

A MONOGRAPH OF THE HAUYEAE AND GONGYLOCARPEAE, TRIBES OF THE ONAGRACEAE.

By JOHN DONNELL SMITH and J. N. ROSE.

INTRODUCTION.

A recent study of the genus *Hauya*, native of the mountains of Mexico and Central America, has led to the discovery of a new species and has shown that an outlying species, *Hauya arborea*, from the desert of Lower California, must be excluded and made the type of a new genus. The differences between *Hauya* and the new genus, here named *Xylonagra*, are so numerous that one feels the need of calling attention less to these than to the points they have in common which are requisite to keep them in the same tribe. Herbarium work on the group has been supplemented by field work on the part of Dr. Rose, who studied *Xylonagra* on Cedros Island and brought back a large number of herbarium specimens.

During his visit to Lower California Dr. Rose collected material of another species of the Onagraceae, which has been referred wrongly to the genus *Gongylocarpus*. This, too, proves to be of a new generic type, here named *Burragea*, which with *Gongylocarpus* forms a new tribe.

SYSTEMATIC TREATMENT.

Tribe HAUYEAE Raim.¹

Calyx tube long-produced above the ovary, cylindrical, deciduous, the segments 4, elongated, reflexed in anthesis; petals 4, inserted at the apex of the calyx tube, sessile; stamens 8, inserted with the petals; filaments subulate or filiform, the anthers linear, versatile; ovary 4-locular, the ovules few or very numerous, affixed to the interior angle of the cells, ascending; capsule oblong, ligneous, loculicidal, the valves 4, septiferous in the middle; seeds few or very numerous, ascending, imbricate, obliquely produced upward into a subcartilaginous wing.

Trees or shrubs; leaves alternate, petiolate, simple, entire; flowers solitary or in leafy racemes.

Hauya was made the type of the tribe Hauyeae by Raimann, it being the only genus. As treated here, the tribe contains *Hauya* and *Xylonagra*.

KEY TO THE GENERA.

- Arborescent; leaves large; flowers large, few, axillary; seeds
biseriate..... 1. HAUYA (p. 288).
A dwarf shrub; leaves small; flowers minute, numerous, in a
terminal, leafy-bracted raceme; seeds uniseriate..... 2. XYLONAGRA (p. 294).

¹ In Engl. & Prantl, Pflanzenfam. 3⁷: 211. 1893.

1. HAUYA DC. Prodr. 3: 36. 1828.

Frutescent or arboreous; flowers large, axillary, solitary, sessile or pedunculate, from white to pinkish; calyx tube cylindrical, elongated, the segments narrow; stamens more or less exerted; filaments filiform; anthers about as long as filaments, awned at apex, reticulate, at length twisted; stigma globose or ellipsoidal; ovules most numerous, in 2 rows to the cell; capsule linear-oblong or ellipsoidal; seeds most numerous, biseriate, the testa coriaceous, the wing longer than the testa, unilaterally auriculate and incrassate; cotyledons oblong, compressed, flat; radicle very short.

The genus *Hauya* was described in 1828 by A. P. De Candolle in the third volume of the *Prodromus*, and a second description, probably prepared before the first, was published the next year. The genus contained a single species, *H. elegans*, based upon a drawing which was published along with the second description. This illustration was one of the few of the Mocino & Sessé drawings which De Candolle was able to reproduce, the others being known only from the tracings which were afterward distributed to a few institutions. Nothing more was learned of the genus until 1877, when M. Barcena, a Mexican, described and figured as *H. elegans* a plant which he had collected in the State of Hidalgo. His illustration is not very good and no specimens of the plant were preserved.

Mr. W. Botting Hemsley in 1878 described two additional species and in 1880 he amplified his descriptions and redescribed *H. elegans*, publishing with the text two plates to illustrate the three species. The first of his new species, *H. barcena*, is based on Andrieux's no. 391 from Oaxaca, Mexico; the second, *H. cornuta*, upon two specimens, one collected by Salvin and one by Savage, in Guatemala. Neither of these species has been re-collected.

In 1883 Dr. Sereno Watson transferred *Oenothera arborea* Kellogg to *Hauya*, and was followed by Mrs. M. K. Curran, Dr. E. L. Greene, and others, but, as will be shown under *Xylonagra*, it is a very different plant from true *Hauya*.

In 1893 Mr. Smith described two new species of *Hauya* from Guatemala and in 1898 he assigned one of these, *H. rodriguezii*, to Costa Rica, publishing a new description, while in 1909 he and Doctor Rose described 5 new species from Central America. This in brief is the taxonomic history of the genus. There are a few more references to it in literature, but they are compiled from the papers mentioned above.

The genus has its center of distribution in Guatemala; in fact, it is largely Guatemalan, for, of the 11 species described below, 7 occur in that country. One species is known from Costa Rica. Three species are known only from Mexico and one of the Guatemalan species has been found just over the border. The Mexican species are widely scattered, one each coming from the States of Hidalgo, Oaxaca, Guerrero, and Chiapas.

This genus was named for Abbé René Just Haüy, celebrated as a mineralogist, being the discoverer of the true laws of crystallization, who was in early life a student of botany. He was born in 1743 and died in Paris in 1822. He was a friend of the elder De Candolle, who published the genus *Hauya* six years after Haüy's death.

KEY TO THE SPECIES OF HAUYA.

Flowers distinctly peduncled.

- | | |
|---|-------------------------|
| Peduncles much longer than the ovary..... | 1. <i>H. heydeana</i> . |
| Peduncles shorter than, or at most equaling, the ovary. | |
| Calyx segments not appendaged..... | 2. <i>H. barcena</i> . |
| Calyx segments appendaged. | |
| Calyx segments shorter than the tube..... | 3. <i>H. lucida</i> . |
| Calyx segments longer than the tube..... | 4. <i>H. rusbyi</i> . |

Flowers sessile.

- Calyx segments not appendaged..... 5. *H. elegans*.
 Calyx segments appendaged.
 Appendages 3 to 4 mm. long.
 Valves of the capsule with a central dorsal ridge.... 6. *H. cornuta*.
 Valves of the capsule without a central dorsal ridge. 7. *H. microcerata*.
 Appendages 10 to 15 mm. long.
 Calyx segments about equaling the tube..... 8. *H. rodriguezii*.
 Calyx segments much shorter than the tube.
 Capsules 3.5 cm. long..... 9. *H. quercetorum*.
 Capsules 6 to 8 cm. long.
 Leaves orbicular to cordate-oval..... 10. *H. ruacophila*.
 Leaves oblong-ovate to oblong-obovate..... 11. *H. lemnophila*.

1. *Hauya heydeana* Donn. Smith, Bot. Gaz. 18: 3. 1893. FIGURE 45.

Shrub or small tree, at most only 6 meters high, glabrous throughout; young branches purplish; leaf blades lanceolate, 6 to 12 cm. long, narrowed at the base, gland-tipped; petioles 2 cm. or less long; peduncles 12 to 35 mm. long; flowers small for the genus, 6 to 7 cm. long; calyx segments narrowly linear, longer than the tube, with short, blunt tips; petals as long as and twice as broad as the calyx segments, purplish; capsule 2.5 cm. long, the valves 4 mm. broad, plane on the back.

TYPE LOCALITY: Along the road from San Cristóbal, Department of Alta Verapaz, to Belejú, Department of Quiché, Guatemala.

SPECIMENS EXAMINED:

GUATEMALA: Belejú, May, 1892, *Heyde & Lux* (*J. D. Smith* 2935). Cobán, von *Türkheim* (*J. D. Smith* 8210) in June, 1902, 604 in 1907.

This species is well marked in both foliage and flowers and especially by the long peduncles.

2. *Hauya barcenae* Hemsl. Diag. Pl. Mex. 1: 13. 1878. FIGURE 46.

Tree 13 meters or more high; young branches puberulent; leaves ovate to rotund, 5 to 6 cm. long, acute, rounded at the base, puberulent, becoming glabrate, subcoriaceous; petiole 25 mm. long; peduncle short but distinct; flowers 6 to 7 cm. long; calyx tube about 3.5 cm. long, the segments about as long as the tube, not appendaged; capsules 5 cm. long, the valves plane on the back; seeds small, 5 mm. long.

