

NEW OR NOTEWORTHY PLANTS FROM COLOMBIA AND CENTRAL AMERICA.

By HENRY PITTIER.

The present paper includes descriptions of a few plants from collections made mainly in the course of my explorations in Costa Rica from 1887 to 1903, and of others obtained more recently in Guatemala and Colombia in connection with investigations conducted on behalf of the United States Department of Agriculture.

The two species from Colombia, *Roupala ferruginea* and *Phyllanthus salviaefolius*, are old, but have remained little known; additional specimens permit several interesting facts to be added to the original descriptions by Kunth. The discovery in Costa Rica of two new species of *Phyllonoma* bridges a gap in the geographical distribution of a genus which has hitherto appeared widely interrupted, as its previously known members came from Peru and Colombia on the one side and from central Mexico on the other. The three Costa Rican species of *Carpotroche* show the extension toward the west and north of a genus thus far considered almost exclusively Brazilian. The remaining species, besides being new, have several interesting features which are noted in connection with the descriptions. I am greatly indebted to Dr. Th. Loesener, of the Berlin Royal Herbarium, for his help in the identification of *Myginda eucymosa*.

Roupala ferruginea H. B. K. Nov. Gen. & Sp. 2: 153. pl. 120. 1817.

A small tree, with alternate limbs, the younger branchlets, petioles, main and secondary veins, peduncles and pedicels ferruginose-tomentose.

Leaves alternate, petiolate; petioles rather thick, 1 cm. long; leaf-blade firm, rounded at base, ovate, more or less acute, pale green and subglabrous above, brownish white and delicately reticulate-venose beneath.

Racemes axillary, pedicellate, the pedicels 3 mm. long, adnate at base. Perianth 7 to 8 mm. long, glabrous outside, longitudinally striate. Stamens glabrous: filaments 5 mm. long, flattened, adhering to sepals; anthers ovate-elliptic, about 2 mm. long; end of connective rounded, scarcely surpassing the anthers. Pollen grains about 0.027 mm. in diameter, tetrahedral with a round nucleus. Glandular appendages at base of pistil glabrous, square at tip; pistil 7 mm. long; ovary ovate, hairy; style claviform.

COLOMBIA: Loma Gorda near Jambaló, Department of Cauca, at an altitude of 2,400 meters, H. Pittier, no. 1451, flowers February 5, 1906 (U. S. National Herbarium no. 531649).

The leaves of these specimens are uniformly rounded at the base and ovate and more or less acute at the tip, while those of the type are described as "obovato-oblongis basi angustatis." Moreover the racemes appear to be single and not geminate. But these small differences would not, apparently, justify the separation of the Jambaló form as a new species.

Phyllonoma tenuidens Pittier, sp. nov.

FIGURE 11.

A bushy tree, 2 to 3 meters high, with erect, glabrous limbs and branchlets. Older branchlets longitudinally striped with brownish white, irregular bands apparently due to the splitting of the dark brown bark.

Foliage very dense. Leaves alternate, exstipulate, glabrous: petioles canaliculate, slender, 7 to 10 mm. long. Leaf blades 5 to 7 cm. long, 2 to 3 cm. broad, elliptic, cuneate, long-acuminate, rather thin, discolorous: primary vein prominent under-

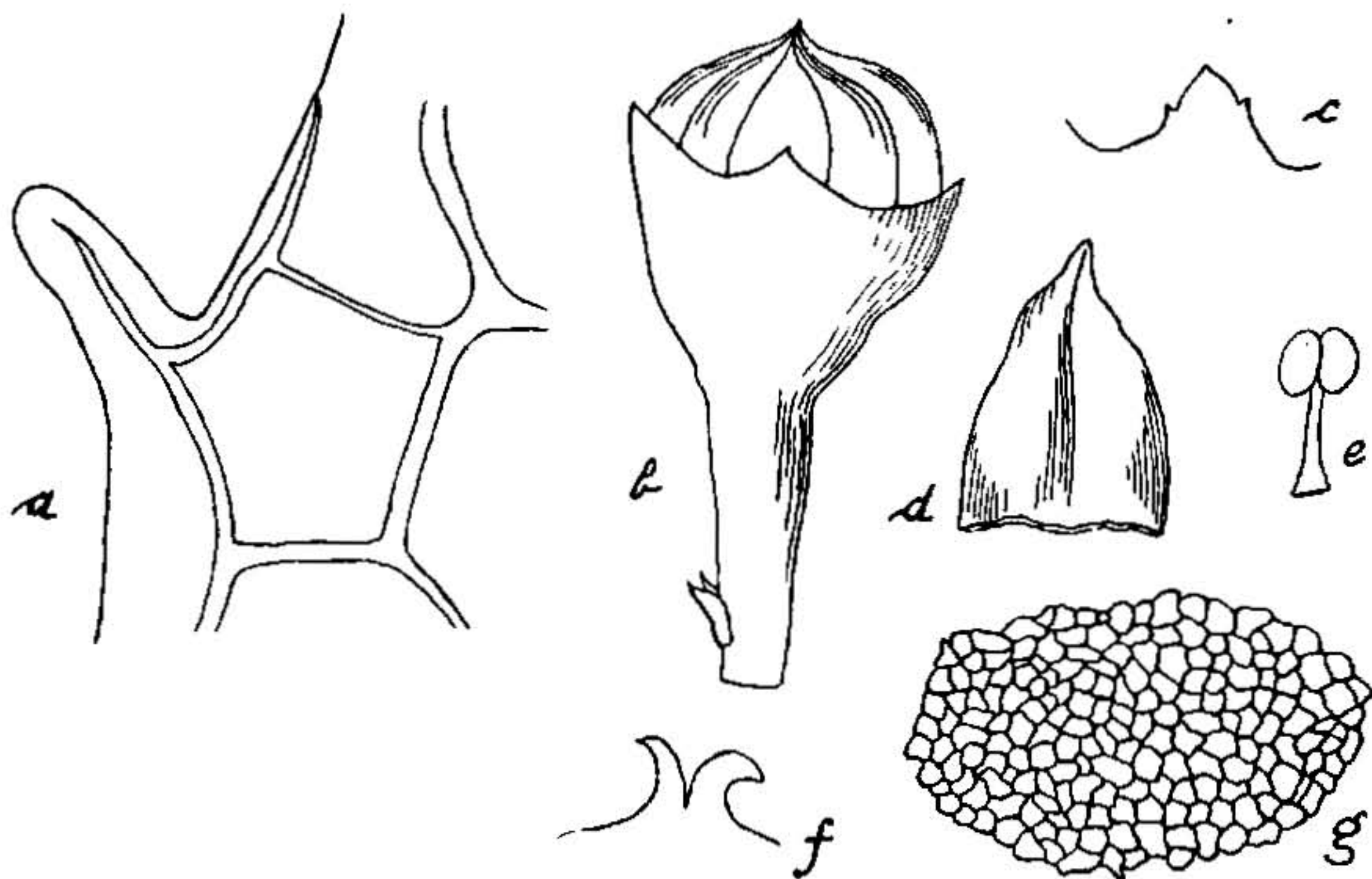


FIG. 11.—Flower parts and tooth of leaf of *Phyllonoma tenuidens*. a, Segment of leaf with tooth; b, floral bud; c, lobe of calyx; d, petal; e, stamen; f, style; g, seed. a, Natural size; b-g, scale 18.

neath, the secondary ones very slender, regular, minutely anastomosing, apparent on both faces; margin revolute, serrate from near the base by numerous regular and very slender teeth.

