

A REVISION OF THE GENUS *BOUCHEA*  
(EXCLUSIVE OF *CHASCANUM*)<sup>1</sup>

MYRLE GRENZEBACH<sup>2</sup>

Formerly Teaching Fellow, Missouri Botanical Garden

HISTORY

The small genus *Bouchea* of the *Verbenaceae* was first described by Chamisso<sup>3</sup> in 1832. The genus as constituted originally embraced two species, namely, *B. pseudogervae*, based on specimens collected by Beyrich near Friburg in Brazil, and *B. Ehrenbergii* which was described from specimens collected by Ehrenberg near Port au Prince in San Domingo. The former species had been described and illustrated previously by St. Hilaire<sup>4</sup> under the name *Verbena pseudogervae*. In 1844 Walpers<sup>5</sup> in his 'Repertorium' recognized the two species of Chamisso and added a third species, *B. hyderabadensis*, from India.

The next mention of the genus was by Schauer<sup>6</sup> who elaborated the *Verbenaceae* for De Candolle's 'Prodromus' in 1847. Schauer extended the limitations of the genus *Bouchea* to include *Chascanum* Meyer,<sup>7</sup> a small but natural alliance of South African plants. He divided *Bouchea* into two sections, namely, *Rhagocarpium* and *Chascanum*. To the former section he referred six species, four of which—*B. pseudogervae*, *B. Ehrenbergii*, *B. laetevirens*, and *B. agrestis*—were attributed to the Western Hemisphere, and two—*B. marrubifolia* and *B. pterygocarpa*—to North Africa. To the latter section he referred seven species, six of which—*B. cuneifolia*, *B. cernua*, *B. garepensis*, *B. pubescens*, *B. pinnatifida*, and *B. adenostachya*—are indigenous to South

<sup>1</sup> An investigation carried out at the Missouri Botanical Garden in the Graduate Laboratory of the Henry Shaw School of Botany and submitted as a thesis in partial fulfillment of the requirements for the degree of master of science in the Henry Shaw School of Botany of Washington University.

<sup>2</sup> Mrs. Lawrence Sherod.

<sup>3</sup> Cham. in *Linnaea* 7: 252-254. 1832.

<sup>4</sup> St. Hil. Pl. Us. des Bres. pp. 1-4. t. 40. 1824-1828.

<sup>5</sup> Walp. Rep. 4: 11-12. 1844.

<sup>6</sup> Schauer in DC. Prodr. 11: 557-560. 1847.

<sup>7</sup> Meyer, Comm. 1: 275-277. 1835.

Issued May 8, 1926.

Africa, and one, *B. hyderabadensis*, to India. Another species, *B. pumila* of South Africa, was transferred from *Chascanum* to *Bouchea*, but being imperfectly known was not given a definite position in either section. Thus fourteen species of *Bouchea* were recognized by Schauer in De Candolle's 'Prodromus'. Subsequent authors, including Sonders,<sup>1</sup> Gürke,<sup>2</sup> and Pearson,<sup>3</sup> have in general followed Schauer's inclusive generic interpretation of the group.

From 1847 to 1925 additional species of *Bouchea* from America and Africa have from time to time been described, so that the number of species now recorded is more than double the number recognized by Schauer. In the meantime, however, no monographic study or revision of the group has been made.

The present study was undertaken to determine whether *Bouchea* as amended by Schauer represents a homogeneous and natural genus or whether there might not be at least two distinct elements involved. A careful survey of all species, as far as material could be obtained, has been made and the writer is convinced that *Bouchea* as circumscribed by Schauer contains two diverse elements which are best regarded as distinct genera. The following revision of the true *Bouchea* is presented.

#### GENERAL MORPHOLOGY

*Stems*.—The stems in the different species of *Bouchea* vary from typically herbaceous to distinctly woody and shrubby forms. In some cases the base only is ligneous while others are woody throughout. The stems are sometimes simple, but as a rule they become more or less dichotomously branched. The main axis and the branches may be four-angled or terete. Quadrangular branches are the more common, but the main axis often becomes terete toward the base.

*Leaves*.—The leaves show considerable diversity in outline, size, texture, and character of margin. In two species the leaves are sessile, while in all others they are petiolate. In the majority

<sup>1</sup> Sond. in *Linnaea* 23: 86. 1850.

<sup>2</sup> Gürke in *K. Bot. Gart. Berlin Notiz.* 3: 74-76. 1900; *K. K. Nat. Hofm. Ann.* 29: 45. 1905.

<sup>3</sup> Pears. in *Fl. Cap.* 5: 194-207. 1901; *S. Afr. Phil. Soc. Trans.* 15: 176-180. 1905.

of cases the leaves are more or less ovate, obovate, or subrotund in outline with serrate margins. Incised and entire margins are more infrequent. There are three species in the genus with very distinct foliage. One species has dissected leaves, another has linear leaves with entire margins, while the third species has entire, thick, scabrous, spatulate leaves. These three species can be readily distinguished by their leaf characters. Hence the leaves furnish excellent characters for specific differentiation.

*Inflorescence*.—The inflorescence is racemose or rarely spicate, commonly terminal or occasionally axillary. The flowers are solitary, mostly short-pedicellate, rarely sessile, subtended by a bract, or by a bract and two bracteoles. The bracts are usually subulate or lanceolate, but in one species, *B. spathulata*, they are leaf-like. The racemes may be loosely or densely flowered. The character of the inflorescence is comparatively uniform and not of much value in specific determination.

*Pubescence*.—All the species except one are more or less pubescent, and the pubescence is relatively uniform as to kind. Some species are densely pubescent while others are nearly glabrous. The pubescence in most cases is of short straight hairs. *B. agrestis* is a notable exception and differs from all other species in having a pubescence of long white, somewhat flaccid hairs. The species can be distinguished by this character.

*Calyx*.—The calyx, although relatively constant throughout the genus, shows considerable diversity in the different species, and these calyx characters are of use in specific determination in several cases. The calyx is persistent, tubular, five-angled, and five-toothed. There is always one tooth (the posterior lobe) shorter than the other four. Sometimes this difference is very marked, and again it is scarcely noticeable. The calyx varies considerably in texture; some are thin and almost hyaline, while others are of a heavier texture. There is also variation in the length of the teeth.

*Corolla*.—The corolla is relatively constant throughout the genus, varying chiefly in size and color. The color is usually white, but blue, lilac, and rose-colored flowers are recorded. The corolla is funnel-shaped, somewhat bilabiate, with an elongated tube and a slightly unequal five-lobed, spreading limb.

A  
nyded

*Stamens*.—The stamens are included, didynamous, and inserted on the corolla-tube. The lower pair (antero-lateral) is inserted at about the middle of the tube, opposite the sinuses of the anterior lip. The other pair (postero-lateral) is inserted at a little higher level opposite the sinuses of the posterior lip. The filaments are short. The anthers are ovate to subcordate with two parallel anther-sacs.

*Pistil*.—The oblong, bilocular, two-ovuled ovary is attached to the receptacle by a short gynophore. The style is long and filiform but included. The stigma is two-lobed. The anterior lobe is the larger and is somewhat subclavate-stigmatose, while the posterior lobe is aborted and tooth-like.

