887) 263; Rehder & Wilson in Sargent Pl. Wils. 1 (1912) 184.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 4425 Mearns, *Bur. Sci.* 31560 Santos, Sandkuhl 258, altitude about 2,300 meters, in flower May to July, in fruit in February, Igorot name *itangan*.

This species has not previously been reported from the Philippines. The specimens cited above conform very closely with our series from Formosa, and from Kwangtung, Fokien, and Yunnan Provinces, China.

CONNARACEAE

CONNARUS Linnaeus

CONNARUS CASTANEUS sp. nov.

Frutex scandens, perspicue castaneo-pubescentibus; foliis circiter 30 cm longis, foliolis plerumque 7, coriaceis, oblongo-ellipticis, leviter acuminatis, 11 ad 18 cm longis, subtus densissime ferrugineo-pubescentibus; infructescentiis paniculatis, terminalibus, usque ad 25 cm longis, folliculis obovatis, compressis, leviter inaequilateralibus, 6 cm longis, extus densissime castaneo-pubescentibus, intus leviter villosis.

A scandent shrub, the branchlets, petioles, infructescences,

and fruits densely castaneous-pubescent, the leaflets beneath densely ferruginous-pubescent. Leaves about 30 cm long, the leaflets usually 7, alternate, coriaceous, oblong-elliptic, somewhat acuminate, base rounded, 11 to 18 cm long, 5 to 7 cm wide, the upper surface greenish, more or less pubescent with deciduous pale hairs; lateral nerves usually 7 on each side of the midrib, prominent on the lower surface, anastomosing, the reticulations rather lax; petiolules 5 to 8 mm long, densely castaneous-pubescent. Panicles terminal, in fruit up to 25 cm long, the primary branches up to 15 cm long. Fruits compressed, obovate, slightly inaequilateral, about 6 cm long and 4 cm wide, externally very densely castaneous-pubescent, inside sparingly villous with pale hairs.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33600 *Ramos & Edaño*, November 30, 1918, in damp forests at low altitudes, the fruits red, the lower surface of the fresh leaves red.

A species strongly characterized by the dense castaneous indumentum on the branchlets, petioles, infructescences, and fruits; and by the leaflets being densely ferruginous-pubescent on the lower surface and reddish-brown in contrast with the green upper surface. The indumentum is composed entirely of simple hairs.

ROUREA Aublet

ROUREA LUZONIENSIS sp. nov.

Frutex scandens, glaber; foliis circiter 10-foliolatis, 8 ad 12 cm longis, foliolis 2 ad 4 cm longis, subcoriaceis, ovatis ad oblongo-ellipticis, obtusis vel obscure breviterque acuminatis, basi plerumque rotundatis; infructescentiis axillaribus, solitariis, racemosis, 8 ad 10 cm longis, fructibus paucis, tenuiter pedicellatis, subaequilateralibus, oblongo-ovoideis, 8 ad 10 mm longis.

A scandent glabrous shrub, about 3 m high. Leaves 8 to 12 cm long, about 10-foliolate; leaflets subopposite and alternate, subcoriaceous, ovate to oblong-elliptic, 2 to 4 cm long, 1.2 to 2.3 cm wide, base rounded, usually somewhat inequilateral, apex obtuse to shortly acuminate, both surfaces rather pale when dry, shining. Inflorescences axillary, solitary, racemose, 8 to 10 cm long, few-flowered. Fruits oblong-ovoid, nearly equilateral, acute or slightly apiculate, 8 to 10 mm long, their pedicels 6 to 10 mm long. Persistent sepals broadly ovate, glabrous, the outer ones acute or slightly acuminate, the inner ones broadly rounded, about 3.5 mm long.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33534 *Ramos & Edaño*, November 29, 1918, in dry thickets at low altitudes.

This species is allied to *Rourea erecta* (Blanco) Merr., from which it is especially distinguished by its fewer, differently shaped, not slenderly acuminate leaflets; and its smaller, nearly equilateral, slenderly pedicelled fruits which are racemously arranged.

LEGUMINOSAE

TRIFIDACANTHUS Merrill

TRIFIDACANTHUS UNIFOLIOLATUS Merr. in Philip. Journ. Sci. 12 (1917) Bot. 269.

Pods straight, about 2 cm long, usually composed of three or four 1-seeded joints, flat, thin, reticulate, sparingly pubescent, the upper suture nearly straight, slightly indented between the joints, the lower suture rather deeply indented; joints usually 6 to 7 mm long, about 4 mm wide, the valves chartaceous or thinly coriaceous.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32925 Ramos, July 18, 1918, in dry thickets at low altitudes.

The original description of this new genus and species was based on flowering specimens, but the second collection, and this from the type locality, shows that I was correct in placing it in the *Papilionatae-Hedysareae-Desmodiinae*, the *Desmodiinae* being indicated in the original description with doubt. It is manifestly most closely allied to *Desmodium*, from which, among other characters, it is distinguished by its characteristic spines.

INDIGOFERA Linnaeus

INDIGOFERA HENDECAPHYLLA Jacq. Coll. 2 (1788) 359, Ic. Rar. 3 (1768-93) t. 570; Baker in Hook. f. Fl. Brit. Ind. 2 (1876) 98 (*endecaphylla*); Craib in Notes Bot. Gard. Edinb. 8 (1913) 68.

Indigofera pusilla Lam. Encycl. 3 (1789) 248.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32770 Ramos, August 5, 1918, in open dry places at low altitudes.

India to southeastern China, tropical and South Africa, and Madagascar; not previously reported from the Philippines.

ORMOSIA Jackson

ORMOSIA ORBICULATA sp. nov. § *Toullichiba*, *Macrodisca*.

Arbor, ramulis inflorescentiisque ferrugineo-pubescentibus exceptis glabra; foliis usque ad 30 cm longis, rhachibus productis; foliolis 7, subcoriaceis, glabris, oblongis ad oblongo-ellipticis, 8 ad 15 cm longis, apice acuminatis, nervis utrinque circiter 8; paniculis circiter 16 cm longis; floribus numerosis, circiter 2 cm

longis, calycis circiter 8 cm longis; ovulis 2; leguminis suborbicularibus ad ovatis, usque ad 7 cm longis, basi late rotundatis, apice apiculatis, valvis crassis, lignosis; seminibus solitariis, ellipsoideis, exarillatis, 2 cm longis.

A tree, attaining a height of at least 10 m, glabrous except the young branchlets, buds, and inflorescences, which are rather densely ferruginous-pubescent. Leaves up to 30 cm long, the rachis extended beyond the distal pair of leaflets; leaflets 7, subcoriaceous, oblong to oblong-elliptic, pale when dry, somewhat shining, 8 to 15 cm long, 3.5 to 7 cm wide, base acute to rounded, apex distinctly acuminate, the acumen usually blunt; lateral nerves about 8 on each side of the midrib, distinct on both surfaces as are the reticulations; petiolules about 5 mm long. Panicles about 16 cm long, densely ferruginous-pubescent, terminal, the primary branches few, the lower ones up to 6 cm long. Flowers white, about 2 cm long. Calyx externally densely ferruginous-pubescent, about 1.5 cm long, the tube broad, up to 8 mm long and 1 cm wide, the lobes oblong, usually obtuse, about 8 mm long, slightly pubescent inside. Standard broadly obovate, about 2 cm long, the claw stout, 4 to 5 mm long. Filaments glabrous. Ovary stipitate, oblong, very slightly pubescent with scattered hairs, soon becoming glabrous, the stipe stout, about 5 mm long; style glabrous, curved, about 1.3 cm long; ovules 2. Pod thick, woody, suborbicular to ovate, up to 7 cm long and 6 cm wide, base broadly rounded, apex prominently apiculate, the valves up to 1 cm in thickness. Seed solitary, ellipsoid, not arillate, red, shining, about 2 cm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32775 *Ramos* (type), July 17, 1918; Pasuquin, *For. Bur.* 22094, 25094 *Paraiso*, July 24, 1914, and February 18, 1916, on forested slopes, ascending to an altitude of 300 meters. Ilocano name *panapotien*.

This species closely resembles *Ormosia macrodisca* Baker, of the Malay Peninsula, but the flowers are much larger and the single specimen that I have with seeds shows no basal aril. From *Ormosia paniculata* Merr. it is at once distinguished by its entirely glabrous leaves.

ORMOSIA CLEMENTIS sp. nov. § *Toulitchiba*, *Macrodisca*.

Arbor circiter 10 m alta, glabra (inflorescentiis ignotis); foliis circiter 40 cm longis, foliolis 5, rhachibus productis, foliolis chartaceis ellipticis ad oblongo-ellipticis, usque ad 20 cm longis, abrupte acute acuminatis, basi acutis, nervis utrinque 8 ad 10, distinctis; leguminis ligneis, subellipticis, circiter 7 cm longis, apice rotundatis vel obscurissime et late apiculatis vel

acutis; seminibus plerumque 2, exarillatis, coccineis, basi nigris, subellipticis, circiter 2 cm longis, 1.5 ad 2 cm latis, nitidis.

A tree about 10 m high, glabrous (inflorescences unknown). Leaves about 40 cm long, the rachis produced above the upper pair; leaflets chartaceous, rather pale when dry, elliptic to oblong-elliptic, 9 to 20 cm long, 3.5 to 8.5 cm wide, the apex rather abruptly and sharply acuminate, base acute; lateral nerves 8 to 10 on each side of the midrib, distinct, anastomosing. Pods woody, subelliptic, about 7 cm long, brown when dry, the valves recurved after dehiscence, base and apex rounded or the apex obscurely and broadly apiculate or merely subacute. Seeds usually 2, not arillate, crimson, with a black base, subellipsoid, about 2 cm long, 1.5 to 2 cm wide, hard, shining, slightly rugose when dry.

MINDANAO, Lanao District, Camp Keithley, Mrs. Clemens 1139, July, 1907, altitude about 900 meters.

This species is probably most closely allied to *Ormosia orbiculata* Merr., but the pods are usually 2-seeded and the seeds have a conspicuous black base.

ORMOSIA BASILANENSIS sp. nov. § *Toullichiba*, *Macrodisca*.

Arbor magna, partibus junioribus et inflorescentiis plus minusve ferrugineo-pubescentibus, ramis circiter 1 cm diametro; foliis circiter 40 cm longis, rhachibus et petiolis et subtus foliolis ad costa ferrugineo-pubescentibus, rhachibus productis; foliolis 9, oblongis ad oblongo-ellipticis, subcoriaceis, 12 ad 17 cm longis, basi acutis, apice acuminatis, nervis utrinque circiter 8; leguminis orbiculari-ovatis, leviter inaequilateralibus, circiter 7 cm longis, valvis crassis, lignosis, apice breviter crasseque acuminatis; seminibus solitariis, 3 cm longis, ellipsoideis, rubris, nitidis, exarillatis.

A large tree, the younger parts, inflorescences, and leaves more or less ferruginous-pubescent, the leaflets only sparingly pubescent beneath along the midrib, the branches rather stout, about 1 cm in diameter, dark colored when dry, glabrous. Leaves about 40 cm long, the rachis and petioles more or less ferruginous-pubescent with rather long hairs, the rachis prolonged beyond the distal pair of leaflets; leaflets 9, oblong to oblongo-elliptic, subcoriaceous, shining, 12 to 17 cm long, 4.5 to 7 cm wide, subequally narrowed to the acute base and the distinctly acuminate apex; lateral nerves about 8 on each side of the midrib, distinct, ascending; petiolules 5 to 7 mm long. Pods orbicular-ovate, slightly inequilateral, about 7 cm long and wide, base rounded, apex with a short stout acumen, the valves woody,

much thickened, much swollen opposite the solitary seed. Seed about 3 cm long, ellipsoid, red, shining, not arillate.

BASILAN, Maluno, *For. Bur.* 17893 *Rafael*, November 13, 1912, *Hollier* 508, January, 1904, in forests, altitude about 140 meters.

This species like the others here described resembles *Ormosia macrodisca* Baker, but the seeds are not arillate. Among the Philippine species it is perhaps most closely allied to *Ormosia orbiculata*, but the leaflets are more numerous, subequally narrowed at both ends, acute at the base, and sparingly pubescent beneath along the midrib.

ORMOSIA GRANDIFOLIA sp. nov. § *Toulichiba*, *Macrodisca*.

Arbor circiter 10 m alta, inflorescentiis foliisque plus minusve pubescentibus; foliis circiter 50 cm longis, rhachibus productis; foliolis 7, terminalibus late obovatis, lateralibus ellipticis, 13 ad 17 cm longis, subcoriaceis, apice abrupte obtuseque acuminatis, basi rotundatis, vel terminalibus acutis, nervis utrinque circiter 8; leguminis ellipticis, 6 ad 7 cm longis, apice late rotundatis, valvis crassis, lignosis; seminibus solitariis ellipsoideis, coccineis, 3 cm longis, exarillatis.

A tree, about 10 m high, the inflorescences, petioles, and leaflets on the lower surface more or less pubescent, the indumentum on the leaflets obscure. Leaves about 50 cm long, the rachis extended beyond the distal pair of leaflets; leaflets 7, the terminal one broadly obovate, the lateral ones elliptic, 13 to 17 cm long, 8 to 10 cm wide, subcoriaceous, rather pale when dry, shining, the base usually rounded or that of the terminal leaflet acute, apex very abruptly and shortly acuminate; the lateral nerves about 8 on each side of the midrib, prominent; petiolules about 1 cm long. Pods elliptic, 6 to 7 cm long, about 5.5 cm wide, apex broadly rounded, scarcely apiculate, the valves thick, woody, recurved, apparently one-seeded. Seed solitary, ellipsoid, scarlet, shining, somewhat rugose when dry, 3 cm long, 2.2 cm wide, slightly compressed, not arillate.

LUZON, Camarines Province, Magdoronganon River, *For. Bur.* 21172 *Alvarez*, March 23, 1914, in forests near the river, altitude about 100 meters.

This species manifestly belongs in the same group as *Ormosia orbiculata*, but has much larger, differently shaped leaflets, which are somewhat pubescent beneath; differently shaped pods, which are broadly rounded and scarcely apiculate at their apices; and much larger seeds. The seed is not at all arillate. *Ormosia basilanensis* Merr. differs in its more numerous leaflets and its elliptic pods, which are broadly rounded at their apices.

DESMODIUM Desvaux

DESMODIUM ORMOCARPOIDES DC. Prodr. 2 (1825) 327; Gagnep. in Not. Syst. 3 (1916) 256; Merr. Interpret. Herb. Amb. (1917) 267, non auct. plur.

Desmodium ormocarpoides Desv. in Mém. Soc. Linn. Paris 1825 (1826) 307, non auct. plur.

Hedysarum adhaerens Poir. in Lam. Encycl. Suppl. 5 (1817) 15, non Vahl.

Desmodium dependens Blume ex Miq. Fl. Ind. Bat. 1¹ (1855) 248.

JOLO, Tagasip, *F. L. Rola* 118, May 27, 1917, in teak forests at low altitudes.

This Malayan species is new to the Philippines, the specimens agreeing perfectly with material from Celebes and Amboina. As Gagnepain notes all modern botanists have misinterpreted *Desmodium ormocarpoides* DC., an examination of the type showing that it is the form described by Blume as *Desmodium dependens*. *Desmodium ormocarpoides* of modern authors, including the Philippine specimens previously so named, is *Desmodium zonatum* Miq.

GERANIACEAE

ERODIUM L'Héritier

ERODIUM CICUTARIUM (Linn.) L'Hérit. ex Ait. Hort. Kew. 2 (1789) 414.

Geranium cicutarium Linn. Sp. Pl. (1753) 680.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31669 Santos, May 9, 1918, in waste places, altitude about 2,300 meters. A weed of wide distribution in temperate regions, unquestionably an introduced plant here.

RUTACEAE

EVODIA Forster

EVODIA MELIAEFOLIA (Hance) Benth. Fl. Hongk. (1861) 58.

Megabotrya meliaefolia Hance in Walp. Ann. 2 (1851-52) 259.

Boymia glabrifolia Champ. in Hook. Kew. Journ. Bot. 3 (1851) 330.

Eurycoma dubia Elm. Leaff. Philip. Bot. 2 (1908) 481.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31968 Santos, June, 1918, altitude 1,800 meters, with the local name *galiny-guiuan*. NEGROS, Cuernos Mountains, *Elmer* 10120 (type of *Eurycoma dubia* Elm.).

The second collection of this species in the Philippines induced me to make a critical study of it, as it was perfectly evident that the form described by Mr. Elmer as *Eurycoma dubia* represented no simarubaceous plant. I cannot distinguish the Philippine form from *Evodia meliaefolia* Benth., which was previously known from southern Japan, the Liu Kiu Islands,

Formosa, and southern China. It is the only pinnate-leaved *Evodia* known from the Philippines.

EVODIA SESSILIFOLIOLA sp. nov.

Arbor usque ad 10 m alta, partibus junioribus inflorescentiisque plus minusve villosis; foliis plerumque 3-foliolatis, interdum 1-foliolatis, foliolis chartaceis ad subcoriaceis, sessilibus, oblongo-obovatis, usque ad 20 cm longis, basi cuneatis, apice obtusis, subtus punctatis, nervis utrinque circiter 13, subtus perspicuis; inflorescentiis axillaribus, pedunculatis, usque ad 10 cm longis; floribus 4-meris, petalis circiter 2.5 mm longis.

A tree, 8 to 10 m high, the younger parts and the inflorescences more or less villous, the indumentum grayish, the older parts soon glabrous. Leaves mostly 3-foliolate, sometimes 1-foliolate ones on the same branchlets with the 3-foliolate ones, their petioles 5 to 7 cm long; leaflets sessile, chartaceous to subcoriaceous, brownish or rather pale when dry, somewhat shining, obovate to oblong-obovate, 9 to 20 cm long, 4 to 10 cm wide, the mature ones glabrous, beneath distinctly punctate, apex obtuse to rounded, base of the terminal leaflet usually cuneate, equilateral, of the lateral ones usually obtuse and distinctly inequilateral; nerves about 13 on each side of the midrib, prominent on the lower surface, anastomosing, the reticulations prominent. Inflorescences axillary, peduncled, up to 10 cm long, paniculate, rather many flowered. Flowers white, 4-merous, their pedicels up to 2 mm in length, densely villous. Sepals oblong, 0.5 mm long. Petals ovate, about 2.5 mm long. Disk densely villous. Fruit of 3 or 4 cocci, glabrous, the individual cocci about 3 mm in diameter.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31788 Santos (type), April 22, 1913, altitude about 2,400 meters, with the Igorot name *itapan*, Mrs. Clemens s. n., January, 1915; Baguio, *Williams 1531*, November 30, 1904, *Sandkuhl 86*, July, 1913.

Among the Philippine species the alliance of this form is with *Evodia semecarpifolia* Merr., and among the extra-Philippine forms with *E. lunur-ankenda* (Gaertn.) Merr. It is distinguished from both by its sessile leaflets. The combination of 3-foliolate and 1-foliolate leaves on the same branchlets is rather unusual in the genus.

MELIACEAE

AGLAIA Loureiro

AGLAIA DIFFUSIFLORA sp. nov. § *Euaglaia*.

Arbor parva, plus minusve brunneo- vel castaneo-lepidotis; foliis alternis, circiter 60 cm longis, 7-foliolatis, foliolis oblongo-

ellipticis, circiter 25 cm longis, chartaceis, obtusis vel obtuse acuminatis, nervis utrinque circiter 16; paniculis diffusis, laxis, foliis subaequantibus, multifloris, ramis inferioribus usque ad 30 cm longis; floribus racemose dispositis, 5-meris, calycis lobis orbicularibus, petalis obovato-ellipticis, 1.4 mm longis, tubo stamineo libero.

A small tree, the branchlets and inflorescences densely covered with closely appressed brown or castaneous scales with similar scattered ones on the lower surface of the leaflets. Leaves alternate, about 60 cm long, 7-foliolate; leaflets alternate or the upper pair opposite, chartaceous, rather pale when dry, oblong-elliptic, somewhat inequilateral, about 25 cm long, 9 to 11 cm wide, the apex obtuse or somewhat obtusely acuminate, base usually rounded on one side and acute on the other; lateral nerves about 16 on each side of the midrib, prominent; petiolules 1.5 to 2.5 cm long. Panicles diffuse, about 50 cm long, the branches spreading, the lower ones up to 30 cm in length, many flowered, the flowers laxly and racemosely arranged on the ultimate branchlets, their pedicels 1 to 2 mm long. Flowers white, 5-merous. Calyx-lobes orbicular, rounded, 0.5 mm in diameter. Petals elliptic-obovate to broadly elliptic, 1.4 mm long. Staminial-tube turbinate, glabrous, about 1 mm long, crenulate, the crenulations minutely puberulent, free, glabrous. Anthers 5, inserted below the rim of the tube, about 0.5 mm long, their tips minutely exerted.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31098 Ramos & Edaña, May 16, 1918, in damp forests.

This species is allied to *Aglaia pallida* Merr., from which it is distinguished by its larger leaflets, the lepidote indumentum not being at all stellate, and by its very much longer petiolules.

ANACARDIACEAE

SEMECARPUS Linnaeus f.

SEMECARPUS SUBSESSILIFOLIA sp. nov.

Species *S. gigantifoliae* affinis, differt inflorescentiis terminalibus, inflorescentiis hypocarpiisque cinereo-pubescens. Frutex vel arbor parva, simplex; foliis oblongo-oblongeolatis, usque ad 50 cm longis et 16 latis, acuminatis, deorsum longe angustatis, basi rotundatis vel obtusis, nervis utrinque 30 ad 35, perspicuis; paniculis circiter 20 cm longis; fructibus oblongis, circiter 1 cm longis.

A shrub or a small unbranched tree, glabrous except the inflorescences. Leaves oblong-oblongeolate, about 50 cm long, 12 to 16 cm wide, firmly chartaceous, shining, the upper surface

olivaceous, the lower pale when dry, apex shortly acuminate, gradually narrowed in the lower two-thirds to three-fourths to the narrow and abruptly rounded or obtuse base, which is at most 2.5 cm wide; midrib very stout, the primary lateral nerves 30 to 35 on each side of the midrib, somewhat curved, anastomosing, prominent, the reticulations rather lax, distinct, the secondary nervules leaving the nerves at about right angles; petioles very stout, about 1 cm long or less, panicles terminal, about 20 cm long, more or less pubescent, the primary branches few, up to 8 cm long. Immature fruits oblong, about 1 cm long, glabrous; hypocarp somewhat turbinate, about 4 mm long, black when dry, cinereous-pubescent.

PANAY, Capiz Province, Mount Madaas, *Bur. Sci.* 30711 Ramos & Edaña, May 12, 1918, in forests.

This species is manifestly allied to *Semecarpus gigantifolia* F.-Vill. and like that species is unbranched. It differs essentially in its terminal, not cauline, inflorescences which are more or less pubescent and in its distinctly pubescent hypocarps.

SEMECARPUS FERRUGINEA sp. nov.

Arbor parva, ramulis inflorescentiisque ferrugineo-pubescentis; foliis oblanceolatis ad oblongo-oblanceolatis, coriaceis, nitidis, acuminatis, basi angustatis, subtus glaucis, nervis utrinque 12 ad 14, perspicuis; paniculis terminalibus, usque ad 28 cm longis; fructibus oblique ovoideis, glabris, 1.2 cm longis, hypocarpio ferrugineo-pubescentis.

A small tree, the branchlets, inflorescences, and hypocarps more or less ferruginous-pubescent. Leaves oblanceolate to oblong-oblanceolate, coriaceous, 12 to 16 cm long, 3 to 4.5 cm wide, apex slightly acuminate, somewhat narrowed below to the cuneate or obtuse base, the upper surface brownish-olivaceous, shining, glabrous except the pubescent midrib, the lower surface glaucous, slightly pubescent along the midrib and nerves; lateral nerves 12 to 14 on each side of the midrib, curved, anastomosing, the reticulations rather lax, distinct, the primary nervules leaving the nerves at nearly right angles; petioles stout, 7 to 10 mm long, sulcate on the upper side, pubescent. Panicles terminal, in fruit up to 28 cm long, the rachis and branches densely ferruginous-pubescent, the primary branches few, scattered, the longer ones about 6 cm in length. Fruits obliquely ovoid, glabrous, black and somewhat shining when dry, about 1.2 cm long, the very young ones with a few ferruginous hairs; hypocarps 5 to 7 mm long, ferruginous-pubescent, the indumentum somewhat deciduous; pedicels 5 to 8 mm long.

PANAY, Capiz Province, Mount Macosolon, *Bur. Sci.* 30756 *Ramos & Edaña*, April 22, 1918, on forested slopes.

This species resembles *Semecarpus philippinensis* Engl., to which it is manifestly allied, but from which it is easily distinguished by its ferruginous-pubescent panicles and hypocarps.

ONCOCARPUS A. Gray

ONCOCARPUS OBOVATA (Elm.) comb. nov.

Dichapetalum obovatum Elm. Leaf. Philip. Bot. 2 (1908) 483.

LUZON, Tayabas Province, Mount Banahao, *Elmer* 7931 (type), May, 1907, in fruit; *Quisumbing* 1346, May, 1918, with staminate flowers.

While it has long been realized by me that the form described by Mr. Elmer could be no dichapetalous plant, no study of it was previously made on account of the incomplete material representing it. Staminate material from near the type locality shows that it is an anacardiaceous plant and is referable to *Oncocarpus*. It differs radically from the other Philippine species of this small genus in its very short inflorescences, the staminate ones being reduced to few-flowered, axillary fascicles; the staminate flowers are moreover 5- to 6-merous, with 5 calyx-lobes and 6 petals and stamens. The petals are oblong-lanceolate, reticulate, villous externally, about 3 mm long, 1 to 1.2 mm wide, obtuse or acute; the filaments are unequal in length and glabrous; the rudimentary ovary densely villous. In the type collection, which was distributed as *Pterospermum*, the single fruit I have seen is 1-celled and 1-seeded, although it is described as 2-celled with one seed in each cell. The pedicel is only slightly thickened in fruit. The alliance of this species is manifestly with *Oncocarpus densiflora* Merr.

PARISHIA Hooker f.

PARISHIA OBLONGIFOLIA sp. nov.

Arbor, inflorescentiis ferrugineo-tomentosis exceptis glabra; foliis usque ad 40 cm longis, foliolis 15 ad 17, coriaceis, aequilateralibus, oblongis ad oblongo-lanceolatis, acuminatis, usque ad 18 cm longis, nitidis, nervis utrinque circiter 20; infructescentiis quam foliis paullo longioribus, calycis accrescentibus usque ad 10 cm longis, ferrugineo-tomentosis, lobis anguste oblongis, obtusis, usque ad 9 cm longis et 1.5 cm latis, tubo inflato, in siccitate brunneis, fructibus densissime villosis.

A tree, with ultimate branches thickened, rugose, dark-brown, about 1.5 cm in diameter. Leaves up to 40 cm long; leaflets 15 to 17, coriaceous, oblong to oblong-lanceolate, 11 to 18 cm long,

8 to 6 cm wide, acuminate, base acute, shining, brown when dry, the lower surface paler than the other; lateral nerves about 20 on each side of the midrib, distinct; petiolules 7 to 10 mm long. Panicles equal to or longer than the leaves, ferruginous-tomentose. Accrescent calyx up to 10 cm in length, the lobes 4, narrowly oblong, up to 9 cm long, about 1.5 cm wide, obtuse, ferruginous-tomentose, at first membranaceous becoming coriaceous, the inflated base brown when fresh, the lobes more or less pink toward their tips, when dry uniformly brown. Young fruits ovoid, very densely ferruginous-villous with spreading hairs about 2 mm long.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31044 Ramos & Edaña, May, 1918 (type); Antique Province, Culasi, *Bur. Sci.* 32219 McGregor, May 24, 1918, on forested hillsides, altitude 900 meters. The same species is represented by a sterile specimen from Sibuyan Island, *For. Bur.* 27040 Sajor, November 7, 1917, with the Visayan name *bulalog*.

This species is the second one of the genus to be found in the Philippines and is readily distinguished from *Parishia malabog* Merr. by its narrower, differentially shaped, equilateral, more numerous nerved leaflets and by its ferruginous-tomentose inflorescences and accrescent, much larger calyces, the lobes of which are much wider than are those of *Parishia malabog*.

ICACINACEAE

VILLARESIA Ruiz and Pavon

VILLARESIA PHILIPPINENSIS sp. nov.

Arbor parva, inflorescentibus exceptis glabra; foliis crasse coriaceis, rigidis, ellipticis ad elliptico-oblongis, olivaceis, nitidis, usque ad 11 cm longis, integris, acuminatis, basi plerumque leviter inaequilateralibus, acutis, nervis utrinque circiter 4, perspicuis, petiolo 2 ad 3 cm longo; inflorescentibus terminalibus, 5 ad 8 cm longis, solitariis vel binis, ramis brevissimis; floribus circiter 6 mm longis, confertis; fructibus ovoideis, 2.5 ad 3 cm longis, inaequilateralibus.

A small tree, 4 to 5 m high, entirely glabrous except the inflorescences. Leaves thickly coriaceous, rigid, elliptic to elliptic-oblong, olivaceous and shining on both surfaces when dry, 6 to 11 cm long, 3 to 6.5 cm wide, entire, the apex rather prominently acuminate, base usually slightly inequilateral, acute; lateral nerves usually 4 on each side of the midrib, curved-ascending, arched-anastomosing, prominent on the lower surface, the reticulations lax, distinct; petioles black when dry, 2 to 3 cm long. Inflorescences terminal, 5 to 8 cm long, solitary or sometimes

in pairs, narrow, more or less hirsute with short, somewhat ferruginous hairs, the branches numerous, rather crowded, racemously arranged, 1 cm long or less, each bearing at the apex 5 to 8, densely crowded, cymosely arranged, sessile flowers. Sepals 5, subelliptic, rounded, imbricate, 1.5 to 2 mm long, sparingly hirsute. Petals 5, narrowly oblong, white, glabrous, 5 to 6 mm long, the tip inflexed, the margins slightly imbricate throughout, prominently keeled inside along the median portion. Filaments free, 5 mm long; anthers broadly ovoid, 1 mm long. Ovary glabrous, ovoid, 1-celled; ovules 2, pendulous; style glabrous, about 3 mm long; stigma minute, obscurely 2-lobed. Fruit ovoid, glabrous, shining, 2.5 to 3 cm long, distinctly inequilateral, black, the pericarp 1 to 1.5 mm thick. Seed deeply sulcate.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33267 (type), 33308 Ramos, August 20, 1918, on forested slopes, altitude about 1,000 meters.

This species is apparently allied to *Villaresia suaveolens* (Blume) Val., the type of the genus *Pleuropetalon* Blume and of the genus *Chariessa* Miq., from which it is perhaps best distinguished by its long petioles; I have seen no specimen of Blume's species and all of the published descriptions are incomplete.

VILLARESIA LATIFOLIA sp. nov.

Arbor alta, inflorescentiis exceptis glabra; foliis crasse coriaceis, nitidis, obovatis ad oblong-obovatis, usque ad 18 cm longis et 11 cm latis, integris, abrupte et brevissime acuminatis, basi acutis ad decurrento-acuminatis, nervis utrinque 5 vel 6, petiolo 1 ad 1.5 cm longo; infructescentiis anguste pyramidatis, 10 ad 15 cm longis, ramis inferioribus usque ad 5 cm longis; fructibus ovoideis, aequilateralibus, 2 cm longis.

A large tree, glabrous except the somewhat hirsute inflorescences. Leaves thickly coriaceous, shining, obovate to oblong-obovate, 12 to 18 cm long, 6 to 11 cm wide, entire, the apex broad, abruptly and shortly acuminate, base acute to decurrent-acuminate, equilateral; lateral nerves 5 or 6 on each side of the midrib, curved-ascending, anastomosing, the reticulations lax; petioles 1 to 1.5 cm long. Infructescences terminal, solitary, narrowly pyramidal, 10 to 15 cm long, tripinnately paniculate, the primary branches racemously arranged, numerous, rather crowded, the lower ones up to 5 cm in length, the uppermost ones simple, about 1 cm long. Fruits (not quite mature) ovoid, equilateral or nearly so, brown and shining when dry, about 2 cm long. Seed deeply longitudinally sulcate.

SAMAR, Catubig River at Pinipisakan, *Bur. Sci.* 24557 Ramos, March 21, 1916, in damp forests near the river at low altitudes, with the Visayan name *malaampipi*, distributed as an unidentified representative of the *Menispermaceae*.

The type of the genus *Villaresia* is a tropical American plant, and after a critical study of the two Philippine forms I am in entire agreement with Bentham and with Valetton in reducing to it the genus *Chariessa* Miquel, which was based on *Pleuropetalon* Blume (non *Pleuropetalum* Hook.), the type of which was a Javan specimen. Engler maintains *Chariessa* as a genus distinct from *Villaresia* chiefly on the basis that the petals of the latter are imbricate and those of the latter are valvate. Blume described the petals of the Javan form as imbricate, while in *Villaresia philippinensis* the petals are distinctly although not prominently imbricate throughout. There appears to be no other character by which the two genera can be distinguished. The genus *Villaresia* has about ten known species in tropical America, one in tropical Africa, one in Java, two in Australia, one in Polynesia, and two in the Philippines.

MIQUELIA Meissner

MIQUELIA PHILIPPINENSIS sp. nov.

Frutex scandens, ramulis junioribus hirsutis; foliis membranaceis, ovatis, 7 ad 11 cm longis, basi late rotundatis et plus minusve cordatis, apice acuminatis, margine integris vel repandis; inflorescentiis ♀ axillaribus, pedunculatis, floribus umbellatim dispositis; fructibus immaturis oblongo-ellipsoideis, 1 ad 1.3 cm longis, longe stipitatis.

A scandent shrub, the young branchlets hirsute. Leaves membranaceous, ovate, olivaceous, 7 to 11 cm long, 5 to 9 cm wide, base broadly rounded and usually shallowly cordate, apex somewhat acuminate, margins entire or somewhat repand; lateral nerves 5 or 6 on each side of the midrib, slender, distinct, the basal ones scarcely distinguishable from the others, reticulations lax; petioles pubescent when young, soon becoming glabrous, 3 to 7 cm long. Pistillate inflorescences axillary, their peduncles about 3 cm long, each bearing usually about 7 umbellately arranged flowers, their pedicels 5 mm long, each subtended by a lanceolate, acuminate, sparingly hirsute bracteole, 1 to 1.5 mm long. Sepals oblong, obtuse, 2.5 mm long. Fruits (immature) slightly pubescent, oblong-ellipsoid, 1 to 1.3 cm long, narrowed below into a pseudostalk as long as the fruit proper.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32885 Ramos, August 6, 1918, in rocky forests at low altitudes.

This is the second species of the genus to be found in the Philippines and differs from *Miquelia cumingii* notably in its umbellately arranged, not capitate, pistillate flowers.

SAPINDACEAE

ALLOPHYLUS Linnaeus

ALLOPHYLUS STENOPHYLLUS sp. nov.

Frutex erectus, ramulis foliisque plus minusve pubescens, ramis glabris, lenticellatis; foliis 5-foliolatis, foliolis chartaceis, angustissime lanceolatis, 5 ad 10 cm longis, 1 ad 1.5 cm latis, tenuiter acuminatis, margine distanter serratis, supra subglabris, subtus ad costa nervisque leviter pubescentibus, axillis dense barbatis; racemis axillaribus, 7 ad 5 cm longis; fructibus subellipsoideis, circiter 5 mm longis.

A small erect shrub, the branches glabrous, brownish, distinctly lenticellate, the branchlets paler and somewhat appressed-pubescent. Leaves palmately 5-foliolate, their petioles 4 to 6 cm long, appressed-pubescent with short hairs; leaflets chartaceous, very narrowly lanceolate, 5 to 10 cm long, 1 to 1.5 cm wide, slenderly acuminate, base decurrent-acuminate, margins rather distantly serrate, the upper surface pale-olivaceous, shining, glabrous or very slightly pubescent especially on the midrib, the lower surface paler, sparingly pubescent on the midrib and nerves, densely bearded in the axils; petiolules of the central leaflets 5 to 10 mm long, the lateral leaflets subsessile. Racemes axillary, solitary, sparingly pubescent, 5 to 7 cm long. Fruits rather numerous, subellipsoid, brown when dry, very slightly pubescent, about 5 mm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32839 Ramos, August 29, 1918, in dry thickets at low altitudes.

This species manifestly belongs in the group with *Allophylus dimorphus* Radlk., from which I do not consider that *A. quinatus* Radlk. can be specifically distinguished. *Allophylus stenophyllus* differs from all forms of the above species in its very narrowly lanceolate leaflets, which are nearly glabrous on both surfaces and which attain a length of 10 cm but do not exceed 1.5 cm in width.

GUIOA Cavanilles

GUIOA PARVIFOLIOLA sp. nov.

Frutex, partibus junioribus foliisque plus minusve pubescens; foliis 10 cm longis, foliolis plerumque 6, anguste oblongis, obtusis, coriaceis, 2 ad 4 cm longis, 6 ad 15 mm latis, basi angustatis, apice obtusis, vetustioribus supra glabris, nervis utrinque

8 ad 10; capsulis late obovatis, 3-lobatis, circiter 1 cm longis et 1.3 cm latis, lobis late rotundatis, apice retusis apiculatisque.

A shrub, the younger parts and the young leaves more or less pubescent, the older leaves glabrous or nearly so, at least on the upper surface. Leaves 10 cm long or less, the rachis and petiolules puberulent; leaflets usually 6, narrowly oblong, coriaceous, 2 to 4 cm long, 6 to 15 mm wide, obtuse, narrowed below to the somewhat decurrent-acuminate base, the upper surface dark-olivaceous, glabrous, the lower surface much paler and, at least when young, more or less pubescent with scattered short hairs; lateral nerves 8 to 10 on each side of the midrib, prominent on the lower surface; petiolules 2 to 5 mm long. Infructescences axillary, 3 to 5 cm long, pubescent, the branches few. Capsules broadly obovate, 3-lobed, apex more or less retuse and distinctly apiculate, about 1.3 cm wide and nearly 1 cm long, the lobes broadly rounded, red, glabrous. Seeds obovoid, smooth, shining, about 6 mm long.

LUZON, Ilocos Norte Province, Mount Nagapatan, *Bur. Sci.* 33187 Ramos, August 8, 1918, on dry slopes, altitude about 700 meters.

The alliance of this species is manifestly with *Guioa obtusa* Merr., from which it radically differs in its very much smaller, relatively much narrower leaflets.

ELAEOCARPACEAE

ELAEOCARPUS Linnaeus

ELAEOCARPUS ILOCANUS sp. nov. § *Dicera*.

Arbor parva inflorescentiis densissime ferrugineo-pubescentis; foliis ellipticis ad obovato-ellipticis, glabris, olivaceis, nitidis, 4 ad 7 cm longis, basi acutis, apice breviter obtuse acuminatis, margine distanter apiculato-crenatis, nervis utrinque circiter 7, distinctis; racemis numerosis, solitariis, plerumque e axillis defoliatis, 5 cm longis; floribus 5-meris, 8 mm longis; sepalis lanceolatis, pubescentibus; petalis glaberrimis, usque ad $\frac{1}{2}$ laciniatis, laciniae circiter 20; staminibus circiter 25, antheris oblongis, obtusis, apice parce ciliatis; ovario pubescente, 3-loculare; fructibus ellipsoideis, 2.5 cm longis, 1-locellatis.

A tree, about 5 m high, the inflorescences very densely ferruginous-pubescent, the branches terete, glabrous, the very young branchlets either more or less pubescent or glabrous. Leaves elliptic to obovate-elliptic, olivaceous and shining on the upper surface, the lower surface paler, 4 to 7 cm long, 2 to 3.5 cm wide, base acute, apex shortly and obtusely acuminate, margins distantly apiculate-crenate; lateral nerves about 7 on each side

of the midrib, prominent; petioles glabrous, 1 to 1.3 cm long, racemes numerous, solitary, chiefly from the axils of fallen leaves, about 5 cm long, usually 6- to 10-flowered. Flowers pink, about 8 mm long, 5-merous, their pedicels 5 to 6 mm long, densely pubescent. Sepals lanceolate, 7 mm long, densely pubescent. Petals entirely glabrous, 7 to 8 mm long, cuneate, split to about the middle into three primary divisions, these again divided, the ultimate laciniae about 20, slender. Stamens about 25, filaments 1 to 1.5 mm long, anthers narrowly oblong, 1.5 to 1.8 mm long, minutely scabrid, the cells slightly unequal, obtuse, sparingly ciliate at their tips. Ovary ovoid, densely pubescent, 3-celled. Fruit ellipsoid, about 2.5 cm long, black when dry, one-celled.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33271 Ramos, August 21, 1918, on forested slopes near the summit, altitude about 1,000 meters.

This species somewhat resembles both *Elaeocarpus cumingii* Turcz. and *E. forbesii* Merr., differing radically from the former in its very densely pubescent racemes and sepals and from the latter in its much longer racemes and entirely glabrous petioles.

SLOANEA Linnaeus

SLOANEA JAVANICA (Miq.) Szyszyl. ex K. Schum in Engl. & Prantl. Nat. Pflanzenfam. 3^e (1890) 5; Koord. & Val. Bijdr. Boom. Java 1 (1894) 239, Atlas Baumart. Java 3 (1914) f. 433 (after Miquel).

Phoenixospermum javanicum Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 68, t. 3.

LUZON, Cagayan Province, Pamplona, *For. Bur.* 14713 Darling, March 17, 1909; Pamplona, *For. Bur.* 16988 Bacani, March, 1907; Laguna Province, Cavinti, *For. Bur.* 19665 Racelis, August, 1912, with mature fruits. MINDORO, Ibolo River, *For. Bur.* 11482 Merritt, May, 1908, sterile. A tree, 10 to 25 m high, in forests up to an altitude of 600 meters.

This species has previously been known only from Java, where it is apparently very rare, as until recently it was known only from trees cultivated in the botanical garden at Buitenzorg; it is now known from Depok, near Buitenzorg, *Koorders* 42807, a duplicate of *Koorders'* specimen being before me. The Philippine specimens have somewhat larger and more prominently acuminate leaves than the Javan material, while the fruits are a little larger. In the absence of flowers I can detect no differential characters of sufficient importance to warrant the separation of the Philippine form from the Javan one. The genus is new to the Philippines.

Szyszyłowicz does not make the transfer of *Phoenixospermum javanicum* Miq. to *Sloanea* in his paper "Zur Systematik der Tiliaceen"³ as indicated by Koorders and Valetton, but merely reduces the genus *Phoenixospermum* to *Sloanea*.

STERCULIACEAE

PTEROSPERMUM Schreber

PTEROSPERMUM MEGALANTHUM sp. nov.

Arbor parva, subtus foliis et ramulis et inflorescentiis densissime ferrugineo-stellato-tomentosis; foliis oblongis, inaequalateralibus, integris, acuminatis, supra glabris, nitidis, usque ad 15 cm longis; inflorescentiis plerumque 2-floris, floribus longe pedicellatis, circiter 6.5 cm longis; sepalis anguste lanceolatis, 6 cm longis et 1 cm latis; petalis oblique obovatis, 3 cm latis, quam sepalis paullo longioribus.

A tree, 7 to 8 m high, the branchlets, petioles, inflorescences, and the lower surface of the leaves densely stellate-tomentose with ferruginous hairs. Branches at first stellate-pubescent, soon becoming glabrous, nearly black when dry. Leaves inequilateral, oblong, chartaceous to subcoriaceous, 9 to 15 cm long, 3 to 6.5 cm wide, entire, or the margins obscurely undulate, rather sharply acuminate, the upper surface olivaceous, glabrous and shining when dry, the basal lobe of the broader side broadly rounded, of the narrower side rounded to acute, the leaf somewhat obliquely cordate; lateral nerves about 6 on each side of the midrib, excluding those extending into the broader basal lobe; petioles densely ferruginous-stellate-pubescent, 5 to 10 mm long. Inflorescences in the uppermost axils and subterminal, usually 2-flowered, the peduncles 1.5 cm long or less, the pedicels in anthesis 3 to 4 cm long, densely ferruginous-pubescent; bracts linear-lanceolate, entire, deciduous. Flowers white, fragrant, about 6.5 cm long, 5-merous. Sepals coriaceous, narrowly lanceolate, about 6 cm long, 1 cm wide, slightly acuminate, externally densely ferruginous-stellate-pubescent, inside densely subappressed fulvous-hirsute. Petals obliquely obovate, membranaceous, glabrous, about 6.5 cm long, 3 cm wide. Staminal column glabrous, 1.5 cm long. Staminodes 3 cm long. Filaments and anthers each 1.5 cm long, sometimes 2, sometimes 3 between each pair of staminodes. Ovary ovoid, densely ferruginous-villous; style glabrous, 3 cm long.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31269 Ramos & Edaña (type), April 28, 1918; Ibahay, *For. Bur.* 25359 Achacoso,

³ Engl. Bot. Jahrb. 5 (1885) 427-457.

April 7, 1916, along streams in open forests, altitude about 100 meters.

This species has almost exactly the vegetative characters of *Pterospermum blumeianum* Korth. (*P. javanicum* Jungh.) and the second specimen cited above, which has only immature buds, was originally so identified. While it is manifestly closely allied to Korthals's species, it differs remarkably in its larger flowers, somewhat longer and much broader sepals, and in its much larger petals, which exceed the sepals in length.

DILLENIACEAE

DILLENIA Linnaeus

DILLENIA MEGALOPHYLLA sp. nov. § *Wormia*.

Arbor, inflorescentiis exceptis glabra, ramulis ultimis 1.5 ad 2 cm diametro; foliis coriaceis, ovatis ad elliptico-ovatis, usque ad 1 m longis, apice rotundatis, basi angustatis, margine undulatis vel obscure dentatis, nervis utrinque 15 ad 18, perspicuis, lamina decurrente, basi conduplicatis; inflorescentiis axillaribus, longe pedunculatis, paucifloris, circiter 40 cm longis, dense pubescentibus; sepalis coriaceis, obovatis ad late ellipticis, 3 cm longis, extus molliter dense fulvo-pubescentibus; carpellis plerumque 8.

A tree, about 7 m high, nearly glabrous except the inflorescences, the ultimate branches 1.5 to 2 cm in diameter. Leaves coriaceous, ovate to elliptic-ovate, up to 1 m long and 60 cm wide, apex rounded, base gradually narrowed, margins somewhat undulate and obscurely toothed, glabrous on both surfaces, what is apparently the petiolar part of the leaf with the lamina continuous but with much slenderer nerves than the leaf proper, extending to the very base of the petiole, conduplicate, the upper surface for a distance of about 2.4 cm on each side of the midrib closely appressed and with a modified, brown, apparently absorbent epidermis, this region in some leaves inhabited by colonies of ants, the lower surface of this conduplicate area rather softly pubescent; lateral nerves above the modified petiolar part of the lamina very prominent, 15 to 18 on each side of the midrib. Inflorescences in the uppermost axils, long-peduncled, few-flowered, sparingly branched above, about 40 cm long, densely and softly pubescent; pedicels 3 to 5 cm long. Sepals coriaceous, obovate to broadly elliptic, rounded, concave, about 3 cm long, softly and densely fulvous-pubescent externally. Petals not seen. Stamens apparently equal or subequal. Carpels usually 8, glabrous, not twisted, the styles up to 3 cm long. Immature carpels coriaceous, about 3 cm long, apparently purplish, dehiscent; ovules about 11 in each carpel; immature seeds with a small basal aril.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 33034 Ramos, August 21, 1918, in forests near the sea at low altitudes.

This species is remarkable for its exceedingly large leaves, which attain at least 1 meter in length. It belongs in the group with *Dillenia suffruticosa* Grieff. and like that species has a portion of the upper surface of the decurrent basal part of the lamina conduplicate and supplied with a modified, apparently absorbent, epidermal tissue. Among the Philippine species it is most closely allied to *Dillenia papyracea* Merr., of Basilan, from which it is readily distinguished by its very much larger leaves, softly pubescent inflorescences and sepals, and fewer carpels.

SAURAUIA Willdenow

SAURAUIA SANTOSII sp. nov.

Arbor 7 ad 9 m alta, *S. eleganti* affinis, differt floribus majoribus, 1.5 ad 2 cm diametro, confertis, foliis subtus densissime fulvo-ferrugineo-lanatis.

A tree, 7 to 9 m high, the branches brown, setose, and densely ferruginous-tomentose, the setae comparatively few, filiform, 4 to 7 mm in length, ascending. Leaves thickly coriaceous, rigid, oblong, 13 to 18 cm long, 5.5 to 7 cm wide, obtuse, the base rounded, cordate, often somewhat oblique, the margins with small, thick, rounded teeth, these often terminating in filiform, deciduous setae, the upper surface brown, glabrous, shining, rugose-pustulate, the nerves impressed, the lower surface very densely fulvous-ferruginous-lanate, the indumentum covering the whole surface, midrib, and nerves, the midrib and nerves also with few, scattered, filiform setae; lateral nerves 25 to 30, prominent, projecting; petioles 2 to 4 cm long, setose and tomentose. Inflorescences axillary, long-peduncled, cymose, the flowers crowded, the peduncles 10 to 12 cm long, densely tomentose and rather sparingly setose, the cymes compact, 4 to 5 cm in diameter. Flowers white, 1.5 to 2 cm in diameter, their pedicels up to 5 mm in length, setose and tomentose. Sepals broadly ovate, obtuse or rounded, 5 mm in diameter, the outer ones thickly coriaceous, densely villous and setose, the setae slender, up to 2 mm in length, the inner ones thinner, rather sparingly villous and not setose. Petals oblong-obovate, rounded, about 11 mm long and 7 mm wide. Ovary glabrous; styles 2, free to the base, 4 mm long.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31937 Santos, May 16, 1918, on slopes, altitude about 2,200 meters.

This species is manifestly allied to *Saurauia elegans* (Choisy)

F.-Vill., from which it is readily distinguished by its dense indumentum, its compact cymes, and its much larger flowers. The two styles are constant in all the flowers examined, *Saurauia elegans* normally having three styles, although in some flowers they are reduced to two.

FLACOURTIACEAE

HOMALIUM Jacquin

HOMALIUM RAMOSII sp. nov. § *Myriantheia*.

Arbor, inflorescentiis exceptis glabra; foliis oblongis ad oblongo-ellipticis, subcoriaceis, integris nitidis, 6 ad 10 cm longis, basi acutis, apice obtuse acuminatis, nervis utrinque circiter 7; inflorescentiis axillaribus terminalibusque, racemosis vel depauperato-paniculatis, usque ad 10 cm longis; floribus fasciculatis, 5-meris, 6 ad 7 mm diametro, petalis oblongis ad oblongo-obovatis; staminibus 15.

A small tree, glabrous except the inflorescences, the branches terete, brownish. Leaves oblong to oblong-elliptic, subcoriaceous, shining, entire, 6 to 10 cm long, 3 to 4.5 cm wide, subequally narrowed to the acute base and acuminate apex, the acumen blunt, short; lateral nerves about 7 on each side of the midrib, arched, anastomosing, distinct as are the reticulations; petioles 5 to 8 mm long. Racemes axillary and terminal, solitary or forming sparingly branched inflorescences, the individual ones up to 10 cm long, cinereous-pubescent, the flowers mostly fascicled at the nodes, usually 2 or 3 in a fascicle, their pedicels 3 to 4 mm long, jointed with the calyx; bracteoles narrowly lanceolate, about 2 mm long. Flowers white, 5-merous, 6 to 7 mm in diameter. Sepals and petals about 2.5 mm long, pubescent, rather densely so inside, oblong to narrowly oblong-obovate. Stamens 15, three opposite each petal, their filaments about 2 mm long, glabrous. Ovary very densely pubescent, styles about 1.8 mm long, villous below.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 32985 *Ramos*, August 12, 1918, on slopes, altitude about 450 meters.

This species has much the vegetative characters of *Homalium multiflorum* Merr. but belongs in a different section of the genus and is most closely allied to *H. samarense* Merr., from which it differs in its much shorter indumentum on its inflorescences; its smaller flowers, which are fascicled and not solitary along the racemes; and its entire leaves. In the present species occasional leaves are found presenting very few greatly reduced marginal teeth, but most of the leaves are quite entire.

BEGONIACEAE

BEGONIA Linnaeus

BEGONIA COLLISIAE sp. nov. § *Diploclinium*.

Herba, pedunculis foliisque utrinque ad nervis plus minusve ferrugineo-villosis; foliis longe petiolatis, in ambitu late ovatis, usque ad 20 cm longis, inaequilateralibus, basi lateraliter cordatis, apice leviter acuminatis, profunde subpalmatim lobatis, lobis numerosis, oblongis, 2 ad 5 cm longis, irregulariter et grosse dentato-serratis vel lobulatis; inflorescentiis longe pedunculatis, dichotome ramosis, parce glandulosis, paucifloris; floribus circiter 3 cm diametro; sepalis late ovatis, circiter 11 mm latis; petalis sepalis aequantibus, 6 ad 7 mm latis.

An herb, from short, rather stout, prostrate rhizomes about 1 cm in diameter. Leaves long-petioled, in outline broadly ovate, 15 to 20 cm long, 10 to 15 cm wide, when dry submembranaceous, the upper surface olivaceous, somewhat shining, the lower brownish, both surfaces more or less ferruginous-villous on the nerves, when fresh the nerves beneath red, inequilateral, subpalmately and conspicuously lobed, the lobes oblong, 2 to 5 cm long, 2 to 3 cm wide below, all acute or acuminate and irregularly and coarsely dentate-serrate or lobulate, the primary lobes usually about 10, the base of the leaf laterally cordate, the sinus narrow, 2 to 4 cm deep, the basal lobes broadly rounded, often overlapping; petioles brown when dry, ferruginous-villous. Peduncles nearly glabrous, up to 20 cm in length, the younger parts sparingly glandular, dichotomously branched at the apex, the primary branches about 4 cm long, few-flowered. Staminate flowers pink and white, about 3 cm in diameter. Sepals broadly ovate, about 14 mm long, 11 mm wide, rounded, with few, small, widely scattered, brown glands. Petals oblong-obovate, as long as the sepals, 6 to 7 mm wide. Stamens many, the anthers narrowly obovoid, 0.8 mm long, equaling or shorter than the filaments. Pistillate flowers and fruits unknown.

PANAY, Capiz Province, Libacacao, *Bur. Sci.* 31469 Ramos & Edaño, May 5, 1918, on stream banks in forests.

This species is remarkably distinct from all previously described Philippine ones in the section *Diploclinium*, and is strongly characterized by its deeply lobed leaves, the lobes being usually about 10 in number, up to 5 cm in length, and coarsely and irregularly toothed and lobulate.

BEGONIA LANCILIMBA sp. nov. § *Diploclinium*.

Herba glaberrima; foliis longe petiolatis, membranaceis, oblongis ad oblongo-lanceolatis, sub-aequilateralibus, usque ad

13 cm longis, basi rotundatis, leviter cordatis, apice tenuiter caudato-acuminatis, margine irregulariter dentatis; petiolo 15 cm longo; inflorescentiis foliis subaequantibus, paucifloris; floribus ♂ circiter 3 cm diametro.

An entirely glabrous herb, the rhizomes creeping, simple, about 5 mm in diameter, supplied with numerous, lanceolate, caudate-acuminate, brown stipules, 1 to 1.5 cm in length. Leaves pale-green on both surfaces when fresh, when dry membranaceous, somewhat shiny, oblong to oblong-lanceolate, nearly equilateral, 7 to 13 cm long, 2.5 to 4 cm wide, base rounded and very slightly cordate, narrowed upward from the lower one-third to the slenderly caudate-acuminate apex, the margin irregularly toothed, a few of the teeth rather large, most of them small; basal nerves about 8 ascending, a few lateral nerves leaving the midrib at and above the middle; petioles about 15 cm long. Peduncles of the staminate inflorescences 19 to 24 cm long, usually with 2 short branches at the apex, each bearing about 2 relatively large white flowers about 3 cm in diameter. Sepals 2, oblong-elliptic rounded, about 1.8 mm long, 10 mm wide. Petals narrowly oblong, equaling the sepals, 3 to 3.5 mm wide, rounded. Stamens about 35, the anthers oblong, about 1.5 mm long; filaments about 1 to 2 mm long.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32232 (type), 32570, 32286 *McGregor*, June 14 and July 14, 1918, on forested slopes, altitude 900 to 1,000 meters.

This species is not closely allied to any previously described Philippine form and is very strongly characterized by being entirely glabrous; by its nearly equilateral, oblong-lanceolate to lanceolate, caudate-acuminate leaves which are slightly cordate at the base; by its long peduncles; and its few, comparatively large, white flowers.

BEGONIA OBTUSIFOLIA sp. nov. § *Diploclinium*.

Herba prostrata, petiolis et subtus foliis ad nervis adpresse ferrugineo-pubescentibus; foliis longe petiolatis, oblongis, inaequilateralibus, 7 ad 10 cm longis, apice obtuse rotundatis, basi leviter oblique cordatis, margine late lobatis vel undulatis, lobis rotundatis; inflorescentiis quam foliis longioribus, paucifloris; floribus ♂ circiter 3 cm diametro; capsulis aequaliter 3-alatis, junioribus circiter 14 mm latis et 10 mm longis, apice subtruncatis, basi rotundatis.

Rhizomes slender, creeping, the petioles and nerves on the lower surface of the leaves appressed ferruginous-pubescent.

Leaves oblong to oblong-ovate, distinctly inequilateral, 7 to 10 cm long, 3.5 to 4.5 cm wide, the upper surface glabrous, somewhat shiny, somewhat narrowed upward to the obtusely rounded apex, the base somewhat obliquely cordate, the sinus shallow, narrow, the margin on the narrower side usually with 1 or 2 short obtuse lobes, on the broader side with from 2 to 4 similar lobes or undulations; basal nerves usually 6, slender, distinct; petioles slender, 10 to 13 cm long. Peduncles 18 to 24 cm long, glabrous, dichotomously branched at the apex, the primary branches up to 3 cm in length, few-flowered. Flowers pink, the sepals of the staminate ones broadly ovate, rounded, about 14 mm long, 11 mm wide. Petals equaling the sepals, narrowly oblong, 4 mm wide. Pistillate flowers as large as the staminate ones, the young capsules equally 3-winged, about 14 mm wide and 10 mm long including the wings, base rounded, apex somewhat truncate.

PANAY, Capiz Province, Mount Macosolon, *Bur. Sci.* 30803, Ramos & Edaño, April 19, 1918, on stones in damp forests.

In the form and characters of its leaves this species is remote from all other described ones of the section and is easily recognized by its usually oblong, rounded, obtuse leaves, which have a few short rounded lobes or undulations on each side.

BEGONIA RUBRIFOLIA sp. nov. § *Diploclinium*.

Herba prostrata, rhizomate brevibus, petiolis et subtus foliis ad nervis plus minusve ferrugineo-lanatis; foliis integris, inaequilateralibus, late ovatis, chartaceis, in siccitate utrinque rubris, in vivo supra viridis, subtus rubris, usque ad 9 cm longis, basi lateraliter cordatis, palmatim 8-nerviis, nervis conspicuis, apice late acutis; infructescentiis 20 ad 30 cm longis, quam foliis multo longioribus, dichotome ramosis; capsulis paucis, inaequaliter 3-alatis, circiter 12 mm longis et 2.3 mm latis, apice truncatis, basi rotundatis.

A prostrate herb, the rhizomes short, stout, brown, glabrous. Leaves chartaceous, when fresh green on the upper surface, red beneath, when dry uniformly reddish-purple on both surfaces, the upper surface glabrous, the lower densely white- or grayish-punctate, rather densely ferruginous-lanate on the nerves, broadly ovate, inequilateral, entire, 8 to 10 cm long and nearly as wide, the apex broadly acute, base laterally cordate and palmately 8-nerved, the nerves conspicuous, margins ciliate, the sinus narrow, basal lobes broadly rounded; petioles sparingly ferruginous-lanate, 7 to 11 cm long; stipules oblong-ovate, some-

what ciliate, about 1 cm long, and with a few fimbriate-ciliate paleae. Infructescences long-peduncled, 20 to 30 cm long, nearly glabrous, dichotomously branched at the apex of the peduncle, the primary branches about 5 cm long. Capsules few, including the wings about 12 mm long and 23 mm wide, inequally 3-winged, one wing about twice as large as the other two, the apex subtruncate, base broadly rounded, the outer upper angles of the wings rounded or obtuse.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32430 McGregor, June 7, 1918, altitude about 1,000 meters.

This species is allied to *Begonia copelandii* Merr. and *B. alvarezii* Merr., but its indumentum is very different from both. The leaves are characteristically reddish-purple on both surfaces when dry.

BEGONIA SERPENS sp. nov. § *Diploclinium*.

Herba prostrata, repens, leviter ciliatis, internodiis 1 ad 3 cm longis; foliis breviter petiolatis, irregulariter rhomboideis, inaequilateralibus, 1.5 cm diametro, basi leviter cordatis, apice acutis vel acuminatis, margine irregulariter lobatis; inflorescentiis paucifloris, circiter 3 cm longis; floribus ♂ circiter 1.5 cm diametro.

A very small, slender, prostrate, sparingly appressed-ciliate herb, the rhizomes 2 mm or less in diameter, attaining a length of at least 25 cm. Leaves irregularly rhomboid, inequilateral, base more or less cordate, apex shortly acuminate, 1.5 to 2.5 cm in diameter, margins shallowly and irregularly lobed, the upper surface usually mottled with gray, glabrous, the lower surface sparingly ciliate on the nerves with appressed brown hairs, the margins more or less ciliate with short spreading hairs; petioles 1 to 1.5 cm long, sparingly ciliate; stipules brown, 5 to 6 mm long, oblong-ovate, with a long slender tip. Peduncles slender, about 3 cm long, usually 2-flowered. Staminate flowers usually pink, about 1.5 cm in diameter. Sepals broadly obovate, rounded, 7 to 8 mm long, 6 to 7 mm wide. Petals equaling the sepals, oblong-obovate, rounded, 4 mm wide. Stamens about 35; anthers oblong-obovoid, 0.8 mm long; filaments 1 mm long or less.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32588 (type), 32541 McGregor, May and June, 1918, on damp forested slopes, altitude 500 to 900 meters.

This species is as closely allied to *Begonia nigritarum* Steud. as to any other but is readily distinguished by its smaller leaves, short petioles, and short, very few-flowered inflorescences as

well as by its very slender, greatly elongated rhizomes; the internodes vary from 1 to 3 cm in length.

BEGONIA PANAYENSIS sp. nov. § *Petermannia*.

Herba suffruticosa, erecta, ramosa, glabra, circiter 1.5 m alta; foliis in siccitate membranaceis, nitidis, oblongis, usque ad 20 cm longis, inaequilateralibus, apice angustatis, tenuiter acuminatis, basi rotundatis, haud cordatis, margine distanter et irregulariter dentatis; inflorescentiis terminalibus, cymoso-paniculatis, usque ad 17 cm longis; floribus ♂ numerosis, circiter 1.5 cm diametro; sepalis orbicularis, 7 ad 8 mm diametro; petalis 0; capsulis ellipticis vel obovato-ellipticis, circiter 2.5 cm longis et 2 cm latis, aequaliter 3-alatis, apice truncato-rotundatis, basi vix angustatis, rotundatis.

An erect, branched, glabrous, suffrutescent herb, about 1.5 m high, the stems and branches stout. Leaves when dry membranaceous, shining, inequilateral, oblong, 16 to 20 cm long, 4 to 6 cm wide, narrowed upward to the slenderly acuminate apex and somewhat narrowed below to the rounded base, or the narrower side of the lamina acute and the broader side rounded, not at all cordate, margins distantly and irregularly dentate, or that of the narrower side often nearly entire except near the apex; nerves prominent, ascending; petioles stout, 1 to 1.5 cm long; stipules membranaceous, oblong to oblong-lanceolate, acuminate, 1.5 to 2 cm long. Inflorescences terminal, cymose-paniculate, up to 17 cm in length, the staminate flowers numerous, the pistillate flowers apparently few and only at the base of the inflorescence, none present on the type, but represented by mature capsules. Staminate flowers pink, about 1.5 cm in diameter. Sepals orbicular, 7 to 8 mm in diameter. Petals none. Stamens about 35, the anthers narrowly oblong to oblong-obovoid, 1.2 to 1.5 mm long, longer than the filaments. Capsules one or two at the base of the inflorescence, including the three equal wings about 2.5 cm long, 2 cm wide, elliptic to obovate-elliptic, apex rounded-truncate, base scarcely narrowed, usually rounded; pedicels 1.5 to 2 cm long.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32309 McGregor, June 8, 1918, in forests along cool mountain streams, altitude about 250 meters.

This unusually robust species is manifestly allied to *Begonia longistipula* Merr., from which it is distinguished by its larger leaves and flowers and by its much larger, differently shaped capsules.

THYMELAEACEAE

PHALERIA Jack

PHALERIA PLATYPHYLLA sp. nov.

Frutex glaber *Phaleria cumingiae* affinis differt foliis multo majoribus, circiter 25 cm longis et 9 ad 11 cm latis, floribus caulinis, fasciculatis.

An entirely glabrous shrub, the branches reddish-brown when dry. Leaves oblong to oblong-ovate, firmly chartaceous, about 25 cm long, 9 to 11 cm wide, brownish-olivaceous when dry, shining, apex slenderly acuminate, base broadly rounded; lateral nerves about 10 on each side of the midrib, distinct; petioles 1 cm long or less. Flowers white, 4-merous, in fascicles on the trunk, about 3 cm long. Perianth-lobes 4, elliptic, rounded, 8 to 9 mm long, 6.5 mm wide. Filaments 8, somewhat exerted. Immature fruit ovoid-ellipsoid, somewhat rostrate, 1.5 cm long.

PANAY, Capiz Province, Mount Macosolon, *Bur. Sci.* 30759 Ramos & Edaña, April 22, 1918, in forests.

This species has the vegetative characters of *Phaleria perrottetiana* F.-Vill., but the flowers are entirely glabrous and are moreover borne in fascicles on the trunk. It is distinguished from *Phaleria cumingii* F.-Vill. by its much larger leaves and cauline inflorescences.

MYRTACEAE

CLOEZIA Brongniart and Gris

CLOEZIA URDANETENSIS (Elm.) comb. nov.

Photinia urdanetensis Elm. Leaf. Philip. Bot. 8 (1915) 2802.

MINDANAO, Agusan Province, Mount Urdaneta, *Elmer* 13694, September, 1912, on exposed forested ridges in the mossy forest, altitude about 1,700 meters.

The genus *Cloëzia* has hitherto been known only from New Caledonia, where it is represented by six species. The discovery of a representative of it in the Philippines adds another genus to the now remarkable list of genera that are known only from the Philippines and the islands to the south and southeast of the Archipelago, including Celebes and the Moluccas generally, New Guinea, New Caledonia, and northeastern Australia. The present species was described by Mr. Elmer as a representative of the rosaceous genus *Photinia*, but a critical examination of the type collection shows that it agrees even to the most minute details with the myrtaceous *Cloëzia*.⁴ In the original description

⁴ Brongniart & Gris in *Ann. Sci. Nat. Bot.* V 2 (1864) 134.

of Mr. Elmer the stamens are described as "about 10," but I find them to vary from 15 to 20. The ovary is two-thirds to three-fourths superior, 3-celled, each cell with about 6 ovules ascending from the inner basal angle. The apical gland of the anthers, or continuation of the connective, is unusually conspicuous, being longer than the anther-cells. The fruits of the Philippine species are as yet unknown. The leaves are distinctly *Eugenia*-like and are glandular-punctate.

TRISTANIA R. Brown

TRISTANIA OBLONGIFOLIA sp. nov.

Species *T. decorticatae* similis, differt foliis junioribus utrinque dense ferrugineo-pubescentibus, inflorescentiis et floribus dense fulvo-pubescentibus, staminibus circiter 35. Arbor circiter 5 m alta, ramis teretibus, glabris; foliis coriaceis, oblongis, in siccitate brunneis, usque ad 9 cm longis, utrinque subaequaliter angustatis, basi cuneatis, apice leviter obtuse acuminatis, nervis primariis utrinque circiter 20, tenuibus; inflorescentiis axillaribus, corymbosis, circiter 3 cm longis; capsulis glabris, subovoideis, circiter 5 mm longis.

A tree, about 5 m high, the older parts glabrous, the younger leaves very densely ferruginous-tomentose on both surfaces, the inflorescences densely fulvous-tomentose. Branches brown, smooth, terete, glabrous, the younger branchlets dark-brown. Leaves oblong, coriaceous, brown when dry, shining, of about the same color on both surfaces, glandular beneath, 6 to 9 cm long, 1.8 to 2.4 cm wide, subequally narrowed to the cuneate base and to the slightly acuminate apex, the tip obtuse or subobtuse; primary lateral nerves about 20 on each side of the midrib, slender, about equally distinct on both surfaces, not much more prominent than are the secondary ones; petioles 5 mm long or less. Inflorescences axillary, about 3 cm long, rather stout, few-flowered, densely fulvous-pubescent. Flowers about 4 mm long, their pedicels stout, pubescent, 1 to 2.5 mm long, the buds ellipsoid. Calyx ovoid, the lobes 5, ovate, obtuse, 1.2 mm long. Stamens in 5 phalanges of about 7 each, inflexed in bud. Infructescences glabrous, 4 to 5 cm long. Capsules somewhat ovoid, dark-brown, glabrous, about 5 mm long.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28617 Ramos & Edaña, May 28, 1917, on forested slopes, altitude at least 400 meters.

In the vegetative characters, other than the very densely ferruginous-tomentose young leaves, this species greatly resembles

Tristania decorticata Merr. It differs remarkably from that species in its densely pubescent, larger flowers and its stamens being arranged in phalanges of about 7 each, not in groups of threes.

MELASTOMATACEAE

MEDINILLA Gaudichaud

MEDINILLA OBLANCEOLATA sp. nov.

Frutex, ramulis et inflorescentiis et foliis subtus ad costa nervisque perspicue setoso-ciliatis; foliis ternatis, breviter petiolatis, chartaceis, oblongo-oblanceolatis, usque ad 38 cm longis, tenuiter acuminatis, deorsum valde angustatis, penninerviis, nervis utrinque circiter 6, perspicuis; inflorescentiis lateralibus, circiter 10 cm longis, pedunculatis, cylindraceo-paniculatis, ramis numerosis, circiter 2 cm longis, patulis, dichotomis; floribus 4-meris, petalis oblongo-obovatis, circiter 13 mm longis, staminibus aequalibus.

A shrub, the stems about 2 cm in diameter, the young branchlets, inflorescences, and the midrib and nerves on the lower surface more or less setose-ciliate with long, spreading, pale-brownish hairs, the ciliae up to 5 mm in length. Leaves verticillate, 3 at each node, chartaceous, oblong-oblanceolate, 35 to 38 cm long, about 10 cm wide, the apex slenderly acuminate, narrowed in the lower one-half or two-thirds to the abruptly obtuse base which is 1 cm wide or less; lateral nerves about 6 on each side of the midrib, distant, ascending, somewhat curved, the primary reticulations subparallel, distant, distinct; petioles very stout, 1 cm long or less. Inflorescences lateral from the trunks, about 10 cm long, solitary, peduncled, paniculate; the primary branches numerous, densely arranged, spreading, about 2 cm long, dichotomous, sparingly ciliate, the bracteoles oblong, about 2 mm long. Flowers 4-merous, red, their pedicels about 5 mm long, petals oblong-obovate, 13 mm long. Stamens 8, equal, their filaments 8 mm long; anthers lanceolate-acuminate, 7 mm long, the dorsal appendage less than 1 mm long, the anterior ones short, curved. Fruit fleshy, glabrous, ovoid or obovoid, truncate, about 1 cm long.

PANAY, Capiz Province, Mount Madias, *Bur. Sci.* 30703 Ramos & Edaño, May 14, 1918.

This species is entirely distinct from all hitherto described forms and is strongly characterized by its elongated, ciliate-setose indumentum, which is dense on the young branchlets and scattered on the midrib and nerves; by its ternate, elongated,

oblong-oblongate, slenderly acuminate leaves which are much narrowed below and very shortly petioled; and by its cauline, paniculate, rather dense inflorescences, the panicles being subcylindric in outline.

MEDINILLA HASSELTII Blume in Flora 14 (1831) 513; Cogn. in DC. Monog. Phan. 7 (1891) 586.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31215 Ramos & Edaño, May 19, 1918, in forests.

Malay Peninsula, Sumatra, Borneo, and Java; not previously recorded from the Philippines.

MEMECYLON Linnaeus

MEMECYLON RAMOSII sp. nov.

Frutex glaber, circiter 2 m altus, ramis ramulisque teretibus; foliis distincte 3-nerviis, oblongis, chartaceis ad subcoriaceis, usque ad 20 cm longis, basi subacutis, apice tenuiter acuminatis; nervis lateralibus inter nervulos transversales plus minusve arcuatis, distinctis, nervis transversalis utrinque circiter 14; petiolo 1.5 ad 2 cm longo; infructescentiis axillaribus, cymosis, circiter 3 cm longis; fructibus ovoideis vel subglobosis, 6 ad 7 mm diametro.

An erect glabrous shrub about 2 m high, the branches and branchlets terete, the latter pale when dry, about 1 mm in diameter. Leaves oblong, chartaceous to subcoriaceous, 15 to 20 cm long, 4.5 to 6 cm wide, the upper surface olivaceous when dry, the lower surface pale; marginal nerves distinct, more or less arched between the tips of the transverse ones, the latter about 14 on each side of the midrib, prominent on the lower surface; petioles 1.5 to 2 cm long. Infructescences axillary, cymose, about 3 cm long, branched from the base or several cymes in a fascicle. Fruit ovoid to globose, 6 to 7 mm in diameter, umbellately arranged on the ultimate branchlets.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 32962 Ramos, August 29, 1918, in forests at low altitudes.

This species belongs in the group with prominently nerved leaves, somewhat arched marginal nerves, and terete branches and branchlets. It is distinguished from all of the other Philippine species of this group by its unusually long petioles.

