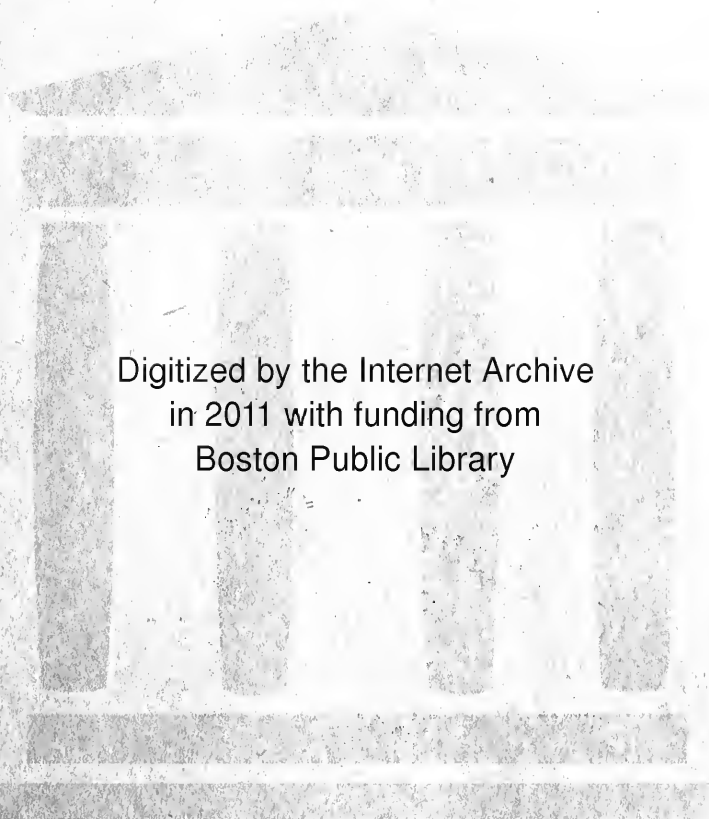


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1904.—No. 17.

DEPARTMENT OF THE INTERIOR.

BUREAU OF GOVERNMENT LABORATORIES.



NEW OR NOTEWORTHY PHILIPPINE PLANTS, II.



BY ELMER D. MERRILL, BOTANIST.



ISSUED OCTOBER 1, 1904.



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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF GOVERNMENT LABORATORIES,
OFFICE OF THE SUPERINTENDENT OF LABORATORIES,
Manila, P. I., June 15, 1904.

SIR: I have the honor to transmit herewith a paper entitled
"New or Noteworthy Philippine Plants, II," by Elmer D. Merrill,
Botanist.

I am, very respectfully,

PAUL C. FREER,
Superintendent of Government Laboratories.

HON. DEAN C. WORCESTER,
Secretary of the Interior.

LIST OF ILLUSTRATIONS.

PLATE I. *Pandanus luzonensis* Merrill, habit.

II. *Pandanus luzonensis* Merrill, fruit.

III. *Pandanus arayatensis* Merrill, fruit.

NEW OR NOTEWORTHY PHILIPPINE PLANTS, II.

By ELMER D. MERRILL.

The descriptions of the new species proposed in the present paper, and the notes on those previously described which are of interest either on account of their distribution or nomenclature, have been prepared from time to time as material and data became available. The types of the new species proposed are deposited in the herbarium of the Bureau of Government Laboratories, the present paper being based entirely on material contained therein. The first paper of this series was issued as Publication 6 of the Bureau.

TAXACEÆ.

PODOCARPUS BLUMEI Endl. Syn. 208. 1847; Pilger in Engler, Pflanzenreich, 18:60. 1903.

This widely distributed species, not previously known from the Philippines, is abundant on Mount Mariveles, Province of Bataan, Luzon, growing on forested slopes and ridges at and above an elevation of 700 m. above the sea, associated especially with *Agathis philippinensis* Warburg. No. 147 Forestry Bureau, collected by Barnes, January, 1904; No. 244, Cope-land, January, 1904, both specimens with mature fruit.

PANDANACEÆ.

FREYCENETIA ENSIFOLIA Merrill, sp. nov.

A scandent, sparingly branched shrub 2 to 3 m. high, with narrow, linear-lanceolate leaves, globose fruits and ovate angular drupes which have from three to six, generally five, stigmas. Branches triangular, glabrous, reddish-brown, 4 mm. thick, the internodes 1 cm. long below, 6 mm. long above. Leaves 7 to 11 cm. long, 5 to 7 mm. wide, gradually narrowed to the slender, scarcely acuminate apex, the base rather abruptly narrowed at a point about 1 cm. from its insertion, scarcely sheathing, glabrous, the margins entire, except at the scabrous apex and near the base of the

leaf where they are finely serrate. Inflorescence terminal, the pistillate spadices in threes, globose after flowering, 1 to 1.5 cm. in diameter; peduncles glabrous 1 cm. long. Drupes ovate, angular, 5 mm. long, 3 mm. in diameter at the middle, the base narrowed, the apex contracted, flattened, about 1 mm. in diameter. Stigmas 3 to 7, usually five. Seeds linear-lanceolate, 2.5 mm. long.

Type specimen No. 3242, Merrill, Mount Mariveles, Province of Bataan, Luzon, October, 1903; growing on exposed wind-swept ridges at an elevation of about 1,200 m.

A species of the section *Pleio stigma*, evidently related to *Freycenetia sphaerocephala* Gaud., but abundantly distinct.

PANDANUS LUZONENSIS Merrill, sp. nov. § *Vinsonia*. Plates I, II.

An arborescent species about 8 m. high, with very long, narrow leaves and solitary, globose, pendant fruits, 8 to 10 cm. in diameter. Trunk erect, 10 to 12 cm. in diameter, much branched above, the branches spreading or ascending, the ultimate ones 2 cm. in diameter. Leaves 1.5 to 2 m. long, 2.5 to 3 cm. wide, glabrous, the apex very long narrowly acuminate, the margins strongly antrorsely toothed throughout, the midrib beneath, below with stout retrorse, curved spines, smooth in the middle, and above with small antrorse spines, the upper surface glabrous except near the apex where there are two rows of small, scattered teeth between the margins and the midrib, the margins at the apex finely serrate. Staminate inflorescence 20 to 30 cm. long, fleshy, branched, the branches thick, ascending, the lower ones 8 cm. long, each branch subtended by a broad, thin bract, 8 cm. wide, the lower one abruptly contracted and the tip foliaceous, 30 cm. long, or longer, the second and third bracts abruptly acuminate, the tips more or less foliaceous, the upper bracts much smaller, acute. Stamens 4 to 9, the filaments united into a fleshy tube 4 to 8 mm. long; anthers 2 mm. long. Pistillate inflorescence unknown. Fruit solitary, the peduncle triangular, gradually thickening upward, 1 cm. thick above, 20 cm. long. Drupes 30 to 60 in each head, yellowish red when ripe, ovate or obovate, 3 to 4 cm. long, 2 to 2.5 cm. thick, smooth and shining, sharply 5 angled, the upper third free, convexly pyramidal, the apex flattened, 5 to 10 mm. in diameter, slightly sulcate, the stigmas flattened, often obscure. Seeds 6 to 10.

Type specimen No. 3317, Merrill, Lamao River, Province of Bataan, Luzon, October, 1903, altitude 100 m. (fruit); No. 92 Forestry Bureau; collected by Barnes, same locality November, 1903 (staminate inflorescence); Subig, Province of Zambales, Luzon, H. Hallier, December, 1903.

This species is very common along the Lamao River and on forested slopes of Mount Mariveles up to an elevation of about 600 m. above the sea, being known to the Tagalogs of Bataan as *Pandan*, a name generally applied by them to all species of *Pandanus*, and some species of *Freycenetia*. It is apparently most closely related to *Pandanus sylvestris* Bory, from the Island of Reunion, differing in its larger size, longer leaves, larger drupes, etc.



PLATE I. PANDANUS LUZONENSIS MERRILL, HABIT.

PANDANUS ARAYATENSIS Merrill, sp. nov. § *Keura*. Plate III.

A stout, erect, branched shrub about 4 m. high, with numerous aerial roots from the lower part of the stem, the leaves crowded at the ends of the branches, about 2 m. long, 6 to 7 cm. wide, and solitary, ellipsoid, pendant, glaucous fruits 14 to 16 cm. long. Trunk erect, 10 to 13 cm. in diameter, with very small white, scattered, pyramidal spines, the few branches from the summit spreading, 4 to 5 cm. in diameter, aerial roots numerous, 3 to 4 cm. in diameter, ascending to a height of about 1 m. on the trunk. Leaves about 2 m. long, 6 to 7 cm. wide, the apex abruptly acute, not acuminate, dark green, glabrous, except for the toothed midrib and margins, shining above, dull beneath, the midrib glabrous above, beneath also glabrous, except near the apex of the leaf where it is more or less antrorsely toothed, margins strongly antrorsely toothed throughout. Fruit green, glaucous, becoming yellowish when ripe, ellipsoid, 15 to 16 cm. long, 12 to 13 cm. thick, the peduncle 3 dm. long, triangular, thickened above, the fruit consisting of from 110 to 120 closely packed, very hard drupes, less than 1 cm. of the drupes free at their apices. Drupes 4.5 to 5 cm. long, about 1 cm. thick at the base, 2 to 3 cm. thick at the apex, irregularly 4 to 6 angled, the apex flattened, sulcate; locules 10 to 13, irregularly disposed, their apices conical or pyramidal, often irregularly so, the separating sulci one-third to one-half as deep as the sulci separating the drupes; stigmas 1 to 2 mm. in diameter, more or less oblique.

Type specimen No. 3832, Merrill, Mount Arayat, Province of Pampanga, Luzon, May 15, 1904; a species found in the forests only at and near the summit of the mountain at an altitude of 878 m.

PANDANUS COPELANDI Merrill, sp. nov. § *Rykia*.

An erect, unbranched plant about 2 m. high. Leaves 1 to 1.5 m. long, 5.5 to 6 cm. wide, glabrous, shining above, glaucous beneath, the margins and the midrib beneath spinously toothed, the teeth pale, coarse below, 3 to 4 mm. long, the marginal teeth antrorse throughout, those on the midrib retrorse below, antrorse above, at a point 6 or 7 cm. from the apex of the leaf the leaf is 3.5 cm. wide, and from this point it tapers abruptly to the acute, not acuminate, apex, the midnerve and margins of the apex finely and densely serrate. Flowers unknown. Rachis triangular, 1.5 cm. thick, 50 cm. long. Fruits solitary or racemed, nearly sessile, elliptical or subspherical, 7 to 9 cm. long, 5 to 6 cm. in diameter, red when mature. Drupes very numerous, 14 mm. long, 3 to 4 mm. in diameter, the apex conical, 10 mm. long, the slender style proper, 5 to 6 mm. long, entire, curved upward. Endocarp 8 mm. long.

Type specimen No. 140, Copeland, Gimagon River, Negros, January 5, 1904; growing in forests at an elevation of about 100 m.

A species of the section *Rykia*, evidently most closely related to *Pandanus sarasinorum* Warb., a Celebes species, differing from the latter in its wider leaves, smaller fruits, thicker drupes, and longer style.

PANDANUS WHITFORDII Merrill, sp. nov. § *Sussea*.

A small, erect, branched shrub, 1.5 m. high or less, with narrow, linear leaves, about 1 cm. wide, and small globose fruits, 1.5 cm. in diameter or

less, which are crowded in a dense erect raceme. Trunk erect, 3 to 5 cm. in diameter, branched from the top, the branches spreading, 1 cm. in diameter. Leaves 50 to 60 cm. long, 10 to 12 mm. wide, tapering above to the long, narrowly acuminate apex, below abruptly widened into a clasping base, which is 2.5 cm. wide, the margins throughout antrorsely scabrous, the midrib glabrous on the upper surface, beneath antrorsely scabrous in the upper portion of the leaf, retrorsely scabrous in the lower portion, some of the nerves antrorsely scabrous near the apex. Peduncle slender, 15 to 20 cm. long, the fruit crowded at the apex, three or four fruits in a raceme, each subtended by a broad bract, the first bract 8 cm. long, 1.5 cm. wide, very long acuminate, the upper bracts gradually shorter but nearly as wide, very abruptly acuminate. Fruits globose, each subtended by a broad-based bract, sessile, 1.5 cm. in diameter or less. Drupes, about 50 in each fruit, 1 celled, obovoid, yellow when mature, 7 mm. long, 4 mm. thick or less, the apex rounded, rarely slightly depressed, the stigma in the center, 1 mm. thick or less.

Type specimen No. 351, H. N. Whitford, Mount Mariveles, Province of Bataan, Luzon, May 31, 1904.

A very common species in this locality, growing as an undershrub on forested slopes and ridges at an elevation of from 600 to 1,100 m. above the sea. Rarely found in fruit.

PANDANUS DUBIUS Spreng. (*Pandanus radicans* Blanco.) § *Hombromia*.

This species has previously been known from New Guinea, the Moluccas, and Polynesia, as far north as Guam, and has recently been collected in the Southern Philippines by E. B. Copeland, No. 613, sea coast, below Malalag, district of Davao, Mindanao, March, 1904. *Pandanus radicans* Blanco is undoubtedly a synonym of this species.

PANDANUS POLYCEPHALUS Lam. § *Sussea*.

This species, which previously has not been definitely known from the Philippines, extends from the Malayan Archipelago to New Guinea. Nos. 386 and 442, E. B. Copeland, Davao, Mindanao, March, 1904. A species generally found in the *Barringtonia* formation along the sea coast.

GRAMINEÆ.

PANICUM NITENS Merrill, sp. nov. § *Effusa*.

A lax, branched, glabrous suberect perennial grass 30 to 90 cm. high, with thin, lanceolate, acuminate leaves, lax, few-flowered panicles, and lanceolate, glabrous spikelets 4 to 4.5 mm. long. Culms slender, not tufted, glabrous and shining, usually purplish, rooting at the lower nodes, suberect, much branched; nodes glabrous or nearly so. Sheaths lax, 2 cm. long, much shorter than the internodes, the margins clothed with long, soft, white hairs; ligule a very short ciliate ring. Leaves 8 to 10 cm. long, 8 to 12 cm. wide, thin, glabrous, shining, tapering to the slender apex, the base rather abruptly contracted, the margins glabrous or slightly scabrous. Panicles terminal and axillary, usually contracted, the rachis and branches glabrous or slightly scabrous, terminal panicles much exserted, about 10 cm. long, the branches 5 to 7 cm. long, few flowered, the axillary panicles from the upper sheaths slender, much

elongated. Spikelets lanceolate, acuminate, 4 to 4.5 mm. long, solitary, equaling or usually shorter than their scabrous pedicels; empty glumes lanceolate, acuminate, subequal in length, more or less scabrous on their nerves, otherwise glabrous; first glume thin, white, with three prominent nerves, narrower than the other two, 3 to 3.5 mm. long; second glume 4 mm. long, 5 nerved; third glume 4 mm. long, 5 nerved, with a thin 2-nerved palea 2.5 to 3 mm. long. Flowering glume coriaceous, elliptical-ovate, obtuse, smooth and shining, 2 to 2.2 mm. long, 1 mm. wide. Palea equaling the glume.

Type specimen No. 3756, Merrill, exposed ridges, Mount Mariveles, Province of Bataan, Luzon, January 1, 1904, growing on ledges at an elevation of 1,200 m. above the sea; No. 3221, Merrill, same locality, October, 1903, is a small form of this species.

OPLISMENUS MINUS Merrill, sp. nov.

A low, decumbent grass, with small, lanceolate leaves and solitary or clustered spikelets, forming a simple terminal spike. Culms slender, 2 dm. long or less, branching and rooting at the nodes, the flowering branches suberect; nodes with few ciliate hairs. Leaves 1.5 to 3 cm. long, 3 to 5 mm. wide, thin, glabrous, or with few long, white hairs, the base abruptly contracted, the apex acute or acuminate; sheaths 0.5 to 1 cm. long, equaling the internodes. Spikes simple, erect, 3 to 5 cm. long. Spikelets 1 to 3 at each node, 3 mm. long, excluding the awns; empty glumes clothed with few long, white hairs; first glume 3 nerved, 2 mm. long, nearly 1 mm. wide, its awn 6 to 8 mm. long; second glume 5 nerved 2.2 mm. long, 1.2 mm. wide, its awn 2 to 3 mm. long, third glume 7 nerved 2.2 mm. long, 1.5 mm. wide, its awn 1 mm. long. Flowering glume lanceolate, acute 2.5 mm. long, 0.8 mm. wide, smooth and shining, enclosing its palea.

Type specimen No. 3203, Merrill, Mount Mariveles, Province of Bataan, Luzon, October, 1903, growing on exposed ridges at an elevation of 1,300 m.

A species most closely related to *Oplismenus undulatifolius* Beauv., but is in every way much smaller than that species.

CYNODON ARCUATUS Presl, Rel. Haenk. 1:290. 1830; Scribn. Rept. Mo. Bot. Gard. 10:41. pl. 40. 1899.

This species is evidently distinct from *Cynodon dactylon* (L.) Pers., although it is closely related to that species. *Cynodon arcuatus* is distinguished from *C. dactylon* especially in its erect, not prostrate habit, larger size, more numerous and longer spikes, and larger leaves. The spikelets of the two species are practically identical, but in habit and appearance the two species are very different. *Cynodon arcuatus* Presl, is represented in the herbarium by No. 3619, Merrill, Concepcion, Province of Tarlac, Luzon, October, 1903; and No. 3171, Merrill, Lamao River, Province of Bataan, Luzon, October, 1903. A species growing in open, dry grass lands.

CASUARINACEÆ.

CASUARINA NODIFLORA Forst.

This species is represented by No. 1234, Copeland, Todaya, district of Davao, Mindanao, altitude 1,200 m. above the sea, a tree growing in

clearings, ravines, etc., reaching a height of 30 m., known to the people of the Bogobo tribe as *Gó-o*. This species has previously not been reported from the Philippines, extending from the Moluccas to New Guinea, New Caledonia, and the Fiji Islands.

MORACEÆ.

ARTOCARPUS XANTHOCARPA Merrill, sp. nov.