*Fruit*.—The fruit furnishes the most important characters used in specific determination in the genus. It separates into two distinct cocci at maturity or remains slightly coherent at the base. The cocci are always elongated, more or less beaked, and vary markedly in length. The dorsal surface is convex and usually more or less reticulately ridged. The commissural surface is either plane, ridged, or somewhat furrowed. The beak is very variable in length; it may be conspicuously different in color and texture from the rest of the fruit, and smooth or pubescent, whereas the body of the fruit is striated or reticulately ridged; or it may be quite inconspicuous, noticeable only by a slight contraction of its base. When the beak is greatly differentiated the edges of the fruit are found to have the same texture and surface characteristics as the beak. The fruit may be included in the calyx or exserted.

#### GENERIC RELATIONSHIPS

*Bouchea* belongs to the tribe *Verbeneae* and is obviously related to *Verbena* from which it was segregated by Chamisso on account of the separation of the fruit into two, instead of four, nutlets or cocci. It is related also to *Stachytarpheta* Vahl, but from that genus *Bouchea* is readily distinguished by the absence of a stout, deeply pitted rachis in which the flowers are more or less immersed. *Bouchea* is furthermore allied to the genus *Priva* Adans., particularly through the species *P. cuneato-ovatis* (Cav.) Rusby, but *Priva* in nearly all cases has an ampliate-globular, instead of a narrow tubular, fruiting calyx.



The immediate relationship of *Bouchea* is with *Chascanum* Meyer, and the two genera, as stated previously, were united by Schau. A careful examination of a relatively large series of specimens, however, reveals important morphological differences which may be tabulated as follows:

*Bouchea* Cham.—Calyx tubular, 5-angled, occasionally slightly cleft at maturity, not inflated; fruit equalling or exceeding the persistent calyx; cocci mostly much longer than broad, distinctly beaked, not usually deeply excavated at the base (pl. 9, figs. 1-12; pl. 10, figs. 13-16; pl. 11, figs. 17-24).

*Chascanum* Meyer.—Calyx tubular, 5-angled, conspicuously splitting from apex to base at maturity, somewhat inflated; fruit included within the persistent calyx; cocci mostly less than twice as long as broad, not beaked, usually deeply excavated at the base (pl. 11, figs. 25-28).

#### GEOGRAPHICAL DISTRIBUTION

The genus *Bouchea* is somewhat limited in its distribution. As here defined, ten species are admitted to the genus and all but one occur in the Western Hemisphere, ranging from New Mexico to Bolivia or between 32° N. and approximately 20° S. The only recognized species of *Bouchea* from the Eastern Hemisphere is *B. pterygocarpa* which is found in Abyssinia.

Three species occur in the United States. *B. linifolia* is found in southwestern Texas, *B. spathulata* in western Texas and northern Mexico, while *B. prismatica*, which is the most widely distributed species, extends southward from New Mexico, through Mexico, Central America, and the West Indies, into Venezuela and Colombia. *B. prismatica* and *B. Nelsonii* are the only species known from Central America; the latter species has been collected only in southern Mexico and Guatemala. *B. dissecta*, the only species limited to Mexico in its distribution, is found in the northwestern part of that country. Three of the four species which are indigenous to South America are, as far as known, rather local in their distribution. *B. pseudochascanum* occurs in Ecuador, *B. agrestis* in Brazil, and *B. incisa* in Bolivia. *B. pseudogervae*, however, has a wider distribution. It is recorded from Peru, Bolivia, and Brazil.

## ACKNOWLEDGMENTS

It is with great pleasure that the writer acknowledges all those who have made possible the present study. Thanks are due to Dr. George T. Moore for the use of the splendid library and herbarium facilities of the Missouri Botanical Garden, where the work was carried on under the constant guidance of Dr. J. M. Greenman. To the latter, especial appreciation is due for his encouragement, and his ever-ready and willing assistance and advice. Thanks are also due Professor J. Paul Goode, of the University of Chicago, for permission to use his Homolosine Equal Area Projection Map No. 101 HC.

Material, also, was borrowed from several herbaria, and appreciation is hereby expressed to Mr. W. R. Maxon, of the United States National Herbarium, Dr. B. L. Robinson, Curator of the Gray Herbarium, Mr. D. C. Davies, Director of the Field Museum of Natural History, and to Dr. N. L. Britton and Dr. J. K. Small, of the New York Botanical Garden.

## ABBREVIATIONS

Abbreviations indicating the herbaria where specimens cited herein are deposited are as follows: US = United States National Herbarium; G = Gray Herbarium of Harvard University; M = Missouri Botanical Garden Herbarium; F = Field Museum of Natural History Herbarium; C = University of Chicago Herbarium (at the Field Museum); CC = Columbia College Herbarium (at the New York Botanical Garden).

## TAXONOMY

*Bouchea* Cham. in *Linnaea* 7: 252. 1832; Schauer in DC. Prodr. 11: 557. 1847, excl. *Chascanum*; Mart. Fl. Bras. 9: 197. 1847-1851; Bocq. Rev. Verb. 139. 1861-1863, excl. *Chascanum*; Benth. & Hook. Gen. Pl. 2: 1144. 1873-1874, excl. *Chascanum*; Briq. in Engler & Prantl, Nat. Pflanzenfam. 4<sup>th</sup>: 153. 1897, excl. *Chascanum*.

*Denisaea* Neck. Elem. 1: 306. 1790.

Annual or perennial plants, herbaceous to woody, densely pubescent to glabrous. Leaves usually petiolate, sometimes sessile, usually serrate to serrate-crenate, rarely incised, dissected,

or entire. Inflorescence racemose, rarely spicate, terminal, seldom axillary, elongate, loosely to densely flowered, bracteate. Flowers solitary, usually pedicellate. Bracts subulate, lanceolate or leaf-like. Calyx persistent, tubular, 5-ribbed, ribs terminating in 5 more or less unequal teeth. Corolla-tube funnelform, cylindrical, erect or curved; limb oblique, spreading, unequally 5-lobed, the two posterior lobes shorter than the anterior lobes. Stamens 4, didynamous, included; filaments short, inserted on the corolla-tube, the posterior pair of stamens inserted at the middle of the tube, the anterior pair inserted at a somewhat higher level; anthers 2-celled, ovate to subcordate. Ovary 2-locular, loculi 1-ovulate, oblong; style filiform; stigma 2-lobed, anterior lobe club-shaped, posterior lobe tooth-like, on a level with the anterior pair of stamens. Fruit dry, linear, beaked, included in the calyx or exserted, separating into two cocci at maturity; cocci totally separate or coherent at the base, dorsal surface more or less reticulately ridged, commissural surface plane, furrowed, or ridged, sometimes a little roughened.

Type species: *B. pseudogervæ* (St. Hil.) Cham. in *Linnaea* 7: 253. 1832.