MEMECYLON STENOPHYLLUM sp. nov.

Frutex erectus, circiter 1 m altus, glaber, ramis ramulisque tenuibus, teretibus; foliis angustate-lanceolatis, subcoriaceis,

usque ad 11 cm longis et 1.3 cm latis, acuminatis, basi abrupte rotundatis, sessilibus vel brevissime petiolatis, in siccitate bullato-rugosis, nervis utrinque circiter 25, patulis, supra leviter immersis, reticulis obsoletis; infructescentiis terminalibus, pedunculatis, 3 ad 4 cm longis, ut videtur paucifloris, fructibus globosis, circiter 7 mm diametro.

An erect glabrous shrub, about 1 m high, the branches and branchlets slender, terete, the latter about 1 mm in diameter, the internodes 2 to 4 cm long. Leaves coriaceous, greenish-olivaceous, shining, narrowly lanceolate, 7 to 11 cm long, 6 to 13 mm wide, narrowed upward to the somewhat acuminate apex, the base abruptly rounded, sessile or subsessile, the midrib and lateral nerves somewhat impressed on the upper surface, the former very prominent beneath, the upper surface especially somewhat bullate-rugose on account of the impressed nerves; lateral nerves slender, spreading, about 25 on each side of the midrib, the reticulations obsolete. Infructescences terminal, peduncled, 3 to 4 cm long, usually trichotomously branched, the ultimate branchlets 1 cm long or less. Fruits globose, black when mature, about 7 mm in diameter, their pedicels about 2 mm long.

LUZON, Bulacan Province, Angat, *Bur. Sci.* 34101 Ramos & Edaña, March 1, 1919, on dry forested slopes at low altitudes.

This species does not closely resemble any previously described form, being remarkably well characterized by its very narrow, sessile or subsessile leaves, which are gradually narrowed upward to the somewhat acuminate apex, the base being abruptly rounded; when dry the leaves are characteristically bullate-rugose by the more or less impressed lateral nerves.

OTANTHERA Blume

OTANTHERA STRIGOSA sp. nov.

Frutex erectus, circiter 1 m altus, ramis ramulisque teretibus, parce adpresse strigosus, ramulis tenuibus; foliis oblongis, usque ad 9 cm longis, chartaceis, utrinque subaequaliter angustatis, basi acutis vel acuminatis, apice acuminatis, supra perspicue adpresse strigosis, subtus, nervis parce strigosis exceptis, glabra; nervis 5; inflorescentiis plerumque 3-floris, bracteis lanceolatis, acuminatis, 5 ad 7 mm longis; floribus 5-meris, calycis perspicue penicellatis, setis patulis, 2 ad 3 mm longis, lobis anguste oblongis, tubo aequantibus; petalis circiter 1.5 cm longis, obovatis.

An erect shrub, about 1 m high, the branches and branchlets slender, terete, brownish when dry, sparingly appressed strigose.

Leaves oblong, chartaceous, 5 to 9 cm long, 1.5 to 2.5 cm wide, subequally narrowed to the acute or acuminate base and to the acuminate apex, chartaceous, the upper surface olivaceous when dry, conspicuously appressed strigose, the lower surface paler, glabrous except for the sparingly appressed strigose nerves, occasionally the primary reticulations with very few short processes; nerves 5, distinct, the inner pair reaching the apex, the marginal pair evanescent above the upper two-thirds. Inflorescences terminal, usually 3-flowered, the pedicels 1 to 1.5 cm long; bracts lanceolate, acuminate, strigose, 5 to 7 mm long. Calyx-tube ovoid, 7 to 8 mm long, conspicuously penicillate, the setae simple, spreading, 2 to 3 mm long, somewhat scattered; calyx lobes 5, as long as the tube, narrowly oblong, setose. Petals purplish, obovate, about 1.5 cm long, their apices sparingly penicillate. Stamens 10, equal; filaments 6 mm long; anthers lanceolate, 5 mm long, the anterior basal appendages nearly round, glandlike, the connectives not at all produced.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 33079 Ramos, August 29, 1918, on forested slopes near small streams at low altitudes.

This species is readily distinguished from its congeners by its appressed-strigose branches, branchlets, and leaves, the latter being nearly glabrous on the lower surface except for the sparingly strigose nerves.

ASTRONIA Noronha

ASTRONIA BRACHYBOTRYS sp. nov.

Frutex vel arbor parva, ramulis junioribus et inflorescentiis leviter castaneo-furfuraceis; foliis coriaceis, rigidis, viridibus, oblongo-ellipticis, minute verruculosus, 5 ad 6 cm longis, utrinque subaequaliter angustatis, basi 3-nerviis, apice acuminatis; paniculis brevissime pedunculatis, 2 ad 3 cm longis, paucifloris, ramis usque ad 1 cm longis; floribus ♂ urceolatis, calycis tubo 2.5 mm longo, lobis reniformibus.

A shrub or small tree, the very young branchlets and inflorescences somewhat castaneous-furfuraceous, otherwise glabrous, the branches and branchlets terete, rather slender. Leaves coriaceous, rigid, oblong-elliptic, green on both surfaces, usually brownish-olivaceous when dry and minutely verruculose, 5 to 6 cm long, 2 to 3 cm wide, subequally narrowed to the acute base and to the distinctly acuminate apex, base prominently 3-nerved and with an additional very slender marginal pair, the latter not more prominent than are the transverse nervules, the pri-

mary lateral nerves anastomosing with the midrib in the axmen, when young the nerves beneath with few, scattered, furfuraceous-castaneous scales, soon becoming glabrous; petioles 1.5 to 2 cm long, glabrous. Panicles terminal, shortly peduncled, rather few-flowered, 2 to 3 cm long, the primary branches few, 1 cm long or less, the flowers somewhat crowded at the apices of the branchlets. Perfect flowers shortly pedicelled, urceolate, the calyx-tube about 2.5 mm long, the limb spreading and about 4.5 mm in diameter, the lobes reniform. Petals obovate, about 3 mm long. Staminate flowers similar to the pistillate ones but the calyx-tube broadly cup-shaped.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33279 (type), 33278, 33266 *Ramos*, August 21, 1918, in forests, altitude about 1,000 meters.

This species is allied to *Astronia pachyphylla* Merr., *A. verruculosa* Merr., and *A. pauciflora* Merr., being distinguished from the first by its smaller, differently shaped leaves and its castaneous-furfuraceous inflorescences and it further lacks the characteristic large bracts of *A. pachyphylla*; the leaves and flowers are much smaller than are those of *A. verruculosa*; while *A. pauciflora* is distinguished, among other characters, by its densely lepidote branchlets and inflorescences.

ARALIACEAE

SCHEFFLERA Forster

SCHEFFLERA OBTUSIFOLIA sp. nov. § *Euschefflera*, *Heptapleurum*.

Frutex erectus, ramulis inflorescentiisque exceptis glaber; foliis brevissime petiolatis, palmatim 7- ad 9-foliolatis, foliolis coriaceis, oblongo-obovatis, integris, 8 ad 15 cm longis, apice plerumque rotundatis, basi acutis; inflorescentiis breviter pedunculatis, ramis primariis racemose dispositis, 18 ad 24 cm longis, leviter pubescentibus; umbellulis numerosis, racemose dispositis, 8- ad 12-floris pedunculis usque ad 1 cm longis; floribus 5-meris; fructibus ellipsoideis ad oblongo-ellipsoideis, 5 mm longis, 5-sulcatis.

An erect shrub, about 2 m high, glabrous except the somewhat pubescent branchlets and slightly pubescent inflorescences. Leaves very short-petioled, 7- to 9-foliolate; leaflets coriaceous, shining when dry, oblong-obovate, entire, 8 to 15 cm long, 4 to 6.5 cm wide, the apex usually rounded, narrowed below to the acute base; primary lateral nerves 7 to 10 on each side of the midrib, the nerves and reticulations distinct on both surfaces; petiolules 3.5 to 8 cm long; petioles stout, 1 to 1.5 cm long. In-

florescence terminal, shortly peduncled, the peduncle and axis 4 to 7 cm long, the former glabrous or nearly so, the bracts subtending the branches deciduous; primary branches 8 to 15, racemosely arranged, 18 to 24 cm long, slightly pubescent, spreading-ascending; umbels numerous, racemosely arranged on the primary branches, 8- to 12-flowered, their peduncles up to 1 cm in length; the pedicels in flower, 2 to 3 mm long, in fruit somewhat longer. Flowers 5-merous, white. Calyx obconic, truncate, about 2.5 mm in diameter. Petals 5, ovate, acute, 2 mm long, somewhat 3-nerved. Filaments 3.5 to 4 mm long. Fruits ellipsoid to oblong-ellipsoid, about 5 mm long, 5-angled or sulcate, 5-celled.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32912 (type), 32901 Ramos, July, 1918, on rocks in dry thickets at low altitudes. *Bur. Sci.* 33207 Ramos from Mount Nagapatan, Ilocos Norte Province, Luzon, perhaps represents a form of the same species but the leaflets are smaller, while the petioles vary from 2 to 6 cm in length; this number was collected at an altitude of about 800 meters, growing on tree trunks.

This species is most closely allied to *Schefflera brevipes* Merr. and is one of the very few Philippine species with short petioles. It is distinguished from *S. brevipes* by its smaller and much fewer-nerved leaflets; its much shorter inflorescence-axis, and rather long-pedicelled, never sessile, umbels.

SCHEFFLERA ALVAREZII sp. nov. § *Euschefflera*, *Heptapleurum*.

Frutex scandens, glaber, ramulis tenuibus; foliis 6-foliolatis, foliolis oblongis ad oblongo-obovatis, integris, subcoriaceis, usque ad 9 cm longis, apice tenuiter acuminatis, basi acutis, nervis utrinque 6 ad 8, subpatulis, perspicuis; inflorescentiis terminalibus, ramis primariis circiter 4, usque ad 25 cm longis; umbellulis circiter 5-floris, racemose dispositis; floribus 5-meris.

An entirely glabrous vine, the ultimate branches 4 mm in diameter or less. Leaves palmately 6-foliolate; leaflets subcoriaceous, oblong to oblong-obovate, entire, pale when dry, shining, 6 to 9 cm long, 2 to 3.5 cm wide, the apex slenderly acuminate, base acute; lateral nerves 6 to 8 on each side of the midrib, spreading or only slightly ascending, prominent on the lower surface as are the reticulations; petiolules 1 to 2.5 cm long; petioles 6 to 7 cm long. Inflorescence terminal, the rachis 2 cm long or less, bearing usually 4 primary branches up to 25 cm long. Flowers 5-merous, about 5 in each umbel, their pedicels about 3 mm long, the umbels widely scattered and racemosely

arranged on the primary branches, their peduncles 4 to 5 mm long. Calyx obovoid, truncate, about 1.2 mm long, petals oblong ovate, acute, 2.5 mm long, ovary 5-celled.

MINDANAO, Lanao District, on the Lanao-Cotabato trail, *For. Bur.* 25240 Alvarez, March 24, 1916, altitude 1,100 meters.

This species is manifestly allied to *Schefflera caudatifolia* Merr., from which it differs especially in its flowers being arranged in umbels rather than in fascicles; in its much shorter rachis and much longer primary branches; while the primary nerves of the leaves are spreading rather than ascending.

SCHEFFLERA GLOBOSA sp. nov. § *Euschefflera*, *Heptapleurum*.

Frutex scandens, ramulis et infructescentiis stellato-tomentosis, indumento brunneo, ramis incrassatis; foliis 6-foliolatis, longissime petiolatis, foliolis oblongis, firmiter chartaceis, integris, usque ad 44 cm longis, apice tenuiter acuminatis; inflorescentiis terminalibus, rhachibus leviter productis, ramis primariis 3 ad 5, usque ad 20 cm longis, racemose dispositis; fructibus globosis, esulcatis, 5-locellatis, 5 mm diametro, umbellulis racemose dispositis, breviter pedunculatis, fructibus confertis brevissime pedicellatis.

A scandent shrub, glabrous except the young branchlets, bracts, and infructescences, which are brown stellate-tomentose, the ultimate branches up to 1 cm in diameter. Leaves palmately 6-foliolate, their petioles inflated and clasping at the base, stout, 30 to 35 cm long; leaflets oblong, firmly chartaceous, entire, glabrous, shiny, 22 to 44 cm long, 7 to 10 cm wide, the base rounded to subacute, the apex slenderly acuminate; lateral nerves 15 to 20 on each side of the midrib, distinct as are the reticulations, anastomosing, petiolules 5 to 11 cm long. Inflorescence terminal, the rachis somewhat produced, the primary branches 3 to 5, 16 to 20 cm long, racemously disposed, each subtended by an oblong-lanceolate, acuminate, subcoriaceous bract about 3 cm in length. Fruits globose, about 5 mm in diameter, very slightly furfuraceous, not sulcate, 5-celled, terminated by the 5 nearly sessile stigmas, arranged in short-peduncled, scattered umbels, 9 to 10 fruits crowded on each umbel, their pedicels 1 to 2 mm long, the peduncles 2 to 7 mm long, the pedicels and peduncles with the same type of indumentum as the rachis.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 30897 Ramos & Edaña, May 21, 1918, on tree trunks in forests along streams.

This species in vegetative characters strongly resembles *Schefflera digitata* (Blanco) Merr. (*S. machranta* Merr.), but differs radically in its very short pedicels and 5-celled fruits. The

brown stellate-tomentose indumentum on the inflorescences; the globose, nonsulcate, short-pedicelled, crowded fruits; and the very long petioles are characteristic.

SCHEFFLERA PLATYPHYLLA sp. nov. § *Euschefflera*, *Heptapleurum*.

Frutex scandens, inflorescentiis brunneo-tomentosis; foliis 5-foliolatis, late oblongo-ovatis, integris, usque ad 34 cm longis et 17 cm latis, apice abrupte acuminatis; inflorescentiis terminalibus, ramis primariis circiter 12, usque ad 40 cm longis, racemose dispositis; floribus minutis, 5-meris, numerosis, confertis, umbellulis globosis, circiter 6 mm diametro, valde numerosis, racemose dispositis, pedunculis 5 ad 10 mm longis.

A vine, glabrous except the rather densely brown-tomentose inflorescence, the indumentum obscurely stellate, the ultimate branches about 1 cm in diameter. Leaves palmately 5-foliolate, their petioles about 15 cm long; leaflets broadly oblong-ovate, coriaceous, entire, 30 to 34 cm long, 15 to 17 cm wide, the upper surface olivaceous, shining, the lower somewhat brownish when dry, the base broadly rounded, the apex rather abruptly acuminate, the acumen up to 2 cm in length; lateral nerves about 25 on each side of the midrib, distinct as are the reticulations; petiolules stout, 5 to 8 mm long. Inflorescence terminal, the rachis stout, up to 8 cm long, bearing about 12 elongated, racemously arranged, primary branches up to 40 cm in length, the subtending bracts oblong-ovate, up to 2.5 cm long. Flowers minute, white, 5-merous, crowded in globose umbels about 6 mm in diameter, 30 to 40 flowers in an umbel, the umbels racemously arranged on the primary branches, about 75 on each branch, their peduncles 5 to 10 mm long; pedicels 1 to 2 mm long. Calyx pubescent, turbinate, truncate, about 1.2 mm long. Petals 5, oblong-ovate, 1.2 mm long.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 30897 *Ramos & Edaña*, April 17, 1918, on tree trunks in forests along streams.

This species has an indumentum similar to that of *Schefflera globosa* Merr. and is manifestly allied to that species, from which it differs radically in its much larger, wider leaflets; in the numerous, elongated, primary branches of the inflorescence; and in its very numerous, densely many-flowered, longer-peduncled umbels. Both species apparently belong in the group with *Schefflera clementis* Merr.

SCHEFFLERA SANTOSII sp. nov. § *Euschefflera*, *Heptapleurum*.

Frutex scandens (vel erectus ?), glaber, ramis in siccitate rugosis; foliis 3- ad 5-foliolatis, brevissime petiolatis, petiolo 1 ad 2 cm longo; foliolis subcoriaceis, in siccitate olivaceis, nitidis,

ellipticis ad oblongo-ellipticis, breviter acuminatis, integris, 6 ad 9 cm longis, nervis utrinque circiter 12, perspicuis; inflorescentiis terminalibus, rhachibus elongatis, ramis primariis 4 ad 8, racemose dispositis, usque ad 20 cm longis; umbellis distantibus, racemose dispositis, 8- ad 12-floris; floribus parvis, 5-meris.

A scandent (or erect ?), glabrous shrub, 3 to 4 m in length, the branches grayish, when dry wrinkled, the ultimate ones 5 mm in diameter or less. Leaves 3- to 5-foliolate, their petioles relatively short, 1 to 2 cm long, inflated and clasping at the base. Leaflets subcoriaceous, entire, olivaceous, shining, elliptic to oblong-elliptic, 6 to 9 cm long, 3 to 5 cm wide, subequally narrowed to the acute base and to the shortly acuminate apex; petiolules 5 to 20 mm long; lateral nerves about 12 on each side of the midrib, distinct and somewhat projecting on the lower surface, anastomosing, spreading-ascending, the reticulations lax, distinct. Inflorescence terminal, the rachis 5 to 7 cm long, the primary branches 4 to 8, racemosely disposed, alternate, up to 20 cm in length. Umbels racemosely arranged on the primary branches, 8- to 12-flowered, their peduncles up to 12 mm in length, the pedicels 1 to 4 mm long. Flowers 5-merous, white or purplish, calyx about 2 mm in diameter. Petals 5, oblong-ovate, 2 mm long.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31722 Santos, June 1, 1918, in thickets near streams, altitude about 2,000 meters.

This species is well characterized by its very short-petioled leaves, in this character resembling *Schefflera brevipes* Merr., but differing radically from that species in its much fewer and smaller leaflets.

SCHEFFLERA PANAYENSIS sp. nov. § *Cephaloschefflera*.

Arbor, partibus junioribus plus minusve furfuraceis, foliis junioribus dense stellato-tomentosis, cito glaberrimis, ramis incrassatis; foliis 10- ad 12-foliolate, longissime petiolatis, foliolis coriaceis, oblongis, usque ad 17 cm longis, tenuiter caudato-acuminatis, nervis utrinque 10 ad 12, perspicuis; capitulis racemose dispositis, globosis, immaturis 1 ad 1.5 cm diametro, fructibus sulcatis, 5-locellatis.

A tree, about 5 m high, the very young parts densely furfuraceous, the very young leaves densely stellate-tomentose, soon becoming entirely glabrous. Ultimate branches about 1.5 cm in diameter, rugose, marked with very large petiolar scars. Leaves 10- to 12-foliolate, their petioles about 25 cm long; leaflets oblong, coriaceous, shining, 10 to 17 cm long, 3 to 3.5 cm wide,

entire, base rounded to obtuse, apex slenderly caudate-acuminate; lateral nerves 8 to 10 on each side of the midrib, anastomosing, distinct, as are the reticulations; petiolules 6 to 8 cm long. Branches of the inflorescence 40 to 45 cm long, stout, glabrous, bearing numerous, racemosely arranged, dense, globose, glabrous heads, which in young fruit are from 1 to 1.5 cm in diameter, their peduncles 1 to 1.5 cm long. Young fruits 5-sulcate, 3 to 4 mm long, 5-celled.

PANAY, Capiz Province, Mount Madias, *Bur. Sci.* 30736, Ramos & Edaño, May 12, 1918, in the mossy forest.

This species resembles *Schefflera catanduanensis*, but has longer inflorescence branches and is furthermore very easily distinguished by its peduncled heads.

BOERLAGIODENDRON Harms

BOERLAGIODENDRON CAUDATUM sp. nov.

Frutex circiter 2 m altus; foliis longe petiolatis, palmatim 7-ad 9-foliolatis, foliolis nitidis, lanceolatis, valde inaequalibus, 10 ad 23 cm longis, tenuiter caudato-acuminatis, basi decurrento-acuminatis, majoribus plerumque utrinque 1- vel 2-lobatis, margine irregulariter perspicue dentatis; petiolo circiter 40 cm longo, basi cristis pectinatis 2 vel 3 instructis, dentibus deflexis; inflorescentiis sessilibus, circiter 15 cm diametro, radiis primariis circiter 25; capitulis ♀ circiter 1 cm diametro, floribus confertis brevissime pedicellatis, 4-meris.

An erect shrub, about 2 m high, the leaf-bearing part of the stem at least 1 cm in diameter. Leaves long-petioled, palmately 7- to 9-foliolate; leaflets subcoriaceous, olivaceous and shining when dry, lanceolate, very unequal in size, 10 to 23 cm long, slenderly caudate-acuminate, base decurrent-acuminate, the larger ones usually deeply lobed, the lobes 1 or 2, rarely 3, extending nearly to the midrib, the margins with irregular, rather prominent, usually incurved teeth; petiolules of the larger leaflets up to 3 cm in length, the smaller leaflets sometimes nearly sessile; petioles about 40 cm long, 4 to 5 mm in diameter, the basal 1 cm supplied with 2 or 3 pectinate crests, their teeth deflexed up to 7 mm long. Inflorescence terminal, sessile, about 15 cm in diameter, composed of about 25 primary branches, each subtended by an oblong to oblong-ovate, coriaceous bract about 1.5 cm long, the primary branches about 4 cm long, glabrous, then dichotomously or trichotomously branched, the bracts subtending the branches oblong to oblong-lanceolate, about 1 cm long, somewhat setose-furfuraceous, central branch 1 to 1.5 cm long, glabrous, bearing a globose head of sterile flowers about 1 cm in

diameter, the bracteoles subtending the sterile flowers oblong, acute to obtuse, 4 to 5 mm long, coriaceous, somewhat keeled, more or less furfuraceous; lateral branches about 4 cm long, straight or somewhat geniculate at the middle, here supplied with a pair of coriaceous, somewhat setose-furfuraceous bracts, 4 to 5 mm in length; heads ellipsoid, dense, about 1 cm long, many-flowered, each flower subtended by an obovate 3 to 4 mm long bracteole, which is thickened in the median portion and rather prominently brown fimbriate-ciliate on the back and margins, and more or less inclosing the flower; pedicels 1 mm long or less. Calyx obovoid, 2 to 2.5 mm long, truncate, narrowed below, obscurely 4-angled by compression, the angles rounded. Ovary 4-celled.

LUZON, Ilocos Norte Province, Mount Palimlin, *Bur. Sci.* 33308 Ramos, August 21, 1918, on forested slopes near the summit, altitude about 1,000 meters.

This strongly marked species is most closely allied to *Boerlagiodendron catanduanense* Merr., from which it is easily distinguished by its pectinate petiolar crests; its much longer petioles; and its few-lobed caudate-acuminate leaflets, the lobes extending nearly to the midrib and ascending rather than divaricate. The inflorescence is also much larger and further differs in its furfuraceous-setose bracts and very different sterile and fertile heads.

ERICACEAE

VACCINIUM Linnaeus

VACCINIUM ILOCANUM sp. nov.

Frutex epiphyticus, inflorescentiis exceptis glaber; foliis ellipticis, crasse coriaceis, nitidis, integris, 6 ad 8 cm longis, basi acutis, apice breviter abrupteque acuminatis, nervis utrinque circiter 4, tenuibus, inferioribus adscendentibus; racemis axillaribus, solitariis, 2 ad 4 cm longis, pubescentibus; bracteis persistentibus, ovatis ad elliptico-ovatis, 5 ad 6 mm longis, acutis vel acuminatis; corolla glabris, 6 mm longa; filamentis barbatis; antheris oblongis, 1.1 mm longis.

An epiphytic shrub, entirely glabrous except the inflorescences, the branchlets about 3 mm in diameter, reddish-brown when dry. Leaves elliptic, thickly coriaceous, olivaceous and shining when dry, entire, 6 to 8 cm long, 3.5 to 5 cm wide, margins somewhat recurved, the lower surface somewhat paler than the upper and distinctly glandular-punctate, the base acute, apex acute to shortly and abruptly acuminate; lateral nerves about 4 on each side of

the midrib, slender, the lower two pairs from near the base ascending, reaching at least to the upper two-thirds of the leaf; petioles very stout, reddish-brown, 5 to 8 mm long. Racemes axillary, and sometimes terminating short lateral branches, 2 to 4 cm long, the rachis, bracts, pedicels, and calyces more or less pubescent with short spreading hairs; pedicels 3 to 4 mm long; bracts persistent, ovate to elliptic-ovate, 5 to 6 mm long, usually acute, sometimes slightly acuminate. Calyx-tube almost obsolete, the lobes triangular, acute, pubescent, 1.5 mm long. Corolla oblong-ovoid, glabrous, narrowed upward, about 6 mm long, 3.5 mm in diameter below the middle, red, the lobes short, broadly ovate, recurved. Filaments densely bearded, about 1 mm long; anthers oblong, about 1.1 mm long, the terminal tubes very short, not narrowed, opening by oblique pairs. Style stout, glabrous, 3 mm long. Top of the ovary very slightly pubescent.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33372 Ramos, August 21, 1918, growing on trees on forested slopes near the summit, altitude about 3,100 meters.

The alliance of this species is manifestly with *Vaccinium platyphyllum* Merr., from which, among other characters, it is distinguished by its smaller, fewer-nerved leaves, shorter pedicels, and only slightly pubescent top of the ovary.

DIPLYCOSIA Blume

DIPLYCOSIA GLABRA sp. nov.

Frutex epiphyticus, glaber, vel ramulis junioribus parcissime setosis; foliis ellipticis ad oblong-ellipticis, acutis vel brevissime apiculatis, basi acutis, usque ad 6 cm longis, in siccitate olivaceo-brunneis vel pallidis, nitidis, nervis utrinque 2, tenuibus, supra leviter impressis, subtus obsoletis; floribus axillaribus, solitariis vel fasciculatis, pedicellatis, bracteolis late ovatis, 1.5 mm longis, margine leviter ciliatis, calycis circiter 2 mm longis, lobis late ovatis, obtusis, 1.5 mm longis.

A glabrous, erect, epiphytic shrub, attaining a height of from 3 to 4 m, the very young branchlets sometimes with a very few slender setae. Leaves coriaceous, elliptic to oblong-elliptic, 2 to 6 cm long, 1 to 2.5 cm wide, brownish-olivaceous or pale when dry, shining, the lower surface with small scattered, brownish glands, the base acute, the apex usually acute and ending in a short, stout, blunt apiculus; lateral nerves 2 on each side of the midrib, slender, slightly impressed on the upper surface, obsolete on the lower surface, curved, the upper pair leaving the midrib at or near the middle of the leaf, the reticulations obsolete; petioles

about 2 mm long. Flowers axillary, solitary or few in a fascicle, their pedicels about 5 mm long, the apical bracteoles connate, broadly ovate, acute or slightly acuminate, margins sparingly ciliate, 1.5 mm long. Calyx about 2 mm long, the lobes broadly ovate, obtuse, 1.5 mm long, their margins slightly ciliate. Corolla not seen. Fruit soft, fleshy, bluish-black, when dry brownish or black, about 5 mm long.

*LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31784 Santos April 22, 1918 (type), *Bur. Sci.* 8509 McGregor, June, 1909, *For. Bur.* 14434 Darling, January, 1909, *Copeland, s. n.*, May, 1913, in the mossy forest, altitude about 2,300 meters. Igorot name *dugui-is*.

Among the Philippine species this is most closely allied to *Diplycosia calelanensis* Elm., from which it is readily distinguished by its nerves being obsolete on the lower surface of the leaves. Among the extra-Philippine species its alliance is manifestly with the Javan *Diplycosia heterophylla* Blume, but its leaves are different in shape, never acuminate, with shorter petioles, while the venation is distinctly different.

MYRSINACEAE

ARDISIA Swartz

ARDISIA ILOCANA sp. nov. § *Akosmos*.

Frutex, ramulis inflorescentiisque castaneo-pubescentibus exceptis glaber; foliis oblongis, membranaceis ad chartaceis, 6 ad 12 cm longis, basi acutis, apice leviter acuminatis, integris, utrinque glandulis perspicuis instructis, nervis utrinque 15 ad 20, tenuibus, subobscuris, reticulis obsoletis; inflorescentiis bipinnatim paniculatis, 8 ad 10 cm longis, pedunculatis, plerumque e axillis defoliatis; floribus racemose dispositis, circiter 8 mm diametro, calycis lobis orbicularibus, leviter ciliatis, petalis punctato-glandulosis, leviter acuminatis.

An erect shrub, the branchlets and inflorescences distinctly castaneous-pubescent, otherwise glabrous. Leaves oblong, membranaceous to chartaceous, 6 to 12 cm long, 2 to 3.5 cm wide, base acute, apex somewhat acuminate, somewhat olivaceous and slightly shining when dry, both surfaces with numerous, relatively large glands which are distinctly visible to the naked eye and which occur at fairly regular intervals on all parts of the leaf; lateral nerves 15 to 20 on each side of the midrib, very slender, not prominent, obscurely anastomosing, the reticulations obsolete or nearly so; petioles pubescent when young, soon becoming

glabrous, 5 to 10 mm long. Panicles lateral, from the ultimate branchlets, axillary and in the axils of fallen leaves, peduncled, bipinnate, 8 to 10 cm long, the flowers racemosely arranged on the primary branches, their pedicels 3 to 4 mm long. Flowers white, about 8 mm in diameter. Calyx lobes orbicular, rounded, glandular-punctate, margins ciliate. Corolla lobes oblong-elliptic, glandular-punctate, glabrous, 4 mm long, somewhat acuminate. Anthers lanceolate, acuminate, 2.5 mm long, the connectives slightly glandular.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 32982 Ramos, August 12, 1918, altitude about 500 meters.

This species is well characterized by its numerous, relatively large, regularly spaced glands, which are distinctly visible to the naked eye on both surfaces of the leaf. Its alliance is with *Ardisia racemoso-panniculata* Mez, from which it is distinguished not only by its very evident glands but also by its very slender obscure nerves and practically obsolete reticulations.

ARDISIA LONGIPETIOLATA sp. nov. § *Pyrgus*.

Frutex glaber, ramis 6 ad 8 mm diametro; foliis confertis, anguste oblongis ad oblongo-ellipticis, usque ad 30 cm longis, integris vel obscurissime denticulatis, obtusis vel acutis, perspicue glanduloso-punctatis, nervis utrinque circiter 12; petiolo 4 ad 7 cm longo; paniculis circiter 30 cm longis, ramis inferioribus 9 ad 12 cm longis, floribus subumbellatim dispositis, sepalis punctatis, margine ciliatis; fructibus circiter 1 cm diametro.

A glabrous shrub, the branches terete, reddish-brown, 6 to 8 mm in diameter. Leaves pseudovericillate, usually about 6 crowded at the end of each branch, narrowly oblong to oblong-elliptic or oblong-ob lanceolate, 23 to 30 cm long, 6 to 10 cm wide, entire, or very obscurely toothed, apex obtuse to acute, base rounded, acute, or somewhat acuminate, when dry grayish or greenish olivaceous, shining, the lower surface rather densely glandular-punctulate with dark-colored glands; lateral nerves usually about 12 on each side of the midrib, prominent, curved, anastomosing, the reticulations distinct; petioles 4 to 7 cm long, somewhat triangular. Panicles terminal, peduncled, about 30 cm long, the lower primary branches 9 to 12 cm long, the flowers subumbellately arranged at the tips of the primary branches. Pedicels about 1.5 cm long, thickened upward. Persistent calyx about 7 mm in diameter, the lobes ovate, acute, about 3 mm long, glandular-punctate, the margins ciliate. Fruits gla-

brous, globose, slightly glandular, red when mature, about 1 cm in diameter.

LUZON, Camarines Province, *Bur. Sci.* 33492 (type), 33554 Ramos & Edaña, December, 1918, in damp forests at low altitudes between Paracale and Mambulao.

This species belongs in the group with *Ardisia perrottetiana* A. DC., from which it is readily distinguished by its larger leaves and elongated petioles.

AMBYLANTHOPSIS Mez

AMBYLANTHOPSIS CRASSIFOLIA sp. nov.

Frutex erectus, glaber, ramulis incrassatis, cylindricis, circiter 1 cm diametro, cicatricibus multis ornatis; foliis crassissime coriaceis, integris, oblongis ad anguste oblongo-obovatis, 10 ad 13 cm longis, minute punctatis, obtusis, nervis utrinque 10, haud perspicuis, admodum subobsoletis; inflorescentiis axillaribus, plerumque racemosis, usque ad 7 cm longis; floribus 4-5-meris, 6 ad 7 diametro, petalis ellipticis ad oblongo-ellipticis, filamentis petalis aequilongis.

An erect glabrous shrub, about 2 m high, the ultimate branchlets much thickened, cylindric, about 1 cm in diameter and marked with numerous, large, petiolar scars. Leaves very thickly coriaceous, entire, oblong to narrowly oblong-obovate, 10 to 13 cm long, 3.5 to 4 cm wide, obscurely and minutely glandular-punctate, the apex obtuse, narrowed below to the acuminate base; midrib very stout, the lateral nerves about 10 on each side of the midrib, not prominent, sometimes nearly obsolete; petioles stout, 6 to 15 mm long. Inflorescences in the upper axil, up to 7 cm in length, the flowers usually racemously arranged, sometimes in very depauperate panicles. Flowers red, 4- and 5-merous, 6 to 7 mm in diameter, their pedicels about 2 mm long. Calyx about 4 mm in diameter, the lobes oblong-ovate, obtuse, somewhat glandular-punctate, glabrous. Corolla lobes elliptic to elliptic-oblong, obtuse, 4 mm long, somewhat punctate, united for the lower 1 mm. Filaments as long as the petals, the anthers longitudinally dehiscent. Ovary and style 2.5 mm long, the ovary ovoid, the style as long as the ovary.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33288 (type), 33381 Ramos, August 21, 1918, on forested slopes, altitude about 1,000 meters.

This species is entirely different from the other described forms of the genus *Amblyanthopsis*, but by definition must be

placed in this genus unless a new one be proposed for it. It cannot be placed in the genus *Discocalyx* on account of its elongated filaments, which equal the corolla lobes in length. In the type specimen the much thickened, prominently scarred, ultimate branchlets attain a length of at least 15 cm and are distinctly thicker than the smooth or nearly smooth branches which bear them. The species is otherwise very prominently characterized by its very thickly coriaceous, entire, obscurely nerved leaves, which are crowded toward the apices of the branchlets and by its usually racemose inflorescences.

SAPOTACEAE

PALAQIUM Blanco

PALAQIUM GLABRIFOLIUM sp. nov.

Arbor novellis et floribus exceptis glabra; foliis subcoriaceis, anguste oblongo-obovatis, usque ad 14 cm longis, apice perspicue acuminatis, basi angustatis, cuneatis vel decurrento-acuminatis, nervis utrinque circiter 20, tenuibus; floribus solitariis vel fasciculatis, sepalis coriaceis, exterioribus glabris, interioribus leviter pubescentibus, circiter 3.5 mm longis; ovario puberulo.

A tree, 6 to 8 m high, entirely glabrous except the growing tips of the branchlets, the inner sepals, and the ovary. Leaves subcoriaceous, rigid, dark-brown when dry, shining, the lower surface paler than the upper, narrowly oblong-obovate, 10 to 14 cm long, 3.5 to 5 cm wide, apex rather conspicuously acuminate, the acumen blunt, narrowed in the lower one-half to the cuneate or somewhat decurrent-acuminate base; primary lateral nerves slender, about 20 on each side of the midrib, anastomosing, slightly more conspicuous than are the secondary nerves and reticulations; petioles 1.5 to 2 cm long. Flowers solitary or fascicled, from the axils of fallen leaves, their pedicels about 1 cm long, in age entirely glabrous. Outer sepals glabrous, thickly coriaceous, somewhat rugose when dry, very broadly ovate, 2.5 to 3 mm long, about 4 mm wide, the inner sepals ovate, obtuse or acute, about 3.5 mm long, slightly pubescent on the median portion, the margins thin, glabrous. Stamens and corolla not seen. Ovary slightly puberulent, 6-celled; style about 9 mm long, glabrous.

PANAY, Capiz Province, Mount Macosolon, *Bur. Sci.* 30820 *Ramos & Edaño*, April 22, 1918, on forested slopes.

This species is most closely allied to *Palaquium dubardii* Elm., from which it is distinguished by its conspicuously acuminate

leaves, which are much narrowed below, and by its much more numerous nerves. The characteristic indumentum of the genus is entirely wanting except on the growing tips of the branchlets and on parts of the flowers. The fruits with the specimens are globose or ovoid, about 2.5 cm in diameter, but are abnormal in that when young some insect has deposited its eggs in them and the developing larvae have destroyed the seeds, the entire fruit, except the parts destroyed by the larvae, being filled with a dense, rather brittle, somewhat woody substance.

SYMPLOCACEAE

SYMPLOCOS Jacquin

SYMPLOCOS BRACHYBOTRYS sp. nov.

Arbor parva, glaberrima; foliis coriaceis, integris, oblanceolatis, 5 ad 8 cm longis, obtuse acuminatis, deorsum angustatis, basi cuneatis, nervis utrinque 15 ad 18, tenuibus; racemis axillaribus, 1 ad 1.5 cm longis; floribus brevissime pedicellatis, circiter 8 mm diametro, calycis tubo circiter 1 mm longo, lobis orbiculari-ovatis, quam tubo brevioribus; fructibus cylindraceis, oblongis, circiter 1 cm longis.

An entirely glabrous tree, about 5 m high. Leaves coriaceous, entire, oblanceolate, 5 to 8 cm long, 1.5 to 2.5 cm wide, blunt-acuminate, much narrowed below to the cuneate base, subolivaceous, shining; lateral nerves slender, 15 to 18 on each side of the midrib, anastomosing, the reticulations lax, distinct; petioles 1 cm long or less. Racemes axillary, few-flowered, black when dry, 1 to 1.5 cm long. Flowers about 8 mm in diameter, pedicels 1 mm long or less, the subtending bracteoles elliptic-ovate, deciduous, about 1 mm long. Calyx-tube somewhat narrowed below, cylindric, 1 mm long, the lobes 5, somewhat spreading, orbicular-ovate, rounded, about 0.8 mm long, the inner ones slightly smaller than the outer three. Petals oblong to oblong-elliptic, obtuse, about 4 mm long. Stamens numerous, free, as long as the petals. Fruit oblong, nearly terete, about 1 cm long and 5 mm in diameter.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33277 Ramos, August 22, 1918, on forested slopes, altitude about 900 meters.

This species closely resembles *Symplocos purpurascens* Brand and is apparently closely allied to that species. It is, however, very easily distinguished by its very short inflorescences and its much more numerous lateral nerves.

LOGANIACEAE

GENIOSTOMA Forster

GENIOSTOMA PACHYPHYLLUM sp. nov.

Frutex vel arbor parva, glabra, ramulis et foliis in siccitate nigris; foliis coriaceis vel subcoriaceis, anguste oblongis ad oblongo-lanceolatis, 5 ad 8 cm longis, basi acutis, apice acutis vel obscure acuminatis, nervis utrinque 5 vel 6, tenuibus, reticulis subobsoletis; fructibus axillaribus, solitariis, ovoideis vel ellipsoideis, circiter 7 mm longis, breviter pedicellatis.

A glabrous shrub or small tree, the branches terete, straw-colored, the young branchlets black when dry as are the leaves and petioles. Leaves coriaceous or subcoriaceous, brittle, narrowly oblong to oblong-lanceolate, 5 to 8 cm long, 1.2 to 2.5 cm wide, subequally narrowed to the acute base and to the acute or slightly acuminate apex; lateral nerves slender, 5 or 6 on each side of the midrib, obscurely anastomosing, the reticulations obsolete or nearly so; petioles about 5 mm long; stipules short, truncate. Fruits axillary, solitary, ovoid or ellipsoid, about 7 mm long, black when dry, their pedicels about 5 mm long; persistent sepals broadly ovate, rounded, their margins slightly ciliate.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33316 *Ramos*, August 21, 1918, on forested slopes, altitude about 1,000 meters.

This species is distinguished among the Philippine forms by its glabrous, slenderly nerved, brittle, coriaceous or subcoriaceous leaves, the reticulations being obsolete or nearly so, and by its solitary, axillary fruits. The whole plant, except the branches, is characteristically black when dry.

APOCYNACEAE

ALYXIA Banks

ALYXIA RETUSA sp. nov.

Frutex scandens, inflorescentiis leviter pubescentibus exceptis glaber, ramulis incrassatis, 5-angulatis; foliis verticillatis, 5-natis, crassissime coriaceis, obovatis ad oblongo-obovatis, 5 ad 8 cm longis, apice late rotundatis retusisque, margine revolutis, nervis tenuibus, indistinctis; cymis axillaribus, breviter pedunculatis, circiter 3 cm longis; fructibus usque ad 3 cm longis, partibus seminiferis solitariis vel binis, ellipsoideis, 10 ad 12 mm longis, 8 mm diametro.

A scandent shrub, glabrous except the sparingly pubescent inflorescence, the branches stout, up to 8 mm in diameter, rugose

when dry, the younger ones distinctly 5-angled. Leaves verticillate, 5 at each node, very thickly coriaceous, obovate to oblong-obovate, 5 to 8 cm long, 2.5 to 4 cm wide, the apex broadly rounded and retuse, base acute to decurrent-acuminate, margins somewhat revolute, the midrib impressed on the upper surface, very prominent on the lower surface; lateral nerves numerous, slender, indistinct; petioles 1 to 2 cm long. Cymes axillary, somewhat pubescent, shortly peduncled, about 3 cm long, excluding the fruits. Flowers apparently few, the persistent sepals ovate to oblong-ovate, obtuse, slightly pubescent, coriaceous, about 2.5 mm long. Fruits shortly pedicelled, either 3 cm long and constricted in the middle, with two ellipsoid seed-bearing parts, or not constricted and consisting of a single seed-bearing part, the seed-bearing parts 10 to 12 mm long, about 8 mm in diameter.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33330 Ramos, August 21, 1918, on forested slopes, altitude about 1,000 meters.

This species is strongly characterized among those with very thick coriaceous leaves by the leaves being broadly rounded and retuse at their apices.

RAUWOLFIA Linnaeus

RAUWOLFIA MEMBRANACEA sp. nov.

Frutex erectus glaber; foliis membranaceis, oblongis ad oblongo-lanceolatis, acuminatis, 7 ad 11 cm longis, nervis utrinque circiter 10, tenuibus; cymis axillaribus terminalibusque, paucifloris, 4 ad 6 cm longis, fructibus ellipsoideis, leviter compressis, 1 cm longis, in siccitate rugosis.

An erect glabrous shrub. Leaves membranaceous, olivaceous, oblong to oblong-lanceolate, slenderly acuminate, base acute, olivaceous and shining when dry, 7 to 11 cm long, 2 to 3 cm wide; lateral nerves slender, about 10 on each side of the midrib, petioles 7 to 12 mm long. Cymes axillary and terminal, peduncled, 4 to 6 cm long, apparently few-flowered, the persistent calyx-lobes lanceolate, acuminate, about 2 mm long. Fruits somewhat ellipsoid, slightly compressed when dry, about 1 cm long and 6 mm wide, somewhat narrowed to the acute base and usually obtuse apex, rugose when dry.

LUZON, Ilocos Norte Province, Mount Nagapatan, *Bur. Sci.* 33214 Ramos, August 9, 1918, on dry slopes, altitude about 700 meters.

This species is not closely allied to any previously described

Philippine form. It is well characterized by its membranaceous, slenderly acuminate, few-nerved leaves.

TABERNAEMONTANA Linnaeus

TABERNAEMONTANA ECARINATA sp. nov.

Frutex glaber; foliis chartaceis, olivaceis, oblongis ad oblongo-ellipticis, 7 ad 14 cm longis, apice late obtuseque acuminatis, nervis utrinque 8 ad 10; infructescentiis circiter 6 cm longis, haud ramosis, folliculis 2 gerentibus; folliculis 2.5 ad 3 cm longis, inaequilateralibus, ecarinatis, apice rostratis; seminibus circiter 18.

A glabrous shrub, the branches slender, terete. Leaves chartaceous, olivaceous, shining, equal, oblong to oblong-elliptic or oblong-lanceolate, 7 to 14 cm long, 3 to 7 cm wide, base often slightly inequilateral, somewhat acuminate, apex broadly and obtusely acuminate; lateral nerves 8 to 10 on each side of the midrib, distinct, anastomosing, the reticulations slender, lax; petioles about 5 mm long. Inflorescences apparently very few-flowered, the peduncles in fruit up to 6 cm long, simple, each bearing a single pair of follicles but usually presenting one or two scars of fallen pedicels. Persistent sepals ovate, about 2.5 mm long. Corolla-tube about 12 mm long, the lobes spreading, narrow, about 1.5 cm long. Follicles yellow, 2.5 to 3 cm long, 1.5 to 2 cm wide, inequilateral, smooth, not at all keeled, somewhat compressed, one side nearly straight, the other semi-circular, apex rather prominently rostrate. Seeds up to 18 in each follicle, irregular, 7 to 8 mm long.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 33022 (type), 33082 Ramos, August, 1918, in forests along small streams at low altitudes.

This species is strongly characterized by its rostrate, rather many-seeded follicles, which are not at all keeled. In vegetative characters it resembles some forms of *Tabernaemontana pandacqui* Poir. but differs entirely in its fruit characters.

CONVOLVULACEAE

IPOMOEA Linnaeus

IPOMOEA POLYMORPHA R. & S. Syst. 4 (1819) 254.

Ipomoea heterophylla R. Br. Prodr. (1810) 487, non Ortega, 1800.

Convolvulus brownii Spreng. Syst. 1 (1825) 612.

Convolvulus robertianus Spreng. op. cit. 5 (1828) 192.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32945 Ramos, July 25, 1918, in open dry places at low altitudes: Union Prov-

ince, San Fernando, *Lete 108, 175*, July and September, 1916, in open sandy places near sea level, with the Ilocano name *camarin*.

This species has been previously reported only from Australia and Formosa, but the Philippine specimens cited above agree very closely with the descriptions and with Australian material kindly supplied by Mr. J. H. Maiden. In vegetative characters the Philippine specimens present great variation, as do the Australian ones. I am further of the opinion that *Henry 1112* from Formosa represents a somewhat dwarfed form of the same species. My specimen of this, identified as *Ipomoea* sp., is but about 10 cm high and has unusually narrow leaves. In floral characters, however, it closely approximates the Luzon form.

VERBENACEAE

CALLICARPA Linnaeus

CALLICARPA OBTUSIFOLIA sp. nov.

Frutex, ramulis et petiolis et inflorescentiis et subtus foliis uniformiter denseque cinereo-stellato-tomentosus; foliis ellipticis ad oblongo-ellipticis, supra glabris, subcoriaceis, usque ad 8 cm longis, apice rotundatis, obtusis, vel subacutis, margine denticulatis, nervis utrinque 5 ad 7, perspicuis; cymis pedunculatis, dichotomis, usque ad 2.5 cm latis; floribus numerosis, circiter 2.5 mm longis, calycis extus dense albido-stellato-tomentosis.

A shrub, the branchlets, petioles, inflorescences, and lower surface of the leaves densely and uniformly cinereous-stellate-pubescent, the indumentum covering the entire surface. Branches terete, pale-brownish, glabrous. Leaves elliptic to oblong-elliptic, subcoriaceous, 5 to 8 cm long, 2.5 to 4 cm wide, the apex rounded, obtuse, or sometimes subacute, base usually obtuse, margins entire below, in the upper part distinctly denticulate, the upper surface brownish-olivaceous, glabrous or when young stellate-pubescent along the midrib; lateral nerves 5 to 7 on each side of the midrib, curved, distinct as are the primary reticulations; petioles 5 to 10 mm long. Cymes axillary, peduncled, dichotomous, up to 2.5 cm wide, the peduncles about 1.5 cm long; bracts linear-lanceolate, acuminate, 2 to 2.5 mm long; pedicels 0.5 mm long or less. Flowers rather crowded, pink. Calyx cup-shaped to obconic, about 1.6 mm long, densely stellate-pubescent, the teeth 4, short. Corolla glabrous, 2.5 mm long, the lobes equal, orbicular-ovate, rounded, nearly 1 mm in diameter. Filaments and style 5 to 6 mm long. Fruit globose, dark-brown and rugose when dry, about 2 mm in diameter.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32921 Ramos, July 27, 1918, in dry thickets at low altitudes, Ilocano *anayop*.

The alliance of this species is manifestly with *Callicarpa blancoi* Rolfe, from which it is especially distinguished by its elliptic to oblong-elliptic, usually rounded or obtuse, never acuminate leaves.

GESNERIACEAE

CYRTANDRA Forster

CYRTANDRA ILOCANA sp. nov.

Frutex glaberrimus; foliis chartaceis, integris, oblongis ad oblongo-obovatis vel oblongo-oblancoelatis, 3 ad 7 cm longis, in siccitate castaneis, basi acutis, apice acuminatis, nervis utrinque 5 ad 7, tenuibus; inflorescentiis tenuibus 1- vel paucifloris, pedunculis capillaris, 3 cm longis; calycibus cupulatis, 3 ad 4 mm longis, lobis late ovatis, 1.5 mm longis, acuminatis.

An entirely glabrous shrub, the branches grayish, 3 to 4 mm in diameter, marked with large petiolar scars; the branchlets slender, smooth, dark reddish-brown. Leaves subequal or one of each pair slightly smaller than the other, chartaceous, entire, oblong to oblong-obovate, or oblong-oblancoelate, 3 to 7 cm long, 1.5 to 2.5 cm wide, the upper surface dark-castaneous when dry, the lower much paler, base usually acute, often slightly inequilateral, apex distinctly acuminate; lateral nerves slender, 5 to 7 on each side of the midrib, curved, anastomosing, close to the margins, the reticulations very lax; petioles 5 to 9 mm long. Inflorescences very slender, axillary, one- or at most few-flowered, the peduncles capillary, about 3 cm long, each bearing one fruit and also presenting one or two scars at the apex as if there might have been two or three umbellately arranged flowers; pedicels slender, up to 1 cm long. Calyx cut-shaped, 3 to 4 mm long, the lobes broadly ovate, 1.5 mm long, acuminate.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33370 Ramos, August 21, 1918, on forested slopes near the summit, altitude about 1,050 meters.

This species is allied to *Cyrtandra glabrifolia* Merr. (*C. glabra* Kränzl., non Jack) but differs in its smaller entire leaves and shorter petioles.

CYRTANDRA PANAYENSIS sp. nov.

Frutex, ut videtur scandens, ramulis junioribus ferrugineo-villosis, ceteroquin glaber; foliis oppositis, aequalibus, coriaceis vel subcoriaceis, ellipticis ad oblongo-ellipticis, 7 ad 10 cm longis, breviter acuminatis, longe petiolatis, nervis utrinque 7 vel 8,

perspicuis, margine distanter serratis; floribus axillaribus, fasciculatis, 2 cm longis, corollae tubo infra angustato, aequaliter 5-lobato, lobis circiter 2 mm longis; ovario glabro.

A shrub, apparently scandent, the young branchlets usually densely villous with brown or ferruginous hairs, the older parts entirely glabrous. Leaves opposite, equal, coriaceous or subcoriaceous, elliptic to oblong-elliptic, 7 to 10 cm long, 3.5 to 5 cm wide, dark-olivaceous and smooth above when dry, the lower surface paler, glabrous, apex shortly acuminate, base acute to decurrent-acuminate, the margins distantly serrate; lateral nerves 7 or 8 on each side of the midrib, very prominent on the lower surface, the reticulations lax, distinct; petioles at first ferruginous-villous, soon becoming entirely glabrous, 3 to 4 cm long. Flowers axillary, pink, about 2 cm long, fascicled, their ferruginous-villous pedicels about 1 cm long or less, subtended by a whorl of small, lanceolate bracts. Calyx about 10 mm long, 7 mm in diameter, ovoid or ellipsoid, black when dry, subcoriaceous, glabrous, the lobes 5, oblong-ovate, acute or slightly acuminate, 3 to 3.5 mm long. Corolla 2 cm long, the lower 12 mm slender, about 2 mm in diameter, then somewhat enlarged and 6 to 7 mm wide when flattened out, slightly pubescent externally or glabrous, the lobes 5, equal, broadly ovate, obtuse, about 2 mm long. Disk glabrous, truncate, about 1.5 mm high. Ovary and style glabrous. Fruit soft, fleshy, ellipsoid, about 12 mm long.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32241 (type), 32411 *McGregor*, May 24, June 20, 1918, in the mossy forest, altitude about 1,000 meters.

This species is closely allied to *Cyrtandra tayabensis* Elm., from which it is distinguished by its smaller, fewer-nerved leaves and its entirely glabrous ovaries.

CYRTANDRA SANTOSII sp. nov.

Frutex 1 ad 2 m altus, partibus junioribus et inflorescentiis et subtus foliis dense et longe ferruginoso-villosis; foliis rigidis, coriaceis, oblongo-ovatis, usque ad 10 cm longis, longe petiolatis, acutis ad acuminatis, basi acutis ad subrotundatis, margine distanter et obscure serratis, supra laevis, nigrescentibus, vetustioribus glabris vel subglabris, subtus ferrugineis, ad costa et nervis et reticulis dense et longiter ferrugineo-villosis; inflorescentiis cymosis, paucifloris, pedunculatis, usque ad 6 cm longis, bracteis oblongis, circiter 2 cm longis; floribus circiter 18 mm longis, extus densissime villosis, calycis lobis longe caudato-acuminatis.

A shrub, 1 to 2 m high, the younger parts, inflorescences, and lower surface of the leaves, especially on the midrib, nerves, and reticulations, densely villous with long, soft, silky, ferruginous hairs. Leaves coriaceous, rigid, oblong-ovate, 7 to 10 cm long, 3 to 4.5 cm wide, often somewhat inequilateral, the apex acute to acuminate, base obtuse to acute, margins obscurely serrate, the upper surface smooth, blackish when dry, when young more or less villous, especially along the midrib, becoming glabrous, the lower surface ferruginous; lateral nerves about 8 on each side of the midrib, curved-ascending, prominent and projecting as are the rather dense reticulations; petioles up to 3.5 cm in length. Inflorescences axillary, solitary, peduncled, cymose, rather lax, densely ferruginous-villous, the peduncles up to 3 cm in length, the bracts membranaceous, oblong, villous, about 2 cm long. Pedicels, in anthesis, about 5 mm long, very densely ferruginous-villous, in fruit up to 1.5 cm in length. Flowers about 1.8 cm long. Calyx glabrous inside, densely villous outside, about 13 mm long, the tube 7 mm long, the lobes with a 4 mm long, stout, caudate acumen from a broad base. Corolla 1.8 cm long, densely villous externally, inside glabrous, the throat and lobes granular, the throat somewhat oblique, the lobes unequal, orbicular-ovate, about 4 mm in diameter. Disk truncate, glabrous; style 4 mm long, prominently capitate-glandular. Fruit white when fresh, brown when dry, oblong-elliptic, 1 to 1.5 cm long.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 32071 Santos, May, 1918, on slopes, altitude about 2,000 meters.

This very characteristic species is perhaps as closely allied to *Cyrtandra hypochrysoides* Kränzl. as to any other described form, but differs remarkably from that species in numerous characters, especially in its entirely different inflorescence, longer petioles, coriaceous rigid leaves, its much denser and longer indumentum, and its very different flowers.

CYRTANDRA LANCIFOLIA sp. nov.

Suffrutex circiter 40 cm altus, e basi ramosus, ramis tenuibus; foliis lanceolatis, membranaceis, in paribus inaequalibus, 5 ad 13 cm longis, utrinque subaequaliter angustatis, acuminatis, margine leviter undulatis, nervis utrinque 4 vel 5, utrinque glabris vel junioribus subtus leviter pubescentibus; floribus axillaribus, subsessilibus, circiter 5 cm longis, plerumque solitariis, bracteis foliaceis, spathaceis, usque ad 1.5 cm longis, deorsum connatis, perspicue acuminatis; calycis oblongis, 7 mm longis, subaequaliter 5-lobatis.

An undershrub, up to 40 cm high, branched from the base, the stems terete, about 4 mm in diameter, the branchlets brownish, slender, somewhat pubescent with very short hairs. Leaves lanceolate, membranaceous, those of each pair similar in shape but unequal in size, one usually one-third to one-half smaller than the other, 5 to 13 cm long, 1 to 2.7 cm wide, subequally narrowed to the acuminate apex and base, the margins somewhat undulate, the upper surface glabrous, brownish-olivaceous, the lower pale, glabrous or when young very slightly pubescent on the midrib and nerves; lateral nerves 4 or 5 on each side of the midrib, curved-ascending, anastomosing, the reticulations very lax; petioles 3 to 10 mm long. Flowers axillary, solitary or in pairs, white, sessile or very shortly pedicelled, about 5 cm long, each subtended by a pair of foliaceous spathe-like bracts which inclose the calyx, being united by their margins in the lower 4 mm, these bracts 1.5 to 1.7 cm long, glabrous or nearly so, prominently acuminate, up to 9 mm wide below. Calyx oblong, about 7 mm long, slightly pubescent, subequally 5-lobed, the lobes lanceolate, acuminate, 2 mm long. Corolla 4.5 to 5 cm long, pilose with long scattered hairs externally, the lower 1 cm of the tube very slender, not exceeding 2 mm in diameter, then broadened, the throat, when flattened, about 1.5 cm wide, subequally 5-lobed, the lobes ovate, rounded, about 1 cm long. Disk cylindric, glabrous, 2 mm long, somewhat crenate. Ovary glabrous. Stamens about 3 cm long.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 33078 Ramos, August 29, 1918, along small streams in forests at low altitudes.

This species belongs in the group with, and is closely allied to, *Cyrtandra livida* Kränzl. and *C. agusanensis* Elm., from both of which it differs notably in its very much larger flowers, while the leaves are merely undulate, not toothed.

ACANTHACEAE

HEMIGRAPHIS Linnaeus

HEMIGRAPHIS NUMMULARIFOLIA sp. nov.

Herba glabra, tenuis, ramosis, prostratis vel subprostratis; foliis orbicularis ad orbiculari-ovatis, integris, 5 ad 10 mm longis; floribus axillaribus, solitariis, ebracteolatis, circiter 1.3 cm longis, calycis segmentis lineari-lanceolatis, 6.5 mm longis; capsulis anguste oblongis, 9 mm longis.

A slender, much-branched herb, the main branches spreading or prostrate, up to 20 cm long, the secondary branches more or

less ascending, glabrous or nearly so, none of the branches more than 1 mm in diameter. Leaves orbicular to orbicular-ovate, 5 to 10 mm long, rounded, entire, olivaceous, the upper surface with rather numerous, irregularly scattered cystoliths, the lower surface slightly hispid on the midrib and nerves; lateral nerves 2 or 3 on each side of the midrib, not prominent. Flowers axillary, solitary, ebracteolate, about 1.3 cm long, sessile. Calyx segments nearly free, about 6.5 mm long, 1.5 mm wide or less, linear-lanceolate, acuminate. Corolla white or faintly tinged with blue, the lower 6 mm of the tube slender, cylindric, then broadened; lobes 5, subequal, orbicular, about 3 mm in diameter. Filaments bearded; anthers 1 mm long. Capsules narrowly oblong, acute or slightly acuminate, glabrous, about 9 mm long, 1.5 mm in diameter. Seeds about 12, orbicular-elliptic.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 33031 (type), 32974 Ramos, August 30, 1918, on dry open banks, the leaves when fresh reddish-purple beneath.

This species belongs in the group with *Hemigraphis reptans* Nees and is most closely allied to *H. fruticulosa* C. B. Clarke. It is well characterized by its unusually small, orbicular, entire leaves; by its axillary, solitary, and ebracteolate flowers; and by being glabrous or nearly so throughout.

COMPOSITAE

VERNONIA Schreber

VERNONIA GLANDULIFOLIA sp. nov.

Frutex scandens, ramulis junioribus bracteisque exceptis glaber; foliis lanceolatis ad oblongo-lanceolatis vel oblongo-ellipticis, subcoriaceis, 4 ad 7 cm longis, basi acutis, apice acutis vel leviter acuminatis, subtus minute et dense glanduloso-punctatis, nervis utrinque 6 ad 8, distinctis; capitulis paucis, solitariis vel binis, circiter 2 cm longis, multifloris, bracteis pubescentibus, interioribus circiter 1 cm longis.

A scandent shrub, glabrous except the very young branchlets and the involucre bracts, the branches grayish-brown when dry, not lenticellate, the slender branchlets dark reddish-brown. Leaves lanceolate to oblong-lanceolate or oblong-elliptic, subcoriaceous, olivaceous when dry, entire, 4 to 7 cm long, 1 to 2 cm wide, subequally narrowed to the acute base and the acute or slightly acuminate apex, the lower surface rather densely and minutely glandular-punctate, the numerous glands sunk in minute pits; lateral nerves 6 to 8 on each side of the midrib, distinct, anastomosing; petioles 5 mm long or less. Heads few, solitary or in

pairs at the tips of the branchlets, in fruit about 2 cm long, their peduncles about 1 cm long; involucral bracts more or less pubescent, the outer ones 2 mm long or less, the inner ones narrowly oblong-lanceolate, about 1 cm long, their margins ciliate. Achenes about 4 mm long; pappus hairs numerous, about 1 cm long, pale reddish-brown.

LUZON, Ilocos Norte Province, Mount Palimlim, *Bur. Sci.* 33374 *Ramos*, August 21, 1918, on forested slopes, altitude about 1,000 meters.

This species is well characterized among the woody scandent forms by its small, densely glandular-punctate, glabrous leaves and its few heads. Its alliance is with *Vernonia pyrrhodasys* Schulz-Bip.

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ON THE APPLICATION OF THE GENERIC NAME
MELÓDORUM OF LOUREIRO

By E. D. MERRILL
Botanist, Bureau of Science, Manila

Separate from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government
Manila, P. I.
VOLUME XV, No. 2, AUGUST, 1919

MANILA
BUREAU OF PRINTING
1919

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THE PHILIPPINE JOURNAL OF SCIENCE

VOL. XV

AUGUST, 1919

No. 2

ON THE APPLICATION OF THE GENERIC NAME MELODORUM OF LOUREIRO

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The genus *Melodorum* was proposed by Loureiro¹ in 1790 for two species from Cochinchina, *Melodorum fruticosum* Lour. and *M. arboreum* Lour., of which the first is manifestly the type of the genus. While the description is not very definite, and while manifestly the fruit characters are based on material from some plant different from the type and in all probability not congeneric with it, it seems to be distinctly advisable to investigate the status of the genus in view of the misinterpretation of it in all modern botanical literature.

Fortunately for the purpose of this investigation Loureiro's type of *Melodorum fruticosum* is preserved in the herbarium of the British Museum, and through the kindness of Dr. A. B. Rendle and Mr. J. G. Baker I have been supplied with a sketch of it with certain notes regarding the specimen. The material consists of a leafy branch with the broken pieces of a flower, from which it was possible to sketch an entire petal.

After receiving the sketch mentioned above it was matched by material in the herbarium of the Bureau of Science and in order to verify my interpretation of Loureiro's species fragments of several specimens were forwarded to the British Museum for purposes of direct comparison with Loureiro's type. In reference to this material Doctor Rendle notes under date of July 3, 1919:

Loureiro's plant is very much like the one labeled *Polyalthia siamensis* Boerl., cult. Hort. Bog.; the large petals seem identical in form but the

¹ Fl. Cochinch. (1790) 351.

prominent lateral veins of the leaf are rather less numerous (about 10 or 11 on each side) in Loureiro's plant, and also slightly farther apart. The twigs are also thicker in Loureiro's specimen. We find nothing that agrees better with it.

Dunal² seems to be the first author to adopt Loureiro's generic name, making it a section of the genus *Unona*. He referred both of Loureiro's species to *Unona*; *Melodorum fruticosum* Lour. = *Unona dumetorum* Dunal and *Melodorum arboreum* Lour. = *Unona sylvatica* Dunal. He saw no specimen but interpreted both species from Loureiro's descriptions. In proposing the section *Melodorum*, Dunal referred to it several other species; *Unona latifolia* Dunal = *Melodorum latifolium* Hook. f. & Th., *U. lucida* DC. = *Xylopia longifolia* A. DC., *Unona acutiflora* Dunal = *Xylopia* sp., *Unona xylopoidea* Dunal, and *Unona polycarpa* DC. = *Xylopia polycarpa* Oliv.

In current botanical literature the authority for the generic name *Melodorum* is given as Hooker f. and Thomson,³ but these authors credit the authority for the genus to Dunal, citing as synonyms *Unona*, section *Melodorum* Dunal; *Uvaria*, section *Melodorum* Blume; and *Polyalthia*, section *Kentia* Blume. Hooker f. and Thomson apparently interpreted the genus largely from the first species cited by Dunal; namely, the Malayan one currently known as *Melodorum latifolium* (Dunal) Hook f. & Th., described and figured by Blume as *Uvaria latifolia* Blume.⁴

Hooker f. and Thomson examined Loureiro's type of *Melodorum fruticosum* in the herbarium of the British Museum with the following comment:

Loureiro's *Melodorum* is different, as we have determined by an inspection of the materials in the British Museum. In that collection there is an authentic specimen of *M. fruticosum* Lour., which is an undescribed plant, of doubtful affinity, as we have not examined the flower, but certainly not belonging to this genus. It has no fruit. There is no authentic specimen of *M. arboreum* Lour., but it is described as a large tree and is perhaps a *Mitrephora*.

While they excluded both of Loureiro's species from *Melodorum*, Hooker f. and Thomson considered it advisable to retain the generic name in the sense in which it was interpreted (in part) by Dunal and by Blume (as a section of *Unona* and of *Uvaria*). All subsequent authors have been content to follow Hooker f. and Thomson, and we hence have an entirely illogical

² Monogr. Fam. Anon. (1817) 98, 115, 116.

³ Fl. Ind. (1855) 112.

⁴ Fl. Jav. Anon. (1828) 37, t. 15, 25A.

case of a generic name proposed by Loureiro currently applied to a group of species quite different from Loureiro's original conception of the genus.

From an examination of the sketch of Loureiro's type kindly prepared by Mr. J. G. Baker I am⁵ confident that *Melodorum fruticosum* Lour. is the species currently known as *Polyalthia aberrans* Maingay and which has been variously described by several authors as *Polyalthia affinis* Teysm. & Binn., *P. siamensis* Boerl., and *Unona mesneyi* Pierre, and which was eventually transferred to *Popowia* by Pierre as *Popowia aberrans* Pierre. From this I cannot distinguish *Popowia diospyrifolia* Pierre by any satisfactory characters. Pierre⁵ has given a detailed account of the characters of this species, indicating that it approaches *Popowia* in certain respects, but concluding that it cannot be referred to Endlicher's genus. He found that it is, in most respects, a *Polyalthia* but proposed for it the group name *Mesneya*, as a subgenus of *Unona*. Safford⁶ has clearly shown that the so-called Old World species of *Unona* have nothing to do with *Unona* as originally described by the younger Linnaeus, this being an American genus, the proper generic name for the Old World species being *Desmos* Lour. King⁷ notes that *Polyalthia aberrans* Maing., as interpreted by him, "save, and except in the much smaller size of the flowers," much resembles the plant figured and described by Pierre under the name of *Unona mesneyi*, and to which Pierre reduced *Polyalthia aberrans*. An examination of Cochinchina material now available to me for study and comparison shows that the size of the flowers in Pierre's drawing is greatly exaggerated, and that they are drawn all out of proportion to the leaves.

In interpreting the true status of *Melodorum* as described by Loureiro, we find that the type of the genus is a species aberrant in all of the genera in which it has been placed. It is to be noted that Pierre proposed for it the group name *Mesneya* (as a subgenus), and that Scheffer, quoted by Boerlage,⁸ proposed for the same form the generic term *Sphaerocoryne*. For the present it seems best to retain *Melodorum* as a genus closely allied to *Popowia*, for which the names *Mesneya* Pierre and *Sphaerocoryne* Scheffer are exact synonyms. *Polyalthia*

⁵ Fl. Forest. Cochinch. 1 (1880) t. 17.

⁶ Bull. Torr. Bot. Club 39 (1912) 501-508.

⁷ Ann. Bot. Gard. Calcutta 4 (1893) 78.

⁸ Boerl. in Ic. Bogor. 1 (1899) 196, in nota sub *Polyalthia siamensis* Boerl.

Blume may then be retained for the numerous Indo-Malayan species currently so called, but the various species of *Melodorum* of all authors except Loureiro will need a new generic name, for which *Fissistigma* Griff. is available.

MELODORUM Loureiro

MELODORUM FRUTICOSUM Lour. Fl. Cochinch. (1790) 351.

Unona dumetorum Dunal Monog. Anon. (1817) 31.

Polyalthia (?) *aberrans* Maingay in Hook. f. Fl. Brit. Ind. 1 (1874) 67; King in Ann. Bot. Gard. Calcutta 4 (1893) 78, t. 109A.

Polyalthia affinis Teysm. & Binn. in Nat. Tijdschr. Nederl. Ind. 27 (1864) 37; Boerl. in Ic. Bogor. 1 (1899) 124, 183, t. 63.

Polyalthia siamensis Boerl. in Ic. Bogor. 1 (1899) 124, 195, t. 69.

Sphaerocoryne siamensis Scheff. ex Boerl. l. c. in syn.

Popowia aberrans Pierre ex Finet & Gagnep. in Bull. Soc. Bot. France 53 (1906) Mem. 4: 109, et in Lecomte Fl. Gén. Indo-Chine 1 (1907) 83.

Unona mesneyi Pierre Fl. Forest. Cochinch. 1 (1880) t. 17.

Popowia diospyrifolia Pierre ex Finet & Gagnep. in Bull. Soc. Bot. France 53 (1906) Mém. 4: 110, et in Lecomte op. cit. 84, t. 10, f. 11-19.

Melodorum glaucum Scortech. ex King in Ann. Bot. Gard. Calcutta 4 (1893) 78, in syn.

Melodorum clavipes Hance in Journ. Bot. 15 (1877) 328.

There may be more than one species represented here, but if so they are very closely allied. According to Loureiro (*Melodorum fruticosum*), Boerlage (*Polyalthia affinis* Teysm. & Binn., *P. siamensis* Boerl.), Pierre (*Unona mesneyi* Pierre), and Gagnepain (*Popowia aberrans* Pierre, *P. diospyrifolia* Pierre), it is an erect shrub or small tree, but according to Maingay and King it is a scandent shrub. The difference between *Polyalthia siamensis* Boerl. (*Polyalthia aberrans* Maing.) and *P. affinis* Teysm. & Binn. appears to me to be trivial. As between *Popowia aberrans* Pierre and *P. diospyrifolia* the same statement holds, the distinguishing character depended upon being only that of the stigma. It is to be noted that Finet and Gagnepain consider that Pierre's drawing of *Unona mesneyi*, as to the habit sketch, is *Popowia aberrans* Pierre, and as to the details of the flower, *P. diospyrifolia* Pierre.

The species extends from Indo-China to Siam and the Malay Peninsula and is in cultivation at Buitenzorg, Java. I have examined the following specimens: Indo-China, Loureiro (sketch of Loureiro's type as preserved in the herbarium of the British Museum, flowering specimen), Thorel 391 (det. by Gagnepain as *Popowia diospyrifolia* Pierre, flowering specimen): Malay Peninsula, Pungah, Curtis 2957; Goping, Kunstler 6136; Ma-

lacca, Burkill 2510; Perak, Scortechini 1946 (all these distributed as *Polyalthia aberrans* Maing., flowering specimens): Java, cult. Hort. Bogor XI-A-41-71 (four sheets, *Polyalthia siamensis* Boerl., flowering specimens from the type plant), XI-A-63 (*Polyalthia affinis* Teysm. & Binn., flowering and fruiting specimens).

As several detailed descriptions of this species, as well as no less than four illustrations of it, with details of the flowers and fruits, have been published, it would seem that a further description is unnecessary. The genus *Melodorum* Lour., as I understand it, contains a single definitely known species, which while well defined and characteristic as a species presents a combination of characters which render it somewhat difficult to separate *Melodorum* from several not closely allied genera. It is clearly no *Unona* (that is, *Desmos*); and it is equally aberrant in *Polyalthia* and in *Popowia*, the two other genera in which it has been placed. I am personally of the opinion that *Melodorum* as originally described by Loureiro and typified by *Melodorum fruticosum* Lour. (not of modern author⁹) is a valid genus, more closely allied to *Popowia* than to *Polyalthia*, and that it belongs in the tribe *Mitrephorae*. Pierre in his critical discussion of *Unona mesneyi* notes that Maingay described the inner petals as imbricate in bud, but that he found them to be perfectly valvate in Wallich's specimen. Both series of petals touch by their thickened margins, and those of the inner series remain in this position long after anthesis. I have seen no fresh material of *Melodorum fruticosum*, but the figures given by Pierre, Boerlage, and King present the outer series of petals as more or less spreading in anthesis; in all the herbarium specimens examined by me none of the petals are spreading. The persistent valvate position of the inner petals is a character by which the genus can be readily distinguished from *Polyalthia* and all the other genera in the tribe *Unonae*; while in the *Mitrephorae* it is readily distinguished from *Fissistigma* Griff. (*Melodorum* auct., non Lour.) by its globose buds and more or less spreading (?) outer petals; from *Popowia* Endl., which seems to be its true alliance, it differs entirely not only in its facies, but also in its larger, long-pedicelled flowers; in its outer petals, which are much larger and entirely different from the sepals; and by the inner petals being valvate by their much thickened margins but not connivent.

Melodorum arboreum Lour.⁹ = *Unona sylvatica* Dunal,¹⁰ the

⁹ Fl. Cochinch. (1790) 351.

¹⁰ Monog. Anon. (1817) 91.

second species of the genus described by Loureiro, is one of doubtful status, but in all probability is not congeneric with *Melodorum fruticosum* Lour. It is described as a large tree growing in forests, the leaves tomentose beneath, the calyx and corolla as in *Melodorum fruticosum* Lour. The indicated floral characters can be considered as no more than approximate. Hooker f. and Thomson have suggested that this may prove to be a *Mitrephora* and, from the description and the various species of *Mitrephora* now known from Indo-China, I strongly suspect that Loureiro's species is the same as *Mitrephora thorelii* Pierre.