A tree 30 m. high or less, with narrowly ovate or ovate-oblong, acuminate, entirely glabrous leaves, and subglobose more or less irregular, entirely glabrous orange-yellow fruit, 3 cm. in diameter or less. Branches slender, glabrous, light gray. Leaves 8 to 12 cm. long, 3 to 4.5 cm. wide, subcoriaceous, shining, the base slightly rounded or subacute, inequilateral; nerves rather prominent beneath, 8 to 9 pairs, the reticulations lax; petioles glabrous, 1 to 2 cm. long. Flowers unknown. Female receptacles axillary, the individual apocarps entirely united, the surface of the syncarpium very smooth, when dry somewhat sulcate between the apocarps; seeds obovoid, more or less irregularly compressed, 1 cm. long, 4 to 15 in each receptacle. Peduncle of the receptacle 1 cm. long or less.

Type specimen No. 367, H. N. Whitford, Lamao River, Province of Bataan, Luzon, June 7, 1904.

A tree on the wooded slopes at an altitude of 200 m. above the sea, reaching a diameter of about 35 cm., the trunk clear to a height of about 17 m. Bark brittle, the outer bark consisting of thin, reddish, papery scales, exuding a white latex when cut. The Tagalogs of Bataan know this species as *Sulipa*.

Possibly related to *Artocarpus lanceolata* Tréc., a species known only from the Island of Luzon, but that species has more or less pubescent branches and leaves and single-seeded receptacles.

FIGUS NOTA (Blanco) (*Ficus aspera* var. *nota* Blanco, Fl. Filip. ed. 1, 677. 1837; *Ficus scabra* Blanco, l. c., ed. 2, 471; ed. 3, 3:381, non Forst.; *Ficus racemifera* F.-Vill. Nov. App. 201, non Roxb.) § *Covellia*.

A medium-sized tree, with broadly ovate, cordate, acuminate leaves which are more or less pubescent, and subglobose, green or purplish receptacles which are borne in masses on specialized leafless branches from the trunk and larger branches. Ultimate branches brownish, usually densely pubescent, rarely nearly smooth. Leaves 15 to 25 cm. long, 9 to 15 cm. wide, the margins entire or usually more or less coarsely serrate above, the base cordate, often inequilateral, the apex abruptly short-acuminate, the upper surface usually rather harsh, densely pubescent on the midrib and nerves, and with few scattered hairs on the leaf surface, becoming glabrous or nearly so, the lower surface light brown when dry, usually uniformly softly pubescent throughout with short scattered hairs, often also with numerous small white papillæ; nerves from the base, seven, the outer two obscure, submarginal, main nerves 8 or 9 pairs, ascending, prominent, especially beneath, the nerves and the larger branches anastomosing near the margin, forming a much-arched marginal nerve; petioles 1.5 to 3.5 cm. long, 4 mm. in diameter, densely pubescent; stipules deciduous, ovate-lanceolate, acu-

minate, 1 to 1.5 cm. long. Inflorescence on stout much-branched specialized branches from the trunk and the larger limbs, forming subspherical masses sometimes 5 to 10 cm. in diameter, but often 30 to 60 cm. in diameter or more. Receptacles very numerous subglobose, or slightly pear shaped, about 3 cm. in diameter, green or purplish, with scattered white and reddish spots, slightly pubescent with short spreading hairs, becoming nearly glabrous, the apex flattened or subtruncate, the base rounded or subacute; umbilicus not prominent; peduncle 1 to 1.5 cm. long, 4 mm. in diameter, pubescent; basal bracts at the apex of the peduncle triangular, acute, 4 mm. long. Fertile female flowers sessile or pedicellate, numerous, when pedicellate the pedicels often 4 mm. long; achene 2 mm. long, reddish, style 0.5 mm. long; perianth very small, hyaline, less than 0.5 mm. long. Gall flowers in good condition, and male flowers not seen.

Specimens examined: Luzon, Manila, No. 350, Merrill, July, 1902; No. 3465, Merrill, November, 1903. Province of Rizal, Malapadnabato, No. 2731 Merrill, June, 1903. Province of Bataan, Lamao, No. 2492 Merrill, June, 1903; No. 324, Forestry Bureau, collected by P. T. Barnes, February, 1904; Mariveles, No. 777, Ahern, January, 1902; Balanga, No. 305, Ahern, 1901 (erroneously distributed as from Mindanao.) Province of Zambales, Botolan, No. 2902, Merrill, May, 1903. Mindoro, Pola, No. 2471 Merrill, June, 1903. Island of Culion, No. 688 Merrill, February, 1903.

Ficus nota is a common tree in the Philippine forests, both in the lowlands and in the hills, reaching a height of from 8 to 10 m. and a diameter of 25 cm. or less. The abundant, milky sap when coagulated is similar in appearance and physical characters to the gum of *Achras sapota*, "Gum chicle" of commerce, which is so extensively used for the manufacture of chewing gum. This species is well known to the natives, although the native names are also sometimes applied to other species of the genus that have a similar cauline inflorescence. T., *Tibig*; I., *Tecbec*.

FICUS MINAHASSÆ Miq. Ann. Lugd. Bat. 3:231, 296. 1867; King, Ann. Bot. Gard. Calcutta, 1:108. *pl.* 140, 141. 1888; *Ficus glomerata* Blanco, Fl. Filip. ed. 1, 683; ed. 2, 475; ed. 3, 3:87, non Roxb. § *Covellia*.

This very striking and characteristic species is known only from the Philippines and Celebes, and was first described by Blanco, his name, *Ficus glomerata*, being, however, previously taken by that of Roxburgh's species. *Ficus glomerata* Blanco is certainly a synonym of *F. minahassæ* Miq., as Blanco's description agrees perfectly with the characters of *Ficus minahassæ*. E-Villar¹ erroneously considered that Blanco described the species of Roxburgh, and accordingly reduced *Ficus glomerata* Blanco to *Ficus glomerata* Roxb., but the only point of resemblance in the two species is in the names. *Ficus minahassæ* Miq., was reported from the Philippines by the author in the year 1903² as a species new to the Archipelago, but at that time the identity of Blanco's *Ficus glomerata* was not established. This species is apparently common and widely distributed in the Philippines, growing especially on river banks in the forests, and is represented by the following specimens: Luzon, Province of Bataan, Lamao River, No.

¹ Nov. App. 201.

² Forestry Bureau, Bull. 1:18.

2534, Merrill, June, 1903; No. 66, Forestry Bureau, collected by Barnes November, 1903, same locality; Province of Tayabas, Guinayangan, No. 2033, Merrill, April, 1903. Mindoro, Baco River, No. 1797, Merrill, April, 1903. Mindanao, Surigao, No. 494, Ahern, 1901; Zamboanga, No. 682, Ahern, 1901. Island of Basilan, No. 26, DeVore and Hoover, April, 1903. T. V., *Aimit*, *Haguimit*, *Ayumit*; V., *Tambis tambis*; T., *Tibig na lalaqui*; (Moro?), *Matanug*.

FIGUS BARNESII Merrill, sp. nov. § *Covellia*.

A small tree about 6 m. high, with narrowly ovate, acuminate, membranaceous, rather harsh, densely papillate leaves, the receptacles on long, drooping, slender, slightly branched, specialized, leafless branches from the trunk and larger branches. Young branches rusty brown, rather densely hirsute with reddish hairs. Leaves 13 to 20 cm. long, 5 to 8 cm. wide, narrowed to the acute base which is slightly inequilateral, tapering from slightly above the middle to the slender acuminate apex, the margins entire, both surfaces rather harsh, and densely punctate with small, white papillæ, the upper surface, especially the midrib and nerves, with few scattered white hairs, the midrib and nerves beneath hirsute with brownish hairs; nerves about 9 pairs, ascending, prominent beneath, rather obscure above, anastomosing near the margin, the reticulations rather prominent; petioles rusty brown, hirsute, 1 to 2.5 cm. long; stipules lanceolate acuminate, hirsute, 5 mm. long. Inflorescence about 1 m. long, the branches glabrous, brownish gray. Receptacles light green, glabrous, solitary or two or three from the same branchlet, pear shaped, 2 to 2.5 cm. long, the apex rounded or truncate, narrowed slightly to the rounded base; umbilicus 5 mm. in diameter; peduncle glabrous, 2 cm. long, the basal bracts triangular, 2 mm. long, at the summit of the peduncle. Fertile female flowers sessile or pediceled, the pediceles often 2 mm. long; perianth wanting; ovary red, ovoid-globose, smooth, 1 mm. long; style lateral, 1.5 to 2 mm. long.

Type specimen No. 325 Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, February, 1904. A tree growing in the hill forests on the river bank at an altitude of 200 m.

FIGUS MINDOROENSIS Merrill, sp. nov. § *Covellia*.

A small tree 10 to 15 m. high, with light-gray glabrous branches, ovate, acuminate leaves, the receptacles borne on long, pendant, specialized, leafless branches from the trunk and larger branches. Branches smooth, the ultimate branchlets appressed pubescent. Leaves thin, membranaceous, 10 to 15 cm. long, 5 to 8 cm. wide, the margins entire, the base acute or somewhat rounded, the apex acuminate, the nerves and midrib beneath pubescent with appressed white hairs, and both surfaces, but especially beneath, uniformly pubescent, but not papillate, with scattered hairs, the upper surface becoming glabrous; nerves, 5 pairs, ascending, curved, rather prominent beneath, the reticulations lax; petioles appressed-pubescent, 1 cm. long or less. Inflorescence on long pendant more or less branched branches, which are from 0.5 to 1.5 m. long, light gray, glabrous. Receptacles light green, glabrous, pear shaped, 1.5 cm. long, and nearly as wide in the upper part, with scattered wart-like growths, the apex

rounded or truncate, the base subacute; umbilicus prominent, about 4 mm. in diameter; peduncle 6 to 8 mm. long, pubescent, the basal bracts at the apex of the peduncle triangular, not well developed, pubescent. Male flowers few, only near the ostiole, 3 mm. long, the perianth brown, inflated, of three much-imbricated parts, 2.5 mm. long, the solitary anther just exerted from the perianth, white, broadly ovate, 0.8 mm. long, 0.5 mm. wide. Gall flowers sessile or pediceled, the pedicels often 3 mm. long, perianth wanting, the ovary ovoid-globose, smooth; style 0.4 mm. long, lateral. Fertile female flowers not seen.

Type specimen No. 1813 Merrill, humid forests, Baco River, Mindoro, April, 1903. A species evidently related to *Ficus conora* King, but very distinct; No. 1797, Merrill, which was issued under this name is *Ficus minahassæ* Miq.

FICUS RUFICAULIS Merrill, sp. nov. § *Eusyce*.

A small tree, reaching a height of 15 m. with broadly ovate, cordate, acuminate leaves and pedunculate, densely pubescent, axillary, ovoid receptacles, 2 to 2.5 cm. long. Ultimate branches thickened, glabrous or nearly so, reddish brown, the leaf scars large and prominent. Leaves 20 to 25 cm. long, 10 to 15 cm. wide, membranaceous, the margins entire, rounded to the cordate base, tapering above to the usually slender acuminate apex, the upper surface glabrous or somewhat pubescent on the midrib and nerves, the under surface uniformly softly pubescent, with rather scattered white or brownish hairs; nerves prominent, ascending, 6 to 7 pairs, the reticulations lax; petioles brownish red, pubescent, 3 to 7 cm. long. Receptacles ovoid solitary or in pairs from the axils of the leaves or from above the leaf scars, densely pubescent with grayish hairs, the umbilicus prominent, the protecting scales more or less exerted; peduncle densely pubescent, 1 cm. long, with three triangular, pubescent basal bracts at or near the base of the receptacle. Fertile female flowers sessile or pediceled, when pediceled the pedicel often 3 mm. long, glabrous or with few appressed white hairs, the base of the pedicel also surrounded by straight white hairs; perianth brownish, four parted, surrounding the achene, 2.5 mm. long, the apices of the segments slightly ciliate; achene subglobose 1.5 mm. long, rugose, the style subterminal, slender, 1 mm. long. Male flowers not seen.

Type specimen No. 1739, Merrill, Antipolo, Province of Rizal, Luzon, March, 1903; No. 2471 Merrill, Pola, Mindoro, June, 1903; No. 512, Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, February, 1904, is an immature specimen of the same, while closely related forms are represented by No. 658, Merrill, Island of Culion, February, 1903, but with sessile or nearly sessile receptacles, and No. 698, Ahern, Surigao, Mindanao, 1901, but with very large leaves 30 cm. long, 20 cm. wide, the pedicels of the female flowers strongly pubescent.

In gross characters this species strongly resembles *Ficus fulva* Reinw., but is not at all closely related to that species.

FICUS VARIEGATA Blume, Bijdr. 459; King, Ann. Bot. Gard. Calcutta, 1:189, pl. 212. 1888. (*Ficus levigata* Blanco, Fl. Filip., ed. 1, 682. 1837; ed. 2, 474; ed. 3, 3:86; *Ficus cuneata* F.-Vill., Nov. App. 202. 1883, non Miq.) § *Neomorphe*.

Ficus lavigata Blanco, was erroneously referred by Villar to *Ficus cuneata* Miq., but is certainly identical with *Ficus variegata* Blume. F.-Villar reduced to *Ficus racemifera* Roxb., which is a synonym of *Ficus variegata* Blume, *Ficus aspera nota* Blanco, which is a very distinct species of the section *Covellia*, which shows that he had no clear conception of the species, to which he reduced the species of Blanco, although his conception of Blanco's species may have been correct. *Ficus variegata* Blume is apparently common and widely distributed in the Philippines and is universally known to the Tagalogs by the peculiar name *Tanġisang baya-uac*, which is explained by Blanco. It is represented in the herbarium by the following specimens, all received under the common name given above. Luzon: Province of Zambales, Botolan, No. 2961, Merrill, May, 1903; Cabangan, No. 3008, Merrill, July, 1903; Province of Bataan, Lamao River, No. 325, Forestry Bureau, collected by Barnes, March, 1904; No. 601, Forestry Bureau, collected by Barnes, same locality, January, 1904; Province of Tayabas, Guinayangan, No. 2022, Merrill, April, 1903.

FICUS MEGACARPA Merrill, sp. nov. § *Synoccia*.

A glabrous vine, ultimately reaching a height of 20 m. or more, and a diameter of 5 or more cm., but when young a slender, profusely branching vine creeping on the trunks of trees. Ultimate branches slender, reddish brown, the tips clothed with few appressed reddish hairs. Leaves ovate or elliptical-ovate, the apex rounded, often slightly emarginate, the base rounded or acute, usually somewhat inequilateral, glabrous, coriaceous, 2 to 5 cm. long, 1.5 to 3 cm. wide, the upper surface grayish when dry, hardly shining, the lower surface with numerous pustules; nerves three or four pairs, not prominent, nearly obsolete above; petioles 3 to 5 mm. long; stipules deciduous, lanceolate, acuminate, 5 mm. long. Receptacles very large, ellipsoid or subglobose, or sometimes somewhat pear shaped, the apex rounded or truncate, the base rounded or subacute, 7 cm. long, 6 cm. wide, solitary or in pairs from small protuberances on the main trunk, green, mottled with white spots, and more or less pubescent with short, scattered hairs, the wall firm, 8 to 10 mm. thick; peduncles 1.5 cm. long, 4 mm. in diameter, pubescent, with three triangular, acuminate bracts at or slightly below the base of the receptacle; umbilicus 5 mm. in diameter, the protecting scales exerted 1 to 2 mm. Male flowers very numerous over the whole of the inside wall of the receptacle, 10 to 14 mm. long; perianth 1 mm. long, brown, of three distinct pieces; filament yellow 3 mm. long; anther one, white, 1 mm. wide, 1.5 mm. long. Gall flowers 8 mm. long stipitate, the ovary red, 2.5 mm. long, the style terminal, 0.5 mm. long. Fertile female flowers not seen.

Type specimen No. 322, Forestry Bureau, collected by P. T. Barnes, Lamao, Province of Bataan, Luzon, February, 1904.

A very striking and characteristic species found in the hill forests at an elevation of 200 m., but not at all common, characterized especially by its habit and very large mottled receptacles.

FIGUS ODORATA (Blanco). *Ficus hispida odorata* Blanco, Fl. Filip. ed. 1, 686; ed. 2, 476; ed 3, 3:89; *Ficus pungens*, Naves, 1 c. ed. 3, t. 358; F.-Vill., Nov. App. 200. 1883, non Reinw. § *Eusyce*.

This very characteristic species is not at all related to *Ficus pungens* Reinw., to which it was reduced by Naves and Fernandez-Villar. It is especially characterized by peculiar, strongly inequilateral, very rough, fragrant leaves, which are very similar in shape to those of *Ficus semicordata* Miq. The dried specimens retain the fragrance for a considerable period. *Ficus odorata* is fairly well represented by t. 358 of the third edition of Blanco's "Flora de Filipinas," although the figure does not show the striking hispid character of the branches. This species is also represented by No. 1522, Merrill, Dinalupijan, Province of Bataan, Luzon, January, 1903; also by No. 620, Forestry Bureau, collected by Borden, Lamao River, Province of Bataan, Luzon, April, 1904. T., *Paquiling* (according to Blanco, *Agos-os*).

FIGUS CONORA King, Ann. Bot. Gard. Calcutta, 1:103. pl. 131. 1888.

This species previously known from New Guinea and Ternate, is represented by No. 683, Ahern, Surigao, Mindanao, 1901, distributed as *Ficus glomerata* Blanco. V., *Amison*. No. 3044, Merrill, from Castillejos, Province of Zambales, Luzon, August, 1903, is a closely related species, but differs from *Ficus conora* in some essential characters.

OLACACEÆ.

STROMBOSIA DUBIA Vidal, Sinopsis, Atlas, 20, t. 30 f. D. 1883.

This species is not noted in Index Kewensis, and is undoubtedly identical with *Strombosia philippinensis* (Baill.) Vidal. Vidal's type specimens were from the Province of Bataan, Luzon, where the species is very common, his type probably being No. 183 of his distribution. It is represented by the following specimens, all from Lamao River, Province of Bataan, Luzon. Nos. 514, 522, 532, 533, 549, 558, 578, 591 and 607 Forestry Bureau, collected by P. T. Barnes, November, 1903, to March, 1904; Nos. 639, 660, and 661 Forestry Bureau, collected by T. E. Borden, April, 1904, and No. 2515 Merrill, June, 1903.

A small tree, very common in the hill forests, reaching a height of 20 m. or less, and a diameter of 30 cm., flowering from April to June. Universally known to the Tagalogs of Bataan as *Camayauan*.

ANONACEÆ.

