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A REVISION OF THE GENUS *PRIVA*¹

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HISTORY OF THE GENUS

The tropical genus *Priva* was established by Adanson² in the 'Familles des Plantes' in 1763. The genus was segregated from *Verbena* on account of the characters of the fruit and was based on a single species, namely, *Verbena lappulacea*, published by Linnaeus³ in the 'Species Plantarum' in 1753.

Jussieu⁴ in 'Observations sur la Famille des Plantes Verbenacees,' published in 1806, accepted Adanson's genus *Priva* and transferred thereto several species, including *P. dentata*, *P. echinata*, *P. hispida*, *P. laevis*, and *P. leptostachya*. In the following year Persoon⁵ gave a brief synopsis of the genus, recognizing the five species listed by Jussieu, but made no further additions to the group.

Humboldt, Bonpland and Kunth,⁶ in 1817, added a new species, *P. aspera*, from material collected in Mexico. During the following three decades five additional species were described by different authors. They were *P. crenata*⁷ Schrad., *P. Forskalii*⁸

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² Adanson, Fam. Pl. 2: 505. 1763.

³ Linnaeus, Sp. Pl. ed. 1. 28. 1753.

⁴ Jussieu, Ann. Mus. Paris 7: 70. 1806.

⁵ Persoon, Syn. Pl. 2: 139. 1807.

⁶ HBK, Nov. Gen. & Sp. 2: 278. 1817.

⁷ Schrader, Linnaea 8, Litteratur Bericht: 24. 1833.

⁸ Jaubert & Spach, Ill. 5: 59, pl. 455. 1842.

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Jaub. & Spach, *P. orchiooides*¹ Walp., *P. tracheliooides*² Mart. & Gal., and *P. lamiifolia*³ Mart. & Gal. Thus in Walpers⁴ 'Repertorium Botanices Systematicae,' published in 1844-1847, more or less complete descriptions were given for ten recognized species.

The first comprehensive monographic treatment of the genus *Priva* was by Schauer⁵ in De Candolle's 'Prodromus' in 1847. In this treatment several previously published species were reduced to synonymy and one new species, *P. bahiensis* DC. from Brazil was described. Since 1847, although several species, namely, *P. tuberosa*⁶ and *P. armata*⁷ Watson, *P. portoricensis*,⁸ and *P. domingensis*⁹ Urban have been published, yet no comprehensive study of the group as a whole has been made.

During recent years the numerous botanical expeditions, particularly to the West Indies, Central and South America, have resulted in the accumulation of a comparatively large representation of many of the smaller genera. In organizing the material of the small genus *Priva* in the herbarium of the Missouri Botanical Garden, although a relatively large number of specimens was available for study, yet considerable difficulty was met in the identification of species as well as in the determination of the proper specific names to be used. Hence the present investigation was undertaken to determine the limitation and geographical distribution of species and to establish the correct names to be used.

GENERAL MORPHOLOGY

Roots.—The root system in the genus *Priva* presents comparatively little variation. Most of the species develop a rather persistent, more or less branched tap-root. *P. rhinanthifolia* with

¹ Walpers, Rep. 4: 36. 1844-1848.

² Mart. & Gal. Bull. Acad. Brux. 11²: 324. 1844.

³ *Ibid.* Bull. Acad. Brux. 11²: 324. 1844.

⁴ Walpers, Rep. 4: 34. 1844-1848; and 6: 687. 1846-1847.

⁵ Schauer in DC. Prodr. 11: 533. 1847.

⁶ Watson, Proc. Am. Acad. 18: 135. 1882-1883.

⁷ *Ibid.* Proc. Am. Acad. 25: 160. 1890.

⁸ Urban, Symb. Ant. 4: 534. 1903.

⁹ *Ibid.* Symb. Ant. 7: 354. 1912.

distinctly tuberous roots is a notable exception, and constitutes therefore an outstanding element in the genus.

Stems.—The stem is typically that of an herbaceous perennial with a woody base. There is considerable variation in size, however, from the low, more or less decumbent stem of *P. rhinanthifolia* to the stout, erect stem of *P. aspera* which grows to a height of 18 decimeters. The stem may be simple or branched. In the case of *P. armata*, the branching is from the base and is usually arcuous-ascending. In all cases the stem is square and often somewhat furrowed or slightly striated.

Leaves.—The variation of the leaf characters within the genus is very great. There is a gradation in length from 1.5 centimeters, as found in *P. portoricensis*, to that of 10 centimeters, as shown by *P. aspera*. The general outline of the leaf, in the majority of species, is more or less of the ovate, subcordate type. *P. rhinanthifolia* presents the only exception. In this species the outline of the leaf is distinctly oblong. All the species have leaves which are quite regularly dentate and pubescent; in some cases, however, the pubescence is strigose. Both petiolate and sessile leaves occur, with the former type the more common.

Inflorescence.—The inflorescence is a spicate raceme throughout the whole genus, varying greatly, however, in length. In the majority of cases the flowers are pedicellate and solitary. The length and the curvature of the pedicel are important points in the delimitation of the species within the genus.

Calyx.—In antithesis variation in the calyx is not very marked. The persistent calyx, however, presents characters most helpful for specific determination. The calyx may be inconspicuously lobed and thus terminate rather abruptly, or it may be distinctly lobed and the lobes contorted, coarctate, and decidedly beaked. The pubescence, usually present and of straight or uncinat-hispid hairs, plays an important role in classification.

Corolla.—The corolla, in most cases, is deciduous and slightly bilabiate. The tube shows diversity in that it may barely exceed the calyx in length, or it may be two or three times as long. Some instances show the tube and throat to be pubescent but in most cases pubescence is absent.

Stamens.—The stamens are didynamous, inserted at unequal

levels in the corolla-tube and included or nearly so. The latero-anterior pair is more highly developed and inserted a little above the middle of the tube. The two smaller latero-posterior stamens are inserted approximately at the middle of the tube. The posterior stamen is rudimentary or entirely lacking. The anthers are two-celled and the cells are parallel or slightly divergent.

Pistil.—The pistil is typically bicarpellate throughout the whole genus with an ovary which, in the majority of cases, is two-celled. *P. mexicana* and *P. aspera* possess a one-celled ovary, due to the abortion of the posterior cell. The style is included and usually glabrous. The stigma is two-lobed, the posterior lobe, which is somewhat reduced, is tooth-like, while the anterior lobe is club-shaped.

Cocci.—The cocci, although varying considerably in shape and size, furnish relatively constant specific characters which aid greatly in specific diagnosis. The dorsal surface may be echinate or ridged. In the latter case the fruit is usually ovate. The commissural surface may be excavated, margined, plane or nearly so. The cocci in most cases are two-celled and two-seeded.

GEOGRAPHICAL DISTRIBUTION

The genus *Priva* is essentially a tropical genus. The majority of species are found between 30° N. and 35° S. latitude. Of the eleven recognized species, nine occur exclusively in the western hemisphere, while the other two are found in the eastern hemisphere only. Two species are confined to South America. *P. bahiensis* is known only from Brazil, while the range of *P. cuneato-ovata* does not seem to extend north of Argentina and Chili. The species *P. rhinanthifolia*, *aspera*, and *mexicana* are indigenous to Mexico and Central America.