#### KEY TO THE SPECIES

- A. Leaves distinctly petiolate; petioles .5-4 mm. in length.
  - B. Beak of the fruit membranous-winged.....1. *B. pterygocarpa*
  - BB. Beak of the fruit not membranous-winged.
    - C. Beak oblong, emarginate.
      - D. Leaves ovate to subrotund, dentate to crenate-dentate, or laciniate-dentate.
        - E. Leaves laciniate-dentate.....2a. *B. prismatica* var. *laciniata*
        - EE. Leaves dentate to crenate-dentate.
          - F. Calyx 5-9 mm. long; beak 1.5 mm. or less in length.
            - G. Beak about 1.5 mm. long.....2. *B. prismatica*
            - GG. Beak about .5 mm. long.....2b. *B. prismatica* var. *brevirostra*
          - FF. Calyx 9-15 mm. long; beak 2-6 mm. in length.
            - H. Beak 2-3 mm. long, glabrous or slightly pubescent.
              - .....2c. *B. prismatica* var. *longirostra*
            - HH. Beak 4-6 mm. long, distinctly pubescent.....3. *B. Nelsonii*
        - DD. Leaves ovate, deeply dissected.....4. *B. dissecta*
      - CC. Beak somewhat obscure to distinctly attenuate and acute.
        - I. Plants conspicuously villous-hirsute.....5. *B. agrestis*
        - II. Plants not villous-hirsute.
          - J. Fruit exserted.
            - K. Calyx-teeth subulate.....6. *B. pseudogervæ*

KK. Calyx teeth triangular; calyx almost truncate  
at the apex.....7. *B. pseudochascanum*

JJ. Fruit not exserted.....8. *B. incisa*

AA. Leaves sessile.

L. Leaves linear to narrowly lanceolate, thin,  
smooth.....9. *B. linifolia*

LL. Leaves spatulate, thick, scabrous..10. *B. spatulata*

1. *B. pterygocarpa* Schauer in DC. Prodr. 11: 558. 1847;  
Engler, Pflanzenw. Ost.-Afr. A. 57 and C. 338. 1895; *ibid.* A.  
44. sphalm. *pterygosperma*.

Stem ligneous, 10-15 dm. high, branched; branches somewhat  
4-angled, glaucescent; leaves petiolate, ovate to ovate-elliptical,  
9-30 mm. long, 7-15 mm. broad, rather thick, somewhat un-  
equally serrate-dentate, obtuse to subacute at the apex, more or  
less cuneate at the base, scabrous-pubescent on both surfaces;  
petioles 5-15 mm. long; racemes terminal, subsessile, 8-42 cm.  
long, pubescent, closely flowered; flowers subsessile; bracts subu-  
late, 2-3 mm. long; calyx 8-9 mm. long, splitting longitudinally  
from apex to base at maturity, scabrous-pubescent, teeth very  
short, apex almost truncate; fruit about as long as the calyx,  
separating into two distinct cocci, dorsal surface slightly ridged,  
commissural surface with a central longitudinal ridge, roughened,  
excavated at the base, beak membranous-winged.

Distribution: Abyssinia.

Specimens examined:

Abyssinia: in the mountains near Adeganna, 11 April, 1839,  
*Schimper 1012* (US, M).

2. *B. prismatica* (Jacq.) Kuntze, Rev. Gen. Pl. 2: 502. 1891.  
*B. Ehrenbergii* Cham. in Linnaea 7: 253. 1832; Walp. Rep.  
4: 12. 1844; Torr. in U. S. & Mex. Bound. Surv. 126. 1859;  
Gray, Syn. Fl. N. Am., ed. 2, 2: 334. 1886; Briq. in Engl. &  
Prantl, Nat. Pflanzenfam. 4<sup>th</sup>: 153. 1897.

*Verbena prismatica* Jacq. Coll. 2: 301. 1788; Icones Pl. Rar.  
2: t. 208. 1786-1793.

*Zapania prismatica* Lam. Encycl. Meth. 1: 59. 1791; Poir.  
Encycl. Meth. 8: 844. 1808.

*Stachytarpheta bifurca* Benth. Pl. Hartw. 21. 1839; Walp. Rep.  
4: 11. 1844.

EON

Stem 1-6 dm. high, 4-angled, more or less pubescent, often furrowed, branched; leaves petiolate, ovate to subrotund, 2-8.5 cm. long, .5-4.5 cm. broad, mucronate-dentate to subrenate, slightly pubescent on both surfaces, acute to somewhat obtuse at the apex, base entire, cuneate to subtruncate; racemes terminal, 8-25 cm. long, often loosely flowered; flowers small, subsessile; bracts lanceolate, 2-3 mm. long; calyx 7-9 mm. long, teeth nearly 2 mm. long; fruit separating into two distinct cocci, equalling or slightly exceeding the calyx, dorsal surface ridged, commissural surface somewhat furrowed, roughened, beak pronounced, about 1.5 mm. long, straight, emarginate.

Distribution: central and southern Mexico, West Indies to northern South America.

Specimens examined:

Tamaulipas: Tula, 1903, *Purpus* 485 (US).

Aguascalientes: Aguascalientes, 20 Aug., 1901, *Rose & Hay* 5949, 6229 (US).

Guanajuato: date lacking, *Dugès* 500 (G).

Vera Cruz: Wartenberg, near Tantoyuca, Prov. of Hausteca, coll. of 1858, *Ervendberg* 280 (G).

Puebla: Tehuacan, 1-2 Aug., 1901, *Rose & Hay* 5949 (US).

Oaxaca: Almaloyas, 14 July, 1910, *Rusby* 49 (US).

Yucatan: Progreso, date lacking, *Gaumer* 1139, 1160 (F).

Haiti: along roads, Port au Prince, 4 July, 1901, *Harshberger* 51 (US).

Santo Domingo: Puerto Plata, 26 April, 1906, *Raunkiaer* 1102 (US); Guayubin, Prov. de Monte Cristi, alt. 100 m. or less, 13-21 Feb., 1921, *Abbott* 958 (US); roadside, Haina, April, 1921, *Faris* 189, 199 (US); without locality, Oct., 1909, *Türkheim* 2532 (F, M, US, G).

Porto Rico: near Coamo siroci los Banos, 11 April, 1885, *Sintenis* 211 F (F, M, US, G); roadside, Coamo Springs, 22 Nov., 1899, *Goll* 689 (US); Coamo Springs, 1 July, 1901, *Underwood & Griggs* 585 (US); Coamo Springs, 24 Nov., 1902, *Heller* 6109 (F, M, G).

Culebra Island: waste places, Culebra, 3-12 March, 1906, *Britton & Wheller* 252 (US).

St. Thomas Island: Nov., *Eggers* 114 (G).

Des,

St. Croix Island: east end roadside, 9 June, 1897, *Ricksecker 409* (M, F, US).

Curaçao Island: 15 Nov., 1916, *Rose 22012* (US).

Margarita Island: El Valle, 20 July, 1901, *Miller & Johnston 205* (M, F, US, G).

Venezuela: between Caracas and La Guayra, alt. 600 m., 16 Sept., 1855, *Fendler 853* (G); wet meadows, vicinity of El Valle, near Caracas, 28 Aug., 1921, *Pittier 9720* (US, G); on slope near El Zigzag between Caracas and Puerto Cabello, 18 Oct., 1921, *Pittier 72* (US); La Trinidad de Maracay, Aragua, alt. 440 m., Jan.-Feb., 1913, *Pittier 5830, 5832* (US).