It is perfectly evident that whatever disposition be made of *Melodorum* as originally described by Loureiro, whether it be considered as a valid genus allied to *Popowia*, or whether it be considered as synonymous with *Popowia*, or with *Polyalthia*, it can no longer be retained in the sense in which it is currently used; that is, as erroneously interpreted by Hooker f. and Thomson. The genera proposed by other authors currently considered as synonyms of *Melodorum* Hook. f. & Th., are *Fissistigma* Griff. (1854), *Mitrella* Miq. (1865), and *Pyramidanthe* Miq. (1865). Of these *Fissistigma* Griff. is an exact synonym of *Melodorum* as interpreted by Hooker f. and Thomson and antedates *Melodorum* as used by the latter authors by one year. It is typified by *Fissistigma scandens* Griff.¹¹ I accordingly propose to adopt Griffith's generic name for the numerous species currently but erroneously known as *Melodorum*. Boerlage¹² retains *Kentia* Miq. and *Pyramidanthe* Miq. as valid genera allied to *Melodorum* Hook. f. & Th., that is, *Fissistigma* Griff.; but in this consideration of the case I have followed current usage and have reduced both to *Fissistigma*.

FISSISTIGMA Griffith

(*Melodorum* auct. plur., non Lour.)

FISSISTIGMA AFRICANUM (Benth.).

Melodorum africanum Benth. in Trans. Linn. Soc. 23 (1862) 477.

Africa.

FISSISTIGMA BALANSAE (Aug. DC.).

Melodorum balansae Aug. DC. in Bull. Herb. Boiss. II 4 (1904) 1070;
Finet & Gagnep. in Lecomte Fl. Gén. Indo-Chine 1 (1907) 104.

Indo-China.

¹¹ Notul. 4 (1854) 706.

¹² Ic. Bogor. 1 (1899) 129, 130.

FISSISTIGMA BECCARII (Scheff.).

Melodorum beccarii Scheff. in Ann. Jard. Bot. Buitenz. 2 (1885) 24.

Mitrella beccarii Diels in Engl. Bot. Jahrb. 49 (1912) 149.

New Guinea.

FISSISTIGMA BICOLOR (Roxb.).

Uvaria bicolor Roxb. Fl. Ind. ed. 2, 2 (1832) 662.

Melodorum bicolor Hook. f. & Th. Fl. Ind. (1855) 119; King in Ann.

Bot. Gard. Calcutta 4 (1894) 133, t. 175B.

Eastern Himalayan region to Assam and Burma.

FISSISTIGMA BORNEENSE (Miq.)

Melodorum borneense Miq. in Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 36.

Borneo.

FISSISTIGMA CINERASCENS (Miq.).

Melodorum cinerascens Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 37.

Sumatra.

FISSISTIGMA CHRYSOSERICUM (Finet & Gagnep.).

Melodorum chrysosericeum Finet & Gagnep. in Bull. Soc. Bot. France

54 (1907) 88, et in Lecomte Fl. Gén. Indo-Chine 1 (1907) 98, f. 12.

Indo-China, *Thorel 2429!*

FISSISTIGMA CYLINDRICUM (Maingay).

Melodorum cylindricum Maingay in Hook. f. Fl. Brit. Ind. 1 (1872)

80; King in Ann. Bot. Gard. Calcutta 4 (1893) 136, t. 177B.

Melodorum cylindraceum Boerl. in Ic. Bogor. 1 (1899) 133.

Malay Peninsula, Singapore, Borneo, *Ridley 1823!*, s. n.!

FISSISTIGMA ELEGANS (Wall.).

Uvaria elegans Wall. Cat. (1832) No. 6474A, *nomen nudum*.

Melodorum elegans Hook. f. & Th. Fl. Ind. (1855) 122; King in Ann.

Bot. Gard. Calcutta 4 (1893) 141, t. 184B.

Malay Peninsula, Penang, *Wray 1079!*, *King's collector 6367!*,
Kunstler 5115!, *Ridley 13516!*, s. n.!

FISSISTIGMA FAGIFOLIUM (Ridl.).

Melodorum fagifolium Ridl. in Kew Bull. (1912) 286.

Borneo, *Hose 397!*

FISSISTIGMA FULGENS (Wall.).

Uvaria fulgens Wall. Cat. (1832) No. 6482, *nomen nudum*.

Mitrephora fulgens Hook. f. & Th. Fl. Ind. (1855) 120; King in

Ann. Bot. Gard. Calcutta 4 (1893) 132, t. 174.

Malay Peninsula, Singapore, Borneo (not in the Philippines!),
Kunstler 2654!, *Haniff & McNur 2317!*, *Wray 2441!* *Ridley 4587!*

FISSISTIGMA GLAUDESCENS (Hance).

Melodorum glaucescens Hance in Journ. Bot. 19 (1881) 112.

Hongkong.

FISSISTIGMA HYPOGLAUCUM (Miq.).

Melodorum hypoglaucum Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 37; King in Ann. Bot. Gard. Calcutta 4 (1893) 136, t. 180A.

Malay Peninsula, Borneo, Sumatra, *King's collector 5060!*, 5806!, 1022!

FISSISTIGMA KENTII (Blume).

Unona kentii Blume Bijdr. (1825) 16.

Polyalthia kentii Blume Fl. Jav. Anon. (1828) 77, t. 38, 52A.

Melodorum kentii Hook. f. & Th. Fl. Ind. (1855) 116.

Mitrella kentii Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 39; Boerl. in Ic. Bogor. 1 (1899) 130, t. 43, f. C.

Java, cult. Hort. Bogor. XI-A-29-64! Boerlage, l. c., retains this as a distinct genus.

FISSISTIGMA KINABALUENSE (Stapf).

Melodorum kinabaluense Stapf in Trans. Linn. Soc. Bot. 4 (1894) 130.

Borneo.

FISSISTIGMA KORTHALSII (Miq.).

Melodorum korthalsii Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 37.

Borneo.

FISSISTIGMA LANUGINOSUM (Hook. f. & Th.).

Melodorum lanuginosum Hook. f. & Th. Fl. Ind. (1855) 117; in Ann. Bot. Gard. Calcutta 4 (1893) 138, t. 182.

Uvaria tomentosa Wall. Cat. (1832) No. 6454, *nomen nudum*.

Malay Peninsula, Penang, Singapore, Indo-China, *King's collector 4664!*, 7890!, 4581!, *Hullett s. n.!*, *Ridley s. n.!*

FISSISTIGMA LATIFOLIUM (Dunal).

Unona latifolia Dunal Monog. Anon. (1817) 115.

Uvaria longifolia Blume Bijdr. (1825) 13.

Uvaria latifolia Blume Fl. Jav. Anon. (1828) 37, t. 15.

Melodorum mollissimum Miq. Fl. Ind. Bat. Suppl. (1861) 374.

Melodorum latifolium Hook. f. & Th. Fl. Ind. (1855) 116; King in Ann. Bot. Gard. Calcutta 4 (1894) 135, t. 178.

Malay Peninsula (Perak), Java, Mt. Salak, *ex herb. Bogor.!* collector not indicated. Borneo, Indo-China, fide Gagnepain, Moluccas.

The type of this species is *Cananga sylvestris* III *latifolia* Rumph.¹³ of Amboina. The species is currently interpreted from Blume's figure and description which were based on Javan material. Boerlage expresses the opinion that *Melodorum mollissimum* Miq. is specifically distinct from *M. latifolium* Hook. f. & Th.

FISSISTIGMA LEICHHARDTII (Benth.).

Melodorum leichhardtii Benth. Fl. Austral. 1 (1863) 52.

Australia (Queensland, N. S. Wales), *White! Boorman!*

FISSISTIGMA LITSAEFOLIUM (King).

Melodorum litsaeifolium King in Journ. As. Soc. Beng. 61² (1889) 103, Ann. Bot. Gard. Calcutta 4 (1893) 132, *t. 173*.

Malay Peninsula, Perak, *King's collector 4986!, 4063*.

FISSISTIGMA LONGIPETALUM (Ridl.).

Melodorum longipetalum Ridl. in Kew Bull. (1912) 387.

Borneo.

FISSISTIGMA MABIFORME (Griff.).

Uvaria mabiformis Griff. Notul. 4 (1854) 709.

Melodorum pisocarpum Hook. f. & Th. Fl. Ind. (1855) 123; King in Ann. Bot. Gard. Calcutta 4 (1893) 142, *t. 187A*.

Melodorum pyramidale Maingay ex King l. c. in syn.

Malay Peninsula, Singapore, Sumatra, *King's collector 6411!, 10602!, Forbes 2182!, Ridley s. n.!*

FISSISTIGMA MACCREAI (F. Muell.).

Melodorum maccraei F. Muell. Fragm. 6 (1867) 176.

Australia.

FISSISTIGMA MACRANTHUM (Kurz).

Melodorum macranthum Kurz in Journ. As. Soc. Beng. 41² (1872) 291; King in Ann. Bot. Gard. Calcutta 4 (1892) 140, *t. 186*.

Unona macrantha Kurz in Andam. Rep. (1867) App. B. I.

Pyramidanthe macrantha Kurz op. cit. ed. 2 (1870) 29.

South Andaman, *Kurz!*

FISSISTIGMA MAINGAYI (Hook. f. & Th.).

Melodorum maingayi Hook. f. & Th. Fl. Ind. (1855) 139; King in Ann. Bot. Gard. Calcutta 4 (1893) 139, *t. 184A*.

Malay Peninsula, Penang, Borneo, *Wray 1112!*

¹³ Herb. Amb. 2: 198.

FISSISTIGMA MANUBRIATUM (Wall.).

Uvaria manubriata Wall. Cat. (1832) No. 6456, *nomen nudum*.

Melodorum manubriatum Hook. f. & Th. Fl. Ind. (1855) 118; King in Ann. Bot. Gard. Calcutta 4 (1893) 134, t. 176.

Melodorum bancanum Scheff. in Nat. Tijdschr. Nederl. Ind. 31 (1870) 343, Flora 53 (1870) 244.

Malay Peninsula, Penang, Bangka, Borneo, *Kunstler 7832!*, *King's collector 4948!*, *5786!*, *Ridley 4712!*, *Cult. Hort. Bogor. XVI-E-107!*, *XI-A-45-67!*

FISSISTIGMA OBLONGUM (Craib).

Melodorum oblongum Craib in Kew Bull. (1914) 5.

Siam, *Kerr 1879!*

FISSISTIGMA OLDHAMII (Hemsl.).

Melodorum oldhamii Hemsl. in Journ. Linn. Soc. Bot. 23 (1886) 27.

Formosa, Southern China, *Dunn 6339!*, *Faurie 430!*, *Tutcher 1052!*, *Japanese collector 1292!*

FISSISTIGMA OVALIFOLIUM (Ridl.).

Melodorum ovalifolium Ridl. in Kew Bull. (1912) 387.

Borneo.

FISSISTIGMA OVOIDEUM (King).

Melodorum latifolium Hook. f. & Th. var. *ovoidea* King in Journ. As. Soc. Beng. 61² (1892) 106, Ann. Bot. Gard. Calcutta 4 (1893) 135, t. 179.

Malay Peninsula, Singapore, *King's collector 8119!*, *10418!*, *Burkill!*

This differs remarkably from the typical form of *Melodorum latifolium* as figured and described by Blume in its very much larger, entirely different fruits, and is certainly worthy of specific rank.

FISSISTIGMA PALLENS (Finet & Gagnep.).

Melodorum pallens Finet & Gagnep. in Bull. Soc. Bot. France 53 (1906) Mém. 4: 137, et in Lecomte Fl. Gén. Indo-Chine 1 (1907) 100, t. 11, f. 7-11.

Indo-China.

FISSISTIGMA PANICULATUM (Ridl.).

Melodorum paniculatum Ridl. in Kew Bull. (1912) 386.

Borneo.

FISSISTIGMA PARVIFLORUM (Scheff.).

Melodorum parviflorum Scheff. in Nat. Tijdschr. Nederl. Ind. 31 (1870) 344, Flora 53 (1870) 244; King in Ann. Bot. Gard. Calcutta 4 (1893) 137, t. 181.

Malay Peninsula, Bangka, Borneo, *King's collector 7276! 8366!, 6498!*

FISSISTIGMA POLYANTHOIDES (Aug. DC.).

Melodorum polyanthoides Aug. DC. in Bull. Herb. Boiss. II 4 (1904) 1070; Finet & Gagnep. in Lecomte Fl. Gén. Indo-Chine 1 (1907) 103.

Indo-China, *Thorel 2431!*

FISSISTIGMA POLYANTHUM (Wall.).

Uvaria polyantha Wall. Cat. (1831) No. 6467, *nomen nudum*.

Melodorum polyanthum Hook. f. & Th. Fl. Ind. (1855) 121; King in Ann. Bot. Gard. Calcutta 4 (1893) 131, t. 172A.

Chittagong.

FISSISTIGMA PRISMATICUM (Hook. f. & Th.).

Melodorum polyanthum Hook. f. & Th. Fl. Ind. (1855) 121; King in Ann. Bot. Gard. Calcutta 4 (1894) 140, t. 185.

Uvaria rufa Wall. Cat. (1832) No. 6455, *nomen nudum*.

Pyramidanthe rufa Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1863) 39; Boerl. in Ic. Bogor. 1 (1899) 130, t. 43, f. D.

Oxymitra bassiaefolia Teysm. & Binn. in Nat. Tijdschr. Nederl. Ind. 25 (1863) 419.

Malay Peninsula, Singapore, Borneo, *King's collector 5737!, 3932!, Baker 5705!*

Boerlage retains *Pyramidanthe* Miquel as a genus distinct from *Melodorum* (*Fissistigma*).

FISSISTIGMA PUNCTULATUM (Baill.).

Melodorum punctulatum Baill. in Adansonia 10 (1871) 107.

New Caledonia.

FISSISTIGMA RIGIDUM (Ridl.).

Melodorum rigidum Ridl. in Kew Bull. (1912) 386.

Borneo.

FISSISTIGMA RUBIGINOSUM (A. DC.).

Uvaria rubiginosa A. DC. in Mém. Soc. Phys. Genève. 5 (1832) 202.

Uvaria nervosa Wall. Cat. (1832) No. 6479, *nomen nudum*.

Uvaria fulva Wall. op. cit. No. 6427, *nomen nudum*.

Melodorum rubiginosum Hook. f. & Th. Fl. Ind. (1855) 138; King in Ann. Bot. Gard. Calcutta 4 (1893) 138, t. 183.

Sylhet to Chittagong, Tenasserim, Penang (var. *oblongum* King, *King's collector 5082!*), Indo-China, and Borneo.

FISSISTIGMA RUFINERVE (Hook. f. & Th.).

Melodorum rufinerve Hook. f. Th. Fl. Ind. 1 (1855) 121; King in Ann. Bot. Gard. Calcutta 4 (1893) 130, *t. 171B*.

India.

FISSISTIGMA RUFUM (Presl).

Anona rufa Presl Rel. Haenk. 2 (1830) 75.

Melodorum clementis Merr. in Philip. Journ. Sci. 3 (1908) Bot. 136.

Melodorum rufum Merr. op. cit. 223.

This species was originally described from Luzon material and it extends from central Luzon to Mindanao. It is closely allied to *Fissistigma latifolium* (Dunal) Merr. (*Melodorum latifolium* Hook. f. & Th.), and Philippine specimens of it have been referred to the latter species.

FISSISTIGMA SCANDENS Griff. Notul. 4 (1854) 706.

Melodorum griffithii Hook. f. & Th. Fl. Ind. (1855) 120; King in Ann. Bot. Gard. Calcutta 4 (1893) 131, *t. 172B*.

Burma, Indo-China.

FISSISTIGMA SCHLECHTERI (Diels).

Mitrella schlechteri Diels in Engl. Bot. Jahrb. 49 (1912) 150.

New Guinea.

FISSISTIGMA SCHEFFERI (Pierre).

Melodorum schefferi Pierre ex Finet & Gagnep. in Bull. Soc. Bot. France 53 (1906) Mém. 4: 134, et in Lecomte Fl. Gén. Indo-Chine 1 (1907) 99, *t. 13, f. 1-8*.

Indo-China.

MELODORUM SPHAEROCARPUM (Blume) Miq. Fl. Ind. Bat. 1² (1858)

35; King in Ann. Bot. Gard. Calcutta 4 (1893) 137, *t. 180B*.

Unona sphaerocarpa Blume Bijdr. (1825) 12, Fl. Jav. Anon. (1828) 39, *t. 16*.

Malay Peninsula, Java, *King's collector 4002!*, *Backer 25558!*

FISSISTIGMA THORELII (Pierre).

Melodorum thorelii Pierre ex Finet & Gagnep. in Bull. Soc. Bot. France 53 (1906) Mém. 4: 133, et in Lecomte Fl. Gén. Indo-Chine 1 (1907) 97, *t. 14, f. 1-6*.

Indo-China.

FISSISTIGMA TONKINENSE (Finet & Gagnep.).

Melodorum tonkinense Finet & Gagnep. in Bull. Soc. Bot. France 53 (1906) Mém. 4: 135, et in Lecomte Fl. Gén. Indo-Chine 1 (1907) 100, *t. 12, f. 1-6*.

Indo-China.

FISSISTIGMA UHRII (F. Muell.).*Melodorum uhrii* F. Muell. Fragm. 6 (1867) 2.

Australia.

FISSISTIGMA UONICUM (Dunn).*Melodorum uonicum* Dunn in Journ. Bot. 48 (1910) 323.

Hongkong.

FISSISTIGMA VERRUCOSUM (Hook. f. Th.).*Melodorum verrucosum* Hook. f. & Th. Fl. Ind. (1855) 119; King in Ann. Bot. Gard. Calcutta 4 (1893) 134, t. 177A.

India. The Hainan specimen referred here by Hance probably represents some other species.

FISSISTIGMA WALLICHII (Hook. f. & Th.).*Melodorum wallichii* Hook. f. & Th. Fl. Ind. (1855) 118; King in Ann. Bot. Gard. Calcutta 4 (1894) 133, t. 175A.*Uvaria bicolor* Wall. Cat. (1832) No. 6466, *nomen nudum*, non Roxb.

Assam, Khasia, and Sylhet.

FISSISTIGMA ZIPPELII (Miq.).*Melodorum zippelii* Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 38.

Sumatra.

DOUBTFUL AND EXCLUDED SPECIES

MELODORUM MICRANTHUM Warb. in Engl. Bot. Jahrb. 18 (1893) 190 = *Papualthia longirostris* (Scheff.) Diels in Engl. Bot. Jahrb. 49 (1912) 140, f. 1, G-H (*Goniothalamus longirostris* Scheff., *G. inaequilaterus* K. Schum. & Lauterb.).**MELODORUM LEFEVRII** Baill. in Adansonia 10 (1871) 108. The type was from Indo-China. I can find no mention of the species in Finet & Gagnepain's treatment of the Annonaceae of Indo-China in Lecomte Fl. Gén. Indo-Chine 1 (1917) 42-123.

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ADDITIONAL NOTES ON THE KWANGTUNG FLORA

By E. D. MERRILL

Botanist, Bureau of Science, Manila

Separate from

THE PHILIPPINE JOURNAL OF SCIENCE

Published by the Bureau of Science of the Philippine Government
Manila, P. I.

VOLUME XV, No. 3, SEPTEMBER, 1919

MANILA
BUREAU OF PRINTING
1919

THE PHILIPPINE BUREAU OF SCIENCE

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ADDITIONAL NOTES ON THE KWANGTUNG FLORA

By E. D. MERRILL

Botanist, Bureau of Science, Manila

This third paper on the flora of Kwangtung Province, China, is essentially like its predecessors.¹ In it have been included the descriptions of fifteen presumably new species, and records of thirty-four previously described forms either new to China or new to Kwangtung Province. The material on which these data are based has been collected by Mr. C. O. Levine and Mr. G. W. Groff, of the Canton Christian College, ably assisted by their Chinese collector To Kang P'eng.

In this paper have also been included some necessary changes in nomenclature for Chinese species occasioned by a recent preliminary study of Loureiro's *Flora Cochinchinensis*. This work was published in 1790. It contains the descriptions of one thousand two hundred ninety-four species and a few varieties, of which about six hundred thirty were described as new, the others ascribed to binomials established by Linnaeus. A preliminary examination of Loureiro's work shows that he frequently described some species twice, or sometimes even three or four times, under the same or under different generic names. In nearly one hundred cases reductions have been made, so that the total number of distinct species described by Loureiro is probably less than one thousand two hundred. In his interpretation of Linnean species he made numerous and frequently grave errors, and in about three hundred seventy cases, or about 56 per cent, he was wrong in the interpretation of such species. Loureiro described as new a total of one hundred eighty-five genera of which forty-two are generally adopted as valid ones or, if strict priority be followed, eliminating those names excluded by the lists of *nomina conservanda* adopted by the Vienna and the Brussels Botanical Congresses, fifty should be adopted. Fourteen of Loureiro's new genera have never been satisfactorily reduced and remain as doubtful ones.

¹ Merrill, E. D., Notes on the flora of Kwangtung Province, China, *Philip. Journ. Sci.* 12 (1917) Bot. 99-111; Notes on the flora of Loh Fau Mountain, Kwangtung Province, China, op. cit. 13 (1918) Bot. 123-161.

The title "*Flora Cochinchinensis*" is somewhat misleading, although more species were described from Cochin China than from any other single region. The geographic sources of his material are as follows: From Cochin China alone, about 697; from China alone, about 254; from both Cochin China and China, about 292; from tropical East Africa opposite Zanzibar, 29; from Mozambique, 9; from Zanzibar, 8; from India, 5; with 1 each from the Philippines, Sumatra, and the Malay Peninsula. Most of the Chinese material mentioned by Loureiro was from the immediate vicinity of Canton, where he resided for a period of three or four years.

In 1774 Loureiro mentions having sent about sixty specimens with descriptions to Europe, and in 1779 another lot of two hundred thirty specimens. I have not as yet succeeded in locating the first lot; the second shipment apparently consisted of those preserved in the herbarium of the British Museum. In the herbarium of the Paris Museum of Natural History ninety specimens from Loureiro are preserved, these having been secured by Geoffroy Saint-Hilaire in Lisbon in 1808. The bulk of Loureiro's collection, however, was retained by him in Lisbon and has long since been destroyed.²

Of the one thousand two hundred ninety-four species recognized by Loureiro not more than three hundred eighty are represented by known extant botanical material from his collections. In the much more numerous cases where Loureiro's types are no longer extant, the species must be interpreted from the original descriptions and such other data as can be secured for the regions in which the specimens were collected.

Considerable time was devoted to a preliminary study of Loureiro's species, and a manuscript commentary on the *Flora Cochinchinensis* was prepared by me and completed April 15, 1919. In this commentary Loureiro's species, so far as possible, were reduced to a family arrangement following the Engler and Prantl system. An attempt was made to determine the oldest valid specific name for each species and the necessary synonymy was added to explain the acceptance of the specific name in each case; all local names cited by Loureiro were recorded; and a more or less critical discussion of each species was given, together with the place of origin for each as cited by Loureiro. This manuscript was prepared in six copies, one of which is

² De Candolle, A, *La Phytographie* (1880) 430.

retained in Manila; one was sent to Dr. A. Chevalier, director of the Institut Scientifique in Saigon, Indo-China; one to the Canton Christian College, Canton, China; one to the library of the United States Department of Agriculture, Washington; one to the British Museum (Natural History), London; and one to the Muséum d'Histoire Naturelle, Paris. The essential object in preparing this manuscript was to establish a basis for further investigations regarding the status of Loureiro's species, as there still remains a high percentage of forms that are unintelligible from the descriptions alone. Eventually, when we shall have secured sufficient additional data to warrant doing so, it is hoped that a critical revision of Loureiro's species may be prepared and published.

The manuscript mentioned above summarizes in convenient form all the data at present available regarding the status of Loureiro's species in relation to those described by other authors, and from it can be determined those that are definitely known and those that are of a more or less doubtful status. Fourteen genera have not definitely been placed, of which twelve have not been referred to their proper families, while about three hundred seventy-five species are still more or less doubtful, and cannot, from the description alone, be safely correlated with those of other authors. Of these doubtful species many cannot be referred to their proper genera, and nearly fifty cannot be even referred to their proper families. Any great reduction in this rather high percentage of doubtful species cannot be expected until intensive field work shall have been prosecuted, with special reference to the problem, in southern China but more especially in Cochin China, in the vicinity of Hue where Loureiro resided.

GRAMINEAE

AGROPYRON Gaertner

AGROPYRON CILIARE (Trin.) Franchet in Nuov. Arch. Mus. Paris II 7 (1884) 151.

Triticum ciliare Trin. in Bunge Enum. Pl. Chin. Bor. (1831) 72.

Kwangtung Province, Shiuchow region, *To Kang P'eng* 2827, April, 1919.

A species of wide distribution in northern and central China but no representative of the genus hitherto recorded from as far south as Kwangtung.

ARACEAE

POTHOS Linnaeus

POTHOS REPENS (Lour.) comb. nov.

Flagellaria repens Lour. Fl. Cochinch. (1790) 212, ed. Willd. (1793) 263.

Pothos loureirii Hook. & Arn. Bot. Beechy's Voy. (1841) 220; Schott Aroid. 1 (1853) 23, t. 49, Prodr. (1860) 567; Engl. in DC. Monog. Phan. 2 (1879) 87; N. E. Br. in Journ. Linn. Soc. Bot. 36 (1903) 186, Curtis's Bot. Mag. t. 7744; Engl. Pflanzenreich 21 (1905) 35, f. 15.

Pothos terminalis Hance in Ann. Sci. Nat. V 5 (1866) 247.

Pothos microphyllus Schott Aroid. 1 (1853) 23, t. 40, f. B.

This species is known from Kwangtung Province, Hainan, and Tonkin, and is represented by *Levine* 1989 from Teng Woo Mountain, Kwangtung Province, and by *Hongkong Botanic Garden* 2243 from Hainan. The oldest valid specific name is here adopted, as Loureiro's description applies in all respects to the species as currently interpreted.

ARISAEMA Martius

ARISAEMA KWANGTUNGENSE sp. nov. § *Pedatisecta*.

Herba circiter 40 cm alta; foliis solitariis, pedatisectis, segmentis plerumque 11, omnibus sessilibus, lanceolatis, acuminatis, 6 ad 9 cm longis, 1 ad 1.8 cm latis, basi angustatis; scapus 15 ad 18 cm longus; spathae tubus 5 cm longus, cylindricus, deorsum leviter angustatus; lamina ovata ad oblongo-ovata, 4 ad 5.5 cm longa, usque ad 3 cm lata, tenuiter acuminata, basi rotundata; spadiceis appendix usque ad 10 cm longa.

Corms unknown. Peduncular part of the plant 15 to 20 cm long, bearing one leaf and one inflorescence, the free petiolar part of the leaf 4 to 6 cm long. Leaves pedately lobed, the segments mostly 11, membranaceous, lanceolate, slenderly acuminate, narrowed below, all sessile, 6 to 9 cm long, 1 to 1.8 cm wide. Scape 15 to 18 cm long, smooth, slender. Spathe pale green, its tube cylindric, slightly narrowed below, 5 cm long, the lamina membranaceous, ovate to oblong-ovate, 4 to 5.5 cm long, up to 3 cm wide, base rounded, apex slenderly acuminate but not caudate. Spadices unisexual, the staminate ones about 3 mm in diameter, floriferous for a distance of about 3 cm, the appendage slender, smooth, up to 10 cm long, 1 to 1.3 mm in diameter.

Kwangtung Province, Shiuchow region, *Levine 3565*, May 3, 1919, scattered along roads northeast of Nam Wa monastery.

I am unable to refer this specimen to any previously described species. It is apparently allied to *Arisaema japonicum* Blume.

LILIACEAE

SCILLA Linnaeus

SCILLA SINENSIS (Lour.) comb. nov.

Ornithogallum sinense Lour. Fl. Cochinch. (1790) 206.

Barnardia scilloides Lindl. in Bot. Reg. t. 1029.

Scilla chinensis Benth. Fl. Hongk. (1861) 373.

Loureiro's species is manifestly identical with the one currently known as *Scilla chinensis* Benth., the latter having been published independently of *Convallaria chinensis* Osbeck³ which is unquestionably a synonym although very imperfectly described. It is not uncommon in open grassy places in the vicinity of Canton whence Loureiro secured his material, and is represented by the following Kwangtung material: *Merrill 10048*, *Levine 3270*, *3421*, the latter with the recorded local name *shik sun tau*.

DISPORUM Salisbury

DISPORUM CANTONIENSE (Lour.) comb. nov.

Fritillaria cantoniensis Lour. Fl. Cochinch. (1790) 206.

Disporum pullum Salisb. in Trans. Hort. Soc. 1 (1812) 331.

Uvularia chinensis Ker in Curtis's Bot. Mag. t. 916.

Loureiro's material was from plants cultivated in Canton, for which he cites the local name *lin ni hoa*. Wright⁴ admits *Fritillaria cantoniensis* Lour. with the following comment: "A doubtful plant supposed by Gawler to be the same as *Uvularia chinensis*, which is now reduced to *Disporum pullum* Salisb." Hooker f.,⁵ under *Disporum pullum* Salisb. states: "The type of this species is the Chinese *Uvularia chinensis* of the Botanical Magazine, a purple flowered plant hardly distinguishable from shortly spurred specimens of *calcaratum*." Loureiro's description is ample and applies unmistakably to *Disporum*; his specific name should be retained for the Chinese form currently referred to *Disporum pullum* Salisb. I am by no means certain that all the Indo-Malayan material currently referred to *Disporum pullum* Salisb. is conspecific with the Chinese form.

³ Dagbok Ostind. Resa (1757) 220.

⁴ Journ. Linn. Soc. Bot. 26 (1903) 136.

⁵ Fl. Brit. Ind. 6 (1892) 260.

ASPARAGUS Tournefort

ASPARAGUS COCHINCHINENSIS (Lour.) comb. nov.

Melanthium cochinchinense Lour. Fl. Cochinch. (1790) 216.

Asparagus lucidus Lindl. in Bot. Reg. (1844) Misc. 29.

Loureiro observed this species in both China and Cochin China, and his description applies unmistakably to the well-known *Asparagus lucidus* Lindl., in spite of his description of the fruit as a capsule, this being a manifest error on the part of Loureiro. Kwangtung material representing the species, and for which the Cantonese name *tin tung* is recorded, corresponding to the form Loureiro cites, *tien muen tum*, is as follows: *Merrill 10699, Levine 2174, Groff 2290, Dunn 6337*. I have also examined the following specimens: Hongkong, *Curran*. Hainan, *Miss Moninger 62*. Formosa, *Faurie 947, Bot. Inst. Tokyo 1570*.

ZINGIBERACEAE

PHRYNIUM Willdenow

PHRYNIUM PLACENTARIUM (Lour.) comb. nov.

Phyllodes placentaria Lour. Fl. Cochinch. (1790) 13.

Phrynium parviflorum Roxb. Fl. Ind. 1 (1820) 7; K. Schum. in Engl. Pflanzenreich 11 (1902) 54.

Loureiro observed this species both in China and in Cochin China. The generic name *Phyllodes* antedates *Phrynium*, but the latter is retained in the list of *nomina conservanda* adopted by the Vienna Botanical Congress. K. Schumann cites Loureiro's species as a doubtful synonym of *Phrynium capitatum* Willd., a purple-flowered species recorded from both China and Cochin China. From Loureiro's description of the flowers of his species as white I am convinced that he had specimens of the species currently known as *Phrynium parviflorum* Roxb., of which I have excellent specimens from Cochin China, *Pierre 626*, and from Kwangtung Province, China, *Levine 1873, Groff 2524*, with the recorded Cantonese name *chung ip*, corresponding to Loureiro's recorded Cantonese name *toung iep*.

ORCHIDACEAE

SPIRANTHES L. C. Richard

SPIRANTHES ARISTOTELIA (Raeusch.) comb. nov.

Epidendrum aristotelia Raeusch. Nomencl. ed. 3 (1797) 265.

Aristotelia spiralis Lour. Fl. Cochinch. (1790) 522.

Spiranthes australis Lindl. in Bot. Reg. (1824) sub *t.* 823, non Koch.

Neottia sinensis Pers. Syn. 2 (1807) 511.

Spiranthes sinensis Ames Orch. 2 (1908) 53.

Aristotelia spiralis Lour., described by him as a new genus and species, was based on specimens from the vicinity of Canton.

It is represented by the following Kwangtung material, *Levine 1014, 2036, 2072*, growing in open grasslands, flowering in April and May. The species is one of very wide distribution, extending from India to Japan southward to New Zealand. Loureiro's type is preserved in the herbarium of the Paris Museum of Natural History.

MORACEAE

ANTIARIS Leschenault

ANTIARIS TOXICARIA (Pers.) Lesch. in Ann. Mus. Paris 17 (1810) 478.
Ipo toxicaria Pers. Syn. 2 (1807) 566.

Kwangtung Province, Kochow region, *To Kang P'eng 2755*, at Koon Shan temple, west of Kochow city, with the local name *to yink*.

Widely distributed in the Indo-Malayan region, but no representative of the genus previously recorded from China. This is the "deadly upas tree," its milky juice being widely used in the Indo-Malayan region for the purpose of poisoning spears and arrows.

CUDRANIA Trécul

CUDRANIA PUBESCENS Tréc. in Ann. Sci. Nat. Bot. III 8 (1847) 125.

Kwangtung Province, Shiuchow region, Tan Ha Shan, *To Kang P'eng 2847*, April 25, 1919.

Yunnan Province, China, Burma, Java; new to Kwangtung.

FICUS Linnaeus

FICUS VARIEGATA Blume Bijdr. (1825) 459; King in Ann. Bot. Gard. Calcutta 1 (1888) 169, t. 212.

Kwangtung Province, Kochow region, Ngau Tsai Wan, *To Kang P'eng 2743*, February 25, 1919, with the local name *tong kwo muk*.

This is the typical form of Blume's species, with broad, undulate-toothed leaves and large fruits. It is certainly specifically distinct from *Ficus chlorocarpa* Benth. which King referred to Blume's species as a variety. *Ficus chlorocarpa* Benth. is represented by *Merrill 10262* and *Levine 1889* from Kwangtung Province.

FICUS BENJAMINA Linn. Mant. 1 (1767) 129; King in Ann. Bot. Gard. Calcutta 1 (1887) 43, t. 52.

Kwangtung Province, Kochow region, Tai Shek Ling, *To Kang P'eng 2663*, March 18, 1919, with the local name *sai ip yung*.

Wild in various parts of the Malayan region and the Philip-

pinus, frequently planted in other parts of tropical Asia. Not before recorded from China proper, although known from Hainan.

LORANTHACEAE

LORANTHUS Linnaeus

LORANTHUS PENTANDRUS Linn. Mant. 1 (1767) 63; Blume Fl. Jav. Loranth. (1828) 33, t. 10; Hook. f. Fl. Brit. Ind. 5 (1886) 216.

Kwangtung Province, Sai Sha, Sz Ooi, *Groff* 2403, April 24, 1918.

This species has not previously been reported from China; the specimens agree closely with the descriptions and with our rather full series of Malayan specimens.

LORANTHUS PARASITICUS (Linn.) comb. nov.

Scurrula parasitica Linn. Sp. Pl. (1753) 110, excl. syn. Camell et Petiver.

Loranthus scurrula Linn. Sp. Pl. ed. 2 (1762) 472, non auct. plur.

Loranthus estipitatus Stapf. (p. p.) in Trans. Linn. Soc. Bot. 4 (1894) 221; Forbes & Hemsl. in Journ. Linn. Soc. Bot. 26 (1844) 405; Dunn & Tutchet Fl. Hongk. Kwangtung (1912) 229 (as to the Chinese plant).

Kwangtung Province, vicinity of Canton, *Merrill* 9987, *Levine* 1277, 1866, 1948, *Groff* 2314. Hongkong, *Hongkong Herbarium* 1232.

The history of this species is as follows: The original binomial, *Scurrula parasitica* Linn., was manifestly based on a specimen, indicated by Linnaeus as originating in China, and in all probability collected by Osbeck near Canton; to the species Linnaeus erroneously referred "*Viscum vitici innascens* Camell. luz. 3 n. 36. Pet. gaz. t. 23, f. 8." Camell's description was based on specimens from Naic, Cavite Province, Luzon, and is manifestly *Loranthus philippensis* Cham. & Schlecht., an endemic Philippine species. Petiver's figure was in all probability based on Camell's drawing or on specimens from him, and a copy of the figure kindly supplied by Mr. Oakes Ames shows that it also represents *Loranthus philippensis* Cham. & Schlecht. The Linnean description does not apply to *Loranthus philippensis* Cham. & Schlecht., but does apply word for word to the Chinese form currently referred to *Loranthus estipitatus* Stapf, which is the commonest species of *Loranthus* found in the vicinity of Canton, the region in which Osbeck botanized. It does not apply to *Loranthus scurrula* of modern authors. In the second edition of the Species Plantarum Linnaeus made *Scurrula parasitica* the

basis of a new binomial, *Loranthus scurrula* Linn., but the earlier specific name should be adopted.

Fragments of recently collected material, cited above, were sent to London and were critically compared by Doctor Stapf with the Linnean type and with the type of *Loranthus estipitatus* Stapf. He writes under date of May 31, 1918, that as a result of his comparison this Chinese form must be accepted as *Loranthus scurrula* Linn. [= *L. parasiticus* (Linn.) Merr.], but that it is distinct from *L. estipitatus* Stapf. *Loranthus chinensis* DC is closely allied, if not identical.

LORANTHUS LEVINEI sp. nov. § *Scurrula*.

Frutex parasiticus, ramis usque ad 60 cm longis, teretibus, glabris, minute lenticellatis, ramulis dense ferrugineo-puberulis; foliis oblongis, coriaceis, obtusis, basi obtusis ad rotundatis, usque ad 8 cm longis, supra glabris, nitidis, olivaceis, subtus densissime ferrugineo-puberulis vel tomentosis, nervis utrinque 4 ad 6, supra distinctis, subtus obscuris; floribus axillaribus, 4-meris, fasciculatis, circiter 2.5 cm longis, curvatis, densissime ferrugineo-tomentosis, pedunculis 1- ad 3-floris, 3 ad 4 mm longis.

A parasitic shrub, the branches up to 60 cm in length, terete, glabrous, dark colored when dry, with scattered minute lenticels, the branchlets densely ferruginous-puberulent. Leaves opposite, subopposite, and alternate, oblong, coriaceous, 6 to 8 cm long, 2 to 3.5 cm wide, obtuse, base obtuse to rounded, the upper surface glabrous, olivaceous, shining, the lower densely ferruginous-puberulent or tomentose; lateral nerves 4 to 6 on each side of the midrib, rather distinct on the upper surface, the reticulations very lax, on the lower surface obscure or even obsolete; petiole 4 to 10 mm long, densely ferruginous-puberulent. Flowers axillary, fascicled, 4-merous, curved, about 2.5 cm long, densely ferruginous-pubescent or tomentose, the peduncles 1- or 2-flowered, 3 to 4 mm long, when 2-flowered the pedicels about 1 mm in length. Calyx oblong-ovoid, about 3 mm long, truncate, densely ferruginous-tomentose, subtended by a small, ovate bract. Corolla in bud curved, about 2.2 cm long, in anthesis split down one side, externally densely ferruginous-tomentose, the tube about 1.6 cm long; lobes reflexed, about 6 mm long, somewhat spatulate. Anthers continuous with the filaments, about 2 mm long.

Kwangtung Province, Lin District, Lo Chi Chui, *Levine 3321*, October 14, 1918, on trees along the river.

This species belongs in the group with *Loranthus parasiticus* Merr. and is perhaps most closely allied to *Loranthus yadoriki*

Siebold. It may be the Kwangtung species recorded by Dunn & Tutchener as *Loranthus scurrula* Linn., but is certainly not the Linnean species.

ELYTRANTHE Blume

ELYTRANTHE FORDII (Hance) comb. nov.

Loranthus fordii Hance in Journ. Bot. 23 (1885) 38.

This species is apparently common in Kwangtung Province and is clearly an *Elytranthe*. It is represented by the following specimens: White Cloud hills, *Levine 2076*; Ting Woo Monastery, *Levine 2025*; Honam Island, *Levine 1006*, and North River, Tseng Uen, *Levine 2390*. The specimens have the following local names: *shui chi kei shaang*, *koh muk kei shang*, and *wo ko*.

VISCUM Linnaeus

VISCUM STIPITATUM Lecomte in Sargent Pl. Wils. 3 (1916) 319.

Kwangtung Province, Lin District, Leung Kong Ngon, *Levine 3465*, October 28, 1918.

Lecomte's species was based on material from Yunnan Province, and Levine's excellent specimen exactly matches the description. In leaf characters the species is distinctly similar to *Ginalloa*.

VISCUM ANGULATUM Heyne ex DC. Prodr. 4 (1830) 225; Hook. f. Fl. Brit. Ind. 5 (1886) 225.

Kwangtung Province, Poon Yue District, *Levine 3165*, November, 1918, with the local name *kei shang*.

This species has not previously been recorded from China. The specimen is in fruit but agrees closely with Indian material representing Heyne's species. India to Australia.

RANUNCULACEAE

RANUNCULUS Linnaeus

RANUNCULUS DIFFUSUS DC. Prodr. 1 (1824) 38.

Kwangtung Province, Shiuchow region, Tan Ha Shan, *To Kang P'eng 2901*, April, 1919, in grassy places.

India to China, Java, and Sumatra; not previously recorded from Kwangtung Province.

BERBERIDACEAE

NANDINA Thunberg

NANDINA DOMESTICA Thunb. Fl. Jap. (1784) 9.

Kwangtung Province, Shiuchow region, Fan Kwai No Shan, *To Kang P'eng 2778*, April 19, 1919, in forests.

Widely distributed in Japan and China, but not previously found so far south as Kwangtung Province.

MENISPERMACEAE

DIPLOCLISIA Miers

DIPLOCLISIA CHINENSIS sp. nov.

Frutex scandens, glaber; foliis late ovatis ad subreniformibus, 5 ad 10 cm longis, 7 ad 12 cm latis, apice acutis, basi 5-nerviis, late truncato-rotundatis ad leviter cordatis, petiolo 4 ad 7 cm longo; inflorescentiis axillaribus, pedunculatis, umbellato-cymosis, 1.5 ad 3 cm longis; floribus ♂ 6-meris, sepalis ellipticis ad obovatis, circiter 2.5 mm longis, lineolatis, petalis rhomboideis 1.5 mm longis, apice rotundatis, basi cuneatis, auriculis laterali-bus acutis, inflexis.

Scandent, glabrous, the branches and branchlets usually red-dish brown, terete. Leaves chartaceous, olivaceous on both surfaces or somewhat glaucous beneath, broadly ovate to subreniform, 5 to 10 cm long, 7 to 12 cm wide, entire or the margin obscurely undulate, apex acute, base broadly truncate-rounded to shallowly cordate, 5-nerved; petioles 4 to 7 cm long. Inflorescences axillary, solitary, umbellate-cymose, the peduncles 1 to 2 cm long, the flower-bearing portion less than 1 cm in diameter, the pedicels 2 to 4 mm long, lineolate. Petals 6, rhomboid, 1.5 mm long, apex rounded, base acute, the auricles lateral, acute, inflexed; filaments 2 mm long.

Kwangtung Province, Shiuchow region, Fan Kwai No Shan, To Kang P'eng 2764 (type), 2779 p. p., April 19, 1919.

This species is closely allied to *Diploclisia affinis* (Oliv.) Diels but differs in its larger leaves which are broadly ovate to subreniform, their bases truncate-rounded to shallowly cordate and not at all peltate. My specimen of No. 2779 cited above consists in part of this species and in part of *Pericampylus glaucus* (Lam.) Merr.

LAURACEAE

LITSEA Lamarck

LITSEA CUBEBA (Lour.) Pers. Syn. 2 (1807) 4.

Laurus cubeba Lour. Fl. Cochinch. (1790) 252.

Litsea piperita Juss. in Ann. Mus. Paris 6 (1805) 213.

Persea cubeba Spreng. Syst. 2 (1825) 269.

Daphnidium cubeba Nees Syst. Lour. (1836) 615.

Tetranthera cubeba Meisn. in DC. Prodr. 15¹ (1864) 199.

Litsea citrata Blume Bijdr. (1825) 595; Lecomte Fl. Gén. Indo-Chine 5 (1914) 138; Gamble in Journ. As. Soc. Beng. 75¹ (1912) 146.

Tetranthera citrata Nees Syst. Lour. (1836) 560.

Tetranthera polyantha Wall. Cat. (1830) No. 2538, *nomen nudum*, Nees in Wall. Pl. As. Rar. 2 (1831) 67, Syst. Lour. (1836) 545.

Tetranthera floribunda Champ. in Hook. Kew Journ. Bot. 5 (1853) 199

Loureiro's material was from Cochin China, but his species and the numerous synonyms based upon it have never been satisfactorily placed and it is not mentioned by Lecomte in his recent treatment of the Lauraceae of Indo China.⁶ Hemsley⁷ states that he had seen only the fruit as it appears in commerce. It is evident from Loureiro's other descriptions of species of *Laurus* that the statement that the leaves of *Laurus cubeba* were nerveless was intended by him to imply that there were no longitudinal nerves as in *Cinnamomum*, for he placed all the species of *Cinnamomum* known to him under *Laurus*. The fruits are black, about the size, shape, and color of the fruits of black pepper, as Loureiro notes, and like the leaves are very aromatic. The species extends from Central China to India southward to Java, and it is manifest that Loureiro's specific name should be adopted for the species currently known as *Litsea citrata* Blume. I have examined the following material:

China, Kwangtung Province, Merrill 10960, Levine & Groff 158, Levine 1398, 3063, 3248, with the local name *tan shi keung*, To Kang P'eng 2658, with the local name *ts'ing tsz muk*: India, Meebold 5532, Craib 255: Indo China, Bon 4278: Malay Peninsula, Perak, Scortechini 270b, Haniff & McNur 2323: Java, Koordeers 3173, 25602, 27798, 32911, 38125, Winckel 256.

MACHILUS Nees

MACHILUS LEVINEI sp. nov.

Arbor parva, glaberrima; foliis oblongis, crasse coriaceis, usque ad 18 cm longis, acuminatis, subtus glaucescentibus, nervis utrinque 15 ad 18, subtus distinctis; inflorescentiis terminalibus, ramis umbellato-fasciculatis, 2 ad 3.5 cm longis; perianthii segmentis anguste oblongis, coriaceis, glabris, circiter 10 mm longis.

A small, entirely glabrous tree, the branches and branchlets reddish brown, wrinkled when dry, not lenticellate. Leaves thickly coriaceous, oblong, 12 to 18 cm long, 3 to 4.5 cm wide, base obtuse to acute, apex shortly acuminate, the upper surface smooth, shining, rather pale when dry, the lower glaucous, the midrib impressed on the upper surface, very prominent and reddish brown on the lower; lateral nerves 15 to 18 on each side of the midrib, slender, distinct beneath, curved-ascending at an angle of about 45 degrees; petioles reddish brown, about 2.5 cm long. Inflorescences terminal, the primary branches about 8, reddish brown, umbellate-fascicled, 2 to 3.5 cm long, few-flowered. Perianth segments oblong or narrowly oblong, acute to obtuse,

⁶ Fl. Gén. Indo-Chine 5 (1914) 107-158.

⁷ Journ. Linn. Soc. Bot. 26 (1891) 380.

coriaceous, about 10 mm long and 3 mm wide, glabrous. Ovary glabrous. Immature fruit globose.

Kwangtung Province, Teng Woo Mountain, *Levine* 2024, May 26, 1918, scattered on slopes, altitude about 300 meters.

This species is well characterized by its oblong, thickly coriaceous, rather numerous nerved leaves which are glaucous beneath, and by its long, coriaceous, glabrous perianth segments. It is apparently as closely allied to *Machilus phoenicis* Dunn as to any other species, which, however, has smaller, differently shaped, fewer-nerved leaves and much shorter petioles.

LINDERA Thunberg

LINDERA SUBCAUDATA (Merr.) comb. nov.

Neolitsea subcaudata Merr. in Philip. Journ. Sci. 13 (1918) Bot. 137.

Additional material with staminate flowers representing this species shows it to be a *Lindera*, allied to *L. strychnifolia* (Meisn.) F.-Vill. It is now represented by *Merrill* 11016, *Levine* 1351, *Groff* 2463, *To Kang P'eng* 2707, the latter with staminate flowers bearing the local name *heung kau shü*.

SAXIFRAGACEAE

ANDROSACE Linnaeus *

ANDROSACE UMBELLATA (Lour.) comb. nov.

Drosera umbellata Lour. Fl. Cochinch. (1790) 186.

Androsace saxifragifolia Bunge in Mém. Acad. St. Pétersb. 2 (1836) 127; Pax & Knuth in Engl. Pflanzenreich 22 (1905) 179.

Loureiro cites both Chinese and Cochinchinese names for this species, although he also states "Habitat in China." It would seem that he observed the species in both regions. The species extends from India to Japan southward to Indo-China and northern Luzon and occurs at low altitudes both in Kwangtung Province, China, and in Indo China. The species is clearly no *Drosera*, but among all the species of plants known from southern China, Loureiro's description applies only to *Androsace saxifragifolia* Bunge. There is, hence, no reason why Loureiro's specific name should not be adopted for this well-known species. Planchon^s has already indicated that Loureiro's species might be an *Androsace*.

ROSACEAE

PYGEUM Gaertner

PYGEUM TOPENGII sp. nov. § *Sericophyllum*.

Arbor circiter 12 m alta, ramis glabris, ramulis ferrugineo-pubescentibus; foliis coriaceis, elliptico-ovatis, usque ad 9 cm

* Ann. Sci. Nat. III 9 (1848) 304.

longis, breviter obtuse acuminatis, basi plerumque acutis, leviter inaequilateralibus, haud vel obscurissime glandulosis, supra in siccitate pallidis, nitidis, glabris, subtus ad costa nervisque leviter ciliatis, nervis utrinque 6 vel 7, subtus perspicuis; infructescentiis axillaribus, solitariis, depauperato-paniculatis, 4 ad 5 cm longis; fructibus subreniformibus, glabris, minute apiculatis, circiter 8 mm longis, 10 ad 12 mm latis; seminibus solitariis, testa extus sericeis.

A tree about 12 m high, the branches dark reddish brown, lenticellate, glabrous, the branchlets ferruginous-pubescent as are the petioles and apparently the inflorescences. Leaves coriaceous, elliptic-ovate, 6 to 9 cm long, 3 to 5 cm wide, shortly and rather bluntly acuminate, base acute, usually somewhat inequilateral, eglandular or the glands obscure and not at all projecting, the upper surface, except in very young leaves, glabrous, pale and shining when dry, the lower somewhat ciliate on the midrib and nerves; lateral nerves 6 or 7 on each side of the midrib, prominent; petioles 5 to 7 mm long; stipules oblong, pubescent, deciduous, about 5 mm long. Infructescences axillary, solitary, from the branchlets below the leaves, 4 to 5 cm long, sparingly pubescent, usually with a single basal branch 1 to 2 cm in length. Fruits subreniform, brown when dry, slightly apiculate, glabrous, about 8 mm long, 10 to 12 mm wide, their pedicels 3 mm long or less. Seeds solitary, the testa distinctly silky-villous.

Kwangtung Province, Kochow region, Shek Kau Tong, *To Kang P'eng* 2750, March 5, 1919.

Pygeum henryi Dunn is the only species of the genus definitely known from China, but the present one is entirely different. *Pygeum latifolium* Miq. is recorded from Hongkong by Hemsley but Miquel's species is definitely known only from Java, having long been confused with a Philippine species. It is possible that the present species is identical with the Chinese form previously referred to *Pygeum latifolium* Miq., but it is safely not Miquel's species.

SANGUISORBA Ruppius

SANGUISORBA OFFICINALIS Linn. Sp. Pl. (1753) 116.

Kwangtung Province, Lin District, Shan Mo Ling and Sing Tize Foo, *Levine* 3181, 3191, September 15, 1918, with the local name *mar lin on*.

The genus is new to Kwangtung Province. There seems to be some difference of opinion among botanists as to the distribution of Chinese forms of this genus between *Sanguisorba offi-*

cinalis Linn. and *S. canadensis* Linn., the present material matching specimens from various parts of China, some identified as *S. officinalis* Linn. and some as *S. canadensis* Linn. The Kwangtung material closely matches European material of *S. officinalis* Linn., and I assume this name to be correct for it. *Sanguisorba formosana* Hayata, as represented by Formosan material, *Kawakami 93*, is scarcely to be distinguished.

POTENTILLA Linnaeus

POTENTILLA DISCOLOR Bunge Enum. Pl. Chin. Bor. (1831) 25.

Kwangtung Province, Shiuchow region, *To Kang P'eng 2775*, April 19, 1919.

Widely distributed in northern and central China, extending to Formosa (a variety); not previously recorded from Kwangtung Province.

LEGUMINOSAE

PITHECOLOBIUM Martius

PITHECOLOBIUM TURGIDUM sp. nov.

Arbor parva, partibus junioribus ferrugineo-pubescentibus; foliis bipinnatis, pinnis 1-jugis, foliolis amplis, bijugis, membranaceis vel chartaceis, glabris, nitidis, acuminatis, majoribus usque ad 15 cm longis, oblongo-ovatis, basi acutis, nervis utrinque 6 ad 8, perspicuis; leguminis turgidis, rectis, dehiscentibus, oblongis, 7 ad 9 cm longis circiter 3 cm latis, et 1 ad 1.5 cm crassis, valvis coriaceis; seminibus ellipsoideis, 1.8 ad 2.5 cm longis, haud compressis.

A small tree, 3 to 4 m high *vide* Levine, glabrous except the younger parts which are ferruginous- or castaneous-pubescent. Leaves bipinnate, pinnae 1-jugate, leaflets bijugate, the petiole 2 to 6 cm long, with a single large gland at the apex below the insertion of the single pair of terminal pinnae, the rachises of the pinnae 5 to 8 cm long, each bearing four large leaflets and usually with a terminal gland; leaflets membranaceous to chartaceous, oblong-ovate to elliptic-ovate, pale greenish and shining when dry, glabrous, base acute, equilateral, the apex acuminate, 9 to 15 cm long, 4 to 7 cm wide, the lateral nerves 6 to 8 on each side of the midrib prominent. Panicles pyramidal, in bud up to 14 cm long, the flowers in globose heads at the tips of the branchlets, pubescent. Pods oblong, turgid, dehiscent, 7 to 9 cm long, about 3 cm wide, 1 to 1.5 cm thick, each usually with about four seeds, the sutures not thickened, the valves coriaceous, continuous, brown, smooth. Seeds contiguous, ellipsoid,

not compressed, brown, smooth, shining, 1.8 to 2.5 cm long, persistent for a considerable period after the pod dehisces by the elongated, slender, more or less curved funiculus, the latter about 1 cm in length.

Kwangtung Province, Teng Woo Mountain, *Levine & Groff* 86, November 18, 1916, with mature fruits, *Levine* 1976, April 26, 1918, from the same tree, with immature buds and fully mature seeds; along streams, altitude about 300 meters.

This species, distributed as an *Albizzia*, like its congener, *Pithecolobium balansae* Oliv., and apparently *P. attopenense* Pierre (of which the fruits are unknown), is anomalous in *Pithecolobium* in its straight, turgid, not at all twisted or curved pods, and is equally anomalous in *Albizzia*. It is suspected that it may prove to represent a distinct generic type.

PAHUDIA Miquel

PAHUDIA XYLOCARPA Kurz Forest Fl. Brit. Burma 1 (1877) 413.

Kwangtung Province, Kochow region, Sai Ngon, *To Kang P'eng* 2705, February 18, 1919, a single tree, said to have been grown from seeds secured in Burma. It is locally known as *min ke*.

The specimen, which presents a mature pod and seeds, agrees closely with Kurz's description, the species having been based on material originating near the Burmese border of Siam.

CASSIA Linnaeus

CASSIA FISTULA Linn. Sp. Pl. (1753) 377.

Kwangtung Province, Tak Hing, *Levine* 3587, April, 1919, from an introduced and cultivated tree. A native of tropical Asia, pantropic in cultivation.

ORMOSIA Jackson

ORMOSIA HAINANENSIS Gagnep. in Not. Syst. 3 (1914) 31.

Hainan, *Hongkong herbarium* 443! *Miss Moninger* 122!, in fruit: Kwangtung Province, Kochow region, Shek Kau T'ong, *To Kang P'eng* 2664, March 3, 1919, in forests.

The pods, description from Miss Moninger's Hainan specimen, contain from 1 to 4 seeds, and when more than 1-seeded are somewhat torulose. They are 2 to 4 cm long and 1 to 1.5 cm wide, much thickened, glabrous, brown when dry, the valves thickened, somewhat woody, irregularly twisted after dehiscence. Seeds red, dangling from the pod after dehiscence, not arillate, 15 to 18 mm long. When but 1-seeded the pods are usually con-

spicuously stipitate, but the pseudostalk presents several undeveloped ovules. The species seems to be allied to *Ormosia fordiana* Oliv.⁹

PTEROLOBIUM R. Brown

PTEROLOBIUM ROSTHORNII Harms in Engl. Bot. Jahrb. 29 (1900) 410.

Kwangtung Province, Lin District, Pak hill, *Levine 3208*, October 21, 1918, with the local name *ye tau*.

This is the second species of the genus to be found in Kwangtung Province. The material agrees very closely with the original description, which, however, is rather short and imperfect. It has not otherwise been reported except by the original collections in southern Szechuen. The Kwangtung material is in fruit, the wings being 1.2 to 1.5 cm wide, brown and shining when dry, and apiculate-acuminate by the nearly straight upper suture which is slightly produced at the tip.

DERRIS Loureiro

DERRIS ELEGANS (Grah.) Benth. in Miq. Pl. Jungh. (1852) 252, Journ.

Linn. Soc. Bot. 4 (1860) Suppl. 109; Baker in Hook. f. Fl. Brit. Ind. 2 (1878) 252.

Pongamia elegans Grah. in Wall. Cat. (1832) No. 7540, *nomen nudum*.

Kwangtung Province, Shai Chiu Mountain, *Levine 2074*, May 4, 1918, with the local name *kau ngar fa*.

This species has not previously been reported from China, but the flowering specimen cited above is an excellent match for our large series of Philippine specimens representing it; fruiting specimens of the Chinese form are desirable to verify the correctness of the determination.

Tenasserim, Andaman Islands, Malay Peninsula, Sumatra, and the Philippines.

DERRIS TRIFOLIATA Lour. Fl. Cochinch. (1790) 433.

The genus *Derris* was based by Loureiro on two species. The first, *D. pinnata*, the type of which is preserved in the herbarium of the British Museum, is *Dalbergia pinnata* (Lour.) Prain, a species of wide distribution in the Indo-Malayan region more commonly known as *Dalbergia tamarindifolia* Roxb. The second species described by Loureiro, *D. trifoliata*, was based on specimens from the vicinity of Canton, and the type is preserved in the herbarium of the Paris Museum of Natural History. I am of the opinion that this species should be interpreted as the type of the genus *Derris*. The species by many authors has been reduced to *Derris uliginosa* (Roxb.) Benth., and a recent critical

⁹ In Hook. Ic. IV 5 (1895) t. 2422.

examination of the type by Doctor Gagnepain shows that it is identical with Roxburgh's species. Prain¹⁰ thought that Loureiro's description did not apply sufficiently closely to *Derris uliginosa* to warrant reducing Loureiro's species to the latter. The examination of the type by Doctor Gagnepain, however, definitely settles this matter; and Loureiro's name, being the older, should be retained for this very common, characteristic, and widely distributed species. It occurs typically along the margins of tidal streams more or less subject to the influence of brackish or salt water, from tropical East Africa through India to southern China and Formosa, southward through Malaya to tropical Australia and Polynesia.

DUNBARIA Wight and Arnott

DUNBARIA ROTUNDIFOLIA (Lour.) comb. nov.

Indigofera rotundifolia Lour. Fl. Cochinch. (1790) 458.

Dolichos conspersus Grah. in Wall. Cat. (1831-32) No. 3342, *nomen nudum*.

Dunbaria conspersa Benth. in Miq. Pl. Jungh. (1852) 242.

Dunbaria punctata Benth. l. c.

Dolichos punctatus Wight & Arn. Prodr. (1834) 237.

Loureiro's type was from the vicinity of Canton, and his description applies closely to the species currently known as *Dunbaria conspersa* Benth. except that the pods have more than two seeds. No other leguminous species known from Kwangtung agrees at all with Loureiro's description. I have examined the following Kwangtung specimens: *Merrill 10146*, *Levine 1111*, *3345*. Loureiro records the Cantonese name as *o tam sin*; that recorded on one of Levine's specimens is *chin tang*, not very different from Loureiro's name if the words be reversed.

MUCUNA Adanson

MUCUNA COCHINCHINENSIS (Lour.) A. Chev. in Bull. Agr. Inst. Sci. Saigon 1 (1919) 91.

Marcanthus cochinchinensis Lour. Fl. Cochinch. (1790) 461.

Carpopogon niveum Roxb. Fl. Ind. ed. 2, 3 (1832) 385.

Mucuna nivea Wight & Arn. Prodr. (1834) 255.

Stizolobium nivum O. Kuntze Rev. Gen. Pl. (1891) 207.

Kwangtung Province, Lin District, *Levine 3283*, with the local name *kau chau tau t'ang*.

Loureiro's material was from Cochin China, undoubtedly from the vicinity of Hue where he resided most of the time while

¹⁰ Journ. As. Soc. Beng. 66² (1898) 458.

in Cochin China. His description applies unmistakably to the widely distributed and cultivated species currently known as *Mucuna nivea* Wight & Arn., and his specific name will replace that based on Roxburgh's binomial. Loureiro's description of the pods was apparently based on fresh rather than on dried material. Loureiro resided at Hue, and a mature pod secured from this locality under the local name cited by Loureiro, submitted to me by Dr. A. Chevalier, is identical with *Mucuna nivea* Wight & Arn. Prof. C. V. Piper informs me that he examined Loureiro's type in the herbarium of the British Museum in 1912, a leaf specimen only, making the note at that time that it might be any of the species allied to *Mucuna nivea*, but that it probably represented the latter species.

POLYGALACEAE

POLYGALA Linnaeus

POLYGALA TENUIFOLIA Willd. Sp. Pl. 3 (1800) 879.

Kwangtung Province, Shiuchow region, *To Kang P'eng* 2809, 2770, 2903, in thickets and forests.

In China previously recorded from Chihli, Shingking, and Shantung, but not previously reported from southern China. The specimens cited above agree closely with material from Chihli, differing chiefly in some of the leaves being broader than in the northern form.

EUPHORBIACEAE

EUPHORBIA Linnaeus

EUPHORBIA ESULA Linn. Sp. Pl. (1753) 461; Boiss. in DC. Prodr. 15² (1862) 160; Forbes & Hemsl. in Journ. Linn. Soc. Bot. 26 (1894) 412.

Kwangtung Province, North River, Fu Ok, *Groff* 2279, March, 1918.

Widely distributed in Asia, but not previously reported from southern China.

EXCOECARIA Linnaeus

EXCOECARIA COCHINCHINENSIS Lour. Fl. Cochinch. (1790) 612; Muell.-Arg. in DC. Prodr. 15² (1866) 1215.

Kwangtung Province, cultivated at the Canton Christian College, *Groff* 2963. This is the typical form with red leaves, cultivated for ornamental purposes; namely, typical *Excoecaria bicolor* Hassk.

EXCOECARIA COCHINCHINENSIS Lour. Fl. Cochinch. (1790) 612, var. *VIRIDIS* (Pax & K. Hoffm.).

Excoecaria bicolor Hassk. Retzia 1 (1855) 158, var. *viridis* Pax & K. Hoffm. in Engl. Pflanzenreich 52 (1912) 159.

Kwangtung Province, Kochow region, Kwong T'am, *To Kang P'eng*, 2672, March 22, 1919.

I believe the cultivated form with colored leaves described by Loureiro as *Excoecaria cochinchinensis* to be identical with *Excoecaria bicolor* Hassk., which being the case Loureiro's name should be retained. The type of *Excoecaria bicolor* Hassk. var. *viridis* Pax & K. Hoffm. was from Cochin China, and the description agrees entirely with the specimen cited above. The species is new to China.

ALCHORNEA Swartz

ALCHORNEA RUGOSA (Lour.) Muell.-Arg. in Linnaea 34 (1865) 170.

Alchornea hainanensis Pax & K. Hoffm. in Engl. Pflanzenreich 63 (1914) 242 !

Cladodes rugosa Lour. Fl. Cochinch. (1790) 574.

Kwangtung Province, Kochow region, Kwanshan temple, *To Kang P'eng* 2662, March 18, 1919.

This is the first record of the species from China proper, although it had previously been recorded from Hainan Island. Unless *Alchornea rugosa* (Lour.) Muell.-Arg. is variable in the number of its stamens, it would seem that Pax and Hoffmann are wrong in their interpretation of *Alchornea rugosa*, and that they described as a new species the typical form as described by Loureiro under *Cladodes rugosa*. Loureiro describes his species as having eight stamens, the only character depended upon by Pax and Hoffmann in separating the Hainan form from *Alchornea rugosa*. In *Alchornea hainanensis* the staminate flowers have eight stamens, as does the Kwangtung specimen cited above, thus agreeing with Loureiro's original description of *Cladodes rugosa*. J. J. Smith states that in all staminate flowers of the Javan form referred by him to *Alchornea rugosa* the number of stamens was four; Pax and Hoffmann state stamens 4, rarely 5 or 6. The actual specimens so closely resemble each other that I strongly suspect that the species has a variable number of stamens, 4 to 8. Should this not prove to be the case, then Loureiro's specific name will have to be retained for the form characterized by Pax and Hoffmann as *Alchornea hainanensis*, while for the common Malayan form the name *Alchornea javanensis* (Blume) Muell.-Arg. will have

to be revived, or the still earlier one, *Croton apetalum* Blume, transferred to *Alchornea*. It is to be noted that Pax and Hoffmann saw no Cochin China material representing Loureiro's species.

ANACARDIACEAE

POUPARTIA Commerson

POUPARTIA CHINENSIS sp. nov.

Arbor circiter 8 m alta, inflorescentiis exceptis glabra; foliis 20 ad 30 cm longis, foliolis 11 ad 15, membranaceis ad chartaceis, oblongo-lanceolatis, 6 ad 9 cm longis, acuminatis, leviter inaequilateralibus, glabris vel junioribus subtus in axillis leviter barbatis, nervis utrinque 9 ad 12; petiolulis circiter 2 mm longis; inflorescentiis terminalis, amplis, circiter 30 cm longis, ramis inferioribus usque ad 15 cm longis, cinereo-pubescentibus; floribus ♂ 5-meris, calyces circiter 1.5 mm diametro; petalis oblongis, 2.5 mm longis, reflexis; staminibus 10, filamentis 2 ad 2.3 mm longis; ovario glabro, 4- ad 5-locellato.

A tree about 8 m high, the inflorescences more or less cinereous-pubescent. Ultimate branches about 5 mm in diameter, smooth, glabrous, terete. Leaves 20 to 30 cm long, the rachis sparingly pubescent; leaflets 11 to 15, membranaceous to chartaceous, oblong-lanceolate, 6 to 9 cm long, 1.5 to 2.5 cm wide, somewhat inequilateral at the base, apex acuminate, glabrous, or the younger ones sparingly bearded in the axils on the lower surface; lateral nerves 9 to 12 on each side of the midrib, slender; petiolules about 2 mm long. Inflorescence a terminal leafy panicle about 30 cm in length, the lower branches up to 15 cm long, subtended by normal but usually reduced leaves, the upper 15 to 20 cm of the panicle leafless; the branches, branchlets, and pedicels cinereous-pubescent. Flowers numerous, white, pistillate and staminate ones in the same inflorescences. Calyx of the staminate flowers about 1.5 mm in diameter, the lobes 5, ovate, acute or obtuse, about 0.5 mm long. Petals oblong, 2.5 mm long, their margins somewhat inflexed, reflexed in anthesis, nerveless. Stamens 10, their filaments filiform, 2 to 2.3 mm long. Pistillate flowers similar to the staminate ones. Ovary glabrous, 4- or 5-celled; styles 4 or 5, about 1 mm long.

Kwangtung Province, Honam Island, on the campus of Canton Christian College, *Levine 3521*, May 13, 1919.

This is the second species of the genus to be found in China, differing radically from *Poupartia fordii* Hemsl. in its very much larger, terminal, distinctly pubescent inflorescences, the

staminate and pistillate flowers borne in the same inflorescences; much smaller pistillate flowers; much more numerous leaflets; and shorter petiolules.

CELASTRACEAE

CELASTRUS Linnaeus

CELASTRUS HOOKERI Prain in Journ. As. Soc. Beng. 72² (1904) 197; Rehd. & Wils. in Sargent Pl. Wils. 2 (1915) 352.

Kwangtung Province, North River and Shiuchow regions, *Groff* 2300, 2294, *To Kang P'eng* 2875.

India; previously recorded from China from Yunnan, Szech'-uan, and Fokien, but not before reported from Kwangtung Province.

SAPINDACEAE

KOELREUTERIA Lakman

KOELREUTERIA BIPINNATA Franch. in Bull. Soc. Bot. France 33 (1886) 463, Pl. Delavay. (1889) 143, t. 29, 30.

Kwangtung Province, Ying Tak District, *Levine* 3484, December 9, 1918.

This species is new to Kwangtung Province and this record represents a considerable southward extension of range for it. The specimen is in fruit and agrees closely with our rather full series of specimens from Yunnan Province.

ELAEOCARPACEAE

ELAEOCARPUS Linnaeus

ELAEOCARPUS DUBIUS A. DC. in Bull. Herb. Boiss. II 2 (1903) 366; Gagnep. in Lecomte Fl. Gén. Indo-Chine 1 (1910) 572.

Kwangtung Province, Kochow region, Shek Kau Tong, *To Kang P'eng* 2686, March 5, 1919, in forests.

The specimen agrees in all respects with the descriptions of this species and with *Bon* 4298!, 2671! from Tonkin. Previously known only from Tonkin.

MALVACEAE

HIBISCUS Linnaeus

HIBISCUS SURATTENSIS Linn. Sp. Pl. (1753) 696.

Kwangtung Province, Kochow region, Fat Tsz Ling, *To Kang P'eng* 2730, February, 1919, along roadsides.

This widely distributed Indo-Malayan species has been recorded from Hainan, but I can find no record for it from China proper.

THEACEAE

EURYA Thunberg

EURYA GROFFII sp. nov.

Frutex vel arbor parva; ramis teretibus, glabris, ramulis pilosis; foliis lanceolatis, chartaceis vel subcoriaceis, usque ad 6 cm longis et 1.2 cm latis, nitidis, supra glabris, subtus pilosis, apice tenuiter acuminatis, basi obtusis, plerumque leviter inaequilateralibus, costa supra impressa, subtus cum venis prominulis; fructibus axillaribus, fasciculatis, globosis vel ovoideis, glabris, stylis connatis; sepalis elliptico-ovatis, exterioribus leviter pilosis, coriaceis, 1.5 ad 2 mm longis.

A shrub or a small tree, the branchlets rather densely pilose. Branches terete, glabrous, dark reddish brown. Leaves numerous, lanceolate, chartaceous to subcoriaceous, greenish olivaceous and shining when dry, 3.5 to 6 cm long, 8 to 12 mm wide, the margins denticulate, the upper surface glabrous, the lower pilose, the midrib above impressed, prominent beneath, the lateral nerves obsolete or subobsolete on the upper surface, distinct and somewhat projecting on the lower surface, the apex slenderly acuminate, the base obtuse and often minutely inequilaterally cordate, sessile or subsessile. Fruits axillary, glabrous, globose or ovoid, 3 to 3.5 mm in diameter, smooth, their pedicels 1 to 1.5 mm long; styles united for the lower 1 mm, the arms about 1 mm long. Sepals coriaceous, elliptic-ovate, 1.5 to 2 mm long, rounded, the outer ones somewhat pilose.

Kwangtung Province, Tiu Kaan Shan, Tseng Uen, *Groff* 2378, March, 1918, on mountain sides.

In vegetative characters and general appearance this species strongly resembles *Eurya swinglei* Merr., but differs radically in its entirely glabrous fruits and much shorter styles. From *Eurya distichophylla* Hemsl. it is readily distinguished by its slenderly acuminate leaves and the veins obsolete or nearly so on the upper surface and projecting on the lower surface. The fruits and staminate flowers of Hemsley's species are as yet unknown.

FLACOURTIACEAE

XYLOSMA Forster f.

XYLOSMA CONGESTUM (Lour.) comb. nov.

Croton congestum Lour. Fl. Cochinch. (1790) 582, excl. descr. fruct.
Xylosma racemosum Miq. Ann. Mus. Bot. Lugd.-Bat. 2 (1865-66) 155.
Hisingera racemosa Sieb. & Zucc. Fl. Jap. Fam. Nat. 1 (1843) 169.
Xylosma japonicum A. Gray in Mem. Amer. Acad. II 6¹ (1863) 381.
Flacourtia chinensis Clos. in Ann. Sci. Nat. Bot. IV 8 (1857) 219.

This species is very common in thickets in the vicinity of Canton, Loureiro's type having been from Canton. J. Mueller¹¹ notes that Loureiro's description of the flowers and of the inflorescences does not conform to *Croton*; further it does not conform with the characters of any euphorbiaceous plant known from Kwangtung Province, but, with the exception of the fruit description, agrees entirely with the species currently known as *Xylosma racemosum* Miq. It is clear that Loureiro either added the fruit description to make his species agree with the generic characters of *Croton*, or described the fruits from material originating from a species entirely unrelated to the flowering specimen described by him. I have examined the following specimens from Kwangtung Province, mostly from the immediate vicinity of Canton: Merrill 9850, 9993, Groff 2252, 2353, Levine 18, 171, 172, 177, 279, 365, 366, 371, 1749, 1809, 1829, 2084, 3261, 3341, To Kang P'eng 2727, 2737. The local names recorded are *wu ying shue* (vicinity of Canton), *ch'ui tung ts'ai* (North River region), and *chü nga lak shü* (Kochow region). The name *pa tau* recorded by Loureiro should probably be excluded as it is the same as the name recorded by him for *Croton tiglium* Linn.