TYPE LOCALITY: "Huauapan" (Huajuapán), Oaxaca, Mexico.

SPECIMENS EXAMINED:

MEXICO: Huajuapán, Oaxaca, *Andrieux* 391.

ILLUSTRATIONS: Hemsl. Biol. Centr. Amer. Bot. 5: pl. 29. f. 2; Engl. & Prantl, Pflanzenfam. 3⁷: f. 87.

3. *Hauya lucida* Donn. Smith & Rose, Bot. Gaz. 52: 48. 1911. FIGURE 47.

Hauya donnellsmithii Loes. Repert. Nov. Sp. Fedde 12: 236. 1913.

Tree 10 to 13 meters high, with a globose or spreading top; very young leaves pubescent on the nerves beneath; mature leaves glabrous and shining, obovate to elliptical, cuspidate, narrowed at the base, 8 to 13 cm. long, 4.5 to 6 cm. broad, with 8 or 9 lateral nerves; petioles 1.5 to 2.5 cm. long; peduncle very short, not over 7 mm. long; flower 8 to 10 cm. long; calyx tube 4 to 6 cm. long, the segments 3 to 4 cm. long, with appendages 3 to 4 mm. long; petals 3 cm. long; filaments 17 to 19 mm. long, or after flowering becoming 20 to 23 mm.; ovary 9 to 12 mm. long; stigma exerted beyond the petals; capsule 3 to 4.5 cm. long, the valves plane on the back; seeds oblong, 11 to 12 mm. long, obtuse; embryo oblong-obovate.

TYPE LOCALITY: Río Torres, San Francisco de Guadalupe, near San José, Costa Rica.

SPECIMENS EXAMINED:

COSTA RICA: Near San José, June, 1893, *Tonduz* 8005 (type); same locality, April, 1894, *J. D. Smith* 4801; June 24, 1896, *Tonduz* 10118; October, 1898, *Tonduz* 7445, 12719.

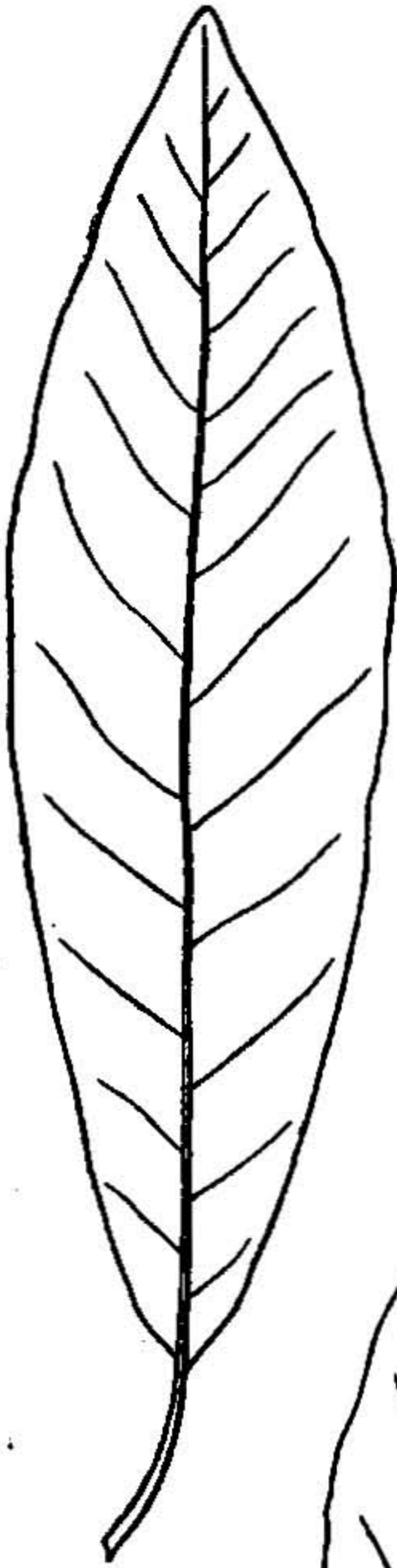


FIG. 45.—*Hauya heydeana*. J. D. Smith's 2935. Natural size.

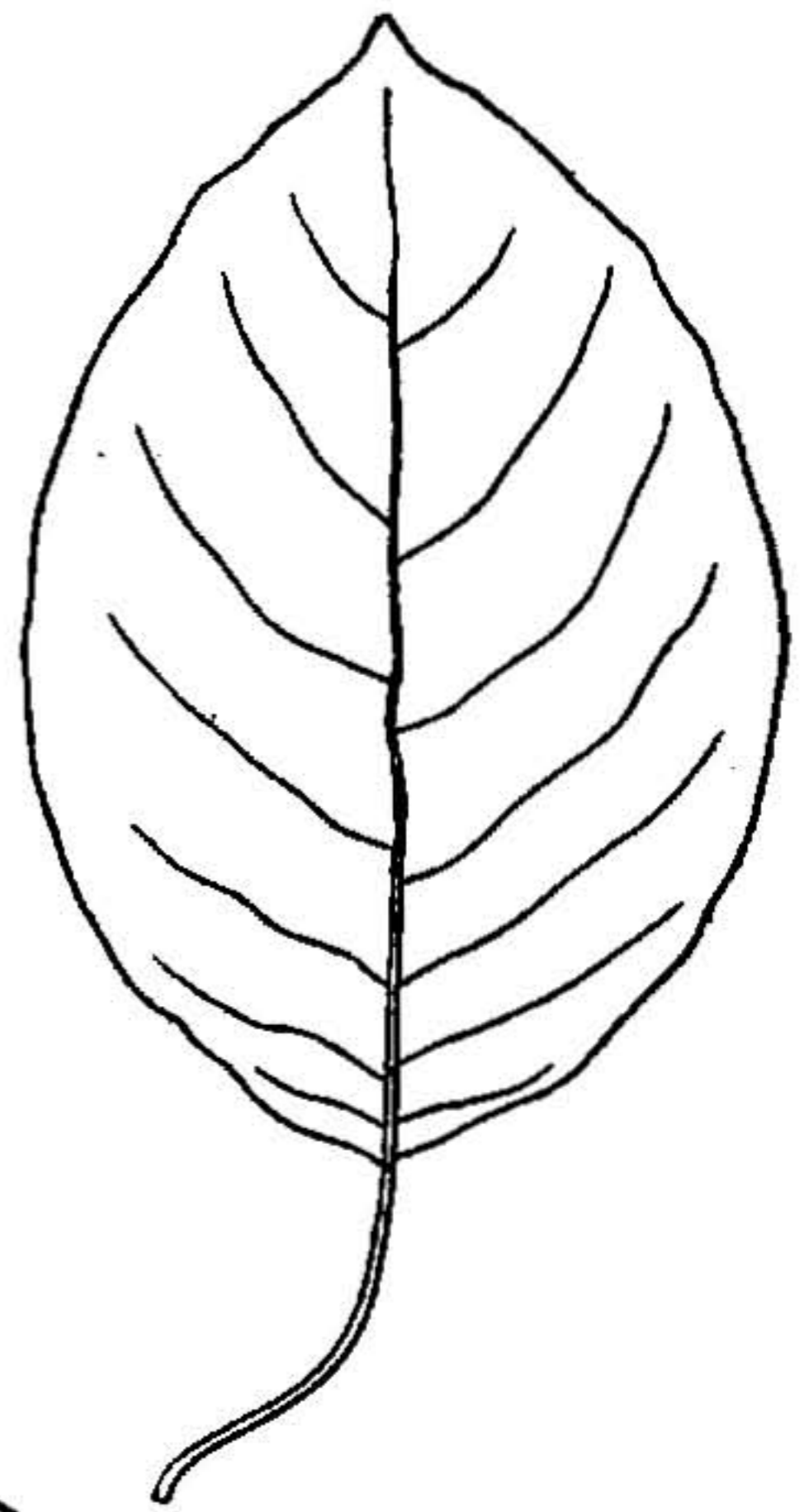


FIG. 46.—*Hauya barceanae*. Andrieux's 391. Natural size.