The only species found in the United States is the type species, *P. lappulacae*, which is rather cosmopolitan in tropical America.

The African species, *P. leptostachya*, seems to offer the greatest problem in distribution. It is possible, however, that this species as here interpreted may be too inclusive; but the material at hand is inadequate, lacking either foliage, flowers, or fruit to permit of satisfactory or final treatment. A survey of the ma-

terial at hand, however, shows the distribution of this species to extend from the island of Socotra south to, and including, Cape Colony.

The geographical distribution of the genus, as well as the distribution of individual species, is indicated in pl. 1.

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ABBREVIATIONS

The abbreviations used, to indicate the herbaria in which the specimens cited in the present paper occur, are as follows: C = University of Chicago Herbarium (deposited in the Field Museum); F = Field Museum of Natural History Herbarium; G = Gray Herbarium of Harvard University; M = Missouri Botanical Garden Herbarium; US = United States National Herbarium.

TAXONOMY

Priva Adans. Fam. Pl. 2: 505. 1763; Persoon, Syn. Pl. 2: 139. 1807; Schauer in DC. Prodr. 11: 532. 1847; Bocquillon, Rev. Verb. 115. 1861-1863, excl. *Diphyrena*; Bentham & Hooker, Gen. Pl. 2: 1145. 1873-1874; Briquet in Engl. & Prantl, Nat.

Pflanzenfam. IV. Abt. 3a, 155. 1897; Lam, Verb. Malayan Arch. 23. 1919.

Blairia Houst. ex Linn. Gen., ed. 1, 334. 1737.

Phryma Forsk. Fl. Aegypt. Arab. 115. 1775, not L.

Streptium Roxb. Pl. Corom. 2: 25. t. 146. 1798.

Tortula Roxb. ex Willd. Sp. Pl. 3: 359. 1800.

Pitraea Turcz. in Bull. Soc. Nat. Moscow 35: 328. 1862.

Phelloderma Miers in Trans. Linn. Soc. London 27: 100. 1870.

Herbaceous caulescent perennials, glabrous or pubescent. Leaves opposite, sessile or petioled, membranaceous, dentate. Inflorescence spicate, terminal or axillary. Flowers small, solitary, and axillary. Bracts small, lanceolate to ovate. Calyx tubular in anthesis, 5-ribbed, terminating in 5 short teeth, persistent, enlarging with and investing the fruit, usually contracted at the orifice at maturity. Corolla-tube cylindrical; limb spreading, oblique, slightly bilabiate. Stamens 4, didynamous, adnate to about the middle of the corolla-tube, included or nearly so; anther cells parallel or slightly divergent; posterior stamen or staminode much reduced, minute or absent. Ovary 2-celled; ovules 2 or by abortion 1; stigma 2-lobed; posterior lobe tooth-like, anterior lobe club-shaped. Fruit included in the enlarged calyx, separating at maturity into 2-celled (or by abortion 1-celled) cocci. Pericarp hard; dorsal surface echinate, ridged, or smooth; commissural surface excavated, concave, or plane.

Type species: *P. lappulacea* (L.) Pers. Syn. Pl. 2: 139. 1807.

KEY TO THE SPECIES

A. Dorsal surface of cocci distinctly echinate.

B. Fruiting calyx uncinately hispid.

C. Leaves sessile.....1. *P. Curtisiae*

CC. Leaves petioled.

D. Leaves ovate, 5-8 cm. long, 3-2 cm. wide; fruit strongly contracted at the base.

E. Inflorescence 10-25 cm. in length.....2. *P. portoricensis*

EE. Inflorescence 6 cm. or less in length.....3. *P. domingensis*

DD. Leaves ovate, 1.5-10 cm. long, 1-6 cm. wide; fruit not strongly contracted at the base.

F. Commissural surface of cocci excavated; corolla at least twice the length of the calyx.

G. Corolla-tube spirally contorted in bud.....4. *P. leptostachya*

GG. Corolla-tube not contorted in the bud.....5. *P. bahiensis*

- FF. Commissural surface of cocci flat or slightly furrowed; corolla slightly exceeding the calyx.....6. *P. lappulacea*
 BB. Fruiting calyx more or less hirsute, not uncinat-hispid.....7. *P. armata*
 AA. Dorsal surface of cocci smooth or furrowed, not echinate.
 H. Stem and leaves glabrous or somewhat puberulent; South American species.....8. *P. cuneato-ovata*
 HH. Stem and leaves more or less hirsute; Mexican species.
 I. Leaves sessile, oblong, sharply dentate toward the apex.....9. *P. rhinanthifolia*
 II. Leaves petioled, ovate, subcordate, uniformly dentate.
 J. Fruiting calyx hirtellous with occasional uncinat hairs intermixed, beaked, erect.....10. *P. aspera*
 JJ. Fruiting calyx densely uncinat-hispid, not beaked, reflexed.....11. *P. mexicana*

1. *Priva Curtisiae* Kobuski, n. sp.¹

Herbaceous perennial; stem erect or somewhat decumbent, quadrangular, pubescent, striate, branched, 30-50 cm. high; leaves sessile, ovate to oblong, 0.5-4.5 cm. long, 0.5-2.5 cm. broad, obtuse at the apex, truncate or nearly so at the base, crenate-serrate, scabrous above, paler and somewhat pubescent beneath; inflorescence terminal, spicate, racemes 8-24 cm. long, loosely flowered, pedunculate; bracts ovate to lanceolate, 1-2 mm. long, covered with a fine pubescence; calyx tubular in anthesis, 5-7 mm. long, teeth short, obtuse, fruiting calyx subglobose, 5 mm. in diameter, densely pubescent with uncinat-hispid hairs intermingled with a straight pubescence, basal portion dilated, enclosing the fruit, apical portion somewhat connivent at the orifice; corolla white, 8-10 mm. long, tube spirally twisted, limb slightly bilabiate, lobes rounded; fruit consisting of 2 bilocular cocci, dorsal surface convex, covered with many stout, pubescent spines, commissural surface deeply excavated, margined.

¹ *Priva Curtisiae* sp. nov., herbaceis perennis; caule erecto vel plus minusve decumbente, ramoso, 30-50 cm. alto, quadrangulare, pubescente, striato; foliis sessilibus, ovatis vel oblongis, 0.5-4.5 cm. longis, 0.5-2.5 cm. latis, obtusis, basi truncatis vel subcordatis, crenato-serratis, supra scabris, subtus pallioribus et hirsuto-pubescentibus; inflorescentiis terminalibus, spicato-racemosis, 8-24 cm. longis, pedunculatis, floribus remotis, pedicellis 1-3 mm. longis; bracteis ovatis vel lanceolatis, 1-2 mm. longis, tenuiter pubescentibus; calyce anthesi tubulosi, 5-7 mm. longo, lobis subobsoletis, calyce fructifero subrotundo, inflato 5 mm. diametro, apice connivente; corolla alba, 8-10 mm. longa, spiraliter contorta, limbo parve bilabiato, lobis rotundatis; capsula late ovata vel subrotunda, matura septicide secedens in coecos duos; coccis bilocularis, dorso convexo grosse multisque pubescentibus spinosis testis; commissura coccorum alte excavata marginata.