THYMELAEACEAE

AQUILARIA Lamareck

AQUILARIA SINENSIS (Lour.) comb. nov.

Ophiospermum sinense Lour. Fl. Cochinch. (1790) 281.

Aquilaria chinensis Spreng. Syst. 2 (1825) 356.

Aquilaria grandiflora Benth. Fl. Hongk. (1861) 297.

Loureiro cites no definite locality, but from the fact that he indicated the local name *pa mou yong* as Chinese it is clear that his material was from China, and in all probability from the vicinity of Canton. The description definitely applies to the species commonly known as *Aquilaria grandiflora* Benth., one that is not uncommon in the vicinity of Canton. Loureiro's description of the perianth as 6-merous was apparently due to an error on his part, for he enumerates the stamens as five, thus indicating that he was describing a 5-merous flower. I have examined the following Kwangtung material: Groff 2487, Merrill 10962, Levine 996, 1400, 2070, from Tsangsheng, Wa Shau Toi, White Cloud Mountain, and Honam Island, the last two localities being in the immediate vicinity of Canton. Loureiro's

¹¹ DC. Prodr. 15² (1866) 696.

type is preserved in the herbarium of the Paris Museum and is identical with the species as here interpreted.

RHIZOPHORACEAE

CARALLIA Roxburgh

CARALLIA BRACHIATA (Lour.) comb. nov.

Diatoma brachiata Lour. Fl. Cochinch. (1790) 296.

Carallia lucida Roxb. Hort. Beng. (1814) 92, *nomen nudum*, Pl. Coromandel 3 (1819) 8, t. 211.

Carallia integerrima DC. Prodr. 3 (1828) 33.

Petalotoma brachiata DC. op. cit. 295.

Kwangtung Province, White Cloud Mountain, near Canton, *Levine 3386*, local name *nik nga tsai*; Poon Yue District, *Levine 3138*; Kochow region, *To Kang P'eng 2676, 2751*, with the local name *ngo shen muk*.

Loureiro's generic name has priority over *Carallia*, but the latter is retained in the list of *nomina conservanda* adopted by the Vienna Botanical Congress. *Petalotoma* DC. is merely a new generic name for *Diatoma*. I believe Loureiro's description applies to the common and widely distributed Indo-Malayan species commonly known as *Carallia lucida* Roxb. and as *C. integerrima* DC., the last two certainly being conspecific.

MYRTACEAE

EUGENIA Linnaeus

EUGENIA BULLOCKII Hance in Journ. Bot. 16 (1878) 227.

Kwangtung Province, Kochow region, Shek Tan Kong, *To Kang P'eng 2995*, March, 1919.

This specimen, although in fruit, agrees closely with the original description and with Hainan material collected by Miss Moninger, which I have identified with Hance's species. It was previously known only from Hainan.

ARALIACEAE

ARALIA Linnaeus

ARALIA SPINIFOLIA sp. nov. § *Arborescentes*.

Frutex erectus, circiter 3 m altus, foliis inflorescentiisque perspicue spinosis atque setosis; foliis magnis, bipinnatis, pinnis circiter 30 cm longis, 5- ad 9-foliolatis; foliolis oblongo-ovatis, usque ad 12 cm longis, membranaceis, acuminatis, brevissime petiolulatis, basi rotundatis, serratis, utrinque ad costa nervisque parce spinosis atque setosis; inflorescentiis magnis, laxis,

umbellulis longe pedunculatis; fructibus ovoideis, 5 mm longis, glabris, 5-carinatis, perspicue 5-sulcatis, pedicellis 1 ad 1.5 cm longis.

An erect shrub about 3 m high. Leaves large, bipinnate, the rachis, partial rachises, and leaflets on both surfaces with scattered, long, slender, nearly straight spines and with more numerous, slender, spreading setae, the spines 3 to 10 mm long, the setae 1.5 to 3 mm in length. Pinnae 5- to 9-foliolate, about 30 cm long; leaflets oblong-ovate, membranaceous, dark brown or olivaceous when dry, the lower surface somewhat paler than the upper, 9 to 12 cm long, 4 to 6 cm wide, subsessile, base rounded, often slightly inequilateral, apex acuminate, margins serrate, the teeth apiculate, the spines few, scattered, and mostly confined to the midrib with a few on the primary nerves, fewer on the lower surface than on the upper, the setae more numerous and scattered all over the epidermis on both surfaces. Inflorescences ample, lax, the ultimate branchlets up to 10 cm in length. Umbels subglobose, about 30 fruits in each, the pedicels 10 to 15 mm long, setose. Fruits ovoid, glabrous, about 5 mm long, prominently 5-keeled and deeply 5-sulcate, the depressions broad, rounded.

Kwangtung Province, Chan Tung hill, *Levine 3242*, October 30, 1918, with the local name *lak cha tsui*.

This species is readily distinguished among its congeners by its spiny and setose rachises, partial rachises, leaflets, and inflorescences.

PRIMULACEAE

LYSIMACHIA Tournefort

LYSIMACHIA CANDIDA Lindl. var. *DEPAUPERATA* var. nov.

A typo differt planta multo minoribus 5 ad 8 cm altus, foliis oblanceolatis ad obovatis, 5 ad 15 cm latis, obtusis vel subacutis, pedicellis quam floribus haud longioribus.

Kwangtung Province, Kochow region, Fung Mun, *To Kang P'eng 2735*, February 22, 1919, in fields.

LYSIMACHIA ALFREDI Hance in Journ. Bot. 15 (1877) 356; Pax & Knuth in Engl. Pflanzenreich 22 (1905) 281.

Kwangtung Province, Shiuchow region, *To Kang P'eng 2858*, *Levine 3524*, April, 1919, in woods.

The identification has been made from the descriptions, the former number cited agreeing better with it than the latter, although differing in some details. The species has previously been known only from Fokien Province.

EBENACEAE

DIOSPYROS Linnaeus

DIOSPYROS SINENSIS Hemsl. in Journ. Linn. Soc. Bot. 26 (1889) 71.

Kwangtung Province, Shiuchow region, *To Kang P'eng* 2785, 2788.

Previously known from Szechuen and Hupeh Provinces, but not before reported from as far south as Kwangtung.

SYMPLOCACEAE

SYMPLOCOS Jacquin

SYMPLOCOS FUSONII sp. nov. § *Hopea*, *Lodhra*.

Frutex 2 ad 3 m altus, ramulis castaneo- vel purpureo-pubescentibus, inflorescentiis cinereo-pubescentibus. Foliis coriaceis vel subcoriaceis, glabris, ellipticis ad oblongo-ellipticis, usque ad 5.5 cm longis, nitidis, margine minute glanduloso-serrulatis vel crenulatis, deorsum integris, apice acutis vel brevissime acuminatis, basi acutis, nervis utrinque 5 vel 6, anastomosantibus, costa supra haud impressa; racemis axillaribus, solitariis vel binis, paucifloris, 8 ad 10 mm longis, floribus omnibus pedicellatis; fructibus oblongo-ovoideis, leviter adpresse pubescentibus, circiter 5 mm longis. Species *S. anomalae* affinis.

A shrub 2 to 3 m high, the branches reddish brown, glabrous, the branchlets slender, somewhat angled, castaneous or purplish, appressed-pubescent with short hairs. Leaves coriaceous or subcoriaceous, shining, glabrous, elliptic to oblong-elliptic, 3 to 5 cm long, 1.5 to 3 cm wide, the apex acute or shortly acuminate, base acute, margins minutely glandular-serrulate or crenulate, toward the base usually entire; lateral nerves 5 or 6 on each side of the midrib, slender, anastomosing, the reticulations lax, the midrib not impressed on the upper surface; petioles 2 to 3 mm long, glabrous or when young pubescent. Racemes axillary, solitary, or in pairs, short, few-flowered, appressed cinereous-pubescent, 8 to 10 mm long, simple, usually 5 to 10 flowers in a raceme. Flowers white, their pedicels 1.5 to 2.5 mm long, the apical bracteoles triangular-ovate, acute, about 1 mm long, somewhat pubescent. Calyx pubescent, the tube short, the limb 2.5 mm in diameter, the lobes orbicular-reniform, spreading, rounded, slightly pubescent, about 1 mm long and 1.2 mm wide. Petals glabrous, oblong-elliptic, 3 mm long. Stamens indefinite, the filaments glabrous, 3 to 4 mm long, slightly united below, forming about 5 indistinct phalanges. Ovary 3-celled; style gla-

brous, 5 mm long. Fruits sparingly appressed-pubescent, oblong-ovoid, terete, about 5 mm long.

Kwangtung Province, Kochow region, Lai Tung and Shan Mi, *To Kang P'eng* 2714 (type), 2677, February and March, 1919, the former with the local name *ye cha fa*.

This species, dedicated to Mr. C. G. Fuson, through whose interest it was possible to do some field work in the Kochow region, is distinctly allied to *Symplocos anomala* Brand of Yunnan Province, from which it differs in its shorter, much less acuminate, fewer-nerved leaves, and somewhat longer, more numerous flowered racemes.

SYMPLOCOS CHINENSIS (Lour.) Desvaux MS. in herb. Mus. Paris. comb. nov.

Myrtus chinensis Lour. Fl. Cochinch. (1790) 313.

Symplocos sinica Ker in Bot. Reg. 9 (1823) t. 710; Brand in Engl. Pflanzenreich 6 (1901) 34.

Loureiro's material was from the vicinity of Canton, and his description applies unmistakably to the species currently known as *Symplocos sinica* Ker. It is common on hills near Canton and is represented by the following Kwangtung material: *Merrill* 10725, *Levine* 15, 294, 637, 1787, 2372, 3198, 3403. The only recorded local name is *hak tsz* in the Lin District; Loureiro records the Cantonese name as *tan quat xiong*. Among the other new genera and species described by Loureiro *Dicalyx cochinchinensis* Lour. is *Symplocos cochinchinensis* Moore; *Decadia aluminosa* Lour. is apparently identical with *Symplocos spicata* Roxb.; *Drupatris cochinchinensis* Lour. is certainly a *Symplocos*; and *Myrtus zeylanica* Lour. (non Linn.) is probably a *Symplocos*. Loureiro's type of *Myrtus chinensis* is preserved in the herbarium of the Paris Museum of Natural History.

LOGANIACEAE

STRYCHNOS Linnaeus

STRYCHNOS UMBELLATA (Lour.) comb. nov.

Cissus umbellata Lour. Fl. Cochinch. (1790) 84.

Strychnos paniculata Champ. in Hook. Kew Journ. Bot. 5 (1853) 56.

Planchon,¹² in excluding Loureiro's species from the Vitaceae, suggests that it might be a *Strychnos*. I am of the opinion that this is the correct disposition of *Cissus umbellata* Lour., and

¹² DC. Monog. Phan. 5 (1887) 626.

further that it is identical with *Strychnos paniculata* Champ., a species strongly characterized by its 4-merous flowers and the only representative of the genus known from the vicinity of Canton.

LIGUSTRUM Linnaeus

LIGUSTRUM GROFFIAE sp. nov.

Frutex circiter 2 m altus, subtus foliis et ramulis et inflorescentiis perspicue molliterque ferrugineo-villosis; foliis oblongo-ovatis, usque ad 7 cm longis, acuminatis, basi acutis, supra olivaceis, nitidis, leviter pubescentibus, subtus pallidioribus, nervis utrinque circiter 6, tenuibus; inflorescentiis axillaribus, paniculatis, 5 ad 6 cm longis, ramis inferioribus usque ad 3 cm longis; floribus numerosis, corolla 4 mm longa, glabra, tubo 2 mm longo.

A shrub about 2 m high, the leaves on the lower surface and especially the branchlets and inflorescences densely and softly ferruginous-villous with spreading hairs. Branches terete, those up to 5 mm in diameter more or less pubescent, the ultimate branchlets about 2 mm in diameter. Leaves chartaceous, oblong-ovate, 5 to 7 cm long, 2.5 to 3 cm wide, apex acuminate, base acute, the upper surface olivaceous, shining, somewhat pubescent, the midrib and nerves impressed, the lower surface paler, softly villous; lateral nerves about 6 on each side of the midrib, slender; petioles 4 to 5 mm long, ferruginous-villous. Panicles axillary, 5 to 6 cm long, many-flowered, the branches usually spreading, the lower ones up to 3 cm in length. Flowers white, fragrant, their pedicels 1 to 2 mm long, glabrous; bracteoles oblong-lanceolate, somewhat acuminate, about 1 mm long. Calyx somewhat cup-shaped, glabrous, 1 to 1.2 mm long, shallowly 4-toothed. Corolla 4 mm long, the tube 2 mm long, the lobes somewhat elliptic, obtuse. Stamens exserted.

Kwangtung Province, Shiuchow region, Tan Ha Shan, *To Kang P'eng* 2820, April 24, 1919, with the local name *mo ch'ung shü*. Possibly referable to this species is No. 2795 of the same collection from the same locality with the local name *sha yeuk shu*; this specimen, however, has much smaller leaves and much-fewer flowered inflorescences than the type.

This species is well characterized by its dense ferruginous-villous indumentum. It is dedicated to Miss Elizabeth H. Groff, through whose interest it was possible to have collections made in the Shiuchow region.

ASCLEPIADACEAE

CRYPTOLEPIS R. Brown

CRYPTOLEPIS SINENSIS (Lour.) comb. nov.

Pergularia sinensis Lour. Fl. Cochinch. (1790) 169.

Emericia sinensis Roem. & Schultes Syst. 4 (1819) 402.

Pergularia chinensis Spreng. Syst. 1 (1825) 836.

Vallaris sinensis G. Don Gen. Syst. 4 (1838) 79.

Cryptolepis elegans Wall. Cat. (1829) No. 1639, *nomen nudum*, G. Don Gen. Syst. 4 (1838) 82.

Aganosma edithiae Hance in Ann. Sci. Nat. Bot. V 5 (1866) 227.

Loureiro's material was from China, presumably from the vicinity of Canton, and has long been considered a species of doubtful status. All the synonyms cited above, except the last two, are based on Loureiro's binomial. The description applies closely to the species currently known as *Cryptolepis elegans* Wall., a species not uncommon in Kwangtung Province and represented by the following specimens: *Merrill 10806, Levine 356, 1850, 3201*. Loureiro described the seeds as naked, perhaps because he saw only those from which the coma had fallen, or perhaps because he really saw no seeds. I am convinced, however, that the species as here interpreted is the one Loureiro intended.

APOCYNACEAE

ALYXIA Banks

ALYXIA LEVINEI sp. nov.

Frutex scandens, glaber, ramis ramulisque tenuibus, olivaceis; foliis oppositis et ternatis, junioribus membranaceis, vetustioribus chartaceis ad subcoriaceis, ellipticis ad oblongis, usque ad 8 cm longis, utrinque subaequaliter angustatis, obtuse acuminatis; inflorescentiis axillaribus brevibus, breviter pedunculatis, ut videtur paucifloris; fructibus junioribus ellipsoideis, circiter 9 mm longis.

A scandent glabrous shrub, the branches and branchlets slender, the internodes up to 25 cm in length, branchlets 1.5 mm in diameter or less, somewhat angled or striate, the older branches terete, smooth, somewhat reddish brown. Leaves opposite and in whorls of three, elliptic to oblong, 5 to 8 cm long, 2 to 3 cm wide, the younger ones membranaceous, the older ones chartaceous to subcoriaceous, olivaceous, shining, subequally narrowed to the acute or somewhat acuminate base and to the bluntly acuminate apex, the nerves often obsolete, never prominent; petioles 4 to 7 mm long. Inflorescences axillary, solitary, short, apparently very few-flowered, their peduncles 5 mm long

or less, obscurely puberulent, the persistent sepals oblong, 1.5 mm long. Young fruit ellipsoid, about 9 mm long.

Kwangtung Province, Ting Woo Mountain, *Levine* 1975, May 26, 1918, scattered along the banks of streams, altitude about 300 meters.

This is the second species of the genus to be found in Kwangtung Province and differs remarkably from *Alyxia sinensis* Champ. in its much larger, differently shaped, acuminate leaves.

LABIATAE

PRUNELLA Linnaeus

PRUNELLA VULGARIS Linn. Sp. Pl. (1753) 600.

Kwangtung Province, Shiuchow region, *To Kang P'eng* 2854, April 25, 1919, with the local name *ha fú ts'o*.

A widely distributed species in the North and South Temperate Zones. Central and northern China and Formosa, but not previously recorded from Kwangtung Province.

BORAGINACEAE

TRIGONOTIS Steven

TRIGONOTIS PEDUNCULARIS (Trev.) Benth. ex Baker & Moore in Journ. Linn. Soc. Bot. 17 (1879) 384.

Myosotis peduncularis Trev. in Schrift. Naturf. Ges. Berl. 7 (1813) 147.

Kwangtung Province, Shiuchow region, *Levine* 3543, along roads, May, 1919.

The genus is new to Kwangtung Province, the species being common in central and northern China, the present locality being far south of its previously known range.

BIGNONIACEAE

DOLICHANDRONE Seemann

DOLICHANDRONE STIPULATA (Wall.) Benth. ex C. B. Clarke in Hook. f. Fl. Brit. Ind. 4 (1884) 379.

Spathodea stipulata Wall. Cat. (1832) No. 6518, *nomen nudum*, Pl. As. Rar. 3 (1832) 20, t. 238.

Kwangtung Province, Kochow region, Kwanshan temple, *To Kang P'eng* 2726, February 18, 1919, with the local name *mau mi muk*.

The Kwangtung specimen is with mature fruits and agrees closely with the description. The species was previously known only from Burma.

ACANTHACEAE

HEMIGRAPHIS Nees

HEMIGRAPHIS PROCUMBENS (Lour.) comb. nov.

Barleria procumbens Lour. Fl. Cochinch. (1790) 377.

Ruellia chinensis Nees in DC. Prodr. 11 (1847) 147.

Hemigraphis chinensis T. Anders. in Journ. Linn. Soc. Bot. 26 (1890) 238.

Strobilanthes scaber Hance in Journ. Bot. 16 (1878) 231, non Nees.

Loureiro's material was from the vicinity of Canton, where the species is still common, and on account of its yellow flowers is rather conspicuous in dry thickets. His description applies unmistakably to the species currently known as *Hemigraphis chinensis* T. Anders. It is represented by Merrill 10135 and Levine 181.

CAPRIFOLIACEAE

LONICERA Linnaeus

LONICERA DASYSTYLA Rehder in Rept. Mo. Bot. Gard. 14 (1903) 158, t. 4, f. 1-3.

Kwangtung Province, North River, Sai Sha, Sz Ooi, Groff 2402, April 24, 1918, with the local name *kam ngan fa*.

The specimen agrees closely with Rehder's figure and description, differing in but few minor details. The leaves average smaller than in the type and are glabrous, while the older branchlets are brownish rather than grayish. The pubescent style is characteristic. Previously reported only from Tonkin.

CUCURBITACEAE

GYMNOPETALUM Arnott

GYMNOPETALUM CHINENSE (Lour.) comb. nov.

Euonymus chinensis Lour. Fl. Cochinch. (1790) 156.

Bryonia cochinchinensis Lour. op. cit. 595.

Gymnopetalum cochinchinense Kurz in Journ. As. Soc. Beng. 40² (1871) 57; Cogn. in DC. Monog. Phan. 3 (1881) 391.

Both of Loureiro's descriptions apply unmistakably to the species currently known as *Gymnopetalum cochinchinense* Kurz, and it is indeed curious that he should have placed a cucurbitaceous plant in the celastraceous genus *Euonymus*. The type of *Euonymus chinensis* was from the vicinity of Canton, for which Loureiro records the Cantonese name *kam qua*. It is represented by the following recently collected material from the vicinity of Canton, with the recorded names *ka shui kwah* and *ye kwah*, Levine 1108, 1705, 2183.

RUBIACEAE

PLECTRONIA Linnaeus

PLECTRONIA LEVINEI sp. nov.

Frutex glaber, ramis spinis longis rigidis rectis armatis; foliis chartaceis, ellipticis ad oblongo-ellipticis, 1.5 ad 4 cm longis, obtusus ad acutis, basi angustatis, acutis, nervis utrinque 2 vel 3, obscuris, subtus in axillis subobsolete glandulosis, reticulis obsoletis; fructibus axillaribus, solitariis, tenuiter pedicellatis, ovoideis, in siccitate nigris vel pruinosis, rugosis, circiter 6 mm longis.

A glabrous shrub, the branches terete or the ultimate branchlets obscurely angled. Leaves usually in pairs on two very short opposite branchlets, appearing like four leaves at each node, chartaceous, elliptic to oblong-elliptic, or sometimes somewhat obovate, rather pale when dry, slightly shining, 1.5 to 4 cm long, 1 to 2 cm wide, obtuse to acute, base narrowed, acute; lateral nerves 2 or 3 on each side of the midrib, slender, indistinct, their axils obscurely glandular on the lower surface, the reticulations obsolete; petioles 1 to 2 mm long; stipules about 1 mm long. Fruits axillary, solitary, black or somewhat pruinose, rugose, ovoid, about 6 mm long, when young crowned by the cylindric, 5-toothed, about 4 mm long calyx-tube, this soon deciduous, the pedicels 10 to 12 mm long, slender. Seeds usually two. Spines straight or slightly curved, stiff, rather slender, sharp, 1 to 1.5 cm long.

Kwangtung Province, Heung Shan District, near Macao, *Levine* 3487, January 18, 1919.

This species belongs in the group with *Plectronia horrida* Benth. & Hook. f., *P. parvifolia* Benth. & Hook. f., and *P. parviflora* Bedd., but is readily distinguished by being entirely glabrous, and by its solitary, slenderly pedicelled fruits.

WENDLANDIA Bartling

WENDLANDIA CHINENSIS sp. nov.

Species *W. paniculatae* affinis, differt stipulis hirsutis, inflorescentiis densissime cinereo-villosis, floribus dense confertis, glomeratim dispositis, more *W. tinctoriae*.

A shrub or small tree up to 8 m high, the branches glabrous or nearly so, the branchlets more or less brownish- or cinereous-pubescent. Leaves chartaceous, oblong-elliptic to oblong-lanceolate, olivaceous and shining when dry, 10 to 12 cm long, 3 to 5 cm wide, subequally narrowed to the acute base and rather slenderly acuminate apex, the upper surface very slightly sub-

strigose-hirsute with widely scattered, short hairs, the lower surface sparingly pubescent with widely scattered, short, cinereous hairs on the midrib, nerves, reticulations, and epidermis; lateral nerves about 10 on each side of the midrib, distinct; petioles 5 to 10 mm long; stipules coriaceous, persistent, orbicular-reniform, somewhat hirsute, 7 to 9 mm wide, rounded, sometimes contracted below and distinctly stipitate. Panicles terminal, ample, up to 20 cm long and wide, densely cinereous-villous. Flowers very numerous, densely crowded in glomerules on the ultimate branches; bracts 5 to 7 mm long. Calyx densely cinereous-villous, about 2.5 mm long, the lobes oblong. Corolla-tube 4 to 5 mm long, slender, glabrous externally, sparingly pubescent within.

Kwangtung Province, Kochow region, Shek Kau Tong, *To Kang P'eng* 2691 (type), March 6, 1919. To this species I also refer the following specimens, both described as shrubs about 2 m high, both with somewhat smaller leaves than the type and with unopened flowers: *To Kang P'eng* 2754, 2702, the former from Sheung Ko Wan, with the local name *fo shiu nap*, the latter from Shek Ling, with the local name *chü lüt shü*.

This species is manifestly allied to *Wendlandia paniculata* (Roxb.) DC., the type of which was from the Molucca Islands. Comparison with Amboina material, *Robinson 1731*, representing the typical form of Roxburgh's species, shows that the Chinese form differs radically in its very densely cinereous-villous inflorescences and calyces, and in its very densely crowded flowers, in the disposition of the flowers strongly resembling *Wendlandia tinctoria* DC. The Chinese form described by Hance as *Wendlandia uvariifolia* has been reduced to *Wendlandia paniculata* DC. It is represented by *Levine 2338*, from the North River region, and is distinctly different from *Wendlandia paniculata* and I believe should be retained as of specific rank under Hance's name. It differs from both *Wendlandia paniculata* DC. and *W. chinensis* Merr. in its leaves being rather densely ferruginous-pubescent beneath, while the disposition of the flowers and the indumentum of the inflorescences and calyces are quite different from the latter species.

MUSSAENDA Linnaeus

MUSSAENDA PARVIFLORA Miq. Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 110.

Kwangtung Province, Ting Woo Mountain and at Wan Lo Mountain, Kochow region, *Levine 1979*, *To Kang P'eng* 2692, April, 1918, and March, 1919.

The specimens agree closely with Formosan material and also conform to Miquel's description. I believe this to be, at least in part, the Kwangtung form referred by Dunn and Tutcher to *Mussaenda frondosa* Linn., but I have seen no Chinese material at all approaching the typical Ceylon form of the Linnean species.

RANDIA Linnaeus

RANDIA ACUMINATISSIMA sp. nov.

Arbor parva, usque ad 8 mm alta, ramulis et inflorescentiis et subtus foliis ferrugineo-pubescentibus; foliis chartaceis, oblongo-ellipticis ad oblongo-lanceolatis, usque ad 20 cm longis, utrinque angustatis, basi acutis, apice tenuiter caudato-acuminatis, supra in siccitate olivaceis, glabris, nitidis; nervis utrinque 10 ad 12, subtus perspicuis; stipulis lineari-lanceolatis, acuminatis, usque ad 1 cm longis; cymis oppositifoliis, 3 ad 4 cm longis, breviter pedunculatis; floribus ad apices ramulorum confertis, calycis segmentis lanceolatis, acuminatis, circiter 1.5 mm longis; fructibus globosis, glabris, 6 ad 8 mm diametro, in siccitate nigris, nitidis; seminibus numerosis, compressis, circiter 1.5 mm diametro.

A small tree about 8 m high, the branchlets, inflorescences, and the lower surface of the leaves rather densely ferruginous-pubescent. Branches dark reddish brown, usually terete, glabrous. Leaves oblong-elliptic to oblong-lanceolate, chartaceous, 11 to 20 cm long, 4 to 7 cm wide, subequally narrowed below to the acute, equilateral base, and above to the slenderly caudate-acuminate apex, the acumen sometimes falcate, the upper surface glabrous, olivaceous and shining when dry, the lower surface rather softly pubescent; lateral nerves 10 to 12 on each side of the midrib, prominent on the lower surface, anastomosing, the reticulations rather lax, distinct; petioles usually pubescent, 5 to 8 mm long; stipules linear-lanceolate, acuminate, pubescent, up to 1 cm long. Cymes leaf-opposed, shortly peduncled, ferruginous-pubescent, 3 to 4 cm long (corollas unknown), the flowers sessile or shortly pedicelled and somewhat crowded at the tips of the branchlets. Calyx ferruginous-pubescent, about 4 mm long, the lobes lanceolate, acuminate, about 1.5 mm long. Fruits globose, glabrous, 6 to 8 mm in diameter, black and shining when dry. Seeds many, flattened, orbicular-ovate to ovate, about 1.5 mm long.

Kwangtung Province, White Cloud Mountain, *Levine* 3130 (type) 3267, August 29, November, 1918; Kong Moon, *Groff*

2471, March, 1918; Ukantin, *Hongkong Herbarium 10918*, distributed as *Randia densiflora* Benth.

This species is manifestly allied to *Randia racemosa* (Cav.) F.-Vill. (*R. densiflora* Benth.), from which it is easily distinguished by its indumentum.

COMPOSITAE

GYNURA Cassini

GYNURA SEGETUM (Lour.) comb. nov.

Cacalia segetum Lour. Fl. Cochinch. (1790) 486, in nota.

Cacalia pinnatifida Lour. l. c. non Linn.

Gynura pinnatifida DC. Prodr. 6 (1837) 301.

Kwangtung Province, Kochow region, Kwong T'am Mountain, To Kang P'eng 2671, March 22, 1919, in a garden, with the local name *tung fung ip*.

The type of Loureiro's species was from Canton, where he observed it growing in rice paddies. He records the Cantonese name as *cien fan sat*. His description applies closely to the specimen cited above. I consider his specific name *pinnatifida* to be invalidated by the earlier *Cacalia pinnatifida* Linn., an entirely different species, and hence adopt the casual name published by him: "unde vernaculum nomen Sinense *Cacalia Segetum*."

CROSSOSTEPHIUM Lessing

CROSSOSTEPHIUM CHINENSE (Linn.) comb. nov.

Artemisia chinensis Linn. Sp. Pl. (1753) 649, excl. syn. Gmelin; Lour. Fl. Cochinch. (1790) 492.

Artemisia judaica Lour. Fl. Cochinch. (1790) 489, non Linn.

Crossostephium artemisioides Less. ex Cham. & Schlecht. in Linnaea 6 (1831) 220.

The genus *Crossostephium* was based on cultivated specimens from Manila and from Canton, the species being widely cultivated in Japan, China, the Philippines, and Indo-China. I have seen no specimens from wild plants, although the species is manifestly a native of either China or Japan. It is currently known in Manila, where it is cultivated in pots, as *ajenjo*, a Spanish name properly belonging to *Artemisia*. The type of the Linnean species was a specimen collected in China by Lagerstroem, and the Linnean description based on this specimen clearly applies to the species currently known as *Crossostephium artemisioides* Less. The species is still common in cultivation in Canton. Both of Loureiro's descriptions cited above apply to this species.

EMILIA Cassini

EMILIA PRENANTHOIDEA DC. Prodr. 6 (1837) 303.

Kwangtung Province, Teng Woo Mountain, *Levine 2041*, 3221, May 26, 1918.

India to the Philippines; this species has previously been tentatively recorded from China by Forbes and Hemsley,¹³ who state that in preparing their list they had recorded the species from China on the basis of a specimen collected by Fortune, but that the specimen was not to be found at the time their manuscript was written. The species is readily distinguished from *Emilia sonchifolia* DC. not only by its narrow leaves, but also by its involucre bracts being much shorter than the flowers and by its glabrous achenes.

SENECIO Tournefort

SENECIO OLDHAMIANUS Maxim in Bull. Acad. Pétersb. 16 (1871) 219.

Kwangtung Province, Shiuchow region, *To Kang P'eng 2852*, April 25, 1919, in grassy places.

Not previously recorded from Kwangtung Province; common in central China.

¹³ Journ. Linn. Soc. Bot. 23 (1888) 449.

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ADDITIONS TO THE FLORA OF GUAM

By E. D. MERRILL
Botanist, Bureau of Science

Separate from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government
Manila, P. I.
VOLUME XV, No. 6, DECEMBER, 1919

MANILA
BUREAU OF PRINTING
1919

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ADDITIONS TO THE FLORA OF GUAM

By E. D. MERRILL

Botanist, Bureau of Science

In 1914 I published an enumeration of the plants of Guam¹ in which about five hundred fifty species are included. Since that paper was published some additional collections have been made in Guam by Mr. Peter Nelson, of the Guam Experiment Station, and in the early part of 1918 a grant of 50 dollars was made to him from the income of the Robinson Memorial Fund of the New York Botanical Garden for the purpose of assisting him in the prosecution of field work in Guam. The arrangements under which this grant was made were that the material collected should be submitted to me for identification; one set to be retained for the herbarium of the Bureau of Science; one set to be returned to the Guam Experiment Station; and the remaining duplicate material to be transmitted to the New York Botanical Garden for distribution by that institution.

Shortly after the field work was commenced by Mr. Nelson, Guam was visited by an unusually severe typhoon, July 6, 1918, resulting in considerable damage to the equipment of the Agricultural Experiment Station there and in the destruction of the field outfit that had been provided for Mr. Nelson's botanical work, and a considerable amount of prepared botanical material. The field work was consequently delayed as several months elapsed before it was possible to replace the destroyed equipment. The collections already made have yielded several species and representatives of a few genera, new to Guam, as well as at least two undescribed species. These data have been incorporated in the present paper, together with a few changes in nomenclature.

SCHIZAEACEAE

SCHIZAEA Smith

SCHIZAEA DICHOTOMA (Linn.) Sm. in Mém. Acad. Turin 5 (1793) 422, t. 9, f. 9.

GUAM, *Nelson 221*, on tree trunks at Cotot, associated with *Psilotum nudum* Griseb. A widely distributed species in the Old World Tropics, the genus new to Guam.

¹ Philip. Journ. Sci. 9 (1914) Bot. 17-155.

CYATHEACEAE

CYATHEA Smith

CYATHEA HAENKEI (Presl) comb. nov.

Alsophila haenkei Presl Rel. Haenk. 1 (1825) 68.

Cyathea marianna Gaudich. Bot. Freyc. Voy. (1826) 265.

GUAM, *Nelson* 538, May, 1919, in ravines near the headwaters of a tributary to the Pago River.

The type of Presl's species was from the Marianne Islands, in all probability from Guam, while that of Gaudichaud was from Guam. Both have been reduced as synonyms of *Alsophila extensa* (Forst.) R. Br., which does not appear to me to be correct. Regarding the occurrence of this species in Guam I wrote to Mr. Nelson in September, 1914, supplying him with photographs of Philippine tree ferns, and suggested that he search for the Guam species, to which he replied that in his fourteen years residence in Guam, in which time he had visited most parts of the Island, he had never seen any tree ferns. A few specimens were located by him in May, 1919, apparently very old plants. The larger plants were about 3 m high, the trunk 15 to 20 cm in diameter below, tapering to 10 cm near the top. The species is apparently very rare and local in Guam and is probably approaching extinction.

GRAMINEAE

THUAREA Persoon

THUAREA INVOLUTA (Forst. f.) R. & S. Syst. 2 (1817) 782.

Ischaemum involutum Forst. f. Prodr. (1786) 73.

Thuarea sarmentosa Pers. Syn. 1 (1805) 110.

GUAM, Anigua, *Nelson* 342, December, 1919, along the sea-shore, local name *las-aga*. A common Malayan-Polynesian strand plant, but not previously recorded from Guam.

GARNOTIA Brongniart

GARNOTIA STRICTA Brongn. in Bot. Duperry's Voy. (1829) 132, t. 21.

GUAM, hills back of Piti, *Nelson* 359, 403, December, 1918, and February, 1919. The genus is new to Guam, the species having been originally described from Tahiti, but now, as a somewhat variable one, known to extend from India, through Malaya to Hawaii.

DIGITARIA Heister

DIGITARIA ROBINSONII sp. nov.

Species *D. pacificae* Stapf et *D. stenotaphrodi* Stapf affinis differt racemis numerosis, plerumque circiter 15, confertis, racemose dispositis.

A glabrous, erect, apparently tufted perennial grass up to 60 cm high. Leaves rather rigid, linear-lanceolate, 15 to 25 cm long, 5 to 8 mm wide, smooth, slenderly acuminate. Inflorescence exserted, composed of about 15, ascending, somewhat crowded, racemously arranged spikes 6 to 12 cm in length, the axis of the inflorescence up to 4 cm long. Axis of the spikes about 1 mm wide, the spikelets numerous, oblong to oblong-lanceolate, about 2.5 mm long, alternate, in two rows. First glume obsolete or reduced to an oblong-lanceolate, somewhat hyaline, pilose scale less than 1 mm in length. Second glume somewhat pubescent, 5- or 7-nerved, usually acute, the margins somewhat inflexed over the flowering glume. Flowering glume lanceolate, glabrous, as long as the second empty glume.

GUAM, Cabras Island, *Nelson 520* (type) April 24, 1919, near the seashore. The same species is represented by *J. Guerrero 471*, collected on rocks at Anaw Point, July 26, 1916.

This species manifestly belongs in the small group of Polynesian ones discussed by Stapf following his description of *Digitaria pacifica* which includes *D. pacifica* Stapf, from Christmas Island; *D. stenotaphrodes* Stapf, which extends from the Caroline Islands to the Paumotu Archipelago; and *D. platycarpa* Stapf, from Bonin Islands. These species, as Stapf has indicated, form a well-marked natural group which seems to be peculiar to the Pacific islands. To this group may also be added *Digitaria mariannensis* Merr., the type of which was also from Cabras Island, Guam, but which differs radically from the other species mentioned above in its entirely different habit; in its small size; in its paired spikes; and in being ciliate-pilose. The group is well characterized by its very greatly reduced or obsolete first glume, the spikelets generally consisting of a single empty glume with the flowering glume and its palea. *Digitaria robinsonii* is well characterized in the group by its numerous spikes.

CYPERACEAE

SCLERIA Linnaeus

SCLERIA LITHOSPERMA (Linn.) Sw. Prodr. (1788) 18.

GUAM, Nasso River, *Nelson 308*, March 21, 1918, common along the banks of the river. A common pantropic species not previously recorded from Guam.

COMMELINACEAE

ANEILEMA R. Brown

ANEILEMA VITIENSE Seem. Fl. Vit. (1865) (73) 312, t. 96, var. PETIOLATA C. B. Clarke in DC. Monog. Phan. 3 (1881) 220.

GUAM, back of Sinajana, *Nelson 413*, January 1, 1919, in damp places at the base of limestone cliffs. The Philippines, Moluccas, and Polynesia.

LEGUMINOSAE

SERIANTHES Benthham

SERIANTHES NELSONII sp. nov.

Arbor alta, partibus junioribus et inflorescentiis et fructibus ferrugineo-pubescent; foliis circiter 20 cm longis, pinnis 12- ad 20-jugis, foliolis circiter 30-jugis, oblongis, obtusis, circiter 5 mm longis; floribus paucis, cylindraceis, breviter pedicellatis, corollae tubo circiter 12 mm longo, lobis lanceolatis, 5 ad 6 mm longis; leguminis circiter 12 cm longis, 2 ad 2.5 cm latis.

A large tree reaching a height of over 20 meters and a trunk diameter of nearly 2 meters, the younger parts, inflorescences, and fruits ferruginous-pubescent. Branches terete, grayish or brownish. Leaves up to 23 cm long, the petioles and rachis ferruginous-pubescent, the latter usually with a prominent gland between the bases of each pair of pinnae; pinnae 12 to 20 pairs, 5 to 7 cm long; leaflets 25 to 30 pairs, oblong, obtuse, about 5 mm long and 2 mm wide, the upper surface glabrous, the lower paler and sparingly pubescent. Flowers few, pink, their pedicels pubescent, stout, 2 mm long or less. Calyx cylindric, pubescent, about 7 mm long, the lobes ovate, acuminate, about 1.5 mm long. Corolla pubescent, cylindric, the tube about 12 mm long, the lobes lanceolate, acuminate, recurved, 5 to 6 mm long. Mature pods about 12 cm long, 2 to 2.5 cm wide, densely ferruginous-pubescent, the valves faintly constricted between the seeds, almost woody; seeds hard, shining, smooth, brown, flattened, elliptic, about 1 cm long, 8 mm wide.

GUAM, Upe District and hills back of Abu, *Nelson s. n.*, 23, 34, 240 (type), in flower in July and in fruit in December, local name *hayun lago*.

This very characteristic species is readily distinguishable in the genus by its small leaflets and its relatively narrow pods. It was originally collected in the Upe District, and regarding its occurrence there Mr. Nelson writes as follows:

The *hayun lago* is a very large and beautiful tree found at Upe at the northern end of the Island, and from what I could ascertain is

very scarce. The native name *hayun lago* means foreign wood, and would indicate that the tree is an introduced one in Guam. Few of the natives have ever seen the species. I saw two trees standing close together with trunks perhaps 6 feet in diameter, and a height of from 60 to 70 feet.

EUPHORBIACEAE

EUPHORBIA Linnaeus

EUPHORBIA MACGILLIVRAYI Boiss. in DC. Prodr. 15² (1862) 26.

GUAM, *Nelson 406*, December, 1918, on rocks along the Atauro road.

The species has previously been reported only from Australia. It is also represented by *Volkens 102* (in part) from Yap, Caroline Islands, this number having been identified by Volkens as *Euphorbia serrulata* Reinw. My sheet of this number presents two distinct species; the softly pubescent one I here refer to Boissier's species, while the glabrous form may be a robust form of *Euphorbia serrulata* Reinw.

STERCULIACEAE

MELOCHIA Linnaeus

MELOCHIA VILLOSISSIMA (Presl) comb. nov.

Riedleia villosissima Presl Rel. Haenk. 2 (1835) 146.

Melochia hirsutissima Merr. in Philip. Journ. Sci. 9 (1914) Bot. 113.

GUAM, *McGregor 456* (type of *Melochia hirsutissima* Merr.), *Nelson 353*, in ravines back of Piti, October and December.

The type of *Riedleia villosissima* Presl was from Guam, but the species was overlooked by me in preparing the manuscript of my first paper on the Guam flora. Presl's description applies unmistakably to the species described by me as *Melochia hirsutissima*, the description apparently having been based on the uppermost and younger leaves.

FLACOURTIACEAE

XYLOSMA Forster f.

XYLOSMA NELSONII nom. nov.

Flacourtia integrifolia Merr. in Philip. Journ. Sci. 9 (1914) Bot. 115,
non *Xylosma integrifolium* Clos.

GUAM, *Nelson 274, 322*, March and December, 1918; *Guam Experiment Station 466*, July, 1912.

Additional material with young fruits shows this species to belong in the genus *Xylosma* rather than in *Flacourtia* where it was originally placed.

RUBIACEAE

HEDYOTIS Linnaeus

HEDYOTIS FRUTICULOSA (Volk.) comb. nov.

Oldenlandia fruticulosa Volk. in Engl. Bot. Jahrb. 31 (1901) 475.

GUAM, *Nelson* 268, in small damp ravines at Santa Rosa, March, 1918. The third species of the genus from Guam, the specimen agreeing closely with *Volkens* 72 and 171 from Yap, cotype material of the species.

TIMONIUS (Rumph.) de Candolle

TIMONIUS NITIDUS (Bartl.) F.-Vill. Novis. App. Fl. Filip. (1880) 109.

Petesia nitida Bartl. in DC. Prodr. 4 (1830) 395.

The original description is short and was based on material collected by Haenke "in insulis Philippicis et Marianis." A part of the original collection is preserved in the Bernhardt herbarium at the Missouri Botanical Garden, an examination of which shows that the species is different from any of the rather numerous forms definitely known from the Philippines, but that this cotype material exactly matches several recent collections from Guam. I accordingly assume that the Philippine locality cited in the original description is erroneous and that the actual specimens came from Guam. It is represented by the following specimens: *Guerrero* 762, *Nelson* 16, 138, 361, collected at Behia, Masso, and near Piti, where it grows in thickets in ravines and along streams. The local names recorded are *sumac lada* and *maholoc layu*.

COMPOSITAE

BLUMEA de Candolle

BLUMEA LACINIATA (Roxb.) DC. Prodr. 5 (1836) 436.

GUAM, *Nelson* 338, in damp places near Abu, December, 1918. The second species of the genus to be found in Guam, doubtless introduced. Tropical Asia and Malaya.

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ON THE IDENTITY OF AEGIPHILA VIBURNIFOLIA
JUSSIEU

By E. D. MERRILL

Director and Botanist, Bureau of Science

Separate from

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Published by the Bureau of Science of the Philippine Government
Manila, P. I.

VOLUME 16, No. 5, MAY, 1920

MANILA
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ON THE IDENTITY OF AEGIPHILA VIBURNIFOLIA JUSSIEU

By E. D. MERRILL

Director and Botanist, Bureau of Science

ONE PLATE

In 1806 Jussieu¹ described as new a supposedly Philippine species which he called *Aegiphila viburnifolia*, the genus appertaining to the Verbenaceae, and all its species being confined to tropical America. No attempt seems to have been made to determine the identity of the species until 1911, when at my request the late Dr. C. B. Robinson, in passing through Paris, looked up Jussieu's type and supplied me with a few notes regarding it and also a photograph of it. Both he and Dr. Gagnepain failed to recognize the genus to which it really belonged, although both agreed that it appertained to the Celastraceae. From a not very critical examination of the photograph in 1914, I determined Jussieu's species as being the same as the Philippine one described in 1908 as *Euonymus philippinensis* Merr. & Rolfe, and erroneously adopted the binomial *Euonymus viburnifolius* Merr. for the Philippine form. A reëxamination of the photograph, the description, and Dr. Robinson's notes shows clearly that this disposition of Jussieu's species is erroneous, but that it is clearly the Malayan form described by King in 1896 as *Elaeodendron subrotundum*. An adjustment of the synonymy follows:

ELAEODENDRON VIBURNIFOLIUM (Juss.) comb. nov. Plate 1.

Aegiphila viburnifolia Juss. in Ann. Mus. Paris 7 (1806) 76; Walp. Repert. 4 (1844-48) 124; Schauer in DC. Prodr. 11 (1847) 655.

Elaeodendron subrotundum King in Journ. As. Soc. Beng. 65² (1896) 356; Merr. in Journ. Str. Branch Roy. As. Soc. 76 (1917) 93.

I have examined the following material representing the species: "Philippines," *Sonnerat*, photograph of the type ex Herb. Jussieu. Malay Peninsula, Selangor, *Burkill* 1248; Johore, *Ridley* 12481. Singapore, *Baker* 5850. Borneo, Sarawak, *Foxworthy* 119; British North Borneo, *Foxworthy* 623.

¹ Ann. Mus. Paris 7 (1806) 76.

The species is not represented in our Philippine collections, and the type may not have come from the Archipelago. It is indicated on the original label as "Philippines herb. D. Commer-son sans nom," and on a second label "Philippines. Plantes récoltées par Sonnerat et données a Commerson." Sonnerat on his voyage to India and China² stopped at Malacca, a locality within the known range of *Elaeodendron viburnifolium*, and he may have collected the specimen there. Or again he may well have collected it in the Philippines at Jolo (Yolo)³ on his first voyage, where he stopped for a short time after leaving Zamboanga (Sambouangue). The Sulu Archipelago, including Jolo, has been very slightly explored from a botanical standpoint, and a species growing in or near the mangrove swamps on the east coast of Borneo is certainly to be expected in similar habitats in Sulu Archipelago. Whether or not the type was really from the Philippines, *Aegiphila viburnifolia* Juss. is clearly identical with *Elaeodendron subrotundum* King, and Jussieu's specific name should be adopted for the species.

For the common Philippine form to which I erroneously applied the binomial *Euonymus viburnifolius*⁴ another name is necessary, and I can now see no reason why *Euonymus cochinchinensis* Pierre should not be adopted, as I can detect no constant differential differences between it and *E. philippinensis* Merr. & Rolfe. The synonymy will then be as follows:

EUONYMUS COCHINCHINENSIS Pierre Fl. Forest. Cochinch. 4 (1894) t. 309; Pitard in Lecomte Fl. Gén. Indo-Chine 1 (1912) 873, fig. 108.

Euonymus timorensis Turcz. in Bull. Soc. Nat. Mosc. 31¹ (1858) 447; F.-Vill. Novis. App. (1880) 46; Vidal Phan. Cuming. Philip. (1885) 103, non Zipp.

Euonymus philippinensis Merr. & Rolfe in Philip. Journ. Sci. 3 (1908) Bot. 238.

Indochina, *Thorel 2080!*, *Harmand, Godefroy!*, *Pierre!* (all det. Pitard). Siam, *Annandale 1585!*, *1829!*. Malay Peninsula, Pahang, *Burn-Murdoch!* (all det. as *E. javanicus* Blume). I refer the following Philippine material here: LUZON, Cagayan Province, *Adduru 68, 179*; Ilocos Norte Province, *Bur. Sci. 33209 Ramos*; Benguet Subprovince, *Elmer 6462, Bur. Sci. 3551 Mearns, Williams 1024*; Pangasinan Province, *For. Bur. 21677 Domingo, For. Bur. 19452 Agama*; Nueva Ecija Province, *Bur.*

² Sonnerat, P., Voyage aux Indes Orientales et a la Chine 2 (1782) 99-103.

³ Sonnerat, P., Voyage a la Nouvelle Guinée (1776) 136.

⁴ Philip. Journ. Sci. 9 (1914) Bot. 312.

Sci. 26322 Ramos & Edaño: Rizal Province, *Merrill Phil. Pl.* 1078, *Bur. Sci.* 4612, 1037, 1443 Ramos: Batangas Province, *Merrill Phil. Pl.* 1897, *For. Bur.* 21562 Tamesis: Tayabas Province, *Bur. Sci.* 26735 Ramos, *For. Bur.* 10267 Curran, *Merrill* 3356. MINDORO, *Cuming* 1552. PALAWAN, *Bur. Sci.* 15541 *Fenix*. BANCALAN, *Weber*. BALABAC, *Weber*. SAMAR, *For. Bur.* 24655 *Lasquety*. MASBATE, *Merrill* 3064. PANAY, *For. Bur.* 15125 *Cenabre*. MINDANAO, Bukidnon Subprovince, *Bur. Sci.* 24946 *Fenix*. In primary forests at low altitudes, often common.

ILLUSTRATION

PLATE 1. *Elaeodendron viburnifolium* (Juss.) Merr. Photograph of the type specimen in the herbarium of the Paris Museum of Natural History.



PLATE 1. ELAEODENDRON VIBURNIFOLIUM (JUSS.) MERR.



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Published by the Bureau of Science of the Philippine Government
Manila, P. I.

VOLUME 16, No. 6, JUNE, 1920

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JUNE, 1920

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NOTES ON PHILIPPINE EUPHORBIACEAE, III

By ELMER D. MERRILL

Director and Botanist, Bureau of Science, Manila

In this series,¹ including the present paper, about one hundred previously undescribed species of Euphorbiaceae have been characterized, while a number of others have been considered either because of their being new to the Philippine flora or because of questions of nomenclature involved. The present paper contains the descriptions of thirty-eight presumably new species and the records of several others not previously recorded from the Philippines. The genera *Wetria*, *Megistostigma*, and *Plukenetia* are new to the Archipelago, *Megistostigma* being of special interest, the genus having been previously a monotypic one known only from the Malay Archipelago. It is of considerable interest to note the continued increase in the number of Philippine species in the small or comparatively small genera *Blumeodendron*, *Trigonostemon*, *Excoecaria*, *Omphalea*, and *Codiaeum*.

PHYLLANTHUS Linnaeus

PHYLLANTHUS PANAYENSIS sp. nov.

Frutex dioicus, ramulis exceptis glaber; foliis numerosis, plerumque lanceolatis, chartaceis, 1.2 ad 3 cm longis, nitidis, basi leviter inaequilateralibus, late rotundatis et plus minusve cordatis, sursum angustatis, acutis vel acuminatis, nervis utrinque circiter 10, tenuibus; floribus circiter 2.8 mm diametro, perianthii segmentis 6, ellipticis ad oblongo-ellipticis, 1.2 mm longis,

¹ Notes on Philippine Euphorbiaceae, Philip. Journ. Sci. 7 (1912) Bot. 379-410; 9 (1914) Bot. 461-493.

obtusis; filamentis 3, liberis, antheris verticaliter dehiscentibus, floribus ♀ plerumque solitariis, pedicellatis, pedicello usque ad 12 mm longo.

A dioecious shrub, glabrous except the branchlets, the branches slender, terete, grayish-brown. Leaves very numerous, mostly lanceolate, chartaceous, 1.2 to 3 cm long, 4 to 10 mm wide, somewhat olivaceous, shining, the base usually more or less inequilateral, broadly rounded and often slightly cordate, narrowed upward to the acute or somewhat acuminate apex; lateral nerves slender, about 10 on each side of the midrib, spreading, not prominent, anastomosing; petioles 1 mm long or less; stipules slenderly acuminate, from a broadened base, about 2 mm long. Staminate flowers fascicled, axillary, but one or few flowers appearing at the same time, each fascicle with numerous, crowded, small bracteoles, the pedicels slender, 6 to 8 mm long, the perianth 2.8 mm in diameter, the segments 6, equal, elliptic to oblong-elliptic, obtuse, 1.2 mm long. Disk glands 6, prominent. Filaments 3, about 1 mm long, free, the anthers dehiscing vertically, 0.2 mm long. Pistillate flowers axillary, mostly solitary, their pedicels in fruit up to 12 mm long, the perianth similar to that of the staminate flowers. Styles 6, free, 1 mm long. Fruit globose, about 4 mm in diameter, composed of three dehiscent cocci.

PANAY, Capiz Province, Mount Bulilao, *Bur. Sci.* 35655, 35679 Martelino & Edaño, June 20, 1919, in forests near the summit, altitude about 650 meters.

The alliance of this species is manifestly with *Phyllanthus lancifolius*, Merr., from which it is especially distinguished by its smaller leaves, its pubescent branchlets, and much shorter pedicels of the pistillate flowers.

PHYLLANTHUS APICULATUS sp. nov.

Frutex glaber, ramis ultimis circiter 7 mm diametro, cicatricibus magnis instructis, ramulis confertis, tenuibus, usque ad 40 cm longis; foliis numerosis, chartaceis, nitidis, oblongo-ellipticis, 3 ad 4.5 cm longis, basi acutis, apice acuminatis et plerumque apiculatis; floribus fasciculatis, breviter pedicellatis, circiter 4 mm diametro, segmentis 6, elliptico-oblongis, 1.8 ad 2 mm longis, staminibus 3, filamentis liberis, antheris verticaliter dehiscentibus.

A glabrous shrub, the ultimate branches terete, about 7 mm in diameter, marked with large scars, these subtended by several small, broadly ovate, stipule-like bracts, the tip and uppermost axils supplied with small, dense rosettes of oblong-lanceolate,

acuminate scales; branchlets crowded toward the tips of primary ones, slender, up to 40 cm in length, somewhat simulating pinnate leaves, 2 mm in diameter or less, terete or somewhat angular near the nodes, the apical portion distinctly angular. Leaves numerous, chartaceous, the upper surface dark brown and shining when dry, the lower paler, oblong-elliptic, 3 to 4.5 cm long, 1.3 to 2 cm wide, subequilateral, narrowed to the acute base and to the distinctly acuminate and often apiculate apex; lateral nerves slender, about 9 on each side of the midrib, anastomosing, the reticulations rather close, distinct; petioles 2 mm long or less; stipules lanceolate to ovate-lanceolate, acuminate, about 3 mm long. Staminate flowers axillary, fascicled, their pedicels about 5 mm long, the perianth about 4 mm in diameter, the lobes 6, equal, elliptic-oblong, rounded or obtuse, 1.8 to 2 mm long. Disk glands 6, globose, conspicuous. Stamens 3, their filaments erect, free, 1.5 mm long, the anthers longitudinally dehiscing, 0.5 mm long.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33813 Ramos & Edaña, November 29, 1919, in damp forests at low altitudes, indicated by the collectors as 2 meters high.

This species may be as closely allied to *Phyllanthus securinegoides* Merr. as to any other species, although it is radically different from the latter in its somewhat thickened ultimate branches bearing the elongated, slender branchlets more or less crowded at the apices.

PHYLLANTHUS INDICUS (Dalz.) Muell.-Arg. in *Linnaea* 32 (1863) 52, DC. Prodr. 16² (1866) 417.

Prosoros indicus Dalz. in Hook. Kew Journ. Bot. 4 (1852) 346.

LUZON, Camarines Province, Mapid, *For. Bur.* 22655 Alvarez, November, 1911. PALAWAN, Aborlan, *Bur. Sci.* 15589 Fénix, July, 1912. MINDANAO, Agusan Province, Tipgon River, *Weber* 1195, July, 1911, with the Visayan name *bungas*. In forests and thickets at low altitudes.

The numbers cited are all in fruit, but they agree perfectly with a full series of Javan specimens representing this species. It has not previously been reported from the Philippines. India and Ceylon to Java.

GLOCHIDION Forster

GLOCHIDION PHYLLANTHOIDES sp. nov. § *Hemiglochidion*.

Arbor parva, glabra, vel partibus junioribus leviter pubescens; foliis oblongo-ellipticis, chartaceis, 2 ad 3 cm longis, apice rotundatis, basi acutis vel leviter rotundatis, nervis utrinque circiter

5, tenuibus; floribus ♂ perianthii segmentis oblongo-ellipticis, obtusis, usque ad 3 mm longis, antheris 3; floribus ♀ breviter pedicellatis, ♂ simillimis, ovario glabro, stylis continuis, cylindraceis, haud constrictis.

A small glabrous tree or the younger parts very slightly pubescent, the branches dark-colored when dry, lenticellate, the branchlets slender, reddish-brown. Leaves oblong-elliptic, chartaceous, 2 to 3 cm long, 1 to 1.5 cm wide, the apex rounded, base broadly acute or somewhat rounded, nearly equilateral; lateral nerves about 5 on each side of the midrib, slender, the reticulations indistinct; petioles 2 to 3 mm long; stipules lanceolate, acuminate, 1.5 to 2 mm long. Flowers axillary, fascicled, the staminate ones with pedicels up to 9 mm in length, the perianth segments oblong-elliptic, obtuse, up to 3 mm long, anthers 3, about 1 mm long, united. Pistillate flowers with pedicels about 2 mm long, the perianth segments similar to those of the staminate flowers. Ovary and style about 2 mm long, cylindric, glabrous, the latter about as thick as the ovary and not at all constricted.

LUZON, Batangas Province, Mount Batulao, *Bur. Sci.* 22358 Ramos, July 30, 1914, on dry slopes, altitude about 190 meters.

This species is apparently most closely allied to *Glochidion breynioides* C. B. Rob., from which it is easily distinguishable by its rounded or obtuse leaves.

GLOCHIDION FALCATILIMBUM sp. nov. § *Hemiglochidion*.

Frutex glaber, circiter 2 m altus; foliis subcoriaceis, falcatis, valde inaequilateralibus, oblongis, usque ad 5 cm longis, apice obtusis vel rotundatis, basi acutis vel acuminatis, nervis utrinque circiter 8, tenuibus; floribus ♀, segmentis 6, oblongo-obovatis ad oblongo-spatulatis, 2 ad 2.5 mm longis; ovario glabro, columno stylari quam ovario duplo longioribus, continuo; staminibus, 3.

A glabrous shrub about 2 m high, the branches brownish, the branchlets slender, reddish-brown. Leaves subcoriaceous, oblong, conspicuously falcate and very inequilateral, 4 to 5 cm long, 1 to 2 cm wide, rather pale and slightly shining when dry, the lower surface often slightly glaucous, the apex obtuse to rounded, the base acute to acuminate, one side very much narrower than the other; primary lateral nerves about 8 on each side of the midrib, slender, not prominent; petioles about 3 mm long; stipules lanceolate to ovate-lanceolate, acuminate, falcate, 2 to 2.5 mm long. Flowers axillary, one or two in each axil opening at the

same time, their pedicels 2 to 3 mm long. Pistillate perianth segments 6, oblong-obovate to oblong-spatulate, 2 to 2.5 mm long, obtuse. Ovary about 1 mm high, glabrous, the style cylindric, not constricted below, continuous with and as wide as the ovary, about 1.8 mm long and 1.2 mm in diameter. Staminate flowers few, their anthers 3, about 1 mm long. Fruits depressed-globose, about 8 mm in diameter, obscurely sulcate, usually 3-celled, 6-seeded.

LUZON, Pangasinan Province, Mount San Isidro, Labrador, *Bur. Sci.* 30059 *Fénix*, November 13, 1917, on grassy and rocky slopes, altitude about 60 meters, with the Pampangan name *malapalin*.

A species well characterized by its small, strongly inequilateral, obtuse, falcate, pale leaves. In appearance it more nearly resembles *Glochidion triandrum* (Blanco) C. B. Rob. than any other Philippine species, but differs totally from that form in its style characters.

GLOCHIDION BRACHYSTYLUM sp. nov. § *Hemiglochidion*.

Frutex vel arbor parva, monoica, ramis hirsutis, valde elongatis; foliis chartaceis, oblongis, tenuiter acuminatis, glabris, usque ad 25 cm longis, nervis utrinque circiter 10, supra impressis, subtus valde prominulis, floribus ♂ longe et tenuiter pedicellatis, sepalis oblongis, 3 mm longis, ♀ breviter pedicellatis, perianthii segmentis recurvatis, utrinque hirsutis; ovario pubescente, columna stylari crassa cylindrica, pubescens, circiter 1 mm diametro, truncata, quam ovario paullo longioribus.

A shrub or small tree, the ultimate branches greatly elongated, spreading-hirsute with short, stiff, dark-brown hairs. Leaves chartaceous, oblong, slenderly acuminate, base rounded to subacute, 20 to 25 cm long, 7 to 8 cm wide, brownish-olivaceous and shining when dry; lateral nerves about 10 on each side of the midrib, impressed on the upper surface, very prominent on the lower surface, curved, anastomosing, the reticulations lax, prominent; petioles about 5 mm long. Staminate flowers up to 25 in a fascicle, their pedicels slender, sparingly spreading-hirsute, 10 to 12 mm long. Perianth segments oblong, 3 mm long, glabrous or the outer ones with a very few, short, spreading hairs. Anthers 3, united, about 1 mm long. Pistillate flowers axillary, fascicled, on the more distal parts of the same branches bearing the staminate ones, 5 to 20 in a fascicle, their pedicels hirsute, about 2 mm long. Perianth segments oblong, recurved, 3 mm long, spreading-hirsute on both surfaces. Ovary pubescent, about 10-celled.

shorter than wide; styler column cylindric, entire, not contracted at the base, nearly as wide as the ovary, pubescent, about 1 mm long and wide, truncate, hollow.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31374 Ramos & Edaño, May 22, 1918, in forests along small streams.

In leaf venation this species resembles *Glochidion dolichostylum* Merr. but differs radically from that species in its longer, slenderly acuminate, more numerously nerved, glabrous leaves, and is entirely different in its floral characters.

GLOCHIDION HUMILE sp. nov. § *Hemiglochidion*.

Frutex parvus, ramis usque ad 30 cm longis e radicibus in-crassatis; foliis ellipticis, subcoriaceis, 4 ad 10 cm longis, utrinque plerumque rotundatis, nervis utrinque circiter 6, cum reticulis perspicuis, subtus ad costa nervisque pubescens; floribus fasciculatis, ♂ tenuiter pedicellatis, perianthii segmentis ellipticis, 3 mm longis, exterioribus pubescens; staminibus 3; floribus ♀ breviter pedicellatis, pubescens, ovario pubescente, columna stylari pubescente, quam ovario duplo longiore, cylindrica, sursum leviter angustata, basi haud constricta.

A shrub or undershrub consisting of short, simple branches produced from the much-thickened roots, these branches varying in length from 7 to 30 cm, slender, terete, up to 3 mm in diameter, the older ones glabrous, the younger parts pubescent. Leaves elliptic to somewhat oblong-elliptic, subcoriaceous, 4 to 10 cm long, 2.5 to 5 cm wide, base rounded, apex usually rounded, sometimes obtuse, the upper surface glabrous or nearly so, usually pale when dry, the lower surface distinctly pubescent on the midrib, nerves, and reticulations; lateral nerves about 6 on each side of the midrib, distinct, the reticulations lax, evident. Male and female flowers fascicled, mostly in separate axils, male flowers with pedicels up to 11 mm long, slightly pubescent, the outer three perianth-segments elliptic, obtuse, about 3 mm long, somewhat pubescent, the inner three somewhat smaller, glabrous or slightly pubescent on the medium portion. Stamens 3, the staminal mass cylindric, about 1.5 mm long. Female flowers with pedicels about 3 mm long, pubescent. Sepals oblong to narrowly oblong, obtuse, pubescent, 2 mm long. Ovary and style pubescent, the styles forming an almost entire or slightly lobed column which is nearly as broad as the ovary, not at all constricted at the base, slightly narrowed upward, and about twice as long as the ovary. Capsules usually about 8-celled, depressed-globose, prominently sulcate, about 1.3 cm in diameter, brown when dry, sparingly pubescent with short hairs.

MINDANAO, Bukidnon Subprovince, near Tanculan, *Bur. Sci.* 26112 *Fénix*, July 17, 1916, in open grasslands.

This species is apparently dwarfed due to its habitat. Like several forms in other genera which occur in open cogon areas, the root becomes more or less thickened and produces few to many shoots which endure but one or two years, as all but the subterranean parts of the individual plants are destroyed by the annual grass fires. In habit it is quite different from any other species known to me.

GLOCHIDION CAULIFLORUM sp. nov. § *Euglochidion*.

Arbor parva; foliis subcoriaceis, oblongis ad oblongo-ovatis, usque ad 25 cm longis, plus minusve pubescens vel vetustioribus subglabris, breviter acuminatis, basi latissime et abrupte subtruncato-rotundatis admodum leviter cordatis, nervis utrinque 9 ad 11, perspicuis; inflorescentiis caulinis, racemosis, racemis solitariis vel fasciculatis, 3 ad 12 cm longis, floribus fasciculatis, floribus ♂ campanulatis, circiter 4 mm longis, segmentis parvis ciliatis, staminibus 5; fructibus obovoideis, 10- ad 12-locellatis, circiter 3 cm longis, leviter pubescens, valvis sublig-nosis.

A small tree 5 to 6 m high, the younger branches densely pubescent. Leaves subcoriaceous, oblong to oblong-ovate, 13 to 25 cm long, 5 to 9 cm wide, the apex shortly acuminate, the base broadly and abruptly rounded, sometimes shallowly cordate, brownish or olivaceous when dry, more or less pubescent on both surfaces or in age the upper surface nearly glabrous; lateral nerves 9 to 11 on each side of the midrib, prominent, the reticulations very distinct on the lower surface; petioles stout, up to 4 mm in length. Inflorescence from the trunk and perhaps from the larger branches, solitary or two or three from a tubercle, racemose, 3 to 12 cm long, pubescent, the male and female flowers borne on the same raceme, fascicled at the leafless nodes of the racemes. Pedicels of the male flowers 5 to 6 mm long, glabrous or very slightly ciliate, the perianth campanulate, about 4 mm long, the lobes elliptic or elliptic-ovate, obtuse, sparingly ciliate with few, long, scattered, spreading hairs. Stamens 5, the staminal mass ellipsoid including the somewhat produced connectives, about 1.7 mm long. Female flowers apparently few, sometimes in separate inflorescences, sometimes in the same fascicles with the male flowers. Sepals oblong-lanceolate, pubescent, about 3.5 mm long and somewhat accrescent. Fruit obovoid, 10- to 12-celled, about 3 cm long, white

when fresh, somewhat pubescent, when mature the valves somewhat woody.

MINDANAO, Lanao District, near Camp Vickers, *For. Bur.* 25183 Alvarez (type), March 17, 1916, in dipterocarp forests, altitude about 900 meters. LEYTE, Dagami, *Bur. Sci.* 15352 Ramos, August 12, 1912, said to be from the mossy forest, Mount Buraui.

Both specimens cited above were originally identified by me as *Glochidion weberi* C. B. Rob., as they distinctly resemble the latter species in vegetative characters. The most remarkable character of the present species and one that distinguishes it from all representatives of the genus known to me is its cauline, solitary or fascicled, racemose inflorescence, the racemes varying in length from 3 to 12 cm and having the flowers either solitary or fascicled at their leafless nodes.

APOROSA Blume

APOROSA ACUMINATISSIMA sp. nov.

Arbor glabra, circiter 7 m alta; foliis subcoriaceis, lanceolatis, tenuiter caudato-acuminatis, integris, usque ad 10 cm longis, pallide olivaceis, nitidis, nervis utrinque circiter 5, distinctis, anastomosantibus, adscendentibus; infructescentiis axillaribus et e axillis defoliatis, racemosis, 2 ad 4 cm longis, glabris vel parvissime pubescentibus; fructibus ovoideis vel ellipsoideo-ovoides, circiter 1 cm longis.

A glabrous tree about 7 m high, the branches and branchlets reddish-brown, slender. Leaves lanceolate, subcoriaceous, pale-olivaceous when dry, somewhat shining, 6 to 10 cm long, 1.5 to 3 cm wide, base acute or acuminate, apex slenderly caudate-acuminate, the acumen usually falcate, margins entire; lateral nerves about 5 on each side of the midrib, slender, distinct, ascending, anastomosing; petioles about 5 mm long; stipules none or minute and caducous. Fruiting racemes axillary and from the axils of fallen leaves, solitary, 2 to 4 cm long, glabrous or very slightly pubescent, each with from two to five fruits; fruits ovoid or ellipsoid-ovoid, about 1 cm long, pale-brownish when dry; stigmas 2.

LUZON, Laguna Province, Cavinti, Palasan, *For. Bur.* 26185 Amarillas, September 9, 1916, on forested slopes, altitude about 465 meters.

A species similar, and manifestly allied, to *Aporosa sphaeridophora* Merr., from which it is readily distinguished by its much narrower, lanceolate, prominently caudate-acuminate leaves.

APOROSA STIPULOSA sp. nov.

Arbor, inflorescentiis exceptis glabra; foliis coriaceis, oblongis vel late oblongo-lanceolatis, nitidis, apice acuminatis, basi rotundatis et leviter cordatis, usque ad 24 cm longis; stipulis usque ad 3 cm longis, late falcato-acinaciformibus, acuminatis; spicis ♂ fasciculatis, sessilibus vel breviter pedunculatis, 1 ad 2 cm longis, cylindræis, floribus sessilibus, staminibus 2 vel 3; inflorescentiis masculinis axillaribus, fasciculatis, floribus 5-meris, racemose dispositis; ovario vestito.

A tree, glabrous or nearly glabrous except the inflorescences. Branches stout, terete, dark colored when dry. Leaves oblong to broadly oblong-lanceolate, 15 to 24 cm long, 5 to 6 cm wide, coriaceous, shining, the base rounded, slightly cordate, the apex prominently acuminate; nerves about 14 on each side of the midrib, very prominent beneath, curved-ascending, anastomosing, the reticulations rather dense, distinct; petioles 1 to 1.5 cm long, pubescent when young, ultimately glabrous; stipules of the same texture as the leaves, large and prominent, broadly falcate-acinaciform, 2 to 3 cm long, the base broad and rounded, the apex acuminate. Staminate inflorescences fasciculate, the flowers arranged in dense cylindric spikes 1 to 2 cm long, which are sessile or very shortly peduncled, their rachises pubescent. Calyx segments 3 or 4, slightly pubescent; stamens 2 or 3, their filaments 2 mm long. Pistillate inflorescences axillary, fascicled, the flowers 5-merous, racemosely arranged, the rachis densely fulvous-pubescent, about 2.5 cm long; pedicels stout, about 1.5 mm long, each subtended by a small, ovate bracteole. Ovary densely fulvous-pubescent. Fruit narrowly ovoid, glabrous, narrowed upward, 1.5 cm long.

BILIRAN, *Bur. Sci.* 18642 McGregor, June, 1914. LEYTE, Wenzel 637, March, 1917. MINDANAO, Agusan Province, *Elmer* 13474, 14042, August and October, 1912: Lanao District, *Mrs. Clemens* 968 (type), March and May, 1907, *For. Bur.* 22029 *Sherfesees*, *Cenabre & Ponce*, April, 1914. In forests at low altitudes, ascending to 800 meters.

This species belongs in the group with *Aporosa lunata* Kurz, *A. benthamiana* Hook. f., and *A. falcifera* Hook. f. together with three Bornean species, *A. hosei* Merr., *A. grandistipula* Merr., and *A. euphlebia* Merr. It seems to be closest, however, to a Celebes form represented by *Koorders 16801* and identified by him, with doubt, as representing *Antidesma auriculatum* Teysm. & Binn. I have not been able to locate any published

description of the latter, but in any case *Koorders 16801* is safely an *Aporosa*, not an *Antidesma*.

ANTIDESMA Burman

ANTIDESMA IMPRESSINERVE sp. nov.

Frutex vel arbor parva, partibus junioribus inflorescentiisque exceptis glaber; foliis chartaceis, oblongis ad elliptico-oblongis, usque ad 30 cm longis, tenuiter subcaudato-acuminatis, nervis utrinque circiter 18, supra cum reti venarum impressis, subtus valde prominulis; inflorescentiis ♀ et ♂ spicatis, simplicibus, tenuibus, valde elongatis, ♀ usque ad 50 cm longis, floribus 5-meris, dispersis; ovario dense pubescente; stylis terminalibus; fructibus oblique ovatis, leviter compressis, valde reticulato-rugosis, circiter 7.5 mm longis, breviter pedicellatis.

A shrub or small tree, glabrous except the very young parts and inflorescences. Leaves chartaceous, oblong to elliptic-oblong, 18 to 30 cm long, 7 to 10 cm wide, brownish or olivaceous and shining when dry, the base rounded to obtuse, apex slenderly subcaudate-acuminate and long-apiculate, the nerves and reticulations impressed on the upper surface, very prominent on the lower surface; lateral nerves about 18 on each side of the midrib, arched-anastomosing, the reticulations lax, distinct; petioles 5 to 8 mm long, glabrous; stipules narrowly lanceolate, long-acuminate, pubescent, 1 to 1.5 cm long. Staminate spikes axillary, solitary or in pairs, slender, densely ferruginous-pubescent, up to 20 cm long, the flowers widely scattered, sessile, about 2 mm in diameter, their subtending bracteoles pubescent, oblong-ovate, about 0.8 mm long. Calyx lobes usually 5, oblong-ovate, pubescent, 1 mm long, free nearly to the base. Disk glabrous. Stamens usually 4, their filaments 1 mm long. Pistillate inflorescences very slender, apparently pendulous, up to 50 cm long, more or less pubescent, the lower part naked, the upper part with usually widely scattered sessile flowers. Calyx lobes ovate, about as large as those of the staminate flowers. Ovary ovoid, densely ferruginous-pubescent; stigmas three, terminal, about 1 mm long, cleft nearly to the middle. Fruits obliquely ovate, somewhat compressed, base rounded, 7 to 8 mm long, 6 mm wide, prominently reticulate-rugose when dry, slightly pubescent when young, soon becoming glabrous; styles terminal.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31409 (type), 31268, 31020 *Ramos & Edaño*, April and May, 1918, in forests along small streams.