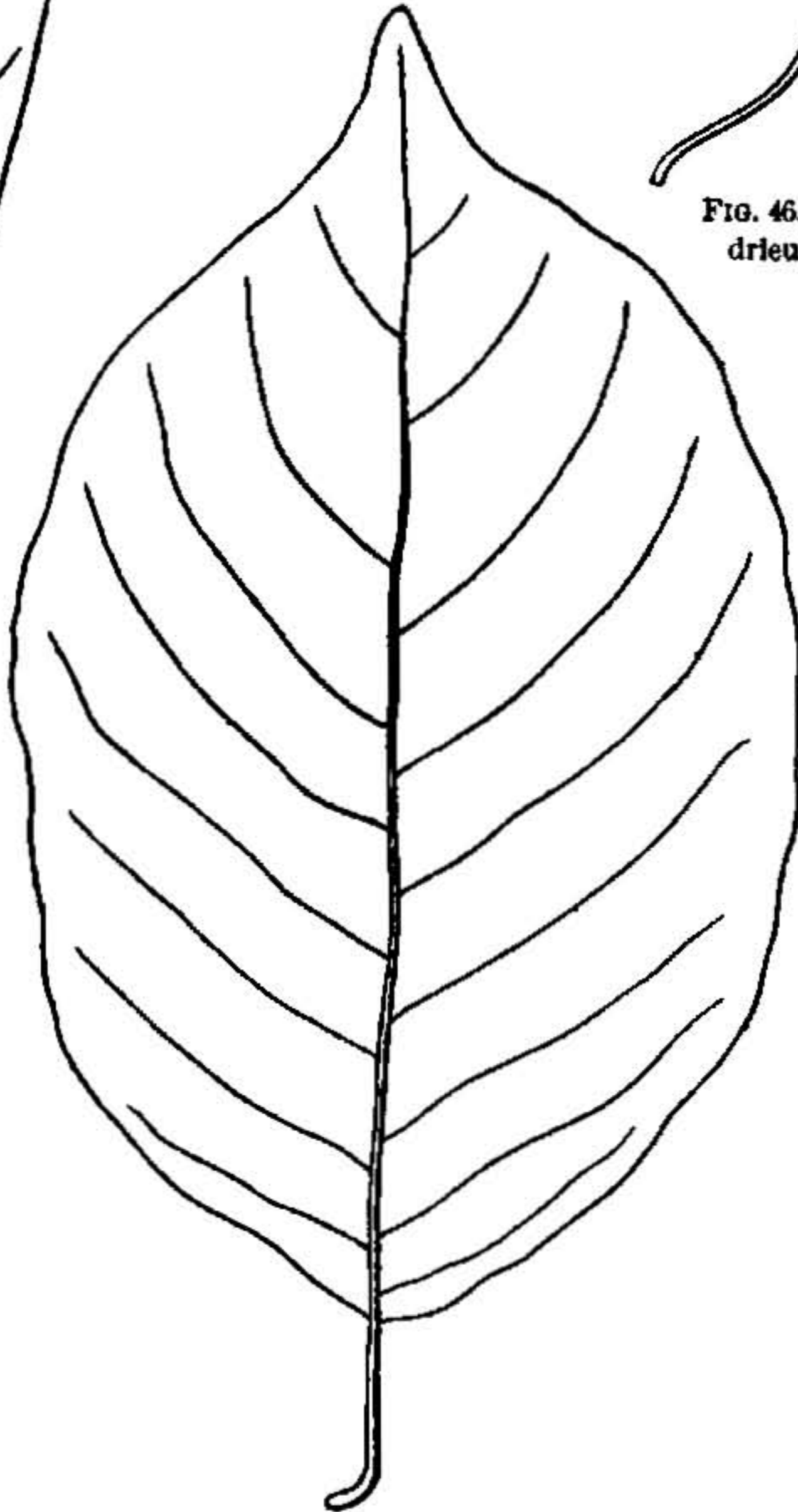


FIG. 47.—*Hauya lucida*. Tonduz's 12719. Natural size.

4. *Hauya rusbyi* Donn. Smith & Rose, sp. nov.

FIGURE 48.

Small tree; young branches greenish, pubescent with soft, spreading hairs; leaves broadly oblong-ovate, 8 to 12 cm. long, sometimes abruptly acuminate, rounded at the base, somewhat pubescent above, paler beneath and with dense soft pubescence; petiole 12 to 20 mm. long; peduncle 8 mm. long; flowers 7 to 8 cm. long; calyx tube 3 cm. long, the segments narrow, 4 to 5 cm. long, appendaged at the tip, very pubescent without, within greenish above, reflexed after flowering and purplish below; petals not seen; style purple; capsule 3.5 to 4 cm. long, plane on the back; seeds 8 mm. long.

Type in the United States National Herbarium, no. 574646, collected on Limón Mountain, Guerrero, Mexico, altitude 1,350 meters, July 28, 1910, by H. H. Rusby (no. 157). Also collected in the mountains near Iguala, Mexico, October 24, 1909, by C. G. Pringle (no. 9258).

Hauya rusbyi is probably nearest *H. barcenae*, differing from it in the shape of the leaves, in its somewhat shorter petioles, in having the calyx tube shorter than the segments and the segments appendaged, and in its somewhat shorter capsule.

5. *Hauya elegans* DC. Prodr. 3: 36. 1828.

Shrub or tree; young branches velvety-pubescent; leaves lanceolate to ovate, 27 to 62 cm. long, rounded at the base, acuminate, tomentose above, velvety-pubescent beneath; flowers sessile, 12.5 cm. long; calyx tube longer than the calyx segments, these not appendaged; petals nearly orbicular, rose-colored; capsule 3.7 cm. long, the valves plane on the back.

TYPE LOCALITY: Mexico.

The taxonomic history of this, the type species of the genus, has already been given with that of the genus. There is only to add that in 1880 Mr. Hemsley referred here Coulter's no. 172 from Zimapán, Mexico.

6. *Hauya cornuta* Hemsl. Diag. Pl. Mex. 1: 13. 1878.

FIGURE 49.

Shrub or small tree; young branches pubescent; leaves rather small for the genus, oblong-lanceolate to elliptical, 5 to 7.5 cm. long, short-acuminate, puberulent above, canescent-tomentose beneath; calyx tube 3 cm. long, puberulent, the segments about half the length of the tube; capsule 22 mm. long, the valves with a short ridge on the back.

TYPE LOCALITY: Volcán de Fuego, Guatemala.

Only the type specimen has been seen, which was collected in Guatemala, August 6, 1873, by Osbert Salvin.

The material was lent us by the director of the Kew Gardens.