POLYALTHIA BARNESII Merrill, sp. nov. § *Monoon*.

Tree about 20 m. high, with broadly lanceolate, or somewhat oblanceolate, glabrous, acuminate leaves, the flowers solitary or in fascicles of two or three, axillary or extra axillary on the branchlets, or on the branches below the leaves. Branches light brownish gray, lenticellate, with few scattered hairs, the ultimate branchlets densely pubescent. Leaves 14 to 19 cm. long, 5.5 to 8 cm. wide, the apex shortly acuminate, the base acute, rarely somewhat rounded, the upper surface glabrous, shining, beneath scarcely shining, and when young, with pubescent midvein and nerves, becoming glabrous;

nerves 12 pairs, rather prominent beneath, the reticulations lax, rather obscure; petiole rugose, thickened, 5 to 8 mm. long, when young densely pubescent, becoming glabrous. Mature flowers open, 5 cm. in diameter. Calyx 6 mm. in diameter, densely rusty pubescent, 3 lobed, the lobes rounded. Corolla of 6 spreading petals in two series, the petals of the inner series similar in shape and size to those of the outer series; petals yellowish green, shading to reddish brown at the base, lanceolate, or linear lanceolate, blunt, 2 to 2.5 cm. long, 5 to 8 mm. wide, sparingly rusty pubescent throughout, except near the base on the outer surface, where the pubescence is very dense; pedicels slender, 1.5 to 2.5 cm. long, densely rusty pubescent, ebracteolate. Ovaries indefinite, 1 mm. long, each with a single erect basal ovule; style oblong, 1 mm. long. Stamens numerous, 1 mm. long. Fruit unknown.

Type specimen No. 596, Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, March, 1904. A tree growing in the hill forests at an altitude of 100 m.

MITREPHORA FERRUGINEA Merrill, sp. nov. (*Mitrephora maingayi* Vidal, Synopsis, Atlas, t. 5. f. F. 1883, non Hook f. et Th.)

A tree 10 to 15 m. high, with ovate-lanceolate, acuminate, membranaceous, more or less pubescent deciduous leaves, and densely ferruginous-pubescent branchlets and fruits. Branches grayish, glabrous, the ultimate branchlets very densely ferruginous-pubescent. Leaves 8 to 22 cm. long, 3.5 to 8 cm. wide, tapering above to the usually slender acuminate, rarely somewhat acute apex, and below to the acute base, the upper surface ferruginous-pubescent only on the midrib, smooth and shining, the under surface and nerves with scattered, rusty or whitish stellate hairs, the midrib densely ferruginous-pubescent; nerves 10 to 15 pairs, prominent beneath, curved upward, the reticulations subprominent, subparallel, lax; petiole thick, 5 mm. long, densely ferruginous-pubescent. Flowers hermaphrodite, odorless, in fascicles of two or three, only one flower developing at a time, 3 to 4 cm. in diameter, the pedicel 5 mm. long, densely ferruginous-pubescent, with three small, ovate, pubescent bracts at about the middle. Sepals very broadly triangular, acute, 3 mm. long, 3.5 mm. wide, densely ferruginous-pubescent on the outside. Petals creamy white, greenish at the base, the three outer ones spreading, narrowly ovate or somewhat obovate, 2 cm. long, 8 mm. wide above, the apex abruptly but bluntly acuminate, densely ferruginous-pubescent on the outside; glabrous on the inside, except for a few scattered hairs near the base, the inner three petals about 1.5 cm. long, vaulted, connivent above, and with long, slender claws, more or less ferruginous-pubescent on the outside. Stamens numerous yellow, slightly exceeding 1 mm. in length, the anther cells concealed by the overlapping connectives. Ovaries few, pubescent, 1 mm. long, 8 ovuled. Immature carpels ellipsoid, densely ferruginous-pubescent throughout, the apex with a small lateral protuberance, 3 to 3.5 cm. long, 2 to 2.5 cm. in diameter, sessile in fascicles of from 3 to 8 fruits each, on a thickened, ferruginous-tomentose receptacle.

Specimens examined, all from the Island of Luzon. Bataan Province, Lamao River, No. 610, Forestry Bureau, collected by Borden, April, 1904 (flower); No. 372, Forestry Bureau, collected by Barnes, November, 1903



PLATE II. PANDANUS LUZONENSIS MERRILL, FRUIT.

(sterile); No. 61, Forestry Bureau, collected by Barnes, October, 1903 (fruit); No. 367, March, 1904 (fruit); No. 3728, Merrill, January, 1904 (fruit); Province of Zambales, near Subig, No. 382, Forestry Bureau, collected by Maule, March, 1904 (fruit); Province of Camarines Sur, Nos. 67 and 253, Ahern, 1902 (fruit).

A rather common and apparently somewhat widely distributed species, growing in the dry hill forests at an altitude of from 100 to 500 m. above the sea. T., *Dalinas*.

CYATHOCALYX GLOBOSUS Merrill, sp. nov.

A tree 25 to 35 m. high, with dark-colored branches, glabrous ovate-lanceolate, acute or slightly acuminate subcoriaceous shining leaves and globose carpels 3.5 to 4 cm. in diameter. Branches glabrous, but the tips densely rusty pubescent. Leaves 15 to 25 cm. long, 5 to 10 cm. wide, both surfaces entirely glabrous, shining, the base acute or rarely somewhat rounded; main nerves 11 to 13 pairs, ascending, prominent beneath, anastomosing near the margin, reticulations rather lax; petiole 2 cm. long, at first densely pubescent, becoming glabrous, dark colored. Inflorescence leaf opposed, the flowers pediceled, two or three together; pedicels 8 mm. long, densely rusty pubescent, with usually a single ovate, densely pubescent bract 2 mm. long. Calyx 4 to 5 mm. long, three lobed, the lobes broadly triangular, acute or very abruptly and obscurely acuminate, densely rusty pubescent. Petals thick, greenish, densely grayish pubescent on both surfaces, 1.5 to 2 cm. long or more, 2 mm. wide above, the dilated base 4 mm. wide, narrowly oblong, lanceolate, obtuse, the inner ones similar in shape and size to the outer ones. Style cylindrical, 2.5 mm. long, the stigma discoid. Ovary one; ovules few. Stamens indefinite, 1.5 mm. long. Fruit solitary, firm, glabrous, black when dry, the peduncle 2 cm. long. Seeds 3 to 6, in two rows, much compressed, ovate, obtuse, 2 cm. long, smooth and shining.

Type specimens No. 560, Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, March, 1904 (flower); No. 489, Forestry Bureau, collected by Barnes, same locality, November 1903 (fruit); other specimens, same locality, Nos. 510 and 523, Forestry Bureau, collected by Barnes, November, 1903 (sterile); Nos. 622, 646, 657, 667, Forestry Bureau, collected by Borden, April, 1904 (flower); No. 2130, Merrill, Lagumanoc, Province of Tayabas, Luzon, April, 1903 (fruit).

A tree, apparently common in the hill forests, reaching a diameter of 50 cm. or less. T., *Latauan*.

UVARIA ALBA Merrill, sp. nov.

An erect shrub about 3 m. high with leaf opposed, 2 to 3 flowered inflorescence, white flowers, oblong-lanceolate, acuminate leaves, the young branches, leaves, and inflorescence densely covered with a rufous pubescence. Leaves 15 to 22 cm. long, 6 to 10 cm. wide, widest in the upper third, from this point tapering gradually to the broad, abruptly rounded base, the apex rather abruptly and narrowly acuminate, the acumens 2 to 3 cm. long, very rarely nearly acute, the upper surface with few scattered, spreading rufous hairs, the nerves and midrib densely rufous pubescent,

the under surface rather densely pubescent throughout with spreading rufous hairs, the nerves and midrib especially densely pubescent; nerves rather prominent, 16 to 18 pairs, anastomosing near the margin, the reticulations nearly obsolete above, prominent on the lower surface; petioles 1 to 1.5 cm. long, densely rufous pubescent. Inflorescence leaf-opposed, 2 to 3 flowered, 4 to 5 cm. long, densely rufous pubescent; peduncles 1.5 cm. long, the bract situated at the upper third, clasping, rufous pubescent, 5 mm. long, 11 mm. wide. Flowers 3 to 3.5 cm. in diameter, white, odorless. Sepals densely rufous puberulent, free or slightly connate at the base, similar to the bract in shape and size. Petals somewhat fleshy when fresh, ovate, obtuse, densely rufous puberulent, 12 to 15 mm. long, 8 mm. wide. Stamens indefinite, 6 mm. long, the outer ones flat. Carpels ovate, 2.5 cm. long, 12 mm. in diameter, densely pubescent with somewhat stellate, rufous hairs.

Type specimen No. 50, Forestry Bureau, collected by P. T. Barnes, Lamao River, Province of Bataan, Luzon, August 11, 1903, in flower; No. 3274, Merrill, from the same locality, October 1903, with flower buds, and fruits is the same. T. *Susu-calabao*.

This species is evidently related to *Uvaria hamiltoni* Hook. f. et Th., from British India, but is entirely distinct. Its striking characteristics are its peculiarly shaped leaves, white flowers, and uniform rufous pubescence.

HERNANDIACEÆ.

ILLIGERA LUZONENSIS (Presl). (*Henschelia luzonensis* Presl, Rel. Haenk. 2:81. t. 63. 1831; *Illigera meyeniana* Kunth, ex Walp. in Nov. Act. Nat. Cur. 19. Suppl. 1:410. 1843; *Illigera appendiculata* Vidal, Synopsis Atlas, t. 48. f. F., non Blume; *Gronovia ternata* Blanco, Fl. Filip. ed. 1; 186. 1837; *Halesia ternata* Blanco, l. c. 399.)

This species is represented in the herbarium by the following numbers, all from Luzon. Province of Rizal, Antipolo, No. 1683, Merrill, March, 1903; Province of Bataan, Lamao River, No. 2557, Merrill, June, 1903; No. 3289, Merrill, same locality, October, 1903.

Presl's name is the earliest for this species and should be taken up. *Gronovia ternata* Blanco, was based on a specimen collected at Malinta, near Manila, and is undoubtedly this species. *Halesia ternata* Blanco, although published in the same work as the preceding species, is without doubt identical. Blanco described the latter from a specimen in fruit only, collected in Angat, Province of Bulacan, Luzon. Blanco gives no native names, but the specimen from Antipolo cited above, bears the Tagalog name *Saling ouac*.

ROSACEÆ.

PHOTINIA LUZONENSIS Merrill, sp. nov.

A small tree, 3 to 6 m. high, with ovate or ovate-lanceolate, acute, serrate leaves, and terminal, corymbose, ferruginous-pubescent inflorescence. Branches gray, glabrous, the ultimate branchlets ferruginous-pubescent. Leaves 5 to 10 cm. long, 1.5 to 4 cm. wide, the base cuneate and somewhat

decurrent, the apex acute, margins serrate in the upper half or two-thirds, entire near the base, subcoriaceous, glabrous and shining above, the under surface with rather prominent brown reticulations, entirely glabrous, or the midrib ferruginous-pubescent in young leaves; nerves about 13 pairs, obscure above, fine, but prominent beneath, brown; petiole about 1 cm. long, ferruginous pubescent, becoming glabrous. Inflorescence a terminal corymbose panicle 2.5 to 7 cm. long, the axis and branches densely ferruginous-pubescent, the branches few, the lower ones, in larger corymbs, 5 cm. long; bracts linear, acuminate, 5 mm. long, the bracteoles 2 mm. long. Flowers white, odorless, 10 to 12 mm. in diameter, the pedicels 4 to 5 mm. long, densely ferruginous-pubescent. Calyx obconic, densely ferruginous-pubescent, the teeth triangular, acute, nearly 2 mm. long. Petals obovate, glabrous, 5 mm. long, 4 mm. wide, the base unequal, reticulate. Stamens many, filaments slender, glabrous, 2 mm. long; anthers 0.5 mm. long. Ovary with a ferruginous-pubescent crown, 2 celled, each cell with two erect ovules. Styles 2, free, slender, glabrous, nearly 3 mm. long.

Type specimen No. 3223, Merrill, Mount Mariveles, Province of Bataan, Luzon, October, 1903; No. 3714, Merrill, from the same locality, January 1, 1904, is the same.

A small tree 3 to 6 m. high, with a trunk diameter of from 20 to 30 cm., growing on exposed wind-swept ridges at an elevation of 1,200 to 1,300 m. above the sea.

PARINARIUM RACEMOSUM Merrill, sp. nov.

A tree 22 m. high, with lanceolate or oblong-lanceolate, nearly glabrous, acuminate, short-petioled leaves, racemose inflorescence, the flowers with 23 stamens. Branchlets dark gray, or nearly black when dry, glabrous. Leaves subcoriaceous, 10 to 13 cm. long, 3 to 5 cm. wide, tapering above to the short, acuminate apex, the base rounded, slightly inequilateral, the upper surface shining, glabrous except for a few scattered hairs on the midrib, the reticulations and veins with numerous, minute papillæ, giving them a beaded appearance under the lens, the under surface glabrous; nerves 10 to 12 on each side of the midrib, not prominent, ascending, reticulations rather dense, the midrib with two glands near the base of the leaf; petioles 4 mm. long, glabrous or with few appressed hairs. Racemes 3 to 8 cm. long, solitary or two or three from the same leaf axil, densely pubescent. Flowers, including the stamens, 2.5 cm. long, the pedicels 3 mm. long. Bracts 7 cm. long, 3 mm. wide, acute, densely pubescent throughout, deciduous. Calyx tube funnel shaped, 8 mm. long, densely pubescent outside, deflexed-villous inside, the lobes 6 to 8 mm. long, 3 to 4.5 mm. wide, acute. Petals 8 to 10 mm. long, 4 to 5 mm. wide, glabrous, obtuse, the base subacute. Stamens 23, the filaments about 2 cm. long, united at the base and somewhat pubescent below. Ovary densely villous, 2 celled. Style filiform, 2 cm. long, densely villous below, glabrous above. Fruit unknown.

Type specimen No. 2416 Merrill, Marintoc River, Island of Masbate, May 17, 1903. A tree in forests along the river slightly above sea level known to the Visayans as *Tambontambon*.

A species evidently closely related to *Parinarium scabrum* Hassk.

LEGUMINOSÆ.

INTSIA ACUMINATA Merrill, sp. nov.

A tree with 4-jugate leaves, the leaflets coriaceous, glabrous, bluntly acuminate. Branches gray, glabrous. Leaf rachis glabrous, 8 cm. long, the internodes 2 cm. long; leaflets broadly ovate, opposite, the base slightly unequal, rounded, the apex rather abruptly tapering to the short, blunt, often emarginate acumen, 5 to 6.5 cm. long, 2.5 to 3.5 cm. wide, coriaceous, shining, entirely glabrous except for the midrib beneath, which is often densely rusty pubescent; petioles thick, glabrous, 2 mm. long; nerves numerous, not prominent, reticulating. Flowers unknown. Pod 15 cm. long, 5.5 cm. wide, glabrous, firm, the apex with a short, sharp, slightly curved acumen.

Type specimen, No. 1108, Merrill, Baler, Province of Principe, Luzon, October, 1903. Locally known as *Tindalo*, but this name is almost invariably applied to *Pahudia rhomboidea* (Blanco) Prain.

This species undoubtedly belongs in the genus *Intsia*, although at present the flowers are unknown. It differs from *Intsia bijuga* (Colebr.) O. Kuntze, in its much smaller, coriaceous, more numerous leaflets, and from both *Intsia bakeri* Prain, and *Intsia palembanica* Miq., in its smaller differently shaped leaflets and other characters.

PTEROCARPUS ECHINATUS Pers. Synopsis, 2:277. 1807. (*Pterocarpus erinaceus* F.-Vill., Nov. App. 68. 1880; Vidal, Synopsis, Atlas, t. 40. f. B. 1883, non Lam.; *Pterocarpus vidalianus* Rolfe, Journ. Linn. Soc. Bot. 21:309. 1884; Vidal, Rev. Pl. Vasc. Filip. 112. 1886; Perkins, Frag. Fl. Philip. 20. 1904.)

The type locality for this species as given by Persoon is "Hab. in India prope Capo de Solar," and in compiling Index Kewensis, the authors of that work could not definitely determine this locality, and accordingly questionably referred *Pterocarpus echinatus* to tropical Africa. It remained for Dr. D. Prain¹ to determine the geographical locality of "Capo de Solar," which is a small island in the Flores Sea, south of Celebes, "Selayar" or "Salajar" of modern maps. Dr. Prain had a specimen of *Pterocarpus echinatus* Pers., from a tree cultivated in the Botanical Garden at Buitenzorg, Java, which was raised from seed collected by Zollinger at Macassar, southern Celebes, on the northern shore of the Flores Sea. This specimen Dr. Prain sent to Kew, and Sir George King compared it with the type of *Pterocarpus vidalianus* Rolfe, and found the two species to be identical.

The establishment of the identity of *Pterocarpus echinatus* and *P. vidalianus* adds another point to our knowledge of the close relationship of the flora of Celebes to that of the Philippines, at the present time 60 or more species being known only from Celebes and the Philippines.

Pterocarpus echinatus is a common species in the Philippine forests but apparently does not extend north of central Luzon (Baler, Province of

¹ Report on the Indian Species of *Pterocarpus*, Indian Forester, 26:10. 1900.

Principe, No. 1016, Merrill). It is especially abundant in the central portions of the Archipelago, but has as yet not been found in Paragua. The natives do not distinguish this species from *Pterocarpus indicus* Willd., both being known as *Narra* or *Asana*.

BAUHINIA PERKINSÆ Merrill, sp. nov. § *Phanera*.