Colombia: open wayside, clay, east of Paso de Caramanta, Cauca Valley, Department of Antioquia, alt. 600-700 m., 20 Sept., 1922, *Pennell 10825* (US).

Colombia: eastern side of Cauca Valley, La Manuelita, near Palmira, Cauca, alt. 1100-1302 m., Dec., 1905-Jan., 1906, *Pittier 833* (US).

**2a. Var. *laciniata* Grenzebach, n. var.<sup>1</sup>**

Stems like the species, leaves ovate, about 4 cm. long, 1.5-2.5 cm. broad, margins distinctly incised, apex acute to acuminate, base cuneate to subtruncate.

Distribution: east central Mexico.

Specimen examined:

Vera Cruz: near Tantoyuca, Prov. of Huasteca, coll. of 1858, *Ervendberg 102* (G, TYPE, photograph in M).

**2b. Var. *brevirostra* Grenzebach, n. var.<sup>2</sup>**

Stem, leaf, and raceme characters like the species; calyx 5-7.5 mm. long; fruit about equalling the calyx, or slightly exserted, beak about .5 mm. long, somewhat curved.

<sup>1</sup> *Bouchea prismatica* (Jacq.) Kuntze var. *laciniata* Grenzebach, var. nov., a forma typica reedit foliis ovatis, circiter 4 cm. longis, 1.5-2.5 cm. latis, laciniato-dentatis, acutis vel acuminatis, basi cuneatis vel subtruncatis.—Near Tantoyuca, Province of Huasteca, Vera Cruz, Mexico, coll. of 1858, *Ervendberg 102* (G, TYPE, photograph in M).

<sup>2</sup> *Bouchea prismatica* (Jacq.) Kuntze var. *brevirostra* Grenzebach, var. nov., calyce 5-7.5 mm. longo; fructo calycem subaequant vel rarius excedenti; rostro circiter 5 mm. longo; aliter formae typicae species simillimum.—Collected at Pungato, vicinity of Morelia, State of Michoacan, Mexico, alt. 2100 m., 9 Aug., 1909, *Arsène 2857* (M, TYPE, US).



Distribution: New Mexico, southward to Salvador, also in the Barbados.

Specimens examined:

New Mexico: coll. of 1851–1852, *Wright 1508* (US).

Sonora: coll. of 1850–1852, *Thurber 1094* (F, G).

Chihuahua: hills and plains near Chihuahua, 2 Sept., 1886, *Pringle 994* (M); and Aug.–Sept., 1885, *Pringle 325* (G, F); Cerro de Guadeloupe, alt. 2250 m., 3 Sept., 1899, *Pringle 7941* (F, G).

Durango: damp, rocky soil, Santiago Papasquiara, Apr. and Aug., 1896, *Palmer 416* (US, G, F, M).

San Luis Potosi: region of San Luis Potosi, alt. 1800–2400 m., coll. of 1878, *Parry & Palmer 716* (M, G).

Jalisco: Guadalajara, July, 1886, *Palmer 261* (G, US).

Colima: Colima, July, 1897, *Palmer 104* (US).

Michoacán: Mont. Zacoalco, 10 July, 1865–1866, *Bourgeau 545* (US, G); Loma del Zapote, vicinity of Morelia, alt. 1950 m., 25 July, 1912, *Arsène 8489* (US); Punguato, vicinity of Morelia, alt. 2000 m., 16 July, 1909, *Arsène 3040* (M, G, US); Punguato, vicinity of Morelia, alt. 2100 m., Aug., 1909, *Arsène 2857* (M, TYPE, US); Punguato, Morelia, alt. 1950 m., 8 Sept., 1909, *Arsène 4* (F).

Guanajuato: coll. of 1909, *Furness*, without number (F).

Queretaro: near San Juan del Rio, Aug., 1905, *Rose, Painter & Rose 9570* (US); locality not indicated, alt. 1850 m., July, 1914, *Arsène 9997* (M, US, G).

Mexico: Tlalpam, valley of Mexico, 20 Aug., 1896, *Harshberger 152* (G).

Puebla: vicinity of San Luis Tlutilanapa, near Oaxaca, June, 1908, *Purpus 3405* (F, M, US, G).

Oaxaca: valley of Etta, Sept., 1895, *Alvarez 747* (G).

Guatemala: Santa Rosa, Department of Santa Rosa, alt. 900 m., June, 1892, *Smith 2965* (US, G).

## 2c. Var. *longirostra* Grenzebach, n. var.<sup>1</sup>

<sup>1</sup>*Bouchea prismatica* (Jacq.) Kuntze var. *longirostra* Grenzebach, var. nov., calyce 7.5–10 mm. longo; fructo 9–11 mm. longo, rostro erecto, 2–3 mm. longo, exserto.—Collected along Hope Road, Jamaica, alt. 120 m., 14 Nov., 1914, *Harris 11792* (M, TYPE, F, G).

Salvador: dry slope, vicinity of San Vicente, Department of San Vicente, alt. 350–500 m., 2–11 March, 1922, *Standley 21620* (US).

Stem and leaf characters like the species; calyx 7.5–10 mm. long; fruit 9–11 mm. long, beak 2–3 mm. long, straight, exserted.

Distribution: southern Mexico, Bahamas and West Indies to northern South America.

Specimens examined:

Oaxaca: Cuicatlan, 15 July, 1895, *Smith 411* (G); vicinity of Cuicatlan, alt. 540–750 m., 8–24 Oct., 1894, *Nelson 1597* (US).

Yucatan: 17 March, 1903, *Seler 3957* (F, G).

New Providence: waste ground, Fort Charlotte, 14 Sept., 1904, *Britton & Brace 782* (F).

Cat Island: waste lands, the Bight and vicinity, 1–6 March, 1907, *Britton & Millspaugh 5796* (F).

Cuba: damp ground, Havana, 11 May, 190–, *Curtiss & West*, without number (F); Cienegñith, district of Cienfuegos, Prov. of Santa Clara, 17 June, 1895, *Combs 154* (F, G, M, C); waste grounds, vicinity of Tiffin, Camaguey, 14–17 Oct., 1909, *Shafer 2861* (US); in orange grove, valley of Rio Matamoras, south of Halguin, Oriente, 14 April, 1909, *Shafer 1364* (F); Santiago de las Vegas, 15–20 March, 1905, *Hitchcock*, without number (F); Santiago de las Vegas, 30 June, 1904, *Baker & Wilson 524* (F, US); low ground, Tueabanda, 21 May, *Wright 3660* (US).

Jamaica: Hope Road, alt. 120 m., 14 Nov., 1914, *Harris 11792* (M, TYPE, F, G); Port Royal, 18 Dec., 1890, *Hitchcock*, without number (M); streets of Kingston, 9 Dec., 1890, *Hitchcock*, without number (M); along the railroad between Kingston and Gregory Park, sea level, 22 Feb., 1920, *Mazon & Killip 314* (US); exact locality not indicated, coll. of 1850, *Alexander*, without number (US).