Distribution: Kenya Colony, British East Africa.

Specimens examined:

British East Africa: in dry, light soil, Loito Plains, Kenya Colony, 1500-2100 m. alt., 6 June 1923, *Curtis 499* (G, TYPE, M, fragment and photograph); hillside in hard, dry soil, open to sun, Loito Plains, Kenya Colony, 1500-2100 m. alt., 28 June 1923, *Curtis 597* (G); Loito Plains, Kenya Colony, 1500-2100 m. alt., 3 July 1923, *Curtis 642* (G); in wet soil, but after rain usually dry, Mau Range, Kenya Colony, 1500-2100 m. alt., 31 May 1923, *Curtis 472* (G).

This species is related to *P. leptostachya* Juss. but differs in having sessile leaves, and evenly echinate and uniformly larger fruit. The species is dedicated to *Mrs. Anita Grosvenor Curtis*.

2. *Priva portoricensis* Urban, Symb. Ant. 4: 534. 1903.

A slender, branched perennial 30-40 cm. high; stem woody below, puberulent; leaves petiolate, deltoid to ovate, 0.5-3 cm. long, 0.3-1.5 cm. broad, somewhat crenate-serrate, acute to obtuse at the apex, nearly truncate at the base, pubescent; racemes 25 cm. or less in length; pedicels 1-1.5 mm. long; calyx 5 mm. long, covered with dense minute hairs, lobes triangular; fruiting calyx somewhat rotund; corolla pale blue, tube 6 mm. long, rising well above the calyx, slightly amplified at the throat, lobes obovate-rotund; fruit cuneate or obcordate, strongly contracted at the base; cocci bearing two rows of spines on the dorsal surface, 2-celled, commissural surface excavated.

Distribution: Porto Rico.

Specimens examined:

PORTO RICO: in thickets near Guanica, 2 Feb. 1886, *Sintenis 3597*, CO-TYPE (US, G).

3. *Priva domingensis* Urban, Symb. Ant. 7: 354. 1913.

Stem 10-20 cm. high, branched below, branches glabrous or sparingly pubescent; leaves petiolate, ovate, 5-15 mm. long, 4-8 mm. wide, truncate at the base and somewhat decurrent on the petiole, obtuse to rotund at the apex, often shortly apiculate, crenate, or rarely subentire, finely pubescent; racemes 6 cm. or less in length with a peduncle 1-3 cm. long; flowers few, 2-5,

pedicels 1.5 mm. long; calyx 5 mm. long, covered with sparse short hairs intermixed with dense hooked hairs, lobes short, widely triangular; corolla violet-red, 11.5 mm. long, nearly twice as long as the calyx, somewhat amplified above, lobes rounded.

Distribution: San Domingo at La Vuelta, near the river Las Lavas, in lime hills.

No specimens seen. Description translated from the original.

4. *Priva leptostachya* Juss. Ann. Mus. Paris 7: 70. 1806; Pers. Syn. Pl. 2: 139. 1807; Walpers, Rep. 4: 35. 1844; Schauer in DC. Prodr. 11: 532. 1847; Bocquillon, Rev. Verb. 116. 1861-1863; Clark in Hooker, Fl. Brit. Ind. 4: 565. 1885; Pearson in Fl. Capensis 5: 206. 1901; Lam, Verb. Malayan Arch. 24. 1919.

Tortula aspera Roxb. in Willd. Sp. Pl. 3: 359. 1801.

P. dentata Juss. Ann. Mus. Paris 7: 70. 1806; Pers. Syn. Pl. 2: 139. 1807; Schauer in DC. Prodr. 11: 533. 1847.

P. abyssinica Jaub. & Spach. Ill. Pl. Orient. 5: 58. t. 453. 1853-57.

P. Forskalii Jaub. & Spach. Ill. Pl. Orient. 5: 59. t. 455. 1853-57.

P. Forskaolaei E. Mey. Comm. Pl. Afr. Austr. 1²: 75. 1837.

P. Meyeri Jaub. & Spach. Ill. Pl. Orient. 5: 57. 1853-57.

An herbaceous perennial 3-9 dm. high, branched; stem 4-sided, striate; leaves petiolate, ovate, 2-11 cm. long, 1-5 cm. wide, coarsely crenate-serrate, rounded or obtuse at the apex, cuneate at the base, strigosely pubescent on both surfaces; racemes terminal or axillary, elongate, 2-3 dm. long; flowers many, distant, shortly pedicellate; calyx in anthesis cylindrical, 3-6 mm. long, in fruit globose, uncinately hispid; corolla white, bilabiate, twice as long as the calyx, twisted in anthesis; fruit ovate, obcordate, hard, glabrous or sometimes pubescent, composed of two slightly coherent 2-celled cocci, longitudinally ridged with two rows of short spines, commissural surface deeply excavated.

Distribution: in grassy plains and river banks, Island of Socotra to South Africa, India, and East Indies.

Specimens examined:

AFRICA: Island of Socotra, Feb.-March 1880, *Balfour 542* (G)

doubtfully referred to this species; vicinity of Kampala, on the trail from Entebbe, Victoria Nyanza to Butiaba, Albert Nyanza, Uganda, 650-1110 m. alt., 21-22 Dec. 1909, *Mearns 2402* (US); Ripon Falls, Uganda Protectorate, 18 July 1913, *Dümmer 30* (US); Nyasaland, Rhodesia, 1891, *Buchanan 887* (US); Mozambique, exact locality and date of collection lacking, *Howard 118* (US); River Shire, British Nyasaland Protectorate, coll. of 1863, *Kirk* (G); Durban, Union of South Africa, March 1894, *Kuntze* (US, 633155); in fields and mountains near Enon, South Africa, 450 m. alt., *Drege a* (M); in woods, Somerset, Cape Colony, 750 m. alt., March 1886, *Bolus 306* (F); exact locality and date of collection lacking, *Burchell 3625* (G); Boschberg, 900 m. alt., without date, *MacOwan* (F).

EAST INDIES: locality and date not indicated, probably collected by Wallich (M, 119874).

ASIA: in the locality of Maisur and Carnatic, British India, without further data, *Thomson* (G).

5. *Priva bahiensis* DC. Prodr. 11: 533. 1847.