A woody, climbing vine, 4 to 5 m. long, with large cordate leaves which are ferruginous-pubescent beneath, and with rounded apical lobes, ample racemose inflorescence, the petals glabrous or nearly so. Branches slightly pubescent, becoming glabrous. Leaves membranaceous, roundish, 12 to 14 cm. long, 14 to 17 cm. wide, the base strongly cordate, the basal lobes rounded, apex cleft, the sinus 3 to 4 cm. deep, narrow, the lobes somewhat overlapping below, the midrib slightly excurrent, glabrous and shining above, or with few scattered hairs near the insertion of the petiole, the pubescence beneath especially prominent on the nerves and reticulations; nerves 13, prominent beneath, the reticulations lax; petiole densely rusty pubescent, 6 cm. long. Racemes 20 cm. long or more, 10 cm. across, the pedicels spreading, 3.5 to 4 cm. long, densely rusty pubescent. Buds acute, club shaped, 2.5 cm. long, the slender basal portion 5 to 8 mm. long; calyx very densely rusty pubescent, the limb splitting into five reflexed, lanceolate, acuminate segments, 2 cm. long, 4 mm. wide, the tube slightly enlarged toward the base, 8 mm. long. Petals five, subequal, broadly oblanceolate, abruptly acute or apiculate, 2.5 cm. long, 8 mm. wide, the claw 5 mm. long, glabrous throughout, or with very few scattered hairs on the outside near the apex. Stamens 3, fertile, the filaments nearly 2 cm. long, the anthers 1 cm. long. Ovary stalked, densely rusty, silky-pubescent, the style stout, rusty-pubescent, 5 mm. long.

Type specimen No. 731, Merrill, Ewiig River, near Puerto Princesa, Paragua, February 15, 1903, a vine growing in rather dry thickets along the river, near sea level.

This species was determined by Perkins¹ as *Bauhinia ferruginea* Roxb., but it certainly can not be that species, differing in its longer petioles, larger leaves, more numerous nerves, and glabrous, or nearly glabrous, not tomentose, petioles.

RUTACEÆ.

CLAUSENA ANISUM-OLENS (Blanco). *Cookia anisum-olens* Blanco, Fl. Filip. ed. 1, 359. 1837; *Cookia anisodora* Blanco, l. c. ed. 2, 253. 1845; *Clausena excavata* F.-Vill., Nov. App. 36. 1880, non Burm.; *Clausena indica* Vidal, Sinopsis, Atlas, t. 25. f. H. 1883, non Oliv.

This species is represented in the herbarium by No. 2509, Merrill, Lamao River, Province of Bataan, Luzon, June, 1903, and is apparently very distinct from *Clausena excavata* Burm., to which it has previously been referred. F.-Villar referred Blanco's species to *Clausena excavata* without comment, although Blanco distinctly states that the flowers of his species were five parted. *Clausena anisum-olens* can be distinguished from *C. exca-*

¹ Frag. Fl. Philip. 9. 1904.

vata, not only by its five-parted flowers, but also by its less numerous and differently shaped leaflets, the leaflets being usually of but four pairs, from 3 to 4 cm. wide, the base more or less unequal, rounded, scarcely narrowed. Vidal in preparing his Synopsis evidently noted Villar's error in the identification of *Clausena excavata*, and identified the same form as *Clausena indica* Oliv., his figure representing a five-parted flower. *Clausena excavata* Burm., is reported from the Philippines by Vidal,¹ Nos. 142, 1217, and 144, and also has been collected by Loher, No. 196, the identifications in both cases having been made at Kew. Careful examination of this material will show whether or not these numbers represent true *Clausena excavata*, or the species here considered. *Clausena anisum-olens* Blanco is known to the Tagalogs as *Calomata*, *Camanguianis*, and *Maisipaisi*. The leaves are very aromatic when crushed.

MELIACEÆ.

AGLAI A BORDENII Merrill, sp. nov. § *Euaglaia*.

A small tree, 12 m. high or less, with bijugate, glabrous or nearly glabrous leaves, and many-flowered panicles, which are about one-half as long as the leaves, or less, with small, very fragrant yellow flowers. Branches glabrous, light gray, the tips more or less brown stellate-pubescent. Leaves alternate, 20 cm. long or less, the rachis 8 cm. long, grayish or brownish stellate-pubescent; leaflets 8 to 11 cm. long, 3 to 4.5 cm. wide, ovate-lanceolate, membranous, the apex slender acuminate, the base cuneate, nearly equilateral, both surfaces glabrous, the midrib beneath with few scattered stellate hairs, the lower leaflets slightly smaller than the upper, and the terminal leaflet about the same size or slightly larger than those of the upper pair; nerves about 10 pairs, rather prominent; petiules, 3 mm. long, very densely clothed with brown stellate hairs. Panicles 10 cm. long or less, axillary, branched from the very base, the lower branches 4 to 7 cm. long, spreading, the branchlets 2 cm. long or less, the entire inflorescence, excepting the flowers, densely brown stellate-pubescent. Flowers yellow, pedicellate, broadly obovoid or subglobose, 2 mm. long, the pedicels 1 mm. long. Calyx deeply 5 toothed, the teeth broadly triangular, 0.5 mm. long. Petals five, free, elliptical, glabrous, obtuse, 2 mm. long, 1.5 mm. wide. Staminal tube 1.5 mm. long, truncate, abruptly widened at about the middle, the five stamens inserted on the tube just above the middle. Anthers ovate, acute, 0.6 mm. long, included, or the very tips exerted.

Type specimen No. 714 Forestry Bureau, collected by T. E. Borden, Lamao River, Province of Bataan, Luzon, May, 1904, also No. 631 Forestry Bureau, collected by Borden, same locality, April, 1904.

A small tree 12 m. high or less, and 20 cm. in diameter or less, branching at a height of from 6 to 8 m., with slightly rough, grayish bark, and reddish-yellow wood, growing on forested ridges, at an elevation of 160 m. above the sea. Tagalog, *Potian*.

¹ Rev. Pl. Vasc. Filip. 77

LANSIUM DUBIUM Merrill, sp. nov.

A shrub or small tree with unequally pinnate leaves, glabrous entire leaflets and slender, glabrous, elongated, few-flowered axillary racemes. Branches dark colored, glabrous. Leaves 20 cm. long, the rachis about 8 cm. long, slender, glabrous, even or odd pinnate, the leaflets usually alternate, rarely opposite, 4 or 5 on each leaf; leaflets ovate-lanceolate, bluntly acuminate, glabrous, tapering to the cuneate or somewhat decurrent, often slightly unequal base, above rather abruptly contracted to the stout, blunt acumen, 8 to 15 cm. long, 2.5 to 5 cm. wide, the nerves very numerous, not prominent, spreading, the primary nerves scarcely more prominent than the secondary ones; petiolules proper, stout, glabrous, 2 mm. long. Racemes slender, usually about as long as the leaves, the flowers scattered, sessile or subsessile. Flowers glabrous, subglobose, yellow, 5 mm. long. Sepals 5 orbicular, rounded, imbricate 2 mm. long. Petals 5, free, imbricate, broadly ovate or obovate, the apex obtuse, 5 mm. long. Staminal tube 4 mm. long, 10 toothed, the teeth acute, less than 0.5 mm. long. Stamens 10, in two series, five inserted in the middle of the tube, included, and five inserted near the tips of alternating teeth of the tube, their apices somewhat exerted, the anthers of the first series 2 mm. long, those of the second series 1.5 mm. long. Ovary conical about 1 mm. long, pubescent, 4 celled, each cell with a solitary axial ovule. Disc inconspicuous or wanting. Stigma sessile. Fruit globose, brown, indihiscent, the pericarp rather thin, brittle, dry, one celled and with a single large seed, the cotyledons very thick, exalbuminous.

Type specimen No. 3081, Merrill, Island of Masbate, August, 1903. A characteristic species, differing from the other species in the genus especially in its fruit characters, but apparently a species of the genus.

AMOORA LEPIDOTA Merrill, sp. nov.

A tree 20 to 30 m. high with pinnate leaves and axillary and terminal panicles of yellow fragrant flowers, the petioles, inflorescence, and young branches being densely clothed with small brownish-ciliate scales. Leaves 2 to 4 dm. long, alternate, the petiole 1 to 2.5 dm. long. Leaflets 4 to 7, alternate, 8 to 20 cm. long, 3 to 7 cm. wide, ovate-lanceolate, the base cuneate, the apex acuminate, glabrous above, or with few scattered scales when young, beneath densely and minutely punctate, and with scattered scales especially on the midrib and nerves; veins about 11 pairs, rather prominent beneath; petiolules densely scaly 0.5 cm. long. Panicles 1 to 2 dm. long including the peduncle, which is from 3 to 8 cm. to the first branches, 10 to 15 cm. wide, much branched, the branches spreading, 3 to 8 cm. long. Flowers numerous, subglobose, 3 mm. long, with a powerful but somewhat disagreeable odor; pedicels densely scaly, 2 to 4 mm. long. Calyx 1.5 mm. long, densely scaly, 5 toothed, the teeth acute, 0.5 to 0.8 mm. long. Corolla glabrous, yellow; petals 5 broadly ovate or ovate lanceolate, concave, obtuse, 3 mm. long, free from the staminal tube, or very slightly joined at the base. Staminal tube equaling the corolla. Stamens 10, included, anthers 1 mm. long. Ovary pubescent 0.5 mm. long; style very short, 0.2 mm. Stigma less than 0.5 mm. long.

Type specimen No. 3173, Merrill, hill forests along the Lamao River, Mount Mariveles, Province of Bataan, Luzon, October, 1903; altitude 100 m.

A species evidently related to *Amoora maingayi* Hiern, from Malacca but distinct from the latter. It is characterized by its inflorescence, petioles, etc., being covered with numerous small scales, the margins of which are lacinate or ciliate, giving the scales a stellate appearance. This species belongs in the section *Pseudo-aglaia*.

AMOORA AHERNIANA Merrill, sp. nov.

A tree 30 m. high, glabrous throughout, with deep-brown branches and inflorescence, alternate, 9 to 10 jugate leaves, and short, axillary, racemose inflorescence. Ultimate branches thickened, 1 cm. in diameter, rugose, the leaf scars very large. Leaves unequally pinnate, crowded at the ends of the branches, about 60 cm. long, the rachis stout, deep brown, glabrous, the petiole 15 cm. long; leaflets opposite, coriaceous, 10 to 15 cm. long, 4 to 5 cm. wide, the upper surface shining, ovate-lanceolate, acuminate, glabrous, brownish when dry, inequilateral, usually somewhat falcate, the base unequal, rounded or somewhat acute, the nerves prominent, 10 to 12 on each side, spreading, curved upward, the reticulations rather lax; petiolules 10 to 15 mm. long, deep brown. Racemes axillary, 5 cm. long (with immature flowers), deep brown, glabrous, striate. Flowers (immature) with a stout deep-brown pedicel, 5 mm. long. Calyx glabrous, reddish brown, subglobose, 4 mm. in diameter, with three, sometimes four, broad, rounded teeth. Petals three, broadly ovate concave, glabrous, obtuse, 6 mm. long, 4 to 5 mm. wide. Staminal tube, 4.5 mm. long, with 10 small blunt teeth. Stamens 9 to 13, included, sessile, the anthers 2.5 mm. long. Disc wanting. Ovary 4 celled, each cell with 2 superposed ovules. Style none. Stigma pyramidal, reddish, 1 mm. long. Fruit globose, glabrous, bright red, three celled, dehiscing by three valves, 6 cm. in diameter, the pericarp spongy when fresh, 1 to 1.5 cm. thick. Seeds one in each cell, or sometimes one or more aborted, 3 cm. long, 1 cm. thick, smooth, flattened, the arillus thick, yellowish, surrounding less than one-half of the seed.

Type specimen No. 823 Forestry Bureau, collected by T. E. Borden, Lamao River, Province of Bataan, Luzon, June, 1904. A tree reaching a diameter of 45 cm., growing on forested ridges at an elevation of 600 m., with reddish-brown bark, and reddish wood, the resinous pericarp of the fruit being somewhat used by the natives for illuminating purposes. Tagalog, *Cato*.

This species is somewhat anomalous, but is apparently a good species of *Amoora*, differing from other species in the genus by the variable number of calyx teeth, variable number of stamens, and four-celled ovary. This distinct species is named in honor of Capt. G. P. Ahern, Chief of the Forestry Bureau.

AMOORA MACROCARPA Merrill, sp. nov.

A small tree 8 m. high, with very short, spicate, axillary inflorescence, and large spherical fruits. Young branches minutely pubescent, becoming glabrous. Leaves alternate, unevenly pinnate, 3.5 to 4.5 dm. long, the rachis minutely pubescent, becoming glabrous; leaflets 4 to 5 on each side, alter-

nate, ovate, 12 to 20 cm. long, 6 to 8 cm. wide, the apex acuminate, the base rounded or acute, more or less irregular, nearly glabrous above, minutely lepidote beneath; nerves rather prominent, about 12 pairs; petioles 5 to 10 mm. long. Inflorescence axillary, spicate, the spikes 1 to 2 cm. long, the axis densely rusty velvety pubescent, 3 mm. in diameter. Flowers sessile, ovate, 5 to 6 mm. long. Calyx truncate, 3 to 4 mm. long, obscurely and broadly three toothed, densely and minutely pubescent. Petals white, three, broadly ovate, 5 mm. long, 3 mm. wide, acute or nearly obtuse, densely and minutely rusty tomentose. Staminal tube cylindrical 3.5 mm. long, glabrous, the margin irregularly and obscurely toothed, the teeth truncate. Stamens 7, the anthers sessile on the upper half of the staminal tube, 1.5 mm. long, included. Disk annular, 1 mm. long, glabrous, truncate. Ovary subglobose, pubescent, three celled, each cell with two ovules. Style 2 mm. long; stigma subglobose. Fruit spherical, 5 to 6 cm. in diameter, brown, minutely and densely velvety pubescent, 2 or 3 celled, with one large seed in each cell, the pericarp subcoriaceous, brittle, thin. Seeds 3.5 cm. long, about the same width and 2.5 cm. thick, the testa coriaceous, tough. Cotyledons about 2 cm. thick, the radicle included.

Type specimen No. 3731, Merrill, Mount Mariveles, Province of Bataan, Luzon, January 1, 1904. A small tree 8 m. high with a trunk diameter of about 10 cm., not common on dry, wooded slopes at an elevation of 600 m.

This plant is undoubtedly a species of *Amoora*, as that genus is treated by C. de Candolle¹ belonging to the section *Pseudo-guarea*. Some of the floral characters of this species, the short inflorescence, the disc, and the obscurely three-toothed calyx, do not agree well with the generic description of *Amoora*, but as the plant is nearest to this genus, it is so referred.

DYSOXYLUM ALTISSIMUM Merrill, sp. nov. § *Eudysoxylum*.

A tree 25 m. high or less, with alternate, glabrous, bijugate or trijugate, odd or even pinnate leaves, many-flowered panicles, half as long as the leaves or less, and creamy white, fragrant flowers 13 mm. long. Branches brownish or brownish gray, rugose, glabrous. Leaves 30 to 40 cm. long, the leaflets three pairs, and even pinnate, or two pairs and odd pinnate by suppression of one of the leaflets of the terminal pair; petiole 7 to 10 cm. long, the rachis with the petiole 13 to 20 cm. long; leaflets opposite or subopposite, ovate-lanceolate, or elliptical-lanceolate, subcoriaceous, glabrous, the upper surface shining, the apex acute, the base acute, inequilateral 11 to 19 cm. long, 5 to 7 cm. wide, the nerves 10 to 11 on each side, curved upward, not prominent, the reticulations nearly obsolete; petiolules rugose 10 to 15 cm. long. Panicles 20 cm. long or less, the branches spreading, the lower ones 8 cm. long or less. Flowers about 13 mm. long, the pedicels 3 mm. long or less, slightly pubescent. Calyx 2 mm. long, reddish brown, pubescent with few scattered hairs, with four short, acute teeth. Petals four, 12 mm. long, 4 mm. wide, the apex bluntly acute, minutely appressed-pubescent outside, the inside glabrous. Staminal tube cylindrical, 9 mm. long, glabrous, the margin entire. Stamens eight, inserted near the apex of the tube, included, the anthers 1.2 mm. long. Disk cylindrical, 4 mm.

¹ Monog. Phan. 1:579.

long, the margin ciliate. Ovary pubescent, four celled. Style elongated, glabrous, swollen at the apex, the tip just exerted from the staminal tube. Stigma discoid, 1.3 mm. in diameter. Fruit unknown.

Type specimen No. 624, Forestry Bureau, collected by T. E. Borden, Lamao River, Province of Bataan, Luzon, April, 1904. A tree reaching a diameter of 70 cm., with brownish-red bark, growing in forests at an altitude of about 100 m. Tagalog, *Guso*.

EUPHORBIACEÆ.

ANTIDESMA EDULE Merrill, sp. nov.

A shrub or small tree 3 to 18 m. high, with ovate-lanceolate or broadly ovate, acute or acuminate, membranaceous, more or less pubescent, shining leaves, the inflorescence in small axillary panicles, 4 cm. long or less. Branches reddish brown, densely pubescent throughout. Leaves 10 to 22 cm. long, 4.5 to 9.5 cm. wide, the base rounded or subacute, often slightly unequal, the apex acute or more often acuminate, the upper surface more or less pubescent, becoming glabrous, shining, the under surface paler than the upper, uniformly pubescent with scattered hairs, the midrib shining and veins densely pubescent; nerves about ten pairs, ascending, obscure above, rather prominent beneath, the reticulations lax; petioles 0.8 to 2 cm. long, densely pubescent. Panicles axillary, the rachis and branches densely tomentose, the branches few, ascending, 3 cm. long or less; bracts lanceolate, acuminate, densely hirsute, 3.5 mm. long; bracteoles ovate-lanceolate, subhyaline, ciliate, 1 mm. long. Male flowers numerous, the calyx 1 mm. long, clothed with scattered white hairs, very obscurely five toothed or nearly entire, ciliate. Stamens 4; filaments glabrous, 2 mm. long. Pedicel thick, 1 mm. long or less. Female flowers not known. Fruit ellipsoid or subglobose, 3.5 to 4 mm. in diameter, pink or red, edible, with a pleasant acid taste, the style persistent near the apex, lateral, the persistent calyx five-lobed, the lobes scarcely reaching the middle of the calyx.

This species is represented by the following specimens, all from Lamao River, Province of Bataan, Luzon: No. 3148, Merrill; October, 1903 (fruit); No. 3784, Merrill, January, 1904 (immature flowers); No. 167, Forestry Bureau, collected by Barnes, January, 1904 (male flowers); No. 574, Forestry Bureau, collected by Barnes, March, 1904 (fruit), the latter number with narrow, very acuminate leaves.

A shrub or small tree growing in the hill forests at an elevation of about 100 m. T., Pamp., *Tanigi*.

CYCLOSTEMON BORDENII Merrill, sp. nov. (*Cyclostemon macrophyllus* Vidal, *Sinopsis*, Atlas, t. 82 f. B. 1883, non Blume.)