This species is manifestly allied to *Antidesma cumingii* Muell.-

Arg. from which it is at once distinguished by its conspicuously impressed nerves and reticulations, and by its very slender, greatly elongated inflorescences, both the staminate and pistillate flowers even in young inflorescences being widely scattered and not densely crowded as in *A. cumingii*.

ANTIDESMA ILOCANUM sp. nov.

Frutex vel arbor parva, ramulis inflorescentiisque castaneo-pubescentibus; foliis lanceolatis, chartaceis, 15 ad 20 cm longis, subtus ad costa nervisque leviter pubescentibus, acuminatis, basi plerumque obtusis, nervis utrinque circiter 12, perspicuis; stipulis linearis vel lineari-lanceolatis, 6 ad 8 mm longis; racemis ♀ axillaribus, solitariis, circiter 20 cm longis; fructibus inaequilateraliter ovoideis, glabris, 9 mm longis, obtusis, stigmate terminale.

A shrub or small tree, the young branchlets and inflorescences castaneous-pubescent. Leaves lanceolate, chartaceous, 15 to 20 cm long, 3 to 4.5 cm wide, pale-olivaceous and shining when dry, the lower surface brownish and sparingly castaneous-pubescent on the midrib and nerves, ultimately glabrous or nearly so, somewhat narrowed upward to the acuminate apex, the acumen with a short mucro, base slightly narrowed, rounded to obtuse; lateral nerves about 12 on each side of the midrib, prominent on the lower surface, arched, anastomosing, the reticulations distinct; petioles stout, 5 to 7 mm long, when young castaneous-pubescent, soon becoming glabrous; stipules linear or linear-lanceolate, acuminate, 6 to 8 mm long. Pistillate racemes axillary, simple, about 20 cm long, the rachis rather stout, castaneous-pubescent, marked with numerous scars of fallen pedicels, the pedicels pubescent, 2 to 3 mm long. Sepals 5, pubescent, about 1 mm long. Fruits ovoid, inequilateral, glabrous, somewhat compressed, about 9 mm long, the base broadly rounded, apex obtuse, when dry prominently reticulate-rugose; stigmas terminal.

LUZON, Ilocos Norte Province, between Bangui and Claveria, *Bur. Sci.* 32998 Ramos, August 12, 1918, in thickets and forests at low altitudes.

The alliance of this species is manifestly with *Antidesma cumingii* Muell.-Arg., from which it is readily distinguished by its relatively much-narrowed leaves and its very narrow stipules.

ANTIDESMA CATANDUANENSE sp. nov.

Arbor parva, inflorescentiis parce pubescentibus exceptis glabra; ramis ramulisque griseis, teretibus; foliis chartaceis, ellipticis, usque ad 11 cm longis et 7 cm latis, breviter acuminatis, basi

acutis ad subrotundatis, supra olivaceis, nitidis, subtus pallidioribus, nervis utrinque 5, perspicuis, reticulis laxis, distinctis; infructescentiis axillaribus terminalibusque, usque ad 5 cm longis, breviter pedunculatis vel e basi ramosis, tri- vel quadripinnatim paniculatis, multifloris; fructibus subovoideis, racemose dispositis, leviter inaequilateralibus, in siccitate nigris, leviter reticulatis, circiter 3 mm longis, stigmate terminale; calycis subulatis, truncatis.

A small tree, 6 m high fide Ramos, entirely glabrous except the sparingly pubescent infructescences. Branches and branchlets smooth, terete, gray. Leaves chartaceous, olivaceous and shining when dry, the lower surface paler than the upper, elliptic, 8 to 11 cm long, 4.5 to 7 cm wide, the apex rather abruptly and shortly acuminate, base rounded to acute; primary lateral nerves 5 on each side of the midrib, rather prominent on the lower surface, curved and somewhat ascending, anastomosing, the reticulations distinct, rather lax; petioles 1 to 1.5 cm long. Infructescences axillary and terminal, shortly peduncled or branched from the base, tri- or quadripinnately paniculate, many flowered, up to 5 cm in length. Fruits racemously disposed on the ultimate branchlets, subovoid, slightly compressed, black when dry, somewhat rugose, about 3 mm long, slightly inequilateral, the stigmas terminal; pedicels 1.5 to 2 mm long, the subtending bracteoles 0.5 mm long or less. Persistent calyx cup-shaped, about 1 mm long and wide, truncate.

CATANDUANES, Mount Mariguidon, along streams in forests, *Bur. Sci.* 30515 Ramos, November 13, 1917.

This species is well characterized by its elliptic, shortly and rather abruptly acuminate, few-nerved leaves, and its many-flowered paniculate inflorescences. It is perhaps as closely allied to *Antidesma microcarpum* Elm. as to any other species.

ANTIDESMA SANTOSII sp. nov.

Arbor parva, subglabra; foliis oblongo-ellipticis, olivaceis, nitidis, usque ad 12 cm longis, caudato-acuminatis, basi acutis, nervis utrinque 7 vel 8, subtus perspicuis, obliquis; infructescentiis terminalibus, pauciramosis, 5 ad 6 cm longis, leviter griseo-puberulis; fructibus pedicellatis, oblongo-ellipticis, utrinque acutis vel leviter acuminatis, aequilateralibus, leviter compressis, glabris, in siccitate reticulatis.

A small tree about 7 m high, subglabrous, or the younger parts sparingly pubescent. Branches grayish-brown, terete, smooth. Leaves chartaceous, oblong-elliptic, olivaceous, shining, subequally narrowed to the acute base and to the prominently

subcaudate-acuminate apex, the acumen blunt, up to 2 cm in length, sparingly pubescent on the midrib on both surfaces or ultimately glabrous; lateral nerves 7 or 8 on each side of the midrib, prominent on the lower surface, anastomosing, ascending; petioles about 1 cm long; stipules apparently minute, caducous. Infructescences terminal, 5 to 6 cm long, sparingly grayish-puberulent, usually with 2 or 3 branches, the branches 3 to 4 cm long. Fruits racemosely arranged, their pedicels 1 to 1.5 mm long, the subtending bracteoles ovate, acute, somewhat pubescent, 0.6 mm long, the fruits brown when dry, shining, glabrous, rugose, oblong-ellipsoid, equilateral, about 4 mm long, subequally narrowed to the acute or slightly acuminate base and apex, the stigma terminal. Calyx cup-shaped, about 1.2 mm long, the teeth 4, broad, shallow, obtuse, somewhat ciliate.

LUZON, Laguna Province, Mount Banahao, *For. Bur.* 26300 Santos, August 28, 1916, on slopes along small streams, altitude about 600 meters.

A species well characterized by its obliquely nerved, subcaudate-acuminate leaves; its branched inflorescences; racemosely arranged, shining, equilateral, 4 mm long, glabrous fruits; and 4-merous flowers. It is apparently most closely allied to *Antidesma obliquinervium* Merr., of Palawan, but is at once distinguished from it by its much longer petioles.

ANTIDESMA MEGALOPHYLLUM sp. nov.

Species *A. cumingii* affinis, differt foliis majoribus, usque ad 33 cm longis et 13 cm latis, stipulis longioribus, circiter 2.5 cm longis, et fructibus majoribus, circiter 13 mm longis.

A tree about 7 m high, glabrous except the younger branchlets. Branches terete, brownish, smooth, glabrous. Leaves firmly chartaceous, oblong to oblong-elliptic, 20 to 33 cm long, 9 to 13 cm wide, base rounded, cordate, apex usually prominently acuminate, entirely glabrous or when young sparingly pubescent on the midrib beneath, subolivaceous, shining and of about the same color on both surfaces when dry; lateral nerves about 15 on each side of the midrib, prominent, arched-anastomosing, the reticulations lax; petioles stout, 5 to 10 mm long, pubescent when young, ultimately glabrous; stipules linear-lanceolate, slightly falcate, acuminate, about 2.5 cm long and 3 mm wide. Pistillate racemes greatly elongated in fruit, pendulous, 30 to 40 cm in length, bearing fruit only in the upper part, the rachis and peduncle sparingly pubescent. Fruits strongly inequilateral, ovoid, obtuse, rounded at the base, prominently and laxly reticulate-

rugose, glabrous, pale and somewhat shining when dry, about 13 mm long and 1 cm wide, the pedicels about 5 mm long; persistent calyx-lobes 5, lanceolate, acuminate, pubescent, about 1.5 mm long.

BABUYAN ISLANDS, Calayan, *For. Bur.* 26642 Velasco, June 6, 1917, in forests, altitude about 40 meters.

A species manifestly closely allied to *Antidesma cumingii* Muell.-Arg., differing in its larger leaves, longer stipules, and larger fruits.

DAPHNIPHYLLUM Blume

DAPHNIPHYLLUM OBTUSIFOLIUM sp. nov.

Frutex glaber, ramulis brunneis, laevis, teretibus; foliis ellipticis ad oblongo-ellipticis, coriaceis, usque ad 9 cm longis, in siccitate nitidis, utrinque olivaceis et concoloribus vel subtus admodum brunneis, apice late rotundatis, interdum brevissime apiculatis, nervis utrinque 6 ad 9, distinctis; infructescentiis circiter 5 cm longis, fructibus ovoideis, laevis, in siccitate nigris, circiter 12 mm longis.

A glabrous shrub about 3 m high, the branches terete, brownish, slightly wrinkled, the branchlets smooth, brown or reddish-brown. Leaves numerous, elliptic to oblong-elliptic, 6 to 9 cm long, 3 to 4 cm wide, olivaceous and shining on both surfaces when dry, coriaceous, usually of the same color beneath as above, sometimes somewhat brownish, never glaucous, entire, the apex broadly rounded and sometimes minutely apiculate, base acute, and obscurely 3-nerved or 3-plinerved; lateral nerves 6 to 9 on each side of the midrib, somewhat curved, distinct on both surfaces as are the reticulations; petioles brown, 2.5 to 3.5 cm long. Infructescences axillary, about 5 cm long. Fruits ovoid, black, somewhat fleshy, about 12 mm long, the pericarp somewhat wrinkled when dry, the styles less than 1 mm long, spreading or recurved.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28705 (type), 28662 Ramos & Edaña, May, 1917, in forests near the summit of the mountain, altitude about 1,000 meters.

This species is perhaps as closely allied to *Daphniphyllum glaucescens* Blume as to any other species, but is readily distinguished by its leaves being broadly rounded at their apices, not acuminate, but at most minutely apiculate. It likewise differs from *Daphniphyllum borneense* Stapf in the same leaf characters and in having much longer petioles.

AGROSTISTACHYS Dalzell

AGROSTISTACHYS LEPTOSTACHYA Pax & K. Hoffm. in Engl. Pflanz-enreich 57 (1912) 102.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33688 Ramos & Edaño, November 30, 1918, in forests near small streams at low altitudes.

This species has previously been known only from Borneo. The Philippine material is an exact match for our series of Bornean specimens including *Hose 162*, cited in the original description.

CLAOXYLON Jussieu

CLAOXYLON ELLIPTICUM sp. nov. § *Indica*.

Frutex vel arbor parva, ramulis inflorescentiisque adpresse hirsutis; foliis ellipticis, chartaceis, usque ad 14 cm longis, basi rotundatis ad subobtusis, apice abrupte acuminatis, nervis utrinque 5, subtus valde prominulis, margine minute et distanter glanduloso-denticulatis; inflorescentiis ♂ axillaribus solitariis, petiolo subaequantibus; floribus circiter 7 mm diametro; staminibus circiter 30, glandulis elongatis, oblongis, supra perspicue albido-ciliatis.

A shrub or small tree, the branches and inflorescences rather prominently appressed-hirsute, the indumentum on the younger parts fulvous. Leaves chartaceous, elliptic to oblong-elliptic, 9 to 14 cm long, 4.5 to 7.5 cm wide, base rounded to subobtuse, apex rather abruptly acuminate, the acumen broad, acute, margins distantly and minutely glandular-serrulate, greenish-olivaceous when dry, shining, both surfaces minutely papillate-scaberulous; lateral nerves 5 on each side of the midrib, curved-ascending, arched-anastomosing, very prominent, primary nerves and larger reticulations more or less pubescent; petioles 1.5 to 3 cm long, appressed-pubescent, eglandular. Staminate inflorescences axillary, solitary, equaling or shorter than the petioles, simple, flowers white, short-pedicelled, in bud fulvous-hirsute as are other parts of the inflorescences. Flowers about 7 mm in diameter. Sepals 3, oblong-obovate, narrowed below, 4 to 5 mm long. Stamens about 30; filaments 2.5 mm long, glabrous, the interstaminal glands narrowly oblong, 2 mm long, conspicuously ciliate at their apices, the cilia white, about 1 mm long.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32303 McGregor, May 18, 1918, on forested slopes, altitude 800 meters.

This species belongs in the group with *Claoxylon longifolium* Miq. and *C. subviride* Elm. and is distinctly more closely allied to the latter, from which it differs in its very minutely glandular-serrulate leaves, eglandular petioles and much fewer stamens. In this connection I am of the opinion that all of the Philippine specimens referred by Pax to *C. longifolium* are referable to *C. subviride* on account of their short inflorescences and their biglandular petioles.

BLUMEODENDRON (Muell.-Arg.) Kurz

This group was first characterized by Muell.-Arg. in 1866 as a subgenus of *Mallotus*, and raised by Kurz to generic rank in 1873, although Bentham and Hooker f. retained it as a subgenus of *Mallotus* as originally placed by Mueller. The type is the Javan species originally described by Blume as *Elateriospermum tokbrai* Blume. J. J. Smith² has justly reinstated the group as of generic rank, in which he has been followed by Pax.³ The two known Malayan species are *Blumeodendron tokbrai* (Blume) Kurz (quoad syn. Blume) and *B. kurzii* (Hook. f.) J. J. Sm.; the former known from Java and Borneo, the latter from Tenasserim, the Andaman Islands, Malay Peninsula, Sumatra, and Java. *Blumeodendron kurzii* J. J. Sm. is the form thought by Kurz to represent *Elateriospermum tokbrai* Blume, and which was later redescribed by Hooker f. as *Mallotus kurzii*. To this genus in 1912 I referred the Philippine species described two years earlier by Mr. Elmer as *Sapium rotundifolium*.

In a note prepared at Kew and supplied to me in 1911 by the late Dr. C. B. Robinson he indicates that both he and Mr. R. A. Rolfe were of the opinion that the Kew material from the Indo-Malayan region then available represented at least four distinct species. In the Philippines I find the genus to be represented by at least five distinct species, and possibly by seven, as a sterile specimen from Leyte is somewhat different from the forms enumerated below, while two fruiting specimens from Basilan, *Bur. Sci.* 16138 Reillo and *For. Bur.* 18906 Miranda can scarcely be referred to described species. The genus *Blumeodendron* is then considerably larger than the current literature would indicate.

² Meded. Dept. Landbouw 10 (1910) 460.

³ Engl. Pflanzenreich 63 (1914) 47.

Key to the Philippine species of *Blumeodendron*.

- a*¹. Fruits globose or subglobose, terete, not compressed or angled.
 - b*¹. Reticulations conspicuous..... 1. *B. paucinervium*.
 - b*². Reticulations not conspicuous.
 - c*¹. Leaves mostly alternate.
 - d*¹. Staminate and pistillate inflorescences axillary, peduncled, the flowers subumbellately arranged..... 2. *B. philippinense*.
 - d*². Flowers solitary or fascicled, chiefly on leafless branches and on the trunks..... 3. *B. subcaudatum*.
 - c*². Leaves all verticillate; flowers fascicled in the axils of fallen leaves, on the larger branches, and on the trunks..... 4. *B. verticillatum*.
- a*². Fruits conspicuously compressed and keeled, or distinctly 3-angled, borne on tubercles along the larger branches and on the trunks.
 - 5. *B. subrotundifolium*.

1. *BLUMEODENDRON PAUCINERVIUM* (Elm.) comb. nov.

Elateriospermum paucinervium Elm. Leaf. Philip. Bot. 2 (1908) 484; Pax in Engl. Pflanzenreich 44 (1910) 102.

LUZON, Tayabas Province, Mount Banahao, *Elmer* 7416, (type), May, 1906: Bataan Province, Mount Mariveles, *For. Bur.* 758 *Borden*, May, 1904. SIBUYAN, *Elmer* 12367, April, 1910, in primary forests.

Of this species fruiting specimens only are known, yet I am now convinced that it is referable to *Blumeodendron*, and among the known species of this genus that it is most closely allied to *B. tokbrai* (Blume) Kurz. I had previously⁴ expressed the opinion that it might be referable to *Cheilosa* or *Alcinaeanthus*. It is distinguished from the other Philippine species of *Blumeodendron* by the prominently reticulate leaves, in this character resembling *B. tokbrai* (Bl.) Kurz, of which I now have seven specimens from Java available for comparison.

2. *BLUMEODENDRON PHILIPPINENSE* Merr. & Rolfe sp. nov.

Arbor glabra, usque ad 25 m alta; foliis alternis, vel superioribus rariter verticillatis, coriaceis, in siccitate brunneis, nitidis, oblongis ad oblongo-ellipticis, 8 ad 20 cm longis, basi plerumque acutis, apice perspicue acuminatis, nervis utrinque 6 vel 7, adscendentibus, perspicuis; inflorescentiis axillaribus, ♂ fasciculatis, 1 ad 1.5 cm longis, floribus subumbellatim dispositis, staminibus circiter 35, ♀ plerumque solitariis, pedunculatis, floribus 4 vel 5; capsulis subglobosis, 3 ad 4 cm diametro, 1- vel 2-locellatis, seminibus 1 vel 2.

A glabrous tree, up to 25 m high, branchlets brownish.

⁴ Philip. Journ. Sci. 7 (1912) Bot. 382.

Leaves all alternate, or the uppermost ones occasionally opposite or rarely in whorls of 3, coriaceous, usually brownish when dry, oblong to oblong-elliptic, 8 to 20 cm long, 4 to 10 cm wide, the base acute, sometimes rounded, the apex rather abruptly and conspicuously acuminate, the acumen 1 to 2 cm long; lateral nerves usually 6 or 7 on each side of the midrib, prominent, ascending, the reticulations slender, subparallel, not prominent; petioles 3 to 7 cm long. Staminate inflorescences, axillary, fascicled, 1 to 1.5 cm long, the flowers subumbellately arranged near the apices of the peduncles, the buds globose, glutinous, the pedicels up to 8 m long. Sepals 3, elliptic-ovate, obtuse, 4.5 mm long. Stamens about 35, the filaments up to 4 mm long. Pistillate inflorescences axillary, usually solitary, 1 to 1.5 cm long, the flowers usually 4 or 5, subumbellate, the pedicels stout, 2 to 3 m long. Calyx 1.5 to 2 mm long, 3- or 4-toothed. Ovary narrowly ovoid, 2-celled; style very short; stigmas 2, stout, recurved. Fruit globose, usually 1- or 2-seeded, 3 to 4 cm in diameter, the pericarp brown, rather brittle, ultimately dehiscent, the sutures obscure.

LUZON, Bataan Province, Mount Mariveles, *For. Bur.* 630, 2377 Borden, *For. Bur.* 2401 Meyer, *For. Bur.* 7511, 7228 Curran, *For. Bur.* 12962 Alvarez, *For. Bur.* 20054 Topacio (type), *For. Bur.* 24782 Sulit, Williams 699, Whitford 339: Laguna Province, San Antonio, *Bur. Sci.* 16549 Ramos, pistillate flowers. In primary forests at low altitudes, ascending to 700 meters, flowering in January, September, and October.

Although much of the material representing this species was collected between the years 1903 and 1905 no description of it has yet been published. Female flowers were not secured until 1912 and from the staminate flowers and fruits it was impossible for me to place it in its proper genus in Manila. In November, 1911, Dr. C. B. Robinson and Mr. R. A. Rolfe made a critical examination of the Philippine material available in the Kew Herbarium, resulting in Mr. Rolfe's placing the species in the genus *Blumeodendron*. In a note supplied by Doctor Robinson at that time he intimated that both he and Mr. Rolfe were in agreement that four distinct species were represented by the Indian and Malayan material then available at Kew. The present species I believe to be most closely allied to *Blumeodendron kurzii* J. J. Sm., of the Andaman Islands, Tenasserim, Malay Peninsula, and Java.

3. *BLUMEODENDRON SUBCAUDATUM* sp. nov.

Arbor glabra, usque ad 25 m alta; foliis omnibus alternis, coriaceis, ellipticis ad elliptico-ovatis, nitidis, in siccitate brunneis vel brunneo-olivaceis, 8 ad 12 cm longis, subcaudato-acuminatis, nervis utrinque plerumque 4, tenuibus, reticulis obscuris. Floribus ♂ solitariis vel fasciculatis, plerumque in ramis defoliatis dispositis, staminibus circiter 35; capsulis solitariis, lateralibus, subglobois, 3 ad 3.5 cm diametro, obscure 2-valvis, seminibus 1 vel 2.

A glabrous tree, at least 25 m high, the branches brown or reddish-brown, shining. Leaves all alternate, coriaceous, elliptic-ovate, usually brownish or brownish-olivaceous when dry, shining, 8 to 12 cm long, 3.5 to 7 cm wide, the base usually rounded, the apex subcaudate-acuminate, the acumen slender, blunt, up to 2 cm long; lateral nerves usually 4 on each side of the midrib, rather slender, distinct, the reticulations not prominent, sometimes subobsolete; petioles 2.5 to 4 cm long. Staminate flowers solitary or fascicled, chiefly on the branches below the leaves, the buds globose, glutinous, their pedicels up to 8 mm long. Sepals 3, elliptic-ovate, obtuse, 4.5 mm long. Stamens about 35. Pistillate flowers unknown. Capsules ellipsoid or subglobose, solitary, on the branches below the leaves, 3 to 3.5 cm in diameter, ultimately 2-valved, the sutures obscure, 1- or 2-seeded, the pericarp brown, smooth, shining; stigmas 2.

LUZON, Sorsogon Province, *For. Bur.* 10598 Curran, June 16, 1908. SAMAR, *For. Bur.* 21075 (type), 21069 Sherfesees, *Cenabre & Cortes* (type), April, 1914, *Bur. Sci.* 17407 Ramos, April, 1914, *For. Bur.* 24643 Phasis. PANAY, Capiz Province, *For. Bur.* 23928 Cortes & Knapp, May, 1915. In primary forests at low altitudes, known in Samar as *sabunotan*, *dancalan*, and *salgnan*, and in Panay as *lindog*.

This species is distinguished from *Blumeodendron philippinense*, described above, by its constantly smaller, fewer-nerved, somewhat caudate-acuminate leaves and by its solitary or fascicled flowers, the rachises of the inflorescences not being at all produced. The field note with one of the Samar specimens cited above indicates that the flowers also grow along the trunk as well as on the branches.

4. *BLUMEODENDRON VERTICILLATUM* sp. nov.

Arbor glabra, usque ad 12 m alta; foliis omnibus verticillatis, coriaceis, subolivaceis vel pallidis, ellipticis ad obovato-ellipticis,

usque ad 15 cm longis, basi acutis, apice abrupte acuminatis, nervis utrinque 5 vel 6, distinctis, reticulis subtus distinctis; floribus ♂ axillaribus, fasciculatis, pedicellatis, resinosis, staminibus circiter 35. Capsulis globosis, 3 ad 3.5 cm diametro, tarde 2-valvis.

A glabrous tree up to 12 m high, the branches and branchlets terete, slender, internodes 6 to 10 cm long. Leaves all verticillate, 3 or 4 at each node, coriaceous, subolivaceous or pale when dry, slightly shining, elliptic to obovate-elliptic, 10 to 15 cm long, 5 to 8 cm wide, base acute, apex rather abruptly acuminate, the acumen blunt, up to 1 cm long; lateral nerves 5 or 6 on each side of the midrib, distinct, somewhat ascending, the reticulations rather lax, evident on the lower surface; petioles 2.5 to 3 cm long. Staminate flowers axillary, fascicled, mostly from leafless branches and on the trunk, the axis of the inflorescences not produced. Pedicels 4 to 5 mm long. Sepals 3, broadly ovate, rounded or obtuse, about 4 mm long. Stamens about 35. Buds globose, glutinous. Pistillate flowers unknown. Capsules globose, 3 to 3.5 cm in diameter, ultimately 2-valved, but the sutures scarcely visible on nearly mature fruits, the pericarp smooth, brown; stigmas 2, short, recurved.

LUZON, Bataan Province, Mount Mariveles, *For. Bur.* 2603 Meyer, February, 1905 (type), *For. Bur.* 1190 Borden, June, 1904, *For. Bur.* 1515 Ahern's collector, July, 1904, Whitford s. n. In primary forests, altitude about 600 meters.

A species characterized by its constantly verticillate leaves and fascicled flowers, the latter being for the most part borne at leafless nodes and on the trunk and larger branches.

5. **BLUMEODENDRON SUBROTUNDIFOLIUM** (Elm.) Merr. in Philip. Journ. Sci. 7 (1912) Bot. 384; Pax & Hoffm. in Engl. Pflanzenreich 63 (1914) 49.

Sapium subrotundifolium Elm. Leaf. Philip. Bot. 3 (1910) 930.

This species is as yet represented by only the type collection, *Elmer* 12349 from Sibuyan, the specimen having very immature fruits. Pax and Hoffmann state regarding it: "species quoad genus incerta." To my mind there is not the slightest doubt that this species is properly placed as to the genus. It differs radically from the other described forms in its fruits being either compressed or 3-angled and further in their being borne on tubercles on the larger branches and apparently also on the trunks.

MALLOTUS Loureiro

MALLOTUS CONFUSUS sp. nov. § *Echinus*.

Mallotus barbatus Merr. in Philip. Journ. Sci. 7 (1912) Bot. 397, non Muell.-Arg.

Frutex dioicus, ad 7 m altus, ramulis junioribus densissime et molliter barbato-papillosis, papillae elongatae, stellato-tomentosae; foliis alternis, longe petiolatis, late ovatis, usque ad 36 cm longis, basi rotundatis, alte peltatis, apice perspicue caudato-acuminatis, margine irregulariter dentatis vel subintegris, subtus densissime griseo- ad ferrugineo-tomentosis; inflorescentiis ♂ circiter 20 cm longis, parce ramosis, floribus pedicellatis, ♀ pedunculatis, spiciformibus, densis, cylindraceis, 1 ad 1.5 cm diametro, floribus sessilibus; infructescentiis densis, cylindraceis, circiter 10 cm longis et 3.5 ad 4 cm diametro, capsulis echinis mollibus incurvis subulato-filiformibus stellato-tomentosis densissime obtectis.

A dioecious shrub up to 7 m in height, prominently stellate-tomentose. Branches terete, rather stout, 5 to 10 mm in diameter, the leaf-bearing parts densely covered with pale-brownish, soft, stout, densely stellate-tomentose papillae about 5 mm in length, the younger petioles often with similar papillae. Leaves alternate, broadly ovate, long-petioled, chartaceous, 13 to 36 cm long, 10 to 25 cm wide, the base broadly rounded and peltate, the petiole inserted 1.5 to 5 cm from the margin, the apex prominently caudate-acuminate, the margins subentire to irregularly dentate, the teeth never large, usually minute, the upper surface eventually glabrous, or the nerves somewhat stellate-tomentose, pale-olivaceous or brownish-olivaceous, the lower surface very densely stellate-tomentose with grayish to subferruginous, short hairs; petioles up to 18 cm in length, those of the smaller leaves very much shorter, sometimes but 3 to 4 cm in length, uniformly and densely stellate-tomentose, the younger ones with projecting stellate-tomentose papillae. Staminate inflorescences about 20 cm long, densely stellate-tomentose, sparingly branched, the branches 3 cm long or less. Pedicels about 3 mm long. Sepals 4, oblong-elliptic, 2.5 mm long. Stamens about 70, their filaments 2 mm long. Pistillate inflorescences solitary, simple, peduncled, the flower-bearing part dense, cylindric, spiciform, 4 to 5 cm long, 1 to 1.5 cm in diameter, the peduncles densely stellate-tomentose and often papillose. Calyx-lobes lanceolate, acuminate, 3 mm

long. Ovary densely tomentose; styles stout, densely bearded, about 4 mm long. Infructescences dense, cylindric, about 10 cm long and 3.5 to 4 cm in diameter, the individual capsules, including the thick indumentum, about 1.5 cm long, densely covered with filiform, densely stellate-tomentose, weak, variously incurved and intertwined, slender processes.

LUZON, Tayabas Province, Mount Tulaog, *Bur. Sci.* 29153 Ramos & Edaño (type), May, 1917; Atimonan, *Whitford* 711, August, 1904. SAMAR, Yabong, *Phil. Pl.* 1650 Merrill, March, 1914, with fruits. MINDANAO, Davao District, *DeVore & Hoover*, May, 1903.

The alliance of this species is manifestly with *Mallotus barbatus* Muell.-Arg., to which I previously referred *Whitford* 711, a specimen with pistillate flowers. Pax & Hoffmann⁵ have already indicated that *Whitford*'s specimen apparently represented a distinct species. Now that complete material is available, presenting staminate and pistillate flowers and fruits, it is clearly evident that this Philippine form is distinct from *Mallotus barbatus* Muell.-Arg.

MALLOTUS PAPUANUS (J. J. Sm.) Pax & K. Hoffm. in Engl. Pflanzenreich 63 (1914) 202.

Mallotus hookerianus Muell.-Arg. var. *papuanus* J. J. Sm. in Nova Guinea 8 (1912) 787, t. 137.

MINDANAO, Surigao Province, *Bur. Sci.* 34549 Ramos & Pascasio, April 30, 1919, in damp forests at low altitudes.

A species previously known only from New Guinea but scarcely distinguishable from *Mallotus hookerianus* Muell.-Arg. from southern China. The specimen is with mature fruits and agrees very closely with a cotype before me, *Gjellerup* 316!, staminate specimen.

MALLOTUS LONGISTYLUS sp. nov. § *Axenfeldia*.

Frutex vel arbor parva, glabra, vel partibus junioribus leviter pubescens; foliis alternis, oblongis, subcoriaceis, nitidis, penninerviis, eglandulosis, 25 ad 30 cm longis, basi rotundatis, apice tenuiter acuminatis, integris, nervis utrinque circiter 15; stipulis ovatis ad oblongo-ovatis, coriaceis, 7 ad 15 mm longis; racemis ♀ solitariis, circiter 10 cm longis, plerumque 3-floris, sepalis anguste lanceolatis, circiter 6 mm longis, capsulis subglobosis, leviter pubescens, haud glandulosis, spinis paucis tenuibus usque ad 2 mm longis, armatis.

⁵ Engl. Pflanzenreich 63 (1914) 165.

A nearly glabrous shrub or small tree, the branchlets terete, brownish, glabrous, about 2 mm in diameter, the very young parts slightly pubescent. Leaves alternate, oblong, subcoriaceous, shining, eglandular, 25 to 30 cm long, 6 to 8 cm wide, the base rounded, without glands, apex rather slenderly acuminate, margins entire; lateral nerves about 15 on each side of the midrib, curved, prominent; petioles 2 to 3 cm long, thickened at base and apex; stipules ovate to oblong-ovate, coriaceous, somewhat acuminate, 7 to 15 mm long, 5 to 8 mm wide, attached by their broad bases. Pistillate racemes solitary, leaf-opposed, slightly pubescent, about 10 cm long, usually about 3-flowered, the pedicels 5 mm long or less. Sepals narrowly lanceolate, acuminate, about 6 mm long, somewhat appressed-pubescent. Capsules subglobose, sparingly pubescent, not glandular, armed with rather slender, spreading, scattered spines up to 2 mm in length, the individual cocci about 7 mm in diameter; styles densely papillate, up to 4 cm in length.

DINAGAT, *Bur. Sci.* 35173 *Ramos & Pascasio*, May 11, 1919, in forests at low altitudes.

This characteristic species apparently belongs in the section *Axenfeldia* and is perhaps most closely allied to *Mallotus calvus* Pax & Hoffm. The elongated, entire, eglandular, alternate leaves, and the persistent, coriaceous stipules are characteristic.

WETRIA Baillon

WETRIA MACROPHYLLA (Blume) J. J. Sm. in *Meded. Dept. Landbouw* 10 (1910) 471; Pax & Hoffm. in *Engl. Pflanzenreich* 63 (1914) 219.

Trewia macrophylla Blume *Bijdr.* (1825) 612.

Wetria trewioides Baill. *Étud. Gén. Euphorb.* (1858) 409.

Pseudotrewia macrophylla Miq. *Fl. Ind. Bat.* 1² (1859) 414.

Alchornea blumeana Muell.-Arg. in *Linnaea* 34 (1865) 167, DC. *Prodr.* 15² (1866) 900.

Agrostistachys pubescens Merr. in *Philip. Journ. Sci.* 4 (1909) Bot. 274; Pax in *Engl. Pflanzenreich* 57 (1912) 99.

LUZON, Bataan Province, *For. Bur.* 5940 *Curran*, January, 1907, *For. Bur.* 23450 *Sherfesees & Alambra*, January, 1915. NEGROS, *For. Bur.* 23871 *Cardona*, April, 1915. BANCALAN, *Weber*, September, 1916. In bamboo thickets and in forests at low altitudes. A monotypic genus previously known from Borneo, Sumatra, and Java.

This species is a very characteristic one and, although our available Philippine material is all in fruit, I have not the slightest hesitancy in referring it to the Malayan *Wetria macrophylla* (Blume) J. J. Sm., it agreeing closely with our series of

but the other specimens cited, including one from near the type of *Agrostistachys pubescens* Merr. has rather pubescent leaves, but the other specimens cited, including one from near the type locality, have glabrous or nearly glabrous leaves.

MACARANGA Thouars

MACARANGA OVATIFOLIA sp. nov.

Arbor parva, inflorescentiis ramulisque exceptis glabra, ramis circiter 1 cm diametro; foliis ovatis, chartaceis, integris, usque ad 25 cm longis, acuminatis, basi late rotundatis et distincte cordatis, subtus glandulosis, nervis utrinque 10 ad 12, perspicuis, petiolo usque ad 16 cm longo; infructescentiis lateralibus, paniculatis, solitariis, e axillis defoliatis, 6 ad 9 cm longis, pubescens; coccis solitariis, globosis, laevis, glabris, circiter 4 mm diametro.

A small tree, glabrous except the tips of the branchlets and the inflorescences, branches brown when dry, terete, the ultimate ones up to 1 cm in diameter, marked with large scattered petiolar scars, the leaf axils and the very tips of the branchlets ferruginous-pubescent. Leaves ovate, chartaceous, 20 to 25 cm long, 16 to 18 cm wide, entire, apex distinctly acuminate, base broadly rounded and distinctly cordate, the upper surface greenish-olivaceous, shining, the lower somewhat paler, with numerous pale-yellowish glands; lateral nerves 10 to 12 on each side of the midrib, prominent, the basal pair with about 10 secondary nerves on the lower side, the reticulations subparallel, distinct; petioles reddish brown, slender, up to 16 cm long. Infructescences paniculate, solitary, in the axils of fallen leaves, spreading, 6 to 9 cm long, ferruginous-pubescent, the branches few, the primary ones 4 cm long or less. Pedicels about 1.5 cm long, the bracteoles pubescent, oblong-obovate, somewhat toothed, up to 3 mm long. Fruit consisting of a single, globose, smooth, ultimately glabrous coccus, about 4 mm in diameter.

MINDANAO, Surigao Province, *Bur. Sci.* 34583 Ramos & Pascasio, June 15, 1919, along streams at low altitudes at the iron deposit on the northeast coast.

This species belongs in the group with *Macaranga noblei* Elm. and *M. piperi* Merr. but is at once distinguishable from both by its leaves being glabrous on the lower surface. It is less closely allied to *M. amplifolia* Merr., from which it is easily distinguished by its cordate leaves, its shorter inflorescences, and its entirely glabrous leaves and petioles.

* MEGISTOSTIGMA Hooker f.

MEGISTOSTIGMA CORDATUM sp. nov.

Herbacea, scandens, partibus junioribus inflorescentiisque exceptis glabra; foliis ovatis, chartaceis, profunde cordatis, acuminatis, longe petiolatis; inflorescentiis racemosis, axillari-bus, pedunculatis, usque ad 16 cm longis, floribus inferioribus ♀, superioribus ♂, sepalis ♀ lanceolatis, acuminatis, 6 mm longis.

A scandent, apparently herbaceous vine, nearly glabrous except the inflorescences and very young vegetative parts. Leaves ovate, chartaceous, 8 to 14 cm long, 6 to 9 cm wide, entire, base prominently cordate, apex acuminate, shining when dry, the upper surface olivaceous, the lower paler; lateral nerves above the basal pair 3 or 4 on each side of the midrib, distinct; petioles 3 to 5 cm long. Inflorescences racemose, axillary, solitary, long-peduncled, up to 16 cm in length, the flower-bearing portion 3 to 5 cm long, the lower flowers in each raceme pistillate, the upper ones staminate. Staminate flowers about 6 mm in diameter, their pedicels about 6 mm long, sparingly pubescent, the calyx-lobes 3, orbicular-ovate, obtuse to acute, 3 to 4 mm in diameter; bracteoles lanceolate, acuminate, somewhat pubescent, 4 to 5 mm long, usually hastate-lobed at the base. Pistillate flowers in the lower part of the same raceme as the staminate ones and fewer in number, yellowish-green. Sepals lanceolate, acuminate, about 6 mm long, pubescent on both surfaces, somewhat inflated at the base. Ovary subglobose, somewhat 3-lobed, pubescent, 3-celled; style pubescent, 2 to 3 mm long; stigma subglobose, obscurely 3-lobed, glabrous, fleshy, about 6 mm in diameter.

SAMAR, Mount Canislagan, *Bur. Sci.* 17591 Ramos, April 3, 1914, in dry forests.

The genus *Megistostigma* has previously been known from the Malay Peninsula where it is represented by a single species, *M. malaccense* Hook. f., the type of the genus. The present species differs radically from *M. malaccense* in its ovate, cordate, long-petioled leaves and in its very much larger flowers, the staminate and pistillate ones being borne in the same racemes, not in separate racemes as in Hooker's species. In essential floral characters, by which the genus is distinguished, both the staminate and pistillate flowers conform entirely to those of *Megistostigma*.

PLUKENETIA Linnaeus

PLUKENETIA CORNICULATA Smith in Nov. Act. Soc. Sci. Upsal. 6 (1799) 4.

LUZON, Rizal Province, Barrio of Pulong, *Bur. Sci.* 24086 Ramos, November 25, 1915, in dry places, old clearings.

The genus is new to the Philippines. While the specimen cited above differs in some details from Smith's species, as described, I can detect no differences, in the absence of named material for purposes of comparison, that would warrant me in distinguishing the Philippine form as specifically or varietally distinct. According to Hooker the species extends from the Himalayan region to Java; it extends at least as far to the southeast as Amboina, as it was figured by Rumphius, *Herb. Amb.* 1 (1741) 194, *t.* 79, *f.* 2, as *Sajor volubilis*.

TRAGIA Linnaeus

TRAGIA LUZONIENSIS sp. nov.

Scandens, ramulis plus minusve pubescentibus; foliis oblongis, chartaceis, usque ad 9 cm longis, acuminatis, basi leviter cordatis et minute peltatis, margine irregulariter undulatis, nervis utrinque 6 vel 7, patulis, distinctis, anastomosantibus; inflorescentiis ♂ axillaribus, spicatis, tenuibus, 5 ad 7 cm longis, puberulis, solitariis vel fasciculatis; floribus 2 mm diametro, 4-meris, sepalis oblongis, acuminatis, 1 mm longis; staminibus 4, quam sepalis brevioribus; bracteolis anguste oblongis, 0.5 mm longis.

A slender vine, the branches terete, 1 to 1.5 mm in diameter, brownish when dry, the younger ones more or less pubescent, the older ones glabrous. Leaves chartaceous, subolivaceous when dry, shining, oblong, 6 to 9 cm long, 2.5 to 3 cm wide, somewhat narrowed to the rounded, slightly cordate, and minutely peltate base, the apex acuminate, margins irregularly undulate, the upper surface glabrous, the lower surface with rather numerous short, stiff stinging hairs from bulbous bases 1 mm long or less; petioles 5 to 10 mm long, sparingly hirsute, ultimately glabrous; lateral nerves 6 or 7 on each side of the midrib, distinct, spreading, anastomosing, the reticulations lax. Staminate inflorescences spicate, slender, axillary, solitary or fascicled, puberulent, 5 to 7 cm long, the bracteoles narrowly oblong, 0.5 mm long, usually curved and persisting after the flowers fall. Flowers sessile, 2 mm in diameter, 4-merous. Sepals oblong, acuminate, 1 mm long. Stamens 4, rarely 3,

shorter than the sepals; rudimentary ovary none. Pistillate flowers and fruits unknown.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 32854 Ramos, July 26, 1918, in dry forests at low altitudes.

This species is entirely different from the other two known from the Philippines and probably belongs in the alliance with *Tragia involucrata* Linn. It is well characterized by its oblong, somewhat undulate leaves, which are rounded, slightly cordate, and minutely peltate at the base, and by its spicately arranged staminate flowers. In this genus the pistillate flowers are usually found at the base of the staminate inflorescences; but none of the specimens of *Tragia luzoniensis* shows any indication whatever of pistillate flowers, so that apparently the present species is dioecious. The stinging hairs of the present species are very short and are apparently confined to the lower surface of the leaves.

TRAGIA PHILIPPINENSIS sp. nov.

Scandens, ramulis, foliis et fructibus pilis numerosis urentibus instructis; foliis oblongo-ovatis ad oblongo-lanceolatis, usque ad 10 cm longis, basi late truncato-subcordatis, leviter hastatis, sursum gradatim angustatis, tenuiter acute acuminatis; sepalis ♀ 3, accrescentibus, subcoriaceis, ovatis, circiter 10 mm longis, obtusis ad leviter acuminatis, integris; coccis circiter 7 mm diametro, perspicue hispidis, pilis urentibus.

A scandent, herbaceous or subherbaceous vine, the branchlets, leaves, and other parts prominently hispid with scattered, white, stiff, stinging hairs 2 to 3 mm in length. Leaves membranaceous, oblong-ovate to oblong-lanceolate, 7 to 10 cm long, 2.5 to 4 cm wide at the truncate-subcordate and slightly hastate base, gradually narrowed upward to the slenderly and sharply acuminate apex, often with 2 or 3 coarse teeth or shallow lobes on each side near the base, otherwise entire, both surfaces with scattered, stiff, stinging hairs, the upper surface brown or castaneous when dry, the lower greenish; lateral nerves 4 or 5 on each side of the midrib, prominent, anastomosing; petioles about 3 cm long. Staminate flowers 3-merous, the buds triangular, the sepals reniform-ovate, about 3 mm long and 4 mm wide. Disk much thickened; stamens 3, about 2 mm long. Pistillate sepals in fruit 3, subcoriaceous, spreading, entire, ovate, obtuse to somewhat acuminate, about 10 mm long and 7 mm wide. Fruits depressed, about 12 mm in diameter, brown,

the cocci globose, about 7 mm in diameter, prominently hispid with white, stiff, spreading, stinging hairs.

LUZON, Abra Province, Mount Posuey, *Bur. Sci.* 27013 Ramos, February 4, 1917, on damp forested slopes.

The third species to be found in the Philippines, and one readily distinguished from *Tragia irritans* Merr. in its leaves being truncate-cordate and somewhat hastate, the sinus very broad and shallow, and the basal lobes not rounded; its three, accrescent, pistillate sepals; and its numerous, very prominent, stinging hairs. It differs notably from the polymorphous *Tragia involucrata* Linn. in its three entire sepals.

TRIGONOSTEMON Blume

TRIGONOSTEMON MACGREGORII sp. nov. § *Pycnanthera*.

Frutex circiter 2 m altus, ramulis inflorescentiisque plus minusve adpresse hirsutis; foliis membranaceis, oblongis, perspicue acuminatis, integris, usque ad 14 cm longis, basi rotundatis vel obtusis, 3-nerviis; paniculis axillaribus, pedunculis, foliis subaequantibus; floribus ♂ circiter 9 mm diametro, sepalis apice perspicue glandulosis, antheris 3, ellipsoideis, integris, ♀ sepalis perspicue ciliato-hirsutis; ovario glabro, stylis 3, brevibus, integris.

A shrub about 2 m high, the branchlets and inflorescences more or less appressed-hirsute. Leaves membranaceous, oblong, prominently acuminate, entire, 10 to 14 cm long, 3 to 5 cm wide, base rounded to obtuse, distinctly 3-nerved; lateral nerves above the basal pair 5 or 6 on each side of the midrib, the midrib and nerves on both surfaces very sparingly appressed-hirsute. Panicles axillary, lax, peduncled, 9 to 16 cm long, the branches slender, irregularly arranged, the lower ones up to 7 cm long. Pistillate and staminate flowers pale-yellow, in the same inflorescences or sometimes in separate inflorescences on the same plant. Staminate flowers about 9 mm in diameter, their pedicels slender, 5 to 10 mm long. Sepals 5, elliptic to elliptic-ovate, 1.5 to 2 mm long, glabrous or with very few ciliate-hirsute hairs, glandular-punctate, the apex obtuse or notched and with a large conspicuous gland. Petals membranaceous, glabrous, obovate, about 4.5 mm long, 3 mm wide, the apex somewhat obliquely truncate-rounded. Disk 1 mm in diameter, entire. Androphore about 2 mm long, anthers 3, ellipsoid, entire, 0.4 mm long, the filaments 0.5 mm long. Pistillate flowers similar to the staminate ones, differing in their larger, prominently hirsute-ciliate sepals which are oblong and

about 3 mm long. Ovary ovoid, glabrous; styles 3, entire, 0.5 mm long. Capsules subglobose, about 1 cm long. Seeds about 6 mm in diameter.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32424 *McGregor* (type), June 3, 1918, in forests, altitude about 300 meters. The same species is represented by *Bur. Sci.* 26228 *McGregor* from the vicinity of Paete, Laguna Province, Luzon, June, 1915.

This species is not closely allied to any other known Philippine form and differs from the other species of this section in its axillary inflorescences. It is easily recognized by its lax inflorescences and its distinctly 3-nerved leaves, the basal nerves usually extending to near the middle of the leaf.

TRIGONOSTEMON LAXIFLORUS sp. nov.

Frutex, partibus junioribus et subtus foliis plus minusve pubescentibus; foliis oblongis ad oblongo-lanceolatis, circiter 25 cm longis, perspicue acuminatis, basi acutis, nervis utrinque circiter 18; inflorescentiis ♀ tenuibus, laxis, axillaribus, usque ad 30 cm longis; floribus paucis, longissime pedicellatis; bracteis foliaceis, lanceolatis, 1 ad 1.5 cm longis; sepalis oblongis ad oblongo-ovatis, acuminatis, ut videtur accrescentibus, 7 ad 11 mm longis; ovario ovoideo, pubescente; stylis 3, brevibus, partitis.

A shrub, more or less pubescent. Branches terete, glabrous, about 4 mm in diameter, the younger parts somewhat pubescent. Leaves oblong to oblong-lanceolate, about 25 cm long and 7 cm wide, narrowed below to the acute base and above to the conspicuously acuminate apex, the margins obscurely and distantly undulate-crenate, the upper surface glabrous, dark-olivaceous when dry, the lower surface paler, rather softly pubescent on the midrib, nerves, and reticulations, and with similar but more scattered hairs on the epidermis; lateral nerves about 18 on each side of the midrib, prominent; petioles 3 to 4.5 cm long, pubescent when young, soon becoming glabrous. Pistillate inflorescences slender, lax, rather few-flowered, long-peduncled, pubescent, up to 30 cm long, the branches few, rather short, each bearing from 1 to 3 very long-peduncled flowers, the branches subtended by lanceolate, 1 to 1.5 cm long, leaflike bracts. Pedicels 2 to 5 cm long, thickened upward, usually with a small linear-oblong bracteole. Sepals 5, oblong to oblong-ovate, acuminate, sparingly pubescent, apparently somewhat accrescent and persistent, 7 to 11 mm long, 2.5 to 5 mm wide. Disk glabrous, with 5, rounded, orbicular-ovate lobes. Ovary ovoid, rather densely cinereous-pubescent; styles 3, about 1.5 mm long,

cleft nearly to the base. Capsules apparently globose, about 1 cm in diameter.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31097 Ramos & Edaño, May 16, 1918, in damp forests.

This species is well characterized by its very slender, few-flowered, elongated, bracteate inflorescences and by its apparently accrescent, persistent, rather large sepals. It is closely allied to *Trigonostemon acuminatus* Merr., from which it is easily distinguished by its smaller bracts, and by its leaves being softly pubescent beneath.

TRIGONOSTEMON LUZONIENSE sp. nov.

Frutex erectus, perspicue hirsutus vel villosus, ramulis circiter 5 mm diametro, cicatricibus magnis instructis; foliis subcoriaceis, oblongo-obovatis ad oblanceolatis, 15 ad 23 cm longis, acutis vel obtusis, deorsum angustatis, integris, nervis utrinque circiter 10, perspicuis; infructescentiis longe pedunculatis, hirsutis, axillaribus, racemosis vel depauperato-paniculatis, foliis subaequantibus; capsulis circiter 1 cm diametro, dense hirsutis.

A shrub about 1 m high, the branchlets, petioles, inflorescences, and leaves on the lower surface more or less hirsute or villous. Ultimate branches about 5 mm in diameter, more or less pubescent, and with large petiolar scars. Leaves chartaceous or subcoriaceous, narrowly oblong-obovate to oblanceolate, 15 to 23 cm long, 6 to 8 cm wide, rather pale when dry, the apex acute to obtuse, narrowed below to the acute or very abruptly obtuse base, the margins entire, the upper surface glabrous, the lower conspicuously pubescent on the midrib, nerves, and reticulations; lateral nerves about 10 on each side of the midrib, curved-ascending, distinct, the reticulations lax; petioles 1.5 to 2 cm long, densely hirsute. Infructescences axillary, equaling or somewhat longer than the leaves, very long-peduncled, hirsute, racemose or depauperate-paniculate, flower-bearing in the upper 10 cm, the branchlets or pedicels subtended by bracts or very greatly reduced leaves which may reach a length of 1.5 cm, the fruiting pedicels up to 3 cm long, thickened upward. Capsules depressed-globose, densely hirsute, about 1 cm in diameter, composed of 3 dehiscent cocci.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33539 Ramos & Edaño, November 28, 1918, in forests along small streams at low altitudes.

This species differs from *Trigonostemon hirsutus* C. B. Rob. in its smaller, fewer-nerved leaves, and from *T. merrillii* Elm.

in its leaves being entirely glabrous on the upper surface; it seems to be more closely allied to the latter.

TRIGONOSTEMON ANOMALUS sp. nov.

Frutex circiter 8 m altus, inflorescentiis parcissime hirsutis exceptis glaber; foliis submembranaceis, oblongo-ovatis, usque ad 18 cm longis, longe acuminatis, integris, nervis utrinque circiter 7; inflorescentiis axillaribus, paucifloris, 1 ad 2 cm longis, racemosis vel corymbosis; floribus ♂ magis numerosis, sepalis 5, ellipticis, circiter 3 mm longis, integris, petalis bifidis, quam sepalis brevioribus latioribusque, glabris; floribus ♀ paucis, longe pedicellatis, sepalis 5 mm longis, petalis nullis.

A shrub about 8 m high, entirely glabrous except for the very slightly hirsute inflorescence. Branches slender, terete, reddish brown. Leaves alternate, oblong-ovate, membranaceous, 7 to 18 cm long, 3.5 to 6.5 cm wide, pale or somewhat olivaceous when dry, somewhat shining, entire, base acute, apex long and slenderly acuminate; lateral nerves about 7 on each side of the midrib, slender, distant, curved, the reticulations lax, subobsolete; petioles 2 to 7 mm long. Inflorescence axillary, 1 to 2 cm long, few-flowered, racemose or cymose. Female flowers apparently 1, few, or perhaps none in some inflorescences, their pedicels about 1.5 cm long, thickened upward. Sepals 5, imbricate, glabrous, oblong-elliptic, obtuse, 5 mm long, 3 mm wide. Petals none (or fallen). Ovary ovoid, glabrous, about 2 mm in diameter, 3-celled, cells 1-ovuled; styles 3, about 1 mm long, recurved. Male flowers more numerous than the females, their pedicels 5 to 6 mm long, the buds globose. Sepals of nearly mature buds 5, eglandular, imbricate, elliptic, rounded, concave, about 3 mm long, 2.2 mm wide, glabrous or externally with very few, scattered hairs. Petals 5, imbricate, 2 to 2.5 mm long, 3 to 3.5 mm wide, cleft to about the middle by a broad sinus, the lobes rounded. Stamens 3; anthers sessile, entire, 2-celled, about 1 mm long, longitudinally dehiscent.

MINDANAO, Zamboanga District, Naganaga, *For. Bur.* 22018 *Villamil*, June 2, 1914, on ridges, altitude about 75 meters, the flowers red.

The species is placed in *Trigonostemon* although it is anomalous in that its pistillate flowers apparently have no petals; as I had for examination but a single pistillate flower, however, it is possible that the petals had already fallen. Otherwise the species is distinguished by its short, racemose or corymbose inflorescences. It may belong in the section *Tylosepalum*.

CODIAEUM Jussieu

CODIAEUM TRICHOCALYX sp. nov.

Frutex erectus, dioicus, partibus junioribus inflorescentiisque exceptis glaber; foliis plus minusve confertis, chartaceis, olivaceis, oblongo-obovatis ad late oblanceolatis, usque ad 20 cm longis, obtusis vel breviter latissime obtuse acuminatis, basi cuneatis, integris, nervis utrinque circiter 15, patulis; petiolo 1.5 ad 2.5 cm longo; racemis ♂ elongatis, adpresse pubescentibus; floribus fasciculatis, pedicellis sepalisque dense longe ciliato-hirsutis; petalis minutis, glabris, oblongo-spatulatis, 1.5 mm longis; staminibus circiter 100.

An erect, apparently unbranched, dioecious shrub, glabrous except the younger parts and the inflorescences. Branches terete, smooth, the ultimate ones 3 to 4 mm in diameter. Leaves crowded at the apices of the branches, chartaceous, oblong-obovate to broadly oblanceolate, 13 to 20 cm long, 4.5 to 7 cm wide, apex obtuse to broadly and obtusely acuminate, gradually narrowed in the lower two-thirds to the cuneate base; lateral nerves about 15 on each side of the midrib, slender, spreading, very obscurely anastomosing; petioles 1.5 to 2.5 cm long. Staminate inflorescences elongated, 20 to 40 cm in length, appressed-pubescent with short hairs. Flowers white, in distant fascicles, up to 5 at a node, but 1 or 2 opening at one time, their pedicels and the sepals densely covered with long, rather stiff, spreading, white or pale hairs, the pedicels up to 1 cm in length. Sepals obovate, rounded, about 4 mm long. Petals minute, oblong-spatulate, 1.5 mm long, glabrous, entire. Disk-glands about 10, thick, angled, about 0.8 mm long, truncate. Stamens 100 or more, the filaments glabrous, 3 to 4 mm long.

LUZON, Zambales Province, Mount Aglao, *Bur. Sci.* 26797 *Edaño*, December 5, 1916, in forests at low altitudes.

A species manifestly allied to *Codiaeum luzonicum* Merr., and *C. cuneifolium* Pax & K. Hoffm., from both of which it is at once distinguished by the dense indumentum on the pedicels and calyces, which consists of long, stiff, spreading, white or pale hairs that are 0.8 to 1 mm in length.

CODIAEUM MEGALANTHUM sp. nov.

Frutex 1 m altus, haud ramosus, floribus ♀ exceptis glaber; foliis longe petiolatis, chartaceis, oblongo-oblanceolatis, 12 ad 27 cm longis, apice rotundatis vel latissime et brevissime acuminatis; inflorescentiis ♂ racemosis, usque ad 35 cm longis, floribus 1.2 ad 1.5 cm diametro, tenuiter longe pedicellatis, plerumque

solitariis, sepalis glabris, staminibus circiter 100, glandulis circiter 15, quadratis, denticulatis; floribus ♀ pubescentibus, stylis 3, recurvatis, integris.

An erect, normally unbranched shrub, about 1 m high, entirely glabrous except the pistillate flowers. Leaves chartaceous, oblong-oblancoolate, 12 to 27 cm long, 3 to 7 cm wide, entire, olivaceous when dry, the apex rounded, or sometimes very broadly and shortly acuminate, gradually narrowed below to the cuneate or acute base; lateral nerves spreading, slender, distinct, up to 20 on each side of the midrib, anastomosing, the reticulations very lax, indistinct; petioles 3.5 to 7 cm long. Pistillate and staminate inflorescences either on the same plant or on separate plants, elongated, 17 to 35 cm long, rachis glabrous. Staminate flowers up to 1.5 cm in diameter, white, their pedicels slender, 2 to 2.5 cm long, solitary or somewhat fascicled. Sepals glabrous, orbicular, about 6 mm in diameter. Stamens 100 or more, their filaments about 6 mm long. Disk glands about 15, stout, 4-angled, about 1.2 mm long, the more or less quadrate apex minutely toothed. Petals none. Pistillate flowers racemose, solitary, their pedicels 1.2 mm long or less. Sepals somewhat pubescent, broadly ovate, acuminate, 1.5 mm long. Ovary ovoid, cinereous-pubescent; styles 3, entire, recurved, 6 mm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27353 Ramos (type), March 12, 1917, in forests at low altitudes; between Bangui and Claveria, *Bur. Sci.* 33014 Ramos, August 1, 1918: Cagayan Province, near Mount Narig, *For. Bur.* 19640 Curran, January 25, 1912.

The type was originally identified as *Codiaeum cuneifolium* Pax & K. Hoffmann, the latter species being identical with *C. luzonicum* Merr. It is distinguished from *C. luzonicum* and from *C. palawanense* Elm. by its larger staminate flowers; in being entirely glabrous except for its pistillate flowers; and more especially in its undivided style arms. In both *Codiaeum luzonicum* (including *C. cuneifolium*) and *C. palawanense* the styles are divided to the base, forming six equal arms. In the present species as in others of this group the staminate flowers are apetalous.

CODIAEUM CILIATUM sp. nov.

Frutex monoicus, 1 ad 2 m altus, perspicue ciliato-hirsutus; foliis oblongo-ovatis ad late oblongo-oblancoolatis, membranaceis ad chartaceis, utrinque plus minusve longe albido-ciliatis, usque ad 35 cm longis, acutis ad acuminatis, basi cuneatis, nervis

utrinque 10 ad 20; inflorescentiis 30 ad 60 cm longis, multifloris; floribus ♂ extus glabris vel subglabris, 5-meris, plerumque fasciculatis, staminibus circiter 45; floribus ♀ pubescentibus, ovario pubescente atque ciliato-hirsuto; stylis 3, bipartitis.

An erect, unbranched, monoecious shrub, 1 to 2 m high, ciliate-hirsute with scattered, spreading, stiff, white hairs, especially on the inflorescences and lower surface of the leaves. Leaves oblong-obovate to broadly oblong-ob lanceolate, membranaceous to chartaceous, 25 to 35 cm long, 9 to 15 cm wide, olivaceous when dry, the lower surface somewhat paler than the upper, the apex acute to somewhat acuminate, narrowed in the lower two-thirds to the usually cuneate base; lateral nerves 10 to 20 on each side of the midrib, prominent, spreading, anastomosing, the reticulations lax; petioles 4 to 8 cm long. Pistillate and staminate inflorescences on the same plant, racemose, stout, 30 to 60 cm long, the rachis cinereous-pubescent with short, appressed hairs and ciliate-hirsute with long, stiff, spreading ones. Staminate flowers usually numerous, fascicled, from 2 or 3 to as many as 100 in a fascicle, their pedicels up to 1 cm in length. Sepals orbicular to reniform, glabrous, the inner three about 4 mm in diameter, the outer two usually smaller. Petals not seen, if present then very minute. Stamens about 45. Pistillate flowers solitary, racemosely arranged, their pedicels 1 to 3 mm long, calyx pubescent and ciliate-hirsute; styles 3, each cleft nearly to the base into two 6-mm long arms. Capsules about 1 cm in diameter, brownish, shining, with few, scattered, short hairs, their pedicels 5 to 10 mm long.

PANAY, Capiz Province, Jamindan, *Bur. Sci.* 31233 (type), 31230, 31231, 31232 Ramos & Edaño, April 6, 1918, in forests along small streams, with the Visayan names *calangcang* and *panagang*.

This species belongs in the same group as *Codiaeum luzonicum* Merr., from which I do not consider *C. cuneifolium* Pax & Hoffm. to be specifically distinct. *Codiaeum ciliatum* is closely allied to *C. hirsutum* Merr., from which it is distinguished by its much broader leaves, its shorter inflorescences, and the glabrous or nearly glabrous sepals of the staminate flowers.

Pax and Hoffmann separated *Codiaeum cuneifolium* from *C. luzonicum* on the basis that the former has monoecious flowers and pubescent capsules, and that the latter is dioecious with glabrous capsules. As a matter of fact the capsules are appressed-pubescent in both species; the plants are more often

monoecious but are frequently dioecious. There are no floral or vegetative characters by which they may be distinguished. In this connection it is well to call attention to the fact that the drawing of the pistillate flower given by Pax and Hoffmann ⁶ is erroneous in that the styles are shown as very short, obovate, and 3-toothed. In this species, as in *C. luzonicum* and all of the other indigenous ones of the genus found in the Philippines, the three styles are elongated and cleft nearly to the base into two long arms. In this character all of our indigenous species of the genus differ from typical *Codiaeum*, and a more natural arrangement would be their segregation as a subgenus or perhaps even their separation generically from *Codiaeum*.

CODIAEUM MACGREGORII sp. nov.

Frutex vel arbor parva, ramulis inflorescentiisque exceptis glabra; foliis lineari-oblongis, usque ad 30 cm longis, 3 ad 3.5 cm latis; inflorescentiis ♀ usque ad 45 cm longis, cinereo-pubescentibus; floribus 5-meris, sepalis dense pubescentibus; ovario dense hirsuto; stylis 3, bifidis, elongatis; capsulis dense hirsutis, obovoideis.

A shrub or small tree, the young branchlets and inflorescences densely cinereous-pubescent with short subappressed hairs. Leaves glabrous, chartaceous, linear-oblong, 30 to 40 cm long, 3 to 3.5 cm wide, their margins parallel, the base rather abruptly acute or cuneate, the apex acuminate; lateral nerves 20 to 30 on each side of the midrib, spreading, anastomosing, distinct; petioles 5 to 8 cm long. Pistillate inflorescences up to 45 cm in length, solitary, subtended by an oblong, sessile leaf about 10 cm long and 3 cm wide. Flowers rather numerous, racemously arranged, their pedicels 2 to 5 mm long. Sepals densely pubescent, oblong-ovate, acute, about 2 mm long. Ovary very densely hirsute; styles 3, glabrous, each cleft nearly to the base into two 5-mm long arms. Young capsules obovate, about 7 mm long, rather densely hirsute with pale, stiff, spreading hairs.

PANAY, Antique Province, Culasi, *Bur. Sci.* 32419 *McGregor*, May 24, 1918, on forested slopes, altitude about 900 meters.

This species is well characterized by its elongated, narrow, glabrous leaves and its rather densely pubescent inflorescences and hirsute capsules; the indumentum is entirely different from that of *C. ciliatum*.

⁶ Engl. Pflanzenreich 47 (1911) 29, f. 7 D.

OMPHALEA Linnaeus

OMPHALEA GRANDIFOLIA sp. nov.

Frutex erectus, haud ramosus, circiter 3 m altus, inflorescentiis parce pubescentibus exceptis glaber; foliis coriaceis, longissime petiolatis, oblongis, 50 ad 60 cm longis, apice breviter acuminatis; nervis utrinque 14 ad 18, perspicuis; inflorescentiis lateralibus, diffusis, multiramosis, usque ad 80 cm longis, ramis irregulariter dispositis, elongatis; floribus ♀ fasciculatis, pedicellatis, circiter 2 mm longis; fructibus junioribus subglobosis, circiter 3 cm diametro.

An erect unbranched shrub, about 3 m high, the trunk 4 to 8 cm in diameter, glabrous except the somewhat puberulent inflorescences. Leaves coriaceous, shining, oblong, 50 to 60 cm long, 15 to 20 cm wide, the apex shortly acuminate, base acute or obtuse and with two conspicuous glands on the upper surface at the junction with the petiole; lateral nerves 14 to 18 on each side of the midrib, prominent as are the reticulations; petioles 14 to 28 cm long. Inflorescences lateral, much branched, diffuse, rather rigid, up to 80 cm in length. The primary branches irregularly arranged. Pistillate flowers numerous, fascicled, each fascicle usually subtended by a conspicuous gland. Pedicels about 8 mm long. Sepals 5, obtuse, oblong-elliptic to elliptic-ovate, about 2 mm long, membranaceous, slenderly nerved, their margins slightly ciliate. Ovary ovoid, glabrous, 3-celled. Immature fruit subglobose, about 3 cm in diameter, 3-celled, each cell with a single large seed.

PANAY, Capiz Province, Mount Macosolon and Jamindan, *Bur. Sci.* 30813 (type), 30825 *Ramos & Edaño*, April 23, and May 25, 1918, in damp forests along small streams.

This species is strongly characterized by its very large, long-petioled leaves as well as by its habit, it being described by the collectors as strictly erect and unbranched; the pistillate inflorescences are unusually large.

OMPHALEA SARGENTII sp. nov.

Frutex scandens, glaber; foliis oblongis, subcoriaceis, in siccite pallidis, nitidis, utrinque concoloribus, circiter 20 cm longis, basi rotundatis ad obtusis, utrinque glandulis solitariis perspicuis instructis, apice obtusis ad brevissime acuminatis vel acutis, nervis utrinque circiter 8, perspicuis; fructibus globosis, circiter 5 cm diametro.

A scandent glabrous shrub reaching a length of 20 cm and

a diameter of 4 cm, the branches terete, longitudinally striate when dry, pale; leaves subcoriaceous, pale and shining when dry, oblong, about 20 cm long, 8 to 9 cm wide, base rounded to obtuse, with a prominent gland on each side at the juncture of the lamina with the petiole, the apex obtuse or very shortly acute or acuminate; lateral nerves about 8 on each side of the midrib, prominent on the lower surface, distant, anastomosing, the reticulations lax; petioles stout, about 3.5 cm long; infructescences up to 40 cm in length, the branches few, short, spreading. Fruits globose, about 5 cm in diameter, smooth, glabrous, dark-brown when dry, shining, the seeds about 3 cm long and wide.

BANCALAN, between Palawan and Balabac, C. M. Weber, September 2, 1916, in forests, altitude about 3 meters.

A species well characterized by its few-nerved leaves and large fruits, by which it is readily distinguished from *Omphalea philippinensis* Merr. and *O. malayana* Merr.; the fourth species for the Philippine-Malayan region. It is dedicated to Dr. C. S. Sargent, director of the Arnold Arboretum, under whose auspices Weber's collection was made.

EXCOECARIA Linnaeus

EXCOECARIA PACHYPHYLLA sp. nov. § *Commia*.

Frutex circiter 2 m altus, glaber, ramis ramulisque teretibus; foliis oppositis, coriaceis, oblongis ad oblongo-ovatis, integris, usque ad 10 cm longis, apice breviter et late obtuse acuminatis, basi acutis, nervis utrinque circiter 9, patulis, vix perspicuis; racemis ♂ terminalibus, circiter 2 cm longis, bracteolis unifloris, floribus distincte pedicellatis, sepalis ovatis, margine glanduloso-denticulatis.

A glabrous shrub about 2 m high, the branches and branchlets terete, usually reddish-brown. Leaves opposite, thickly coriaceous, oblong to oblong-obovate, 7 to 10 cm long, 2.5 to 3.5 cm wide, smooth, shining, the upper surface pale-olivaceous, the lower paler when dry, entire, base acute, apex with a short, very broad, blunt acumen; lateral nerves about 9 on each side of the midrib, not prominent, spreading, rather obscurely anastomosing, usually more distinct on the upper than on the lower surface; petioles 1 to 1.5 cm long. Staminate racemes terminal, simple, solitary, about 2 cm long, the bracteoles ovate, rounded, about 1 mm long, the margins obscurely glandular-denticulate, 1-flowered, the glands prominent, about 1 mm in diameter. Pedicels stout, about 1 mm long. Sepals suborbicular, about 0.8

mm in diameter, margins obscurely glandular-denticulate. Filaments nearly 1 mm long. Pistillate flowers and fruits not seen.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci.* 25404 Yates, December 12, 1916, in the mossy forest, altitude at least 800 meters.

A characteristic species, readily distinguished by its thick, entire, opposite leaves, and its short, simple, terminal or subterminal racemose, not spicate, staminate inflorescences. Under Pax and Hoffmann's arrangement of the species of *Excoecaria*, it comes nearest to *Excoecaria crenulata* Wight and *E. bantamensis* Muell.-Arg.

EXCOECARIA MIRANDAE sp. nov. § *Commia*.

Frutex monoicus, circiter 2 m altus, glaber; foliis oppositis, chartaceis, oblongis, usque ad 13 cm longis, olivaceis, integris, acuminatis, basi acutis ad subobtusis, nervis utrinque circiter 9, curvatis, anastomosantibus, reticulis subobsoletis; inflorescentiis junioribus terminalibus, circiter 4 cm longis, basi floribus ♀ solitariis instructis; bracteolis unifloris; floribus ♂ sepalis lanceolatis, 1.5 mm longis, acuminatis, ♀ ovatis, 2.2 mm longis, longe et tenuiter acuminatis.

A monoecious glabrous shrub about 2 m high, the branches and branchlets slender, terete, reddish-brown. Leaves opposite, chartaceous, olivaceous when dry, the lower surface paler than the upper, 10 to 13 cm long, 3.5 to 4 cm wide, entire, base acute, apex distinctly acuminate, the acumen rather blunt; lateral nerves about 9 on each side of the midrib, curved, rather distinct, anastomosing, the reticulations obsolete or subobsolete; petioles 5 to 8 mm long. Inflorescences terminal, when young about 4 cm long, with a single pistillate flower at the base, the bracteoles 1-flowered. Pistillate flowers: Sepals ovate, 2.2 mm long, long and slenderly acuminate, the shoulders minutely denticulate. Ovary ovoid, glabrous, the style-arms rather stout, about 2 mm long. Staminate flowers: Sepals lanceolate, long-acuminate, about 1.3 mm long, the bracts ovate, acuminate. Fruits apparently about 1.5 cm in diameter, the pericarp crustaceous.

BASILAN, Bocboc Barrio, near Matangal Point, *For. Bur.* 20062 Miranda, October 4, 1912, altitude about 25 meters.

The alliance of this species is manifestly with *Excoecaria bicolor* Hassk., from which it is distinguished by being monoecious, although Hasskarl states that *E. bicolor* is sometimes monoecious; by its longer inflorescences; and by its prominently long-acuminate pistillate sepals.

EXCOECARIA MACROPHYLLA (Hassk.) J. J. Sm. in Meded. Dept. Landbouw 10 (1910) 611.

LUZON, Nueva Ecija Province, Muñoz, *For. Bur.* 6029 Zschokke, November, 1906; Pangasinan Province, Umingan, *For. Bur.* 26299 Ablaza, September, 1916, in both localities known as *sausao* or *sausau*.

This species has previously been reported only from Java and from Borneo, but I can detect no characters by which the Luzon form can be distinguished from the Javan one, of which three specimens collected by Koorders are before me. The Philippine form has intensely irritating milky juice, Ablaza merely stating that it burns the skin, while Zschokke states: "The sap is milky and the natives dread it very much. It makes painful burns, destroying the skin as an acid does."

SAPIUM Jacquin

SAPIUM LUZONICUM (Vidal) comb. nov.

Myrica luzonica Vidal Sinopsis Atlas (1883) 40, t. 90, f. B; Rolfe in Journ. Linn. Soc. Bot. 21 (1884) 316.

Sapium merrillianum Pax & Hoffm. in Engl. Pflanzenreich 52 (1912) 213.

Sapium lateriflorum Merr. in Philip. Journ. Sci. 1 (1906) Suppl. 83; Elm. Leaflet. Philip. Bot. 4 (1911) 1303, non Hemsl. (1901).

Urandra elliptica Merr. in Philip. Journ. Sci. 5 (1910) Bot. 195.

The type of *Myrica luzonicum* Vidal was from Montalban, Rizal Province, Luzon, a specimen with staminate flowers; and, while the original description is short, both it and its accompanying figure definitely place the species as identical with the one I later described as *Sapium lateriflorum*, this being later renamed by Pax and Hoffmann *Sapium merrillianum*. The type of *Sapium lateriflorum* Merr. was from Bataan Province, Luzon. The form later described by me as *Urandra elliptica*, the type being a fruiting specimen, was also from Bataan Province; it is clearly synonymous with *Sapium luzonicum*, representing a plant with relatively broader leaves than the common form. The species is now represented by the following specimens:

LUZON, Ilocos Sur Province, Tambor, *For. Bur.* 13027 Paraiso; Danglao, *For. Bur.* 23109 Cruz; Bulacan Province, Angat, *Merrill Phil. Pl.* 1407; Bataan Province, Mount Mariveles, Lamao, *Williams* 643, *For. Bur.* 338 Barnes, *For. Bur.* 2565 Borden (type of *Sapium lateriflorum* Merr. and of *S. merrillianum* Pax), *For. Bur.* 17601, 19153 Curran; Duale, *For. Bur.* 20003 Topacio (type of *Urandra elliptica* Merr.): Rizal Province, San Isidro, *For.*

Bur. 1991 *Ahern's collector*, *Merrill Phil. Pl.* 2013: Laguna Province, Mount Maquiling, Los Baños, *For. Bur.* 11676, 19808 *Whitford*, *For. Bur.* 11919 *Tamesis*, *For. Bur.* 22955 *Calycosa*, *For. Bur.* 13232 *Curran*. MINDORO, *For. Bur.* 9913 *Merritt*. PALAWAN, Brooks Point, *Elmer* 12630. TICA0, *For. Bur.* 1080 *Clark*. BUCAS GRANDE, *Bur. Sci.* 35078 *Ramos & Pascasio*. MINDANAO, Davao Province, *For. Bur.* 27587 *De Mesa*.