Inflorescence inserted on the blade, 1 cm. or more from the base of the acumen, cymose, and generally formed of 2 clusters of 4 flowers each on very short, squamose peduncles. Bracts at base of pedicels broadly ovate and subulate. Pedicels of mature flowers pubescent, seldom over 1.4 mm. long. Prefloration valvate.

Flowers very small. Sepals glabrous, broadly triangular, about 0.5 mm. long, with one minute tooth on each side. Petals 1.4 mm. long, 1 mm. broad, lanceolate-acuminate, yellow. Stamens 1 to 1.2 mm. long, filaments broader at base: cells of the anthers ovate, full. Hornlike styles about 0.5 mm. long.

Usually a single, small, pedicellate berry at each inflorescence, the diameter about 4.5 mm., the length 5.5 mm. Seeds usually 5 in each berry, ovate or ovate-elongate, about 1.5 to 2 mm. long, reddish brown, densely covered with conical tubercles.

COSTA RICA: Cuesta de los Borucas, on the mountain road leading from San Marcos de Dota to the Diquis Valley, altitude 2,900 meters; H. Pittier, flowers and fruit, January, 1897 (Instituto ffs.-geog. Costa Rica, no. 10552; type U. S. National Herbarium no. 578896).

Phyllonoma triflora Pittier, sp. nov.

FIGURE 12.

A bushy shrub or small tree, 2 to 3 meters high. Branchlets ascending, flexuous, glabrous.

Leaves numerous, alternate, exstipulate, glabrous. Petioles 7 to 8 mm. long, canaliculate, decurrent in two narrow wings; leaf blades 6 to 7 cm. long, 2 to 2.5 cm. broad, elliptic, acute at base, long-acuminate, coriaceous, yellowish green above, pale green beneath; primary vein apparent as a dark line above, very prominent beneath; secondary veins anastomosing along the margin, and connected by numerous transverse, ramified venules, forming a prominent network on the upper face of the leaf, but scarcely visible underneath; margins subrevolute, entire for the first third of their length, with acute, distant teeth on the upper two-thirds, these usually 4 on one side and 5 on the other side.

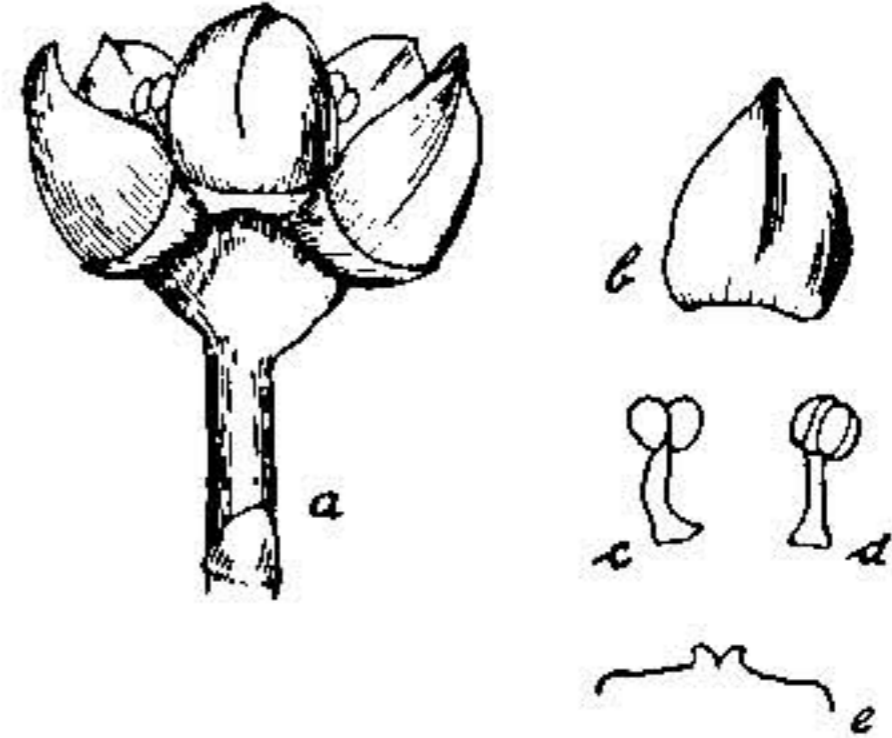


FIG. 12.—Flower and flower parts of *Phyllonoma triflora*. a, Open flower; b, petal; c, d, stamens; e, style and upper section of disk. a-e, Scale 18.

Inflorescence in sessile clusters of 3 flowers each on the midvein of the blade, at about two-thirds of the total length of the leaf from the base of the petiole.

Flowers pedicellate, very small, greenish yellow, opening in succession. Pedicels about 2 mm. long, gradually thickening toward the upper end, glabrous, with a small rounded bract at base of each. Lobes of calyx short, broadly triangular, acute. Petals 1.5 mm. broad at base, ovate-triangular with rounded tips. Stamens short, glabrous, inflected on the disk before anthesis, hanging between the petals later; filaments subulate; anthers broadly ovate-cordate, basifix. Disk large, yellow, covering the ovary and concrescent with it. Ovary inferior, two-celled (?); style none; stigmas 2, short, emerging from the disk. Ovules ventrifix, 3 or 4 in each cell.

Berry globose, fleshy, shortly pedicellate, showing at the top the 5 teeth of the concrescent calyx and the two stigmas. Seeds 3 to 6, subreniform, with a coarse, brown aril, about 2.5 mm. long.

COSTA RICA: La Palma, in the Central Cordillera, altitude 1,500 meters, H. Pittier, flowers and fruits, October, 1902 (Instituto fís.-geog. Costa Rica no. 16553; type U. S. National Herbarium no. 578054).

The type of the genus is *Phyllonoma ruscifolia* Willd., a species from Peru, elaborately described and figured by Kunth^a under the name of *Dulongia acuminata*. In 1858, Turczaninow published two species; one, collected by Galeotti (no. 7197) in the forests of Oaxaca, Mexico, at an altitude of 1,700 to 2,000 meters, he named *Dulongia laticuspis*; the other, a native of the mountains of Pamplona in the Colombian Department of Santander, whence it was brought by Funk and Schlim (no. 1657), is his *D. integerrima*.

The first species differs from the type mainly by the indentation of the margin, which begins near the base, instead of being limited to the upper third, and also by its acumen "articulate on the blade, and parted to the main nerve." In the U. S. National Herbarium there is a species brought from around Teponapa, in the mountains near Pápalo (State of Oaxaca, Mexico), where it grows at an altitude of 500 meters above sea level (collected by Gonzalez and Conzatti, no. 764), that agrees with Turczaninow's description as to the indentation of the leaf, but does not show any distinctive character in its long and acutely pointed tips. It differs also from *P. ruscifolia* in having the inflorescences affixed at the base of the acumen, and not on the blade proper; the marginal teeth, moreover, instead of being broad and short, as shown in the H. B. K. plate, are narrow and finely mucronate. In all probability these specimens correspond to *Dulongia laticuspis* Turcz.

^a In H. B. K. Nov. Gen. & Sp. 7: 76. pl. 623. 1825.

Dulongia integerrima Turcz. differs from Willdenow's species by its leaves being perfectly entire, twice as large, and one-half as broad as in that species; the stigmas, also, are said to be supported by very short styles. Dr. Britton referred to this species Rusby's no. 2521 collected at Mapirí, Bolivia. In the specimen of this collection at hand almost every leaf bears a few irregularly placed teeth; they are larger, but never twice as large, and decidedly not one-half broader (if a little so), as in *D. laticuspis*. In the only flower that was available for study, there were 3 stigmas, this being without doubt an anomaly, but they were just as sessile as in *D. acuminata* and *D. laticuspis*. Taking into consideration, also, the wide distance that separates the two localities where the specimens were collected, I feel inclined to consider Rusby's plant a distinct species; but I must refrain from describing it as such, on account of the insufficiency of material at hand.