Haiti: open waste places, vicinity of Pikmi, Gonave Island, 5–9 July, 1920, *Leonard 5219* (US); in cultivated fields, vicinity of St. Marc, near sea level, 25–28 Feb., 1920, *Leonard 2981* (G, US); vicinity of Port au Prince, 21–23 Feb., 1920, *Leonard 2852* (US).

Porto Rico: limestone, La Vigia Ponce, 14 March, 1915, *Britton, Cowell & Brown 5378* (F, M).

Venezuela: in savannas or in wooded gorges, lower Cotiza, near Caracas, alt. 800–1200 m., June, 1918, *Pittier 7887* (US).

3. *B. Nelsonii* Grenzebach, n. sp.<sup>1</sup>

Herbaceous, more or less pubescent throughout, especially above; stems 2.5–6 dm. high, terete below, 4-angled and furrowed above, sparingly branched; leaves petiolate, ovate to subrotund, 2–6 cm. long, 1–4.5 cm. broad, mucronate-dentate, acute to obtuse at the apex, narrowed slightly into the petiole or almost truncate at the base, pubescent on both surfaces, especially along the nerves; inflorescence racemose, terminal or axillary, usually densely flowered, 10–15 cm. long, .8–1 cm. broad; flowers short-pedicellate; bracts linear-lanceolate, about 5 mm. long, pubescent; calyx erect and narrow, 13–15 mm. long, pubescent; fruit separating into two distinct cocci at maturity, 11–16 mm. long, dorsal surface somewhat ridged, commissural surface plane, a little rough, beak about one-third the length of the entire fruit, 4–6 mm. long, slightly pubescent at the tip.

Distribution: southern Mexico and Guatemala.

Specimens examined:

Oaxaca and Chiapas: between Topana, Oaxaca, and Tonalá, Chiapas, alt. 60–150 m., 1–3 Aug., 1895, *Nelson 2867* (US, TYPE, G, photograph and fragments in M).

Guatemala: Zacapa, alt. 180 m., 24 Jan., 1905, *Deam 173* (G), slender form.

This species resembles *B. prismatica* (Jacq.) Kuntze to which the specimens cited have been referred hitherto, but it differs in having longer fruit, with a distinctly longer and pubescent beak,

<sup>1</sup> *Bouchea Nelsonii* Grenzebach, sp. nov., herbaeae plus minusve pubescens; caulibus 2.5–6 dm. altis inferne teretibus superne quadrangularibus sulcatisque, parce ramosis; foliis petiolatis, ovatis vel subrotundatis, 2–6 cm. longis, 1–4.5 cm. latis, mucronato-dentatis, acutis vel obtusis, basi cuneatis vel subtruncatis, utrinque pubescentibus; inflorescentiis racemosis, terminalibus vel axillaribus racemis 10–15 cm. longis, .8–1 cm. latis; floribus crebre brevi-pedicellatis; bracteis linearilanceolatis, circiter 5 mm. longis, hirtellis; calyce erecto, plicato-angulato, 13–15 mm. longo, hirtello, dentibus 5 subulatis, inaequalibus; fructo exserto maturitate in 2 distincte cocci sponte secedens, coccis linearibus, 11–16 mm. longis, dorso striatis vel parce reticulato-jugis, commissura plana verruculosa, rostro 4–6 mm. longo ad apicem parce pubescente.—Between Topana, Oaxaca and Tonalá, Chiapas, Mexico, alt. 60–150 m., Aug. 1–3, 1895, *Nelson 2867* (US, TYPE, G, photograph and fragments in M).

longer and pubescent calyx, and usually a stouter, denser, and broader inflorescence. The entire plant, furthermore, is more pubescent than *B. prismatica*.

4. *B. dissecta* Wats. in Proc. Am. Acad. 24: 68. 1889.

An annual, distinctly herbaceous, slender, very finely puberulent to glabrous; stems 4–6.5 dm. high, 4-angled, sulcate; leaves ovate, 2–7 cm. long, 1–4 cm. broad, thin, pinnately cleft nearly to the midrib, the narrow segments entire, or 1–3-toothed, minutely pubescent; racemes terminal, 10–30 cm. long, slender, loosely flowered; flowers short-pedicellate; bracts subulate, only a little longer than the pedicels; calyx 7–8 mm. long, shortly toothed, slightly pubescent, thin; corolla white; fruit 10–12 mm. long, about one-third longer than the calyx, conspicuously long-beaked, beak 3.5–4 mm. long, dorsal surface longitudinally ridged, commissural surface somewhat furrowed, smooth.

Distribution: northwestern Mexico.

Specimens examined:

Sonora: rocky ridges, Guaymas, Oct., 1887, *Palmer 259* (G, TYPE); Agiabampo, 3–5 Oct., 1890, *Palmer B* (G).

Sinaloa: Culiacan, 27 Aug.–15 Sept., 1891, *Palmer 1485* (G, US); San Augustin, San Ignacio, coll. of 1921, *Ortega 621* (US).

5. *B. agrestis* Schauer in DC. Prodr. 11: 558. 1847, and in Mart. Fl. Bras. 9: 197. 1847–1851.

An annual, villous-hirsute in the younger stages, more or less glabrate; branches somewhat 4-angled; leaves short-petiolate, obovate, elliptical-oblong, 1.5–4 cm. long, 1–1.7 cm. broad, acutely serrate from the middle of the leaf to the apex, entire towards the base, attenuate on the petiole, villous-hirsute; racemes terminal, slender, loosely flowered; flowers pedicellate; bracts linear, 5–6 mm. long; calyx 7–9 mm. long, hirsute, teeth long; corolla lilac to rose; fruit separating into two distinct cocci, 6.5–8 mm. long, included within the calyx, beak long, attenuate, slightly pubescent, dorsal surface distinctly ridged, commissural surface plane, smooth.

Distribution: Brazil.

Specimen examined:

Brazil: vicinity of Bahia, date lacking, *Blanchet 3731* (M).

6. *B. pseudogervæ* (St. Hil.) Cham.<sup>1</sup> in *Linnaea* 7: 253. 1832; Walp. Rep. 4: 11. 1844; Schauer in DC. Prodr. 11: 557. 1847; and in Mart. Fl. Bras. 9: 195. 1847-1851.

*Verbena pseudogervæ* St. Hil. Pl. Us. des Bres. pp. 1-4. t. 40. 1824-1828.

(?) *Verbena fluminensis* Vellozo,<sup>2</sup> Fl. Flum., t. 33. 1827.

Stem 6-9 dm. high, somewhat ligneous, stout, almost glabrous, below terete; branches usually 4-angled, glabrous to slightly pubescent; leaves petiolate, ovate to elliptical-oblong, 6-10 cm. long, 2.5-5 cm. broad, membranous, coarsely mucronate-dentate, acuminate, entire and cuneate at the base, essentially glabrous on both surfaces, dark green above, pale beneath; inflorescence racemose, terminal, 10-30 cm. long, glabrous or slightly pubescent; flowers short-pedicellate, almost sessile; bracts linear-lanceolate, about 5 mm. long; bracteoles about one-third as long as the bracts; calyx 10-13 mm. long, finely pubescent; fruit of two cocci coherent at the base, cocci almost cylindrical, slightly exerted beyond the calyx, beak short, obscure, only slightly contracted at the base, dorsal surface ridged from base to apex, commissural surface plane or slightly convex, smooth.