In forested ravines and on forested slopes at low altitudes. Endemic.

EUPHORBIA Linnaeus

EUPHORBIA LUZONIENSIS sp. nov. § *Chamaesycae*.

Herba perennis, tenuibus, prostratis, e radice lignosis, ramulis parce pubescentibus; foliis orbicularis ad orbiculari-ovatis, subcoriaceis, integris vel obscure crenulatis, apice late rotundatis, basi inaequilateralibus, usque ad 8 mm longis; involucri numerosis 1.5 mm longis cymosis, cymis 1 ad 1.5 cm longis, foliis depauperatis 1 ad 3 mm longis instructis, glandulis reniformibus, integris; capsulis ovoideis, 1.5 mm longis, 3-angulatis, leviter pubescentibus.

A slender, prostrate, dichotomously branched, perennial herb from thick woody roots, the branchlets very slightly pubescent, the woody roots up to 8 mm in diameter. Branches 1 mm in diameter or less, the internodes up to 1.5 cm in length. Leaves orbicular to orbicular-ovate, 5 to 8 mm long, subcoriaceous, entire or very obscurely crenulate, apex broadly rounded, base distinctly inequilateral, more or less oblique on one side, sometimes shallowly laterally cordate, olivaceous when dry, the upper surface glabrous, the lower when young often slightly pubescent, soon becoming glabrous; lateral nerves 3 or 4 on each side of the midrib, faint, obscure, the reticulations close; petioles 1 to 2 mm long; stipules broadly ovate, thin, denticulate, sometimes cleft, 0.5 to 1 mm long. Involucres rather numerous, forming terminal leafy cymes 1 to 1.5 cm long and about as wide, the leaves associated with the involucres in the inflorescence similar to the normal ones but very much smaller, 1 to 3 mm long. Individual involucres cup-shaped, very slightly pubescent, about 1.5 mm long, their pedicels 1 to 1.5 mm long; bracteoles thin, short, somewhat ciliate; glands reniform, about 0.6 mm wide, the appendages entire. Ovary slightly pubescent; styles cleft about one-third to the base, the arms short, somewhat thickened. Capsule ovoid, about 1.5 mm long, very slightly pubescent, 3-angled. Seeds slightly rugose, about 1 mm long.

LUZON, Ilocos Norte Province, between Burgos and Bangui, *Bur. Sci.* 27309 bis (type), 27517 Ramos, March, 1917, on open dry slopes at low altitudes.

This species is distinguished among its congeners such as *Euphorbia humifusa* Willd., *E. makinoi* Hayata, and allied forms by its orbicular leaves and its cymose inflorescences.

EUPHORBIA MAKINOI Hayata in Journ. Coll. Sci. Tokyo 30¹ (1911) 262.

Euphorbia microphylla Hayata op. cit. 20³ (1904) 79, t. 5, f. H, non Heyne.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27309, 32746 Ramos, February, 1917, and July, 1918, in open dry places at low altitudes.

This species has previously been known only from Formosa, the specimens cited above agreeing perfectly with Hayata's description and figure. It is very closely allied to *Euphorbia neo-caledonica* Boiss., as represented by *Cribs* 753 and 758 from New Caledonia, the former number having minutely serrulate leaves, as described by Boissier, the latter having entire leaves.



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NEW OR NOTEWORTHY PHILIPPINE PLANTS, XVI

By ELMER D. MERRILL

Director and Botanist, Bureau of Science, Manila.

Separate from

THE PHILIPPINE JOURNAL OF SCIENCE

Published by the Bureau of Science of the Philippine Government.
Manila, P. I.

VOLUME 17, No. 3, SEPTEMBER, 1920

MANILA
BUREAU OF PRINTING
1920

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NEW OR NOTEWORTHY PHILIPPINE PLANTS, XVI

By ELMER D. MERRILL

Director and Botanist, Bureau of Science, Manila

The sixteenth paper of this series is essentially like its predecessors, the last number having been published in 1919.¹ The present paper contains the descriptions of about one hundred presumably hitherto undescribed species of flowering plants, with some notes on nomenclature and some proposed changes in generic and specific names, as well as the records for a few species previously described from extra-Philippine material now found for the first time in the Archipelago. The genera *Fibraurea* of the Menispermaceae, *Phyllochlamys* of the Moraceae, *Eurycoma* of the Simarubaceae, and *Ixonanthes* of the Linaceae are new to the Philippine flora, the last two being represented by previously undescribed species.

A large number of the new species described in the present paper is from the eastern coast of Surigao Province, Mindanao, and the neighboring islands of Dinagat, Siargao, and Bucas Grande, regions in which no intensive botanical collecting has hitherto been done. Extensive collections were made in these regions by Messrs. M. Ramos and J. Pascasio, April to June, 1919; and, as is usual in previously unexplored regions in the Philippines, their material contains a high percentage of previously undescribed species. Doubtless any general collection made in the same regions, but at a different time of the year, would yield an equally high percentage of novelties.

¹ Merrill, E. D., New or noteworthy Philippine Plants, XV, Philip. Journ. Sci. 14 (1919) 365-457.

PANDANACEAE

PANDANUS Linnaeus f.

PANDANUS APICULATUS sp. nov. § *Rykia*.

Arbor, circiter 5 m alta, ramulis 2.5 ad 3 cm diametro; foliis circiter 1 m longis et 5.5 cm latis, in siccitate subflaccidis, sursum angustatis, apice tenuiter acuminatis, inter nervis transversalibus distincte reticulatis; infructescentiis lateralibus, 10 ad 15 cm longis, syncarpiis spicatum dispositis, plerumque 10, confertis, ovoideis ad globosis, 15 cm diametro; drupis numerosis, confertis, cylindricis vel oblongis, 1-locellatis, 6 ad 7 mm longis, 2 ad 2.5 mm diametro, apice rotundatis et acute apiculatis, stylis circiter 1 mm longis.

A tree, about 5 m high, the ultimate branches 2.5 to 3 cm in diameter. Leaves about 1 m long and 5.5 cm wide, somewhat flaccid when dry, the margins armed with rather conspicuous teeth, the midrib beneath near the base with retrorse teeth and toward the apex with antrorse teeth, the 2 lateral nerves sometimes with a few scattered teeth on the upper surface near the apex, the blade more or less narrowed to the distinctly and rather slenderly acuminate apex, distinctly transversely reticulate between the numerous secondary nerves. Infructescences lateral, from the base of the apical tufts of leaves, 10 to 15 cm long, the syncarps ovoid to globose, sessile, about 1.5 cm in diameter, usually about 10 on each infructescence, the peduncles closely covered in the lower half with numerous, imbricate, spirally arranged, oblong bracts, which are usually about 4 cm in length. Drupes numerous, crowded, red, cylindric or oblong or sometimes narrowed below, 1-celled, 6 to 7 mm long, 2 to 2.5 mm in diameter, the apical 1.5 to 2 mm free, rounded, terminated by the indurated, slightly upward-curved, usually acute style, which is usually about 1 mm in length.

MINDANAO, Surigao Province, *Bur. Sci.* 34572 *Ramos & Pascasio*, April 25, 1919, on ridges, altitude about 690 meters, at the iron deposit on the northeast coast.

A rather remarkable species on account of its lateral infructescences and its multibracteate peduncles. It is manifestly allied to *Pandanus multibracteatus* Merr., but has much wider leaves and differs essentially in its fruit characters, the drupes being much smaller and not prolonged into slender, elongated tips, as in the latter species.

PANDANUS DINAGATENSIS sp. nov. § *Rykia*.

Frutex parvus, ramulis circiter 3 cm diametro; foliis usque ad 1.75 m longis, circiter 6.5 cm latis, subcoriaceis, sursum

angustatis, acuminatis; infructescentiis plerumque 3, pedunculatis, syncarpiis circiter 10, spicatum dispositis, oblongo-ovoideis ad anguste oblongis, 2 ad 4 cm longis, confertis, pedunculo usque ad 10 cm longo; drupis minutis, confertis, oblongis, 1-locellatis, 5 ad 6 mm longis, usque ad 2 mm diametro, apice rotundatis vel conicis, stigma plerumque rotundata et circiter 1 mm diametro.

A small shrub, the ultimate branches about 3 cm in diameter. Leaves up to 1.75 m long, about 6.5 cm wide, subcoriaceous, the margins armed with small teeth, the midrib beneath in the upper part with small scattered teeth, more or less narrowed above to the acuminate apex. Syncarps about 10, spicately arranged on each peduncle, oblong-ovoid to narrowly oblong, 2 to 4 cm long, 1.5 to 2 cm wide, crowded toward the upper tips of the peduncles, usually 3 or more infructescences terminating each branchlet, the peduncles up to 10 cm long and 5 to 7 mm in diameter. Drupes very numerous, crowded, oblong or somewhat narrowed below, 1-celled, 5 to 6 mm long, 2 mm in diameter or less, their apices somewhat rounded or conical, terminated by the flattened and rounded or sometimes papilliform stigma which is usually less than 1 mm in diameter.

DINAGAT, *Bur. Sci.* 35183 *Ramos & Pascasio*, May 12, 1919, in forests along streams at low altitudes.

A species remarkable for its numerous, small, crowded syncarps and for the very unusual character of several peduncles terminating each branchlet. The species is further characterized by its very small drupes, and is not closely allied to any previously described form.

PANDANUS MULTIBRACTEATUS sp. nov. § *Acrostigma*.

Arbor, circiter 4 m alta, ramulis circiter 3.5 cm diametro; foliis rigidis, coriaceis, anguste acuminatis, 1.5 ad 2 m longis, 3 ad 3.5 cm latis; infructescentiis lateralibus, spicatis, pedunculo usque ad 10 cm longo, bracteis numerosis spiraliter dispositis, oblongis, 2 ad 3 cm longis, obtecto; syncarpiis 8 ad 10, confertis, ovoideis, 1.5 ad 2.5 cm longis, drupis numerosis, usque ad 3 mm diametro, confertis, stylis tenuibus, rigidis, integris vel obscure dentatis, circiter 5 mm longis.

A small tree, about 4 m high, the ultimate branches about 3.5 cm in diameter. Leaves coriaceous, rigid, 1.5 to 2 m long, 3 to 3.5 cm wide, the margins armed with short, sharp, rather closely arranged teeth, gradually narrowed upward to the slenderly acuminate apex. Infructescences lateral, from the branches below the leaves, the peduncles up to 10 cm in length,

densely covered by spirally arranged, very numerous, imbricating, coriaceous, rigid, oblong, entire or slightly toothed bracts, 2 to 3 cm in length. Syncarps 8 to 10, red, spicately arranged, rather crowded, ovoid, 1.5 to 2.5 cm long, composed of numerous, densely arranged, 1-celled drupes which are 3 mm or less in diameter, their apices abruptly narrowed, somewhat ridged, terminated by the slender, entire or slightly toothed, rigid, straight or somewhat curved styles which are up to 5 mm in length.

MINDANAO, Surigao Province, *Bur. Sci.* 34571 (type), 34819 Ramos & Pascasio, April 25, 1919, at the iron deposit on the northeast coast on the Hegapit River, altitude about 680 meters. The fruit red when mature.

A remarkable species, not closely allied to any previously described Philippine form and easily recognizable by its lateral, spicate inflorescences; by its small, ovoid syncarps, the tips of the drupes narrowed and elongated; and by the multibracteate peduncles.

PANDANUS RAMOSII sp. nov. § *Bryantia*.

Frutex, 2 ad 3 m altus, ramulis ultimis circiter 1.5 cm diametro; foliis crasse coriaceis, linearis, circiter 1.5 m longis, 2 ad 2.5 cm latis, apice tenuiter acuminatis; syncarpiis terminalibus, erectis, solitariis, ovoideis, 5 ad 6 cm longis, pedunculo usque ad 20 cm longo, circiter 7 mm diametro; drupis numerosis, 1-locellatis, 10 ad 12 mm longis, circiter 3 mm diametro, anguste oblongis, $\frac{1}{2}$ superioribus liberis, rotundatis, stigma sessile, planum, circiter 1.3 mm diametro.

A shrub, 2 to 3 m high, the ultimate branches about 1.5 cm in diameter. Leaves thickly coriaceous, rigid, rather pale when dry, linear, about 1.2 m long, 2 to 2.5 cm wide, narrowed above to the rather slender, acuminate apex, the margins distinctly toothed, the midrib on the lower surface in the upper part more or less toothed as are the 2 primary veins on the upper surface toward the apex. Syncarps terminal, erect, solitary, ovoid, 5 to 6 cm long, somewhat triangular in cross section, the basal part somewhat inclosed by a few, broadly ovate, leaflike bracts, the peduncles up to 20 cm long, triangular, about 7 mm in diameter, supplied with 2 or 3 reduced leaves 25 to 40 cm in length in addition to the terminal, leaflike bracts. Drupes very numerous, crowded, red, 1-celled, 10 to 12 mm long, about 3 mm in diameter, narrowly oblong, the apical half free, somewhat angular, rather abruptly rounded or narrowed at the apex and terminated by the flat, sessile, truncate stigma, which is usually about 1.3 mm in diameter.

BUCAS GRANDE, *Bur. Sci. 35136 Ramos & Pascasio*, June 10, 1919, in dry forests at low altitudes. The same species is apparently represented by *Bur. Sci. 35198 Ramos & Pascasio* from the neighboring island of Dinagat, the latter number consisting of leaves only.

A species not closely allied to any previously described Philippine form, well characterized by its narrow, rigid leaves; its solitary, erect, long-peduncled syncarps, the peduncles being supplied with several reduced leaves and several additional, reduced, apical, leaflike bracts; and by its very numerous, small, narrow, 1-celled drupes. Allied to *Pandanus brachyspathus* Martelli, but with very different leaves.

PANDANUS TENUIPEDUNCULATUS sp. nov. § *Bryantia*.

Frutex erectus, ramulis 1 ad 1.3 cm diametro; foliis subflaccidis, anguste oblongo-lanceolatis, 50 ad 75 cm longis, 3 ad 4.5 cm latis, apice abrupte angustatis, breviter acuminatis; syncarpiis ovoideis, erectis, circiter 3 cm diametro, pedunculo usque ad 9 cm longo, 5 mm diametro; drupis numerosis, obovoideis ad anguste obovoideis, 10 ad 12 mm longis, circiter 5 mm diametro, 1-locellatis, apice rotundatis, stigma sessile, planum, circiter 1.2 mm diametro.

A shrub, the ultimate branches 1 to 1.3 cm in diameter. Leaves subflaccid, narrowly oblong-lanceolate, 50 to 75 cm long, 3 to 4.5 cm wide, about the same width throughout or somewhat narrowed below, the apex abruptly tapering to the short acumen, the latter 5 mm long or less, the margins rather finely toothed, the midrib beneath in the uppermost part with few small teeth, the 2 lateral nerves on the upper surface toward the apex with similar scattered teeth. Heads ovoid, solitary, terminal, erect, about 3 cm in diameter, the peduncles triangular, about 9 cm long, 5 mm in diameter. Drupes red, obovoid to narrowly obovoid, 10 to 12 mm long, up to 5 mm in diameter, 1-celled, narrowed below to the cuneate base, the apical portion rounded, the very tip sometimes depressed, terminated by the flat stigma which is about 1.2 mm in diameter.

MINDANAO, Surigao Province, *Bur. Sci. 34739 Ramos & Pascasio*, June 20, 1919, in open forests at low altitudes. *Bur. Sci. 34842 Ramos & Pascasio* from Siargao Island, a specimen with staminate flowers, probably represents the same species.

This species is readily distinguishable by its rather flaccid leaves which are of about the same width throughout and rather abruptly narrowed to the short-acuminate apex; and by its slenderly peduncled, solitary, erect syncarps.

PIPERACEAE

PIPER Linnaeus

PIPER ANGUSTIPELTATUM sp. nov. § *Eupiper*.

Frutex dioicus, scandens, glaber; foliis oblongis, nitidis, 10 ad 16 cm longis, aequilateralibus, chartaceis, basi rotundatis et anguste peltatis, 7-nerviis, apice perspicue acuminatis; spicis ♀ cylindricis, circiter 3 cm longis et 12 mm diametro, bracteis peltatis, glabris, stylis tenuibus, patulis, confertis, 3 ad 4 mm longis.

A glabrous, dioecious vine, the ultimate branches terete, about 2 mm in diameter. Leaves chartaceous, oblong, 10 to 16 cm long, 3 to 6 cm wide, equilateral or nearly so, the base rounded and narrowly peltate, the petioles inserted, 2 to 4 mm from the edge of the leaf, 7-nerved, the inner pair of nerves extending to the apex, the reticulations horizontal, distinct, subparallel, the apex rather prominently acuminate, both surfaces shining when dry; petioles 2 to 2.5 cm long. Pistillate spikes, leaf-opposed, cylindric, about 3 cm long and 12 mm in diameter, their peduncles up to 2 cm in length; bracts peltate, rounded, 0.8 mm in diameter, styles numerous, densely crowded, spreading, slender, 3 to 4 mm long. Stigmas 2, recurved, 0.5 mm long.

LUZON, Tayabas Province, Mount Binuang, *Bur. Sci.* 28846 Ramos & Edaña, May 19, 1917, in damp forests along rivers at low and medium altitudes.

This species is similar and very closely allied to *Piper longistigmum* C. DC. from which it is easily distinguished by its narrowly peltate leaves.

PIPER CATUBIGENSE sp. nov. § *Eupiper*.

Frutex dioicus, scandens, foliis subtus ad costa nervisque pubescens; foliis penninerviis, membranaceis, lanceolatis ad oblongo-ovatis, 15 ad 17 cm longis, basi obtusis ad rotundatis, leviter inaequilateralibus, apice tenuiter acuminatis, nervis utrinque circiter 9, distinctis; spicis ♂ cylindricis, tenuibus, 5 ad 7 cm longis, circiter 3 mm diametro, bracteis peltatis.

A scandent, dioecious vine, the branchlets, petioles and leaves along the midrib and nerves on the lower surface distinctly pubescent. Leaves membranaceous, lanceolate to oblong-ovate, penninerved, 15 to 17 cm long, 4 to 9 cm wide, the base obtuse or rounded and slightly inequilateral, the apex slenderly acuminate; lateral nerves about 9 on each side of the midrib, distinct, ascending, somewhat curved; petioles 10 to 12 mm long. Staminate spikes cylindric, rather slender, black when dry, 5 to 7 cm long, about 3 mm in diameter, their peduncles 10 to 12 mm

in length, sparingly pubescent. Bracts peltate, about 1 mm in diameter. Anthers apparently 2.

SAMAR, Catubig River, *Bur. Sci.* 24278 Ramos, March 13, 1916, on trees in damp forests at low altitudes.

A species belonging in the group with *Piper penninerve* C. DC. and most closely allied to *Piper longilimbum* C. DC., from which it is distinguished by its smaller, caudate-acuminate leaves and by its staminate spikes being but half as long as in the latter species.

PIPER ELMERI sp. nov. § *Eupiper*.

Frutex dioicus, scandens, ramis circiter 1 cm diametro; foliis chartaceis ad subcoriaceis, late ovatis, aequilateralibus, basi profunde cordatis, 10- vel 12-plinerviis, apice acutis vel acuminate, usque ad 30 cm longis, subtus molliter pubescens; spicis ♂ usque ad 25 cm longis, circiter 4 mm diametro, bracteis pubescens, peltatis, 2.5 ad 3.5 mm longis; spicis ♀ usque ad 25 cm longis, cylindricis, densis; fructibus pedicellatis, ovoideis, 7 ad 9 mm longis, pedicellis usque ad 1.5 cm longis.

A coarse, woody, dioecious vine, the branches up to 1 cm in diameter, the older ones somewhat angled, rugose and brownish when dry. Leaves chartaceous to subcoriaceous, broadly ovate, 15 to 30 cm long, 11 to 23 cm wide, equilateral or nearly so, the base deeply cordate, 10- or 12-plinerved, the sinus rather narrow up to 4 cm deep, the basal lobes broadly rounded, apex acute or somewhat acuminate, the upper surface glabrous, shining, olivaceous, the lower surface softly pubescent; nerves prominent, the reticulations distinct; petioles up to 6 cm in length. Inflorescences simple, leaf-opposed, the staminate ones up to 25 cm long, about 4 mm in diameter, their peduncles 1.5 to 2 cm long. Staminate flowers numerous, the stamens 2, about 2 mm long, the bracts peltate, oblong-ovate, obtuse, pubescent, 2.5 to 3.5 mm long. Pistillate inflorescences up to 20 cm long or in fruit up to 25 cm in length, the rachis rather stout, cylindric, about 5 mm in diameter, the flowers numerous, crowded, sessile or subsessile, the ovary ovoid to elliptic, glabrous, about 2 mm long, the stigmas 3 or 4, sessile, the pedicels increasing in length immediately after anthesis and in fruit up to 1.5 cm long, spreading, the fruits ovoid, yellowish-red when fresh, somewhat wrinkled and usually black when dry, 7 to 9 mm long, the rachis with numerous unfertilized flowers in addition to those which develop into fruits.

SAMAR, Catubig River, *Bur. Sci.* 24256 Ramos (type), February 10, 1916. LUZON, Sorsogon Province, Mount Pokdal,

Bur. Sci. 23490 Ramos, August 3, 1915, with staminate flowers and the local Bikol name *buyong halas*: Laguna Province, Mount Maquiling, *For. Bur.* 26751 Mabesa, March, 1917, *Elmer* 18059, June, 1917. In damp forests at low and medium altitudes, ascending to 450 meters on Mount Maquiling.

A remarkable species not at all resembling any previously described form, easily recognizable by its broadly ovate, deeply cordate, equilateral leaves which are softly pubescent beneath; by its rather stout, cylindric, elongated spikes and their pubescent bracts; and by its large, long-pedicelled fruits.

ULMACEAE

CELTIS Linnaeus

CELTIS ASPERIFOLIA sp. nov.

Arbor magna, plus minusve pubescens; foliis tenuiter chartaceis, scaberulis, ovatis, integris, 5 ad 8 cm longis, acuminatis, basi inaequilateralibus, 3-nerviis, oblique truncatis ad rotundatis vel acutis; inflorescentiis pubescens, usque ad 5 cm longis, inferioribus ♂ superioribus ♀, sepalis et staminibus 5, ovario pubescente.

A tree, about 25 m high, more or less pubescent. Leaves thinly chartaceous, rather scabrous, both surfaces with scattered, very short hairs, ovate, entire, 5 to 8 cm long, 3 to 5 cm wide, the base inequilateral, 3-nerved, somewhat oblique-truncate to rounded or even shallowly cordate, the younger leaves sometimes acute, apex acuminate; nerves slender, including the basal pair usually 3 on each side of the midrib; petioles pubescent, about 5 mm long. Inflorescences axillary and from the axils of fallen leaves, the latter usually wholly staminate, the former with both male and perfect flowers, cinereous-pubescent, up to 5 cm long. Male flowers sessile, somewhat glomerate on the branchlets, 5-merous, about 4 mm in diameter, the sepals distinctly pubescent, oblong-obovate, 2 mm long. Stamens equalling the sepals. Perfect flowers fewer than the male, sessile or short-pedicelled, the sepals 5, elliptic to oblong-elliptic, 2 to 2.5 mm long. Ovary oblong-ovoid, pubescent, the style arms forked. Stamens 5, filaments 2 mm long.

MINDANAO, Davao Province, Santa Cruz, *For. Bur.* 27562 De Mesa, May 2, 1919, in sandy soil, altitude about 70 meters, with the local Tagakaolo name *sikim*.

This species does not appear to be very closely allied to any previously described form. It is easily distinguished among the Oriental species with entire leaves by its indumentum and

its scabrous leaves. The collector gives the height of the tree as 25 meters with a trunk diameter of 1 meter.

MORACEAE

PHYLLOCHLAMYS Bureau

PHYLLOCHLAMYS TAXOIDES (Heyne) Koord. Exkursionsfl. Java 2 (1912) 89, var. PARVIFOLIA var. nov.

A rigid, branched, spiny shrub, 1 to 3 m high, entirely glabrous. Leaves chartaceous, oblong to elliptic-oblong or oblong-lanceolate, entire or with one or two teeth near their tips, acute to slightly acuminate, 2 to 4 cm long, 1 to 2.3 cm wide, the nerves not prominent. Pistillate flowers solitary, their pedicels about 4 mm long, each with a pair of bracteoles at about the middle, these ovate, obtuse, about 1 mm long. Sepals 4, in anthesis 4 to 8 mm long, lanceolate to oblong-lanceolate, not reticulate, slenderly acuminate, pale-green when fresh.

PALAWAN, Lake Manguao, *Merrill 9482*, April 27, 1913, on steep, dry, forested banks, altitude about 70 meters.

This is the first record for *Phyllochlamys* as Philippine, the form above described differing from the typical Indian *P. taxoides* (Heyne) Koord. (*P. spinosa* Bureau) in its much smaller, not prominently nerved, entire or only slightly toothed leaves. It may ultimately prove to be specifically distinct, as it is rather different from the single Indian specimen I have for examination, *Wight 817*. The species is widely distributed in India, but is reported from the Malay Archipelago only from Timor.

PROTEACEAE

HELICIA Loureiro

HELICIA PAUCINERVIA sp. nov.

Arbor parva glabra; foliis coriaceis, oblongo-ellipticis, utrinque angustatis, basi acutis vel leviter decurrentibus, apice obtusis vel obtuse acuminatis, usque ad 14 cm longis, sursum distanter dentatis, vel integris, pagina superiore valde nitidis, nervis utrinque circiter 5, perspicuis; racemis lateralibus, e axillis defoliatis, circiter 20 cm longis; floribus solitariis vel binis, 2 cm longis.

A glabrous tree, about 5 m high, the branches dark reddish-brown. Leaves coriaceous, oblong-elliptic, narrowed to the acute or somewhat decurrent base and to the obtuse or bluntly acuminate apex, 10 to 14 cm long, 4.5 to 6 cm wide; the margins distantly and rather coarsely toothed above or sometimes entire,

the upper surface brownish-olivaceous, strongly shining, the lower surface dull, paler; lateral nerves about 5 on each side of the midrib, prominent; petioles about 1 cm long. Racemes solitary, lateral, in the axils of fallen leaves, about 20 cm long. Flowers white, solitary or paired, 2 cm long, their pedicels 2 to 3 mm long, when in pairs free nearly to the base. Perianth lobes 4, the somewhat enlarged tips narrowly oblong, about 3 mm long and 1.2 mm wide. Hypogynous scales more or less united into a prominent white disk about 1 mm high.

MINDANAO, Surigao Province, *Bur. Sci.* 34610 *Ramos & Pascasio*, April 25, 1919, on river banks at the iron deposit on the northeast coast, altitude about 300 meters.

A species closely allied to *Helicia oligophlebia* Merr. but with larger leaves and flowers. It is possible that *Bur. Sci.* 34621 *Ramos & Pascasio* from the same locality represents the same species. This specimen, however, is in fruit, and the leaves are relatively narrower and are wholly entire.

ARISTOLOCHIACEAE

BRAGANTIA Loureiro

BRAGANTIA BREVIPES sp. nov.

Suffrutex simplex, erectus, 0.5 m altus, leviter pubescens; foliis subcoriaceis, oblongo-ellipticis ad elliptico-ovatis, 11 ad 17 cm longis, basi obtusis ad rotundatis, 3-nerviis, apice obtusis ad rotundatis, plerumque minute apiculatis, breviter petiolatis, petiolo 5 ad 8 mm longo; racemis basilaribus, solitariis, 4 ad 12 cm longis, bracteis lineari-lanceolatis; floribus circiter 12 mm diametro, hirsutis, lobis late ovatis, reticulatis; capsulis tenuis, leviter torulosis, circiter 4 cm longis et 4 mm diametro.

An erect, small undershrub, up to 50 cm high, the stems sulcate when dry, grayish, 5 mm in diameter or less, solitary or 2 or 3 from the same root, more or less cinereous-pubescent as are the leaves on the lower surface. Leaves subcoriaceous, grayish or olivaceous when dry, oblong-elliptic to elliptic-ovate, 11 to 17 cm long, 6 to 10 cm wide, base rounded to obtuse, 3-nerved, the apex rounded or obtuse and usually minutely apiculate; lateral nerves above the basal pair about 5 on each side of the midrib, ascending, distinct on the lower surface as are the close reticulations; petioles 5 to 8 mm long. Racemes basal, solitary, the rachis 4 to 12 cm long, the bracts linear-lanceolate, pubescent, about 7 mm in length. Flowers about 12 mm in diameter, somewhat hirsute, yellowish, the perianth tube broadly cup-shaped or ovoid, about 4 mm long, the limb spreading, the

lobes broadly ovate, reticulate, 6 mm long and 8 mm wide, stamens 6, free, the filaments about 1 mm in length. Capsules slender, somewhat torulose when dry, about 4 cm long and 4 mm in diameter.

MINDANAO, Surigao Province, *Bur. Sci.* 34811 (type), 34369 *Ramos & Pascasio*, April and May, 1919, in forests along small streams at low altitudes. To this species I also refer *Merrill* 10490 from Alabat and *Bur. Sci.* 13370 *Ramos* from Tayabas Province, Luzon, both of which were originally identified as *Bragantia affinis* Planch.

The alliance of this species is manifestly with *Bragantia affinis* Planch., a species definitely known only from Panay. It is distinguished from the latter especially by its much shorter petioles.

MENISPERMACEAE

FIBRAUREA Loureiro

FIBRAUREA CHLOROLEUCA Miers in *Ann. Nat. Hist.* III 13 (1864) 489; Diels in *Engl. Pflanzenreich* 46 (1910) 120, f. 43.

DINAGAT, *Bur. Sci.* 35224, 35229 *Ramos & Pascasio*, May 12, 1919, in forests along small streams at low altitudes.

This is the first record of this genus as Philippine, the specimens cited above coming well within the range of variation of Miers's species as represented by ample material before me from Borneo, Sumatra, Java, and the Malay Peninsula, although the inflorescences are 30 cm in length; the longest inflorescence on the extra-Philippine material available for comparison is 25 cm, while Diels gives the maximum as 20 cm. The species extends from Burma, through Malaya, to Celebes.

MAGNOLIACEAE

TALAUMA Jussieu

TALAUMA RETICULATA sp. nov.

Arbor glabra, pedunculis ramulisque exceptis glabra; foliis anguste oblongis ad oblongo-oblongeolatis, 24 ad 34 cm longis, 5 ad 7.5 cm latis, crasse coriaceis, nitidis, deorsum angustatis, basi cuneatis, apice acutis vel breviter acuminatis, nervis utrinque circiter 14, cum reticulis valde perspicuis; carpellis ut videtur paucis 1.5 ad 3 cm longis, 1 ad 1.5 cm latis, obtusis, haud rostratis.

A small tree, glabrous except the peduncles and very young branchlets, the latter about 5 mm in diameter. Leaves narrowly oblong to oblong-oblongeolate, 24 to 34 cm long, 5 to 7.5

cm wide, thickly coriaceous, shining, narrowed below to the cuneate base and above to the acute or shortly acuminate apex; lateral nerves about 14 on each side of the midrib, distant, anastomosing, prominent, the reticulations very distinct on both surfaces; petioles stout, about 2 cm long. Fruits solitary, their peduncles about 5 cm long, appressed-pubescent, the rachis of the infructescence 5 to 6 cm long, the individual carpels apparently few, brown when dry, 1.5 to 3 cm long, 1 to 1.5 cm wide, their tips blunt, not at all prolonged into a beak.

DINAGAT, *Bur. Sci.* 35187 Ramos & Pascasio, May 12, 1919, in forests at low altitudes.

This species in its vegetative character resembles *Talauma angatensis* F.-Vill., but has narrower, differently shaped, more conspicuously reticulate leaves; it further differs from the latter species in its apparently few carpels which are merely blunt at their apices, not at all beaked.

ANNONACEAE

OXYMITRA Hooker f. and Thomson

OXYMITRA OLIGOPHLEBIA sp. nov.

Frutex scandens, ramulis floribusque exceptis glaber, ramis tenuibus; foliis chartaceis vel subcoriaceis, oblongis ad oblongo-lanceolatis, usque ad 10 cm longis, basi rotundatis, sursum angustatis, acutis vel leviter acuminatis, olivaceis, nitidis, subtus brunneis, nervis utrinque plerumque 5, tenuibus, distinctis; floribus extra-axillaribus, solitariis, circiter 3 cm longis, lanceolatis, ferrugineo-pubescent, longetenuiterque pedicellatis.

A scandent shrub, glabrous except the very slightly pubescent branchlets and the rather densely ferruginous-pubescent flowers; the branches terete, slender, about 3 mm in diameter, shining, dark reddish-brown when dry. Leaves firmly chartaceous or subcoriaceous, oblong to oblong-lanceolate, 6 to 10 cm long, 2 to 3.5 cm wide, the base rounded, narrowed upward to the acute or slightly acuminate apex, the upper surface olivaceous, shining, the lower surface brownish; lateral nerves usually 5 on each side of the midrib, slender, distinct, curved, the reticulations not prominent; petioles about 3 mm long. Flowers yellow, solitary, extra-axillary, about 3 cm long, lanceolate, acuminate, their pedicels up to 2.5 cm long, slender, sparingly pubescent with a small bract below the midrib. Calyx-lobes triangular-ovate, pubescent, acuminate, about 3 mm long. Outer petals when young densely ferruginous-pubescent, the indumentum more or less scattered in age.

BUCAS GRANDE, *Bur. Sci.* 35068 Ramos & Pascasio, June 10, 1919, in dry forests at low altitudes.

This species is probably more closely allied to *Oxymitra paucinervia* Merr. than to any other species, but differs in its fewer-nerved leaves which are not at all glaucous beneath.

GONIOTHALAMUS Hooker f. and Thomson

GONIOTHALAMUS PANAYENSIS sp. nov.

Arbor parva, ramulis junioribus et floribus plus minusve pubescens; foliis chartaceis vel subcoriaceis, oblongis, 15 ad 30 cm longis, basi acutis, apice tenuiter acuminatis, nervis utrinque circiter 12, perspicuis; floribus solitariis vel fasciculatis e truncis vel ramis majoribus, breviter pedicellatis, circiter 2.5 cm longis; petalis exterioribus lanceolatis, crasse coriaceis sursum angustatis, utrinque plus minusve pubescens; petalis interioribus circiter 1.3 cm longis, conniventibus.

A tree, about 5 m high, the very young branchlets sparingly pubescent, the flowers usually densely so, otherwise glabrous. Leaves chartaceous or subcoriaceous, oblong, shining, 15 to 30 cm long, 4 to 10 cm wide, the base acute, apex slenderly acuminate; lateral nerves about 12 on each side of the midrib, prominent, the reticulations rather lax, distinct; petioles 1 to 2 cm long. Flowers yellowish, solitary or fascicled on the trunk and larger branches, rarely axillary on the younger branches, their pedicels densely pubescent, about 4 mm long, usually subtended by a pair of small bracts. Calyx about 1.3 cm in diameter, the lobes ovate, acute or somewhat acuminate, more or less pubescent. Outer 3 petals lanceolate, apparently fleshy, thickly coriaceous when dry, about 2.5 cm long and 8 mm wide, narrowed upward to the acute or slightly acuminate apex, slightly constricted toward the base, both surfaces more or less pubescent with short, appressed, shining, brownish hairs. Inner petals about 1.3 cm long, appressed-pubescent, connivent.

PANAY, Capiz Province, Libacao and Mount Salibongbong, *Bur. Sci.* 35290 (type), 35575 Martelino & Edaño, June, 1919, in forests.

This species is distinctly allied to *Goniothalamus amuyon* (Blanco) Merr., from which it is readily distinguished by its larger, slenderly acuminate leaves, and smaller flowers.

PSEUDUVARIA Miquel

PSEUDUVARIA CAUDATA sp. nov.

Arbor parva, dioeca, partibus junioribus floribusque exceptis glabra, ramis tenuibus; foliis lanceolatis, 5 ad 14 cm longis,

nitidissimis, basi acutis, apice caudato-acuminatis, nervis utrinque 7 ad 10, perspicuis; floribus axillaribus, petalis exterioribus late ovatis, obtusis, 2.5 mm longis, interioribus arcuatis, 8 ad 9 mm longis; staminibus circiter 40.

A tree, about 7 m high, glabrous except the younger parts and the flowers. Branches slender, terete, nearly black when dry, glabrous, the branchlets sparingly pubescent. Leaves lanceolate, 6 to 14 cm long, 1.5 to 3.5 cm wide, chartaceous, strongly shining when dry, base acute, narrowed upward to the slenderly caudate-acuminate apex, the lower surface slightly pubescent on the midrib; lateral nerves 7 to 10 on each side of the midrib, prominent, curved-ascending, anastomosing; petioles 3 to 5 mm long. Flowers axillary, greenish, solitary or in pairs, their pedicels 7 to 10 mm long, finely pubescent, bearing a small bract at the middle 1 mm long or less and wider than long. Sepals broadly ovate, rounded, pubescent, about 1.8 mm in diameter. Outer 3 petals broadly ovate, rounded or obtuse, pubescent, about 2.5 mm long; inner 3 petals arched, 8 to 9 mm long, pubescent; the limb 5 mm wide, 2 to 3 mm long, the claw 5 to 6 mm in length. Stamens about 40, densely crowded, less than 1 mm long.

LUZON, Camarines Province, Sipocot, *For. Bur.* 25533 *Cenabre*, May 15, 1916, on forested slopes, altitude about 80 meters.

A species well characterized in this small genus by its lanceolate, caudate-acuminate leaves. The specimen presents only male flowers.

POPOWIA Endlicher

POPOWIA LANCEOLATA sp. nov.

Arbor parva, ramis tenuibus, glabris, ramulis ferrugineo-pubescentis; foliis chartaceis vel subcoriaceis, lanceolatis, 4 ad 6 cm longis, 1 ad 1.5 cm latis, utrinque subaequaliter angustatis, basi cuneatis, apice tenuiter acuminatis, supra glabris, subtus ad costa nervisque adpresse pubescens; nervis utrinque plerumque 5, tenuibus, adscendentibus, reticulis obsoletis; fructibus globosis circiter 8 mm diametro.

A tree, about 8 m high, the branches and branchlets terete, the former glabrous, nearly black when dry, slender, the latter more or less ferruginous-pubescent. Leaves lanceolate, firmly chartaceous or subcoriaceous, 4 to 6 cm long, 1 to 1.5 cm wide, subequally narrowed to the cuneate base and to the rather slenderly acuminate apex, the upper surface glabrous, the lower surface paler and appressed-pubescent on the midrib and nerves; lateral nerves slender, ascending, usually 5 on each side of the

midrib, the reticulations obsolete; petioles about 2 mm long. Very young flowers in axillary, short, few-flowered cymes, the pedicels, sepals, and petals ferruginous-pubescent. Fruits globose, sparingly pubescent, about 8 mm in diameter.

DINAGAT, *Bur. Sci.* 35186 *Ramos & Pascasio*, May 12, 1919, in forests at low altitudes.

A species manifestly allied to *Popowia polyandra* (Presl) Merr., which in turn is perhaps not specifically distinct from the Malayan *P. pisocarpa* Endl. The present species is strongly characterized by its narrow, lanceolate, slenderly acuminate leaves.

MYRISTICACEAE

HORSFIELDIA Willdenow

HORSFIELDIA ACUMINATA sp. nov. § *Irya*, *Euirya*.

Arbor, ramulis junioribus inflorescentiisque exceptis glabra, ramulis teretibus, haud longitudinaliter lineatis; foliis chartaceis, lanceolatis ad oblongo-lanceolatis, 15 ad 20 cm longis, basi acutis, apice tenuiter acuminatis, nervis utrinque circiter 16, tenuibus, distinctis; inflorescentiis ♂ axillaribus, paniculatis, usque ad 12 cm longis, ferrugineo-pubescent, floribus breviter pedicellatis, confertis, circiter 1.5 mm diametro.

A tree, glabrous except the very youngest branchlets and the inflorescences which are more or less ferruginous-pubescent. Branches terete, reddish-brown, lenticellate, the twigs without longitudinal lines. Leaves chartaceous, lanceolate to oblong-lanceolate, 15 to 20 cm long, 3.5 to 4 cm wide, somewhat olivaceous, shining, the base acute, the apex slenderly acuminate; lateral nerves about 16 on each side of the midrib, slender, distinct; petioles about 8 mm long. Staminate inflorescences axillary, paniculate, up to 12 cm long, branched from near the base, the primary branches up to 4.5 cm in length, the flowers somewhat crowded on the ultimate branchlets, the rachis, branches, and branchlets when young densely ferruginous-pubescent, the indumentum somewhat deciduous. Staminate flowers globose, glabrous, about 1.5 mm in diameter, the perianth 2-valved, their pedicels up to 1 mm long. Anther cells short, on the margin of the disk, their tips free.

MINDANAO, Davao Province, Astorga, *For. Bur.* 27507 *De Mesa*, April 23, 1919, in rich, level, forested areas, altitude about 20 meters, with the local Maguindanao name *kaná*.

A species belonging in the group with *Horsfieldia irya* Warb.

but distinguished from it and its congeners by a number of characters.

HORSFIELDIA RAMOSII sp. nov.

Arbor parva, ramulis et inflorescentiis et foliis subtus secus costam castaneo-stellato-pubescent, ramulis ultimis haud lineatis; foliis oblongis ad oblongo-lanceolatis, subcoriaceis, 13 ad 17 cm longis, basi acutis, apice tenuiter acute acuminatis, nervis utrinque circiter 15, reticulis laxis, subobsoletis; inflorescentiis ♀ axillaribus, 2 ad 3 cm longis, paucifloris, racemosis vel depauperato-paniculatis; floribus globosis, 2 mm diametro.

A tree, the branchlets and lower surface of the leaves along the midrib stellate-pubescent with short, castaneous hairs, the indumentum somewhat deciduous, the branches glabrous, the ultimate branchlets without longitudinal lines. Leaves oblong to oblong-lanceolate, subcoriaceous, 13 to 17 cm long, 4 to 6 cm wide, narrowed below to the acute or somewhat decurrent base, and above to the slenderly and sharply acuminate apex; lateral nerves about 15 on each side of the midrib, obscurely anastomosing, the reticulations lax, indistinct or obsolete; petioles 8 to 12 mm long, stellate-pubescent when young, becoming glabrous. Pistillate inflorescences axillary and from the axils of fallen leaves, stellate-pubescent, 2 to 3 cm long, few-flowered, racemose or depauperate-paniculate, the primary branches when present few, about 3 mm long. Perianth glabrous, globose or ovoid, 2-valved, about 2 mm in diameter, the pedicels about 2 mm long.

BUCAS GRANDE, *Bur. Sci.* 35047 Ramos & Pascasio, June 11, 1919, in dry forests at low altitudes.

This species is apparently most closely allied to *Horsfieldia obscurinervia* Merr., but is readily distinguished by its castaneous, stellate indumentum on the branchlets, inflorescences, and lower surface of the leaves. The two species are not, however, directly comparable, as of the latter the staminate flowers are known and of the species described above only the pistillate ones.

MYRISTICA Linnaeus

MYRISTICA LAXIFLORA sp. nov.

Arbor, subtus foliis et ramulis et inflorescentiis ferrugineo-pubescent; foliis lanceolatis ad oblongo-lanceolatis, chartaceis, 10 ad 15 cm longis, utrinque angustatis, basi acutis, apice acutis vel leviter acuminatis, supra glabris, nitidis, subtus subcupreis,

nervis utrinque circiter 12, tenuibus, reticulis subobsoletis; inflorescentiis ♂ axillaribus, paniculatis, laxis, 4.5 ad 6 cm longis; floribus subumbellatim dispositis, pedicellatis, ellipsoideis, 4 mm longis; fructibus ellipsoideis, circiter 4.5 cm longis, dense ferrugineo-puberulis.

A tree, the branchlets, inflorescences, and leaves on the lower surface ferruginous-pubescent or puberulent with dense short hairs. Branches reddish-brown, glabrous. Leaves lanceolate to oblong-lanceolate, chartaceous, 10 to 15 cm long, 2.5 to 4.5 cm wide, narrowed below to the acute base and above to the acute or somewhat acuminate apex, the upper surface glabrous, smooth and shining when dry, the lower often somewhat cupreous from the rather dense, close indumentum; lateral nerves about 12 on each side of the midrib, slender and not prominent, scarcely impressed on the upper surface, the reticulations nearly obsolete; petioles 1 to 2.5 cm long, when young pubescent, eventually glabrous. Staminate inflorescences axillary, paniculate, rather lax, 4.5 to 6 cm long, ferruginous-pubescent, the primary branches 1.5 cm long or less, the flowers rather laxly and umbellately arranged at the tips of the branches, their pedicels 4 to 5 mm long. Perianth about 4 mm long, pubescent, ellipsoid, 3-lobed, anthers about 8, the anther-mass about 1.5 mm long, borne on a 1-mm long column; bracteole at the base of the calyx reniform, obscure, 0.4 mm long or less. Fruit ellipsoid, ferruginous and rather densely puberulent, when dry smooth, about 4.5 cm long, and the aril lacinate to the very base.

BASILAN, *Bur. Sci.* 15498 *Reillo* (type), August 14, 1912, in forests at low altitudes. TINAGO, *Ahern* 421, February to June, 1901, with the local name *dugan*.

A species belonging in the *littoralis* series, well characterized by its cupreous or ferruginous indumentum and by its rather large, lax, minutely bracteolate, staminate inflorescences. *Ahern* 421 cited above is a fruiting specimen and was originally identified as *Myristica cumingii* Warb.

MYRISTICA CAGAYANENSIS sp. nov.

Arbor circiter 8 m alta, ramulis junioribus fructibusque ferrugineo-pubescentibus; foliis coriaceis, oblongis, 13 ad 18 cm longis, utrinque obtusis vel apice late obtuseque acuminatis, nervis utrinque circiter 18, reticulis subobsoletis; fructibus ellipsoideis, circiter 7 cm longis, minute ferrugineo-pubescentibus, in siccitate rugosis, seminibus circiter 4 cm longis.

A tree, about 8 m high, the very tips of the branchlets and

the fruits ferruginous-pubescent, otherwise glabrous (inflorescences unknown). Leaves coriaceous, oblong, 13 to 18 cm long, 4 to 5.5 cm wide, the base obtuse to rounded, the apex obtuse or very broadly obtuse-acuminate, the lower surface distinctly paler than the upper, sometimes slightly glaucous; lateral nerves about 18 on each side of the midrib, somewhat impressed on the upper surface, slightly projecting on the lower surface, the reticulations nearly obsolete; petioles 1.5 to 2 cm long. Fruits solitary, ellipsoid or cylindric, brown and minutely ferruginous-pubescent when mature, rugose, about 7 cm long, the seed smooth, shining, about 4 cm long, the aril laciniate nearly to the base.

LUZON, Cagayan Province, San Vicente, *For. Bur.* 24277 *Bernardo*, August 12, 1915, in dense forests at low altitudes with the local Negrito name *ngabngab*.

A species apparently belonging with *Myristica philippensis* Lam. but with much smaller, entirely glabrous leaves.

KNEMA Loureiro

KNEMA ACUMINATA sp. nov.

Arbor circiter 12 m alta, ramulis fructibusque ferrugineo-pubescent; foliis subcoriaceis, lanceolatis ad oblongo-lanceolatis, 3 ad 13 cm longis, basi acutis, sursum angustatis, tenuiter acuminatis, supra subolivaceis, nitidis, subtus pallidioribus, vix glaucescentibus, nervis utrinque 8 ad 12, perspicuis; fructibus subglobosis ad ovoideis, 1.5 ad 2 cm longis.

A tree, about 12 m high, the branchlets and fruits ferruginous-pubescent. Leaves subcoriaceous, lanceolate to oblong-lanceolate, entire, 9 to 13 cm long, 2.5 to 4.5 cm wide, the base acute or somewhat decurrent-acuminate, the apex slenderly acuminate, the upper surface somewhat olivaceous, glabrous, the lower pale but scarcely glaucous, glabrous or nearly so; lateral nerves distinct, 8 to 12 on each side of the midrib, the reticulations fine, rather close; petioles 1 to 1.5 cm long. Fruits subglobose to ovoid, 1.5 to 2 cm long, ferruginous-pubescent, their pedicels about 7 mm long, usually 3 borne on a common, very short, axillary peduncle at most 5 mm in length.

LUZON, Isabela Province, Ilagan, *For. Bur.* 11266 *Klemme*, May 18, 1908, in dense level forests at low altitudes.

A species probably most closely allied to *Knema vidalii* Warb., but easily distinguished by its slenderly acuminate, few-nerved leaves.

LAURACEAE

CRYPTOCARYA R. Brown

CRYPTOCARYA OLIGOCARPA sp. nov.

Frutex vel arbor parva, partibus junioribus exceptis glabra; foliis coriaceis, oblongo-ellipticis ad oblongo-ovatis, 6 ad 10 cm longis, apice breviter obtuseque acuminatis, basi acutis vel rotundatis, utrinque laevis, supra nitidis, subtus albido-glauciscentibus, nervis utrinque circiter 7, perspicuis; infructescentiis axillaribus, spicatus, usque ad 1.5 cm longis, fructibus paucis ellipsoideis, nitidis, glabris, circiter 1 cm longis.

A shrub or small tree, glabrous except the younger parts. Branches terete, glabrous, usually brownish, the very young branchlets appressed-pubescent, soon becoming glabrous. Leaves coriaceous, oblong-elliptic to oblong-ovate, 6 to 10 cm long, 2.5 to 5 cm wide, the apex shortly and obtusely acuminate, the base acute to rounded, the upper surface smooth, shining, pale greenish when dry, the lower surface glaucous; lateral nerves about 7 on each side of the midrib, prominent on the lower surface, brown in contrast with the glaucous epidermis, the reticulations slender, not prominent; petioles 8 to 10 mm long, glabrous. Infructescences in the uppermost axils, usually reduced to a simple spike, the axils 1.5 cm long or less. Fruits few, somewhat ellipsoid, smooth, shining, glabrous, nearly black when dry, about 1 cm long.

MINDANAO, Surigao Province, *Bur. Sci. 34716 Ramos & Pascasio*, June 14, 1919, at the iron deposit on the northeast coast along streams at low altitudes.

This species is apparently most closely allied to *Cryptocarya ramosii* Merr., but the leaves and fruits are smaller and the former are not at all foveolate, both surfaces being entirely smooth.

PITTOSPORACEAE

PITTOSPORUM Banks

PITTOSPORUM OBSCURINERVE sp. nov.

Arbor parva, ramulis junioribus leviter ferrugineo-pubescent; foliis verticillatis, coriaceis, rigidis, oblongis-obovatis ad oblanceolatis, 7 ad 9 cm longis, acutis vel breviter acuminatis, basi tenuiter cuneatis; nervis utrinque circiter 7, tenuibus, obscuris; capsulis subumbellatis, oblongis 2-valvis, circiter 1.8 cm longis.

A glabrous tree, about 4 m high, the very young branchlets

more or less ferruginous-pubescent. Leaves verticillate, coriaceous, rigid, brownish-olivaceous and slightly shining when dry, oblong-obovate to oblanceolate, 7 to 9 cm long, 1.5 to 3.5 cm wide, the apex acute or shortly and acutely acuminate, narrowed below to the slenderly cuneate base; lateral nerves about 7 on each side of the midrib, very slender, obscure, obsolete on the upper surface; petioles about 1 cm long. Infructescences terminal, subumbellate, their peduncles up to 4 cm long slightly pubescent, the pedicels 1 cm long or less. Capsules yellow when fresh, fleshy, glabrous, oblong, about 1.8 cm long, 2-valved, the valves black and rugose when dry, spreading, obtuse.

MINDANAO, Surigao Province, *Bur. Sci.* 34441 *Ramos & Pascasio*, April 25, 1919, along small streams at the iron deposit on the northeast coast, altitude about 590 meters.

A species belonging in the group with *Pittosporum odoratum* Merr., but readily distinguishable by its thickly coriaceous, rigid, very obscurely nerved leaves.

PITTOSPORUM EUPHLEBIUM sp. nov.

Frutex vel arbor parva, ramulis junioribus leviter ferrugineo-pilosis; foliis verticillatis, chartaceis, oblongis ad oblongo-oblanceolatis, nitidis, acute acuminatis, basi cuneatis, nervis utrinque circiter 5, subtus cum reticulis valde perspicuis; capsulis terminalibus, solitariis anguste ellipsoideis, 2-valvis, circiter 3 cm longis.

A shrub or small tree, glabrous except the very young parts which are sparingly ferruginous-pilose, the indumentum deciduous, branchlets slender, terete, the internodes 7 to 14 cm long. Leaves verticillate, chartaceous, oblong to oblong-oblanceolate, olivaceous, shining, the apex sharply acuminate, the base cuneate, 7 to 12 cm long, 2 to 3 cm wide; lateral nerves about 5 on each side of the midrib, distant, very prominent on the lower surface, projecting, laxly anastomosing, the primary reticulations lax, distinct. Capsules terminal, solitary, narrowly ellipsoid and nearly smooth when dry, 2-valved, about 3 cm long, their peduncles about 1.5 cm in length.

PANAY, Capiz Province, Libacao, *Bur. Sci.* 35416 *Martelino & Edaño*, May 30, 1919, on open forested slopes at low altitudes.

By its solitary, terminal capsules this species apparently belongs in the group with *Pittosporum glaberrimum* Merr. from which it is distinguished by its larger leaves and capsules and by its nerves and lax reticulations being prominently raised on the lower surface.

ROSACEAE

ROSA Linnaeus

ROSA LUZONIENSIS sp. nov. § *Synstylae*.

Frutex scandens, usque ad 4 m altus, glaber, ramis aculeatis, aculeis sparsis, curvatis, tenuibus, usque ad 6 mm longis; foliis 3 ad 5 cm longis, 5- vel 7-foliatis, foliolis parvis, elliptico-ovatis, leviter acuminatis, 5 ad 15 mm longis, inermis vel subtus ad costa aculeis paucis armatis; stipulis adnatis, margine pectinatis atque glandulis capitatis paucis instructis; floribus plerumque solitariis, calycis tubo glabro, lobis oblongo-lanceolatis, usque ad 10 mm longis, intus pilosis, extus glabris, margine parce capitato-glandulosis, atque laciniis tenuibus 2 vel 3 utrinque instructis; stylis circiter 15, glabris, connatis, 3 ad 5 mm longis.

A scandent shrub, attaining a length of 4 m, glabrous except the inner surface of the sepals. Branches armed with slender, somewhat curved spines 4 to 6 mm in length. Leaves pinnate, 5- or 7-foliolate, 3 to 5 cm long, glabrous, the leaflets small, elliptic-ovate, acute or acuminate, or the lower ones sometimes obtuse, sharply serrate, 5 to 15 mm long, the midrib beneath unarmed or with a few short spines; stipules adnate, pectinate, the outer margins also somewhat capitate-glandular. Flowers white, mostly solitary, about 3 cm in diameter, their pedicels unarmed, not at all glandular, usually about 1 cm long. Calyx-tube glabrous, oblong-obovoid, about 6 mm long; lobes oblong-lanceolate, about 10 mm long, externally glabrous, inside pubescent, the margins sparingly capitate-glandular and with two or three, slender, 1.5 to 2 mm long lacinae on each side. Petals broadly obovate, about 17 mm long, retuse. Stamens indefinite, their filaments glabrous, up to 5 mm long. Styles about 15, glabrous, more or less united, 3 to 5 mm long.

LUZON, Benguet Subprovince, Pauai, *Bur. Sci.* 31876 Santos (type), May 29, 1918, *Bur. Sci.* 4300 Mearns, July, 1907, *Bur. Sci.* 3336 McGregor, June, 1909, on slopes in thickets near the mossy forest, altitude about 2,300 meters, with the local name *pauican*.

This form has been confused with *Rosa multiflora* Thunb., from which, among other characters, it is distinguished by its much smaller leaves and leaflets; in being entirely glabrous, except for the sepals; in the absence of capitate glands on the branchlets and vegetative parts; and in its usually solitary flowers. It is apparently closely allied to the Formosan *Rubus transmorrisonensis* Hayata.

ROSA PHILIPPINENSIS sp. nov. § *Synstylae*.

Rosa multiflora Vidal Rev. Pl. Vasc. Filip. (1886) 123; Merr. in Philip. Journ. Sci. 5 (1910) Bot. 352, non Thunb.

Frutex suberectus vel scandens, 1 ad 4 m altus, ramis parce aculeatis, ramulis perspicue capitato-glandulosis; foliis 5- ad 9-foliolatis, 9 ad 12 cm longis, glabris, foliolis chartaceis, oblongo-ellipticis ad oblongo-ovatis, 3 ad 5 cm longis, serratis, plerumque acutis; stipulis adnatis, angustis, haud pectinatis, margine capitato-glandulosis; floribus numerosis, paniculatis, 3 ad 3.5 cm diametro, pedicellis calycibusque extus leviter hirsutis atque capitato-glandulosis, lobis oblongo-lanceolatis, caudato-acuminatis, usque ad 12 mm longis, intus cinereo-villosis, margine plerumque integris vel lobis angustis 1 vel 2 utrinque instructis; stylis connatis, hirsutis, circiter 5 mm longis.

A suberect or more or less scandent shrub, 1 to 4 m in height, nearly glabrous. Branches armed with scattered, stout, recurved spines about 4 mm in length, the branchlets conspicuously capitate-glandular as are the inflorescences and calyces. Leaves 5- to 9-foliolate, glabrous, 9 to 12 cm long, the rachis sparingly aculeate; leaflets chartaceous, oblong-elliptic to oblong-ovate, mostly acute, 3 to 5 cm long, sharply serrate; stipules adnate, scarcely pectinate, narrow, their margins capitate-glandular, the linear, free, apical parts 3 mm long or less. Panicles terminal, ample, somewhat leafy, many-flowered, up to 20 cm in length, all parts capitate-glandular, the pedicels 2.5 to 4 cm long. Flowers white, 3 to 3.5 cm in diameter. Calyx-tube somewhat pubescent, glandular-capitate, about 5 mm long, the lobes oblong-lanceolate, caudate-acuminate, up to 12 mm long, pubescent and capitate-glandular outside, inside densely cinereous-pubescent, caudate-acuminate, entire or with one or two narrow lobes on each side. Petals obovate, retuse. Stamens indefinite. Styles hirsute, connate, about 5 mm long.

LUZON, Benguet Subprovince, Baguio and vicinity, *Elmer* 5794 (type), *Merrill Phil. Pl.* 882, *Bur. Sci.* 2519, 4290 *Mearns*, *Sandkuhl* 371, *Santos* 14: Bontoc Subprovince, *Vanoverbergh* 50. In thickets, gulches, etc., in the pine region, altitude 1,200 to 1,700 meters.

This species has long been confused with *Rosa multiflora* Thunb., the typical form of which is apparently confined to Japan and Korea. A more critical examination of the Philippine material than has hitherto been made shows that this form is distinguishable from Thunberg's species in numerous charac-

ters and is really more closely allied to *Rosa wichuraiana* Crépin than to *R. multiflora* Thunb.

Var. **DEPAUPERATA** var. nov.

A typo differt foliis minoribus, foliolis 1 ad 3 cm longis.

LUZON, Benguet Subprovince, *Williams* 972, *Clemens* 9106, *Elmer* 8416, *Merrill* 4643, 6532, *Topping* 32, *Bur. Sci.* 3376 *Mearns*, *Bur. Sci.* 5568, 5821 *Ramos*, *For. Bur.* 18168 *Curran*, *Zschokke*, & *Merritt*: Bontoc Subprovince, *For. Bur.* 14462 *Darling*: Lepanto Subprovince, *For. Bur.* 5746 *Klemme*: Ifugao Subprovince, *Bur. Sci.* 19653 *McGregor*.

In the same habitats as the typical form of the species but more abundant. The recorded local names are *pigit* in Bontoc and *kuyaob* in Lepanto.

CONNARACEAE

CONNARUS Linnaeus

CONNARUS CAUDATUS sp. nov.

Frutex scandens, inflorescentiis exceptis glaber, foliis usque ad 30 cm longis, 5-foliolatis, foliolis oblongo-ovatis ad oblongo-lanceolatis, nitidis, subcoriaceis, usque ad 17 cm longis, apice tenuiter caudato-acuminatis, basi obtusis et minutissime, peltatis, nervis utrinque plerumque 4, distinctis; infructescentiis leviter castaneo-pubescent, paniculatis, folliculis oblique obovoideis, extus glabris, intus pubescens, circiter 2.5 cm longis, apice rotundatis, oblique rugulosis vel striatis.

A woody vine, glabrous except the inflorescences. Leaves up to 30 cm long, pinnately 5-foliolate; leaflets oblong-ovate to oblong-lanceolate, olivaceous, shining, subcoriaceous, 7 to 17 cm long, 2.5 to 5 cm wide, the apex long and slenderly caudate-acuminate, the base obtuse and very minutely peltate; lateral nerves usually 4 on each side of the midrib, distinct, anastomosing, the reticulations lax. Infructescences peduncled; somewhat castaneous-pubescent, paniculate, the follicles obliquely obovoid, slightly compressed, about 2.5 cm long, the apex broadly rounded, the base acute, the remains of the style somewhat lateral, the valves brown when dry, rugulose or striate, glabrous externally or very slightly pubescent when young, inside more or less pubescent.

BUCAS GRANDE, *Bur. Sci.* 35059 *Ramos & Pascasio*, June 10, 1919, in dry forests at low altitudes.

In its follicle characters this species is similar to *Connarus*

neurocalyx Planch., but it differs radically from Planchon's species in its caudate-acuminate leaflets.

ELLIPANTHUS Hooker f.

ELLIPANTHUS LONGIFOLIUS sp. nov.

Arbor parva, ramulis et inflorescentiis et fructibus exceptis glaber; foliis anguste oblongo-lanceolatis, coriaceis, 23 ad 30 cm longis, 4 ad 6 cm latis, apice tenuiter acuminatis, basi late acutis, utrinque nec profunde foveolatis, nervis utrinque circiter 9, distantibus, distinctis; fructibus inaequilateralibus, oblongis, circiter 3 cm longis, acuminatis, deorsum angustatis, extus densissime castaneo-pubescentis.

A shrub or small tree, glabrous except the very young branchlets, inflorescences, and fruits. Branches terete, glabrous, reddish-brown. Leaves narrowly oblong-lanceolate, coriaceous, 23 to 30 cm long, 4 to 6 cm wide, shining when dry, the apex slenderly acuminate, the base broadly acute; lateral nerves about 9 on each side of the midrib, distant, distinct, anastomosing, the ultimate reticulations often distinct; both surfaces appearing shallowly foveolate; petioles 1.5 to 3 cm long. Infructescences axillary and from the axils of fallen leaves, the carpels either solitary or in pairs or threes on a common peduncle which is less than 1 cm in length. Follicles inequilateral, oblong, about 3 cm long and 1 cm wide, one side nearly straight, the other curved, apex acuminate, base narrowed into a 5 mm long pseudostalk, densely pubescent outside with short castaneous hairs.

DINAGAT, *Bur. Sci.* 35180 Ramos & Pascasio, May 12, 1919, on the forested banks of small streams at low altitudes.

A species belonging in the group with *Ellipanthus luzoniensis* Vid., but readily distinguished by its elongated narrow leaves.

LEGUMINOSAE

PITHECOLOBIUM Martius

PITHECOLOBIUM SESSILIFLORUM sp. nov.

Arbor parva, inflorescentiis perspicue ferrugineo-pubescentis, ramulis angulatis; foliis circiter 40 cm longis, pinnae plerumque 10-jugis, jugis intermediis usque ad 17 cm longis, apice 1-glandulosis; foliis circiter 15-jugis, rhomboideis vel oblique rhomboideis, valde inaequilateralibus, subcoriaceis, 1.5 ad 3.5 cm longis, acuminatis; paniculis usque ad 50 cm longis, floribus sessilibus, subumbellatim confertis, calycis dense ferrugineo-pubescentis, corolla 8 ad 9 mm longa, dense ferrugineo-pubescentis.

A small tree, about 4 m high, the inflorescences prominently ferruginous-pubescent on the younger parts, the plant otherwise nearly glabrous, the branchlets dark brown when dry, prominently angled. Leaves about 40 cm long, the pinnae usually about 10 pairs, the lowest 1 or 2 pairs usually much shorter than the others, the intermediate ones up to 17 cm long, the main rachis slightly pubescent as are the secondary ones, angular, and with a single prominent gland near the base, the secondary rachises with a single small gland at the base of the ultimate pair of leaflets; leaflets on the intermediate pinnae about 15 pairs, rhomboid or obliquely rhomboid, very inequilateral, the midrib diagonal, subcoriaceous, brown and strongly shining when dry, 1.5 to 3.5 cm long, 6 to 15 mm wide, acuminate, the lower surface very sparingly pubescent. Panicles terminal, ample, peduncled, up to 50 cm long, the flowers white, numerous, subumbellately crowded at the tips of the ultimate branchlets, sessile or nearly so, the subtending bracteoles obovate to oblong-obovate, somewhat acuminate, about 3 m long. Calyx about 4 mm long, densely ferruginous-pubescent, cup-shaped, the teeth triangular, acute, about 1 mm long. Corolla 8 to 9 mm long, densely ferruginous-pubescent, the lobes oblong-ovate, about 3.5 mm long. Ovary oblong-ovate to somewhat obovate, pubescent, 1.5 to 2 mm in length.

MINDANAO, Surigao Province, *Bur. Sci.* 34675 *Ramos & Pascasio*, June 15, 1919, along streams at low altitudes at the iron deposit on the northeast coast.

A species belonging in the group with *Pithecolobium clypearia* Benth. and in this group apparently most closely allied to *Pithecolobium contortum* Mart., from which it is readily distinguished, among other characters, by its very densely ferruginous-pubescent corollas.

ORMOSIA Jackson

ORMOSIA SURIGAENSIS sp. nov.

Arbor, ramulis junioribus inflorescentiisque dense ferrugineo-pubescentis; foliis 11 ad 15 cm longis, foliolis 5 vel 7, coriaceis, oblongo-ovatis ad oblongo-ellipticis, olivaceis, nitidis, 5 ad 9 cm longis, basi late rotundatis, apice obtusis vel late obtuseque acuminatis; paniculis terminalibus, circiter 20 cm longis, e basi ramosis; calycis dense ferrugineo-pubescentis, lobis oblongis, obtusis, circiter 6 mm longis, vexilla violacea, late reniformi-orbicularis, appendicibus anterioribus carnosius, oblongis, 2.5 mm longis; ovulis plerumque 3.

A tree, the very young branchlets and inflorescences densely ferruginous-pubescent, otherwise glabrous or nearly so. Leaves 11 to 15 cm long, the rachis and petioles sparingly pubescent, ultimately glabrous or nearly so; leaflets 5 or 7, coriaceous, oblong-ovate to oblong-elliptic, olivaceous, shining, 5 to 9 cm long, 2.5 to 5 cm wide, the base usually broadly rounded, apex obtuse or broadly and obtusely acuminate; lateral nerves usually 6 on each side of the midrib, slender, not prominent; petiolules 5 to 7 mm long. Panicles terminal, branched from the base, about 20 cm long, the lower branches up to 13 cm in length. Flowers numerous, their pedicels about 1 cm long. Calyx densely ferruginous-pubescent, about 1.5 cm in diameter, the lobes oblong-ovate, about 6 mm long, 4.5 mm wide, obtuse. Petals violet, glabrous, the standard reniform-orbicular, rounded, about 13 mm wide, the claw stout, thick, with two anterior oblong, fleshy, 2.5 mm long appendages, wing and keel of the petals subequal, their claws 4 to 6 mm long. Filaments glabrous. Ovary oblong, densely pubescent, usually 3-ovulate.

MINDANAO, Surigao Province, *Bur. Sci.* 34494 *Ramos & Pascasio*, April 24, 1919, on ridges at low altitudes at the iron deposit on the northeast coast.

The alliance of this species is not entirely clear, as the fruits are unknown. It is, however, radically different from all other species of the genus known to me.

LINACEAE

IXONANTHES Jack

IXONANTHES LONGIPEDUNCULATA sp. nov.

Arbor parva, glabra; foliis ellipticis ad elliptico-obovatis, 9 ad 12 cm longis, apice rotundatis, basi acutis, coriaceis, nitidis, nervis utrinque circiter 8; infructescentiis axillaribus, longe pedunculatis, apice dichotome ramosis, ramis primariis circiter 1 cm longis, pedunculis circiter 15 cm longis; capsulis oblongis, 2.5 cm longis, sepalis persistentibus rotundato-ovatis, 5 ad 7 mm longis.

A glabrous tree, 4 to 5 m high, the branchlets smooth, reddish-brown. Leaves elliptic to elliptic-obovate, rounded, the base usually acute and often narrowly decurrent along the petioles, brownish-olivaceous when dry, shining, 9 to 12 cm long, 5 to 8 cm wide; lateral nerves about 8 on each side of the midrib, distinct, as are the reticulations. Petioles about 2 cm long. Infructescences axillary, solitary, 2-branched at the apex, the

primary branches 1 cm long, the peduncles about 15 cm long. Capsules oblong, 2.5 cm long, the persistent sepals ovate-rounded, 5 to 7 mm long.

MINDANAO, Surigao Province, *Bur. Sci. 34488 Ramos & Pascasio*, April 24, 1919, at the iron deposit on the northeast coast, on ridges at low altitudes.

This is the second representative of this small genus to be found in the Philippines and is strongly characterized by its elongated peduncles.

RUTACEAE

EVODIA Forster

EVODIA CORIACEA sp. nov.

Arbor parva, partibus junioribus exceptis glabra, ramulis circiter 6 mm diametro; foliis 3-foliolatis, foliolis coriaceis, obovatis ad oblongo-obovatis, 6 ad 8 cm longis, apice late rotundatis admodum leviter retusis, basi cuneatis, nervis utrinque circiter 7, cum reticulis valde perspicuis; infructescentiis axillaribus, 2 ad 2.5 cm longis, depauperato-paniculatis, fructibus confertis, coccis ovoideis, 4 mm longis.

A small tree, glabrous except the younger parts, ultimate branches about 6 mm in diameter, rugose, the petiolar scars large and conspicuous. Leaves 3-foliate, their petioles 3.5 to 7 cm long; leaflets coriaceous, somewhat shining, obovate to oblong-obovate, 6 to 8 cm long, 3.5 to 4.5 cm wide, the apex broadly rounded, sometimes slightly retuse, narrowed below to the cuneate or somewhat decurrent-acuminate base; lateral nerves about 7 on each side of the midrib, prominent and conspicuous as are the lax reticulations; petiolules 5 to 8 mm long. Infructescences axillary, 2 to 2.5 cm long, depauperate-paniculate, the fruits somewhat crowded, the individual cocci ovoid, about 4 mm in length.

DINAGAT, *Bur. Sci. 35172 Ramos & Pascasio*, May 12, 1919, in forests at low altitudes.

In many respects this species resembles *Evodia laxireta* Merr., from which it is readily distinguished by its shorter infructescences and smaller fruits, as well as by its shorter, differently shaped, rounded or retuse, fewer-nerved leaflets.

TETRATOMIA Hooker f.

TETRATOMIA ACUMINATA sp. nov.

Frutex 3 ad 5 m altus, inflorescentiis leviter pubescens exceptis glaber; foliis oblongo-obovatis ad oblongo-ellipticis, sub-

coriaceis, basi acutis, apice perspicue sed breviter acuminatis, nervis utrinque 8 ad 10, distinctis; inflorescentiis axillaribus, solitariis, pedunculatis, 7 ad 13 cm longis, partibus junioribus leviter pubescens, floribus numerosis; calycis lobis late ovatis; petalis accrescentibus, persistentibus, ad 4 mm longis; capsulis solitariis, oblongis, obtusis, rugosis, 5 mm longis.

A shrub, 3 to 5 m high, glabrous except the younger parts of the inflorescences, the branches usually reddish-brown. Leaves oblong-obovate to oblong-elliptic, 8 to 13 cm long, 4 to 6 cm wide, subcoriaceous, narrowed to the acute base and to the conspicuously but shortly acuminate apex, brownish or olivaceous when dry, shining; lateral nerves 8 to 10 on each side of the midrib, distinct, anastomosing; petioles 1.5 to 2.5 cm long, jointed with the leaflets. Inflorescences axillary, solitary, peduncled, 7 to 13 cm long, the branches spreading or ascending, the younger parts sparingly pubescent. Flowers numerous, yellowish-green, 4-merous. Calyx about 4 mm in diameter, the lobes 4, broad. Petals ovate, acute, persistent and accrescent, up to 4 mm long. Filaments of the 4 fertile stamens 2.5 mm long, on the margin of the very broad disk, carpels 4 but only 1 developing into a fruit. The mature capsule oblong, obtuse, 5 mm long, the valves rugose externally. Seed solitary, including the broad 2.5 mm wide wing about 4 mm in length.

BUCAS GRANDE, *Bur. Sci.* 35135 (type), 35106 Ramos & Pascasio, June 10, 1919. MINDANAO, Surigao Province, at the iron deposit on the northeast coast, *Bur. Sci.* 34707 Ramos & Pascasio, June 15, 1919, in forests at low altitudes, ascending to 350 meters.

The third species of this genus to be found in the Philippines and readily distinguishable from its congeners by its acuminate leaves.

SIMARUBACEAE

EURYCOMA Jack

EURYCOMA EGLANDULOSA sp. nov.

Arbor parva, inflorescentiis et ramulis junioribus exceptis glabra; ramulis incrassatis, 1.5 ad 2 cm diametro; foliis numerosis, confertis, usque ad 60 cm longis, foliolis circiter 30, coriaceis, anguste oblongis ad anguste oblongo-obovatis, acutis ad rotundatis, basi acutis, 6 ad 8 cm longis; paniculis axillaribus, foliis aequantibus, castaneo-pubescens, haud glandulosis; floribus circiter 7 mm longis, petalis utrinque pubescens.

