

Tribe 1. VERNONIEAE

BY HENRY ALLAN GLEASON

Heads homogamous, hermaphrodite, 1-many-flowered. Scales of the involucre loosely or closely imbricate in few or several spiral series, or in decussate pairs, or rarely few and not imbricate. Receptacle flat or subconvex, normally smooth or pitted, rarely hairy, bristly, or chaffy. Corolla white to red or blue, never yellow, frequently glandular without, regularly toothed or lobed, or rarely irregularly lobed (*Elephantopus* and allied genera) or subligulate (*Stokesia*). Anthers sagittate at base or in some genera subcaudate. Branches of the style slender, tapering, acute, hairy without, stigmatose within, or fused nearly to the apex. Achenes terete, subterete, 10-angled, or 10-costate, or by reduction or interposition 3-20-costate or angled. Pappus none, or of bristles, of scales, or of both scales and bristles, in one or more series. Annual or perennial herbs, shrubs, vines, or small trees, with alternate or scattered (rarely opposite), simple, entire or serrate, sessile or petiolate leaves.

Heads separate

- Pappus an entire or minutely denticulate cartilaginous ring; stems herbaceous.
- Pappus-bristles none; achenes 1-2 mm. long; involucre 5 mm. high or less. 1. STRUCHIUM.
- Pappus-bristles present within the cartilaginous ring; achenes 1 cm. long; involucre about 2 cm. high. 2. PACOURINA.
- Pappus of short caducous bristles; outer involucre scales foliaceous; heads many-flowered; diffusely branched herbs with petioled serrate leaves. 3. CENTRATHERUM.
- Pappus persistent, or somewhat deciduous in a few species with 1-10-flowered heads, of scales, of bristles, or of scales and bristles; stems herbaceous or woody.
- Corollas regularly lobed, tubular.
- Receptacle not chaffy.
- Foliage glabrous or pubescent, but not lepidote.
- Pappus-bristles in one or more series, essentially uniform in length.
- Leaves all basal. 4. LACHNORHIZA.
- Leaves chiefly cauline. 5. LEIBOLDIA.
- Stems woody; leaves densely tomentose beneath.
- Stems herbaceous; leaves thinly pubescent beneath. 6. CYANTHILLIUM.
- Pappus in two series, the outer series of scales or bristles and much shorter than the inner.
- Inner pappus of numerous terete or slightly flattened bristles.
- Heads 5-many-flowered; scales of the involucre persistent, spreading or reflexed at maturity. 7. VERNONIA.
- Heads 1-8-flowered, in rounded corymboid clusters; scales of the involucre deciduous before or with the achenes. 8. EREMOSIS.
- Inner pappus of a few linear scales; heads 2-flowered. 9. OLIGANTHES.
- Foliage lepidote; woody plants with 4-8-flowered heads.
- Scales of the outer pappus conrescent into a short tube with lacrose margin; inner pappus of a few bristles. 10. EKMANIA.
- Scales or bristles of the outer pappus distinct.
- Outer pappus of broad scales, the inner of twisted linear scales. 11. PIPTOCOMA.
- Outer pappus of linear scales, the inner of bristles. 12. PIPTOCARPHA.
- Receptacle chaffy; floccose or tomentose herbs with large, many-flowered heads. 13. BOLANOSA.
- Corollas irregularly lobed, appearing subligulate; stems herbaceous. 14. STOKESIA.

Heads aggregated into secondary capitula or glomerules

- Corolla 5-cleft; style deeply 2-lobed; involucre scales 8 or more.
- Pappus-bristles all alike, straight.
- Pappus-bristles numerous, not enlarged at base. 15. ORTHOPAPPUS.

Pappus-bristles about 5, dilated and flattened at the base.
 Pappus-bristles dissimilar, two of them longer and conduplicate near the apex.
 Corolla 3-5-toothed; style-branches short; involucre scales only 2-5.
 Involucral scales 2; pappus a persistent toothed crown.
 Involucral scales 5; pappus of deciduous separate scales.

16. ELEPHANTOPUS.
 17. PSEUDELEPHANTOPUS.
 18. ROLANDRA.
 19. SPIRACANTHA.

1. **STRUCHIUM** P. Br.; J. St. Hil. Expos. Fam. 1: 406. 1805.

Stems annual, herbaceous, erect, simple or sparingly branched, with short internodes. Leaves alternate, petiolate, pinnately veined. Heads small, many-flowered, single or clustered in the axils of the leaves. Involucre hemispheric, its scales numerous, imbricate in several series, scarious at the margin, the outer ones shorter. Receptacle naked, subconvex. Corolla tubular, purple, regularly 3-4-lobed. Anthers sagittate, acuminate at base. Styles slender. Achenes 3-4-angled and ribbed, glabrous or minutely glandular, truncate at the apex, surmounted by a persistent, shallowly lobed or entire cartilaginous crown.