Following the law of priority, the name *Dulongia* was dropped and *Phyllonoma* maintained by Bentham and Hooker. Also the genus was transferred from the Celastraceae, where it had been placed by Kunth, to the Saxifragaceae, to which it belongs by a majority of its structural characters.

Dr. Engler^a admits only two species, viz, *P. ruscifolia* Willd., of New Granada (Colombia), which he characterizes by its entire leaves and longer pedicellate flowers, and *P. laticuspis* (Turcz.) Engler with serrate leaves and short-pedicellate flowers, from the high mountains of Mexico. This evidently leaves out the species of the *Nova Genera et Species*, minutely described by Kunth, apparently from the same specimens as those on which Willdenow established his species. Should this view be maintained, there would now be the following species: *P. ruscifolia* Willd. = *P. (Dulongia) integerrima* Turcz., with entire leaves; *P. laticuspis* (Turcz.) Engler, serrate on almost the whole margin of the leaf; *P. (Dulongia) acuminata* H. B. K., serrate on the upper half of the leaf only; Rusby's species with subentire leaves; and lastly the two Costa Rican species here described, that differ from all the others more than these among themselves. On account of the scarcity of material in the European and American collections, the true status of the doubtful forms can scarcely be determined at present.

Phyllanthus salviaefolius H. B. K. Nov. Gen. & Sp. 2: 117. pl. 107. 108. 1817.

Phyllanthus floribundus H. B. K., loc. cit.

Kirganelia salviaefolia Spreng. Syst. 3: 48. 1828.

Oxalystylis kunthiana Baill. Étud. Gen. Euphorb. 629. pl. 24. fig. 15-19. 1858.

A small tree about 3 meters high, with numerous, alternate, tortuose, almost horizontal limbs and a depressed crown. Pseudo-branchlets 15 to 25 cm. long, caducous, obscurely 4-angled, covered, like the ends of the permanent branches, with dense, furfuraceous, brownish hairs, and provided at the base with 3 ovate, acute, stipule-like scales.

Leaves alternate or distichous, petiolate, with narrow, pointed stipules, 6 to 7 mm. long; petioles short (4 to 5 mm.), hairy; leaf blades 4 to 8 cm. long, 2 to 3 cm. broad, ovate-oblong, rounded or subcordate at base, narrowing gradually to an acute tip, densely furfuraceous beneath, more or less smooth above except on main nerves; primary and secondary veins hirsute and very apparent on both sides, the latter regularly alternate, arcuate and parallel.

Flowers dichinous, forming short-pedunculate, compound corymbs in the axils of leaves, each secondary cluster made up of 1, 2, or more pistillate flowers, accompanied by 1 to 3 staminate flowers, all together surrounded at base of pedicels by an involucre of generally 4, lanceolate, hirsute bracts, the larger of which are about 5 mm. long.

Staminate flowers small; pedicels glabrous, 3 to 5 mm. long. Sepals 6 in two alternate circles of 3, each 1.5 mm. long, 1 mm. broad, ovate-oblong, with slightly narrower claw. Disk cupuliform, plicate; stamens 3 to 9; filaments connate at base in a cylindrical column 0.5 mm. long, then free and unequal; connective broadened; anthers bilocular, each cell opening longitudinally.

^a In Engl. & Prantl, Pflanzenfam. 3^{2a}: 88. 1890.



MYGINDA EUCYMOSA LOESENER & PITTIER.

Pistillate flowers larger, on glabrous pedicels 25 to 35 mm. long, these capillary, but thickening slightly just below the flower. Perianth 6-partite, reddish or purplish, glabrous, with ovate divisions about 5 mm. long, rounded at tip and each marked with 3 dark, branched veins. Disk cupuliform, rather broad, obscurely 6-lobate. Pistil glabrous, 5 to 6 mm. long; ovary subglobose, 3-locular, and surmounted by a style first forming a short (about 1.5 mm.) column, and then dividing into generally 3 or sometimes only 2, or again very rarely 4 branches, each ending in a subflabellate, crenate-lobate, deep purple stigma.

"Capsule of the size of a pea, 3-coccos, depressed-globose, 6-sulcate, smooth, brownish, inclosed in the persistent, subequal perianth and crowned by the style; cells 2-spermous. Seeds triangulate, longitudinally striate, glabrous, brownish."^a

Bitoncó, in Moras Valley, in the Central Cordillera of Colombia, at an altitude of 2,500 m. above sea level, H. Pittier, no. 1322, flowers, February 3, 1906 (U. S. National Herbarium nos. 531520 and 531521). It grows in clusters around houses and if not semicultivated is at least tolerated on account of its uses.

General distribution, Andes of Ecuador, Colombia, and Venezuela.

Local names, *teñidero*; Paez language. *šal*.

Although this interesting species has been thoroughly described by several authors besides the original, I venture here to give a new description based on the specimens mentioned above, except for the characters of the seeds, which I have not seen.

This plant, along with the several species of *Castilla*, belongs to that imperfectly known series of tropical trees which, besides the usual ramification, bear other appendages that come midway between a branchlet and a leaf, and that may be called either pseudo-branchlets or pseudo-leaves. As a matter of fact they are more like compound leaves, and in *Phyllanthus salviaefolius* they even show at their base stipule-like scales; to make the likeness greater it may be added that they are shed once a year, like the true leaves in deciduous trees. But on the other hand, their insertion on the limbs of the tree seems to be more like the insertion of a true branchlet, and in the axils of their leaflets they bear the inflorescences, thus playing the rôle of true branchlets. This peculiarity seems to have been first observed on the *Castilloa* of the Isthmus of Panama, by Robert Cross, who claims to have noticed the same phenomenon on several other tropical trees. It would be interesting to make a list of these and on that account the attention of future collectors is called to that striking feature of tropical vegetation.

As the styles are usually trifid, only occasionally bifid, and very seldom quadrifid, *Phyllanthus salviaefolius* should perhaps not come under Series II, but under Series I, in the systematic arrangement as given by Pax in the *Pflanzenfamilien*.^b Moreover, the dehiscence of the anther cells is not transverse, but clearly longitudinal, as already stated by Bonpland and Kunth.

The Paez Indians, in the mountainous valleys surrounding the Páramo de Moras, in the Central Cordillera of Colombia, use the decoction of the leaves to dye the wool of their sheep, which they use for their clothing. The black color thus obtained is said to be firm and lasting.

Myginda eucymosa Loesener & Pittier, sp. nov.

PLATE XVIII.

A small tree 2 to 5 meters high, with dichotomous, erect ramification. Flowering branchlets slender, flattened at the ends, glabrous.

Leaves petiolate, glabrous, opposite, each pair set at right angles with the adjoining pairs. Petioles about 5 mm. long, canaliculate. Leaf blades 4.5 to 7.5 cm. long, 2 to 4 cm. broad, elliptic-ovate to ovate-oblong, broadly cuneate, acuminate, dark green above, paler beneath; main and secondary veins slightly prominent on lower face; margin obscurely revolute, obsolete serrulate with very minute, caducous, appressed, nigrescent teeth.

Inflorescence distinctly cymose and profusely ramified, solitary, axillary, and not quite as long as the leaves or much shorter. Bracts narrow and acute, opposite,

^aH. B. K., loc. cit.