A tree 23 m. high or less, with oblong-ovate or oblong-lanceolate, coriaceous, entire, glabrous leaves, the flowers in axillary fascicles, or on the branches below the leaves. Branches light gray, the tips usually brownish. Leaves 10 to 23 cm. long, 4 to 7 cm. wide, those of the sterile branches 20 to 40 cm. long, 6 to 11 cm. wide, smooth and shining on both surfaces, the apex acute or slightly acuminate, the base very unequal, one side rather broadly rounded, the other very acute; nerves 6 to 9 pairs, ascending, curved, rather prominent, freely anastomosing, the reticulations rather

prominent, lax; petioles thickened, rugose, 6 to 9 mm. long; stipules narrowly lanceolate-acuminate, somewhat pubescent. Male flowers globose, about 6 mm. in diameter, short pediceled, 6 to 10 in a fascicle, the pedicels 3 mm. long or less, densely pubescent; sepals four, coriaceous, concave, orbicular, entire, about 6 mm. in diameter, the outside densely pubescent with short, appressed grayish-brown hairs, the inside glabrous. Stamens many, the anthers 2 mm. long; disk broad, glabrous. Female flowers unknown. Fruit subglobose, 1.5 cm. in diameter, gray, pubescent, becoming glabrous, 2 celled, each cell with a single large seed.

Specimens examined: Nos. 333 (type), 542, 563, 573 Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, 1904; Nos. 671 and 673 Forestry Bureau, collected by T. E. Borden, same locality, May, 1904, also No. 11 Ahern, Pasacao, Province of Camarines Sur, Luzon, January, 1902 (flower). Of the specimens collected by Barnes, No. 333, February, 1904, only is in flower.

This species is rather common in the hill forests at Lamao, at an elevation of about 100 m. above the sea, reaching a diameter of 30 cm. or less, and a height of 23 m. or less. Tagalog *Diladila* or *Talimorong*.

CYCLOSTEMON MICROPHYLLUS Merrill, sp. nov.

A tree 16 m. high or less, with glabrous ovate or ovate-lanceolate inequilateral, acuminate leaves, and fasciculate axillary inflorescence. Branchlets slender, light gray, glabrous. Leaves 4 to 7 cm. long, 1.5 to 3.5 cm. wide, subcoriaceous, glabrous, shining, the base unequal, rounded or subacute, tapering above to the acuminate apex, the nerves four on each side, ascending, curved, obscure above, not prominent beneath, anastomosing, the reticulations obscure, lax; petioles 4 to 5 mm. long, slightly pubescent at first, becoming glabrous. Flowers in fascicles of ten or less in the axils of leaves or of fallen leaves, greenish white, odorless, globose, 4 mm. in diameter, the pedicels slender, slightly pubescent 4 to 5 mm. long. Sepals four, sparingly rusty-pubescent, imbricate, broadly ovate or suborbicular, 4 mm. long. Stamens 9 to 12, the filaments 1 mm. long, the anthers 1.7 mm. long. Female flowers and fruit unknown.

Type specimen No. 296, Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, January, 1904. A small tree, 16 m. high or less and 25 cm. in diameter or less, in the hill forests at an altitude of 150 m. above the sea. Tagalog, *Tangnaranig*.

ANACARDIACEÆ.

MANGIFERA ALTISSIMA Blanco, Fl. Filip. ed. 1, 181. 1837; ed. 2, 129; ed. 3, 1:230.

This species was reduced by Fernandez-Villar¹ to *Mangifera longipes* Griff., which is certainly an error. *Mangifera altissima* Blanco is very closely related to, if not identical with, *Mangifera quadrifida* Jack, a species of the Malayan Peninsula. Engler² retains Blanco's species among the uncertain species. The vegetative and floral characters of *Mangifera altissima* Blanco agree very well with those of the published descriptions of

¹ Nov. App. 54. 1880.

² Monog. Phanerog. 4:214.

Mangifera quadrifida Jack, but the fruit of the latter is very imperfectly known, and is described as subglobose, which does not apply to Blanco's species. The fruit of *Mangifera altissima* strongly resembles that of *Mangifera indica* Linn., in form, but is much smaller and not as much compressed. It is smooth and green or somewhat yellowish when ripe, ovoid or ellipsoid, rounded at both ends, slightly compressed, 5.5 to 8 cm. long, 4 to 6 cm. thick, the fleshy pericarp rather firm, white, not at all stringy. Frequently the point of insertion of the style persists in the ripened fruit as a small protuberance on the side near the apex. Seed similar in shape to the fruit, glabrous, not stringy, 3 to 5.5 cm. long, 3 to 4 cm. thick.

There are apparently two forms of this species, as noted by Blanco, the one here described being that noted by Blanco under the native name *Pahohotan*, the fruits having a very strong flavor of turpentine. Possibly the form noted by Blanco under the native name *Paho*, may be distinct, but no specimens have been seen, the ones cited below bear the three native names, *Paho*, *Pahunan*, and *Pahohotan*.

Specimens examined: Luzon—Province of Zambales, Subig, No. 1757, Merrill, April, 1903; Province of Bataan, Lamao, Nos. 256, 484, 485, 487, 502, Forestry Bureau, collected by Barnes, March 1904; Nos. 642, 643, Forestry Bureau, collected by Borden, April, 1904, same locality; No. 3807 Merrill, March, 1904, same locality; Province of Rizal, Antipolo, No. 51, Decades Philippine Forest Flora, collected by Ahern's collector, February, 1904. Mindoro—Pola, No. 2366, Merrill, May, 1903; Calapan, without collector or date. A common tree, flowering in February and March, fruiting in March, April, and May.

MANGIFERA MONANDRA Merrill, sp. nov.

A medium-sized tree, entirely glabrous, with coriaceous, lanceolate, broadly lanceolate or sometimes obovate-lanceolate, acute or very shortly and bluntly acuminate, rather long petioled leaves, small panicles, 10 cm. long or less, and small flowers, 3.5 mm. long. Branches grayish brown, glabrous, not thickened. Leaves 9 to 16 cm. long, 2.5 to 6.5 cm. wide, narrowed to the cuneate base, the upper surface shining, the nerves 11 to 13 on each side, rather distinct, at intervals of about 1 cm., the reticulations beneath, fine, distinct, nearly obsolete above; petioles thickened and rugose at the base, 2.5 to 4 cm. long, those of the upper and smaller leaves shorter. Panicles glabrous, 10 cm. long or less, two or three from the tip of each branchlet, the branches slender, the lower ones 3.5 cm. long or less, the panicle in fruit elongated to 20 cm. Flowers white, the pedicels 1 to 2 mm. long. Sepals 4, broadly ovate, 2 to 2.5 mm. long, 1.5 mm. wide, thin, acute, three nerved. Petals 4, broadly ovate, obtuse, the veins 5 to 7, prominent as thickened, confluent ridges below, slender and branched above, not extending to the margins. Disk thickened, nearly 2 mm. wide, and 1 mm. thick. Fertile stamen one, the filament about 1 mm. long, the anther 0.8 mm. long; staminodes three, very minute, or obsolete. Ovary globose, glabrous, the style sublateral, 1.5 mm. long. Fruit, ellipsoid, somewhat inequilateral, subcompressed, 3.5 cm. long, 1.8 cm. wide, 1.5 cm. thick, the pulp very thin.

Type specimens No. 414, Forestry Bureau, collected by Ahern's collector, Antipolo, Province of Rizal, Luzon, February, 1904 (flower). No 441, same collector and locality, April, 1904 (fruit). A tree growing in the forests. Tagalog, *Clamansane*.

STERCULIACEÆ.

STERCULIA PHILIPPINENSIS Merrill, new name (*Sterculia cordifolia* Blanco, Fl. Filip. ed. 1, 764; ed. 2, 525; ed. 3, 3:163, non Cav.; *Sterculia urens* F.-Vill., Nov. App. 26. 1880, non Roxb.).

This species is very characteristic, and is not closely related to *Sterculia urens* Roxb., to which it was reduced by F.-Villar. The latter species does not extend to the Philippines. Blanco's name is preoccupied by that of Cavanilles, and accordingly the name given above is here proposed. *Sterculia philippinensis* is well represented by No. 2159, Merrill, Pinamalayan, Mindoro, May, 1903, and No. 225, Forestry Bureau, collected by Gammill, Guimaras Island, January, 1904, both specimens in fruit. V., *Banilad*.

MALVACEÆ.

ABELMOSCHUS SHARPEI Copeland, sp. nov.; perennial, with woody base, all younger parts hispid; leaves with sagittate base, 3 to 5 partite, segments linear, entire or nearly so; peduncles exceeding petioles of their subtending leaves; bracteoles 7 to 10, linear, shorter than calyx.

Davao, Mindanao, in wet pastures, Copeland No. 364.

Usually branched from the base, 40 to 100 cm. high; pedicels and peduncles 2 to 4 cm.; longest lobes of leaves 7 cm. long, 5 mm. wide; bracteoles 10 to 12 mm.; calyx 3 to 5 toothed; petals 2.5 to 4 cm. long, yellow, reddish toward base, turning maroon; capsule 2 to 2.5 cm. long, globose-oblong; seeds reniform, not musky.

This plant seems to be as near *A. moschatus* Moench, as to any species, but differs in the woody base, smaller flowers, narrow entire leaf lobes, short capsules, and nonmusky seeds. *A. moschatus* has been collected in Paragua by Merrill (795), and is probably widespread; but specimens from near Manila determined as such by J. Perkins are remarkably distinct in their bracteoles.

GUTTIFEREÆ.

KAYEA PANICULATA (Blanco). (*Plinia paniculata* Blanco, Fl. Filip. ed. 1, 423; ed. 2, 296; ed. 3, 2:184; *Kayea racemosa* F. Villar, Nov. App. 17. 1880, non Pl. et Tr.)

A medium-sized tree with oblong-lanceolate, acuminate leaves, the inflorescence in axillary and terminal panicles and racemes, 5 to 7 cm. long. Branchlets, slender, gray, glabrous. Leaves thin, glabrous, shining, the base acute, the apex acuminate, 10 to 14 cm. long, 2.5 to 3.2 cm. wide, the nerves obscure, very numerous, the more prominent ones about 4 mm. apart; petioles 8 to 10 cm. long, rugose. Inflorescence few, or rather many flowered, the bracts, if present, early deciduous, the few branches opposite,

2 cm. long or less, each with from one to three flowers. Flowers white, 2 cm. in diameter. Sepals glabrous, orbicular, rounded, 3.5 to 4 mm. long, the outer two slightly thickened and rugose. Petals ovate, obtuse, 10 mm. long, 6 mm. wide. Fruit (immature) 1 cm. in diameter, the persistent, much-thickened accrescent calyx lobes covered with small brownish scales.

This species is rather common in the hill forests of Bataan, and is represented by the following specimens: Lamao, Province of Bataan, Luzon, No. 364, Forestry Bureau, collected by P. T. Barnes, March, 1904 (flower); No. 2539, Merrill, same locality (fruit), June, 1903.

These specimens are taken from the neighborhood where Blanco secured his type material, and agree perfectly with his description. According to Blanco the Tagalog name for this species in Bataan was *Guisian*; according to Barnes it is *Carinas*.

LECYTHIDACEÆ.

PLANCHONIA SPECTABILIS Merrill, sp. nov. (*Planchonia valida* Vidal, Sinopsis, Atlas, t. 50 f. D. non Blume.)

A large tree, reaching a height of 30 m. or more, entirely glabrous, with thin membranaceous, broadly ovate or obovate acuminate leaves and short erect racemes bearing solitary or few large showy flowers. Young branches slender, brown, glabrous. Leaves alternate 10 to 15 cm. long, 7 to 10 cm. wide, entirely glabrous, the margins finely serrate, the apex very sharply and abruptly acuminate, the acumen about 1 cm. long, the base cuneate, somewhat decurrent; nerves 11 or 12 pairs, obscure above, distinct beneath; petioles 1.5 to 2 cm. long, narrowly wing-margined. Racemes terminal erect, 1 to 3 flowered, 1 cm. long. Flower 7 cm. long, slightly fragrant. Calyx tube funnel shaped, cylindrical or very obscurely angled, glabrous, 1 cm. long, the lobes four, imbricate round-ovate, 5 mm. long, 8 to 10 mm. wide. Petals obovate-oblong, pale green, acute or obtuse, 3 cm. long, 12 to 13 mm. wide. Staminal tube nearly 2 cm. long, the stamens 6 cm. long, the filaments slender, white at the apex, shading to deep red at the base; anthers yellow. Style, stigma and ovary green, the former very slender, 6 cm. long. Fruit ovoid, glabrous, green, not compressed or angled, 4.5 cm. long, 3 cm. thick, the calyx crowned apex 1 cm. in diameter. Seeds irregularly compressed, few, 4 to 6, 1.5 cm. long.

Type specimen No. 58 Forestry Bureau, collected by Mr. P. T. Barnes at Lamao River, Province of Bataan, Luzon, October, 1903; No. 2612, Merrill, from the Province of Tayabas, Luzon, appears also to be a form of this species.

This tree reaches a large size and grows in the hill forests up to an elevation of 600 m., where it was observed by the author in October, 1903. The type was collected by Mr. Barnes at an elevation of about 100 m. The trunk is straight and columnar, reaching a diameter of 1 m., the bark being brown and very scaly. It is not uncommon in the forests at Lamao River, but so far as known is of no economic value. The flowers are produced in great abundance, but are of short duration, falling in the early morning, often hundreds of fresh-fallen flowers being found under a tree. T., *Llamog*; V., *Uban*.

COMBRETACEÆ.

TERMINALIA.

The first Philippine species of *Terminalia* described are *T. latifolia* Blanco, and *T. angustifolia* Blanco, in the first edition of his Flora de Filipinas in 1837. In the second edition of the same work, published in 1845, the former was changed to *Terminalia mauritiana*, and the latter to *Terminalia edulis*. *Terminalia latifolia* Blanco and *T. mauritiana* Blanco, are synonyms of *Terminalia catappa* L. *T. edulis* Blanco, is a valid species, *T. angustifolia* Blanco, being a synonym. In 1845 Blanco described a third species of *Terminalia* under the generic name *Gimbernatia*, this species, *G. calamansanai*, not being transferred to *Terminalia* until 1884. In 1849 Presl described in his *Epimiliæ Botanica*, based on Cuming's Philippine material, four species of *Terminalia*—*T. polyantha*, *T. parviflora*, *T. nitens*, and *T. pellucida*—and a fifth species sub *Pentaptera*, *P. mollis*. Of these species described by Presl, four are apparently valid, *Terminalia polyantha* here being reduced to *Terminalia catappa* L. The next consideration of Philippine *Terminalia* is by Fernandez-Villar, in the *Novissima Appendix* to the third edition of the Flora de Filipinas, in 1880. F.-Villar enumerates six species with numerous synonyms, nearly the entire list being erroneous, and at the same time but one of the five species described from Philippine material by Presl, is mentioned and that as a synonym. Of the list of *Terminalia* given by F.-Villar, *Terminalia catappa* with synonyms is correct, *Terminalia belerica* F.-Vill., non Roxb., var. *typica* is *Terminalia edulis* Blanco. The variety No. 2 of F.-Villar is unknown, but should be excluded. *Terminalis belerica* var. *laurinoides* F.-Vill., non T. et B., is *Terminalia nitens* Presl., *T. procera* F.-Vill., non Roxb., is *Terminalia magarapali* Vidal, *Terminalia. chebula* Retz., is credited to the Philippines, but this is undoubtedly an error, as F.-Villar reduces to this species *Bucida comintana* Blanco, but it is at once evident from Blanco's description, that *Bucida comintana* is not a species of *Terminalia*, but probably *Calycopteris*. *Terminalia arjuna* Bedd., is another species undoubtedly erroneously credited to the Philippines by F.-Villar, no synonyms are given, and it is impossible to determine at this time just what the species may be, so referred by F.-Villar. *Terminalia bialata* F.-Vill., non Kurz, is *Terminalia calamansanai* (Blanco) Rolfe.

In 1883 Vidal's "Sinopsis" was published, and in the Atlas of this work three species of *Terminalia* are partially figured. Of these three species, *Terminalia belerica* Vidal, non Roxb., is *Terminalia edulis* Blanco, *Terminalia bialata*, Vidal, non Kurz, is *Terminalia calamansanai* (Blanco) Rolfe, *Terminalia magarapali* Vidal, is here first described, but the description is very imperfect and only the fruit is figured. This species is, however, most distinct, but as yet has not been collected a second time. In 1884 Rolfe transferred to *Terminalia*, *Pentaptera mollis* Presl, and *Gimbernatia calamansanai* Blanco. The last enumeration of Philippine *Terminalia* is the list given by Vidal in his Revision, published in 1886, where nine species

are noted, *Terminalia magarapali* Vidal, is not listed here, from which it is evident that the type of this species was lost or destroyed before 1886. In the present enumeration eleven species of *Terminalia* are discussed, of which three are proposed as new.

Key to the Philippine species of Terminalia.

Leaves ovate, lanceolate or elliptical.

Leaves obtuse, glabrous; flower glabrous on the outside;
fruit obovate two or three winged..... *T. parviflora*

Leaves acuminate or acute.

Inflorescence paniculate; flowers glabrous on the
outside..... *T. multiflora*

Inflorescence spicate; flowers densely pubescent on
the outside.

Fruit with broad, thin wings *T. calamansanai*

Fruit ovate, compressed, wingless *T. edulis*

Leaves obovate.

Leaves pilose..... *T. mollis*

Leaves glabrous or nearly so.

Fruit not compressed or keeled.

Fruit ellipsoid, 4 to 4.5 cm. long, 3 to 3.5 in diam-
eter, rounded at both ends; leaves 5.5 to 7
cm. wide..... *T. ellipsoidea*

Fruit egg-shaped, 4.5 to 5.5 cm. long, 3 to 3.5
cm. in diameter; leaves 8 to 10 cm. wide --- *T. ovocarpa*

Fruit 4 cm. long, 1.5 cm. in diameter, the apex
acuminate; leaves brown, glossy *T. nitens*

Fruit 2 to 2.5 cm. long *T. pellucida*

Fruit more or less compressed, keeled.

Fruit less than 4 cm. long, strongly keeled.... *T. catappa*

Fruit often 10 cm. long, slightly compressed and
keeled; leaves truncate or with a short
acumen, the margins undulate; petioles 2 cm.
long, with two glands at the apex..... *T. magarapali*

TERMINALIA OVOCARPA Merrill, sp. nov.