Type species, *Ethulia sparganophora* L.

1. **Struchium sparganophorum** (L.) Kuntze, Rev. Gen. 366. 1891.

Ethulia sparganophora L. Sp. Pl. ed. 2. 1171. 1763.
Sparganophorus Vaillantii Crantz, Inst. 1: 261. 1766.
Struchium herbaceum P. Br.; J. St. Hil. Expos. Fam. 1: 406. 1805.
Sparganophorus Struchium Poir. in Lam. Encyc. 7: 302. 1806.
Sparganophorus fasciatus Poir. in Lam. Encyc. 7: 302. 1806.
Struchium americanum Poir. in Lam. Encyc. 7: 475. 1806.

Plant erect, 2-10 dm. high, usually unbranched; stems puberulent or glabrate; leaf-blades thin, bright-green, linear-lanceolate to oblanceolate or elliptic, 5-12 cm. long, 1-4 cm. wide, acuminate at both ends, sharply serrate, glabrous above, minutely strigose and glandular-punctate beneath; petioles slender, 1-2 cm. long; heads sessile in small axillary clusters, about 50-flowered; involucre hemispheric, 4-5 mm. high, the scales appressed and rather closely imbricate at the base, abruptly acuminate into a slender or spinulose tip, scarious on the margin; achenes oblong, quadrangular, ribbed at the angles, 1.5-2 mm. long, the crown nearly white, half the length of the achene.

TYPE LOCALITY: India.

DISTRIBUTION: West Indies, southern Mexico, and Central America; also in tropical South America; introduced into Africa.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 670; P. Br. Hist. Jam. pl. 34, f. 2; Gaertn. Fruct. pl. 165; Jacq. f. Eclog. Pl. pl. 131.

2. **PACOURINA** Aubl. Pl. Guian. 2: 800. 1775.

Haynea Willd. Sp. Pl. 3: 1787. 1804.
Pacourinopsis Cass. Bull. Soc. Philom. 1817: 151. 1817.

Tall, erect, nearly glabrous herbs, with large, thin, dentate or runcinate, alternate, thistle-like leaves on winged petioles, and large, axillary, sessile, many-flowered heads. Involucre broadly depressed-hemispheric, its scales scarious, appressed, and closely imbricate at the base in many series, herbaceous and spreading at the apex. Receptacle flat, naked. Corolla regular, 5-cleft, the slender tube dilated below. Anthers sagittate, the lobes obtuse at the base. Styles slender, long-exserted. Achenes prismatic, elongate, glandular, obscurely 10-ribbed, tipped with a minute, denticulate or entire, cartilaginous ring, with about two inner rows of short, deciduous, hispid bristles more or less connected at the base.

Type species, *Pacourina edulis* Aubl.

1. **Pacourina edulis** Aubl. Pl. Guian. 2: 800. 1775.

Haynea edulis Willd. Sp. Pl. 3: 1787. 1804.
Pacourinopsis integrifolia Cass. Bull. Soc. Philom. 1817: 151. 1817.
Pacourinopsis dentata Cass. Bull. Soc. Philom. 1817: 151. 1817.
Pacourina cirsiifolia H. B. K. Nov. Gen. & Sp. 4: 30. 1818.
Vernonia edulis Steud. Nom. Bot. ed. 2. 2: 753. 1841.
Pacourina edulis spinosissima Britton, Ann. N. Y. Acad. Sci. 7: 132. 1893.

Stems 1-2 m. tall, thinly pubescent or nearly glabrous; leaf-blades narrowly oblong to broadly elliptic, oblanceolate, or ovate, 15-20 cm. long, 5-8 cm. wide, deeply and irregularly

serrate or runcinate with spinous teeth, or nearly entire, acute or acuminate, nearly glabrous on both sides, narrowed below into a winged petiole 2-3 cm. long and auriculate at its base; heads chiefly in the upper axils, 3 cm. wide and high; involucre scales broadly ovate-oblong; achenes linear, 1 cm. long, glandular.

TYPE LOCALITY: French Guiana.

DISTRIBUTION: Santo Domingo and Nicaragua; also in South America.

ILLUSTRATIONS: Lam. Tab. Encyc. *pl.* 665; Aubl. Pl. Guian. *pl.* 316.

3. CENTRATHERUM Cass. Dict. Sci. Nat. 7: 383. 1817.

Ampherephis H.B.K. Nov. Gen. & Sp. 4: 31. 1818.