Stem quadrangular, narrow, branched, 1.5-3 dm. high, finely pubescent; leaves shortly petiolate, ovate, subcordate, 2.8-4 cm. long, 1-2 cm. wide, coarsely serrate, narrowed at the base into the petiole, strigosely pubescent above, finely pubescent beneath; racemes terminal, 2 dm. long, flowers solitary, in the axils of the bracts, distant; bracts 3-4 mm. long, about twice as long as the pedicels, somewhat linear, pubescent; calyx slender, tubular, 5-ribbed, densely uncinat-hispid, especially between the ribs, 4-5 mm. long, accrescent, becoming broadly inflated, globose, splitting in halves, connivent at the orifice; corolla twice the length of calyx; fruit obovate, attenuate at base, splitting into 2 bilocular cocci at maturity, dorsal surface convex, possessing two rows of long, slender, curved spines, transversely ridged between the two rows of spines, commissural surface excavated and margined.

Distribution: eastern Brazil.

Specimens examined:

BRAZIL: along fences and near water, Province of Bahia, *Salzmann* (M, 118802).

6. *Priva lappulacea* (L.) Pers. Syn. Pl. 2: 139. 1807; Kuntze, Rev. Gen. Pl. 2: 509. 1891; Rusby, Bull. Torr. Bot. Club 27: 80. 1900; Urban, Symb. Ant. 4: 534. 1903; Britton, Fl. Bermuda, 313. 1918; Britton & Millsp. Bahama Fl. 367. 1920; Urban, Symb. Ant. 8: 597. 1921.

Verbena lappulacea L. Sp. Pl. 28. 1758.

Priva echinata Juss. Ann. Mus. Paris 7: 70. 1806; Kunth, Syn. Pl. Aeq. 2: 61. 1823; Walpers, Rep. 4: 34. 1844-1847; Schauer in DC. Prodr. 11: 534. 1847; Bocquillon, Rev. Verb. 116. 1861-1863; Griseb. Fl. Br. W. Ind. 492. 1864; Griseb. Cat. Pl. Cubensis, 215. 1866; Gray, Syn. Fl. N. Am. 2: 324. 1878; Small, Fl. Southeastern U. S., ed. 2, 1013. 1913.

P. lamiifolia Mart. & Gal. Bull. Acad. Brux. 11: 325. 1844.

Stem erect, simple or branched, quadrangular, 2-6 dm. high, pubescent; leaves petiolate, ovate, subcordate, 2.5-11 cm. long, 1-6 cm. wide, coarsely dentate, slightly acuminate at the apex, truncate to subcordate at the base, strigosely pubescent; racemes loosely flowered, 8-18 cm. long; flowers pedicellate; calyx in anthesis tubular, 2-3 mm. long, densely uncinat-hispid, fruiting calyx broadly ovate, coarctate at the apex; corolla slightly surpassing the calyx, blue, pink or white, salverform, oblique, slightly bilabiate, 5-lobed, lobes small, rotund; fruit consisting of 2 bilocular cocci, quadrangular, dorsal surface echinate, scrobiculate between the spines, commissural surface plane or nearly so.

Distribution: cosmopolitan weed of tropical America and the West Indies; in sandy soil, along railroad tracks, open fields, and rocky places.

Specimens examined:

UNITED STATES:

FLORIDA: Key West, Aug. 1877, *Garber* (US, G); Key West, date lacking, *Blodgett* (US, G); Key West, 1874, *Ed. Palmer 395* (C, US, M); exact locality lacking, coll. of 1842-1849, *Rugel* (M).

MEXICO:

LOWER CALIFORNIA: San José del Gabo, 15 Sept. 1890, *Bran-degee* (US, G).

TAMAULIPAS: vicinity of Victoria, 320 m. alt., 1 May-13 June 1907, *Ed. Palmer 502* (US, G, and F); near Tampico, 15 m. alt., 1-31 Jan. 1910, *Ed. Palmer 8* (G, US, M).

SINALOA: Culiacan, 1891, *Ed. Palmer* (US); Culiacan, 12 Oct. 1904, *Brandege* (US); Culiacan, 27 Aug.–15 Sept. 1891, *Ed. Palmer 1458* (G); foothills of Sierra Madre, near Colomas, 21 July 1897, *Rose 3240* (US); foothills of Sierra Madre, near Colomas, 16 July 1897, *Rose 1722* (US); rancho del Agua Fria, San Ignacio, 430 m. alt., 12 June 1918, *Montes 389* (US); dry hills near Mazatlan, 30 March 1910, *Rose 13711* (US).

JALISCO: Manzanillo, 1–31 Dec. 1890, *Ed. Palmer 1007* (US).

COLIMA: coffee plantation northwest of Colima, 540 m. alt., 28 July 1905, *Goldsmith 89* (G).

GUERRERO: Iguala, 10–12 Aug. 1905, *Rose 9419* (US); vicinity of Acapulco, Oct. 1894–Mar. 1895, *Ed. Palmer 551* (F, G, US, C, M).

VERA CRUZ: near Tantoyuca, prov. Huasteca, 1858, *Ervendberg 148* (G); sandy soil by Rio de Santa Maria, Zacuapan, Aug. 1906, *Purpus 2009* (G); Vera Cruz, 12 March 1910, *Orcutt 2999* (F, M); in dry sunny places near fences, 17 March 1857, *Mohr* (US).

OAXACA: Tuxtepec, 90 m. alt., 24 Aug. 1895, *L. C. Smith 647* (G).

CAMPECHE: Canasayal, 20 m. above Chanpotan River, 12 Dec. 1900, *Goldman 458* (F).

YUCATAN: Izamal, coll. of 1888, *Gaumer* (F); Merida, 24 Nov. 1864, *Schott 22, 23* (F); Buena Vista, 21 June 1892, *Gaumer* (F); open places, Casa de las Monjas, 20 March 1903, *Seler 3995* (G, F); Chicankanab, 1895, *Gaumer 394* (F) *364* (US, F, G, M).

COZUMEL: center of Island, 20 Feb. 1899, *Millsbaugh 1548* (F).

CENTRAL AMERICA:

BRITISH HONDURAS: without exact locality, coll. of 1905–1907, *Peck 293* (G).

GUATEMALA: Puerto Barrios, 2 April 1922, *Greenman 5978* (M); Puerto Barrios, Dept. de Izabal, sea level, 2–6 June 1922, *Standley 24795* (US); Quirigua, Dept. de Izabal, 75–225 m. alt., 15–31 May 1922, *Standley 23762* (US); clear places, Chama, Alta Verapaz, 270 m. alt., 8 June 1920, *Johnson 211* (US); eastern Verapaz and Chiquimla, 1885, *Watson 346, 3732* (G); Santa Barbara, Dept. of Solola, 415 m. alt., Aug. 1891, *Shannon 247* (US); Santa Rosa, 900 m. alt., July 1892, *Heyde & Lux 3017* (G).

EL SALVADOR: Ahuachapan, Dept. of Ahuachapan, 800-1000 m. alt., 9-27 Jan. 1922, *Standley 19749* (US); vicinity of Sonsonate, Dept. de Sonsonate, 220-300 m. alt., 18-27 March 1922, *Standley 22003* (US); Santa Emilia, Sonsonate, 135 m. alt., 22-25 March 1922, *Standley 22097* (US); Acajutla, Sonsonate, 30 m. or less alt., 20 March 1922, *Standley 21905* (US); Ateos, Dept. de la Libertad, 17 April 1922, *Standley 23339* (US); San Salvador, April 1905, *Velasco 8854* (G); dry thicket, San Miguel, Dept. de San Miguel, 110 m. alt., 24-27 Feb. 1922, *Standley 21114* (US).