A large tree with glabrous, obovate leaves and egg-shaped fruits 4.5 to 5.5 cm. long. Ultimate branches somewhat thickened, glabrous, the older branchlets marked with many prominent leaf scars. Leaves 13 to 15 cm. long, 8 to 10 cm. wide, glabrous on both surfaces, minutely pellucid-punctate, tapering from above the middle to the cuneate base, the apex very abruptly acuminate, or rarely rounded or emarginate, the acumen blunt, obscurely emarginate, less than 5 mm. long; nerves 10 pairs, rather prominent beneath, anastomosing near the margins; petioles glabrous, 2 cm. long, with two glands near the middle. Flowers unknown. Fruit egg shaped, 4.5 to 5.5 cm. long, 3 to 3.5 cm. in diameter, the base rounded, the apex subacute, pericarp 2 to 6 mm. thick, spongy, the endocarp hard.

Type specimen No. 67, Forestry Bureau, collected by P. T. Barnes at Lamao River, Province of Bataan, Luzon, November, 1903.

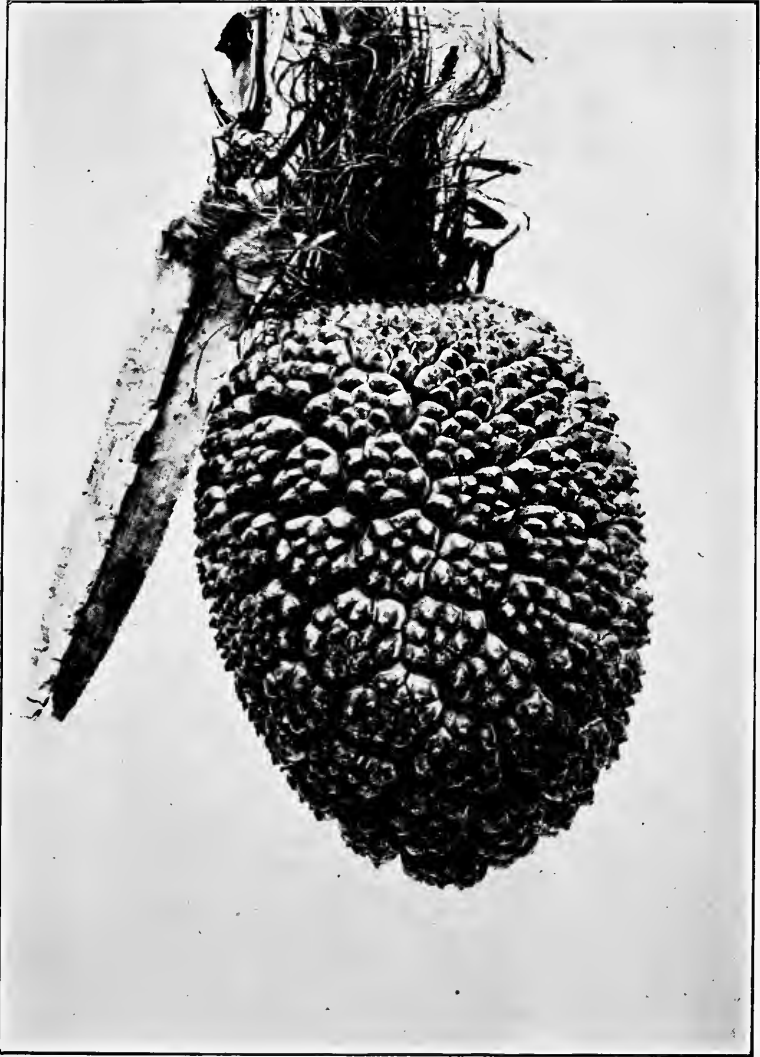
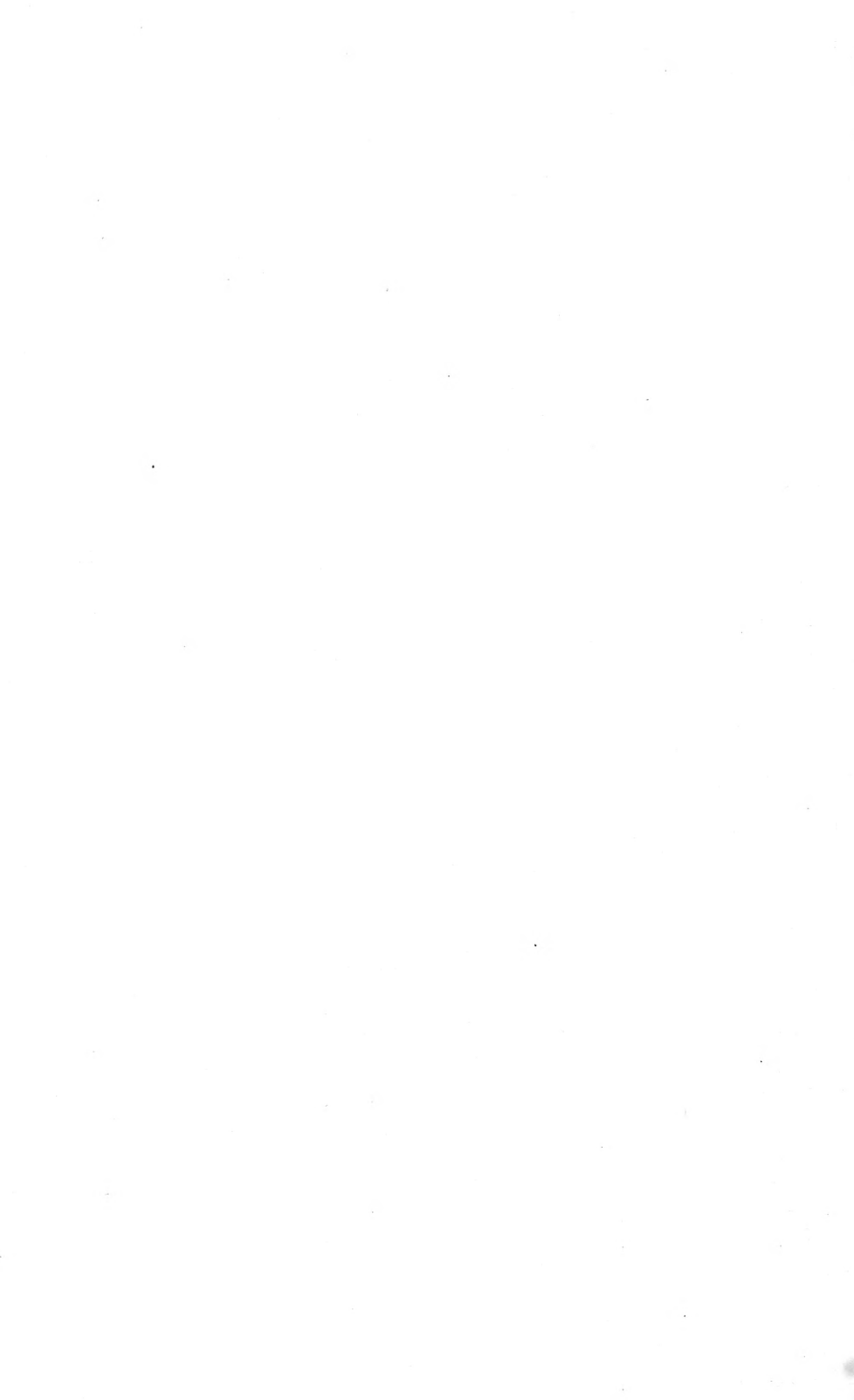


PLATE III. PANDANUS ARAYATENSIS MERRILL, FRUIT.



A large tree, growing in dry hill forests at an elevation of 100 m. above the sea, with columnar, buttressed trunks nearly 1 m. in diameter and about 25 m. to the first branches, the buttresses nearly 1 m. wide at the base, extending to a height of 2 m. Bark very scaly, light gray. The wood is brown and is used by the natives in the construction of bancas (native canoes) and for boards in the construction of houses. Locally known to the Tagalogs of Bataan as "*Talisay del monte*."

This species is distinguished from *Terminalia pellucida* Presl, by its much larger fruits, broader and entirely glabrous leaves, and glabrous petioles; from *Terminalia magarapali* Vidal, in its smaller, differently shaped and not angled fruits, and from *T. phellocarpa* King, a species of the Malayan Peninsula, especially in its much smaller, narrower leaves.

TERMINALIA ELLIPSOIDEA Merrill, sp. nov.

A tree with glabrous, obovate, abruptly blunt-acuminate leaves, the nerves of which are prominent beneath, and ellipsoid fruits 4 to 4.5 cm. long. Ultimate branches somewhat thickened, rusty pubescent, becoming glabrous. Leaves subcoriaceous 10 to 14 cm. long, 5.5 to 7 cm. wide, the under surface minutely and obscurely punctate, and with few rusty hairs along the midnerve, the margins slightly undulate, apex, except for the abrupt blunt acumen, rounded, the base cuneate; nerves 11 pairs, prominent beneath; petioles 1 to 1.5 cm. long, appressed rusty-pubescent when young and with two glands at the upper third. Flowers unknown. Fruit ellipsoid glabrous, not compressed, rounded at both ends, 4 to 4.5 cm. long, 3 to 3.5 cm. thick.

Type specimen No. 2148 Merrill, Pinamalayan, Mindoro, May, 1903. Locally known to the Tagalogs as *Calumpit*, but this name is usually applied to *Terminalia edulis* Blanco.

A tree 18 m. high, and 40 to 50 cm. in diameter with rough grayish-red bark, and ash-colored wood, which is used by the natives in the construction of houses and boats.

TERMINALIA NITENS Presl, Epim. Bot. 213. 1849; Walp. Ann. 3:859. 1853; Vidal, Rev. Pl. Vasc. Filip. 127. 1886; *Terminalia belerica* Roxb. var. *laurinoides* F.-Vill., Nov. App. 80. 1880, non *Terminalia laurinoides* T. et B.

Type locality: "Habitat in insula Luzon." (No. 1326 Cuming.) Specimens examined: Luzon, Province of Bataan, Lamao River, No. 64, Forestry Bureau, collected by P. T. Barnes; Province of Rizal, Bosoboso, No. 2800, Merrill. T., *Sacat*. A species not as yet found outside of the Philippines, although *Terminalia phellocarpa* King, from the Malayan Peninsula, is closely related.

TERMINALIA EDULIS Blanco, Fl. Filip. ed. 2, 265. 1845, 1. c. ed. 3, 2:127; Vidal, Rev. Pl. Vasc. Filip. 127. 1886. *Terminalia angustifolia* Blanco, Fl. Filip. ed. 1, 377. 1837, non Jacq. *T. belerica* F.-Vill., Nov. App. 80. 1880; Vidal, Sinopsis, Atlas, t. 48. f. B. non Roxb.

Specimens examined: Luzon, Province of Rizal, Antipolo, No. 1626, Merrill; Tanay, No. 2283, Merrill; Province of Zambales, No. 2968, Merrill;

Province of Bataan, Balanga, No. 306, Ahern; Province of Tayabas, Lagui-manoc, No. 2588, Merrill; Malicboi, No. 35, Ritchie; Province of Camarines, Dalupaon, No. 1, Ahern; Island of Masbate, No. 2759, Merrill.

This common endemic species is universally known to the Tagalogs as *Calumpit*. Other names, Zambales, *Gayumayen*; V., *Magtalisay*. *Catumanog*; (Masbate), *Cotmoc* (Camarines).

TERMINALIA MULTIFLORA Merrill, sp. nov.

A large tree with paniceled terminal inflorescence and glabrous ovate or lanceolate leaves, which are not crowded at the apices of the branches. Branches dark brown, glabrous, subopposite. Leaves alternate or subopposite, 5 to 8 cm. long, 2.5 to 3.5 cm. wide, the base rounded or subacute, the apex acuminate or acute; nerves 11 or 12 pairs, spreading, curving upwards, the upper surface minutely white punctate, the lower surface finely brown-reticulate, glabrous, the petioles 1.5 cm. long, with two glands at the apex. Panicles much branched, the spike-like ultimate branches many flowered 5 to 9 cm. long, 6 to 8 cm. wide, the axis and branches densely brown tomentose. Flowers all perfect, sessile, 4 mm. long, including the exerted stamens, 2 to 2.5 mm. wide, the younger ones subtended by a linear-lanceolate, deciduous bracteole, 1.5 mm. long, slightly hirsute at the base, otherwise glabrous; calyx glabrous on the outside, the spreading border densely villous inside, the teeth acute. Ovary glabrous, oblong, 1 mm.; stamens, 10, the filaments glabrous, 2.5 long; style glabrous, equaling the stamens.

Type specimen No. 2796, Merrill, Bosoboso, Province of Rizal, Luzon, July, 1903, known to the Tagalogs of Rizal as *Naghubo*; No. 2647, Merrill, from the same locality. with very young fruit, is also referred here.

A species evidently related to *Terminalia chebula* Retz, but abundantly distinct, so far as can be determined from the descriptions of that species available. This species may represent the form credited to the Philippines by F.-Villar¹ as *Terminalia chebula* Retz., but it is impossible to determine this as F.-Villar gives no description and no specimens were preserved.

F.-Villar² without comment refers Blanco's *Bucida comintana* to the species he considered to represent *Terminalia chebula*, without having seen authentic specimens of either species. A cursory examination of Blanco's description shows at once that *Bucida comintana* can not be referred to *Terminalia*, as the fruit is described as being crowned by the persistent calyx. Blanco's *Bucida comintana* is undoubtedly a species of *Calycopteris*, but judging from his description is distinct from *Calycopteris floribunda* Lam.

TERMINALIA MOLLIS (Presl) Rolfe, Journ. Linn. Soc. Bot. 21:310. 1884; Vidal, Rev. Pl. Vasc. Filip. 127. 1886; *Pentaptera mollis* Presl, Epim. Bot. 214. 1849; Walp. Ann. 3:859. 1853.

Type locality: "Habitat in insula Luzon" (No. 1004 Cuming).

This species is represented by No. 6395 A. D. E. Elmer, Twin Peaks, Province of Benguet, Luzon, June, 1904.

¹ Nov. App., Fl. Filip., 80.

² l. c.

TERMINALIA PELLUCIDA Presl, Epim. Bot. 214. 1849; Walp. Ann. 3:859. 1853; Vidal, Rev. Pl. Vasc. Filip. 127. 1886.

Type locality "Habitat in insula Luzon." (No. 1326 Cuming.) Specimens examined: Luzon, Province of Tayabas, Pagbilao, No. 1943, 1951, 2846, Merrill; Province of Rizal, Bosoboso, No. 1829, Merrill. These specimens do not agree entirely with Presl's description, but are so referred. Nos. 1755 and 2901, Merrill, from the Province of Zambales, appear to well represent the species.

TERMINALIA MAGARAPALI Vidal, Synopsis, Atlas, XXVI. t. 48. f. c. 1883. (*T. procera* F.-Vill. Nov. App. 80. 1880, non Roxb.)

This species is not listed in Index Kewensis, and is based on a specimen collected on the Island of Alabat, off the Pacific coast of Tayabas Province, Luzon. The type has undoubtedly been destroyed, as this species is not mentioned by Vidal in his "Revision de Plantas Vasculares Filipinas" in 1886. It is characterized by its large, obovate glabrous leaves, and very large, somewhat compressed and keeled fruits, which are often 10 cm. long. It is known only from Vidal's imperfect description and figure of the fruit. The Tagalogs of Alabat Island know this species as *Magarapali*.

TERMINALIA CATAPPA Linn. Mant. 2:519. 1771; Hook; Fl. Brit. Ind. 2:444; Vidal, Rev. Pl. Vasc. Filip. 127. 1886. *T. latifolia* Blanco, Fl. Filip. ed. 1, 376. 1837, non Swartz. *T. mauritiana* Blanco, l. c. ed. 2, 264. 1845, non Lam. *T. polyantha* Presl, Epim. Bot. 213. 1849. ex. deser.

This species is found throughout the Malayan region, and is very common and widely distributed along the coast in the Philippines, being much cultivated for shade, but proving very unsatisfactory for this purpose in Manila. There is no doubt as to the proper reference of Blanco's names. Presl's *Terminalia polyantha* was based on No. 1516 Cuming, from Mindoro, and judging from his description is only a form of *Terminalia catappa* L., although it is held distinct by Vidal¹. This species is universally known in the Philippines as *Talisay*, while many of the Spanish-speaking people call it *Almendras*.

TERMINALIA CALAMANSANAI (Blanco) Rolfe, Journ. Linn. Soc. Bot. 21: 310. 1884; Vidal, Rev. Pl. Vasc. Filip. 127. 1886. *Gimbernatia calamansanai* Blanco, Fl. Filip. ed. 2, 266. 1845. *Terminalia bialata* F.-Vill. Nov. App. 80. 1880; Vidal, Synopsis, Atlas, t. 48. f. B. 1883, non Kurz.

Specimens examined: Luzon, Province of Zambales, Botolan, No. 2981, Merrill; Province of Principe, Baler, No. 1069, Merrill. Mindanao, Province of Surigao, No. 329, Ahern.

A common and widely distributed endemic species, known to the Tagalogs as *Calamansanai*, and *Malacalumpit*, and to the Visayans as *Lumanog*.

Blanco has included two forms in this species, which may prove to be distinct when more material is available for comparison. One form mentioned has fruits 1½ inches wide, and the other has fruits 2½ inches wide.

¹ Phan. Cuming. Philip. 112.

TERMINALIA PARVIFLORA Presl, Epim. Bot. 214. 1849; Walp. Ann. 3:858. 1853.

Type locality "Habitat in insula Luzon." (Cuming 1439, Batangas.) This endemic species is characterized by its ovate-elliptical, obtuse leaves, and obovate, two to three winged fruits. It has been collected by Loher, and is represented in our herbarium by No. 785 Ahern, Mariveles, Province of Bataan, Luzon. T., *Calamansanai*.

A species evidently closely related to *Terminalia calamansanai* Rolfe.

MYRTACEÆ.

JAMBOSA BATAANENSIS Merrill, sp. nov.