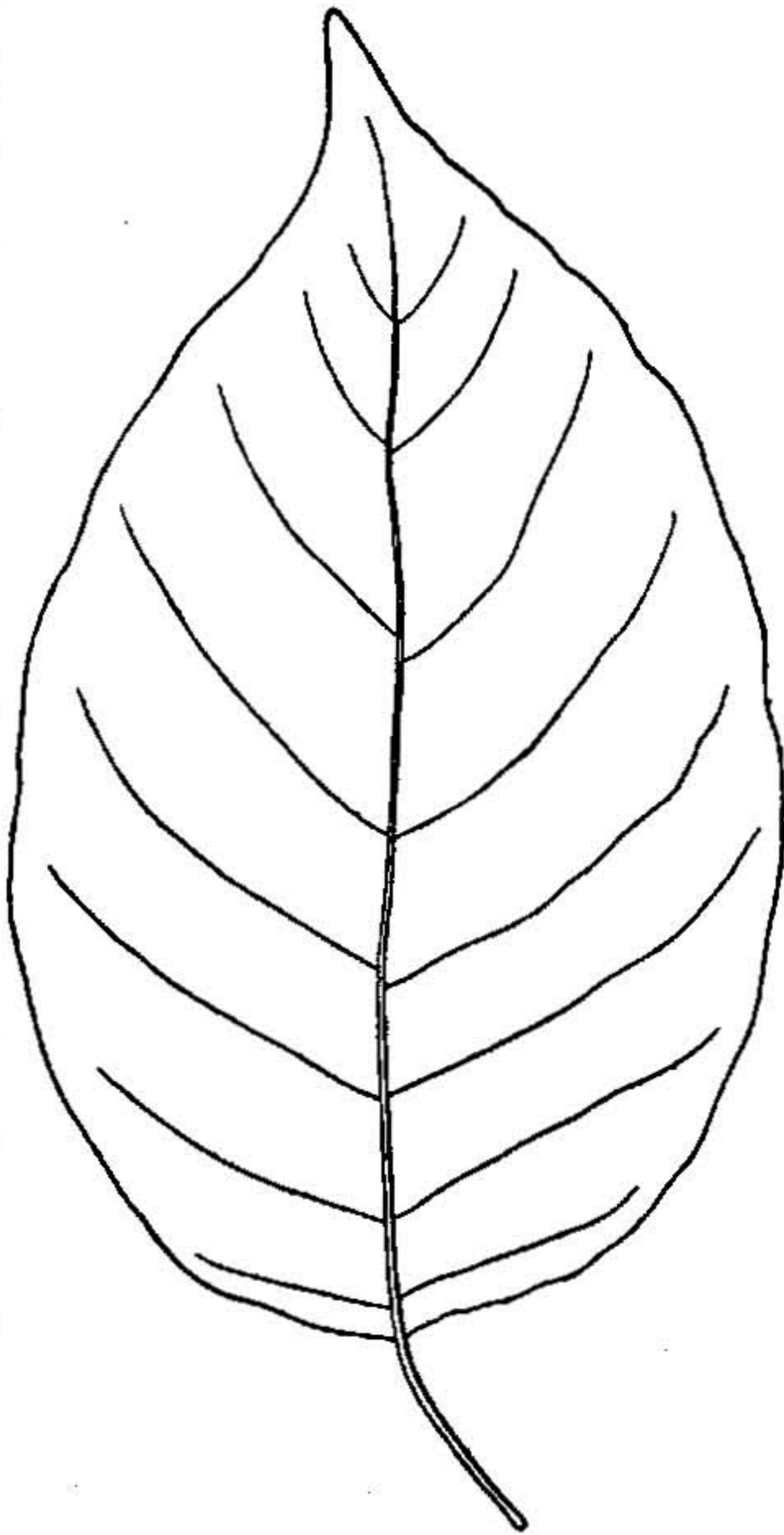


FIG. 48.—*Hauya rusbyi*. Rusby's 157. Natural size.

7. *Hauya microcerata* Donn. Smith & Rose, Bot. Gaz. 52: 46. 1911. FIGURE 50.

Probably a small tree; young branches and buds with appressed, canescent pubescence; leaves long-petiolate, obovate to oblong-obovate, 7 to 11 cm. long, 4 to 6 cm. broad, shortly cuspidate, glabrate above, tomentose beneath; flowers sessile; calyx tube 8.5 to 10 cm. long, the segments 3.5 to 4 cm. long, with appendages 3 to 4 mm. long; petals oval, 33 mm. long; ovary velvety-pubescent, 11 mm. long; capsule 5 cm. long, the valves plane on the back; seeds unknown.

TYPE LOCALITY: Santa Rosa, Department of Baja Verapaz, Guatemala.

SPECIMENS EXAMINED:

GUATEMALA: Santa Rosa, alt. 1,500 meters, September, 1888, *von Türckheim* (*J. D. Smith* 1423). Cuesta de Quililhá, near Purulhá, alt. 1,400 meters, April, 1905, *Pittier* 155.

MEXICO: Canjob, Chiapas, May 2, 1904, *Goldman* 923.

The specimen from Mexico is referred here with some doubt.

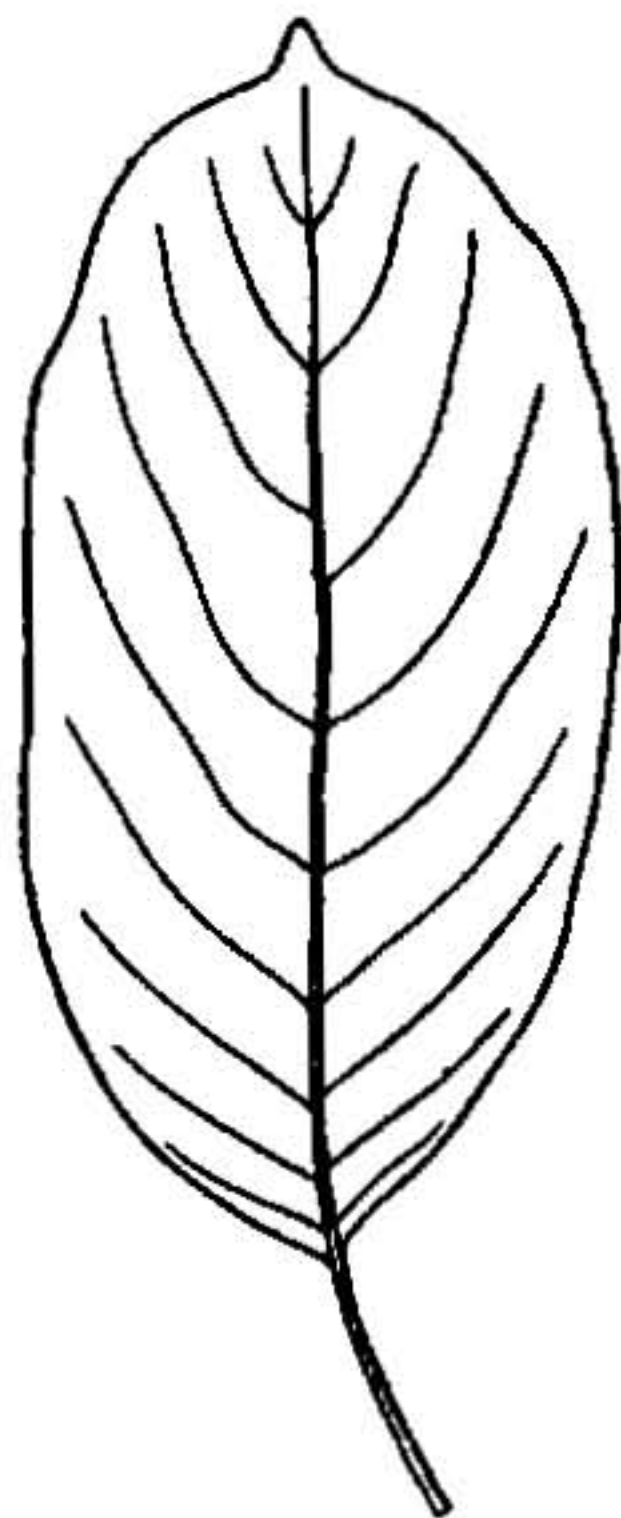


FIG. 49.—*Hauya cornuta*.
Type. Natural size.

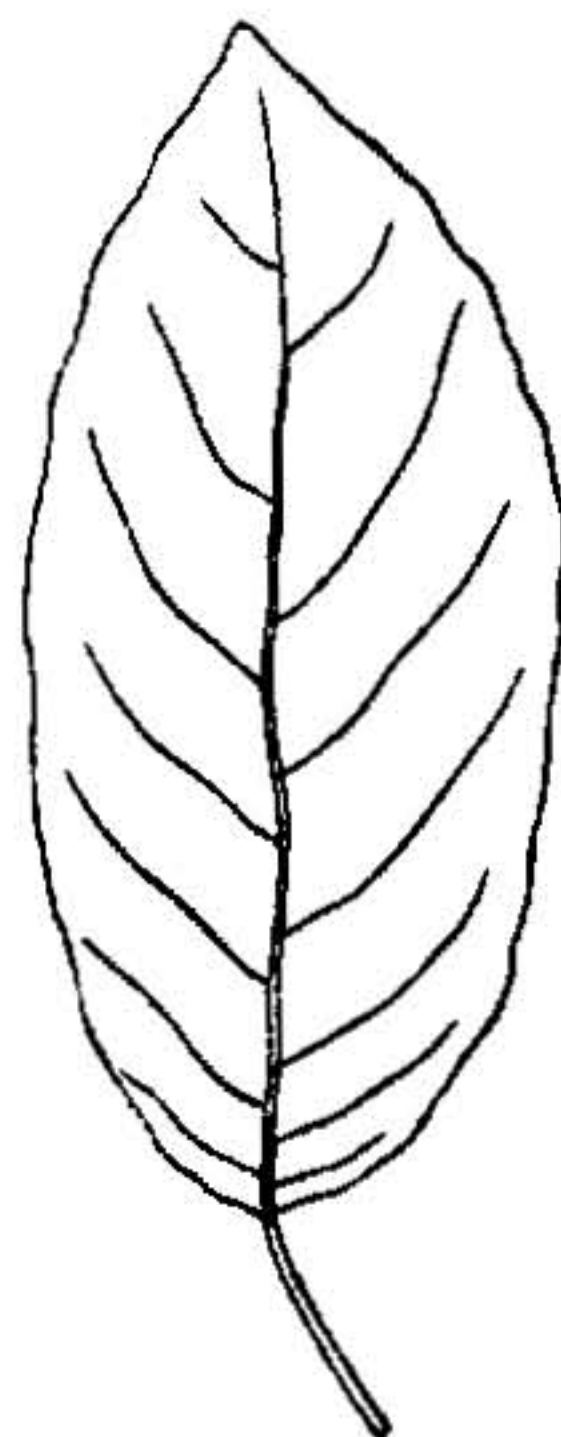


FIG. 50.—*Hauya microcerata*. *Pittier's* 155.
Natural size.