^bEngl. & Prantl, *Planzenfam.* 3⁵: 18-23. 1890.

minutely hairy when seen with a strong glass, each ending in a callose tooth, very small, deep orange-red at tip. Peduncles and pedicels also minutely hairy; main peduncles 2 to 3.5 cm. long, floral pedicels 1 to 1.5 mm. long.

Flowers numerous, tetramerous, of a yellow-green color. Sepals distinct in two opposite pairs, orbicular, 1 mm. long, hairy outside. Petals obovate, 2 to 2.5 mm. long, 1.6 mm. broad, attenuate into a short claw. Disk cupuliform, thick, divided into 4 segments. Stamens 1 mm. long, alternate with the segments of the disk; filaments slender, erect; anthers subreniform, of a deep orange-red color. Pistil glabrous; ovary semiinferior, globose, 2-celled, the cells 1-ovulate; style 0.4 mm. long, dividing at tip into 2 flat, rounded stigmas.

GUATEMALA: Department of Alta Verapaz, along the Cahabon River between Chimaxte and Cajval, altitude 200 meters, H. Pittier, no. 239, flowers, May 4, 1905 (U. S. National Herbarium no. 472895, type); on the hills around Secanquim, altitude 550 meters, H. Pittier, no. 301, flowers, May 9, 1905 (U. S. National Herbarium no. 472964).

This new species is intermediate between *M. uragoga* Jacq. and *M. gaumeri* Loesener. It is somewhat like the first in habit, but differs obviously from it by being almost entirely glabrous and in having larger leaves and more developed inflorescences. From *M. gaumeri* it is easily distinguished by its elongate, smooth branchlets, obovate petals, and bifid style.

EXPLANATION OF PLATE XVIII.—*a*, Flowering branchlet; *b*, cyme; *c*, bract; *d*, tip of same enlarged to show terminal gland; *e*, petal; *f*, stamens; *g*, ovary and disk. *a*, Scale $\frac{1}{2}$; *b*, *c*, *e*, *f*, scale 9; *d*, larger.

Hippocratea (Cuervea) obovata Pittier, sp. nov.

FIGURE 13.

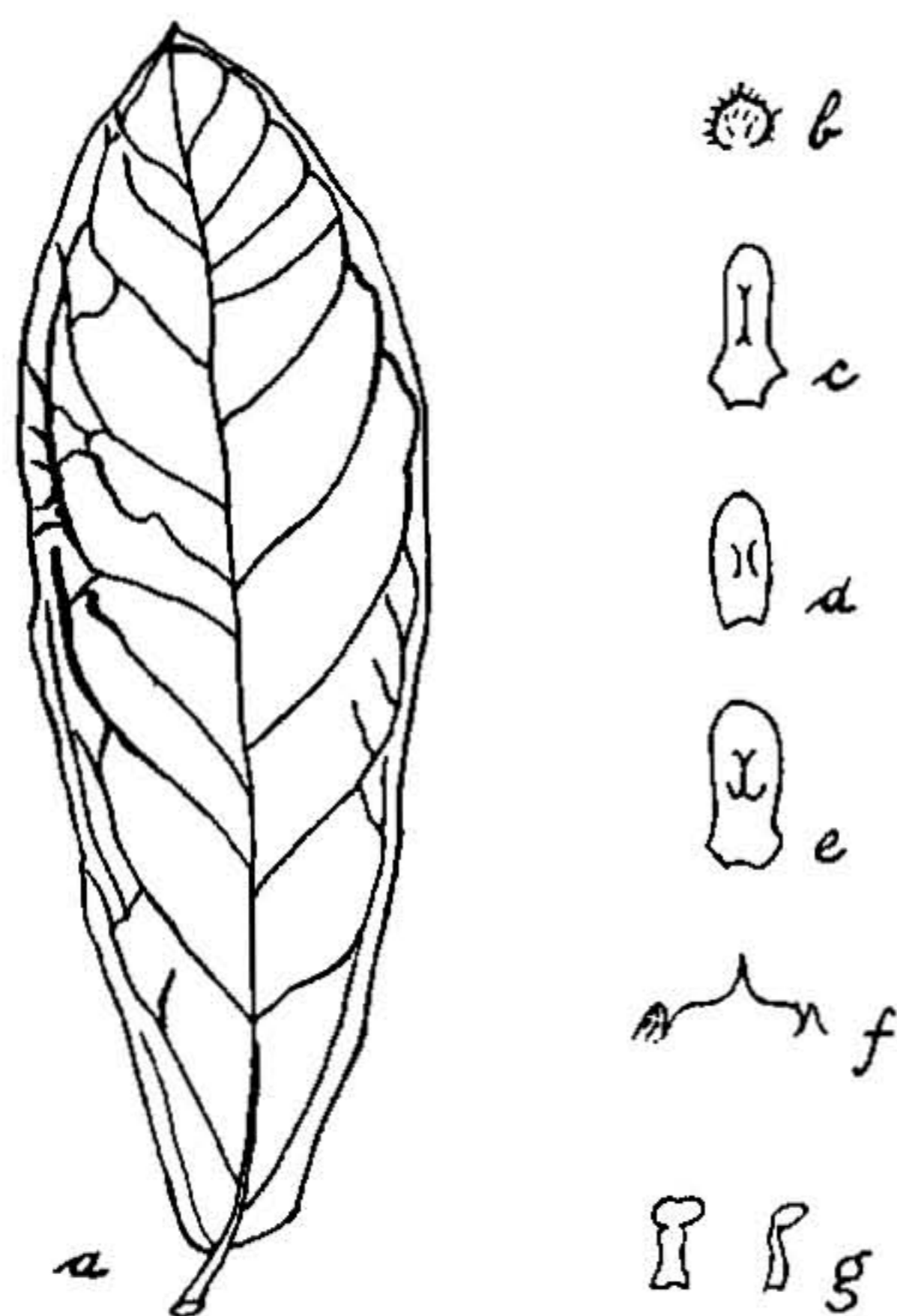


FIG. 13.—Leaf and flower parts of *Hippocratea obovata*. *a*, Leaf; *b*, sepal; *c*, *d*, *e*, forms of petal; *f*, ovary and disk; *g*, front and side view of stamen. *a*, Natural size; *b* to *g*, enlarged.

A small tree with divaricate limbs; floral branchlets opposite, short, thick, almost perpendicular to their axis.

Leaves opposite or in pairs at end of branchlets, petioles 3 to 4 mm. long, sulcate, hispidulous. Leaf blade 5 to 10 cm. long, 2 to 3 cm. broad, glabrous, discolor, i. e., light green above and pale brown beneath, obovate, or obovate-elliptic, narrow and distinctly rounded, broadly pointed; margin obscurely sinuate, secondary nerves subopposite, generally 9 pairs on each leaf, arcuate and connected near margin.

Inflorescence forming terminal dichotomous cymes with 4 to 6 main minutely hispid peduncles 15 mm. long. Pedicels short, hispid, with minute bractlets at base. Sepals 5, ovate-acuminate, 1.5 mm. long, 1.2 mm. broad, finely hispidulous or hirsute, ciliate. Petals 5, ovate-elliptic, 4 mm. long, 2.5 mm. broad, thick, carnosae, pale yellow and smooth, with a gland opening in one or two longitudinal slits on the upper face; disk obscurely 5-lobed, cupuliform, carnosae, about 1 mm. deep. Stamens 3, inserted inside the disk, filaments short, triangular,

nearly 1 mm. broad at base and 1 to 1.2 mm. long; anthers extrorse, as broad or broader than the filaments. Ovary depressed, obscurely trilobulate; ovules not more than 6 in each cell; style very short; stigma indistinct. Fruit not known.