A small tree, 8 m. high or less, with lanceolate, acuminate, few-nerved leaves, and large, solitary flowers which either terminate the branchlets, or are borne on the larger branches, and rarely also on the trunk of the tree. Branches gray, smooth, the branchlets brownish, slender, terete, glabrous. Leaves glabrous, 7 to 10 cm. long, 2 to 3 cm. wide, the apex with a rather slender, elongated, but blunt acumen, the base acute, rarely somewhat obtuse, the upper surface dark colored, the lower pale; nerves very irregular, about 10 on each side of the midrib, not prominent, reticulations lax, marginal nerves two, the outer very faint; petioles less than 2 mm. long. Flowers 3 cm. long, 4 to 5 cm. wide, when open, red and white, or pinkish, the peduncle slender 1 to 1.5 cm. long. Calyx 1.5 cm. long, 1.5 cm. wide, funnel shaped, the lobes four, irregular, 4 to 6 mm. long, 8 to 10 mm. wide. Petals orbicular, distinct, four, 1 cm. in diameter, the base pink, the tip red. Filaments 2 to 2.5 cm. long, the base deep red, the tip white or pink; anthers 1.5 mm. long. Style about 4 cm. long.

Type specimen No. 3761, Merrill, Mount Mariveles, Province of Bataan, Luzon, January 1, 1904. Rather common on forested ridges at elevations of from 800 to 1,000 m. above the sea.

JAMBOSA GARCLEÆ Merrill, sp. nov.

A tree with very large sessile, ovate-lanceolate or oblong leaves, strongly four-angled branches and terminal paniculate inflorescence. Branchlets brown, glabrous, about 1 cm. in diameter, strongly four-angled, the angles winged. Leaves coriaceous, glabrous, about 40 cm. long, 15 cm. wide, the apex acute or slightly acuminate, the base rather abruptly narrowed, rounded, strongly cordate, the upper surface dark brown, the lower pale when dry, the midnerve very prominent, brown; primary nerves prominent, about 20 on each side of the midrib, 1 to 2 or 3 cm. apart, the reticulations lax, but rather prominent, the main nerves arching and anastomosing near the margin. Panicles 20 cm. long or more, the axis and stout spreading branches and branchlets four-angled, the lower branches 8 cm. long; bracts ovate, 3 to 4 mm. long. Flowers sessile, 1 cm. long, 1.5 cm. wide when open, each subtended by a whorl of four small bractlets. Calyx turbinate, about 5 mm. in diameter, four lobed, the lobes 1.5 mm. long, 3 mm. wide. Petals orbicular, 5 to 6 mm. in diameter, thick, coriaceous. Filaments about 1 cm. long; anthers 0.5 mm. long. Style 1 cm. long.

Type specimen collected at Pola, Mindoro, by R. Garcia, an employee of

the Forestry Bureau, May, 1903, distributed as No. 2367, Merrill, under the name *Eugenia garciae* Merrill.

JAMBOSA LONGIPEDICELLATA Merrill, sp. nov.

A small tree with broadly ovate, obtuse, strongly cordate sessile leaves, and much elongated, three-flowered, racemose inflorescence. Branches terete, glabrous, light gray. Leaves glabrous, coriaceous, 12 to 14 cm. long, 6.5 to 8 cm. wide, scarcely narrowed at the abruptly rounded, strongly cordate base; primary nerves 8 to 10 on each side of the midrib, with one or two less prominent secondary nerves between each two primary nerves, the primary nerves anastomosing 8 to 10 mm. from the margin, reticulations lax, rather prominent. Inflorescence terminal, solitary, or two peduncles from the tip of the same branchlet, the peduncle very much elongated, slender, 20 to 25 cm. long, the pedicels 5 cm. long. Flowers about 3 mm. long, and 4 mm. wide or more when open, the buds obovate. Calyx funnel-shaped, the tube 1 cm. long, 1.5 cm. in diameter, four lobed, the lobes large, very unequal, one pair 1.5 cm. wide, 9 to 12 mm. long, the other 8 to 10 mm. wide, 4 to 8 mm. long. Petals 2.5 cm. long, 1.5 cm. wide. Filaments 2 cm. long; anthers 2 mm. long. Style 3 cm. long.

Type specimen No. 1046, Merrill, Baler, Province of Principe, Luzon, August, 1902. T., *Lipote*.

JAMBOSA BARNESII Merrill, sp. nov. § *Eujambosa*.

A tree 10 to 15 m. high, with glabrous, ovate or ovate-lanceolate, few-nerved, acuminate leaves, which are cordate at the base, and terminal panicles of medium-sized white flowers. Branches slender, glabrous, light gray, terete or the ultimate branchlets sometimes four angled. Leaves firm, plumbeous when dry, glabrous, the upper surface shining, the lower surface with small scattered glands, dull, 8 to 13 cm. long, 3.5 to 5.5 cm. wide, the apex rather abruptly acuminate, rounded below to the slightly cordate base; main nerves about 13 on each side, very irregular, anastomosing in a subprominent marginal nerve at a distance of about 4 mm. from the margin, between this nerve and the edge of the leaf is a second one very faint, reticulations lax, not prominent; petiole dark colored 2 mm. long. Panicles 8 to 10 cm. long, about the same diameter, terminal, the branches ascending, the lower ones 5 to 6 cm. long. Flowers 2 cm. long, 2 cm. wide when open, white, fragrant, the flower buds globose. Calyx funnel shaped, 1 cm. long, nearly truncate, or with inconspicuous rounded lobes. Petals 5, orbicular, 5 mm. in diameter. Filaments 12 mm. long. Style 10 mm. long or more.

Type specimen No. 140, Forestry Bureau, collected by P. T. Barnes, Lamao River, Mount Mariveles, Province of Bataan, Luzon, January, 1904.

A small tree reaching a diameter of 15 cm., growing in dry hill forests at an elevation of 800 m. above the sea.

JAMBOSA LUZONENSIS Merrill, sp. nov.

A tree 10 m. high, with glabrous, lanceolate, acuminate, few-nerved leaves, which are acute at the base, and axillary few-flowered panicles of medium-sized white flowers. Branchlets small, glabrous, terete, brownish. Leaves 9 to 14 cm. long, 3.5 to 5 cm. wide, the base acute, the apex acumi-

nate; main nerves 8 or 9 on each side of the midrib, distant, anastomosing 3 to 7 mm. from the margin, a second indistinct marginal nerve between the nerve thus formed and the margin, reticulations fine, obscure; petioles thickened, rugose, dark colored, 1 cm. long. Inflorescence from the branches and branchlets below the leaves, about 8 cm. long, the few branches spreading or ascending, each bearing two to four flowers. Flowers about 1.5 cm. long, 2 cm. wide when open, slightly fragrant, the buds obovate, the pedicels about 4 mm. long. Calyx turbinate, 7 mm. long, 5 mm. wide, four lobed, the lobes orbicular, very unequal, two about 4 mm. long and 5 mm. wide, the other two about 3 mm. in diameter. Petals orbicular, 6 to 7 mm. in diameter, distinct, rather densely punctate with prominent but small yellow glands. Filaments 1.5 to 2 cm. long; anthers 1 mm. long. Style about 1.5 cm. long.

Type specimen No. 83, Forestry Bureau, collected by P. T. Barnes, Lamao River, Province of Bataan, Luzon, November, 1903.

A tree with yellowish-red bark, growing in the forests along the river at an elevation of 100 m. above the sea. T., *Malarukat*, but this name is applied to various other species of *Jambosa*.

Jambosa luzonensis is apparently closely related to the species described by Blanco as *Myrtus subrubens*, which is a true *Jambosa*, but Blanco's description does not apply to the species here described.

SYZYGIUM PALLIDUM Merrill, sp. nov.

A small tree with lanceolate, acuminate, glabrous, very pale leaves, and terminal and axillary panicles of small flowers. Branchlets terete, glabrous, slender, brownish gray. Leaves 5 to 7 cm. long, 1.5 to 3 cm. wide, coriaceous, with very numerous inconspicuous nerves, pale above, very pale, almost white, beneath, the apex and base acuminate, or the latter sometimes acute; petioles about 1 cm. long. Panicles many flowered, 4 to 6 cm. long, the lower branches ascending, about 2 cm. long. Flowers 6 to 7 mm. long, including the stamens. Calyx crateriform, 4 mm. long, truncate, 2 mm. in diameter. Corolla calyprate, falling as a whole. Filaments 4 to 5 mm. long; anthers 0.4 mm. long. Style about 4 mm. long.

Type specimen No. 1764, Merrill, Subig, Province of Zambales, Luzon, April, 1903.

A very characteristic species, recognized by its pale greenish-white leaves (when dry).

MELASTOMACEÆ.

MELASTOMA TOPPINGII Merrill, sp. nov.

A shrub with narrowly ovate, acute, 5-nerved leaves, angular ultimate branchlets, which are densely clothed with long brownish or reddish hairs, and lanceolate-acuminate calyx lobes shorter than the calyx tube. Branches brownish, the clothing hairs of the ultimate branchlets minutely scabrid, 2 to 4 mm. long, more or less spreading and curved upward. Leaves 5 to 8 cm. long, 2 to 3.5 cm. wide, the base slightly rounded, the upper surface rather densely clothed with short, stiff, subappressed hairs, beneath rather densely strigose-pubescent, the hairs on the nerves beneath

longer and more appressed; petioles densely clothed with long hairs, 5 to 8 mm. long. Flowers purplish, fasciculate, usually in threes. Calyx tube 1 cm. long, densely clothed with more or less appressed stout hairs 1 to 3 mm. long, which are arranged in fascicles, the calyx lobes lanceolate-acuminate, 7 mm. long, 2 mm. wide, near the base densely ciliate with long hairs, the alternating teeth slender, 2 mm. long, ciliate, and with a tuft of long, penicillate hairs at the apex. Petals obovate, 2 to 2.3 cm. long, 1.5 cm. wide, the margins ciliate. Larger stamens 2 cm. long, the anther 9 mm. long, the connective scarcely elongated, 1.5 mm. or less in length.

Type specimen No. 17, D. LeRoy Topping, Baguio, Province of Benguet, Luzon, January, 1903.

MELASTOMA FUSCA Merrill, sp. nov.

A shrub 2 m. high or less, with lanceolate, acuminate, 5-nerved leaves, the lobes of the calyx broad, nearly truncate, one-half as long as the calyx tube. Branches pale brown, densely clothed with appressed, brownish, lanceolate, chaffy scales, 1 mm. long or less. Leaves 9 to 13 cm. long, 2 to 3.5 cm. wide, the base acute, the apex acuminate, rarely acute, the marginal nerves not prominent, both surfaces scabrous with short, scattered, subappressed, stiff hairs; petiole pale brown, scaly, 1 to 1.5 cm. long. Flowers purplish, solitary in the axils of the leaves or three or four together at the ends of the branches, short pedicellate. Bracts obovate, 2 cm. long, 1.5 cm. wide, densely scaly, the margins ciliate. Calyx tube pale brown, 10 to 12 mm. long, densely clothed with imbricated lanceolate, ciliate, appressed scales 2 mm. long or less, the lobes 6 to 7 mm. long, 4 to 5 mm. wide, the apex very abruptly apiculate, almost truncate, densely scaly, the alternating teeth very short, less than 1 mm., penicillate-ciliate. Petals obovate, 2.5 cm. long, 1.7 cm. wide. Longer stamens 3 cm. long, the anther 12 mm. long, the connective 10 mm. long.

Type specimen No. 340, Forestry Bureau, collected by P. T. Barnes, Lamao River, Province of Bataan, Luzon, February, 1904. No. 204 Forestry Bureau, collected by Barnes in the same locality, January, 1904, is the same.

ASCLEPIADACEÆ.

DISCHIDIA PURPUREA Merrill, sp. nov.

An epiphytic, herbaceous, creeping vine on erect tree trunks, rooting at every node, the fleshy coriaceous leaves flattened against the supporting tree trunk, the hollow space formed by the shield-like leaves being occupied by colonies of ants, a single much-branched root, from each axil spreading over the entire area covered by the leaf. Stems slender, glabrous, sometimes 1 m. long, the internodes 2 to 4 cm. long. Leaves in pairs, opposite, sessile, orbicular, fleshy, coriaceous deep purple, glabrous when fresh, when dry the under surface minutely warty, 3.5 to 5 cm. in diameter, nerves 4 or 5 pairs, rather prominent beneath, obsolete above. Inflorescence axillary, the peduncle slender, 4 cm. long, the apex with two short divergent much-thickened branches, the flowers produced from the tips of the branches. Pedicels glabrous, slender, 1.5 mm. long. Flowers few, 4 to 4.5 mm. long,

pink to white, glabrous throughout. Sepals thin, ovate, obtuse or subacute, 1 mm. long. Corolla urceolate, membranous, 3 mm. in diameter, 4 mm. long, the lobes triangular, acute, 1 mm. long. Coronal scales, five, the tips 2-fid, recurved, 0.5 mm. long. Column 2 to 2.5 mm. long.

Type specimen No. 3735, Merrill, growing on tree trunks on exposed wind-swept ridges, Mount Mariveles, Province of Bataan, Luzon, January 1, 1904, at an elevation of 1,200 m.

This species of the section *Conchophyllum* is distinguished from the widely distributed *Dischidia imbricata* K. Sch., by its larger flowers, which are not subsessile, and rather larger leaves, which have more numerous veins than the leaves of *Dischidia imbricata*.

There are several distinct species of the genus *Dischidia*, section *Conchophyllum*, common and widely distributed in the Philippines, but the various ones are rarely found in flower, and accordingly can not be readily identified. The genus is especially interesting on account of the symbiosis with ants, colonies of these insects being almost invariably found living under the shield-like leaves of the species of the section *Conchophyllum*, and inside of the hollowed pendant leaves of that of the section *Ascidiphora*. The much-branched axillary roots which are found covering the space protected by the flattened leaves of the species of the former, and inside of the hollow leaves of the species of the latter, evidently serve the purpose of assimilating the refuse matter of the living ants, while the peculiar leaves in both cases conserve moisture for the plant.

CONVOLVULACEÆ.

RIVEA BARNESII Merrill, sp. nov.

A woody vine reaching a height of 30 m. and a diameter of 4 cm. with ovate-acuminate, coarsely papillate-pubescent leaves, and lavender flowers, the corolla very densely silky pilose on the outside with long appressed yellowish hairs, deeply lobed. Ultimate branches brownish, densely pubescent. Leaves 8 to 10 cm. long, 4 to 5.5 cm. wide, the base broad, rounded or subcordate, tapering from the lower third to the slender acuminate apex, the margins obscurely undulate, both surfaces uniformly and rather thickly covered with rather harsh upwardly curved white hairs, each hair from a small papilla; nerves about 7 pairs; petioles 2 to 2.5 cm. long, densely pubescent. Inflorescence cymose, from the axils of the leaves; peduncles pubescent, 3 to 4 cm. long, one to three flowered, pedicels thick 4 to 5 mm. long, pubescent. Bracts pubescent, lanceolate, 1 cm. long. Calyx 8 mm. long, the lobes rounded pubescent. Corolla 3 to 3.5 cm. long, the outside densely silky pubescent, deeply five lobed, the lobes lanceolate, 2 cm. long, 3 to 4 mm. wide, acute. Stamens five, alternating with the lobes, thickened below, and with a sharp inward curve above the base, closely surrounding the pistil, but not connivent, 2 cm. long, not exerted. Anthers 4 mm. long. Style slender glabrous, equaling the stamens; stigma two lobed, the lobes globose. Ovary two celled, two ovules in each cell. Fruit ovoid, 1 cm. long, one seeded.

Type specimen No. 68, Forestry Bureau, collected by P. T. Barnes, Lamao

River, Province of Bataan, Luzon, November, 1903, growing in dry hill forests, at an elevation of about 100 m. No. 1657 Merrill, Antipolo, Province of Rizal, Luzon, March, 1903, is the same.

SAPOTACEÆ.

CHRYSOPHYLLUM ROXBURGHII G. Don.

No. 2479, Merrill, Pola, Mindoro, June, 1903, represents this species, its previous known range having been from British India to Java and Sumatra. T., *Pisang dagá*.

Chrysophyllum grandifolium Steud., the only species of this genus previously reported from the Philippines, is very imperfectly known, having been described from leaf specimens only. Judging from the description it is a species of *Palaquium*, very close to, if not identical with, *Palaquium oleiferum* Blanco.

ILLIPE CORIACEA Merrill, sp. nov.

A tree with glabrous, coriaceous, oblong-obovate, obtuse leaves and ovate fruits. Branches glabrous, gray, the ultimate branchlets brown. Leaves brown when dry, 8 to 15 cm. long, 2.5 to 4 cm. wide, narrowed to the cuneate base; nerves obscure, 15 pairs; petiole about 2 cm. long, glabrous, rugose below, somewhat margined above by the slightly decurrent leaf blade. Flowers unknown. Fruit solitary, ovate, glabrous, 4 cm. long, 1.5 cm. broad, the peduncle 2 to 2.5 cm. long, glabrous, thickened above, the persistent calyx segments four, in two series, glabrous, rounded, 4 mm. long, the outer ones broader than the inner; seed solitary, 2.5 to 3 cm. long, ovate, acute, smooth, and shining, the hilum extending the length of the seed, 5 mm. broad; endosperm 2 cm. long, narrowly ovate, 8 mm. broad, the cotyledons 3 to 3.5 mm. thick.

Type specimen No. 1008, Merrill, Baler, Province of Principe, Luzon, August, 1902. T., *Lisong insic*.

ILLIPE MULTIFLORA Merrill, sp. nov.

A tree with ovate-lanceolate, coriaceous leaves which are at first minutely pubescent beneath, becoming glabrous, both surfaces shining, the flowers very numerous, crowded in fascicles of ten or more flowers each, in the axils of the leaves, or in the axils of fallen leaves, toward the ends of the branchlets. Ultimate branches reddish brown, thickened, the very tip rusty pubescent, otherwise glabrous. Leaves 11 to 16 cm. long, 4.5 to 8 cm. wide, the apex acute or slightly acuminate, below rounded to the generally somewhat acute, rarely obtuse base, the under surface densely and minutely silvery pubescent when young, becoming glabrous; nerves about fifteen pairs, subprominent on both surfaces, spreading, freely anastomosing near the margins; petioles glabrous, thickened and rugose below, 2 to 4.5 cm. long. Flowers greenish yellow, the pedicels 12 mm. long, densely rusty tomentose. Calyx 8 mm. long, densely rusty tomentose on the outside, the lobes broadly ovate, acute, 7 mm. long, 6 mm. wide, the two inner ones thinner than the outer, their margins glabrous. Corolla glabrous 9 to 10 mm. long, eight lobed, the lobes 7 mm. long, 3 mm. wide, the apex obtuse.