8. *Hauya rodriguezii* Donn. Smith, Bot. Gaz. 18: 3. 1893. FIGURE 51.

Tree, 10 meters high, with a stout trunk; young branches slightly pubescent; leaves pubescent when young, soon glabrate except the angles, rhombic-oval to elliptical, 11 to 12 cm. long, abruptly acuminate, narrowed or rounded at base, with 8 or 9 pairs of nerves; petioles 1 to 3 cm. long; flowers sessile, 13 to 15 cm. long; calyx tube 6.25 to 7.5 cm. long, the segments of about the same length as the tube, with slender appendages; petals oval, two-thirds the length of the calyx segments; ovary canescent; capsule 5 to 5.25 cm. long.

TYPE LOCALITY: Acatepeque, Guatemala.

SPECIMENS EXAMINED:

GUATEMALA: The type specimen, collected at Acatepeque, March, 1892, by *J. D. Smith* (no. 2529).

9. *Hauya quercetorum* Donn. Smith & Rose, Bot. Gaz. 52: 47. 1911. FIGURE 52.

Probably a small tree; old branches glabrescent, the growing parts somewhat hirsute; leaves large, orbicular to lanceolate, obtuse to acuminate, glabrous or nearly so above,

glaucous and glabrous beneath except for the hairs along the midrib and lateral veins; petioles 2 to 3 cm. long; flowers sessile; calyx tube 7 to 9 cm. long, pubescent, the segments 3.5 to 5 cm. long, with appendages 5 to 6 mm. long; ovary very pubescent, 10 to 11 mm. long; capsule woody, 3.5 cm. long, the valves plane on the back; seeds lanceolate, 15 mm. long, 5 mm. broad, acute.

TYPE LOCALITY: Volcano of Juamaytepeque, Department of Santa Rosa, Guatemala.

Known only from the type locality; collected by Heyde and Lux in March, 1883. On the same volcano and at the same altitude Heyde and Lux collected additional material of a *Hauya* which may or may not belong here, the leaves being of somewhat

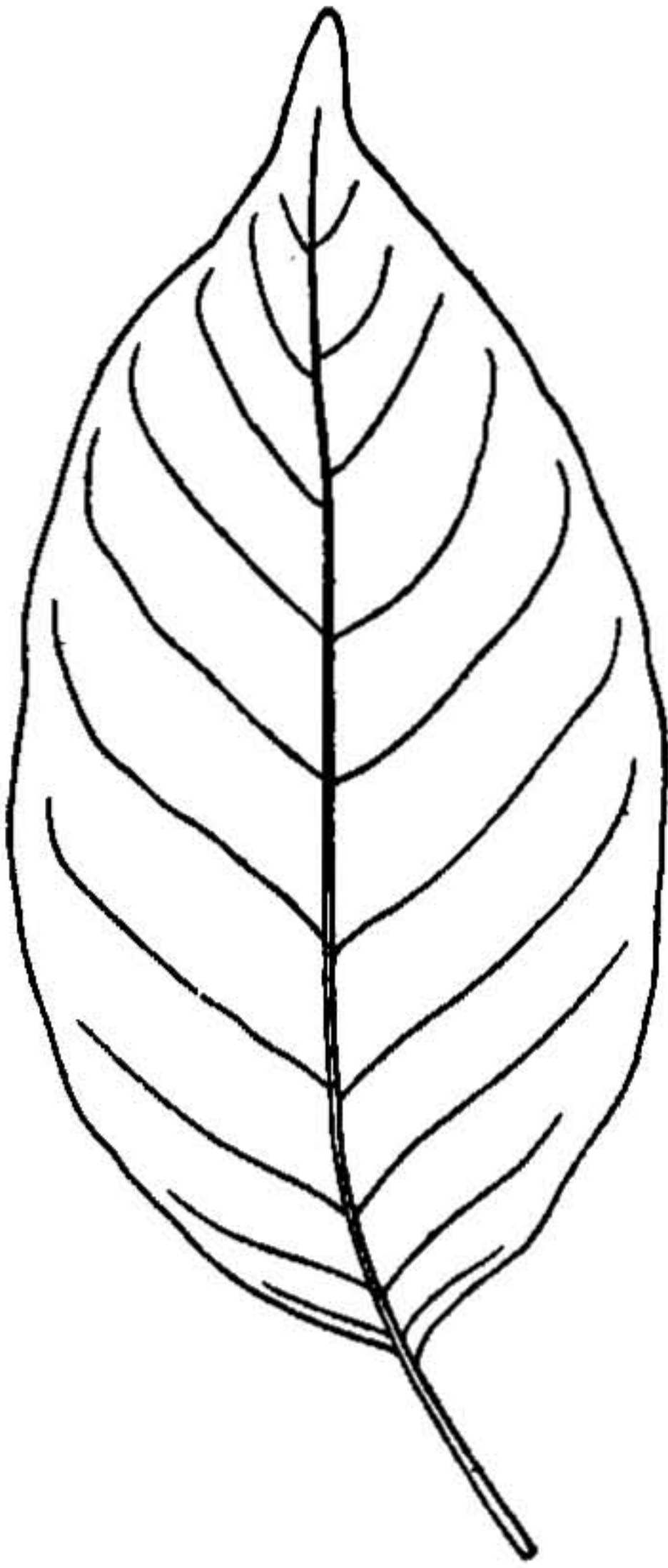


FIG. 51.—*Hauya rodriguezii*. Type. Natural size.