A small tree, 7 to 8 m high, glabrous except the tips of the branchlets and the inflorescences, the ultimate branchlets terete,

1.5 to 2 cm in diameter. Leaves numerous, crowded at the tips of the branchlets, about 60 cm long, the rachis reddish-brown when dry, glabrous; leaflets about 15 pairs, coriaceous, narrowly oblong to narrowly oblong-obovate, the upper surface brownish-olivaceous and strongly shining when dry, the lower surface much paler and scarcely shining, 6 to 8 cm long, 1.5 to 2 cm wide, base acute, often slightly inequilateral, apex rounded to acute; lateral nerves indistinct, 12 to 15 on each side of the midrib; petiolules 2 mm long or less. Panicles axillary, as long as the leaves, sparingly castaneous-pubescent with very short simple hairs, not at all glandular. Flowers about 7 mm long. Calyx-teeth ovate, obtuse, about 1.5 mm long, puberulent. Petals oblong, acute or obtuse, about 6 mm long and 3 mm wide, both surfaces puberulent, the margins below inflexed. Filaments 2.5 mm long, the basal glandular appendages 2, narrowly oblong, up to 1 mm long, slightly pubescent. Ovary pubescent. Immature fruits oblong-ellipsoid, 1.5 mm long, apex rounded, base narrowed and subacute.

MINDANAO, Surigao Province, *Bur. Sci.* 34592 *Ramos & Pascasio* (type), April 24, 1919. DINAGAT, *Bur. Sci.* 35207 *Ramos & Pascasio*, May 12, 1919. On ridges and in forests at low altitudes, the type from the iron deposit on the northeast coast of Surigao.

Eurycoma longifolia Jack has been accredited to Luzon on the basis of a specimen, so labeled, collected by Lobb; it is absolutely certain that Lobb's specimen came from Malay Peninsula or from Borneo where Jack's species is common, and not from Luzon. The present species then is the first definite record for this small genus for the Philippines. In general appearance *Eurycoma eglandulosa* closely resembles *E. longifolia*, but the indumentum on the inflorescences consists solely of very short, castaneous, simple hairs, and is never glandular as in Jack's species.

BURSERACEAE

CANARIUM Linnaeus

CANARIUM UNIFOLIOLATUM sp. nov.

Arbor parva, glaberrima, foliis 1-foliolatis, oblongis, coriaceis, nitidis, integris, 9 ad 15 cm longis, perspicue acuminatis, basi acutis, nervis utrinque 8 ad 10, perspicuis; racemis axillaribus, 1.5 ad 2 cm longis, paucifloris, floribus circiter 4 mm longis; drupis subteretibus, leviter inaequilateralibus, acutis, circiter 1.3 cm longis, rugosis.

A small, entirely glabrous tree with simple leaves. Leaves

oblong, coriaceous, shining when dry, 9 to 15 cm long, 3.5 to 6 cm wide, entire, the apex rather prominently acuminate, the base acute; lateral nerves 8 to 10 on each side of the midrib, prominent, the reticulations distinct. Petioles 5 to 20 cm long. Racemes simple, axillary, few-flowered, 1.5 to 2 cm long, the pedicels stout, 1.5 mm long or less, the bracteoles linear-lanceolate, acuminate, about 1 mm long. Calyx somewhat cup-shaped, narrowed below, 2 to 2.5 mm long, the lobes short, broader than long. Petals oblong-elliptic, 3 mm long. Disk prominent, truncate. Staminodes 6, inserted outside of the disk. Ovary ovoid, 1.2 mm long. Fruit nearly terete, oblong-ovoid, somewhat inequilateral, acute, about 1.3 cm long, the pericarp thin, wrinkled when dry.

MINDANAO, Surigao Province, *Bur. Sci.* 34720 Ramos & Pascasio, June 14, 1919, along streams at low altitudes at the iron deposit on the northeast coast.

A species belonging in the same group with *Canarium villosum* F.-Vill. but distinguished from all previously described forms of the genus by its simple leaves.

MELIACEAE

DYSOXYLUM Blume

DYSOXYLUM CAPIZENSE sp. nov. § *Eudysoxylum*.

Arbor parva, partibus junioribus inflorescentiisque puberulis; foliis alternis, usque ad 18 cm longis, foliolis oppositis, circiter 10, chartaceis, nitidis, oblongo-ovatis ad oblongo-lanceolatis, 4 ad 8 cm longis, acuminatis, nervis utrinque circiter 15, indistinctis, reticulis subobsoletis; inflorescentiis solitariis, spiciformibus, e axillis defoliatis, 4 ad 5 cm longis; floribus 4-meris, 5 ad 6 cm longis, calycis circiter 3 mm diametro; petalis oblongis, extus puberulis; ovario 4-locellato, pubescente.

A tree, about 5 m high, the young branchlets, inflorescences, and petioles grayish or yellowish puberulent. Leaves alternate, 15 to 18 cm long, the petioles and rachis somewhat angular; leaflets opposite, usually 10 or 11, firmly chartaceous, brownish and shining when dry, glabrous, somewhat inequilateral, oblong-ovate to oblong-lanceolate, 4 to 8 cm long, 2 to 3 cm wide, the apex acuminate, base acute or rounded; lateral nerves slender, indistinct, up to 15 on each side of the midrib, the reticulations obsolete or nearly so; petiolules 3 mm long or less. Inflorescences simple, solitary, spikelike, from the axils of fallen leaves, 4 to 5 cm long. Flowers sessile or subsessile, 4-merous, 5 to 6 mm long. Calyx shallowly cup-shaped, about

3 mm in diameter, 4-toothed, the teeth broad, subacute or obtuse, about 1 mm long. Petals oblong, obtuse, free, 5 mm long, 2 mm wide, puberulent externally. Staminal tube oblong, cylindric, or obscurely angled, 4 mm long, glabrous on both sides, crenate. Stamens 8, about 0.7 mm long. Disk annular, about 1 mm high and 1.5 mm in diameter. Ovary 4-celled, pubescent as is the base of the style, the ovary and style together about 3 mm long.

PANAY, Capiz Province, Mount Salibongbong, *Bur. Sci.* 35631 Martelino & Edaño, June, 1919, in forests near the summit, altitude about 650 meters.

This species has somewhat the appearance of *Dysoxylum turczaninowii* C. DC. but is not closely allied to that species, differing essentially in its simple, spicate inflorescences; the leaflets are also much smaller than in the latter species.

DYSOXYLUM SIARGAOENSE sp. nov. § *Eudysoxylum*.

Arbor parva, partibus junioribus et inflorescentiis caulinis plus minusve pubescens; foliis alternis, circiter 35 cm longis, vetustioribus glabris, foliolis circiter 13, chartaceis, oppositis, oblongis ad oblongo-lanceolatis, plerumque inaequilateralibus, 10 ad 15 cm longis, acuminatis, nervis utrinque circiter 15, tenuibus; racemis caulinis, fasciculatis 1.5 ad 2.5 cm longis; floribus 4-meris, breviter pedicellatis, 5 mm longis, calycis circiter 2 mm diametro; petalis oblongis liberis, glabris; ovario pubescente.

A small tree, the younger parts and the cauline inflorescences more or less pubescent. Branches terete, brownish when dry, the ultimate ones about 7 mm in diameter, glabrous, the branchlets and very young leaves more or less pubescent. Leaves alternate, about 35 cm long, glabrous when mature, the leaflets about 13, opposite, chartaceous, oblong to oblong-lanceolate, usually inequilateral, olivaceous when dry, 10 to 15 cm long, 3.5 to 4.5 cm wide, acuminate, the base usually strongly inequilateral and acuminate, the lamina longer on one side than on the other, or the uppermost leaflets equilateral; lateral nerves about 15 on each side of the midrib, slender and anastomosing, the reticulations lax, distinct; petioles 6 mm long or less. Racemes fascicled on the larger branches, 1.5 to 2.5 cm long, cinereous-pubescent. Flowers 4-merous, about 5 mm long, their pedicels 1.5 to 2 mm in length. Calyx pubescent, somewhat cup-shaped, about 2 mm long and wide, broadly and irregularly 4-toothed. Petals 4, white, free, oblong to oblong-oblongeolate, about 5 mm long, 1.5 mm wide, glabrous or slightly pubescent

at their apices outside. Staminal tube cylindric, toothed, glabrous on both surfaces, 3.5 mm long. Anthers usually 7, 0.8 mm long. Disk glabrous, free, about 1 mm high. Ovary and stigma about 4 mm long, the stigma 1 mm in diameter, the ovary pubescent, no thicker than the glabrous style.

SIARGAO, *Bur. Sci.* 35021 Ramos & Pascasio, May 27, 1919, in forests at low altitudes.

The alliance of this species is apparently with *Dysoxylum cumingianum* C. DC., but the mature leaves are glabrous while the flowers are very much smaller than in the latter species, there being further many other differential characters; the two are not closely allied.

DICHAPETALACEAE

DICHAPETALUM Thouars

DICHAPETALUM NITIDUM sp. nov.

Frutex scandens, ramulis et petiolis et inflorescentiis pubescens; foliis coriaceis, olivaceis, nitidissimis, oblongis ad oblongo-lanceolatis, 10 ad 14 cm longis, basi acutis vel obtusis, apice leviter acuminatis, nervis utrinque circiter 6, reticulis ultimis utrinque distinctis; cymis pedunculatis, 3 ad 4 cm longis, dense pubescens, petalis oblongo-obovatis, deorsum angustatis, 2 mm longis, apice retusis.

A woody vine, the branchlets, petioles, and inflorescences more or less pubescent with short, yellowish-brown or ferruginous hairs, the younger parts densely pubescent. Branches reddish-brown when dry. Leaves coriaceous, olivaceous and strongly shining when dry, oblong to oblong-lanceolate, 10 to 14 cm long, 2.5 to 4.4 cm wide, the base acute or obtuse, narrowed upward to the somewhat acuminate apex; lateral nerves about 6 on each side of the midrib, curved, anastomosing, distinct, the ultimate reticulations rather close, raised, and distinct on both surfaces; petioles about 1 cm long. Inflorescences peduncled, cymose, 3 to 4 cm long, dichotomously branched, up to 2 cm in diameter, the peduncles up to 2.5 cm long, the younger parts especially densely pubescent with short hairs. Pedicels about 1 mm long, twice as long as the lanceolate bracteoles. Flowers about 3.5 mm in diameter. Sepals densely pubescent, oblong, obtuse, 1.7 mm long. Petals glabrous, oblong-obovate, rounded, narrowed below, about 2 mm long, the apex minutely cleft for about 0.5 mm. Filaments about 1.2 mm long. Ovary densely lanate.

MINDANAO, Surigao Province, *Bur. Sci.* 34596 Ramos & Pas-

casio, April 24, 1919, at the iron deposit on the northeast coast on ridges at low altitudes.

This species apparently belongs in the group with *Dichapetalum timoriense* Engl. and seems to be sufficiently well characterized by its coriaceous leaves, the ultimate reticulations of which are rather close, raised, and distinct on both sides.

DICHAPETALUM OBLONGIFOLIUM sp. nov.

Frutex scandens, conspicue ciliatus; foliis chartaceis, oblongis, 8 ad 14 cm longis, in siccitate pallidis, basi acutis, sursum angustatis, apice obtuse acuminatis, nervis utrinque circiter 7, distinctis, reticulis laxis; cymis axillaribus, solitariis, brevissime pedunculatis, 1 ad 1.5 cm longis, sepalis dense pubescens, late ovatis, rotundatis, 2 mm longis, petalis oblongo-obovatis, apice retusis.

A woody vine, all parts ciliate with rather pale, spreading, more or less scattered hairs, the indumentum dense on the younger parts. Branches glabrous, grayish, about 3 mm in diameter, the younger branchlets rather densely ciliate. Leaves chartaceous, oblong, 8 to 14 cm long, 2 to 3.5 cm wide, rather pale when dry, the base acute, narrowed upward to the somewhat blunt-acuminate apex, both surfaces prominently ciliate with long, scattered hairs; lateral nerves about 7 on each side of the midrib, curved, distinct, the reticulations lax; petioles densely villous, 3 to 5 mm long. Cymes axillary, solitary, short-peduncled, dichotomous, 1 to 1.5 cm long, densely ciliate. Flowers white, 4 to 5 mm in diameter, their pedicels 2 mm long or less, the bracts lanceolate, acuminate, up to 3 mm in length, the bracteoles linear. Sepals densely pubescent, broadly ovate, rounded, 2 mm long. Petals 5, thin, oblong to narrowly oblong-obovate, about 1.8 mm long, the apex cleft for 0.5 mm or less. Filaments stout, about 1 mm long, the anthers about as long as the filaments.

BUCAS GRANDE, *Bur. Sci.* 35044 *Ramos & Pascasio*, June 6, 1919, in thickets along streams at low altitudes.

A species manifestly allied to *Dichapetalum ciliatum* Merr., but with longer, differently shaped leaves which are prominently ciliate on both surfaces.

DICHAPETALUM HOLOPETALUM sp. nov.

Frutex scandens, partibus junioribus et foliis et inflorescentiis perspicue ciliatis; foliis membranaceis, oblongo-ellipticis, 10 ad 18 cm longis, basi acutis, apice tenuiter acuminatis, nervis utrinque circiter 6, perspicuis, reticulis laxis; cymis

axillaribus, breviter pedunculatis, densis, subglobosis, circiter 1 cm diametro, petalis anguste spatulatis, 2 mm longis, integris; capsulis ellipsoideis, compressis, dense pubescens, 1.4 ad 2 cm longis, retusis.

A woody vine, the younger parts, leaves, and inflorescences prominently ciliate, the hairs spreading. Branches reddish brown, somewhat lenticellate, glabrous, the branchlets conspicuously ciliate. Leaves membranaceous, greenish when dry, oblong-elliptic, 10 to 18 cm long, 3.5 to 7 cm wide, narrowed below to the acute base and above to the rather slenderly acuminate apex, rather prominently ciliate on both surfaces or the upper surface ultimately glabrous; lateral nerves about 6 on each side of the midrib, prominent, the reticulations lax; petioles ciliate, 4 to 7 mm long. Cymes axillary, dense, subglobose, about 1 cm in diameter, short-penduncled. Sepals elliptic-ovate to elliptic-obovate, pubescent, 2 to 2.5 mm long. Petals glabrous, somewhat fleshy, not cleft, narrowly spatulate, about 2 mm long. Filaments about 2 mm long. Ovary villous. Capsules ellipsoid, compressed, 1.4 to 2 cm long, densely pubescent, normally retuse at the apex with a median dividing line, 2-seeded.

MINDANAO, Lanao District, Camp Keithley, *Mrs. Clemens* 1039, May and June, 1907 (type); Kolambugan, *For. Bur.* 23320 *Agama*, December 3, 1914; Tutunod, *For. Bur.* 23382 *Acuña*, December 12, 1914. In thickets at low altitudes, ascending to at least 670 meters.

A species in many respects resembling *Dichapetalum ciliatum* Merr. but distinguishable, among other characters, by its petals being entire and not cleft at their apices.

ANACARDIACEAE

SEMECARPUS Linnaeus

SEMECARPUS SURIGAENSIS sp. nov.

Arbor, circiter 8 m alta, inflorescentiis exceptis glaber, ramis circiter 8 mm diametro; foliis subcoriaceis, oblongo-ellipticis, nitidis, subtus pallidioribus, circiter 35 cm longis et 15 cm latis, basi acutis, apice breviter acuminatis, nervis utrinque circiter 22, valde perspicuis; inflorescentiis ♂ circiter 50 cm longis, multifloris, pubescens; floribus, subfasciculatis, sessilibus, 5 ad 6 mm diametro, sepalis et petalis extus dense ferrugineo-pubescens.

A tree, about 8 m high, the inflorescences and flowers ferruginous-pubescent, otherwise glabrous or nearly so. Branches terete, glabrous, the ultimate ones about 8 mm in diameter,

brownish, the very young branchlets slightly pubescent. Leaves oblong-elliptic, subcoriaceous, rather pale and shining when dry, the lower surface paler than the upper, but scarcely glaucous, about 35 cm long and 15 cm wide, the base acute, the apex abruptly acuminate, the acumen usually about 1 cm long; lateral nerves about 22 on each side of the midrib, very prominent on the lower surface, the reticulations distinct, the primary ones leaving the nerves at about right angles; petioles 2 to 3 cm long. Staminate panicles terminal, about 50 cm long, many-flowered, the lower branches up to 30 cm long. Flowers somewhat fascicled on the branchlets, rather densely ferruginous-pubescent, sessile or with very short pedicels, 5 to 6 mm in diameter. Calyx about 3 mm in diameter, the lobes triangular, acute, about 1 mm long. Petals oblong-lanceolate, acute, 2.8 mm long, densely ferruginous-pubescent externally. Filaments 1.5 to 3 mm long.

MINDANAO, Surigao Province, *Bur. Sci.* 34772 *Ramos & Pascasio*, June 19, 1919, along streams at low altitudes.

This species is well characterized by its ample, glabrous leaves, and its very large, ferruginous-pubescent panicles. It is apparently most closely allied to the Moluccan *Semecarpus cassuvium* Roxb. and has no close allies among the known Philippine species.

AQUIFOLIACEAE

ILEX Linnaeus

ILEX CURRANII sp. nov. § *Euilex*, *Rugosae*.

Arbor parva, glabra, circiter 3 m alta; foliis eglandulosis, numerosis, coriaceis, olivaceis, nitidis, ovatis, 1 ad 1.5 cm longis, basi acutis ad rotundatis, sursum angustatis, apice breviter acuminatis, margine crenatis, nervis utrinque circiter 6, subtus cum reticulis prominulis; floribus axillaribus, fasciculatis vel solitariis, 4-meris, calycis lobis leviter ciliatis; fructibus globosis, 5 mm diametro, pyrenis 4.

A glabrous shrub, or small tree, about 3 m high, the branches rather pale, the branchlets nearly black when dry. Leaves coriaceous, ovate, 1 to 1.5 cm long, 7 to 12 mm wide, olivaceous, shining, not glandular, the base acute to rounded, the apex shortly and bluntly acuminate, margins distinctly crenate, the crenulations often with an indurated, incurved tip; lateral nerves about 6 on each side of the midrib, somewhat impressed on the upper surface, distinct on the lower surface as are the reticulations; petioles 2 to 4 mm long. Fruits subglobose, about 5 mm in diameter, somewhat rugose and nearly black when dry, containing 4 pyrenes, the persistent calyx about 2 mm in

diameter, obscurely 4-lobed, lobes slightly ciliate, the pedicels up to 4 mm in length. Flowers axillary, solitary or sometimes two or three in a fascicle, the pedicels subtended by several small bracts.

LUZON, Benguet Subprovince, Mount Pulog, *For. Bur.* 18069
• *Curran, Merritt, & Zschokke*, January 6, 1908, on slopes in the mossy forest, altitude about 2,500 meters.

This species apparently belongs in the group with *Ilex rugosa* Schmidt and is well characterized by its small, ovate, rather distinctly nerved and reticulate, eglandular leaves. In general appearance it resembles *Ilex buergeri* Miq., but it has much smaller leaves.

ILEX PAUCINERVIA sp. nov. § *Thyrsoprinus*, *Indico-Malaicae*.

Frutex vel arbor parva glabra; foliis integris, coriaceis, oblongo-ellipticis ad oblongis, usque ad 4 cm longis, eglandulosis, supra minutissime puncticulatis, utrinque aequaliter angustatis, basi acutis, apice obtusis retusisque, in siccitate castaneis vel brunneis, nitidis, nervis utrinque 4 vel 5, reticulis obsoletis; inflorescentiis racemosis, axillaribus, solitariis, 5- ad 10-floris, floribus 5-meris; fructibus circiter 3 mm diametro.

A glabrous shrub or small tree, the branches and branchlets grayish yellow or the very young parts sometimes reddish brown. Leaves numerous, coriaceous, oblong-elliptic to oblong, 2 to 4 cm long, 10 to 18 mm wide, not glandular, the upper surface very minutely pitted, brown or castaneous and somewhat shining when dry, entire, subequally narrowed to the acute base and to the obtuse and distinctly retuse apex; lateral nerves slender, somewhat ascending, 4 or 5 on each side of the midrib, not prominent, arched-anastomosing, the reticulations obsolete or nearly so; petioles 2 to 4 mm long. Racemes axillary, solitary, usually about 1 cm long, 5- to 10-flowered; flowers 5-merous, their pedicels about 2 mm long. Fruits brown, ovoid or globose, about 3 mm in diameter, each containing 5 pyrenes, the persistent calyx about 2 mm in diameter, the lobes suborbicular, rounded, entirely glabrous.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26396 *Ramos & Edaño*, August 19, 1916, in forest at the summit, altitude probably about 1,000 meters. This number was originally identified as *Ilex brunnea* Merr.

This species is well characterized by its oblong-elliptic to oblong leaves which are eglandular but which are minutely pitted on the upper surface and are further subequally narrowed to the acute base and to the obtuse and retuse apex. It is somewhat

similar to *Ilex microthyrsa* Loesen, but has very differently shaped leaves.

CELASTRACEAE

MICROTROPIS Wallich

MICROTROPIS ROSTRATA sp. nov.

Frutex glaber, ramulis rubro-brunneis, laevis; foliis oblongis ad late oblongo-lanceolatis, chartaceis, usque ad 20 cm longis, utrinque acutis vel leviter acuminatis, nervis primariis utrinque circiter 12, tenuibus, distinctis, floribus 5-meris; infructescentiis axillaribus, brevibus, cymosis, fructibus oblongis, circiter 2 cm longis, perspicue rostrato-acuminatis.

An erect glabrous shrub, the branches and branchlets terete, smooth, reddish-brown, the latter about 2.5 mm in diameter. Leaves opposite, chartaceous, pale and shining when dry, oblong to broadly oblong-lanceolate, 17 to 20 cm long, 5 to 6 cm wide, narrowed to the acute or somewhat acuminate base and apex; primary lateral nerves about 12 on each side of the midrib, slender, distinct, anastomosing, the reticulations lax; petioles about 1 cm long. Infructescences axillary, or sometimes terminating short lateral branchlets, usually solitary, cymose, peduncled, the peduncles 1 cm long or less. Fruits greenish-yellow when fresh, reddish-brown when dry, oblong, about 2 cm long and 8 mm in diameter, the apex prominently rostrate-acuminate. Persistent sepals 5, broadly ovate, rounded, about 2 mm long, the calyx 6 mm in diameter.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33568 Ramos & Edaño, November 29, 1918, in damp forests at low altitudes.

The alliance of this species is with *Microtropis philippinensis* Merr., from which it is distinguished by its larger leaves, more numerous lateral nerves and more prominently acuminate fruits.

HIPPOCRATEACEAE

HIPPOCRATEA Linnaeus

HIPPOCRATEA ELLIPTICARPA sp. nov.

Frutex scandens, glaber; foliis ellipticis ad elliptico-ovatis, crasse coriaceis, 15 ad 20 cm longis, nitidis, supra olivaceis, subtus brunneis, nervis utrinque 7, perspicuis; fructibus ellipticis, utrinque rotundatis, ligneis, 7 cm longis et 4 cm latis.

A scandent, glabrous vine, the branches somewhat reddish-brown, lenticellate, the ultimate ones 4 to 5 mm in diameter. Leaves elliptic to elliptic-ovate, thickly coriaceous, 15 to 20 cm long, 10 to 12 cm wide, shining, the upper surface olivaceous, the lower surface somewhat brownish, base rounded, apex

rounded to shortly and obtusely acuminate; lateral nerves about 7 on each side of the midrib, prominent, curved, the reticulations distinct; petioles about 1 cm long. Infructescences woody, about 6 cm long, trichotomous, each branch bearing 2 or 3 capsules. Mature fruits brownish, elliptic, rounded at both ends, somewhat woody, about 7 cm long and 4 cm wide.

MINDANAO, Surigao Province, *Bur. Sci.* 34761 Ramos & Pascasio, May 18, 1919, in dry forests at low altitudes.

The alliance of this species is with *Hippocratea megalocarpa* Merr., from which it is especially distinguished by its larger and more-numerously nerved leaves and its differently shaped, shorter fruits.

ICACINACEAE

GOMPHANDRA Wallich

GOMPHANDRA OBLONGIFOLIA sp. nov.

Arbor glabra, usque ad 10 m alta; foliis chartaceis, oblongo-ellipticis ad oblongis, olivaceis, nitidis; 9 ad 15 cm longis, utrinque subaequaliter angustatis, basi acutis, apice acuminatis, nervis utrinque 5 vel 6, reticulis obsoletis vel subobsoletis; cymis plerumque terminalibus oppositifoliisque, usque ad 4 cm longis; fructibus ellipsoideis, 1.5 ad 1.8 cm longis.

A tree, up to 10 m high, glabrous except the somewhat pubescent inflorescences. Leaves chartaceous, oblong-elliptic to oblong, olivaceous, when dry shining, the lower surface paler than the upper, 9 to 15 cm long, 3.5 to 6 cm wide, subequally narrowed to the acute base and to the more or less acuminate apex; lateral nerves 5 or 6 on each side of the midrib, distinct, obscurely anastomosing, the reticulations obsolete or nearly so; petioles about 1 cm long. Cymes solitary, peduncled, sparingly pubescent, leaf-opposed, mostly at the tips of the ultimate branchlets, in fruit up to 4 cm long. Fruit ellipsoid to oblong-ellipsoid, 1.5 to 1.8 cm long, brown when dry, faintly ridged or sulcate.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33727 Ramos & Edaña (type), *For. Bur.* 27403 Alambra; Lagonoy, *For. Bur.* 21103 Hsia. CATANDUANES, *Bur. Sci.* 30258, 30355 Ramos. In dipterocarp forests at low altitudes, fruiting in December and in April.

This species somewhat resembles *Urandra luzoniensis* Merr., which I now consider to belong in the genus *Gomphandra*, and the specimens cited above were originally so identified. The present species differs from *Urandra luzoniensis* in its oblong to oblong-elliptic, more-numerously nerved leaves which are

subequally narrowed to both base and apex and which do not approach the obovate type. It is possible that *Bur. Sci. 35264 Ramos & Pascasio* from Dinagat Island is referable to the same species. In this specimen the cymes are axillary and also from the axils of fallen leaves, while the leaves are relatively narrower and subcaudate-acuminate. The extra-Philippine alliance of the species seems to be with *Gomphandra lanceolata* King, of the Malay Peninsula.

GOMPHANDRA LANCIFOLIA sp. nov.

Arbor parva, glabra, foliis lanceolatis, brunneo-olivaceis, nitidis, chartaceis vel subcoriaceis, 7 ad 9 cm longis, utrinque subaequaliter angustatis, apice tenuiter subcaudato-acuminatis, nervis utrinque 3, tenuibus, reticulis obsoletis; fructibus carnosus, oblongo-obovoideis ad oblanceolatis, 2.5 ad 3 cm longis, mesocarpio leviter sulcato.

A glabrous tree, about 6 m high. Leaves lanceolate, chartaceous or subcoriaceous, brownish-olivaceous and somewhat shining when dry, 7 to 9 cm long, 1.5 to 2.5 cm wide, subequally narrowed to the cuneate or somewhat acuminate base and to the slenderly subcaudate-acuminate apex, the acumen usually about 1 cm long; lateral nerves usually 3 on each side of the midrib, distant, curved-ascending, slender, the reticulations nearly obsolete; petioles 5 to 7 mm long. Fruits axillary, their peduncles up to 1 cm long, fleshy, oblong-obovate to oblanceolate, salmon-colored, 2.5 to 3 cm long, the mesocarp somewhat longitudinally ridged.

LUZON, Tayabas Province, Mount Dingalan, on the east coast, on dry forested slopes, altitude about 300 meters, locally known to the Negritos as *paranuyog*.

A species well characterized by its lanceolate, subcaudate-acuminate, few-nerved leaves which are subequally narrowed to both base and apex, as well as by its rather large fruits. It is probably as closely allied to *Stemonurus fuliginea* Elm., which belongs in *Gomphandra*, as to any other described species.

GOMPHANDRA GLABRA sp. nov.

Arbor, circiter 10 m alta, ramulis junioribus inflorescentisque parciissime pubescentibus exceptis glabra; foliis oblongis, membranaceis, usque ad 11 cm longis, in siccitate nitidis, olivaceo-brunneis, acutis vel leviter acuminatis, basi subacutis, nervis utrinque circiter 10, subtus perspicuis; cymis axillaribus, paucifloris, usque ad 3.5 cm longis; fructibus oblongis, inaequilateralibus, glabris, usque ad 8 mm longis.

A tree, about 10 m in height, glabrous except the very tips of the branchlets and the cymes which are sparingly appressed-pubescent. Branches terete, grayish, smooth, the branchlets reddish brown, slender. Leaves alternate, oblong, membranaceous, 9 to 11 cm long, 3.5 to 4 cm wide, brownish-olivaceous, of the same color and shining on both surfaces when dry, the apex acute to slightly acuminate, minutely apiculate, base subacute; lateral nerves about 10 on each side of the midrib, slender but prominent on the lower surface, curved-anastomosing, the reticulations distinct, lax; petioles 8 to 10 mm long. Cymes axillary, solitary, peduncled, lax, apparently few-flowered, up to 3.5 cm long, in age white-glabrous, but in flower slightly appressed-pubescent. Fruits oblong, up to 8 mm long, glabrous, the pericarp somewhat fleshy, prominently gibbous on one side.

SAMAR, Yabong, *Phil. Pl.* 1628 Merrill (type), April, 1914, on forested slopes; Catubig River, *Bur. Sci.* 24241, 24547 Ramos, March 10, 1916, *Sablaya* 16; Cauayan Valley, *Bur. Sci.* 17660 Ramos, March, 1914. LEYTE, Wenzel 1029, 1722, 1744. In primary forests at low altitudes.

Similar and closely allied to *Gomphandra cumingiana* F.-Vill., differing in being almost entirely glabrous, and in its somewhat differently shaped, more-numerously nerved leaves.

GNOCARYUM Miquel

GNOCARYUM GRANDIFOLIUM sp. nov.

Arbor parva, glabra; foliis coriaceis, late elliptico-ovatis, 25 ad 28 cm longis, circiter 18 cm latis, nitidis, basi late rotundatis, apice breviter obtuse acuminatis, nervis utrinque circiter 4, perspicuis; floribus sessilibus, 6 ad 7 mm longis, fasciculatis, fasciculis in axillis defoliatis, paucifloris; sepalis suborbicularibus, 1 ad 1.5 mm diametro, leviter pubescens.

A glabrous tree, at least 5 m high. Leaves coriaceous, broadly elliptic-ovate, 25 to 28 cm long, about 18 cm wide, shining when dry, base broadly rounded, the apex shortly and bluntly acuminate; lateral nerves about 4 on each side of the midrib, the primary reticulations very lax; petioles stout, about 2 cm long. Flowers sessile, fascicled in the axils of fallen leaves, 6 to 7 mm long. Calyx lobes suborbicular, slightly pubescent, 1 to 1.5 mm in diameter. Corolla white, glabrous, the lobes oblong, acute, 1.5 to 2 mm long. Ovary ovoid, the style cylindric, stout, 1.2 mm in length.

DINAGAT, *Bur. Sci.* 35205 Ramos & Pascasio, May 11, 1919, in forests along small streams at low altitudes.

This species is especially characterized by its large leaves and

its fascicled flowers, in these characters being readily distinguished from its ally *Gonocaryum calleryanum* Becc.

SAPINDACEAE

GUIOA Cavanilles

GUIOA BICOLOR sp. nov.

Arbor parva, partibus junioribus leviter pubescens; foliis 25 ad 30 cm longis, foliolis plerumque 9, crasse coriaceis, oblongo-ovatis ad oblongo-ellipticis, 9 ad 12 cm longis, acute acuminatis, subtus glaucescentibus; paniculis axillaribus usque ad 15 cm longis, leviter pubescens; floribus numerosis, petalis anguste obovatis, 1.5 mm longis, appendiculis villosis, petalis subaequantibus.

A small tree, the younger parts sparingly pubescent, the older parts glabrous. Branchlets dark reddish-brown or nearly black when dry. Leaves 25 to 30 cm long, the leaflets usually 9, thickly coriaceous, oblong-ovate to oblong-elliptic, 9 to 12 cm long, 3.5 to 5.5 cm wide, the base somewhat inequilateral, the apex rather sharply acuminate, the upper surface brownish when dry, glabrous, shining, the lower surface glaucous and sparingly pubescent with short, widely scattered hairs; lateral nerves about 9 on each side of the midrib, distinct, the reticulations not prominent; petiolules up to 1 cm in length, their bases much thickened. Panicles axillary, up to 15 cm long, branched from the base, very slightly pubescent. Flowers white, numerous; sepals unequal, 2 to 2.5 mm long. Petals narrowly obovate, 1.5 mm long, their margins slightly ciliate, the villous scales about as long as the petals.

MINDANAO, Surigao Province, *Bur. Sci.* 34487 Ramos & Pascasio, April 25, 1919, at the iron deposit on the northeast coast, on ridges, altitude about 780 meters.

This species is rather radically different from the previously described Philippine representatives of the genus in its thickly coriaceous leaflets which are glaucous on the lower surface.

VITACEAE

TETRASTIGMA Planchon

TETRASTIGMA MINDANAENSE sp. nov.

Frutex scandens, partibus junioribus inflorescentiisque pubescens; foliis 3-foliolatis, foliolis chartaceis, ellipticis ad ovato-ellipticis, 10 ad 13 cm longis, usque ad 7 cm latis, basi rotundatis, apice abrupte acuminatis, marginae distanter dentatis, dentibus apiculatis; inflorescentiis pubescens, circiter 10 cm longis, ramis primariis paucis, floribus umbellatim dispositis; petalis oblongo-

ovatis, obtusis vel acutis, obscure cucullatis, haud corniculatis, 2 mm longis, pubescens.

A vine, the younger parts and inflorescences rather distinctly pubescent or puberulent, the branches terete, glabrous, about 3 mm in diameter, the younger ones more or less pubescent. Leaves 3-foliolate, their petioles about 4 cm long and with 1- to 2-cm long petiolules, somewhat pubescent; leaflets chartaceous when dry, olivaceous, elliptic to ovate-elliptic, 10 to 13 cm long, 5 to 7 cm wide, base rounded, often somewhat inequilateral, apex abruptly acuminate, the margins distantly toothed, the teeth rather coarsely apiculate; lateral nerves slender, distinct, about 8 on each side of the midrib. Inflorescences pubescent, about 10 cm long, the primary branches few, the secondary and tertiary ones umbellately arranged, the flowers umbellate at the tips of the ultimate branchlets, their pedicels 3 to 5 mm long, pubescent, primary branches subtended by broadly ovate, pubescent bracts, about 3 mm in length; petals 4, oblong-ovate, obtuse or acute, obscurely cucullate at their apices but not at all corniculate, about 2 mm long, pubescent externally. Ovary glabrous, ovoid, the stigma obscurely lobed.

MINDANAO, Surigao Province, *Bur. Sci.* 34463 Ramos & Pascasio, April, 1919, in damp forests at low altitudes.

The alliance of this species is apparently with *Tetrastigma loheri* Gagnep., but the inflorescences are much more ample, while the leaflets are much broader and very differently shaped than in Gagnepain's species.

LEEA Royen

LEEA PLATYPHYLLA sp. nov.

Frutex erectus, glaber; foliis pinnatis, circiter 70 cm longis, plerumque 7-foliolatis, foliolis circiter 34 cm longis et 14 cm latis, oblongis ad oblongo-ovatis, basi late acutis vel subrotundatis, apice acuminatis, nervis utrinque circiter 18, perspicuis; inflorescentiis sessilibus, ovoideis, densis, subcapitatis, circiter 2.5 cm longis; floribus numerosis, confertis, 4-meris, calycis 4 mm longis, petalis (partibus liberis) 3.5 mm longis; fructibus globosis, carnis, circiter 1.5 cm diametro.

A glabrous shrub, the ultimate branches about 1.5 cm in diameter. Leaves simply pinnate, about 70 cm long, usually 7-foliolate; leaflets about 34 cm long and 14 cm wide, subcoriaceous, brownish when dry, oblong to oblong-ovate, the base broadly acute or somewhat rounded, the apex distinctly acuminate, the margin rather coarsely toothed except near the base; lateral nerves about 18 on each side of the midrib, very prominent, the

primary reticulations distinct, subparallel; petiolules stout, 1 to 1.5 cm long. Inflorescences dense, ovoid, sessile, about 2.5 cm long, the flowers greenish-yellow, 4-merous, their petals up to 5 mm in length. Calyx about 5 mm long, cup-shaped, broadly 4-lobed. Petals oblong-ovate, about 3.5 mm long and 3 mm wide, the tube extended 2.5 to 3 mm above the attachment of the petals, the anthers narrowly oblong, 2 to 2.5 mm long. Fruit fleshy, globose, glabrous, red, about 1.5 cm in diameter, 1- or 2-seeded, the seeds subglobose, about 7 mm thick.

MINDANAO, Surigao Province, *Bur. Sci. 34397 Ramos & Pascasio*, April 30, 1919, in damp forests at low altitudes.

A species belonging in the group with *Leea congesta* Elm., but with very much larger, more-numerously nerved leaflets.

LEEAE CAPITATA sp. nov.

Frutex erectus, glaber; foliis pinnatis, usque ad 90 cm longis, plerumque 11-foliolatis, foliolis oblongis ad oblongo-lanceolatis, coriaceis, 23 ad 36 cm longis, 5 ad 10 cm latis, basi late rotundatis, apice tenuiter acuminatis, nervis utrinque circiter 16, perspicuis; inflorescentiis ovoideis vel subglobois, densis capitatis, 3 ad 4 cm diametro; floribus confertis, 4-meris, calycis circiter 5 mm longis, petalis (partibus liberis) circiter 4 mm longis.

An erect, glabrous shrub, 1 to 2 m high, the ultimate branches up to 1.5 cm in diameter. Leaves simply pinnate, up to 90 cm long, usually 11-foliolate; leaflets oblong to oblong-lanceolate, coriaceous, 23 to 36 cm long, 5 to 10 cm wide, olivaceous when dry, the base rather broadly rounded, the apex slenderly acuminate, the acumen up to 2.5 cm long, margins rather coarsely toothed; lateral nerves about 16 on each side of the midrib, prominent, the reticulations subparallel; petiolules stout, 1 to 4 cm long. Inflorescences sessile, ovoid or subglobose, very dense, 3 to 4 cm in diameter. Flowers numerous, crowded, white, 4-merous, their pedicels up to 5 mm in length. Calyx cup-shaped, about 5 mm long, irregularly 3- or 4-lobed. Petals oblong-ovate, about 4 mm long, 2 to 3 mm wide, reflexed, the tube projecting about 3 mm above the insertion of the petals. Anthers 4, elliptic, about 2 mm long.

LUZON, Tayabas Province, Mount Cadig, Mount Pular, and Mount Binuan, three localities on the east coast, *Bur. Sci. 19430 Ramos*, *Bur. Sci. 28506 Ramos & Edaña*, *Bur. Sci. 25502 Yates*, in flower December to May. In damp forests along small streams at low and medium altitudes.

The alliance of this species is with *Leea congesta* Elm., from

which it is readily distinguished by its much larger and fewer-nerved leaflets which are broadly rounded at the base; it is distinguished from *Leea platyphylla* especially by its fewer, differently shaped, relatively much narrower leaflets.

LEEALONGIPETIOLATA sp. nov.

Frutex, circiter 1 m altus, glaber; foliis unifoliolatis, longe petiolatis, chartaceis vel subcoriaceis, oblongis ad oblongo-ellipticis, utrinque acutis, usque ad 30 cm longis, margine grosse sinuato-dentatis, nervis utrinque circiter 11, subtus perspicuis, curvatis; petiolo circiter 9 cm longo; infructescentiis in axillis superioribus, circiter 4 cm longis, sparse ramosis; fructibus carnosus, subglobosis, circiter 1.5 cm diametro, seminibus 2 vel 3.

An erect shrub, about 1 m high, glabrous throughout, the ultimate branches terete, dark brown, nearly smooth, about 4 mm in diameter. Leaves simple, oblong to oblong-elliptic, chartaceous to subcoriaceous, olivaceous and somewhat shining when dry, the lower surface paler than the upper, 22 to 30 cm long, about 11 cm wide, base and apex acute, margins rather coarsely sinuate-dentate; lateral nerves about 11 on each side of the midrib, prominent on the lower surface, curved, anastomosing close to the margin, the reticulations subparallel, distinct; petioles about 9 cm long. Infructescences in the upper axils, about 4 cm long, sparingly branched. Fruits fleshy, globose or subglobose, reddish when fresh, dark brown when dry, each with 2 or 3 globose seeds.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33633 *Ramos & Edaña*, December 11, 1918, in damp forests at low altitudes.

This species belongs in the group with *Leea acuminatissima* Merr. and *L. unifoliolata* Merr. and is closely allied to both of these, from which it is readily distinguished by its larger leaves and very much longer petioles.

LEEARAMOSII sp. nov.

Frutex erectus, inflorescentiis laxis, cinereo-pubescentis; foliis circiter 60 cm longis, bipinnatis, pinnis paucis, plerumque 5-foliolatis; foliis chartaceis, ellipticis ad oblongo-ellipticis; 12 ad 22 cm longis, basi plerumque late rotundatis, apice subabrupte tenuiter acuminatis, nervis utrinque circiter 12, perspicuis, subtus ad costa leviter fasciculato-ciliatis; inflorescentiis usque ad 20 cm longis; floribus 5-meris, subalbidis, sessilibus, 5-meris, circiter 5.5 mm longis; fructibus depresso-globosis, 6 ad 8 mm diametro.

An erect shrub, about 2.5 m high, the inflorescences cinereous-pubescent, the leaflets with few, scattered, somewhat tufted cilia on the midrib beneath, the ultimate branches about 8 mm in diameter. Leaves bipinnate, about 60 cm long, the pinnae few, the lower ones usually 5-foliolate; leaflets chartaceous, elliptic to oblong-elliptic, 12 to 22 cm long, 6 to 10 cm wide, the base usually broadly rounded, the apex rather abruptly acuminate, the acumen slender, blunt, 1 to 1.5 cm long, margins distinctly toothed; lateral nerves prominent, about 12 on each side of the midrib, the reticulations distinct; petiolules 5 to 15 mm long. Inflorescences lax, branched from near the base, up to 20 cm long and as wide as or somewhat wider than long, the branches few, spreading. Flowers 5-merous, numerous, white or somewhat yellowish, sessile or subsessile and somewhat crowded at the tips of the ultimate branchlets, about 5.5 mm long. Calyx cup-shaped, 2.5 mm long, 5-lobed, the lobes broadly ovate, about 1 mm in length, glabrous. Petals oblong, 3 mm long, obtuse to acute, recurved. Anthers 1.2 mm long. Fruits depressed-globose, red when fresh, dark brown when dry, 6 to 8 mm in diameter, obscurely 5- or 6-sulcate when dry.

MINDANAO, Surigao Province, *Bur. Sci.* 34550 *Ramos & Pascasio*. SIARGAO, *Bur. Sci.* 34945 (type), 34907 *Ramos & Pascasio*, May 27, 1919, in thickets and forests at low altitudes.

This species in general appearance is not radically different from *Leea indica* (Burm. f.) Merr. and several other species allied to the latter. The scattered ciliate hairs on the midrib beneath are a distinguishing character.

STERCULIACEAE

STERCULIA Linnaeus

STERCULIA GLABRIFOLIA sp. nov.

Arbor glabra, vel ramulis junioribus leviter pubescens, ramis circiter 5 mm diametro; foliis subcoriaceis, oblongis ad oblongo-ellipticis, integris, 8 ad 22 cm longis, breviter obtuse acuminatis, basi late rotundatis et distincte cordatis, nervis utrinque 8 ad 12, perspicuis; petiolo 4 ad 7 cm longo; inflorescentiis ♂ solitariis, glabris, axillaribus, anguste paniculatis, circiter 12 cm longis, paucifloris; floribus 4-meris, extus glabris, intus dense villosis, alabastro 7 ad 8 mm longo, lobis acutis, liberis.

A tree, about 5 m high, entirely glabrous except the very young tips of the branchlets and the inside of the calyx. Branches te-

rete, rugose when dry, the ultimate ones about 5 mm in diameter, the very tips of the branchlets sparingly ferruginous-pubescent. Leaves subcoriaceous, oblong to oblong-elliptic, 8 to 22 cm long, 4 to 10 cm wide, entire, the apex shortly blunt-acuminate, the base broadly and abruptly rounded and rather deeply cordate; lateral nerves 8 to 12 on each side of the midrib, prominent, obscurely anastomosing, sparingly bearded on the axils on the lower surface; petioles 4 to 7 cm long. Staminate inflorescences axillary, solitary, narrowly paniculate, about 12 cm long, the branches few, the lower ones 2 cm long or less, 2- or 3-flowered, the upper ones small and 1-flowered, the pedicels 1.5 to 2 cm long, slender. Staminate flowers 4-merous, the buds ovoid, about 7 to 8 mm long, the calyx glabrous externally except at the edges of the valvate lobes, the lobes broad, acute, irregular, apparently free at maturity, inside densely villous. Anthers many in a globose head.

MINDANAO, Surigao Province, Hegapit River, *Bur. Sci.* 34517 *Ramos & Pascasio*, April 23, 1919, in forests at low altitudes.

A very characteristic species, not closely related to any other one known to me, readily distinguished by its being nearly glabrous and by its oblong to oblong-elliptic, glabrous leaves which are broadly rounded and rather deeply cordate at the base.

DILLENiaceae

SAURAUIA Willdenow

SAURAUIA MINDORENSIS sp. nov.

Arbuscula, circiter 3 m alta; foliis oblanceolato-ellipticis, chartaceis, circiter 25 cm longis, apice breviter abrupteque acuminate, basi angustatis, acutis, supra glabris, nitidis, subtus pallide tomentosis nitidisque, nervis utrinque circiter 22; cymis axillaribus, brevibus, paucifloris, floribus circiter 2 cm diametro, calycis lobis setis patulis 2.5 ad 4.5 mm longis; obtectis.

A shrub, about 3 m high. Branches slender, glabrous, except for few scattered, appressed scales, the branchlets with numerous, appressed, acicular, 2 to 6 mm long scales. Leaves oblanceolate-elliptic, chartaceous, 20 to 24 cm long, about 8 cm wide, the upper surface dark-colored when dry, glabrous and somewhat shining, the lower surface densely pale ferruginous-tomentose, almost flesh-colored, the apex shortly and abruptly acuminate, the acumen apiculate, the leaf gradually narrowed in the lower half to the acute base, the margins prominently apiculate-dentate; nerves about 22 on each side of the midrib distinct beneath, obscurely anastomosing, the reticulations obscure; petioles

2.5 to 5 cm long, with few appressed setose scales. Cymes in the upper axils, few-flowered, shorter than the petioles. Outer sepals orbicular-ovate, very shortly acuminate, about 13 mm long and wide, more or less tomentose outside and densely covered with acicular spreading scales 2.5 to 4.5 mm long, the inner surface tomentose, the inner sepals smaller and setose only on the exposed portions. Ovary densely ferruginous-hirsute, ovoid; styles 5, free, in bud 2 mm long.

MINDORO, south of Lake Naujan, *For. Bur.* 6849 Merritt, April, 1907, in forests, at an altitude of about 100 meters.

A species well characterized by its chartaceous leaves which are entirely glabrous above and densely tomentose and shining beneath, the indumentum somewhat salmon- or flesh-colored; its short cymes; comparatively large flowers; densely setose calyx; and pubescent ovary.

SAURAUIA TRUNCIFLORA sp. nov.

Arbor parva, ramulis irregulariter adpresse setosis exceptis glabra; foliis oblanceolatis, chartaceis, 22 ad 35 cm longis, supra olivaceis laevis, apice breviter acuminatis, deorsum angustatis, basi cuneatis, margine serrulatis, nervis utrinque 15 ad 20, perspicuis, adscendentibus; inflorescentiis caulinis, floribus tenuiter pedicellatis, confertis, fasciculis usque ad 7 cm diametro; sepalis elliptico-ovatis, 5 ad 9 mm longis, glabris; ovario glabro; stylis 3, deorsum connatis.

A small tree, reaching a height of 5 m, the branches glabrous, the young branchlets with few to many, appressed, unequal, ovate to lanceolate, acuminate scales. Leaves oblanceolate, chartaceous, 22 to 35 cm long, 6 to 10 cm wide, the upper surface dark-olivaceous, smooth, the lower surface glabrous, apex acuminate, gradually narrowed from above the middle to the cuneate base, the margins rather finely serrate; lateral nerves 15 to 20 on each side of the midrib, ascending, the reticulations lax, obscure or nearly obsolete; petioles 2 cm long or less. Flowers white, in dense fascicles from tubercles on the trunk, the fascicles up to 7 cm in diameter, the pedicels slender, somewhat furfuraceous, unbranched, 2 to 3.5 cm long, ebracteolate or with a pair of small bracteoles. Sepals glabrous or slightly furfuraceous, not at all setose, elliptic-ovate, 5 to 9 mm long, about 5.5 mm wide, the inner ones slightly exceeding the outer ones and subpetaloid. Petals about 10 mm long and 7 mm wide, the apex retuse. Stamens 20, the anthers 3 mm long. Ovary ovoid, glabrous; style about 4 mm long, the arms usually 3, free or somewhat united at the base.

MINDANAO, Lanao District, near Camp Keithley, *For. Bur.* 3918 *Hutchinson* (type), March 9, 1906, *Clemens* 426, March, 1906, *For. Bur.* 25172 *Alvarez*, March, 1916. In thickets and forests, altitude 700 to 1,000 meters.

A species strongly characterized by its glabrous, or nearly glabrous, oblanceolate leaves, and by its dense, fascicled, cauline inflorescences.

SAURAUIA LANAENSIS sp. nov.

Arbor parva, ramulis petiolisque adpresse setosis, foliis subtus ad costa nervisque adpresse-setulosis; foliis oblanceolatis, 11 ad 20 cm longis, tenuiter acuminatis, deorsum angustatis, basi cuneatis, margine spinulosis, supra glabris, laevis, nervis utrinque 10 ad 12, perspicuis, reticulis distinctis; cymis axillaribus, paucifloris quam petiolo brevioribus, plus minusve setosis; floribus parvis, sepalis leviter subadpresse-setosis, circiter 3 mm longis; ovario glabro; stylis 4, liberis.

A shrub or small tree, 3 to 5 m high, the branchlets appressed-setose with short, brown, lanceolate scales, the petioles and midrib on the lower surface with similar scales. Leaves chartaceous, oblanceolate, 11 to 20 cm long, 3 to 6 cm wide, the apex slenderly acuminate, narrowed to the cuneate base, the margins somewhat spinulose, the upper surface smooth, olivaceous, glabrous, the lower surface paler, appressed-setose with short scales on the midrib and lateral nerves; lateral nerves 10 to 12 on each side of the midrib, distinct, anastomosing, the reticulations evident; petioles 1 to 1.5 cm long. Inflorescences of very short, axillary, solitary or fascicled, few-flowered cymes usually 1 cm or less in length, the rachis and pedicels setose. Flowers white, small, the sepals elliptic-ovate to oblong-ovate, about 3 mm long and 2 mm wide, with few, slender, subappressed setae up to 1 mm in length. Petals narrowly oblong-obovate, about 5 mm long, 2.5 mm wide, the apex somewhat inequilaterally retuse. Anthers about 1.2 mm long. Ovary ovoid, glabrous; styles 4, free, 2 to 2.5 mm long.

MINDANAO, Lanao District, Camp Keithley, *Mrs. Clemens* 868, collected at various times on the forested slopes of Sacred Mountain, altitude about 800 meters: Misamis Province, Mount Malindang, *For. Bur.* 4683 *Mearns & Hutchinson*, May, 1906, in forests, altitude about 700 meters.

Among the Philippine forms this species is well characterized by its oblanceolate, slenderly acuminate leaves, and its short, few-flowered, axillary cymes, and small flowers.

OCHNACEAE

OURATEA Aublet

OURATEA MINDANAENSIS sp. nov.

Arbor parva, glabra; foliis oblongis, coriaceis, 7 ad 11 cm longis, basi rotundatis, apice acutis vel leviter acuminatis, distincte serratis, dentibus tenuiter apiculatis, nervis primariis quam secundariis haud distinctioribus; inflorescentiis terminalibus, floribus umbellatim dispositis, umbellis 2 vel 3; sepalis 3 vel 4, ellipticis ad oblongo-ellipticis rotundatis, 6 ad 7 mm longis; staminibus 8 ad 10, antheris 3 mm longis.

A small glabrous tree, about 4 m high, the branches brownish, slender, terete. Leaves oblong, coriaceous, 7 to 11 cm long, 2 to 4 cm wide, the base rounded, apex acute to somewhat acuminate, margins distinctly toothed, the teeth slenderly apiculate, pointing upward, the upper surface brownish-olivaceous and strongly shining when dry, the lower surface paler and slightly shining; primary lateral nerves scarcely more distinct than are the secondary ones, curved, not prominent, anastomosing, and forming 1 or 2 more or less distinct marginal nerves; petioles up to 5 mm in length. Inflorescences terminal, consisting of 2 or 3 peduncled, umbellike cymes, the peduncles less than 1 cm long, the bracts oblong, about 2.5 mm in length. Flowers few, their pedicels up to 1.5 cm long. Sepals 3 or 4, elliptic to oblong-elliptic, rounded, 6 to 7 mm long. Petals similar to the sepals but thinner, usually 3 or 4. Stamens 8 to 10, their filaments 1 mm long, the anthers linear, 3 mm in length.

MINDANAO, Surigao Province, *Bur. Sci.* 34479 Ramos & Pascasio, April 25, 1919, along streams at low altitudes at the iron deposit on the northeast coast.

In general this species is similar to *Ochna fascicularis* Blanco, but by definition it belongs in the genus *Ouratea* and may be readily distinguished from Blanco's species not only by its floral characters but also by its distinctly and sharply toothed leaves which are rounded at the base.

GUTTIFERAE

CRATOXYLON Blume

CRATOXYLON LIGUSTRINUM (Spach) Blume Mus. Bot. Lugd.-Bat. 2 (1852) 16.

Ancistrolobus ligustrinus Spach Suit. Buff. 5 (1836) 358, Ann. Sci. Nat. II 5 (1836) 352, t. 6.

Hypericum biflorum Lam. Encycl. 4 (1797) 170.

- Hypericum chinense* Retz. Obs. 5 (1789) 27, non Linn.
Hypericum olympicum Lour. Fl. Cochinch. (1790) 471, non Linn.
Hypericum petiolatum Lour. op. cit. 472, non Linn.
Elodes chinensis Hance in Hook. Lond. Journ. Bot. 7 (1848) 472.
Cratoxylon biflorum Turcz. in Bull. Soc. Nat. Mosc. 36¹ (1863) 580.
?Elodea pulchella Hort. Chels. ex Loud. Hort. Brit. Suppl. 1 (1832) 587, *nomen nudum*.
Ancistrolobus brevipes Turcz. in Bull. Soc. Nat. Mosc. 31¹ (1852) 383.
Cratoxylon polyanthum Korth. Verh. Nat. Gesch. Bot. (1839-42) 175, t. 36; Gagnep. in Lecomte Fl. Gén. Indo-Chine 1 (1909) 290.
Cratoxylon chinense Merr. in Philip. Journ. Sci. 4 (1909) Bot. 292.

The earliest description of this species seems to be *Hypericum chinense* Retz. (1789), non Linn., this description being the basis of *Hypericum biflorum* Lam. (1797). *Cratoxylon biflorum* Turcz. is typified by Wallich 4820, this binomial being published without reference to Lamarck's earlier name (sub *Hypericum*), although representing the same species. The two forms described by Loureiro, one from Kwangtung Province, China, and one from Cochinchina, are both safely referable to the form currently known as *Cratoxylon polyanthum* Korth. The oldest specific name, regarding the validity of which there can be no question, appears to be *Cratoxylon ligustrinum* (Spach) Blume. *Elodea pulchella* Hort. Chels. ex Loud. Hort. Brit. Suppl. 1 (1832) 587, currently reduced here, is practically a *nomen nudum*, the whole description being the statement that it is an evergreen, herbaceous, ornamental plant with rosy flowers. The description of it as herbaceous would exclude this as a synonym of *Cratoxylon ligustrinum* Blume, and for that matter would exclude the species from the genus *Cratoxylon*.

CALOPHYLLUM Linnaeus

CALOPHYLLUM CUCULLATUM sp. nov.

Arbor parva, ramulis junioribus petiolisque ferrugineo-hirsutis, ramulis tenuibus, teretibus; foliis coriaceis, oblongis, 11 ad 20 cm longis, distincte acuminatis, basi late rotundatis et distincte cucullatis, petiolo 7 ad 10 mm longo; infructescentiis axillaribus, pedunculatis, circiter 5 cm longis, pedicellatis, plerumque 3 vel 4 flabellatim dispositis; fructibus ovoideis, laevis, 1 cm longis.

A small tree, the branchlets more or less ferruginous-hirsute as are the young petioles; the ultimate branches slender, terete, reddish-brown, 3 to 4 mm in diameter, the internodes up to 15 cm in length. Leaves oblong, coriaceous, smooth, shining, 11 to 20 cm long, 4.5 to 8 cm wide, the apex distinctly acuminate, the base broadly rounded and distinctly cucullate; midrib very

prominent, the lateral nerves slender, very densely arranged; petioles 7 to 10 mm long. Infructescences axillary, peduncled, about 5 cm long, the peduncle 1 to 2 cm long, bearing usually 3 or 4 flabellately arranged pedicels, these up to 2 cm in length. Fruits ovoid, smooth, brown when dry, about 1 cm long.

MINDANAO, Surigao Province, *Bur. Sci.* 34518 *Ramos & Pascasio*, April 25, 1919, in thickets along streams at the iron deposit on the northeast coast.

Although the flowers of this species are as yet unknown, it seems to belong in the group with *Calophyllum soulattri* Burm. f. (*C. spectabile* Willd.); it is well characterized by its leaves being broadly rounded and conspicuously cucullate at the base.

CALOPHYLLUM OLIGANTHUM sp. nov. § *Apetalum*.

Arbor parva, glabra, ramulis tenuibus, teretibus; foliis oblongo-ellipticis ad oblongo-lanceolatis, coriaceis, 5 ad 10 cm longis, utrinque subaequaliter angustatis, basi cuneatis, apice distincte acuminatis; petiolo 8 ad 10 mm longo; inflorescentiis plerumque axillaribus, solitariis, pedunculatis, 2.5 ad 4 cm longis, floribus 3 ad 5, racemosis vel umbellatis; sepalis interioribus elliptico-obovatis, circiter 6 mm longis, exterioribus late ovatis, 4 mm longis, apice rotundatis et perspicue cucullatis; fructibus ellipsoideis, 1.5 cm longis.

A glabrous tree, 5 to 8 m high, the branches and branchlets slender, dark reddish-brown, terete, the internodes up to 5 cm in length. Leaves oblong, elliptic to oblong-lanceolate, coriaceous, shining, 5 to 10 cm long, 1.5 to 4 cm wide, subequally narrowed to the cuneate base and to the distinctly but blunt-acuminate apex; lateral nerves very slender, densely arranged; petioles 8 to 10 mm long. Inflorescences chiefly axillary, sometimes terminal, solitary, peduncled, 2.5 to 4 cm long, 3- to 5-flowered, the flowers either racemosely or umbellately arranged, their pedicels 1 to 1.5 cm long. Sepals white, the inner 2 elliptic-obovate, rounded, somewhat concave, about 6 mm long and 4 mm wide, the outer 2 broadly ovate, rounded, and conspicuously cucullate at their apices, about 4 mm long. Ovary globose, glabrous; style 3 mm long. Fruits dark brown when dry, nearly smooth, ellipsoid, 1.5 cm long.

BUCAS GRANDE, *Bur. Sci.* 35110 *Ramos & Pascasio* (type), June 10, 1919. MINDANAO, Surigao Province, *Bur. Sci.* 34520 *Ramos & Pascasio*, April 25, 1919. In forests at low altitudes, the branches pendulous.

This species very closely resembles *Calophyllum gracilipes* Merr. but the petals are lacking, and it further differs from this

species in having the branches and branchlets terete instead of angled.

CALOPHYLLUM BRACHYPHYLLUM sp. nov.

Arbor parva, glaberrima, ramulis tenuibus, plus minusve angulatis; foliis crasse coriaceis, late ovatis ad elliptico-ovatis, 1.5 ad 2.5 cm longis, basi late rotundatis, apice rotundatis vel retusis; petiolo 1 ad 2 mm longo; fructibus globosis, laevis, 1.5 cm diametro.

A small glabrous tree, or the very tips of the branches obscurely puberulent, the branches grayish, the branchlets slender, usually somewhat angled, reddish-brown. Leaves thickly coriaceous, broadly ovate to elliptic-ovate, 1.5 to 2.5 cm long, 1.2 to 2 cm wide, the base broadly rounded, the apex rounded or often retuse; lateral nerves very slender and very densely arranged; petioles 1 to 2 mm long. Fruits globose, smooth, 1.5 cm in diameter, their peduncles usually solitary, 1 to 2 cm long.

MINDANAO, Surigao Province, *Bur. Sci.* 34482 *Ramos & Pascasio*, April 25, 1919, on the banks of Hegapit River at the iron deposit on the northeast coast, altitude about 350 meters.

A species manifestly allied to *Calophyllum pentapetalum* (Blanco) Merr. (*C. amplexicaule* Choisy), but its leaves are not cordate at the base and are distinctly petioled while the fruits are larger and perfectly globose.

KAYEA Wallich

KAYEA LANCEOLATA sp. nov.

Arbor parva, glabra, ramis ramulisque teretibus; foliis coriaceis, lanceolatis, usque ad 23 cm longis, basi acutis vel obtusis, sursum sensim angustatis, tenuiter acute acuminatis, nitidis, nervis primariis utrinque 15 ad 20, tenuibus, quam secundariis vix magis distinctioribus; floribus terminalibus, sessilibus, dense fasciculatis, in siccitate nigris, sepalis obovatis, circiter 7 mm longis.

A small glabrous tree, the branches and branchlets yellowish, terete, smooth. Leaves lanceolate, coriaceous, rather pale and shining when dry, 18 to 23 cm long, 3 to 4 cm wide, base acute to obtuse, gradually narrowed upward from the lower one-fourth or one-third to the slenderly acuminate apex, the acumen acute or acuminate, subcaudate; primary lateral nerves 15 to 20 on each side of the midrib, scarcely more prominent than are the secondary nerves, both surfaces very shallowly foveolate by the rather close reticulations; petioles 1 to 1.5 cm long. Flowers white when fresh, black when dry, sessile, densely crowded in terminal

fascicles 1 to 1.5 cm in diameter. Sepals obovate, about 7 mm long.

LUZON, Camarines Province, Paracale, *Bur. Sci.* 33591 Ramos & Edaño, November 28, 1918, in damp forests at low altitudes.

This species is readily distinguished by its lanceolate leaves, which are gradually narrowed upward to the slenderly subcaudate-acuminate apex, and by its terminal, crowded, sessile, fascicled flowers.

FLACOURTIACEAE

HYDNOCARPUS Gaertner

HYDNOCARPUS HUTCHINSONII sp. nov. § *Euhydnocarpus*, *Oliganthera*.

Arbor, usque ad 15 m alta, partibus junioribus floribusque exceptis glabra; foliis oblongis, coriaceis, 15 ad 25 cm longis, basi distincte inaequilateralibus, apice acuminatis, nervis utrinque 12 ad 14, perspicuis; floribus longe pedicellatis, 5-meris, sepalis pubescens, 9 ad 11 mm longis; petalis glabris, usque ad 13 mm longis, appendicibus linearis, usque ad 10 mm longis; staminibus 5; fructibus globosis, circiter 8 cm diametro, pericarpio fragile, seminibus usque ad 2 cm longis.

A tree, reaching a height of 15 m, glabrous except the younger parts and flowers. Leaves oblong, coriaceous or subcoriaceous, entire, 15 to 25 cm long, 5 to 9 cm wide, the base distinctly inequilateral, usually rounded or obtuse on the broader side and often acute on the narrower side, the apex rather abruptly and distinctly acuminate, the upper surface subolivaceous or brownish, shining, smooth, the lower surface brownish, distinctly reticulate; lateral nerves 12 to 14 on each side of the midrib, prominent, curved, anastomosing close to the margin; petioles usually about 1 cm long. Flowers yellow, the inflorescence axillary, few-flowered, the axils of the inflorescence up to 8 mm long, somewhat pubescent, usually simple; pedicels up to 2 cm long. Sepals 5, from 9 to 11 mm long, pubescent, reflexed in anthesis, oblong-elliptic to elliptic-ovate, rounded. Petals glabrous, up to 13 mm long, about 5 mm wide when spread, ultimately involute and inclosing a linear-oblong, flattened, free appendage up to 10 mm long and 1 mm wide, which is slightly pubescent above and attached by its base only. Stamens 5, the filaments 5 mm long, much thickened below, tapering upward, glabrous; anthers as long as the filaments. Rudimentary ovary pubescent. Fruit globose, about 8 cm in diameter, the pericarp rather thin when dry, brittle, externally puberulent. Seeds numerous, irregular, up to 2 cm in length.

MINDANAO, Zamboanga District, *For. Bur.* 4822 Hutchinson,

For. Bur. 9138, 9158, 9303, 9429 (type) Whitford & Hutchinson: Lanao District, *For. Bur.* 23162, 23178 Agama; Malangas, *Bur. Sci.* 36938, 36943 Ramos & Edaño. BASILAN, *For. Bur.* 3435, 3916, 6116, *Hutchinson, Bur. Sci.* 15436 Reillo, 18959 Miranda.

This species is common in primary forests in various parts of the Zamboanga District and in Basilan. Fruiting specimens have been collected in July, August, September, November, December, and January. Flowering specimens have been collected in December and February. What is apparently the same species is represented by 574 Agama, from near Sandakan, British North Borneo. The local names recorded are *mangasalaokag* (Sul.), *bagarbas* (Lan.), and *kamupang* (Sul.).

BEGONIACEAE

BEGONIA Linnaeus

BEGONIA DOLICHOTRICHA sp. nov. § *Petermannia*.

Herba erecta, ramosa, saltem 50 cm alta, perspicue et patule ciliatis; foliis inaequilateralibus, chartaceis, oblongis ad oblongo-lanceolatis, 8 ad 13 cm longis, tenuiter acuminatis, basi lateraliter cordatis, margine irregulariter grosse dentatis, dentibus ciliatis, utrinque perspicue ciliatis; inflorescentiis circiter 5 cm longis, floribus ♂ paucis, sepalis 2, orbiculari-ovatis, circiter 1.5 cm longis, petalis, 0; capsulis solitariis, obovoideis, 2 cm longis et latis, truncatis, basi abrupte truncato-rotundatis, aequaliter 3-alatis, perspicue ciliatis.

An erect, branched herb, at least 50 cm high, the branches, petioles, leaves, and fruits conspicuously ciliate with long, slender, spreading, scattered, brownish hairs. Leaves thinly chartaceous, inequilateral, oblong to oblong-lanceolate, 8 to 13 cm long, 2.5 to 5 cm wide, the apex slenderly acuminate, the base laterally cordate, one side very broadly rounded, the other much narrower and acute or abruptly obtuse, the margins rather coarsely and irregularly toothed, the primary and secondary teeth terminated by rather long cilia, both surfaces with long, scattered, spreading hairs; petioles 7 to 15 mm long; stipules oblong-elliptic, up to 1.5 cm long, somewhat ciliate, terminated by a long, sparingly ciliate mucro, up to 5 mm in length. Inflorescences in the uppermost axils up to 5 cm long, somewhat peduncled, dichotomously branched, bearing near the base one or few female flowers, and above a few male ones, the bracts narrowly lanceolate, acuminate, 5 mm long or less. Staminate flowers white, the sepals 2, orbicular-ovate or somewhat reniform, rounded, up to 1.5 cm wide and nearly as long. Petals

none. Stamens numerous, the anthers obovoid, about 1 mm long, shorter than the filaments. Capsules usually solitary, in outline obovoid, including the wings about 2 cm long and 2 cm wide at the truncate apex, somewhat narrowed below, the base abruptly truncate-rounded, the wings subequal, conspicuously ciliate with long, scattered, brownish hairs.

LUZON, Camarines Province, Mount Bagacay, *Bur. Sci.* 33855, 33926 (type) Ramos & Edaña, December 18, 1918, on forested slopes, altitude about 650 meters, the leaves when fresh very red on the lower surface but merely brownish or brownish-red when dry.

This species is probably as closely allied to *Begonia macgregorii* Merr. as to any other described form. It is easily distinguishable by its numerous cilia and especially by its ciliate capsules.

BEGONIA LONGIBRACTEA sp. nov. § *Petermannia*.

Herba erecta, ramosa, saltem 40 cm alta, ramis perspicue subadpresse ciliatis; foliis membranaceis, inaequilateralibus, oblongo-obovatis, 6 ad 14 cm longis, profunde et irregulariter pinnatim lobatis, lobis usque ad 2.5 cm longis, plerumque grosse 1- vel 2-dentatis, apice tenuiter acuminatis, basi lateraliter cordatis; inflorescentiis axillaribus, solitariis, racemosis, circiter 1 cm longis, bracteis numerosis anguste lanceolatis leviter ciliatis, 8 ad 10 mm longis instructis; floribus ♂ paucis, sepalis 2, elliptico-ovatis, 5 mm longis, petalis 2, quam sepalis multo angustioribus; capsulis solitariis, 10 ad 12 mm longis, usque ad 15 mm latis, truncatis, basi late rotundatis, aequaliter 3-alatis, leviter ciliatis.

An erect, somewhat branched herb, at least 40 cm high, the lower nodes often rooting, the branches rather conspicuously subappressed-ciliate, the leaves slightly so. Leaves greenish when dry, membranaceous, in outline oblong-obovate, 6 to 14 cm long, 2 to 7 cm wide, conspicuously inequilateral, deeply and irregularly pinnately lobed, the lobes up to 2.5 cm long and often coarsely 1- or 2-toothed, the apex long and slenderly acuminate, the acumen toothed, the base somewhat narrowed, laterally cordate, one side rounded, the other usually acute, the upper surface with few, scattered, elongated hairs, the lower somewhat appressed-hirsute on the midrib and veins; petioles 5 mm long or less; stipules narrowly lanceolate, acuminate, about 8 mm long, sparingly ciliate. Inflorescences axillary, of short, few-flowered, simple racemes, the axils, 1 cm long or less, supplied with numerous, narrowly lanceolate, long, acuminate, somewhat ciliate

bracts, 8 to 10 mm in length and about 1.5 mm wide. Male flowers pinkish-white, their pedicels up to 10 mm in length. Sepals 2, elliptic-ovate, slightly ciliate, about 5 mm long. Petals 2, narrowly elliptic-oblong, about 3.5 mm long, 1.5 mm wide. Capsules solitary, axillary, including the wings 10 to 12 mm long and 12 to 15 mm wide, the apex truncate, the outer angles acute, slightly narrowed below to the rather broadly rounded base, sparingly ciliate.

SIARGAO, *Bur. Sci.* 34870 Ramos & Pascasio, May 27, 1919, among boulders on forested slopes at low altitudes.

A species similar and distinctly allied to *Begonia urdanetensis* Elm. but with larger leaves, quite different indumentum, and narrower stipules.

THYMELAEACEAE

GYRINOPSIS Decaisne

GYRINOPSIS ACUMINATA sp. nov.

Frutex, floribus exceptis glaber, foliis anguste lanceolatis ad lanceolatis, 12 ad 20 cm longis, tenuiter acuminatis, basi cuneatis, nervis numerosis, dense dispositis; floribus axillaribus, fasciculatis, leviter pubescens, circiter 5 mm longis; capsulis circiter 1 cm longis, rugosis, obovoideis.

A shrub or small tree, entirely glabrous except the flowers, the branchlets usually reddish-brown. Leaves narrowly lanceolate to lanceolate, 12 to 20 cm long, 2.5 to 4.5 cm wide, narrowed to the cuneate base and to the slenderly acuminate apex, greenish or olivaceous and shining when dry. The primary lateral nerves scarcely distinguishable from the densely arranged secondary ones; petioles 5 mm long or less. Flowers axillary, fascicled or in very greatly reduced cymes, their pedicels about 2.5 mm long. Perianth slightly pubescent, about 5 mm long, the lobes 5, oblong, obtuse, about 1.5 mm long. Stamens 10 in a single row near the throat, 5 alternating anthers slightly longer than the others. Ovary oblong-ovoid, narrowed upward, pubescent; style very short. Capsules yellowish, rugose when dry, 1 cm long or less, 2-valved, usually containing a single, subglobose, black seed, 5 to 6 mm in diameter.

DINAGAT, *Bur. Sci.* 35158 Ramos & Pascasio (type), May 13, 1919. BUCAS GRANDE, *Bur. Sci.* 35055 Ramos & Pascasio, June 11, 1919, in forests at low altitudes.

This species is closely allied to *Gyrinopsis brachyantha* Merr., from which it is distinguished by its longer, slenderly acuminate, differently shaped leaves.

COMBRETACEAE

TERMINALIA Linnaeus

TERMINALIA SURIGAENSIS sp. nov. § *Diptera*.

Arbor parva, glabra, ramulis incrassatis, 1 ad 1.5 cm diametro, cicatricibus multis instructis; foliis numerosis, confertis, coriaceis, anguste oblongo-obovatis ad oblanceolatis, 10 ad 14 cm longis, basi cuneatis, apice obtusis ad rotundatis, nervis utrinque circiter 10, tenuibus; inflorescentiis simplicibus, 7 ad 13 cm longis; fructibus 2-alatis, late ellipticis, 1.5 ad 1.8 cm longis et latis, apice retusis apiculatisque.