Stamens 20, the anthers sessile, 3.5 mm. long, clothed with long, stiff, white hairs. Ovary glabrous, nine celled. Fruit unknown.

Type specimen No. 411, Forestry Bureau, collected by Ahern's collector, Antipolo, Province of Rizal, Luzon, February, 1904; No. 762, Ahern, Mari-veles, Province of Bataan, Luzon, January, 1902, is the same. T., *Calamyanes*.

ILLIPE RAMIFLORA Merrill, sp. nov.

A tree reaching a height of 35 m., with oblong, glabrous, coriaceous leaves, five-parted calyx, the flowers borne on the medium-sized branches, not on the leaf-bearing branchlets. Branches grayish-brown, glabrous. Leaves 9 to 16 cm. long, 3.5 to 5 cm. wide, both surfaces smooth and shining, somewhat narrowed below to the abruptly acute or somewhat rounded base, the apex abruptly acute, the tip blunt; nerves obscure above, rather prominent below, ascending, 7 to 8 pairs, the reticulations lax, rather prominent, especially near the margins; petioles glabrous, thickened and rugose below, 1.5 to 3.5 cm. long, reddish brown. Flowers about 1 cm. in diameter, in fascicles of from three to six or more from protuberances on the branches, the pedicels 1.5 cm. long, appressed rusty-pubescent. Calyx five parted, the lobes very broadly ovate, 7.5 mm. long, 6 mm. wide, acute, coriaceous, densely pubescent with rusty appressed hairs. Corolla white, 8 mm. long, ten lobed, the lobes about 6 mm. long, 2 mm. wide, acute. Stamens 20; filaments 4 to 5 mm. long; anthers 4 mm. long. Ovary densely rusty pubescent, seven celled. Fruit unknown.

Type specimen No. 189, Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, January, 1904; also a sterile specimen from the same locality, No. 583, Forestry Bureau, collected by Barnes, March, 1904.

A very characteristic species, which is perhaps worthy of being described under a new genus on account of its five-parted calyx, but as Engler includes such plants in the genus (*Illipe butyracea* (Roxb.) Engl.), it has been considered advisable to place the present species in the genus *Illipe*. A tree growing in the hill forests at an elevation of about 100 m., the latex produced being of no value. T., *Baniti*.

PAYENA LANCEOLATA Merrill, sp. nov.

A tree with glabrous lanceolate, acuminate leaves. Branches brownish gray, glabrous, the ultimate branchlets black when dry, deciduously rusty-pubescent. Leaves thinly coriaceous 8 to 11 cm. long, 3 to 4.5 cm. wide, brown when dry, entirely glabrous, the base acute, the apex acuminate; nerves 13 or 14 pairs, not prominent, dark brown beneath, anastomosing at the very margin; petioles 2 to 2.5 cm. long, glabrous or with very few rusty, appressed hairs; stipules caducous, 2 mm. long, ovate lanceolate, acute, densely pubescent with rusty appressed hairs. Inflorescence fasciulate in the axils of the branchlets or the fallen leaves, two to six flowers in a fascicle; peduncles 10 to 12 mm. long, dark brown or black when dry, pubescent with scattered appressed grayish hairs. Calyx lobes four, in two series, the outer broadly triangular-ovate, acute, 5 mm. long, 4 mm. wide, pubescent with scattered appressed grayish hairs, inner lobes thinner

than the outer, similar in shape and size, but slightly narrower, the exposed outer surface densely appressed pubescent, the margin with a narrow glabrous border, the edge sparingly ciliate. Corolla lobes (from immature flowers) 10, thin, glabrous, linear lanceolate, obtuse, 2.5 mm. long, 1 mm. wide. Stamens in two series, 18, the anthers lanceolate acuminate, 2 mm. long, clothed with very long (1 mm.) scattered appressed, rusty hairs. Fruit unknown.

Type specimen No. 493, G. P. Ahern, Island of Dinagat, 1901. Locally known as *Lonolono*.

This species in general appearance resembles *Payena lucida* A. DC., a species of the Malayan Peninsula, but differs from the latter in its longer petioles, more numerous corolla lobes, and stamens, the latter being glabrous in *Payena lucida*. *Payena lanceolata* should possibly be referred to the genus *Illipe*, but this point can only be determined by the examination of ripe seeds.

SIDEROXYLON RAMIFLORUM Merrill, sp. nov.

A tree with lanceolate or elliptic-lanceolate, nearly glabrous coriaceous leaves, the inflorescence in fascicles on simple specialized branches from above the scars of fallen leaves. Ultimate branches thick, densely brown tomentose, the older branches gray, glabrous, the leaf scars on the latter large and prominent, 4 to 5 mm. in diameter. Leaves 10 to 22 cm. long, 5 to 10 cm. wide, the base acute, the apex acute or acuminate, when young rather densely brown tomentose beneath, becoming glabrous in age, or the brown tomentum persistent along the nerves and midrib, glabrous above; nerves prominent, 11 pairs; petioles 3 to 5 cm. long, densely rusty tomentose when young, becoming glabrous. Branches bearing the inflorescence from above scars of fallen leaves, simple, rusty tomentose 2 to 8 cm. long, these branches rarely foliaceous at their apices, when foliaceous, often exceeding 8 cm. in length; fascicles 5 to 12 flowered; pedicels 5 to 6 mm. long, rusty tomentose; flower buds subglobose. Flowers 2.5 mm. long. Calyx rusty tomentose, the teeth acute, about 0.5 mm. long. Corolla 2 mm. long, the lobes obtuse, 1 mm. long, slightly less than 1 mm. wide, glabrous. Stamens not exerted; filament 0.5 mm. long, about equaling the nearly round anther. Connectives lanceolate-acuminate, about 8 mm. long. Ovary densely pubescent. Fruit unknown.

Type specimen No. 2793, Merrill, Bosoboso, Province of Rizal, Luzon, July, 1903; No. 3413, Merrill, from a specimen cultivated in the old Botanical Garden in Manila, October, 1903, and No. 77, Forestry Bureau, collected by P. T. Barnes at Lamao River, Province of Bataan, Luzon, are also referred here. This species is known to the Tagalogs of Rizal as *Bancalande*, and to those of Bataan as *Malapaho*, the latter name usually, however, being applied to a species of *Mangifera*.

This species is evidently most closely related to *Sideroxylon nitidum* Blume, from Java, but is distinguished by its leaf characters, acute calyx lobes, smaller flowers, etc.

PALAEQUIMUM ANGUSTIFOLIUM Merrill, sp. nov.

A tree 8 to 10 m. high, with entirely glabrous, narrowly oblanceolate or

lanceolate leaves. Branches grayish brown, glabrous, the flower-bearing ones rough with many prominent leaf scars. Leaves 5 to 8 cm. long, 1.5 to 2.5 cm. wide, coriaceous, smooth and shining, the apex abruptly shortly blunt-acuminate, slightly or not at all tapering from the upper third to a point near the base, then rather abruptly cuneate; nerves prominent, 11 to 13 pairs; petioles 1 to 2.5 cm. long, glabrous, or the base slightly rusty puberulent. Flowers unknown. Fruit solitary, peduncles 1 cm. long, glabrous, the persistent calyx lobes six, in two series, the inner ones thinner than the outer, rounded, 5 mm. long, rusty pubescent, becoming glabrous on the outside, densely, appressed rusty pubescent on the inside, the fruit one-seeded ovate or obovate, the apex rounded, and with a short minute mucro, smooth and shining, 2 cm. long, 1 cm. thick, the seed ovate acute, 1.5 cm. long, smooth and shining.

Type specimen No. 3744, Merrill, Mount Mariveles, Province of Bataan, Luzon, January 1, 1904.

A tree 6 to 8 m. in height, the trunk about 20 cm. in diameter, growing on exposed ridges at an elevation of about 1,000 m. above the sea. The bark has a small amount of milky sap which, however, is not utilized by the natives. A most distinct species especially characterized by its small and relatively very narrow leaves.

PALAQIUM BATAANENSE Merrill, sp. nov.

A tree reaching a height of 45 m. with coriaceous, glabrous, obovate, acute or obtuse leaves, the nerves about nine pairs. Branches reddish brown, the tips more or less pubescent with rusty appressed hairs. Leaves pale when dry, 10 to 14 cm. long, 4 to 6 cm. wide, entirely glabrous, narrowed more or less from above the middle to the cuneate base, the apex obtuse or abruptly acute, rarely acuminate; nerves obscure above, not especially prominent beneath, at intervals of from 12 to 15 mm., the reticulations faint, lax; petioles glabrous, 1 to 1.5 cm. long. Flowers near the tips of the branches, solitary or in pairs from the axils of the leaves, or from the axils of fallen leaves, numerous, greenish white, the pedicels 1 cm. long, minutely and densely rusty pubescent. Calyx 4 mm. long, the three outer sepals broadly ovate, acute, densely rusty pubescent, the three inner ones thinner, pubescent only where not protected by the overlapping outer sepals, broadly obovate or rotund, the apex rounded. Corolla 14 mm. long, the six lobes reflexed in anthesis, 10 to 11 mm. long, 3 mm. wide, acute, glabrous. Filaments 4 to 5 mm. long; anthers 3 to 3.5 mm. long. Style exerted, 1.5 cm. long. Fruit unknown.

Type specimen No. 169, Forestry Bureau, collected by Barnes, Lamao River, Province of Bataan, Luzon, January, 1904; No. 156, Forestry Bureau, collected by Barnes, same locality, is apparently the same but with leaves much attenuated at the base.

A tree growing in the dry hill forests at an elevation of 100 m., the gutta-percha produced being of no value. Perhaps most closely related to *Palaquium luzoniensis* (F.-Vill.) Vidal, but the leaves with few nerves, entirely glabrous, and the petioles comparatively short. In this species the corolla

is very persistent, while in all the others of the genus known from the Philippines, the corolla falls very readily.

PALAQIUM TENUIPETIOLATUM Merrill, sp. nov.

A tree 18 to 35 m. high, with glabrous, lanceolate, acuminate leaves, the nerves about ten pairs. Branches slender, dark reddish gray, sometimes almost black, glabrous. Leaves lanceolate, or sometimes somewhat oblanceolate, 5 to 10 cm. long, 3 to 5 cm. wide, firm, entirely glabrous, or the midrib below, with few appressed, ferruginous hairs, usually rather abruptly acuminate, often caudate, the acumen slender, blunt, 1 cm. long or less, rarely nearly acute, the base cuneate; nerves not prominent, irregular, obsolete or nearly so near the base of the leaf; petioles slender about 1.5 cm. long, glabrous, or with few appressed, ferruginous hairs. Flowers fasciculate or sometimes solitary, on the branches below the leaves, the fascicles containing from two to four flowers; pedicels rusty pubescent, 3 to 8 mm. long. Calyx lobes 3 mm. long, 2 mm. wide, obtuse or somewhat acute, densely rusty-tomentose, the inner lobes thinner and somewhat exceeding the outer. Corolla greenish white, the tube about 2 mm. long, lobes lanceolate, 6 mm. long, 2 mm. wide, acute, reflexed in anthesis, glabrous. Stamens nine to twelve, the filaments 3 to 3.5 long; anthers 2 mm. long. Style exserted 1 cm. long. Ovary rusty-pubescent.

Type specimen No. 154, Forestry Bureau, collected by P. T. Barnes, Lamao River, Province of Bataan, Luzon, January, 1904; Nos. 516, 520, and 191, Forestry Bureau, collected by Barnes from the same locality, are the same, also No. 1991, Merrill, Pagbilao, Province of Tayabas, Luzon, March, 1903.

A tree 18 to 35 m. high, and 1 m. in diameter or less, with somewhat developed buttresses, extending to a height of 2 m. or less, and dark gray, nearly smooth bark which produces a thin milk sap, which flows rather freely, but which does not coagulate readily.

A species growing in dry hill forests, and apparently most closely related to *Palaquium lanceolatum* Blanco, differing from that species in its differently shaped leaves, longer petioles, absence of evident nerves near the base of the leaves, and dark-colored branchlets, the milk sap of the two species being also very different in quality. No. 1991 Merrill, has previously been referred to *Palaquium lanceolatum* Blanco.¹

EBENACEÆ.

DIOSPYROS COPELANDI Merrill, sp. nov.

A small tree 8 m. high and 8 to 10 cm. in diameter, with oblong, glabrous, coriaceous leaves, slender pendant branchlets, and entirely glabrous inflorescence which is borne in fascicles on the trunk of the tree. Pendant branchlets sometimes 2 m. long, 0.5 mm. in diameter, the bark gray, glabrous. Leaves 1 to 3.3 dm. long, 7 to 10 cm. wide, glossy above, dull beneath, the apex acute or abruptly, broadly, short-acuminate, the base rounded, subcordate, the nerves not prominent, freely anastomosing, the reticulations

¹ Merrill, Govt. Lab. 6:15. 1904.

lax, the main nerves about 15 pairs; petiole thickened, 0.5 mm. long. Staminate flowers 13 mm. long, glabrous, crowded in fascicles on the trunk of the tree, the peduncles 1, rarely two or three-flowered, glabrous, 6 to 8 mm. long, with a whorl of minute bracts at the base. Calyx 4 mm. long, 5 mm. in diameter, 5 to 6 lobed, the lobes broad, short, acute or rounded. Corolla flesh colored, 10 to 11 mm. long, 5 mm. in diameter, 6 or rarely 7 lobed, when open the lobes spreading or reflexed, lobes 3 mm. long, 4 mm. wide, rounded. Stamens about 25, inserted on the disc and the base of the corolla; filaments 1 to 1.5 mm. long; anthers lanceolate, glabrous 6 to 7 mm. long, dehiscing longitudinally, the rudimentary ovary glabrous. Female flowers and fruit unknown.

Type specimen No. 246, E. B. Copeland, Lamao River, Province of Bataan, Luzon, February, 1904. A species probably of the section *Ermellinus*, growing in hill forests along the river at an elevation of about 100 m. above the sea.

GESNERACEÆ.

TRICHOSPORUM CARDINALE Copeland, sp. nov.

Calyx 5-partite almost to the base, persistent. Seeds with one very short hair at each end. Corolla cardinal, eurved.

No. 997, E. B. Copeland, in thickets along the trail to Mount Apo, district of Davao, Mindanao, April, 1904, altitude 5,000 feet.

A climbing vine, where the moisture-demanding epiphytes begin to dominate the forest. Stem glabrous. Leaves opposite, equal, subcoriaceous, glabrous, entire, acuminate, very pale beneath, the lateral veins obscure, 12 cm. long, 3 cm. wide, the petioles 6 mm. long. Flowers in clusters of two or three on almost obsolete peduncles, the hairy pedicels 1 cm. long, axillary and terminal. Calyx lobes linear, 5 mm. long, hairy. Corolla hairy without, 4 cm. long. Stamens didynamous, exerted, filaments glandular. Ovary linear, three times as long as the pubescent style. Capsule about 10 cm. long, eurved. Seeds less than 1 mm. long, the single hair at each end shorter than the seed.

DICHROTRICHUM GLABRUM Copeland, sp. nov.

Leaves broadly lanceolate, acute, obscurely serrate, glabrous to the naked eye, a very few hairs visible under the lens. Peduncles long. Calyx shallowly 5-toothed, the segments acute.

No. 998, E. B. Copeland, Mount Apo, district of Davao, Mindanao, altitude about 6,000 feet, April, 1904. No. 297, DeVore and Hoover, same locality, May, 1903.

A vine with pendent tips, in the mossy forest. Stem slender and almost glabrous. Larger leaves 10 cm. long, by above 3 cm. broad, on petioles 4 or 5 cm. long; veins about 6 on each side of the midrib. One leaf of each pair reaches a length of less than 2 cm. and soon falls. The pendent peduncles are 20 to 40 cm. long, and, like the less (in anthesis) than 1 cm. long pedicels, glabrous or nearly so. The showy cyme comprises about eight flowers, with eurved, obscurely bilabiate red corollas about 2.5 cm. long. The campanulate calyx is about 5 mm. long, and divided not more than one-fifth of its length. The capsules reach a length of 25 cm. Seeds as in *Dichrotrichum ternateum* Reinw.

DICHROTRICHUM CHORISEPALUM Clarke, in DC. Monog. Phanerog. 5:53.

Specimens of this species collected by W. Klemme, Mount Banajao, Province of Tayabas, Luzon (Forestry Bureau No. 888) differ from Clarke's description in having the leaves acute-serrate rather than dentate, not very sparsely hirsute, too abruptly contracted to be called cuneate, and with four instead of six prominent nerves on each side of the midrib. Peduncles 40 cm. long (E. B. C.).

RUBIACEÆ.

GARDENIA BARNESII Merrill, sp. nov.

A shrub or small tree with ovate-lanceolate petioled leaves, and large white fragrant flowers, 10 cm. long. Ultimate branches glabrous, slender, light gray, the terminal buds resinous. Leaves 8 to 15 cm. long, 4 to 7 cm. wide, both surfaces shining, the upper glabrous, the lower slightly pubescent on the nerves, apex short acuminate, sometimes acute, the base cuneate: nerves about 15 pairs, rather prominent beneath; petiole 1 to 1.5 cm. long; stipules caducous. Flowers solitary, axillary, the pedicel 0.5 cm. long, sometimes wanting. Calyx 2 to 3 cm. long, glabrous, the tube gradually widened upward, about 1.5 cm. long, somewhat cleft on one side, with two short broad teeth, four or five ridged, the ridges extending into as many linear obtuse ascending or spreading lobes 1 to 1.5 cm. long, 4 mm. wide. Corolla about 8 cm. long, the tube glabrous throughout, 5 to 6 cm. long, the limb 5 to 7 parted spreading, 6 to 7 cm. in diameter, the lobes obovate, rounded, glabrous, about 3 cm. long, 2 to 2.5 cm. wide. Stamens as many as the lobes of the corolla, the anthers 13 mm. long, partly exerted. Stigma 1 cm. long, three cleft. Fruit unknown.

Type specimen No. 163, Forestry Bureau, collected by P. T. Barnes at Lamao River, Province of Bataan, Luzon, January, 1904. A shrub or small tree growing in hill forests at an elevation of 100 m. above the sea, reaching a height of 9 m. and a diameter of 11 cm. The bark is light gray and the wood light yellow, hard.

A species of the section *Eugardenia*.



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