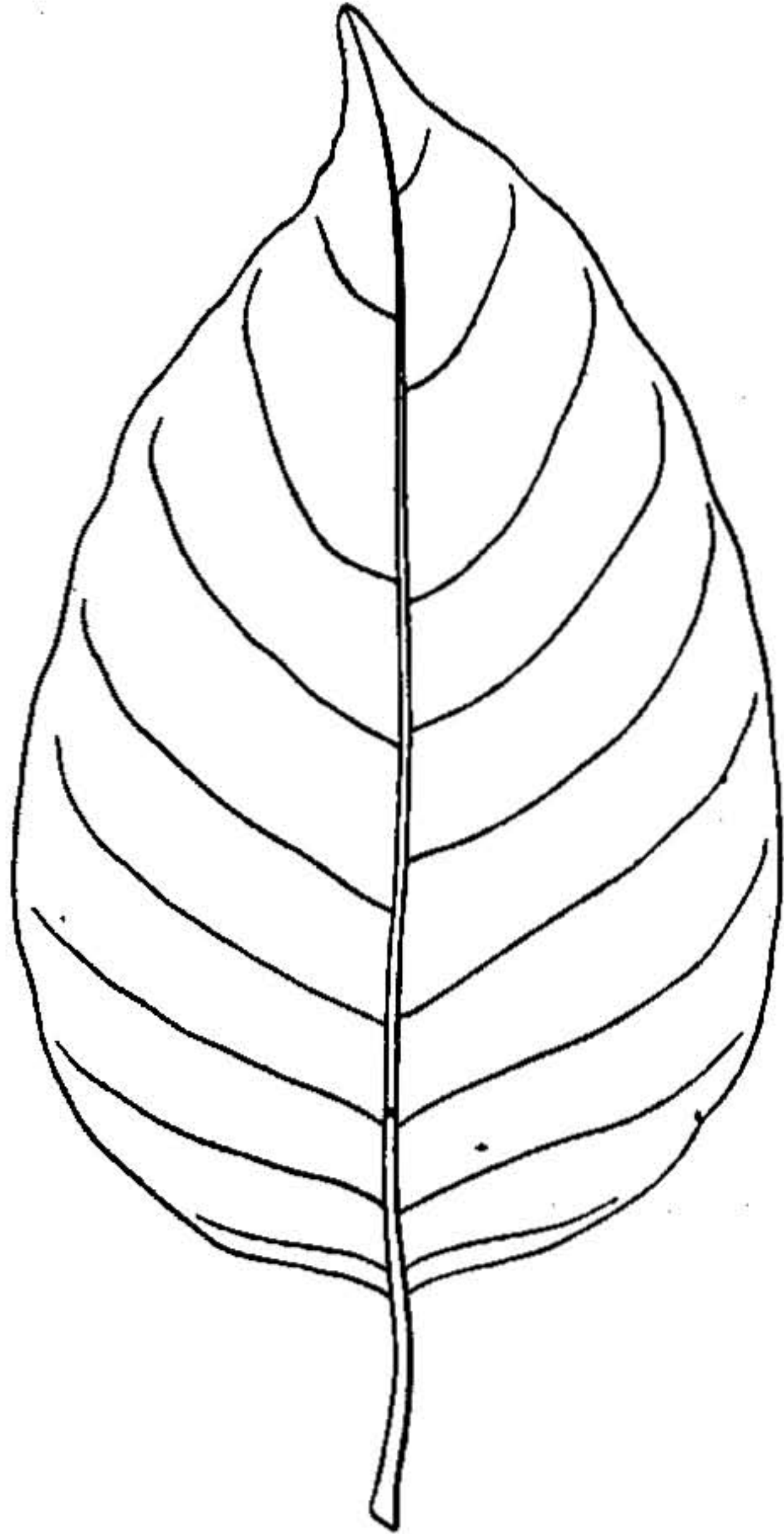


FIG. 52.—*Hauya quercolorum*. Type. Natural size.

different shape, the ovary more hirsute, and the flower somewhat different in several respects.

10. *Hauya ruacophila* Donn. Smith & Rose, Bot. Gaz. 52: 47. 1911. FIGURE 53.

Hauya longicornuta var. *a ovalifolia* Loes. Repert. Nov. Sp. Fedde 12: 237. 1913.

Small tree; young branches velvety-pubescent; leaves orbicular to ovate, 5 to 7 cm. long, 3 to 6 cm. broad, somewhat pointed, cordate or rounded at the base, glabrous above, densely cinereous beneath; flowers sessile; calyx tube 9.5 to 10 cm. long, pubescent, the segments 5 to 5.5 cm. long, with appendages 10 to 12 mm. long; petals elliptical, 4.5 cm. long, 2.5 cm. broad; ovary velvety; capsule woody, 6 cm. long, the valves plane on the back; seeds oblong, 13 mm. long.

TYPE LOCALITY: Volcán Acatenango, Guatemala.

SPECIMENS EXAMINED:

GUATEMALA: Volcán Acatenango, Department Zacatepéquez, alt. 1,700 meters, March, 1892, *J. D. Smith* 2528 (type). Alotenango, Department Zacatepéquez, alt. 1,300 meters, March, 1892, *J. D. Smith* 2527.

11. *Hauya lemnophila* Donn. *Smith & Rose, Bot. Gaz.* 52: 48. 1911. FIGURE 54.

Hauya longicornuta var. *b. oblongifolia* Loes. *Repert. Nov. Sp. Fedde* 12: 237. 1913.

Probably a small tree; young branches cinereous-hirsute; leaves oblong-ovate to oblong-obovate, 9 to 15 cm. long, 4.5 to 7.5 cm. broad, rounded at the base, somewhat pointed, glabrate above, hirsute beneath; flowers sessile, calyx tube 7.5 to 9 cm. long, the segments 4.5 to 5 cm. long, with appendages 12 mm. long; petals white, 33 to 35 mm. long; ovary hirsute, 13 to 14 mm. long; capsule linear-oblong, 7.5 to 8 cm. long, the valves plane on the back.

TYPE LOCALITY: Laguna de Carrazal, Department of Santa Rosa, Guatemala, altitude 1,500 meters.

Known from the type material, collected in May, 1892, by Heyde and Lux (*J. D. Smith* 2936), and also from Heyde's no. 516, which may be a part of the type collection.

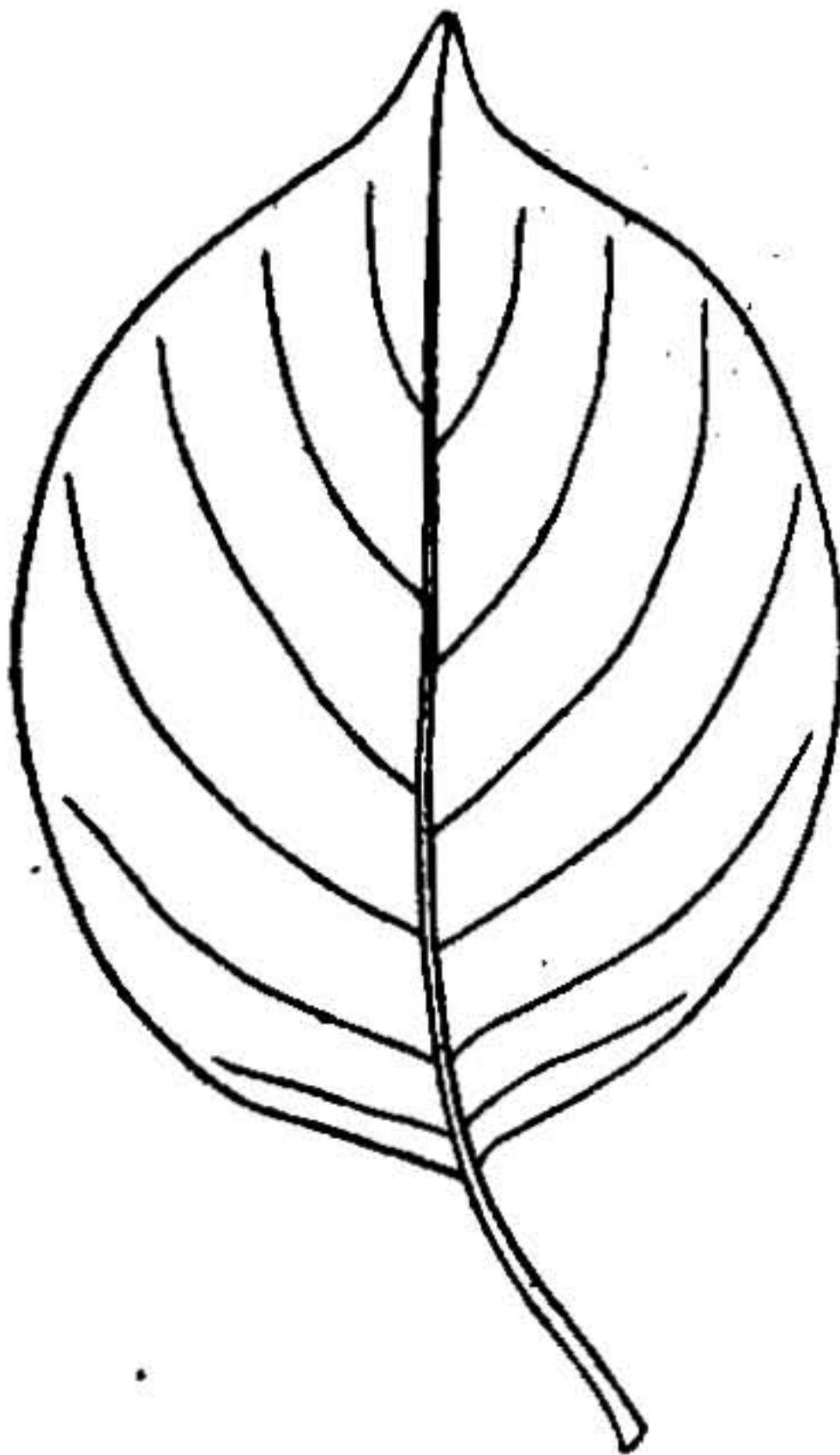


FIG. 53.—*Hauya ruacophila*. Type.
Natural size.