NICARAGUA: open ground near Chinandega, 21 Jan. 1903, *Baker 754* (US); Granada, 25 Feb. 1903, *Baker 166* (G, M).

COSTA RICA: along railroad tracks near Moin Junction, 1 Sept. 1919, *Rowlee 505* (US); Hacienda de Guacimo, date and collector's name lacking, *United Fruit Co. 71* (US).

PANAMA: vicinity of Cristobal, Colon, 5 Jan.-22 Feb. 1923, *Broadway 67* (G, US); Bocas del Toro, 6 Feb. 1921, *Carleton 147* (G).

WEST INDIES:

BAHAMAS: Governors Harbor, Eleuthera, 14 Dec. 1890, *Hitchcock* (F, M); Governors Harbor, Eleuthera, 19-20 Feb. 1907, *Britton & Millspaugh 5534* (F); Nassau, New Providence, 6 Jan. 1903, *Curtis 24* (F, G, US, M); waste places, Nassau, New Providence, 9 Sept. 1904, *Britton & Brace 655* (F); Nassau, New Providence, 13 Jan. 1905, *Wight 40* (F, G); New Providence, 15 July, 1879, *Brace 23* (F); coppice, near Nicholl's Town, northern section of Andros, 4-5 Feb. 1910, *Small & Carter 8928* (F); open ground near lighthouse, Watling Island, 13 March 1907, *Britton & Millspaugh 6616* (F); sandy soil between dunes, Parrot Cay, Caicos Group, 3 March 1911, *Millspaugh 9196* (F); Inagua, 3 Dec. 1890, *Hitchcock* (F, M).

CUBA: in thickets near trail, Sierra Mendoza, Prov. of Pinar del Rio, 25 Dec. 1911, *Shafer 11144* (US, F); Santiago, Prov. of Havana, 10 April 1904, *Van Hermann 113* (F); Cienfuegos, Prov. Santa Clara, 24 June 1895, *Combs 220* (F, C, G, M); Ingenio Soledad, Cienfuegos, Prov. Santa Clara, 24 Jan. 1903, *Pringle 9* (G, US); waste places, La Gloria, Camaguey, 30 Jan. 1909, *Shafer 128* (F); forests about Paso Estancia, Oriente, 27 April 1909, *Shafer 1576* (US); San Juan Hill, Santiago, 2 Feb. 1899,

Millspaugh 1043, 1048 (F); Santiago, 15-18 Feb. 1902, *Pollard & Palmer 329* in part (F).

HAITI: vicinity of Etroite, Gonave Island, 15-21 March 1920, *Leonard 3302* (US); vicinity of Pikmi, Gonave Island, 5-9 July 1920, *Leonard 5124, 5229* (G, US); Guayubin, Monte Cristi, 100 m. or less alt., 13-21 Feb. 1921, *Abbott 1026* (US); waste and cultivated ground, Anse Gallette, Gonave Island, 3-14 March 1920, *Leonard 3101* (US); St. Marc, sea level, 25-28 Feb. 1920, *Leonard 2943* (G, US); Puerto Frances, Samana Peninsula, sea level to 200 m. alt., 28-29 March 1921, *Abbott 1200* (US); Samana Peninsula, sea level to 200 m. alt., 30 Dec. 1920, *Abbott 498* (US); Hispaniola, Puerto Plata, 26 April 1906, *Raunkiaer 869* (US); Haina, July 1921, *Faris 303* (US); railroad, Pimental, Prov. Pacificador, 20-25 Jan. 1921, *Abbott 641, 648* (US); sandy loam, open hilltops, July 1921, *Faris 324* (US); Barahona, April 1911, *Fuertes 886* (US); locality lacking, Jan.-March 1871, *Wright, Parry & Brummel 354* (US).

PORTO RICO: Santurce, 8 Nov. 1899, *Goll 68* (US); Camuy, 21 June 1901, *Underwood & Griggs 201a* (US); Santa Anna, 9 Nov. 1899, *Goll 150* (US); Cantano, 6-11 Jan. 1899, *Millspaugh 337* (F); near hot springs, Coama, 1 July 1901, *Underwood & Griggs 529* (US); open fields, Coama Springs, 22 Nov. 1899, *Goll 675* (US); Mayaguez, 11 Jan. 1884, *Sintenis 157* (G); Adjuntas Road, seven miles from Ponce, 2 Dec. 1902, *Heller 6181* (G, F, M); roadside near Isabel Segunda, Vieques Island, 24-27 Jan. 1914, *Safer 2425* (US); locality lacking, 1899, *Heller 149* (F).

GRAND CAYMAN: Spot Bay, 13-14 Feb. 1899, *Millspaugh 1286* (F); Jan. 1890, *Hitchcock* (M).

JAMAICA: rocky bank at roadside in vicinity of Montego Bay, 28-30 March 1920, *Maxon & Killip 1605* (US, G); woods near Port Antonio, 29 June 1897, *Fredholm 3081* (US); Port Antonio, 28 Jan.-6 Feb. 1899, *Millspaugh 921* (F); Porus, Jan. 1892, *Lloyd 1104* (F, M); Ferry River on Spanish Town road, sea level, 24 May 1904, *Maxon 2180* (US); along railroad between Kingston and Gregory Park, sea level, 22 Feb. 1920, *Maxon & Killip 313* (US); dryish situation near Kingston, 28 April 1903, *Maxon 1657* (US); streets in Kingston, 9 Dec. 1890, *Hitchcock* (M); Public Gardens, Hope Grounds, Kingston, 210 m. alt., 13 Nov. 1914,

Harris 11796 (F, US, C, M); open railroad embankment at St. Margaret's Bay, Nov. 1900, *Millsbaugh 1910* (F); on Windward Road, 27 Aug. 1902, *Harris* (F); King's House, *Campbell 6785* (F); locality lacking, Dec. 1869, *Alexander* (F, US, G).

ST. JAN: rocky hillside, Lamosure, 10-12 Feb. 1913, *Britton & Shafer 507* (US).

LESSER ANTILLES: near Bassin Yard, St. Croix, Dec. 1895, *Ricksecker 167* (F, G, US, M); near Bassin Yard, St. Croix, 17 Feb. 1897, *Ricksecker 131* (F, US, M); St. Thomas, Dec. 1886, *Eggers* (F); among fields in St. Thomas, Jan. 1887, *Eggers 26* (US); St. Thomas, Dec. 1880, *Eggers 365* (G); St. Thomas, *Ehrenberg 107* (M); St. Thomas, *Krebs* (F); roadside at Kinsale, Montserrat, 22 Jan. 1907, *Shafer 138* (F); Martinique, date lacking, *Sieber 316* (M); Barbados, coll. of 1900, *Botanic Station Herbarium 139* (F, G, US); roadside ditch, St. Vincents, March 1890, *Smith 714* (G); in cocoa fields, Grenada, Oct. 1904, *Broadway* (G, F); St. Georges, Grenada, 26 Oct. 1904, *Broadway* (US, M); Government House, Tobago, 19 Nov. 1913, *Broadway 4845* (US); bank of saddle road, Trinidad, 28 Feb. 1920, *Britton & Hazen 162* (US, G).