Distribution: Brazil.

Specimens examined:

Peru: in hedge-rows, La Merced, 19-24 Aug., 1923, *Macbride* 5304 (F).

Bolivia: Junction of Rivers Beni and Madre de Dias, Aug., 1886, *Rusby* 915 (F, M, US, G); near Cochabamba, 1891, *Bang* 2001 (CC).

Brazil: Minas Geraes, 31 Oct., 1856. *Regnell* 340 (US).

7. *B. pseudochascanum* (Walp.) Grenzebach, n. comb.

*B. laetevirens* Schauer<sup>3</sup> in DC. Prodr. 11: 557. 1847, and in Mart. Fl. Bras. 9: 196. 1847-1851.

<sup>1</sup> Examination of specimens of *B. pseudogervæ* from Bolivia and Peru show them to have a slightly longer and more attenuate beak than the specimens studied from Brazil, but this difference is not great enough in the material at hand to warrant even varietal differentiation.

<sup>2</sup> Although Vellozo used the specific name *fluminensis* in referring to this species in his 'Flora Fluminensis' in 1827, yet the illustration is unaccompanied by a description, and it seems advisable, therefore, to retain the name *pseudogervæ*.

<sup>3</sup> It is impossible to separate *B. laetevirens* and *B. incrassata* specifically. The

(?) *B. incrassata* Lange, Ind. Sem. Hort. Haun. 31. 1870; Bot. Tidssk. 8: 3. 1874-1876.

*Stachytarpheta pseudochascanum* Walp. Rep. 4: 11. 1844.

Stems somewhat ligneous, terete, glabrous at the base; branches obtusely 4-angled, erect-spreading, pubescent; leaves short-petiolate, ovate to subrotund or elliptical-ovate, 2-7 cm. long, 1.5-3 cm. broad, serrate, acute to subobtuse, entire, cuneate at the base, young leaves pubescent on both surfaces, glabrate except along the nerves beneath; petioles 6-12 mm. long; inflorescence racemose, terminal or axillary, 14-30 cm. long, pubescent; flowers short-pedicellate; bracts subulate, short, a little longer than the pedicels; bracteoles minute; calyx about 8-9 mm. long, almost truncate at the apex, teeth very short, triangular, slightly pubescent, ciliate, occasionally splitting along one side; fruit separating into two cocci at maturity except at the slightly coherent base, about one-third longer than the calyx, beak short, attenuate, dorsal surface ridged, commissural surface plane, almost smooth.

Distribution: Ecuador.

Specimens examined:

Ecuador: Caragues, 23 June, 1923, *Anthony & Tate 87* (US).

8. *B. incisa* Rusby in Bull. N. Y. Bot. Gard. 4: 432. 1907.

Stem somewhat ligneous, glabrous to slightly pubescent, terete below, purplish, finely striate, branched; branches somewhat 4-angled; leaves short-petiolate, ovate, 5-12 cm. long, 2-4 cm. broad, upper half somewhat incisely serrate toward the apex or rarely entire, acuminate, entire at the apex and base, glabrous or slightly pubescent on both surfaces, especially along the nerves on the under side, green above, pale beneath; racemes terminal, 1-3 dm. long; flowers shortly and stoutly pedicellate; bracts about 3 mm. long, subulate, pubescent; bracteoles about one-third as long as the bracts; calyx about 1.5 cm. long, pubescent, cylindrical, recurved in anthesis, erect in fruit; corolla-tube nearly 2 cm. long, strongly recurved, limb broad; fruit about 1.5 cm. long, the two cocci slightly coherent at the base, beak short,

descriptions of the two are practically the same, and the excellent illustrations in Bot. Tidssk. 8: t. 2. 1874-1876, and in Mart. Fl. Bras. 9: t. 33. 1847-1851, show them to be the same in all essential details.

dim



rather inconspicuous, dorsal surface slightly ridged, commissural surface plane, smooth.

Distribution: Bolivia.

Specimens examined:

Bolivia: without exact locality and date of collection, *Bang 2226* (CC, TYPE M, G, F).

9. *B. linifolia* Gray in Am. Jour. Sci. II. 16: 98. 1853; Torr. in U. S. & Mex. Bound. Surv. 2: 126. 1859; Gray, Syn. Fl., ed. 2, 2': 335. 1886; Coult. Bot. Western Texas, 326. 1891-1894.

Stem simple or fastigiately branched from a somewhat woody base, 3-6 dm. high, glabrous; branches rigid, striate, sulcate, very leafy; leaves sessile or nearly so, linear to linear-lanceolate, 2-4.5 cm. long, 2-5 cm. broad, acute at both ends; racemes terminal or axillary, 4-15 cm. long, loosely flowered; pedicels about 2 mm. long; bracts linear to linear-lanceolate, 2-3 mm. long, somewhat longer than the pedicels; calyx 10-13 mm. long, slender, glabrous; corolla large, limb wide-spreading; fruit separating into two distinct cocci, barely included in the calyx, pubescent along the margin, dorsal surface ridged, commissural surface smooth or nearly so, beak pointed, villous.

Distribution: western and southern Texas.

Specimens examined:

Texas: west Texas to El Paso, New Mexico, May-Oct., 1849. *Wright 449* (US); valley of the Rio Grande below Donana, date lacking, *Emory 814* (US); dry calcareous hillsides, Montell, Uvalde County, 15 Oct., 1917, *Palmer 13007* (M); Neuces River, date lacking, *Havard 1383* (M); San Pedro, coll. of 1851-1852, *Wright 1509* (M, US).

10. *B. spatulata* Torr. in U. S. & Mex. Bound. Surv. 2: 126. 1859; Gray, Syn. Fl., ed. 2, 2': 335. 1886; Coult. Bot. Western Texas, 326. 1891-1894.

Distinctly ligneous, 3-6 dm. high, usually branched; branches terete, softly pubescent, very leafy; leaves sessile, obovate, spatulate, 5-18 mm. long, 3-7 mm. broad, entire, obtuse, acute at the base, coriaceous, scabrous; spikes terminal, short, loosely flowered; flowers divergent from the rachis; bracts leaf-like, oblanceolate, about three-fourths the length of the calyx; calyx

8-11 mm. long, scabrous-pubescent; corolla much exceeding the calyx; fruit separating into two distinct cocci at maturity, not exerted above the calyx, dorsal and commissural surfaces smooth, beak pointed, pubescent, margins of the fruit also pubescent.

Distribution: western Texas and northern Mexico.

Specimens examined:

Texas: mountains east of Tornillo Creek, Aug., 1883, *Havard* 96 (US); Canyon Boquillas, 3 Aug., 1919, *Hanson* 718 (US).