COSTA RICA: Along roads on the peninsula of Nicoya, Tonduz, flowers, April, 1900 (Instituto ffs.-geog. Costa Rica no. 13891; type U. S. National Herbarium no. 472375).

This species differs from *H. setulifera* (Miers) Hemsl., with which it was associated by Mr. Donnell Smith, in having its floral branchlets generally opposite, the leaves much narrower, and the peduncles longer, and in other minor characters.

Carpotroche Endl.

There are here to be described three new Costa Rican species of this genus, the hitherto known species of which are confined to the eastern part of tropical South America. Of the new species one (*C. platyptera*), at least, is rather common in the shady, damp forests of the Atlantic plains and lower hills of Costa Rica, and will doubtless be found also in Panama and in the zone of permanent rains in the northern part of Colombia. No reason can be assigned why these interesting trees have so long escaped the attention of botanists, unless it be the difficulty of collecting them, on account of their large, bunched leaves, all crowded toward the ends of the branchlets.

The genus *Carpotroche* was based by Endlicher^a on *Mayna brasiliensis* Raddi.^b *Mayna* itself is an obscure genus, incompletely defined by Aublet, and Zuccarini^c had already stated that Raddi's plant, which he carefully described, had been wrongly included in it and should form a genus by itself, mainly differing by its winged fruits, but also by a few floral characters.

Endlicher's elaborate description of the new genus founded by him at Zuccarini's suggestion was modified by Bentham & Hooker on account of the introduction of several new species, also detached from *Mayna*. In 1845, Poeppig and Endlicher^d described and figured their *C. (Mayna) longifolia* (Poepp.) Benth., the first known of the truly dioecious species of the genus. In his revision of the genus in 1861, Bentham transferred this last species from *Mayna* into its right place, included the new *C. grandiflora* Spruce, but ignored *C. amazonica* Mart., the description of which was published for the first time in 1871.^e These additions caused important changes to be made in Bentham & Hooker's definition of the genus, and this was further modified, although not in its essential parts, by Warburg.^f The further addition of the three new Costa Rican species makes it necessary to introduce again a few minor changes. The following definition including these amendments will cover every one of the 7 species at present known:

Flowers unisexual, seldom polygamous. Prefloration imbricate. Sepals 2 or 3, persistent. Petals 4 to 12, in two rows. Staminate flowers numerous, lacking even the rudiments of a pistil. Stamens hairy, inserted on a scarcely thickened torus; filaments short; anthers linear, 2-celled, free or connected at base, opening in a longitudinal slit. Pistillate flowers solitary, often larger than the staminate, lacking any rudiments of stamens. Ovary superior, 1-celled, with 4 to 8 carpels and an equal number of parietal placentas, provided outside with twice as many longitudinal wings. Styles 4 to 8, short, persistent, with scarcely capitellate stigmas. Ovules numerous, anatropous. Fruit a large coriaceous or ligneous capsule, indehiscent, ovate or rounded, provided with large, slightly undulated wings and crowned at the end with the persistent styles. Seeds numerous, irregularly obovate, immersed in a fleshy pulp that originates in the aril-like outer layer of the seed envelope, smooth

^aGen. 918. no. 5066. 1839.

^bMem. Soc. Ital. delle Sci. 18: Fisica. 402. 1820.

^cAbh. Münch. Akad. 2: 363. 1837-40.

^dNov. Gen. ac Sp. Pl. 3: 64. pl. 271. 1845.

^eSpruce; Eichler, in Mart. Fl. Bras. 13¹: 437. 1871.

^fGen. Pl. 1: 125. 1862-67.

^gIn Engl. & Prantl, Pflanzenfam. 3^{6a}: 19. 1893.

outside, with a large chalaza, much albumen, and a straight embryo. Cotyledons foliaceous, covering each other.

Erect monoecious shrubs or trees reaching 17 meters high, with alternate, entire or serrate leaves and early deciduous stipules; the flowers odorous, of variable size, the staminate in few-flowered, axillary racemes, the pistillate almost solitary. Hairs always single.

The seven species known to-day can be distinguished by means of the following key, the imperfection of which is unavoidable, owing to the incomplete knowledge of these plants:

KEY TO THE SPECIES.

- Flowers polygamous, rather large; sepals longer than the petals; a large tree, Brazil *C. brasiliensis*.
- Flowers dioecious.
- Staminate flowers very large, petals almost 3 times as large as the sepals. Brazil *C. grandiflora*.
- Staminate flowers small, petals only a little larger than the sepals.
- Sepals 3 or 4. Brazil and Peru *C. longifolia*.
- Sepals 2.
- Capsules with long (2.5 to 3.5 cm.) pedicels. Brazil.... *C. amazonica*.
- Capsules with very short pedicels.
- Tree entirely glabrous; leaves serrate. Costa Rica. . *C. glaucescens*.
- Tree more or less pubescent, furfuraceous or hairy.
- Leaves sinuate-dentate; teeth acute; wings on the capsule 8. Costa Rica..... *C. platyptera*.
- Leaves irregularly sinuate-dentate; teeth sub-spathulate; branchlets thick; wings on the capsule 10. Costa Rica *C. crassiramca*.

Carpotroche glaucescens Pittier, sp. nov.

FIGURE 14.

A small tree 1.50 meters high, with few short branchlets, densely foliate toward the end.

Leaves large, glaucous. Petioles 2 to 3 cm. long, flattened on the upper side. Leaf blades 35 to 40 cm. long, 10 to 13 cm. broad, obovate, long-cuneate and narrowly rounded at base, sharply acuminate or seldom rounded at tip; glabrous, of a glaucous green color above, and paler beneath; margin sinuate-dentate near the base, distinctly serrate toward the apex; stipules thick, 15 to 20 mm. long, acutely lanceolate, furfuraceous, caducous.

Flowers unknown.

Young fruits glaucous, 8 to 10 winged, with furfuraceous pedicels 1 cm. long, 2 persistent sepals about 12 mm. long, and 4 or 5 short styles. Seeds not known.

COSTA RICA: Grape Point, coast of Talamanca. H. Pittier, young fruit, September, 1900 (Instituto fis.-geog. Costa Rica, no. 14089; type U. S. National Herbarium, no. 577934).

Differs from *C. platyptera* by its smaller size, its glaucous appearance, the form of the stipules, the indentation of the leaf, and the apparently variable number of the placentas and styles.

Carpotroche platyptera Pittier, sp. nov.

PLATE XIX. FIGURES 15, 16.

A small tree 3 to 4 meters high, with few branches. Young shoots furfuraceous.

Leaves petiolate, the young ones densely hairy on their whole surface. Petioles 4 to 5 cm. long, furfuraceous, thickening slightly from base to end. Fully developed leaf blades 35 to 49 cm. long, 10 to 14 cm. broad, obovate-elliptic, cuneate, acuminate, smooth above except on the furfuraceous main nerve, hairy underneath, the midrib



CARPOTROCHE PLATYPTERA PITTIER.

and secondary veins also furfuraceous, or velvety; margin broadly sinuate-dentate; main and secondary nerves very prominent beneath, the latter arcuate and anastomosing at the ends and connected through parallel venules. Stipules broadly triangular, furfuraceous.

Staminate inflorescence very much reduced, the flowers appearing as if almost sessile on the trunk or in the axils of leaves. Pedicels and calyx densely furfuraceous.