SOUTH AMERICA:

COLOMBIA: Santa Marta, 30 m. alt., Nov. 1898-1901, *Smith 1465* (F, G, US, M); Santa Marta, 75 m. alt., Nov. 1898-1901, *Smith 545* (F, G, US, M); Boco Verde, on Rio Sinu, Cacaolate, Dept. of Bolivar, 90-120 m. alt., 13-14 Feb. 1918, *Pennell 4198* (US, G).

VENEZUELA: Margarita Island, 9 July 1901, *Miller & Johnston 96* (F, G, US, M); Sacuapana, April 1896, *Rusby & Squires 306* (F, G, US, M); near colony of Tovar, 16 Aug. 1855, *Fendler 912* (G).

BRITISH GUIANA: Promenade Gardens, Georgetown, 30 Oct.-1 Nov. 1919, *Hitchcock 16593* (US, G); weed in the field, Mahaica, on coast, 20 miles east of Georgetown, 15 Nov. 1919, *Hitchcock 16773* (G, US).

FRENCH GUIANA: grassy places, Cayenne, 2 May 1921, *Broadway 89* (US, G).

ECUADOR: Caraques Bay, 17 June 1923, *Anthony and Tate 118* (US); occasional in shady places around 300 m. alt., on Charles

Island, Galapagos Islands, 28 Feb. 1905, *Stewart 3312* (G, US, M).

PERU: sandy roadside, La Merced, 600 m. alt., 10-24 Aug. 1923, *Macbride 5296* (F); locality and date lacking, *Ruiz 4785* (US).

BOLIVIA: junction of the rivers Beni and Madre de Dios, Aug. 1886, *Rusby 1784* (F, US, G); Guanai-Tipuaní, Apr.-June 1892, *Bang 1375* (F, G, US, M).

7. *Priva armata* Watson, Proc. Am. Acad. 25: 160. 1890.

A low slender herb, 3 dm. or less high, much branched from the base, lower branches often arcuate-ascending; stem slender, square, more or less pubescent; leaves sessile, ovate, 10-15 mm. long, 6-7 mm. broad, irregularly toothed, acute at the apex, pubescent; spikes few-flowered, short; bracts broadly ovate, spatulate, rough, hispid, 4-5 mm. long; calyx tubular, finely pubescent, accrescent, at maturity subglobose, 8-10 mm. long, loosely inclosing the fruit, thin, membranaceous; fruit hard, consisting of two bilocular cocci, dorsal surface covered with stout straight spines, commissural surface flat.

Distribution: near Monterey, Mexico.

Specimens examined:

MEXICO: Valley of Monterey, 7 July 1889, *Pringle 1931* (G, TYPE, F); Valley of Monterey, 18 July 1889, *Pringle 2674* (M, C).

8. *Priva cuneato-ovata* (Cav.) Rusby, Bull. Torr. Bot. Club 27: 80. 1900.

Castelia cuneato-ovata Cav. Anal. Cienc. Nat. Madrid 3: 134. 1801; Ic. and Des. Pl. 6: 60. t. 583. 1801.

Priva laevis Juss. Ann. Mus. Paris 7: 70. 1806; Pers. Syn. Pl. 2: 139. 1807; Walpers, Rep. 4: 36. 1844-1847.

Verbena tuberosa R. Graham, Edinb. N. Phil. Jour. 29: 174. 1840.

Priva orchioides Walpers, Rep. 4: 36. 1844-1847.

Bouchea copiapensis Gay, Hist. Nat. Chile 5: 26, *Atlas 1*, pl. 55. 1849.

Stem simple or branched, 3-4.5 dm. high, 4-angled, lower branches often arcuate-ascending, glabrous or very slightly

pubescent; leaves petiolate to nearly sessile, ovate to subrotund, 3-8 cm. long, 1-4 cm. broad, coarsely mucronate-serrate to crenate, acute to obtuse at the apex, attenuate at the base into a petiole, glabrous or somewhat puberulent; racemes terminal, flowers distant, opposite or distinctly verticillate, shortly pedicellate; bracts lanceolate, acuminate, 4-7 mm. long; calyx pubescent, 10-12 mm. long, folded, with long acuminate lobes, tips of calyx lobes involute, hyaline-margined, more or less contorted over the fruit at maturity; corolla bluish-red, tube pubescent, spread of limb approximately equaling the length of the calyx-tube; fruit included within the persistent calyx, ovate, 4-5 mm. long, 2-3 mm. wide, splitting at maturity into two bilocular cocci, dorsal surface of individual coccus convex, somewhat longitudinally ridged, commissural surface flat.

Distribution: moist places, Argentina and Chile.

Specimens examined:

SOUTH AMERICA:

ARGENTINA: Territorio del Chaco, 9 April 1918, *Jörgensen 2480* (G, US, M); Dept. Andalgala, Prov. de Catamarca, 16 Sept. 1918, *Jörgensen 1022* (G, US, M); Cordoba, Nov. 1892, *Kuntze* (F).

CHILE: along irrigating ditches and in moist places, Tacna Arica region, 20 April 1922, *Shepard 269* (US); Vallenar, Prov. Atacama, 300 m. alt., 1 Feb. 1923, *Werdermann 137* (M); Santiago, Jan. 1919, *Bro. Claude-Joseph 735* (US); Santiago, Jan. 1919, *Bro. Claude-Joseph 804* (US); without exact locality, Oct. 1914, *Buchtien 4381* (US).

9. *Priva rhinanthifolia* (Mart. & Gal.) Robinson, n. comb.

Verbena rhinanthifolia Mart. & Gal. in Bull. Acad. Brux. 11²: 323. 1844.

Priva tuberosa Watson, Proc. Am. Acad. 18: 135. 1883.

Roots tuberous; stems branched at the base, erect or decumbent, 4-angled, hairy, 5-30 cm. long; leaves sessile, oblong, 1.5-4 cm. long, 0.5-1 cm. broad, coarsely toothed, especially toward the apex, somewhat narrowed at the base, more or less strigosely pubescent on the upper surface, sometimes uniformly, often in patches, pubescence prominent on the under surface, especially along the midrib and veins; racemes extremely short and few-

Ux.

flowered; bracts lanceolate, pubescent, 4-5 mm. long; calyx unequally and deeply 5-lobed, conspicuously pubescent, becoming 8-9 mm. long, somewhat accrescent, more or less constricted over the cocci at maturity; corolla exceeding the calyx-tube, pubescent; fruit somewhat globose, consisting of two bilocular cocci which are irregularly and coarsely reticulated, not spiny.

Distribution: central and southern Mexico.