2. **XYLONAGRA** Donn. *Smith & Rose,*
gen. nov.

A low, bushy shrub with numerous short, ascending branches; leaves alternate, small, solitary or in fascicles, with glandular tips; inflorescence of elongated terminal racemes; flowers pediceled; calyx scarlet, the proper tube short, abruptly enlarging into a long, funnel-shaped throat, the segments 4, short, ovate to triangular, about one-third the length of the tube; petals 4, scarlet, shorter than the calyx segments; stamens 8, exserted a little beyond the petals, the filaments short, the anthers mucronate; style exserted beyond the stamens; stigma capitate; capsule small, 4-celled, loculicidal; seeds few to

the cell, in one row, with a small subterminal, acuminate wing; embryo oblanceolate, the cotyledons elliptical, thrice longer than radicle.

This genus differs from *Hauya* in its bushy habit and small leaves, in the character of the inflorescence, in its much smaller flowers, differently shaped calyx tube, highly colored petals, short filaments, merely mucronate and not reticulate anthers, much smaller capsules of different texture with cells containing one row of few seeds instead of two rows of very numerous ones, and in the very small seeds with a different kind of wing. It has, moreover, a very different range and habitat.

1. *Xylonagra arborea* (Kellogg) Donn. *Smith & Rose.*

Oenothera arborea Kellogg, *Proc. Calif. Acad.* 2: 32. pl. 1859.

Hauya californica S. Wats. *Proc. Amer. Acad.* 20: 366. 1885.

Hauya arborea Curran, *Proc. Calif. Acad.* II. 1: 253. 1888.

Low shrub, 60 to 120 cm. high (originally described as 6 to 8 feet), with slender woody branches, these when young red and covered with short, appressed, cinereous pubescence; leaves petioled, small, the blade lanceolate, 8 to 15 mm. long, entire, obtuse, tipped by a large orange yellow, sometimes red, gland, scantily pubescent on

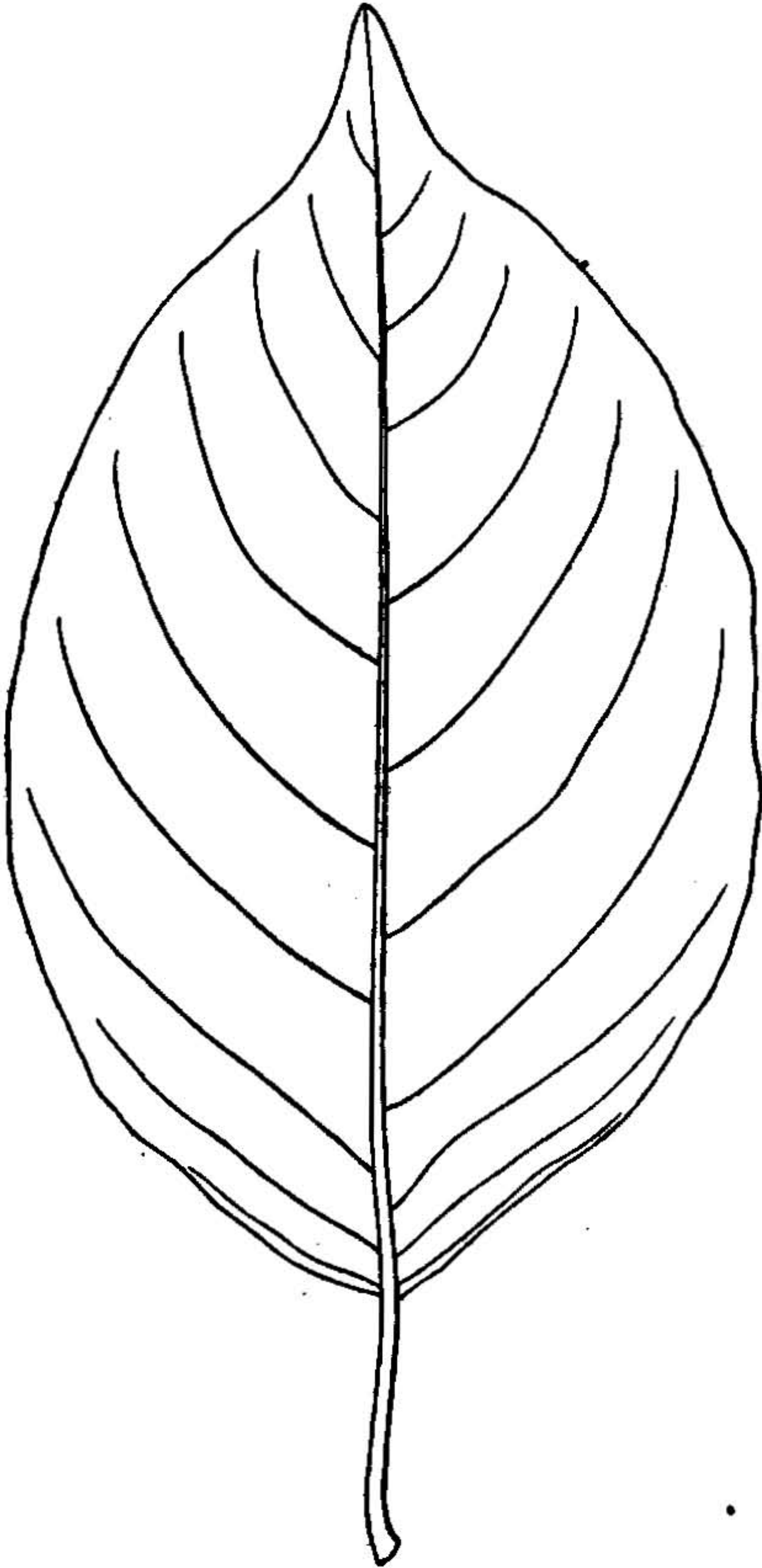


FIG. 54.—*Hauya lemnophila*. Heyde's 516. Natural size.

both surfaces; inflorescence a terminal, leafy raceme, sometimes consisting of only 1 to 3 flowers, sometimes much elongated (in one case measuring 50 cm. long) and bearing 100 or more flowers; pedicels 5 mm. long, becoming stout; flowers scarlet, 2 to 2.5 cm. long; petals erect, 5 mm. long; stamens only slightly longer than the petals; style slender, scarlet, pubescent, exserted; capsule 10 to 12 mm. long; seeds 5 to 8 in each cell, in one row, each slightly winged on one side and at the summit, the terminal portion as long and broad as the body itself.

The above description differs somewhat from Doctor Kellogg's rather extravagant one. He characterizes it as a tree primrose with a stem 5 to 8 cm. in diameter, the floral branches bearing glandular hairs, the leaves sessile, and the flowers in dense spikes.

The specific name *arborea* is unfortunate, as there is not the least suggestion of a tree in either the size or the habit of the plant.

TYPE LOCALITY: Cedros Island, Lower California.

The range and habitat are Cedros Island and the west coast of Lower California on the open desert hills and low mountains, along with Agaves and junipers.

SPECIMENS EXAMINED:

LOWER CALIFORNIA: Cedros Island, 1896, *Anthony* 46; March, 1911, *Rose* 16133.

San Andrés, September 21, 1905, *Nelson & Goldman* 7157. San Bartolome

Bay, April 29, 1889, *Pond*. Rosalia Bay, 1896, *Anthony* 46a.

This species was collected in considerable abundance on Cedros Island by Dr. Rose during his recent trip with the *Albatross*. He found it only after an all-day climb. Unfortunately, only a single flower was seen, but fruiting specimens with leaves were taken, and these will doubtless be a welcome addition to many herbaria.

The plant is low, usually 60 to 90 cm. high, a bush with many slender upright branches, often forming thickets along the dry ravines and stony hillsides. The leaves, as seen, were always small, and no evidence was met that they are ever large, so that doubtless the record of their being sometimes 2 inches long is due to a slip of some kind. Each leaf is tipped with a large gland, which suggests those found on the tips of leaflets in ant-inhabited Acacias. Whether these glandular bodies serve any special use in the economy of this plant we do not know. The inflorescence is somewhat curious, and it is not easy to decide whether the flowers should be said to be axillary or, taken together, to form a leafy raceme. The flowering branch seems to die after the fruit matures, although it may persist for years. In one case, however, a branch bearing perhaps a hundred capsules had stopped flowering and been continued as a leafy shoot. This was probably abnormal and doubtless due to its desert surroundings. This plant, like so many desert plants, must have a severe struggle all the time. The warm sunshine urges it into leaf and flower, while the dry soil withholds what little water it has. One day it puts forth its leaves; the next it must drop them or die. A day later a shower stimulates it to a new effort. Thus are produced these abnormal forms—stunted branches an inch long, which are 20 years old, and elongated branches measured in feet which have grown in a season.