Staminate flowers rather numerous, small (about 12 mm. in diameter); sepals 2, ovate-conchiform, smooth inside, furfuraceous outside except on the margin covered in prefloration, persistent, 3.4 mm. long. Petals 4 or more, 4.5 mm. long, the exterior ones broadly ovate, the interior narrower, elliptic, both hairy outside and inside in the middle, a narrow marginal strip being entirely glabrous. Stamens numerous (15 to 19), erect, apparently free, about 3 mm. long, filaments very short, free; anthers elliptic-linear, 2.5 mm. long, the cells opening first by a terminal pore, which widens later to a longitudinal slit.

Pistillate flowers large, about 30 mm. in diameter, few and single in the axils of leaves. Sepals as in staminate flower but larger in proportion. Petals 8, elliptic-

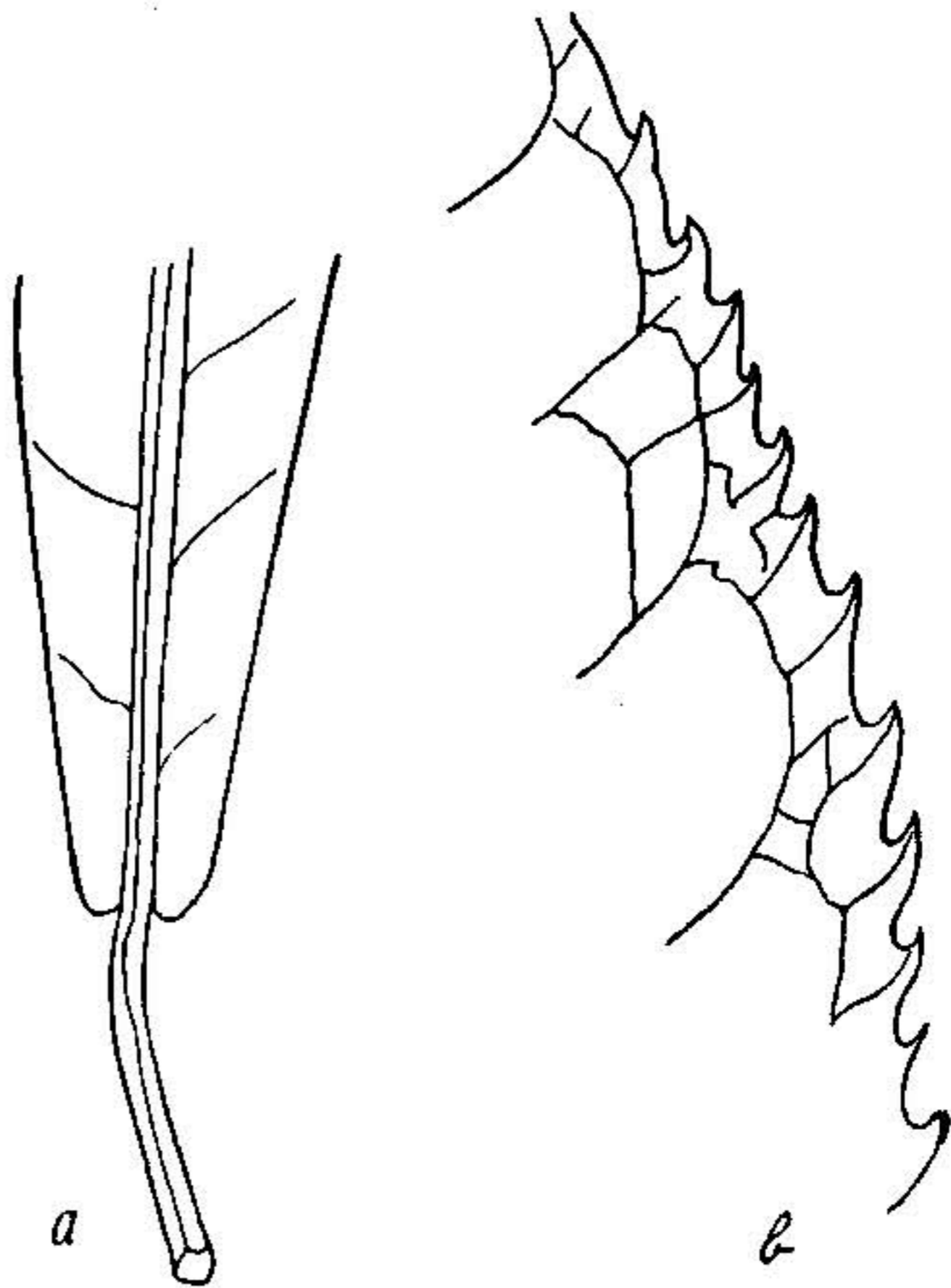


FIG. 14. — Leaf parts of *Carpotroche glaucescens*. a, Base; b, segment of margin. a, b, Natural size.