Specimens examined:

MEXICO:

CHIHUAHUA: Parral, 1800 m. alt., 19 Sept. 1898, *Goldman 103* (US); oak woods and plains near Cosihuiriac, 27 Aug. 1887, *Pringle 1549* (G, C); under oaks, hills near Cosihuiriac, 19 Sept. 1888, *Pringle 3057* (F).

DURANGO: Otinapa, 25 July-5 Aug. 1906, *Ed. Palmer 396* (M, G); city of Durango, 1 Aug. 1898, *Nelson 4635* (F, G, US); grassy sides of ravines at Santiago Papasquiara, Apr.-Aug. 1896, *Ed. Palmer 424* (F, G, M).

SAN LUIS POTOSI: in the mountains near San Miguelito, 1876, *Schaffner 713* (C).

HIDALGO: calcareous soil near Tula, 2640 m. alt., 25 July 1898, *Pringle 7586* (G, F).

JALISCO: road between Huejuquilla and Mesquite, 25 Aug. 1897, *Rose 3576* (US).

MEXICO: Teoloyucan, 11 Aug. 1913, *Salazar* (US); vicinity of Tlalnepantla, 6 July 1905, *Rose 8422* (US); near Guadalupe, Valley of Mexico, 1905, *Rose 8511* (US); San Angel, Valley of Mexico, 1865-1866, *Bourgeau 357* (G, US); San Angel, Valley of Mexico, 15 Aug. 1905, *Rose 9496* (US).

MICHOACAN: Punguato, 2100 m. alt., 20 June 1912, *Arsène 8296* (US); grassy hills near Patzcuaro, 19 July 1892, *Pringle 4147* (C, F, G, M); Lama Santa Maria, 1950 m. alt., 14 June 1909, *Arsène 3499* (US).

10. *Priva aspera* HBK. Nov. Gen. & Sp. 2: 278. 1817; Walpers, Rep. 4: 34. 1844; Schauer in DC. Prodr. 11: 534. 1847; Engl. & Prantl, Nat. Pflanzenfam. 4: Abt. 3a, 155. 1895.

Priva tracheloides Mart. & Gal. in Bull. Acad. Brux. 11²: 324. 1844.

Priva Orizabae Watson, Proc. Am. Acad. **23**: 282. 1888.

Stem erect, 12–18 dm. high, branched; branches four-sided, striate, pubescent; leaves petiolate, ovate, 6–20 cm. long, 3–10 cm. wide, crenate, acuminate, acute at the base, scabrous above, pale beneath, reticulately veined, nerves and veins rather prominent beneath; racemes terminal, solitary or in threes, 15–45 cm. long; bracts lanceolate, 1–2 mm. long; flowers solitary, distant; pedicels stout, 1.5–2 mm. long; calyx tubular in flower, lobes involute, hyaline-margined, sparsely pubescent, in some instances pubescent with both straight and uncinate hairs, globose in fruit, sulcate; corolla bilabiate, slightly exceeding the calyx, tube pubescent, throat hairy; fruit inclosed in the persistent calyx, erect, consisting of two 1-celled cocci, dorsal surface convex, reticulately ridged, without spines, commissural surface oblique, excavated.

Distribution: Mexico and Central America.

Specimens examined:

MEXICO:

CHIHUAHUA: Santa Eulalia Mts., 8 Sept. 1885, *Pringle 287* (G, C, F, US, M); Sierra Madres near Seven Star Mine, 2100 m. alt., 15 Sept. 1899, *Townsend & Barber 422* (G, F, US, M); Sierra Madre Mts. in Guayanopa Canyon, 1080 m. alt., 24 Sept. 1903, *Jones 7323* (G).

SAN LUIS POTOSI: near San Luis Potosi, 1800–2400 m. alt., 1787, *Parry & Palmer 713* in part (M).

SINALOA: Santa Lucia, Sept. 1919, *Dehesa 1644* (US); in thickets along the Rio Fuerte, near San Blas, 24 March 191–, *Rose 13371* (US).

TEPIC TERRITORY: 5 Jan.–6 Feb. 1892, *Ed. Palmer 1999* (G, F, US).

JALISCO: Guadalajara, July–Oct. 1886, *Ed. Palmer 500* (G, US).

VERA CRUZ: moist rocky slopes, Zacuapan, Sept. 1906, *Purpus 1921* (F, G, M); Zacuapan, Sept. 1917, *Purpus 8054* (G, US, M); Mt. Orizaba, 1865–1866, *Bourgeau 2950* (G, US); near Orizaba, 1200 m. alt., July 1891, *Seaton 465* (G); Orizaba, 25 Sept. 1865–1866, *Bourgeau 3118* (G); Orizaba, without date, *Botteri 593* (G).

MICHOACAN: vicinity of Morelia: northwest of Punguata, 570

m. alt., Sept. 1900, *Arsène* (US, M); Rincon, 1950 m. alt., 21 Aug. 1922, *Arsène 8696* (F, US, M); Rincon, 1900 m. alt., 8 Sept. 1910, *Arsène 5292* (G, US, M); Rincon, 1850 m. alt., 19 Sept. 1909, *Arsène 2545* (US); Rincon, 1950 m. alt., 25 July 1909, *Arsène 2796* (G, M); 2000 m. alt., 9 Nov. 1909, *Arsène* (US); Morelia, Apr. 1909, *Arsène 45* (F).

OAXACA: Rancho de Coldevin, 1650 m. alt., 10 Sept. 1894, *L. G. Smith 160* (G).

CENTRAL AMERICA:

GUATEMALA: Coban, Dept. Alta Verapaz, 1350 m. alt., Sept. 1907, *von Türrckheim 1628* (G); coll. of 1892, *Heyde 206* (US).

COSTA RICA: locality and date lacking, *Kuntze* (F).

11. *Priva mexicana* (L.) Pers. Syn. Pl. 2: 139. 1807.

Verbena mexicana L. Syst. 66. 1784; Willd. Sp. Pl. 1: 116. 1797.

Zapania mexicana Lam. Ill. Gen. 1: t. 17, f. 1. 1823; Poir. Dict. 8: 845. 1808.

Blairia mexicana Gaertn. Fruct. 1: 265. t. 56. 1787.

Priva hispida Juss. Ann. Mus. Paris 7: 70. 1806; Walpers, Rep. 4: 34. 1844; Schauer in DC. Prodr. 11: 534. 1847.

(?) *Priva crenata* Schrad. Ind. Sem. Hort. Götting, 1831; Linnaea 8, Litteratur-Bericht: 24. 1833.

Stem erect, simple or branched, quadrangular, striate, 3-12 dm. high, more or less pubescent; leaves short-petiolate or sessile, ovate, subcordate, 2-8 cm. long, 1-5 cm. broad, somewhat crenate-dentate, acute at the apex, subcordate at the base, strigosely pubescent on the upper surface, pale beneath; racemes terminal or axillary, pedunculate, erect or subflexuous, 5-30 cm. long; bracts lanceolate, usually longer than the pedicels; pedicels very minute, 0.5-1 mm. long; calyx in flower cylindrical, densely uncinat-hispid, fruiting calyx globose, close-fitting, connivent at orifice, 2-parted, splitting at maturity of fruit; corolla usually twice the length of the calyx, lilac; fruit consisting of 2 unilocular cocci, reflexed, convex on the dorsal surface, reticulately ridged, without spines, commissural surface somewhat concave on either side of a persistent longitudinal median ridge, smooth, not margined.