Coahuila: Sierra de la Poila, Oct., 1910, *Purpus* 4750 (F, M, G).

#### LIST OF EXCLUDED SPECIES

*Bouchea adenostachya* Schauer in DC. Prodr. 11: 560. 1847 = Chascanum.

*B. caespitosa* Pearson in Trans. S. Afr. Phil. Soc. 15: 178. 1904 = Chascanum.

*B. cernua* Schauer in DC. Prodr. 11: 559. 1847 = Chascanum cernuum Meyer, Comm. 1: 276. 1897.

*B. copiapensis* Gay, Hist. Chile 5: 26. 1849 = *Priva cuneato-ovata* (Cav.) Rusby.

*B. cuneifolia* Schauer in DC. Prodr. 11: 559. 1847 = Chascanum cuneifolium Meyer, Comm. 1: 276. 1897.

*B. garepensis* Schauer in DC. Prodr. 11: 560. 1847 = Chascanum garepense Meyer, Comm. 1: 277. 1897.

*B. glandulifera* Pearson in Fl. Cap. 5: 204. 1901. = Chascanum.

*B. Hanningtonii* Oliver in Hook. Ic. Pl. t. 1446 = Chascanum.

*B. hederacea* Sond. in Linnaea 23: 86. 1850 = Chascanum.

*B. incisa* Pearson in Trans. S. Afr. Phil. Soc. 15: 180. 1904 = Chascanum.

*B. integrifolia* Pearson in Trans. S. Afr. Phil. Soc. 15: 179. 1904 = Chascanum.

*B. Krookii* Guerke in Ann. Nat. Hofmus. 20: 45. 1905 = Chascanum.

*B. latifolia* Harv. Thes. Cap. 2: 57. = Chascanum.

*B. longipetala* Pearson in Fl. Cap. 5: 199. 1901 = Chascanum.

*B. marrubiiifolia* Schauer in DC. Prodr. 11: 558. 1847 = Chascanum.

*B. namaquana* Bolus, ex Pearson in Fl. Cap. 5: 204. 1901 = Chascanum.

*B. pinnatifida* Schauer in DC. Prodr. 11: 560. 1847 = Chascanum pinnatifidum Meyer, Comm. 1: 277. 1897.

*B. pumila* Schauer in DC. Prodr. 11: 500. 1847 = Chascanum pumilum Meyer, Comm. 1: 277. 1897.

*B. rariflora* Chiov. in Ann. Bot. Roma 9: 127. 1911 = Chascanum.

*B. Schlechteri* Guerke in Notiz. K. Bot. Gart. Berlin 3: 75. 1903 = Chascanum.

*B. sessilifolia* Vatke in Linnaea 43: 529. 1880-1882 = Chascanum.

*B. Wilmsii* Guerke in Notiz. K. Bot. Gart. Berlin 3: 74. 1903 = Chascanum.

#### DOUBTFUL SPECIES

*B. hyderabadensis* Walp. Rep. 4: 12. 1844, is a species not sufficiently known for definite specific determination.

#### LIST OF EXSICCATAE CITED

Distribution numbers are in *italics*. The numbers in parentheses are those of the species in the present revision. Collections distributed without numbers are indicated by a dash.

- |  |  |
|--|--|
| Abbott, W. L. 558 (2).                               | Dugès, A. 500 (2).                       |
| Alexander, R. C.—(2c).                               | Eggers, Baron H. F. A. 114 (2).          |
| Alvarez, C. 747 (2b).                                | Emory, W. H. 814 (9).                    |
| Anthony, H. E. & Tate, G. H. H. 87 (7).              | Ervendberg, L. C. 102 (2a); 280 (2).     |
| Arsène, Bro. G. 4, 2857, 3040, 3489, 9997 (2b).      | Faris, J. A. 189, 199 (2).               |
| Baker, C. E. & Wilson, 524 (2c).                     | Fendler, A. 853 (2).                     |
| Bang, A. M. 2001 (6a); 2226 (8).                     | Furness, D. R.—(2b).                     |
| Blanchet, J. S. 5731 (5).                            | Gaumer, G. F. 1139, 1160 (2).            |
| Bourgeau, E. 545 (2b).                               | Goll, G. P. 689 (2).                     |
| Britton, N. L. & Brace, L. J. K. 782 (2c).           | Hanson, H. C. 718 (10).                  |
| Britton, N. L., Cowell, J. F. & Brown, S. 5378 (2c). | Harris, Wm. 11798 (2c).                  |
| Britton, N. L. & Millsbaugh, C. F. 5796 (2c).        | Harshberger, J. W. 51 (2); 158 (2b).     |
| Britton, N. L. & Wheller, W. M. 259 (2).             | Havard, V. 96 (10); 1583 (9).            |
| Combs, R. 154 (2c).                                  | Heller, A. A. 6109 (2).                  |
| Curtiss & West,—(2c).                                | Hitchcock, A. S.—(2c).                   |
| Deam, C. C. 173 (3).                                 | Leonard, E. C. 2852, 2981, 5219 (2c).    |
|  | Macbride, J. F. 5304 (6).                |
|  | Maxon, W. P. & Killip, E. P. 314 (2c).   |
|  | Miller, O. O. & Johnston, J. R. 205 (2). |
|  | Nelson, E. W. 1597 (2c); 2807 (3).       |

Ortega, J. G. 621 (4).

Palmer, E. 104, 261, 416, (2b); B, 259, 1485 (4).

Palmer, E. J. 13007 (9).

Parry, C. C. & Palmer, Ed. 716 (2b).

Pennell, F. W. 10825 (2).

Pittier, E. 72 (2).

Pittier, H. 833, 5830, 5832, 9720 (2); 7887 (2c).

Pringle, C. G. 325, 994, 7941 (2b).

Purpus, C. A. 485 (2); 3405 (2b); 4750 (10).

Raunkiner, C. 1108 (2).

Regnell, A. A. 340 (6).

Ricksecker, Mrs. Rev. J. J. 409 (2).

Rose, Mr. & Mrs. J. N. 22012 (2).

Rose, J. N. & Hay, R. 5943, 6229 (2).

Rose, J. N., Painter, J. H. & Rose, J. S. 9570 (2b).

Rusby, H. H. 49 (2); 915 (6a).

Schimper, W. 1012 (1).

Schumann, W. 232 (2).

Seler, Caec. and E. E. 3957 (2c).

Shafer, J. A. 1364, 2861 (2c).

Sintenis, P. 211F (2).

Smith, J. D. 2965 (2b).

Smith, L. C. 411 (2c).

Standley, P. C. 21620 (2b).

Thurber, G. 1094 (2b).

Underwood, L. M. & Griggs, R. F. 585 (2).

von Türckheim, H. 2532 (2).

Wright, C. 449, 1509 (9); 1508, (2b); 3660 (2c).

INDEX TO SPECIES

New species, varieties, and combinations are printed in **bold face** type; synonyms in *italics*; and previously published names in ordinary type.