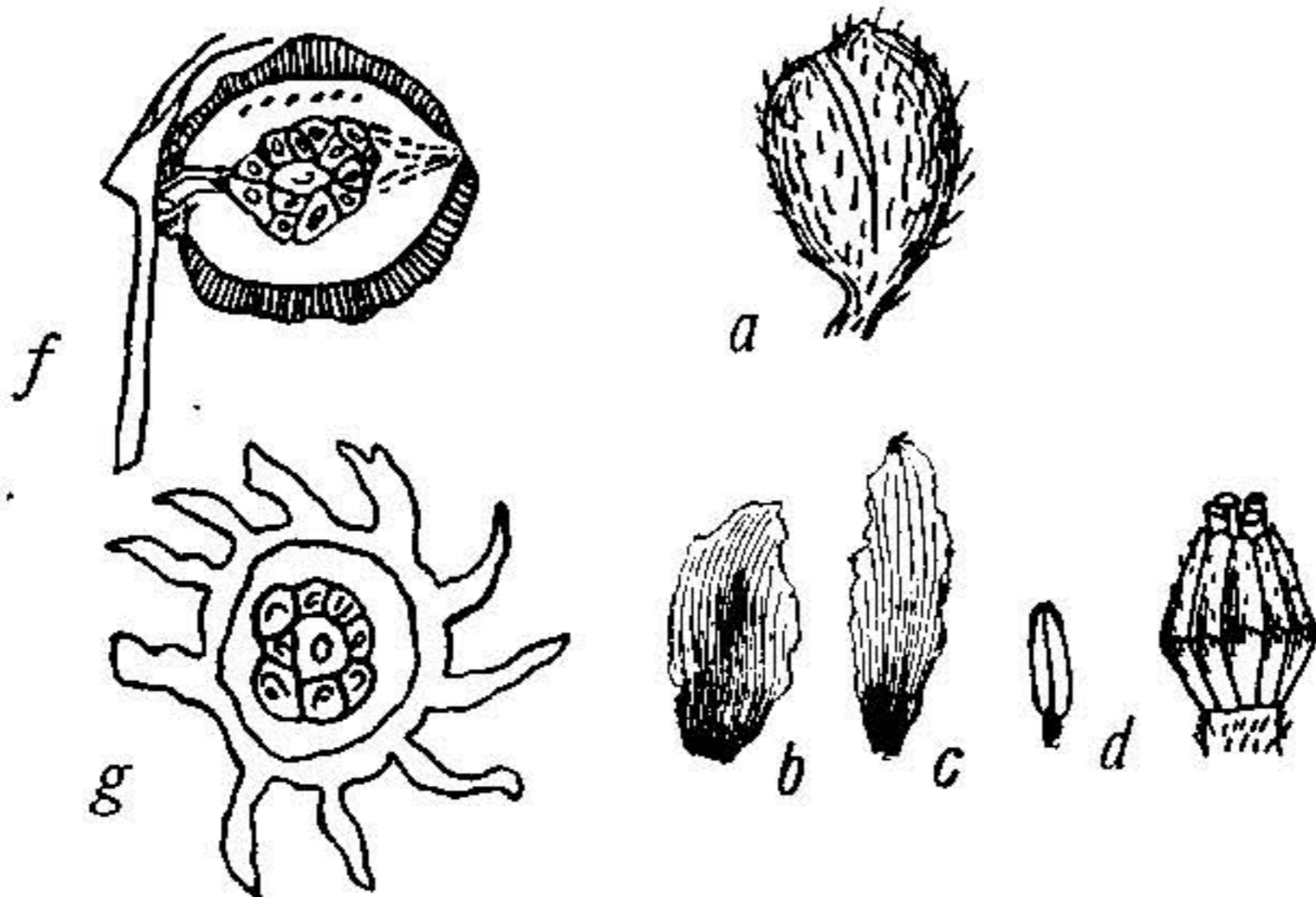


FIG. 15. — Flower and fruit of *Carpotroche platyptera*. a, Flower just before anthesis; b, interior petal; c, exterior petal; d, stamen; e, pistil; f, longitudinal, and g, transverse section of fruit. a, Natural size; b-e, scale about 3; f, g, scale $\frac{1}{2}$.

obovate, more or less obtuse. Ovary ovoid, hairy, provided outside with 8 longitudinal wings. Placentas 4, parietal. Styles 4, free, very short.

Fruit a purple, pediceled, ovoid capsule, 3.5 to 4 cm. long, 3 cm. in diameter, ligneous, subpubescent, provided with 8 broad, undulate-margined wings, about 15 mm. broad in the middle; pedicel about 1 cm. long. Seeds obovate, flattened.

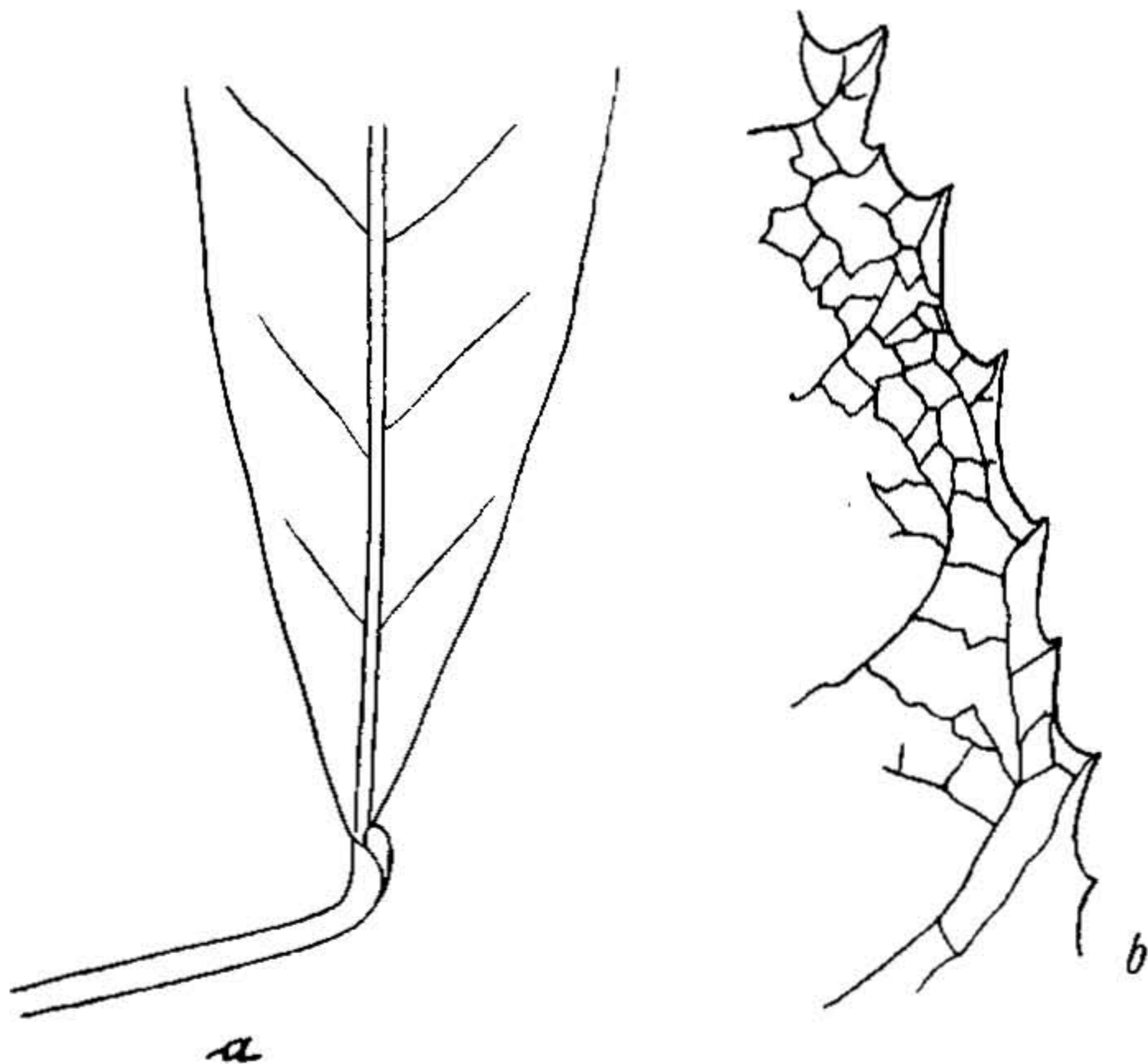


FIG. 16.—Leaf parts of *Carpotroche platyptera*. *a*, Leaf base; *b*, segment of margin. *a*, *b*, Natural size.

COSTA RICA: Rio Hondo, plains of Santa Clara, at an altitude of 50 to 100 meters; H. Pittier, flowers and fruit, February 15, 1903 (Instituto fis.-geog. Costa Rica no. 16634; U. S. National Herbarium no. 578981, type); same locality, in forest, fruit brick-red; Cook & Doyle, no. 485, flowers and fruit, May 6, 1903 (U. S. National Herbarium no. 474340); same locality, little-branched tree, 3 to 4 meters high, the flowers scattered on trunk or in axils of leaves; H. Pittier, flowers and fruit, June, 1903 (Instituto fis.-geog. Costa Rica no. 16702; U. S. National Herbarium no. 578983); same locality, H. Pittier, flowers and fruit, September, 1903 (Instituto fis.-geog. Costa Rica no. 16923; U. S. National Herbarium no. 578982).



FIG. 17.—Flower parts of *Carpotroche crassiramea*. *a*, Exterior petal; *b*, interior petal; *c*, *d*, stamen, front and side view. *a*, *b*, Scale 6; *c*, *d*, scale 3.

EXPLANATION OF PLATE XIX.—Twigs of *Carpotroche platyptera* Pittier, showing small staminate flower, larger pistillate flower, and fruit. Scale $\frac{1}{2}$.

***Carpotroche crassiramea* Pittier, sp. nov.**

FIGURES 17. 18.

A small tree, 1.5 to 2 meters high. Branchlets few, short, thick, pubescent, densely leafy toward their extremities.