A glabrous tree, about 6 m high, the ultimate branchlets thickened, 1 to 1.5 cm in diameter, marked with numerous crowded scars of fallen leaves. Leaves densely crowded at the tips of the branchlets, narrowly oblong-obovate to oblanceolate, 10 to 14 cm long, 2 to 5 cm wide, coriaceous, shining, yellowish-green or brownish when dry, gradually narrowed to the cuneate base, the apex obtuse to rounded; lateral nerves about 10 on each side of the midrib, slender; petioles 1 to 1.5 cm long, usually with 2 rather conspicuous glands. Inflorescences axillary, simple, 7 to 13 cm long. Flowers reddish. Calyx funnel-shaped, glabrous, about 5 mm long, the teeth 5, triangular, acute. Fruits 2-winged, including the wings broadly elliptic, 1.5 to 1.8 cm long and nearly as wide, the apex retuse and reticulate, base rounded, the seed-bearing portion of the fruit plane on one side and somewhat keeled on the other, the wings coriaceous.

MINDANAO, Surigao Province, *Bur. Sci.* 34711 (type), 34600, *Ramos & Pascasio*, April 25 and June 15, 1919, along streams at low altitudes ascending to 350 meters.

A species very similar in appearance and very closely allied to *Terminalia darlingii* Merr., from which it is distinguished by its smaller leaves and fruits.

MELASTOMATACEAE

MEDINILLA Gaudichaud

MEDINILLA CAPITATA sp. nov.

Frutex epiphyticus, scandens, ramis ramulisque teretibus, partibus junioribus stellato-pubescentibus; foliis oppositis, subsessilibus, penninerviis, obovato-ellipticis, usque ad 13 cm longis, acuminatis, basi rotundatis vel obscure cordatis, nervis utrinque 3; inflorescentiis lateralibus, solitariis, 2 ad 2.5 cm longis, subglobosis ad ovoideis, densis; floribus 5-meris, racemosis; bracteis ovatis-obovatis ad spatulatis, 10 ad 13 mm longis.

A slender, epiphytic, scandent shrub, the stems frequently emitting roots, the branches and branchlets terete, the latter, and the petioles and leaves on the midrib beneath, distinctly stellate-pubescent with short brown hairs. Leaves opposite, penninerved, obovate-elliptic, subsessile, 10 to 13 cm long, 5 to 9 cm wide, the apex shortly acuminate, the base somewhat narrowed, rounded or obscurely cordate; midrib prominent, the lateral nerves leaving it in the lower 2 to 4 cm, distinct, ascending, usually 3 on each side of the midrib, the inner pairs extending to the apex; petioles 2 mm long or less. Inflorescences lateral, solitary, subsessile, the flowers densely arranged in simple, globose to ovoid racemes, 2 to 2.5 cm long, each flower subtended by an obovate to spatulate, red, slightly pubescent bracteole, 10 to 13 mm in length. Pedicels short. Calyx urceolate, about 7 mm long and 5 mm in diameter, slightly stellate-pubescent, the limb produced, obscurely 5-toothed. Ovary 5-celled.

DINAGAT, *Bur. Sci.* 35179, *Ramos & Pascasio*, May 11, 1919, on tree trunks in forests at low altitudes.

A remarkably characteristic species not closely allied to any previously described form, distinguishable by its subsessile, penninerved, opposite leaves; its stellate, brownish, rather sparse indumentum; and its dense, lateral, subcapitate, simple racemes of 5-merous flowers.

MEDINILLA CONFERTIFLORA sp. nov.

Frutex erectus, glaberrimus, ramulis teretibus, foliis oppositis, sessilibus, oblongo-obovatis ad oblongo-lanceolatis, usque ad 20 cm longis, tenuiter acuminatis, basi perspicue angustatis, penninerviis, nervis utrinque 4; inflorescentiis caulinis, ramosis, circiter 7 cm longis, densissime multifloris et multibracteatis, bracteis angustis obovatis ad spatulatis usque ad 15 mm longis; floribus 4-meris.

An erect, entirely glabrous shrub, about 3 m high, with terete stems and opposite, sessile leaves. Leaves chartaceous when dry, oblong-obovate to oblong-lanceolate, 14 to 20 cm long, 5 to 10 cm wide, olivaceous, penninerved, the apex slenderly acuminate, narrowed below to the rounded base, the narrow basal portion of the leaf 2 to 5 cm in length and 1.5 to 3 cm in width; lateral nerves usually 4 on each side of the midrib, leaving it in the lower half, ascending, the inner two pairs reaching the apex or nearly so, the transverse reticulations distant, parallel, prominent. Inflorescences from the trunks, woody, branched, about 7 cm long, densely many-flowered and multibracteate, the bracts narrowly obovate to spatulate, glabrous, up to 15 mm long, the

younger ones red when dry, the older ones greenish. Flowers 4-merous, their pedicels up to 6 mm long. Calyx urceolate, up to 6 mm long, the limb much produced and about 3 mm long, obscurely 4-toothed, the teeth broad, nerved. Stamens 8, equal. Ovary 4-celled.

PANAY, Capiz Province, Libacao, *Bur. Sci.* 35413 Martelino & Edaño, June 3, 1919, on forested slopes at low altitudes.

This species belongs in the group with *Medinilla trunciflora* Merr. and *M. aurantiaca* Elm., but differs from both in being entirely glabrous.

MEDINILLA FERRUGINEA sp. nov.

Frutex scandens, partibus junioribus dense ferrugineo-villosis, ramulis teretibus, foliis oppositis, in paribus valde inaequalibus; foliis majoribus, lanceolatis ad oblongo-lanceolatis, penninerviis, acuminatis, basi angustatis, acutis, usque ad 20 cm longis, nervis utrinque 3, perspicuis, breviter petiolatis; foliis minoribus late ovatis, acuminatis, basi profunde cordatis, sessilibus, 1 ad 2 cm longis; inflorescentiis lateralibus, solitariis vel fasciculatis, racemosis, 2 ad 3 cm longis, bracteis numerosis, ovatis* ad oblongo-ovatis, villosis, 10 ad 12 mm longis; floribus 4-meris.

A scandent shrub, with terete branches and branchlets, and opposite, very unequal leaves, the smaller leaves of each pair often deciduous on the older stems, the branchlets, petioles, inflorescences, and the younger leaves rather densely ferruginous-pilose with long, weak, spreading hairs. Leaves chartaceous, the larger ones of each pair lanceolate to oblong-lanceolate, penninerved, slenderly acuminate, narrowed below to the obtuse or acute base, 14 to 20 cm long, 3 to 6 cm wide, the lateral nerves usually 3 on each side of the midrib and leaving it in the lower 2 to 4 cm, sharply ascending, prominent, the transverse reticulations distinct; petioles 7 mm long or less. Smaller leaves of each pair broadly ovate, acuminate, deeply cordate at the base, the sinus narrow, the lobes broadly rounded, of the same texture and with the same type of indumentum as the larger leaves, 1 to 2 cm long, sessile.* Inflorescences chiefly from the branches below the leaves, solitary or fascicled, consisting of short, chiefly simple racemes, 2 to 3 cm in length, supplied with numerous, ovate to oblong-ovate, acute or acuminate, villous, 10 to 12 mm long bracts, two bracts subtending each flower. Calyx villous, ovoid, the limb slightly produced, obscurely and shallowly 4-toothed. Stamens 8, apparently equal. Ovary 4-celled.

DINAGAT, Bucas Grande, *Bur. Sci.* 35217 (type), 35048, 35223

Ramos & Pascasio, May and June, 1919, in forests at low altitudes.

A species remarkable for its ferruginous indumentum and its very unequal leaves, the opposite one of each pair being reduced to a broadly obovate, acuminate, deeply cordate, sessile one, entirely different in shape and size from the other of the same pair.

MEDINILLA PURPUREA Elm. in herb. sp. nov.

Frutex scandens, nodis densissime longeque setosis exceptis glaberrimus, ramis teretibus; foliis oppositis, coriaceis, valde inaequalibus, majoribus oblongo-ovatis ad oblongo-ellipticis, petiolatis, usque ad 25 cm longis et 12 cm latis, basi cordatis vel rotundatis, perspicue 7-plinerviis, apice perspicue acuminatis, nervis transversalibus obsoletis, minoribus ovatis, sessilibus, 2 ad 3 cm longis, vel obsoletis. Inflorescentiis axillaribus, longe pedunculatis, capitatis, 4 ad 5 cm diametro, pedunculo usque ad 2 cm longo, bracteis numerosissimis, obovatis, usque ad 1.5 cm longis; floribus 4-meris.

A scandent shrub, entirely glabrous except the densely long-setose nodes, the branches terete, the numerous, rather soft setae at the nodes 1 to 3 cm in length. Leaves opposite, in very unequal pairs, or the smaller one of each pair sometimes obsolete; larger leaves coriaceous, oblong-ovate to oblong-elliptic, pale or somewhat olivaceous when dry, shining, 22 to 26 cm long, 8 to 12 cm wide, the base more or less cordate, sometimes rounded, prominently 7-plinerved, the inner two pairs of nerves reaching the apex, the transverse nerves and reticulations obsolete, the apex rather abruptly and prominently acuminate, the acumen slender, blunt, up to 1.5 cm long; petioles 1 to 1.5 cm long; smaller leaves of each pair same in texture as the larger ones, ovate, sessile, 2 to 3 cm long, 1 to 2 cm wide, frequently wanting. Inflorescences axillary, solitary, long-peduncled, the flowers crowded in dense, globose to ovoid heads at the ends of the peduncles, the latter 12 to 20 cm long, the heads 4 to 5 cm in diameter. Flowers 4-merous, their pedicels up to 4 mm long, the bracts very numerous, obovate, often retuse, red or purple, up to 15 mm long and 10 mm wide. Calyx truncate. Petals 4, obovate, at least 1 cm long. Stamens 8, unequal, the anthers lanceolate-acuminate, 6 mm long, the appendages and spur short. Fruit ovoid, up to 1.5 cm long.

LUZON, Sorsogon Province, Mount Kililibong, *Bur. Sci.* 23701 *Ramos* (type), August, 1919: Tayabas Province, Mount Cadig, *Bur. Sci.* 25461 *Yates*, December 12, 1916. CATANDUANES,

Mount Mariguidon, *Bur. Sci.* 30526 Ramos, November, 1917. On trees in the mossy forests at and above an altitude of 700 meters.

A remarkable species, entirely different from all other known representatives of the genus, strongly characterized by its densely long-setose nodes; its remarkably unequal leaves, the smaller leaf of each pair being very greatly reduced or even obsolete; and by its long-peduncled, capitate, densely bracteate inflorescences. The name *Medinilla purpurea* was applied by Mr. Elmer to 23701 Ramos with reference to material collected by him in Sorsogon that represented the same species. Unfortunately Mr. Elmer's material was lost and, as the duplicates of the specimen cited above have been distributed under his manuscript name, the description is accordingly published here.

MEDINILLA UMBELLATA sp. nov.

Frutex scandens, partibus junioribus minute castaneo-furfuraceis, ramulis teretibus, foliis verticillatis, sessilibus, obovatis, usque ad 23 cm longis, apice abrupte breviter acuminatis, basi angustatis, penninerviis, nervis utrinque 3, valde perspicuis; inflorescentiis lateralibus, umbellatis, pedunculatis, pedunculato 5 cm longo; floribus circiter 15, pedicellatis, 5-meris, bracteis anguste oblanceolatis, circiter 1 cm longis.

A scandent shrub with terete branchlets, verticillate, obovate, penninerved, sessile leaves, and lateral, simple, peduncled, umbellate inflorescences, the indumentum, chiefly confined to the inflorescences and the younger parts, consisting of very short, dark-brown, furfuraceous hairs. Leaves usually 4 at each node, sessile, obovate, 20 to 23 cm long, 12 to 14 cm wide, chartaceous to subcoriaceous, the upper surface olivaceous, the lower usually brownish, abruptly and shortly acuminate, narrowed below to the obtuse base, the narrow basal portion up to 5 cm long, at the very base not exceeding 1 cm in width, penninerved, the lateral nerves usually 3, leaving the midrib in the lower half, ascending, curved, the inner 2 pairs reaching the apex, the transverse reticulations distant, very prominent, the upper surface glabrous, the midrib on the lower surface very sparingly brown-furfuraceous. Inflorescences from leafless nodes, apparently solitary, simple, umbellate, their peduncles about 5 cm long, each bearing 15 or fewer flowers, the subtending bracts narrowly oblanceolate, about 1 cm long, the pedicels about 5 mm long, all parts distinctly but minutely furfuraceous-pubescent with dark-brown hairs. Buds ellipsoid, about 7 mm long; calyx obscurely 5-toothed.

MINDANAO, Surigao Province, *Bur. Sci.* 34744 (type), 34773 Ramos & Pascasio, June 20, 1919, along streams in forests at low altitudes.

This characteristic species is as closely allied to *Medinilla furfuracea* Merr. as to any other described form, but differs radically in its sessile, entirely differently shaped leaves, and different inflorescences.

ARALIACEAE

ANOMPANAX Harms

ANOMPANAX PHILIPPINENSIS Harms, in *Ann. Jard. Bot. Buitenz.* 19 (1904) 15.

Pentapanax sp. Ceron Cat. Pl. Herb. Manila (1892) 89.

The type of this species is *Warburg 14470*, from Davao, Mindanao, and it is by no means certain that the species is really different from the type of the genus, *Anompanax celebicus* Harms. Regarding the latter, I examined Koorders's Celebes material in the Buitenzorg herbarium in January, 1914, noting that the Celebes material looks exactly like the Philippine specimens and that the two species were either identical or very closely allied. *Anompanax philippinensis* is now known from a number of localities in the central and southern Philippines, as follows: SAMAR, *Bur. Sci.* 17454 Ramos. NEGROS, *For. Bur.* 17355 Curran, 7269, 12329 Everett, Merrill 7034. PANAY, Vidal 2930 in *Herb. Kew.*, Yoder, *Bur. Sci.* 30798 Ramos & Edaño, 32354 McGregor. MINDANAO, Merrill 8293, Clemens 1058, *For. Bur.* 4686 Mearns & Hutchinson. BASILAN, *For. Bur.* 18936 Miranda. A species widely scattered on damp forested slopes at medium altitudes.

ANOMPANAX CUMINGIANUS (Presl) comb. nov.

Paratropia cumingiana Presl *Epim.* (1851) 250; *Walp. Ann.* 2 (1852) 725.

Panax cumingiana Rolfe in *Journ. Linn. Soc. Bot.* 21 (1884) 310.

Polyscias cumingiana F.-Vill. *Novis. App.* (1880) 102.

Nothopanax cumingii Seem. in *Journ. Bot.* 4 (1866) 295.

MINDORO, *Cuming 1553*.

Seemann, l. c., records this species also from Borneo, but I have seen no material representing it other than Cuming's collection, the type of the species. My specimen is incomplete, but the ovary is always 2-celled and, although the calyx is truncate, not at all toothed or lobed, I feel confident that *Anompanax* is its correct generic position. It certainly cannot properly be placed in any of the other genera to which it has been assigned by various botanists.

ANOMPANAX DIGITATUS sp. nov.

Frutex erectus, parvus, glaber; foliis longipetiolatis, digitatim 5-foliolatis, foliolis exterioribus subsessilibus, interioribus longipetiolulatis, membranaceis, oblongo-ovatis ad oblongo-ellipticis, acutis vel acuminatis, 12 ad 24 cm longis, nervis utrinque 6 ad 12; inflorescentiis brevibus, circiter 10 cm longis, ramis primariis 2 vel 3, ramis secundariis umbellatim dispositis; calycis ovoideis, circiter 5 mm longis, 5-dentatis, dentibus acutis, 1 mm longis.

An erect, slender shrub, the ultimate branches about 5 mm in diameter. Leaves long-petioled, digitately 5-foliolate, the outer two leaflets sessile or nearly so, the inner three with petiolules 3 to 5 cm in length; petioles 12 to 15 cm long, inflated and clasping at the base; leaflets membranaceous or thinly chartaceous, shining, oblong-ovate to oblong-elliptic, 12 to 24 cm long, 5 to 10 cm wide, the apex acute or obscurely but sharply acuminate, the base often somewhat inequilateral, acute or acuminate; lateral nerves slender, 6 to 12 on each side of the midrib. Inflorescences short, about 10 cm long, the peduncle about 1 cm in length with 2 or 3 primary branches, these bearing from 4 to 7 secondary, umbellately arranged, 1 to 2 cm long branchlets; the flowers subumbellately or racemosely arranged toward the tips of the branchlets, their pedicels about 5 mm long, jointed. Calyx after flowering ovoid, about 5 mm long, 5-toothed, the teeth oblong-ovate, acute, 1 mm long. Ovary 2-celled; styles 2, stout, somewhat recurved, about 1.5 mm long.

SIARGAO, *Bur. Sci.* 34925 Ramos & Pascasio, June 2, 1919, in forests at low altitudes, the height indicated as 0.5 meter.

This species differs from *Anompanax philippinensis* Harms in its smaller size, its strictly digitate leaves, fewer leaflets, and in its short, comparatively simple inflorescences.

BOERLAGIODENDRON Harms**BOERLAGIODENDRON DINAGATENSE** sp. nov.

Frutex glaber, circiter 2 m altus, ramulis ultimis circiter 5 mm diametro; foliis oblongis ad oblongo-ellipticis, coriaceis, 14 ad 18 cm longis, basi acutis vel obtusis, apice plerumque acutis, marginae leviter undulatis et minute denticulatis, penninerviis, nervis utrinque circiter 12, tenuibus, petiolo 2 ad 2.5 cm longo; inflorescentiis circiter 7 cm diametro, breviter pedunculatis, ramis primariis circiter 15, umbellatim dispositis, ramis secundariis circiter 2 cm longis, fructibus umbellatim dispositis, ovoideis, circiter 5 mm longis.

A glabrous shrub, about 2 m high, the ultimate branchlets about 5 mm in diameter. Leaves coriaceous, oblong to oblong-elliptic, 14 to 18 cm long, 5 to 7 cm wide, somewhat narrowed below to the acute or obtuse base, the apex usually acute, margins somewhat undulate and minutely toothed in the sinuses of the undulations; lateral nerves slender, pinnately arranged, about 12 on each side of the midrib, not very prominent; petioles 2 to 2.5 cm long, their bases with a single, obscure, unarmed crest. Inflorescences terminal, about 7 cm in diameter, the peduncle rather slender, about 2 cm long; primary branches about 15, umbellately arranged, these bearing 2 lateral branches and a central, nearly sessile, or short-peduncled umbel of sterile flowers, the lateral branches jointed at about the middle and bearing 2 small bracts. Fruits umbellately arranged at the tips of the lateral branchlets, ovoid, about 5 mm long, their pedicels 2 to 3 mm in length; seeds usually 3.

DINAGAT, *Bur. Sci.* 35220 *Ramos & Pascasio*, May 12, 1919, in forests at low altitudes.

This species is distinctly an ally of *Boerlagiodendron simplicifolium* Elm. and, like it, is characterized by its oblong, entire, pinnately nerved leaves; among other characters it differs radically from the latter species in its much shorter petioles.

MYRSINACEAE

DISCOCALYX Mez

DISCOCALYX LONGISSIMA sp. nov.

Frutex glaber, circiter 1 m altus; foliis numerosis, linearis, integris, 18 ad 25 cm longis, 7 ad 14 mm latis, utrinque angustatis, acuminatis, subtus glandulosis, breviter petiolatis; racemis brevibus, tenuibus, paucifloris, 1 ad 1.5 cm longis, in ramulis axillaribus tenuibus dispositis, ramulis specialibus 12 ad 16 cm longis, foliis paucis valde reductis instructis, partibus apicalibus cicatricibus bracteisque multis instructis; floribus minutus, 5-meris, sepalis perspicue glandulosis.

A glabrous shrub, about 1 m high, the branches smooth, terete, brownish, the ultimate ones about 1 mm thick. Leaves numerous, linear, entire, 18 to 25 cm long, 7 to 14 mm wide, narrowed to the acuminate apex, the base much narrowed and abruptly acute or obtuse, olivaceous and shining when dry, distinctly glandular-punctate beneath, the midrib very prominent, the reticulations rather close, distinct; petioles stout, 3 mm long or less. The specialized slender branches bearing the inflorescences axillary, solitary, 12 to 16 cm long, each supplied with

2 or 3 greatly reduced, narrowly lanceolate leaves about 1.5 cm in length, the apical 1 to 2 cm slightly thickened, about 1.5 mm in diameter, these thickened parts supplied with many narrowly lanceolate, acuminate bracts 5 to 10 mm in length and marked with numerous scars of fallen bracts, this thickened portion bearing 1 or 2 slender, few-flowered racemes 1 to 1.5 cm long. Flowers 5-merous, reddish; the sepals narrowly oblong, about 1 mm long, with few, large, prominent glands.

MINDANAO, Surigao Province, *Bur. Sci.* 34456 Ramos & Pascasio, April 14, 1919, on rocky forested slopes at low altitudes.

This species is similar and manifestly closely allied to *Discocalyx angustissima* Merr., from which it is distinguished by its entire leaves.

EBENACEAE

DIOSPYROS Linnaeus

DIOSPYROS LONGICILIATA sp. nov.

Frutex parvus, ramulis et petiolis et foliis perspicue longe ciliatis, ramis ramulisque tenuibus; foliis chartaceis, oblongo-lanceolatis, 9 ad 16 cm longis, basi rotundatis, apice tenuiter acute acuminatis, nervis utrinque circiter 12; floribus longe ciliatis, axillaribus, solitariis, sessilibus, calycis tubo brevissimo, lobis lanceolatis, acuminatis, circiter 4 mm longis; ovario densissime ciliato.

A small shrub, the branchlets, petioles and portions of the leaves prominently ciliate with long, slender, spreading hairs, these hairs usually about 2 to 3 mm in length. Branches slender, erect, glabrous, black when dry. Leaves oblong-lanceolate, chartaceous, 9 to 16 cm long, 2 to 3.5 cm wide, brownish-olivaceous when dry, base rounded, apex rather slenderly and sharply acuminate, both surfaces and the margins long-ciliate with scattered hairs, these more numerous on the midrib than on other parts of the leaf; lateral nerves slender, about 12 on each side of the midrib, anastomosing, the reticulations lax, distinct; petioles about 3 mm long. Pistillate flowers solitary, axillary, sessile, 4-merous. Calyx-tube very short, the lobes lanceolate, prominently long-acuminate from a broad base, about 4 mm long, conspicuously long-ciliate. Corolla reddish, the tube about 5 mm long, externally long-ciliate, the lobes oblong, about 6 mm in length. Stamines 4. Ovary very densely ciliate with long ascending hairs up to 4 mm in length; style densely hirsute below.

DINAGAT, *Bur. Sci.* 35189, Ramos & Pascasio, May 11, 1919, in forests at low altitudes.

A species, prominently characterized by its numerous, long, spreading hairs, closely allied to *Diospyros everettii* Merr., one that has the same type of indumentum. The present species differs from the latter in its much thinner, more-numerously nerved leaves and in the much more conspicuous and denser indumentum which is found on the branchlets, petioles, both surfaces of the leaves, and the flowers, while in *D. everettii* the hairs are few in number and are practically confined to the branchlets and flowers.

LOGANIACEAE

GENIOSTOMA Forster

GENIOSTOMA LANCILIMBUM sp. nov.

Arbor parva, glabra, ramis teretibus, tenuibus; foliis lanceolatis ad oblongo-lanceolatis, 7 ad 10 cm longis, utrinque angustatis, basi acutis, apice caudato-acuminatis, chartaceis, nervis utrinque circiter 7, reticulis subobsoletis; floribus axillaribus, solitariis, pedicellatis; fructibus subglobosis, 6 ad 8 mm diametro.

A glabrous shrub or small tree, 3 to 4 m high, the branches and branchlets terete, slender, the former grayish, the latter often black when dry. Leaves lanceolate to oblong-lanceolate, 7 to 10 cm long, 1.5 to 3 cm wide, narrowed below to the acute base and above to the slender, caudate-acuminate apex, chartaceous, shining, olivaceous or black when dry, the midrib distinct; lateral nerves slender, indistinct, usually about 7 on each side of the midrib, obscurely anastomosing, the reticulations obsolete or nearly so; petioles 3 to 6 cm long. Flowers white, axillary, solitary, their pedicels about 5 mm long. Calyx 2.5 to 3 mm in diameter, the lobes 5, glabrous, broadly triangular-ovate, acute, about 1 mm long, their margins very obscurely ciliate. Corolla-tube 3 mm long, the lobes reflexed, oblong-ovate; 2 mm long, the throat densely villous inside. Fruits subglobose, black when dry, 6 to 8 mm in diameter.

PANAY, Capiz Province, Libacao, *Bur. Sci.* 35332 (type). 35344 Martelino & Edaño, May 28, 1919, in open forests at low altitudes.

In its axillary, solitary flowers this species is apparently allied to *Geniostoma longipes* Merr., but is radically different from that species in its vegetative and other characters.

GENIOSTOMA RAMOSII sp. nov.

Frutex erectus, 3 m altus, inflorescentiis exceptis glaber; foliis membranaceis, oblongo-ellipticis, 10 ad 13 cm longis, breviter acuminatis, basi rotundatis et leviter decurrentibus, nervis utrinque circiter 8, tenuibus, distinctis; floribus fasciculatis,

pedicellatis, calycis lobis triangulari-ovatis, acutis, 2 mm longis; fructibus subglobosis, circiter 5 mm diametro.

An erect shrub, about 3 m high, glabrous except the inflorescences, the branches and branchlets terete, pale. Leaves membranaceous, oblong-elliptic, nearly black when dry, 10 to 13 cm long, 4 to 6.5 cm wide, the base rounded to subacute or somewhat decurrent, the apex shortly but distinctly acuminate; lateral nerves slender, distinct, anastomosing, about 8 on each side of the midrib, the reticulations lax, not prominent; petioles 1 cm long. Flowers axillary, fascicled, their pedicels somewhat pubescent, about 7 mm long. Calyx about 5 mm long, the lobes pubescent, triangular-ovate, acute, 2 mm in length. Fruits 4 to 10 in each fascicle, subglobose, black when dry, about 5 mm in diameter, when young somewhat pubescent, ultimately glabrous, their pedicels up to 8 mm in length.

SIARGAO, *Bur. Sci.* 34893 *Ramos & Pascasio*, May 29, 1919, in forests at low altitudes.

A species closely allied to *Geniostoma nigrescens* (Blanco) Merr. but with the exception of the inflorescences entirely glabrous and with larger leaves.

APOCYNACEAE

ALYXIA Banks

ALYXIA STENOPHYLLA sp. nov.

Frutex scandens, glabra, ramis ramulisque teretibus, tenuibus, ultimis 1 ad 1.5 mm diametro; foliis plerumque verticillatis, 4 ad 6 cm longis, 6 ad 10 mm latis, anguste lanceolatis, utrinque subaequaliter angustatis, basi acutis, apice obtuse acuminatis, chartaceis vel subcoriaceis, nervis lateralibus obsoletis; inflorescentiis axillaribus, solitariis, pedunculatis, umbellatim 3- vel 4-floris, pedunculo 1 ad 1.5 cm longo. Corollae tubo 7 mm longo.

A glabrous vine, the branchlets slender, terete, the ultimate ones 1 to 1.5 mm in diameter. Leaves mostly verticillate, sometimes opposite, narrowly lanceolate, 4 to 6 cm long, 6 to 10 mm wide, subequally narrowed to the acute base and the blunt-acuminate apex, firmly chartaceous or subcoriaceous, shining when dry, the margins slightly recurved; midrib prominent, the lateral nerves and reticulations obsolete; petioles 2 to 3 mm long. Inflorescences axillary, solitary, umbellately 3- or 4-flowered, the peduncles 1 to 1.5 cm long, the pedicels about 3 mm long, 2-bracteolate at their apices, the bracteoles lanceolate, acuminate, 1 mm long. Calyx about 3 mm long, the lobes lanceolate-acuminate. Corolla-tube about 7 mm long, white.

PANAY, Capiz Province, Mount Salibongbong, *Bur. Sci.* 35574 Martelino & Edaña, June 19, 1919. In thickets and forests near the summit, altitude about 650 meters.

This species resembles *Alyxia blancoi* Merr. but is easily distinguished by its longer peduncles and by its terete, not 4-angled, branchlets; it differs from *Alyxia lanceolata* Merr. in its glabrous inflorescences.

ALYXIA OBOVATIFOLIA sp. nov.

Frutex scandens, partibus junioribus pubescens, ramulis acute 4-angulatis; foliis verticillatis, crasse coriaceis, obovatis ad oblongo-obovatis, 4 ad 6 cm longis, apice late rotundatis, deorsum angustatis, basi cuneatis, margine valde recurvatis, nervis lateralibus obsoletis; floribus axillaribus, sessilibus vel subsessilibus, plerumque binis, calycis pubescens, corollae tubo circiter 1 cm longo.

A scandent vine, the branchlets sharply 4-angled, the internodes 2 to 4 cm long, the younger parts somewhat pubescent. Leaves verticillate, usually 4 at each node, thickly coriaceous, obovate to oblong-obovate, shining, 4 to 6 cm long, 1.5 to 2.5 cm wide, the apex broadly rounded and sometimes slightly retuse, narrowed below to the cuneate base, the margins strongly recurved, the midrib prominent, the lateral nerves obsolete, the mature leaves glabrous, the very young ones somewhat pubescent; petioles about 5 to 7 mm long. Flowers white, axillary, usually in pairs, sessile or subsessile, the calyx pubescent, the lobes lanceolate, acuminate, about 1.5 mm long. Corolla-tube glabrous, about 1 cm in length.

MINDANAO, Surigao Province, *Bur. Sci.* 34492 Ramos & Pascasio, April 25, 1919, in rather dry thickets along small streams at low altitudes at the iron deposit on the northeast coast.

A species strongly characterized by its thickly coriaceous, obovate to oblong-obovate, rounded, nerveless leaves, and its very short, axillary, usually 2-flowered inflorescences. It is not closely allied to any previously described form.

KIBATALIA G. Don

(*Kickxia* Blume, non Dumortier)

In 1827 Dumortier published the generic name *Kickxia* for a small group of scrophulariaceous plants which some subsequent botanists have placed in *Linaria*. This disposition of Dumortier's genus is by no means universally accepted and some European and American botanists maintain *Kickxia* Dum. as a valid genus in spite of the fact that all current botanical works of a general nature and those on the African and Indo-Ma-

layan floras maintain *Kickxia* Blume for a genus of apocynaceous plants. Under the circumstances it would seem that *Kickxia* Blume must be abandoned, as its use is distinctly invalidated by Dumortier's previous use of the same name for a different genus of plants.

The genus under discussion was originally described in 1826 as *Hasseltia* Blume, this name being invalidated by the earlier *Hasseltia* HBK. The first description of the genus under the name *Kickxia* was published in 1848,² but as early as 1828 Blume had realized the necessity of a new name for his *Hasseltia* and proposed³ to substitute the name *Kickxia* which, however, due to a typographical error appears as *Kixia*; as Blume himself in later publishing a description and figure of this genus altered the name to *Kickxia* and, further, as the genus was dedicated to Prof. Jean Kickx no other explanation of *Kixia* is possible and accordingly this form has no valid standing.

No new name is necessary for this apocynaceous genus in view of the fact that G. Don⁴ has proposed the generic designation *Kibatalia* for *Hasseltia* Blume, non HBK. So long as individual botanists differ in their conception as to what constitutes and what does not constitute a genus cases of nomenclature like this will occur; and unless Blume's generic name be definitely abandoned we have here a case where *Kickxia* Blume will be recognized by those botanists who do not recognize *Kickxia* Dum. as distinct from *Linaria*, while those who recognize Dumortier's genus as a valid one cannot recognize *Kickxia* Blume as a generic designation. The logical course to follow in this case seems to be to abandon Blume's generic name and adopt *Kibatalia* for the group as proposed by G. Don.

KIBATALIA LONGIFOLIA sp. nov.

Arbor glabra; foliis chartaceis, oblongis, usque ad 17 cm longis, basi acutis, apice acutis vel breviter acuminatis, nervis utrinque circiter 10, tenuibus, vix anastomosantibus; inflorescentiis 2- vel 3-floris, breviter pedunculatis, corollae tubo circiter 2.5 cm longo, lobis 4 cm longis; folliculis subligneis, rectis vel leviter curvatis, 17 ad 20 cm longis, 2 cm diametro.

A glabrous tree, about 16 m high, the branchlets smooth, reddish-brown, the branches of about the same color and distinctly lenticellate. Leaves firmly chartaceous, oblong, 12 to 17 cm long,

² Blume, C. L. Rumphia 4 (1848) 25.

³ Blume, C. L. Fl. Jav. Praef. 1 (1828) VII.

⁴ Gen. Syst. 4 (1838) 86.

4.5 to 6.5 cm wide, the base acute, apex acute to very shortly and obscurely acuminate; lateral nerves about 10 on each side of the midrib, slender, distinct, somewhat curved, scarcely anastomosing; petioles 5 to 8 mm long. Inflorescences axillary and terminal, usually 2- or 3-flowered, the peduncles 1 cm long or less, the pedicels 2 to 3 cm in length. Calyx-lobes broadly ovate to elliptic-ovate, rounded to subacute, 4 to 5 mm long. Corolla-tube cylindric for about 1.6 cm, then inflated for about 1 cm, the lobes about 4 cm long. Disk cylindric, 3 to 4 mm high, irregularly and coarsely toothed. Ovary glabrous, ovoid, narrowed upward; style about 2 cm long. Anthers inserted at the expansion of the corolla tube, lanceolate, long-acuminate, about 9 mm long, the basal indurated part of the connective ovoid, about 3 mm long. Follicles somewhat woody, divaricate, straight or slightly curved, 17 to 20 cm long, about 2 cm in diameter. Seeds linear-lanceolate, long-acuminate, about 3 cm long, the coma copious, the hairs about 4 cm in length.

MINDANAO, Davao Province, Santa Cruz, Balutakay, *For. Bur.* 27534 *De Mesa*, April 28, 1919, growing in deep rich soil at an altitude of 40 meters with the local Tagakaolo name *klangnita*.

The alliance of this species is apparently with *Kibatalia wigmani* (Koord.) Merr. of Celebes, from which it differs conspicuously in its slenderly nerved leaves, the lateral nerves scarcely anastomosing.

KIBATALIA STENOPETALA sp. nov.

Arbor glabra, circiter 5 m alta, ramulis tenuibus; foliis subcoriaceis, oblongo-ellipticis, 5 ad 7 cm longis, utrinque subaequaliter angustatis, acuminatis, nervis utrinque circiter 6; floribus axillaribus, solitariis vel binis, tubo corollae 1.5 cm longo, cylindrico, intus pubescens, lobis anguste lanceolatis, acuminatis, circiter 2.5 cm longis, 4 mm latis.

A glabrous tree, about 5 m high, the branches nearly black when dry. Leaves subcoriaceous, oblong-elliptic, shining, 5 to 7 cm long, 1.5 to 3 cm wide, subequally narrowed to the blunt-acuminate apex and to the somewhat decurrent-acuminate base; lateral nerves about 6 on each side of the midrib, distinct, the reticulations very obscure; petioles 2 to 4 mm long. Flowers white, axillary, solitary or in pairs, their pedicels about 2 cm long. Calyx-lobes broadly ovate, 1.5 to 2 mm long, acute or obtuse. Corolla-tube cylindric, about 1.5 cm long, 2.5 mm in diameter, not at all enlarged upward, pubescent inside, the lobes narrowly lanceolate, acuminate, about 2.5 cm long, 4 mm wide. Anthers narrowly lanceolate, acuminate, 5 mm long, the indurated

base of the connectives broadly ovate, about 1 mm long. Disk obscurely toothed, 1 mm high.

MINDANAO, Surigao Province, *Bur. Sci.* 34691 Ramos & Pascasio, June 14, 1919, along streams at low altitudes at the iron deposit on the northeast coast.

This species is at once distinguished from *Kibatalia blancoi* Merr., to which it is most closely allied, by its cylindric corolla-tubes which are not enlarged upward, and by its narrowly lanceolate corolla-lobes which do not exceed 4 mm in width.

The hitherto described species of this genus are as follows:

KIBATALIA AFRICANA (Benth.) comb. nov.

Kickxia africana Benth. in Hook. Ic. III 3 (1877-79) 59, t. 1276.

Tropical Africa, Kamerun, *Preuss* 1382!

KIBATALIA ARBOREA (Blume) G. Don Gen. Syst. 2 (1837) 86.

Hasseltia arborea Blume Bijdr. (1826) 1045.

Kickxia arborea Steud. Nomencl. ed. 2, 1 (1840) 846; Blume Rumphia 4 (1848) 26, t. 179, f. l.

Kixia arborea A. DC. Prodr. 8 (1844) 408.

Java, *cult. Hort. Bogor.* IV-A-80!, IV-A-80a!, XI-B-186!

KIBATALIA BLANCOI (Rolfe) comb. nov.

Kickxia blancoi Rolfe in Journ. Linn. Soc. Bot. 21 (1884) 313.

Kickxia arborea F.-Vill. Novis. App. (1880) 132; Naves in Blanco Fl. Filip. ed. 3 (1877-83) t. 428 bis, non Blume.

Kickxia merrittii Merr. in Philip. Journ. Sci. 4 (1909) Bot. 315.

Kickxia macgregorii Elm. Leaflet. Philip. Bot. 4 (1912) 1457.

A Philippine species widely distributed from northern Luzon southward to Guimaras and Negros, represented by *For. Bur.* 26678 Peñas, 25863 Adduru, 25465 Paraiso, 20964 Villamil, 25726 Mabesa, 7649 Curran & Merritt, 11488 Merritt, 21545 Tamesis, 15113 Tabat, Elmer 12373, Wenzel 320.

KIBATALIA BORNEENSIS (Stapf) comb. nov.

Kickxia borneensis Stapf in Hook. Ic. IV 7 (1901) t. 2693.

Borneo.

KIBATALIA ELASTICA (Preuss) comb. nov.

Kickxia elastica Preuss in Notizbl. Bot. Gart. Berlin 2 (1899) 353.

Tropical Africa, Kamerun, *Zenker* 188!

KIBATALIA LATIFOLIA (Stapf) comb. nov.

Kickxia latifolia Stapf in Kew Bull. (1898) 307.

Tropical Africa.

KIBATALIA SCHEFFERI (K. Schum.) comb. nov.

Kickxia schefferi K. Schum. in Notizbl. Bot. Gart. Berlin 3 (1900) 81.

German East Africa, *herb. Amani* 416!

KIBATALIA WIGMANI Koord. in Meded. Lands Plantent. 19 (1898) 521.
Celebes, *Koorders 16045!*

KIBATALIA ZENKERI (K. Schum.) comb. nov.

Kickxia zenkeri K. Schum. in Notizbl. Bot. Gart. Berlin 3 (1900) 81.
Tropical Africa.

PARSONSIA R. Brown

PARSONSIA PHILIPPINENSIS sp. nov.

Frutex scandens, partibus junioribus cinereo-pubescent; foliis oppositis, subcoriaceis, oblongo-ellipticis ad oblongo-ovatis, 8 ad 13 cm longis, basi leviter acuminatis, apice tenuiter acute acuminatis, nervis utrinque circiter 6, distinctis; inflorescentiis terminalibus, anguste paniculatis, 10 ad 12 cm longis, floribus umbellatim dispositis, extus pubescens, corollae tubo 5 mm longo, filamentis villosis, haud contortis.

A woody vine, the young branchlets and inflorescences sparingly cinereous-pubescent, the branchlets terete, smooth, dark reddish-brown when dry. Leaves subcoriaceous, oblong-elliptic to oblong-ovate, 8 to 13 cm long, 3.5 to 6 cm wide, dark olivaceous when dry, the base usually somewhat acuminate, apex sharply and slenderly acuminate; lateral nerves about 6 on each side of the midrib, distinct, the reticulations lax; petioles 1 to 2 cm long. Inflorescences terminal, paniculate, peduncled, 10 to 12 cm long, more or less pubescent, the flowers subumbellately arranged at the tips of the primary branches, the lower branches 2 cm long or less. Flowers white, their pedicels about 5 mm long. Calyx-lobes obtuse or rounded, 2 to 2.5 mm long. Corolla-tube about 5 mm long and 3 mm in diameter, somewhat angled, glabrous below, pubescent above, the lobes oblong, 4 mm in length. Disk-lobes broadly ovate, rounded, about 0.6 mm long. Anthers narrowly lanceolate, 3.5 mm long, the filaments villous, not twisted.

MINDANAO, Surigao Province, *Bur. Sci. 34585 Ramos & Pascasio*, April 25, 1919, at the iron deposit on the northeast coast along streams at an altitude of about 500 meters.

The distinguishing characters of the present species are its narrowly paniculate inflorescences and its slenderly acuminate, opposite leaves.

ASCLEPIADACEAE

HOYA R. Brown

HOYA CARDIOPHYLLA sp. nov. § *Euhoya*.

Planta epiphytica, ramulis leviter pilosis, glabriscentibus; foliis oppositis, late ovatis, basi late rotundatis et perspicue cordatis, apice breviter acute acuminatis, 5 ad 7 cm longis, in

siccitate subflaccidis, nervis utrinque circiter 4, patulis, cum reticulis laxis subperspicuis; umbellis multifloris, floribus glabris, circiter 1 cm diametro, corolla rotata, lobis rhomboideo-ovatis, obtusis vel acutis, processibus turgidis, crustaceis, oblongo-ovatis, acuminatis.

An epiphytic vine, the branchlets sparingly pilose, soon becoming glabrous. Leaves heart-shaped, apparently fleshy when fresh, rather flaccid when dry, 5 to 7 cm long, 4.5 to 5 cm wide, pale when dry, glabrous or the younger ones slightly ciliate near the basal margins, the base broadly rounded and distinctly cordate, the sinus acute, the basal lobes broadly rounded, the apex shortly and sharply acuminate; petioles 5 to 7 mm long; lateral nerves about 4 on each side of the midrib, somewhat spreading, anastomosing, the reticulations lax and distinct on both surfaces. Umbels many-flowered, the flowers yellowish-white, usually 5-merous, rarely 4-merous, 10 to 11 mm in diameter, their pedicels about 2 cm long, glabrous. Calyx-lobes triangular-ovate, acute or obtuse, 1 mm long. Corolla rotate, the lobes rhomboid-obovate, about 4 mm long, obtuse or somewhat acute, the tips more or less inflexed. Lower lobe of the coronal processes oblong-ovate, acuminate, turgid, somewhat crustaceous, the upper surface somewhat concave. Staminal column short, sessile.

DINAGAT, *Bur. Sci.* 35160 *Ramos & Pascasio*, May 13, 1919, on tree trunks at low altitudes.

A species well characterized by its broadly ovate, rather prominently cordate, shortly and sharply acuminate, conspicuously and laxly reticulate leaves.

HOYA RETICULATA sp. nov. § *Euhoya*.

Planta epiphytica, scandens, pedicellis exceptis glabra; foliis coriaceis, ovatis ad oblongo-ovatis, nitidis, 8 ad 12 cm longis, basi late rotundatis, apice tenuiter acute acuminatis, in siccitate utrinque perspicue reticulato-rugosis, nervis utrinque circiter 4, patulis, vix perspicuis; umbellis multifloris, pedunculo usque ad 10 cm longo, pedicellis leviter pubescens; floribus rotatis, circiter 1 cm diametro, glabris, corollae lobis rhomboideo-ovatis, acutis, processibus crustaceis, turgidis, oblongo-ovatis, acutis; folliculis 9 ad 11 cm longis, usque ad 4 mm diametro.

An epiphytic vine, glabrous except the sparingly pubescent pedicels. Leaves fleshy when fresh, coriaceous when dry, ovate to oblong-ovate, shining, 8 to 12 cm long, 4 to 7 cm wide, the base broadly rounded, the apex slenderly and sharply acuminate, the epidermis on both surfaces coarsely reticulate-wrinkled when dry; petioles 1 to 2.5 cm long; lateral nerves about 4 on each

side of the midrib, somewhat spreading. Umbels many-flowered, their peduncles 2 to 10 cm in length, the somewhat thickened parts marked with scars of fallen pedicels, 1 to 6 cm in length, the pedicels 1.5 to 2 cm long, slightly pubescent. Flowers rotate, glabrous, about 1 cm in diameter, yellowish-white. Calyx-lobes ovate, acute, about 1 mm long. Corolla lobes 4 to 4.5 mm long, about 3.5 mm wide, rhomboid-ovate, acute, spreading, glabrous. Coronal processes crustaceous, the lower lobes turgid, oblong-ovate, acute, about 2.5 mm long, the upper surface flat. Staminal column short, sessile. Follicles slender, cylindric, somewhat acuminate, 9 to 11 cm long, up to 4 mm in diameter, the seeds terete, about 3 mm long.

MINDANAO, Surigao Province, *Bur. Sci.* 34530 Ramos & Pascasio, April 17, 1919, in swampy thickets at low altitudes.

This species is manifestly allied to *Hoya cardiophylla* described above but is readily distinguished by its differently shaped, slenderly acuminate leaves which are broadly rounded but not cordate at the base, its pubescent pedicels, and other characters.

TELOSMA Coville

TELOSMA PARVIFLORA sp. nov.

Planta scandens, glabra; foliis membranaceis, ovatis, 15 ad 18 cm longis, perspicue cordatis, apice tenuiter acuminatis; inflorescentiis laxis, calycis lobis 2 mm longis; corollae tubo cupulato, 3 mm longo, lobis anguste lanceolatis, acuminatis, circiter 6 mm longis; folliculis acuminatis, usque ad 15 cm longis.

A glabrous vine, the branches up to 5 mm in diameter. Leaves membranaceous, ovate, olivaceous, 15 to 17 cm long, 9 to 12 cm wide, the base prominently cordate, the apex rather abruptly and slenderly acuminate; lateral nerves about 5 on each side of the midrib, prominent, the reticulations lax, distinct. Inflorescences axillary, lax, the flowers greenish-yellow, their pedicels 5 to 7 mm long. Calyx-lobes oblong, membranaceous, 2 mm long. Corolla glabrous, the tube cup-shaped, about 3 mm long, wider than long, the lobes narrowly lanceolate, acuminate, about 6 mm in length. Ovary, stamens and corona about 2 mm long and wide, the free tips of the coronal processes ovate, acute or slightly acuminate, about 0.5 mm long. Follicles lanceolate in outline, acuminate, narrowed below to the acute or abruptly obtuse base, 13 to 15 cm long, when dry and somewhat flattened 3 to 4 cm wide. Seeds thin, brownish, ovate, about 1.2 cm long, rounded, the coma copious. Peduncles of the infructescences elongated, including the few branches up to 15 cm in length.

SIARGAO, *Bur. Sci. 35011 Ramos & Pascasio*, May 27, 1919, in dry forests at low altitudes.

In the genus, if correctly placed, this species is easily recognized by its short corolla-tube and its slender corolla-lobes.

VERBENACEAE

CALLICARPA Linnaeus

CALLICARPA LONGIVILLOSA sp. nov.

Arbor parva, ramulis et petiolis densissime et longe ferrugineo-villosis; foliis chartaceis, oblongo-ovatis, 18 ad 25 cm longis, integris vel subintegris, apice tenuiter longissime caudato-acuminatis, basi acutis, utrinque plus minusve stellato-tomentosis, nervis utrinque 10 ad 12; cymis axillaribus, longe pedunculatis, usque ad 10 cm diametro, bracteis linearis, 5 ad 7 mm longis; calycis dense stellato-tomentosis, obscure 4-dentatis, 2 mm longis.

A tree, about 5 m high. The branches and petioles densely villous with long, spreading, ferruginous hairs. Leaves chartaceous, oblong-ovate, entire, 18 to 25 cm long, 8 to 10 cm wide, narrowed upward to the very slender, caudate acumen, the latter up to 5 cm in length, base acute, usually inequilateral, both surfaces more or less stellate-pubescent and with elongated simple hairs on the midrib and nerves, the indumentum dense only on the midrib and nerves; lateral nerves 10 to 12 on each side of the midrib, distinct as are the reticulations on the lower surface; petioles about 4 cm long. Cymes axillary, long-peduncled, about 12 cm long including the peduncle and up to 10 cm in diameter, dichotomous, stellate-pubescent and villous, the bracts linear, 5 to 7 mm long. Flowers violet, 4-merous. Calyx cup-shaped, densely stellate-pubescent, obscurely 4-toothed, about 2 mm long and wide. Corolla puberulent, the tube cylindric, 3 mm long and the lobes broadly oblong, rounded, 1.3 mm long. Stamens exserted, the anthers about 2 mm in length.

MINDANAO, Surigao Province, *Bur. Sci. 34538 Ramos & Pascasio*, April 19, 1919, in forests along streams at low altitudes.

The prominent characteristics of this species are its densely ferruginous-villous branches, branchlets, and petioles, similar simple hairs being intermixed with the stellate indumentum on other parts of the plant; its very slenderly acuminate, entire leaves; and its long-peduncled inflorescences.

CALLICARPA FASCICULIFLORA sp. nov.

Frutex vel arbor parva, partibus junioribus villosis, ramis et foliis et inflorescentiis stellato-tomentosis; foliis oblongis ad

ellipticis, 13 ad 24 cm longis, tenuiter acuminatis, nervis utrinque circiter 10; floribus fasciculatis, sessilibus vel breviter pedicellatis, fasciculis plerumque in axillis defoliatis, 1 ad 1.5 cm diametro; calycis dense villosis atque stellato-tomentosis, tubo 3 mm longo, dentibus lanceolatis, acuminatis, 1.5 ad 2 mm longis.

A shrub or small tree, the younger parts villous and stellate-tomentose, especially the branchlets and petioles. Leaves thinly chartaceous, oblong to elliptic, 13 to 24 cm long, 6 to 12 cm wide, the upper surface olivaceous, sparingly stellate-pubescent, becoming glabrous or nearly so, the lower surface pale, stellate-pubescent on the midrib, nerves, and reticulations, base acute, apex rather slenderly acuminate, margin entire or very obscurely and distantly toothed; lateral nerves about 10 on each side of the midrib, distinct; petioles 1 to 2 cm long. Inflorescences mostly in the axils of fallen leaves, the flowers fascicled, sessile or shortly pedicelled, the fascicles rather dense, 1 to 1.5 cm in diameter. Bracts narrowly oblong, stellate-pubescent, 4 to 5 mm long, the bracteoles filiform, 3 mm long. Calyx densely villous and stellate-tomentose, the tube cylindric, 3 mm long, the teeth 4, lanceolate, acuminate, 1.5 to 2 mm long. Corolla pale violet, the tube 4 mm long, externally somewhat pubescent, the lobes 4, oblong, rounded, about 2 mm long. Stamens exserted, the anthers 3 mm long. Fruit globose, about 2.5 mm in diameter, glabrous, inclosed by the calyx.

BUCAS GRANDE, *Bur. Sci.* 35123 Ramos & Pascasio, June 9, 1919, in open forests at low altitudes.

This species is readily distinguished from its congeners by its fascicled, sessile or subsessile flowers, this type of inflorescence being unknown to me in any other species of the genus.

ACANTHACEAE

GYMNOSTACHYUM Nees

GYMNOSTACHYUM SPICIFORME (Elm.) comb. nov.

Justicia spiciformis Elm. Leaf. Philip. Bot. 1 (1908) 349.

LEYTE, Palo, *Elmer* 7347, January, 1906.

This species is known only from the type collection, and is clearly a species of *Gymnostachyum*, agreeing in all characters with the typical representatives of the genus.

GYMNOSTACHYUM LONGISPICATUM sp. nov.

Herba erecta, usque ad 50 cm alta, plus minusve pubescens; foliis oblongis ad elliptico-oblongis, 10 ad 15 cm longis, obtusis, nervis utrinque circiter 6; spicis elongatis, usque ad 20 cm longis,

multifloris; floribus alternis, bracteis bracteolisque ovatis, acuminatis, glabris vel subglabris, calycis lobis lanceolatis; capsulis lineari-oblongis, glabris, circiter 1.5 cm longis, seminibus circiter 10.

An erect, sparingly branched, more or less pubescent herb, up to 50 cm high. Leaves membranaceous or chartaceous, dark-colored when dry, oblong to elliptic-oblong, 10 to 15 cm long, 4 to 8 cm wide, the base obtuse to acute on the lower ones, the uppermost ones sometimes cordate, the apex obtuse or rounded, margins somewhat undulate, the upper surface glabrous or nearly so, dark olivaceous, the lower somewhat pubescent on the midrib and nerves; lateral nerves about 6 on each side of the midrib, slender, distinct; petioles of the lower leaves up to 2 cm long, of the uppermost ones 5 mm long or less. Spikes elongated, up to 20 cm in length, many-flowered, the flowers alternate, sessile, white, the subtending bracts ovate, acuminate, 2 mm long, the bracteoles similar but slightly smaller, glabrous or nearly so. Calyx 3 to 3.5 mm long, the tube 1.5 mm in length, the lobes lanceolate, acuminate. Corolla-tube 3 mm long, the upper lobe broadly ovate, erect, 3 mm long, the lower one spreading, 3-lobed, each lobe elliptic-oblong, about 3 mm long, 2 to 2.5 mm wide, anther about 2 mm long. Capsule linear-oblong, glabrous, about 1.5 cm long and 2 mm wide, each valve carrying about 5 seeds.

SIARGAO, *Bur. Sci.* 34999 Ramos & Pascasio, May 27, 1919, in thickets or forests at low altitudes.

A species well characterized by its ample leaves and by its greatly elongated spikes.

GESNERIACEAE

CYRTANDRA Forster

CYRTANDRA CAULIFLORA sp. nov.

Frutex erectus, foliis oppositis, aequalibus, perspicue ferrugineo- vel castaneo-villosus; foliis oblanceolatis ad oblongo-ob lanceolatis, 10 ad 20 cm longis, tenuiter acuminatis, basi cuneatis, margine perspicue dentatis, supra subglabris, nervis utrinque circiter 8; inflorescentiis caulinis et e ramis majoribus, cymosis, circiter 5 cm longis, dense villosis; calycis circiter 1.5 cm longis, lobis linearis, 1 cm longis; corolla 2 cm longa.

An erect shrub, the leaves opposite, those of each pair subequal, the branchlets, petioles, inflorescences, and leaves on the lower surface conspicuously ferruginous- or castaneous-villous with weak spreading hairs. Leaves oblanceolate to oblong-

oblanceolate or the lower ones sometimes lanceolate, 10 to 20 cm long, 2 to 6 cm wide, the apex rather slenderly acuminate, narrowed below to the cuneate base, the margins conspicuously toothed, especially toward the apex where the teeth are large and irregular, the upper surface dark-olivaceous with very few widely scattered, weak hairs, ultimately glabrous or nearly so, the lower surface conspicuously and softly villous; lateral nerves about 8 on each side of the midrib, prominent, the reticulations very lax; petioles 2 to 3 cm long. Inflorescences from the trunk or larger branches below the leaves, peduncled, cymose, all parts densely villous with weak spreading hairs, the peduncles 1 to 2 cm long, the pedicels 5 to 8 mm long, the subtending bracts lanceolate or linear-lanceolate, 1 cm long or less. Calyx including the very slender lobes about 1.5 cm long, the lobes linear, about 1 cm in length. Corolla slender, about 2 cm long, externally prominently villous. Style somewhat pubescent.

PANAY, Capiz Province, Libacao, *Bur. Sci.* 35342 Martelino & Edaño, June 3, 1919, along streams at low altitudes, the flowers white.

This species apparently belongs in the group with *Cyrtandra ramiflora* Elm., from which *C. laxa* Elm. is scarcely distinguishable. It differs radically from the above species, in its totally different leaves, flowers, and inflorescences.

TRICHOSPORUM D. Don

TRICHOSPORUM PANAYENSE sp. nov.

Planta scandens, partibus junioribus parce pilosis vel glabris; foliis coriaceis, oblongo-ovatis ad oblongis, usque ad 6 cm longis, basi rotundatis, apice acutis vel obtusis; floribus axillaribus, solitariis vel binis, glabris vel subglabris, calycis subtruncatis, cylindraceutis, 1.2 ad 1.5 cm longis, corolla leviter curvata, 4 ad 4.5 cm longa.

A scandent vine, the stems up to 3 mm in diameter, the younger parts sparingly pilose with weak, widely scattered hairs, soon becoming glabrous or nearly so. Leaves fleshy when fresh, coriaceous when dry, oblong-ovate to oblong, 2.5 to 6 cm long, 1.5 to 2.5 cm wide, the base rounded, the apex acute or obtuse; lateral nerves usually 4 on each side of the midrib, often obsolete, never prominent; petioles about 5 mm long. Flowers axillary, usually 2 on each peduncle, the peduncle less than 5 mm long. Calyx cylindric, truncate or somewhat angulate, 1.2 to 1.5 cm long, usually glabrous. Corolla apparently reddish, somewhat curved, 4 to 4.5 cm long, glabrous or nearly so, the lobes ovate

to ovate-elliptic, rounded, about 7 mm long. Capsules slender, up to 20 cm long, about 3 mm in diameter, glabrous.

PANAY, Mount Bulilao, Mount Salibongbong, and Libacao, *Bur. Sci.* 35720 (type), 35392, 35535, 35588, 35676 *Martelino & Edaño*, June, 1919, in forests along streams, ascending to an altitude of 600 meters.

In general this species resembles, and is manifestly allied to, *Trichosporum truncatum* Elm. and *T. bakeri* Merr.; but the calyx is half as long as in the latter, while it differs from the former in several characters.

RUBIACEAE

TIMONIUS de Candolle

TIMONIUS ROTUNDUS sp. nov.

Arbor glabra, circiter 5 m alta; foliis crasse coriaceis, late elliptico-ovatis, nitidis, apice late rotundatis, basi subtruncatis ad acutis, nervis utrinque 4 vel 5, valde perspicuis; infructescentiis axillaribus, pendunculatis, usque ad 10 cm longis, dichotome ramosis, ramis primariis usque ad 7 cm longis; fructibus sessilibus, depresso-globosis, glabris, 5 ad 8 mm diametro.

A small glabrous tree, about 5 m high, the branchlets about 6 mm in diameter, marked with large petiolar scars. Leaves thickly coriaceous, broadly elliptic-ovate, brownish-olivaceous and shining when dry, the apex broadly rounded, base subtruncate to acute; lateral nerves 4 or 5 on each side of the midrib, very prominent, the reticulations fine, dense; petioles about 4 cm long; stipules oblong-elliptic, rounded, about 2 cm long, deciduous. Infructescences axillary, peduncled, up to 10 cm long, dichotomously branched, the peduncles about 3 cm long, the primary branches up to 7 cm in length, the secondary ones when present shorter. Fruits sessile, arranged on one side of the primary or secondary branches, depressed-globose, pale when dry, 5 to 8 mm in diameter.

DINAGAT, *Bur. Sci.* 35176 *Ramos & Pascasio*, May 17, 1919, in forests at low altitudes.

A species apparently belonging in the group with *Timonius obovatus* Elm. but with very differently shaped, much larger leaves.

TIMONIUS PANAYENSIS sp. nov.

Arbor dioica, partibus junioribus inflorescentiisque ferrugineo pubescens; foliis variabilis, 12 ad 28 cm longis, coriaceis, oblongis ad ovato-ellipticis vel obovato-ellipticis, breviter acuminatatis, basi acutis, subtus leviter pubescens, nervis utrinque

circiter 10, valde perspicuis, inflorescentiis ♂ circiter 4 cm longis, pedunculatis, dichotome ramosis, ramis 2, paucifloris; floribus sessilibus, calycis cylindraceis, 10 ad 12 mm longis, 2- vel 3-lobatis; fructibus pedunculatis, solitariis, ellipsoideis, circiter 1.5 cm diametro, ferrugineo-pubescens, calycis tubo persistentibus, cylindraceis.

A dioecious tree, 10 to 15 m high, the younger parts and inflorescences distinctly ferruginous-pubescent with short, appressed hairs. Branches terete, glabrous, the ultimate branchlets somewhat angled, pubescent. Leaves opposite, exceedingly variable in size, coriaceous, oblong to ovate-elliptic or obovate-elliptic, shortly acuminate, base acute, the upper surface glabrous, the lower sparingly pubescent, 12 to 28 cm long, 5 to 14 cm wide; lateral nerves very prominent, about 10 on each side of the midrib, the primary reticulations lax, distinct; petioles when young pubescent, in age nearly glabrous, 5 to 10 mm long; stipules oblong-ovate, shortly acuminate, pubescent, about 12 mm long. Staminate inflorescences axillary, ferruginous-pubescent, about 4 cm long, peduncled, dichotomously once-branched, few-flowered. Flowers ferruginous-pubescent, sessile. Calyx cylindric, 10 to 12 mm long, irregularly 3-toothed or 3-lobed, the teeth broad, 2 to 3 mm long. Corolla-tube about 6 mm long, the lobes 5, oblong, 5 mm in length. Fruits apparently solitary, the peduncles 2 to 2.5 cm long, the fruits ellipsoid, appressed-pubescent with short, shining, ferruginous hairs, smooth, about 1.5 cm in diameter, crowned by the elongated, persistent, cylindric calyx-tube which is about 8 mm in length.

PANAY, Capiz Province, Libacao, *Bur. Sci.* 35445 (type), 35447 Martelino & Edaño, June 13, 1919, in open forests and along small streams at low altitudes.

This species is characterized by its exceedingly variable leaves; its elongated staminate flowers; and its ellipsoid fruits which are crowned by the cylindric, persistent, elongated calyx-tube.

• **TIMONIUS LANCEOLATUS** sp. nov.

Frutex dioicus, circiter 3 m altus, partibus junioribus et subtus foliis ferrugineo-pubescens; foliis coriaceis, lanceolatis, nitidis, 7 ad 13 cm longis, utrinque angustatis, basi cuneatis, apice tenuiter acuminatis, nervis utrinque 5 ad 7, distinctis, reticulis subobsoletis; floribus ♂ axillaribus, sessilibus, fasciculatis, calycis tubo 3 ad 4 mm longo, lobis lanceolatis, tubo aequantibus, patulis; fructibus axillaribus, solitariis, brevissime pedicellatis, depressoglobosis, 6 ad 9 mm diametro, dense pubescens.

A shrub, about 3 m high, the younger parts, flowers, and

leaves on the lower surface more or less ferruginous-pubescent. Branches grayish to reddish-brown, terete, glabrous, the growing branchlets densely ferruginous-pubescent with short appressed hairs. Leaves coriaceous, lanceolate, brownish-olivaceous when dry, shining, 7 to 13 cm long, 2 to 4.5 cm wide, narrowed to the slenderly acuminate apex and below to the cuneate base, the upper surface glabrous, the lower somewhat paler and appressed-pubescent with short hairs; lateral nerves 5 to 7 on each side of the midrib, distinct, the reticulations very obscure or often obsolete; petioles 3 mm long or less; stipules lanceolate, acuminate, about 8 mm long, connate below, deciduous. Male flowers axillary, sessile, fascicled, ferruginous-pubescent, usually 3 or 4 in a fascicle, the bracts linear-lanceolate, acuminate, 2.5 to 4 mm long. Calyx-tube 3 to 4 mm long, the lobes 5, rarely 6, lanceolate, acuminate, 3 to 4 mm long, somewhat spreading. Corolla-tube about 1 cm long, the lobes oblong, 4 mm in length. Fruits axillary, usually solitary, depressed-globose or globose, 6 to 9 mm in diameter, densely pubescent with shining, short, brownish hairs, the pedicels about 2 mm long.

DINAGAT, *Bur. Sci.* 35211 *Ramos & Pascasio* (type), May 12, 1919. MINDANAO, Surigao Province, *Bur. Sci.* 34613 *Ramos & Pascasio*, April 24, 1919. In forests at low altitudes.

This species somewhat resembles *Timonius longistipulus* Merr., but its true alliance seems to be with *T. valetonii* Elm., from which it is distinguished by its entirely differently shaped leaves.

GREENIOPSIS Merrill

GREENIOPSIS EUPHLEBIA sp. nov.

Arbor parva, plus minusve hirsuta, ramulis dense hirsutis; foliis chartaceis, oblongo-obovatis ad oblongo-oblanceolatis, breviter petiolatis, 16 ad 23 cm longis, 5 ad 10 cm latis, nitidis, in siccitate brunneis, apice acute acuminatis, basi anguste cuneatis, supra glabra, subtus ad costa nervisque hirsutis; nervis utrinque circiter 15, supra impressis, subtus valde conspicuis; paniculis terminalibus, pedunculatis, usque ad 26 cm longis, omnibus partibus hirsutis, corolla circiter 1 cm longa.

A tree, about 4 m high, rather prominently hirsute, the branchlets and inflorescences densely so, the indumentum brownish or ferruginous. Leaves oblong-obovate to oblong-oblanceolate, chartaceous, brown and shining when dry, 16 to 23 cm long, 5 to 10 cm wide, the apex shortly and sharply acuminate, the base narrowly cuneate, the upper surface glabrous or with few hairs along the midrib, the lower surface hirsute on the midrib and

nerves; lateral nerves about 15 on each side of the midrib, impressed on the upper surface, very prominent on the lower surface; petioles 1 cm long or less; stipules oblong-lanceolate, glabrous, or the median part pubescent, acuminate, 2 to 2.5 cm long, brown when dry. Panicles peduncled, terminal, up to 26 cm long, usually supplied with a few reduced leaves, all parts rather prominently hirsute. Flowers numerous, white, their pedicels 1 to 2 mm long. Calyx 6 mm long, funnel-shaped, the lobes 5, obovate to oblong-obovate, rounded, 3 mm long. Corolla 1 cm long, pubescent, funnel-shaped, the tube about 22 mm in diameter for the lower 3 mm, then expanded, the throat 6 to 7 mm in diameter, the lobes about 2 mm long and 4 mm wide, broadly rounded or retuse, the tube villous inside in the narrower part. Anthers 2 mm long.

BUCAS GRANDE, *Bur. Sci.* 35134 Ramos & Pascasio, June 9, 1919, in open forests at low altitudes.

This species is well characterized by its indumentum and by its very prominently nerved leaves, and is readily distinguishable from the other described species of the genus.

IXORA Linnaeus

IXORA ANGUSTILIMBA sp. nov.

Frutex glaber, 1 ad 2 m altus; foliis lanceolatis ad anguste lanceolatis, subcoriaceis, 7 ad 22 cm longis, 1 ad 3 cm latis, basi acutis, apice acute acuminatis, nervis utrinque circiter 20, tenuibus; cymis 6 ad 12 cm longis, laxis, pedunculatis, floribus plerumque in triadibus dispositis, calycis dentibus brevissimis, corollae tubo 1.8 cm longo, lobis anguste oblongis, 5 ad 6 mm longis.

A glabrous shrub, 1 to 2 m high. Leaves lanceolate to narrowly lanceolate, subcoriaceous, 7 to 22 cm long, 1 to 3 cm wide, subequally narrowed below to the usually acute base and above to the sharply acuminate apex, shining when dry, often somewhat falcate; lateral nerves slender, spreading, often indistinct, up to 20 on each side of the midrib; petioles 2 mm long or less, stout; stipules truncate, abruptly terminated by a 1.5 to 2 mm long acuminate tip. Inflorescences terminal and in the upper axils, usually solitary, 6 to 12 cm long, peduncled, the flowers rather laxly disposed; the primary branches up to 4 cm in length. Flowers reddish-white, usually borne in triads at the tips of the ultimate branches, their pedicels about 5 mm long, the subtending bracts lanceolate, acuminate, 1.5 mm long or less, the bracteoles subtending, the flowers similar but smaller. Calyx about

2 mm long, the teeth very short. Corolla-tube slender, about 1.8 cm long, the lobes narrowly oblong, spreading or reflexed, 5 to 6 mm long. Fruits ovoid, red when fresh, dark brown when dry, 6 to 8 mm in diameter.

MINDANAO, Surigao Province, *Bur. Sci.* 34588 *Ramos & Pascasio* (type), April 24, 1919. DINAGAT, *Bur. Sci.* 35222 *Ramos & Pascasio*, June, 1919. BUCAS GRANDE, *Bur. Sci.* 35087 *Ramos & Pascasio*, June 11, 1919. On dry forested slopes and ridges at low altitudes.

A species strongly characterized by its narrow, elongated leaves, apparently not closely allied to any previously described form.

IXORA TENUIPEDUNCULATA sp. nov.

Frutex glaber, foliis chartaceis, oblanceolatis, 9 ad 13 cm longis, 2 ad 3 cm latis, deorsum angustatis, basi cuneatis, apice acuminatis, nervis utrinque circiter 20; inflorescentiis axillaribus, solitariis, 3-floris, tenuiter pedunculatis, pedunculo 5 ad 6 cm longo; calycis dentibus brevissimis, corollae tubo 2.8 cm longo, lobis lineari-lanceolatis, circiter 1.2 cm longis.

A glabrous shrub. Leaves chartaceous, oblanceolate, rather pale and somewhat shining when dry, 9 to 13 cm long, 2 to 3 cm wide, narrowed below to the cuneate base, the apex distinctly acuminate; lateral nerves slender, spreading at nearly right angles, about 20 on each side of the midrib; petioles rather stout, 2 to 3 mm long; stipules broad, subtruncate, terminated by a 5-mm long filiform tip. Inflorescences axillary, solitary, 3-flowered, their peduncles very slender, 5 to 6 cm long, the pedicels slender, about 1 cm long. Flowers pink, the calyx about 2 mm long, the teeth very short. Corolla-tube slender, about 2.3 cm long, the lobes linear-lanceolate, about 1.2 cm long. Fruits brown when dry, about 7 mm long and nearly 1 cm wide.

MINDANAO, Surigao Province, *Bur. Sci.* 34475 *Ramos & Pascasio*, April 30, 1919; in damp forests at low altitudes.

A species strongly characterized by its 3-flowered inflorescences and its very slender elongated peduncles.

IXORA CONFERTIFLORA sp. nov.

Frutex glaber, circiter 3 m altus; foliis coriaceis, oblongo-ellipticis ad oblongo-obovatis, 9 ad 13 cm longis, basi cuneatis, apice acute acuminatis, nervis utrinque circiter 12, tenuibus; stipulis tenuiter caudato-acuminatis; cymis subcapitatis, pedunculatis, axillaribus terminalibusque, 1.5 ad 3 cm diametro, pedunculo 2 ad 6 cm longo; bracteis bracteolisque linearis, 2.5 ad

4 mm longis, calycis dentibus oblongis ad oblongo-ellipticis, quam tubo paullo longioribus, corollae tubo 10 ad 12 mm longo, lobis ellipticis, 2.5 mm longis.

A glabrous shrub, about 3 m high. Leaves coriaceous, dark brown and shining when dry, oblong-elliptic to somewhat oblong-obovate, 9 to 13 cm long, 3 to 5.5 cm wide, the base cuneate, the apex sharply acuminate; lateral nerves spreading at nearly right angles, about 12 on each side of the midrib, slender, distinct, the reticulations evident; petioles 5 mm long or less; stipules broadly ovate, abruptly contracted into a slender, caudate, 5 to 7 mm long tip. Cymes subcapitate, peduncled, axillary, and terminal, 1.5 to 3 cm in diameter, few- to many-flowered, their peduncles 2 to 6 cm long, the terminal one usually subtended by a pair of ovate to broadly ovate, rounded, or cordate, sessile leaves, 3 to 5 cm in length. Flowers white, the subtending bracts and bracteoles linear, 2.5 to 4 mm long. Calyx-tube somewhat ovoid, about 2 mm long, the lobes oblong to oblong-elliptic, acute, usually exceeding the tube in length. Corolla-tube slender, 10 to 12 mm long, the lobes elliptic, 2.5 mm in length. Fruits red when fresh, dark brown when dry, ovoid, 5 to 7 mm in diameter, crowned by the conspicuous calyx-lobes.

DINAGAT, *Bur. Sci.* 35206 Ramos & Pascasio, May 12, 1919, in forests at low altitudes.

This species somewhat resembles *Ixora capitulifera* Merr. but differs very radically in its calyx characters. It is easily recognizable by its subcapitate, dense, paniced cymes; its very slender bracts and bracteoles; its calyx-teeth distinctly exceeding the tube in length; and in its rather short, white flowers.

CAMPANULACEAE

PENTAPHRAGMA Wallich

PENTAPHRAGMA PLATYPHYLLA sp. nov.

Planta erecta, 0.5 m alta, partibus junioribus dense pubescens; foliis late ovatis ad elliptico-ovatis, chartaceis, leviter inaequilateralibus, usque ad 28 cm longis, basi, saltem in foliis majoribus, distincte cordatis, nervis utrinque circiter 6; racemis axillaribus, pubescens, bracteis anguste oblongis; floribus haud secundis, pedicellatis, tubo perianthii pubescens, 3 cm longo, calycis lobis inaequalibus, majoribus usque ad 2.5 cm longis.

A suffrutescent plant, about 0.5 m high, the younger parts densely pubescent with crisped hairs. Leaves broadly ovate to elliptic-ovate, slightly inequilateral, chartaceous, up to 28 cm long and 20 cm wide, the upper surface glabrous, the lower more

or less pubescent with scattered hairs, the apex subacute, the margin with distant, short, blunt teeth, base somewhat inequilateral, distinctly cordate, at least that of the larger leaves; lateral nerves about 6 on each side of the midrib, prominent; petioles up to 10 cm long. Inflorescences axillary, the rachis and peduncle up to 8 cm long, pubescent, the bracts narrowly oblong, about 1 cm long. Flowers white, not secund, their pedicels about 1.5 cm long, gradually merging with the perianth-tube which is up to 3 cm in length, terete or obscurely angled and more or less pubescent. Calyx lobes white, spreading, elliptic, the two larger ones 2 to 2.5 cm long, about 1.5 cm wide, rounded, the three others smaller, usually about half as large as the other two. Petals 5, oblong to narrowly oblong-obovate, rather thick, rounded, about 10 mm long, 5 to 6 mm wide.

DINAGAT, *Bur. Sci.* 35258 Ramos & Pascasio, May 12, 1919, in forests along small streams at low altitudes.

A species belonging in the same group with *Pentaphragma philippinense* Merr., from which it differs especially in its larger leaves, which are cordate at the base.

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