Distribution: Mexico.

Specimens examined:

CHIHUAHUA: shaded ravines and mesas near Cosihuiriac, 28 Aug. 1887, *Pringle 1354* (G, US, F).

COAHUILA: Saltillo, Sept. 1898, *Ed. Palmer 281* (G, US, M).

DURANGO: near the city of Durango, Apr.–Nov. 1896, *Ed. Palmer 578* (G, F, US, M); Ramos Inde, 11–14 Aug. 1898, *Nelson 4709* (US).

NUEVO LEON: Monterey, 800 m. alt., Aug. 1911, *Abbon 6178* (US).

SAN LUIS POTOSI: Minas de San Rafael, July 1911, *Purpus 5518* (G, F, US, M); region of San Luis Potosi, 1800–2400 m. alt., 1878, *Parry & Palmer 713* (G, F, M, US).

HIDALGO: Zimapan (fide Hemsley), date lacking, *Coulter 1141* (G); near Tequixquiac, 30 Aug. 1903, *Rose 6642* (US); hills near El Salta, 2100 m. alt., 17 Sept. 1901, *Pringle 9287* (G, F, M).

MEXICO: Mexico City, Apr.–Nov. 1896, *Ed. Palmer 578* (M); Mixcoac, Federal District, 11 Aug. 1913, *Arsène 8808* (US); Mixcoac, Federal District, 11 Aug. 1913, *Arsène 8508* (F, M); Talpam, Federal District, 1910, *Orcutt 3628* (US, F, M); Valley of Mexico, 18 June 1865, *Bourgeau 359* (G); Valley of Mexico, 1875, *Schaffner 425* (G).

PUEBLA: vicinity of Puebla: 2170–2270 m. alt., 27 Oct. 1907, *Arsène 1195* (US); Mayorazzo sier l'Atayac, 2120 m. alt., 4 July 1907, *Arsène 1340* (US); Cerro Tepaxuchil, 2330 m. alt., 11 July 1907, *Arsène 10207* (US); Cerro Tepaxuchil, 2330 m. alt., 14 Nov. 1908, *Arsène 7054* (US); Santa Barbara, 2150 m. alt., 20 June 1910, *Nicolas & Arsène 5280* (US, M); San Luis Tultitlanapa, July 1908, *Purpus 3524* (F).

OAXACA: Valley of Oaxaca, 1550 m. alt., 21 July 1897, *Gonzalez 290* (G); near Cuicatlan, 750–1200 m. alt., 24 Oct. 1894, *Nelson 1822* (US, G).

MICHOACAN: vicinity of Morelia: Lorna Santa Maria, 1950 m. alt., 28 Aug. 1910, *Arsène* (US, M); Jaripeo, 2100 m. alt., 13 July 1911, *Arsène* (G, US, M).

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EXPLANATION OF PLATE

PLATE 1

Geographical distribution of the genus *Priva*.

WESTERN HEMISPHERE

- = *Priva lappulacea*.
 ————— = *Priva mexicana*.
 - - - - - = *Priva aspera*.
 ~~~~~~ = *Priva cuneato-ovata*.  
 ..... = *Priva rhinanthifolia*.  
     ● = *Priva armata* (in Mexico).  
     ◐ = *Priva domingensis* (in West Indies).  
     ■ = *Priva portoricensis* (in West Indies).  
     ▲ = *Priva bahiensis* (in South America).

## EASTERN HEMISPHERE.

- - - - - = *Priva leptostachya*.  
     ✻ = *Priva Curtisiae*.



For class use in Geography, History, Civics, Economics, etc.

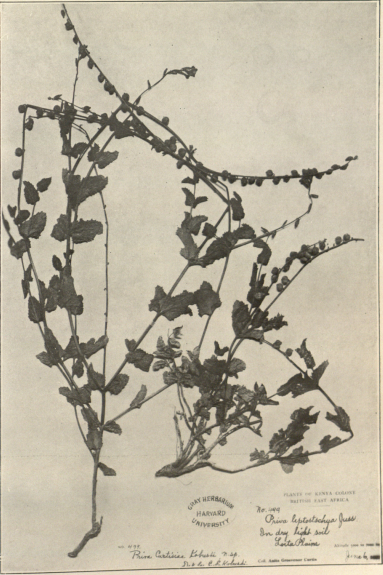
EXPLANATION OF PLATE

PLATE 2

*Priva Curtisiae* Kobuski

British East Africa

From the type specimen, Curtis No. 499, in the Gray Herbarium  
of Harvard University.



KOBUSKI—REVISION OF GENUS PRIVA

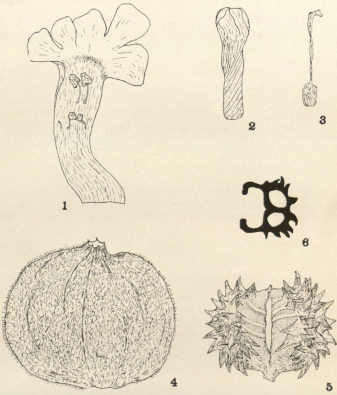


## EXPLANATION OF PLATE

## PLATE 3

*Priva Curtisiae* Kobuski

- Fig. 1. Open corolla,  $\times 6$ .  
Fig. 2. Corolla in bud,  $\times 6$ .  
Fig. 3. Pistil,  $\times 6$ .  
Fig. 4. Mature calyx,  $\times 6$ .  
Fig. 5. Mature fruit,  $\times 6$ .  
Fig. 6. Cross-section of coccus,  $\times 6$ .

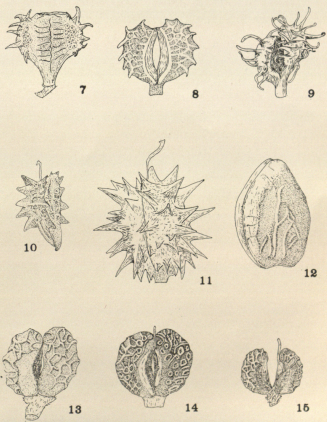


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## EXPLANATION OF PLATE

## PLATE 4

- Fig. 7. Fruit of *Priva portoricensis* Urban,  $\times 6$ .  
Fig. 8. Fruit of *Priva leptostachya* Juss.,  $\times 6$ .  
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Fig. 14. Fruit of *Priva aspera* HBK.,  $\times 6$ .  
Fig. 15. Fruit of *Priva mexicana* (L.) Pers.,  $\times 6$ .



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## EXPLANATION OF PLATE

## PLATE 5

- Fig. 16. Mature calyx of *Priva portoricensis* Urban,  $\times 6$ .  
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