Tribe GONGYLOCARPEAE Donn. Smith & Rose.

Calyx tube produced above the ovary, filiform, nearly closed at the apex by an annular disk; calyx segments 4, much shorter than the tube; petals 4, inserted at the base of the disk; stamens 8, inserted with the petals, inappendiculate, four longer than the others, all fertile, the anthers ovoid; ovary immersed; stigma capitate exindusiate; fruit immersed, subdrupaceous, rhomboidal, bilocular, 2-seeded; putamen ligneous.

Leaves alternate; flowers axillary, solitary.

The tribe Gongylocarpeae, here described as new, seems to be abundantly distinct from the Gaureae by its immersed ovary and 2-celled fruit.

KEY TO THE GENERA.

- Herbaceous; leaves not crowded, petiolate, denticulate; disk glandular; ovary concrete with the stem and petiole, 2 or 3-celled, 2 or 3-ovuled; fruits remote. 1. GONGYLOCARPUS (p. 297).
 Fruticose; leaves crowded, subsessile, entire; ovary immersed in the stem, 2-celled, 2-ovuled; fruits approximate in the thickened stems..... 2. BURRAGEA (p. 297).

1. GONGYLOCARPUS Schlecht. & Cham. *Linnaea* 5: 557. 1830.

An annual herb, glabrous, the stem becoming reddish; leaves petiolate, ovate-lanceolate, denticulate-ciliate; flowers remote; calyx tube adnate to both branch and petiole, the segments spreading, linear, cucullate; petals inserted on the glandular disk of the calyx, obovate-cuneate, shorter than the calyx segments, entire; ovary 2 or 3-celled, the style filiform and short, the ovules solitary in each cell; fruit concrete with branch and petiole.

Only a single species of *Gongylocarpus* (*G. rubricaulis*) has been described, which is extremely rare in collections. The type came from near Jalapa, Vera Cruz, Mexico, and the species has been reported also from the States of Jalisco and Chihuahua, widely separated localities. There is a possibility that more than one species is represented by this material. Owing to the weedy appearance of the plant and to its inconspicuous flowers and seemingly abnormal fruits, it is likely to be neglected by collectors.

1. *Gongylocarpus rubricaulis* Schlecht. & Cham. *Linnaea* 5: 558. 1830.

Stem 45 cm. long, erect; branches remote, shorter than the stem; leaves acuminate or acute, narrowed into the petiole, remotely and sharply denticulate, shortly or obsoletely ciliate, the cauline 6 cm. long and 2.5 cm. broad, petiole 1.25 cm. long; calyx tube above ovary 4 to 10 mm. long; segments 4 mm. long; petals deciduous; stamens and style equaling or exceeding the calyx segments.

TYPE LOCALITY: Jalapa, Mexico.

SPECIMENS EXAMINED:

MEXICO: Near Jalapa, Vera Cruz, *Schiede & Deppe*. Naolinco, Vera Cruz, August, 1912, *C. A. Purpus* 6155. Mountains near Chapala, Jalisco, November 18, 1892, *C. G. Pringle* 5344. Southwestern Chihuahua, August to November, 1885, *Dr. E. Palmer* 34.

2. BURRAGEA Donn. Smith & Rose, gen. nov.

A perennial shrub; leaves alternate, closely set, subsessile, thickish, entire; sepals 4, in the bud free at the tip, highly colored, oblong, becoming reflexed, all similar; calyx tube very slender, much longer than the segments, partly closed at the apex by an annular disk; filaments 8, 4 longer; style slender; stigma capitate, at length bipartite; ovary imbedded in the branch, 2-celled; fruit somewhat diamond-shaped, 2-celled, 2-seeded, imbedded in the flowering shoot and tardily breaking away.

Type species, *Gaura fruticulosa* Benth.

This remarkable genus is dedicated to Commander Guy H. Berrage, United States Navy, who was in charge of the U. S. steamer *Albatross* during the spring of 1911, when Dr. Rose made his expedition to Lower California. We thus render a slight token of our appreciation of the facilities so richly supplied during this expedition.

The genus *Burragea* is to be associated with *Gongylocarpus*, but in its bushy, perennial habit, large, showy flowers, and elongated flowering branches it must be regarded as quite distinct. As in that genus the ovary is sunk in the flowering branch; but in *Gongylocarpus* the fruits are single and suggest little nuts, while in *Burragea* they represent a persistent collective fruit.

Mr. Bentham, who was the first to study the species, took the specimens for a deformed *Gaura*, and commented on them as follows: ¹

"In all specimens there is the same semiarticulation and thickening of the flowering part of the branches so as to enclose the ovaria, which Chamisso and Schlechtendal observed in an allied Mexican species, and which appeared to them to justify the constituting a distinct genus under the name of *Gongylocarpus*. It is, however, much more probably the effect of some disease or parasite. I could not indeed, any more than the above quoted authors, discover any traces of fungus or insect, but the distortion of the ovaries, as well as of the more enlarged capsules and seeds which may be found still remaining in their hardened state in the old woody branches, show that this is not the healthy natural form of the plant. The flowers appear in all other respects perfect, and are evidently showy."

KEY TO SPECIES.

Glandular-pubescent; leaves linear..... 1. *B. fruticulosa*.
Glabrous; leaves oblanceolate..... 2. *B. frutescens*.

1. *Burragea fruticulosa* (Benth.) Donn. Smith & Rose.

Gaura fruticulosa Benth. Bot. Voy. Sulph. 15. 1844.

Gongylocarpus fruticulosus T. S. Brandeg. Proc. Calif. Acad. II. 2: 158. 1889.

A low, bushy plant, 30 to 60 cm. high; young branches purple, covered with short, spreading, glandular (?) hairs; leaf branches often short and stunted, showing numerous closely set leaf scars; leaves numerous, often closely set, on vigorous branches more remote, linear, 2 mm. broad, entire, acute, slightly narrowed at base, not perceptibly veined, glandular-pubescent; calyx tube slender, 15 mm. long, the segments oblong, pointed, 7 mm. long, becoming reflexed; petals obovate, about 7 mm. long.

TYPE LOCALITY: Magdalena Bay, Lower California.

Collected on Santa Margarita Island, Lower California, March 19, 1911, by J. N. Rose (no. 16284).

Bentham evidently had both species of *Burragea* in his *Gaura fruticulosa*, for he says that some of the specimens are glabrous and others are pubescent. The pubescent form has been selected to serve as a type for Bentham's species. Both species grow about Magdalena Bay, but, so far as observed, not together.

2. *Burragea frutescens* (Curran) Donn. Smith & Rose.

Gongylocarpus frutescens Curran, Proc. Calif. Acad. II. 1: 231. 1888.

A low, widely spreading shrub, rarely over 30 to 60 cm. high, glabrous throughout, with numerous short branches, the young ones dark purple; leaves alternate, narrowly oblanceolate, often 7 mm. broad, 3 cm. long, thickish, the midvein indistinct; calyx tube 2 to 2.5 cm. long, petals 12 mm. long; fruiting branches thick, 1 to 10 cm. long, turgid, purple, at first leafy but becoming naked.

TYPE LOCALITY: Magdalena Bay, Lower California.

Collected also on the shore of Santa Maria Bay, Magdalena Island, Lower California, March 18, 1911, by J. N. Rose (no. 16263).

NOTE.

While reading the final proof of this paper, our attention was called to two species, one with two varieties, just described by T. Loesener in Fedde, *Repertorium Specierum Novarum Regni Vegetabilis*, volume 12. These are based on the same collections which we have studied and, being clearly synonyms, are so referred. Two names, *H. hemsleyana* and *H. pedicellata*, also are mentioned, but doubtless have not been published.

¹ Bot. Voy. Sulph. 15. 1844.