Leaves large, coarse, almost entirely glabrous, shortly petiolate; petioles thick, 2 to 3 cm. long, flattened on upper side; leaf blades obovate, 45 to 65 cm. long, 16 to 20 cm. broad, long-attenuate at base, rounded or acuminate; midrib thick and very prominent beneath, slightly pubescent; secondary veins also prominent, arcuate and running into each other at marginal end, anastomosing through parallel, almost perpendicular venules; margin irregularly sinuate-dentate, the teeth broad, more or

less spatulate. Stipules caducous, lanceolate, acute, 18 to 20 mm. long, 4 to 5 mm. broad, pubescent outside.

Staminate inflorescence in sessile cymes in the axils of leaves or else on the branchlets. Pistillate flowers probably isolated in the axils of leaves. Bracts hairy, small, narrow, and acute. Staminate flowers on pedicels about 4 mm. long. Floral bud ovoid, 5 mm. long, 4 mm. broad; sepals 2. Petals pinkish white, the 3 exterior 5 mm. long and 3.5 to 4 mm. broad, the 4 interior 6 mm. long and 2.5 mm. broad. Stamens about 24; filaments not over 0.5 mm. long, flattened, broader at base; anthers linear. Pollen grains 0.09 mm. in diameter, with 3 or more poral points.

Pistillate flower unknown.

Fruit reddish, short-pedunculate, ovate, 3.5 cm. long, 2 cm. in transverse diameter, provided with 10 puberulent wings.

COSTA RICA: In forest around Banana River near Port Limon; Cook & Doyle, no. 424, flowers and fruit, May, 1903 (U. S. National Herbarium no. 474262, type, and no. 474263).

***Aegiphila anomala* Pittier, sp. nov. FIGURE 19.**

A small tree, 4.5 meters high, sparsely branched.

Leaves bunched at the ends of the shoots, shortly petiolate (petioles 1 to 2 cm. long); leaf blades 17 to 26 cm. long, 6 to 8 cm. broad, obovate, obtusely acuminate, long-cuneiform, paler beneath, smooth on both sides, with an entire, slightly revolute margin.

Flowers very odorous, in axillary, rather few-flowered cymes. Calyx 10 to 11 mm. long, rather narrow, campanulate, truncate, 3 to 5-parted, very

much enlarged in the ripe fruit; lobules irregular, 3 mm. deep, slightly emarginate.

Corolla rotaceous, rather small and included in calyx; tube subconical, 7 mm. long; lobes 5, about 6 mm. long, ovate, obtuse, imbricate, white. Stamens 5, equal, inserted very low on tube; scarcely emerging, finely hairy; filaments slender, slightly shorter than anthers; anthers elliptic-elongate, forming a tube around style. Ovary superior, spherical, surmounted by a slender, smooth style, this divided into two long filiform, woolly stigmas, emerging above the anthers.

Fruit a hard nutlet, surrounded almost completely by the enlarged (15 mm. long, 15 mm. thick), verrucose calyx, almost spherical, 9 mm. in diameter, with a large stigmatic impression on tip, imperfectly 4-celled, with only one cell occupied by one seed.

This species belongs to the *Cymosae amarinae*.

COSTA RICA: Forests of Rio Hondo, llanos de Santa Clara, H. Pittier, flowers and fruit, July 5, 1903 (Instituto fis.-geog. Costa Rica, no. 16711; type U. S. National Herbarium no. 578905).

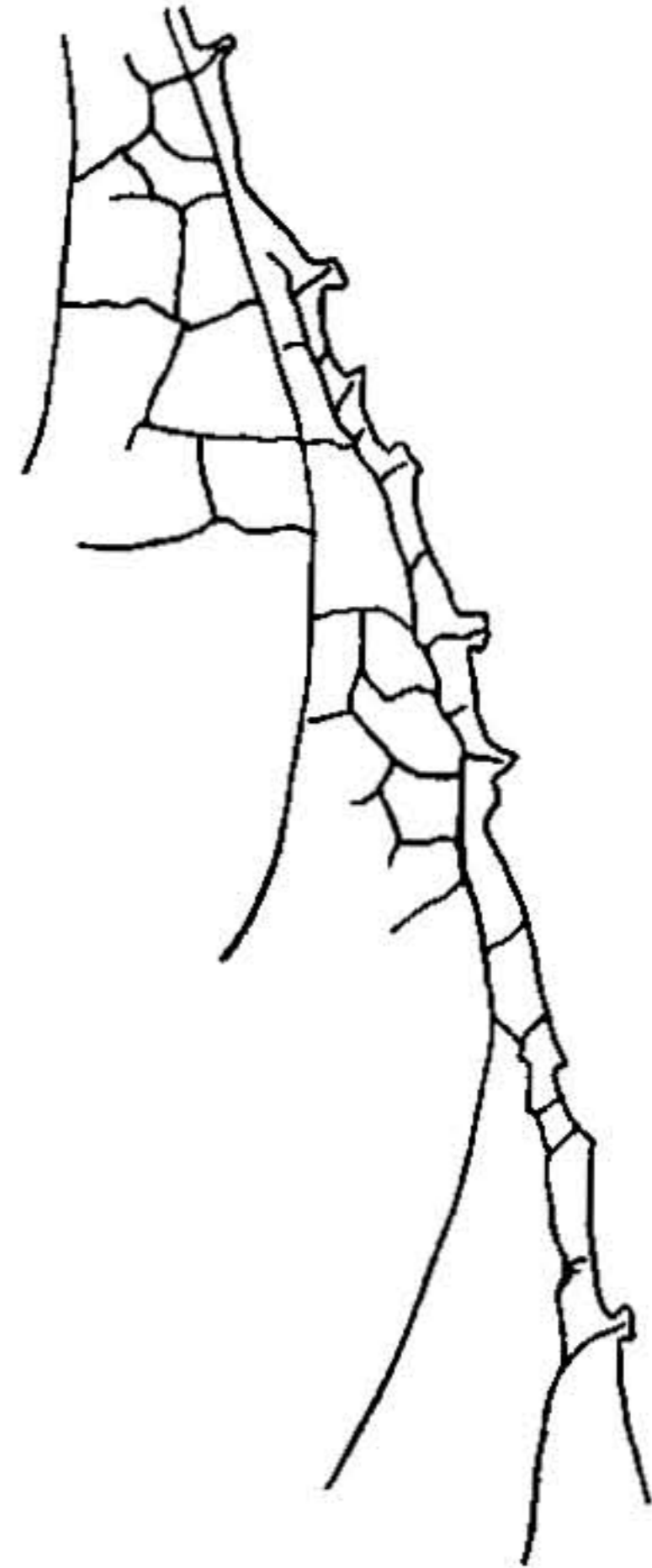


FIG. 18.—Leaf margin of *Carpotroche crassiramea*. Natural size.

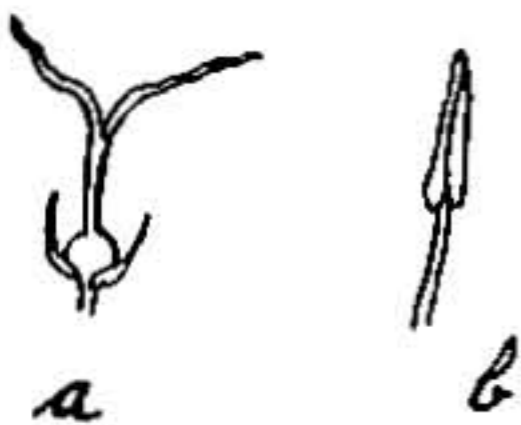


FIG. 19.—(a) Ovary and (b) stamen of *Aegiphila anomala*. a, b, Scale about 3.