	PAGE		PAGE
Bouchea . . . . .	76	pseudogervad . . . . .	85
agrestis . . . . .	84	pterygoearpa . . . . .	78
dissecta . . . . .	84	spatulata . . . . .	87
Ehrenbergii . . . . .	78	Chascanum . . . . .	71
incisa . . . . .	86	Denisiaes . . . . .	76
incrassata . . . . .	86	Stachytarpheta	
lactesirens . . . . .	85	bifurca . . . . .	78
linifolia . . . . .	87	pseudochascanum . . . . .	86
Nelsonii . . . . .	83	Verbena	
prismatica . . . . .	78	fluminensis . . . . .	85
prismatica var. brevirostra . . . . .	80	prismatica . . . . .	78
prismatica var. laciniata . . . . .	80	pseudogervad . . . . .	85
prismatica var. longirostra . . . . .	81	Zapania prismatica . . . . .	78
pseudochascanum . . . . .	85		

EXPLANATION OF PLATE

PLATE 8

Geographical distribution of the genus *Bouchea*.

The generic distribution of the genus *Bouchea* is shown by the outlined areas. ¶ The specific distribution is indicated by numerals which correspond to the numbers of the various species as treated in this revision.

- |                           |                              |
|---------------------------|------------------------------|
| 1. <i>B. pterygocarpa</i> | 6. <i>B. pseudogervod</i>    |
| 2. <i>B. prismatica</i>   | 7. <i>B. pseudochascanum</i> |
| 3. <i>B. Nelsonii</i>     | 8. <i>B. incisa</i>          |
| 4. <i>B. dissecta</i>     | 9. <i>B. linifolia</i>       |
| 5. <i>B. agrestis</i>     | 10. <i>B. spathulata</i>     |



For class use in Geography, History, Civics, Economics  
Copyright

GRENZER



## EXPLANATION OF PLATE

## PLATE 9

*Bouchea prismatica* (Jacq.) Kuntze

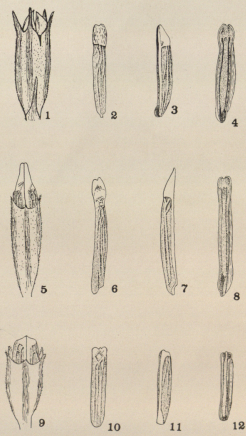
- Fig. 1. Mature cocci within persistent calyx,  $\times 5$ .  
Fig. 2. Mature coccus, dorsal surface,  $\times 5$ .  
Fig. 3. Mature coccus, side view,  $\times 5$ .  
Fig. 4. Mature coccus, commissural surface,  $\times 5$ .

*Bouchea prismatica* var. *longirostra*

- Fig. 5. Mature cocci within persistent calyx,  $\times 5$ .  
Fig. 6. Mature coccus, dorsal surface,  $\times 5$ .  
Fig. 7. Mature coccus, side view,  $\times 5$ .  
Fig. 8. Mature coccus, commissural surface,  $\times 5$ .

*Bouchea prismatica* var. *brevirostra*

- Fig. 9. Mature cocci within persistent calyx,  $\times 5$ .  
Fig. 10. Mature coccus, dorsal surface,  $\times 5$ .  
Fig. 11. Mature coccus, side view,  $\times 5$ .  
Fig. 12. Mature coccus, commissural surface,  $\times 5$ .



GRENZEBACH—REVISION OF BOUCHEA

## EXPLANATION OF PLATE

## PLATE 10

## A

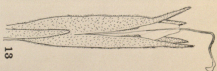
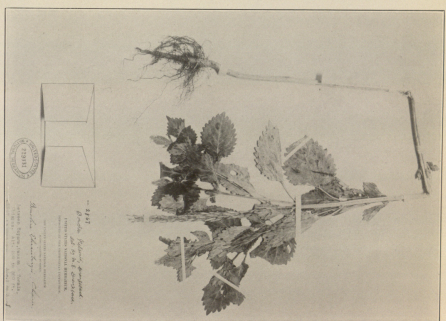
*Bouchea Nelsonii* Grenzbach

Southern Mexico and Guatemala

From the type specimen, *Nelson 2867*, in the United States National Herbarium.

## B

Fig. 13. Mature cocci within persistent calyx,  $\times 5$ .Fig. 14. Mature coccus, dorsal surface,  $\times 5$ .Fig. 15. Mature coccus, side view,  $\times 5$ .Fig. 16. Mature coccus, commissural surface,  $\times 5$ .



## EXPLANATION OF PLATE

## PLATE 11

*Bouchea pseudogera* (St. Hilaire) Cham.

Fig. 17. Mature cocci within persistent calyx,  $\times 5$ .

Fig. 18. Mature cocci, side view,  $\times 5$ .

Fig. 19. Mature coccus, dorsal surface,  $\times 5$ .

Fig. 20. Mature coccus, commissural surface,  $\times 5$ .

*Bouchea pseudogera* (St. Hilaire) Cham. (showing the more attenuate character of the beak of the fruit)

Fig. 21. Mature cocci within persistent calyx,  $\times 5$ .

Fig. 22. Mature cocci, side view,  $\times 5$ .

Fig. 23. Mature coccus, dorsal surface,  $\times 5$ .

Fig. 24. Mature coccus, commissural surface,  $\times 5$ .

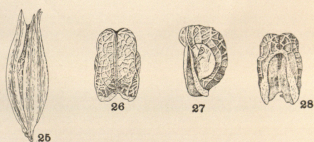
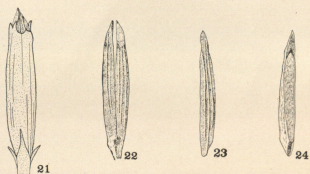
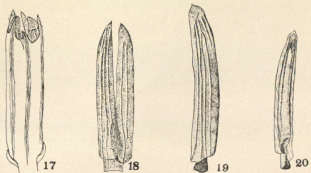
*Chascanum cernuum* Meyer

Fig. 25. Mature fruit within persistent calyx,  $\times 5$ .

Fig. 26. Mature fruit, dorsal surface,  $\times 5$ .

Fig. 27. Mature fruit, side view,  $\times 5$ .

Fig. 28. Mature fruit, commissural surface,  $\times 5$ .



GRENZEBACH—REVISION OF BOUCHEA



## EXPLANATION OF PLATE

## PLATE 12

Open calyces.

Fig. 29. *B. prismatica* (Jacq.) Kuntze,  $\times 5$ .Fig. 30. *B. prismatica* var. *brevirostra*,  $\times 5$ .Fig. 31. *B. Nelsonii* Grenzebach,  $\times 5$ .Figs. 32, 33. *B. pseudogervasi* (St. Hil.) Cham.,  $\times 5$ .Fig. 34. *Chascanum cernuum* Meyer,  $\times 5$ .



Grenzebach, Myrle. 1926. "A Revision of the Genus *Bouchea* (Exclusive of *Chascanum*).*" Annals of the Missouri Botanical Garden* 13, 71–100.

<https://doi.org/10.2307/2394056>.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/86340>

**DOI:** <https://doi.org/10.2307/2394056>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/4194>

#### **Holding Institution**

Missouri Botanical Garden, Peter H. Raven Library

#### **Sponsored by**

Missouri Botanical Garden

#### **Copyright & Reuse**

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.