Spixia Schrank, Pl. Rar. Hort. Monac. *pl.* 80. 1821.

Stems herbaceous, diffusely branched, with alternate, petioled, serrate leaves and peduncled heads, usually terminating the branches. Involucre hemispheric to broadly campanulate; its scales in several series, the outer foliaceous and spreading, the intermediate and inner erect and appressed, membranous or scarious. Heads many-flowered. Receptacle subconvex, naked or foveolate. Corolla tubular, regular, deeply 5-cleft, purplish or blue. Anthers sagittate, obtuse at the base. Style-branches slender. Achenes 8-10-ribbed. Bristles of the pappus few to many, short, caducous.

Type species, *Centratherum punctatum* Cass.

Inner scales obtuse or rounded at the apex, ciliate-denticulate with glandular hairs and more or less glandular on the back.

Inner scales rounded to aristate, the margin minutely glandular or not at all, arachnoid or tomentose on the back.

Inner scales obtuse or acute, mucronate or aristate, the intermediate ones with awns 2 mm. or more in length.

Inner scales obtuse or rounded, the intermediate ones with awns less than 1 mm. long or none.

1. *C. violaceum*.

2. *C. punctatum*.

3. *C. muticum*.

1. *Centratherum violaceum* (Schrank) Gleason.

Spixia violacea Schrank, Pl. Rar. Hort. Monac. *pl.* 80. 1821.

Ampherephis intermedia Link & Otto, Ic. Pl. Sel. 65. 1822.

Centratherum intermedium Less. Linnaea 4: 320. 1829.

Baccharoides violaceum Kuntze, Rev. Gen. 320. 1891.

Stems erect, with ascending branches, 3-5 dm. high, stout, somewhat angled, puberulent; leaves 3-4 cm. long, 1-1.8 cm. wide, the blades thin, ovate to oblong-ovate, obtuse or subacute, deeply crenate-serrate, glabrous above, puberulent beneath, abruptly arcuately narrowed at base into a long margined petiole; heads on terminal peduncles; outer involucre scales 5-9, 15-25 mm. long, foliaceous, resembling the foliage leaves in shape and texture; intermediate scales scarious, ovate to ovate-lanceolate, acuminate into a prominent awn, glabrous except some arachnoid tomentum near the base of the awn; inner scales rounded to subacute at the apex, ciliate with short glandular hairs and somewhat glandular on the back; achenes obovoid, prominently ribbed.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Martinique and Guadeloupe; also in northern South America.

ILLUSTRATIONS: Link & Otto, Ic. Pl. Sel. *pl.* 29; Schrank, Pl. Rar. Hort. Monac. *pl.* 80.

2. *Centratherum punctatum* Cass. Dict. Sci. Nat. 7: 384. 1817.

Ampherephis aristata H.B.K. Nov. Gen. & Sp. 4: 32, 1818.

Baccharoides punctatum Kuntze, Rev. Gen. 320. 1891.

Stems erect, 2-5 dm. high, puberulent to tomentulose, especially above; leaf-blades firm, lanceolate to oblong-lanceolate, 2-3 cm. long, 4-7 mm. wide, acute, serrulate or entire, attenuate at base into a margined petiole, thinly pubescent and glandular-punctate on both sides; outer involucre scales foliaceous, narrowly oblanceolate, serrulate or entire, little exceeding the head; intermediate scales pubescent near the tip, abruptly narrowed into an awn 2-4 mm. long; inner scales obtuse or acute, spinulose-denticulate, mucronate or short-awned.

TYPE LOCALITY: Isthmus of Panama.

DISTRIBUTION: Panama; also in Colombia.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. *pl.* 314.

3. **Centratherum muticum** (H. B. K.) Less. *Linnaea* 4: 320. 1829.

Ampherephis mutica H.B.K. *Nov. Gen. & Sp.* 4: 32. 1818.

Baccharoides muticum Kuntze, *Rev. Gen.* 320. 1891.

Stems thinly pubescent below, cinereous and branching above, 5–8 dm. high; leaf-blades rather thick and firm, narrowly ovate or ovate-oblong, 15–20 mm. long, 5–7 mm. wide, sharply serrate, gradually attenuate at base, puberulent on both sides, resinous beneath; outer involucre scales equaling or a little longer than the heads, the intermediate acute or with short awns, the inner obtuse to rounded, not glandular-ciliate, glabrous below, glandular on the back toward the apex.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Mexico and Central America; also in South America.

ILLUSTRATION: H.B.K. *Nov. Gen. & Sp. pl.* 315.

4. **LACHNORHIZA** A. Rich.; *Sagra, Hist. Cuba* 11: 34. 1850.

Scapose, puberulent, perennial herbs, with leaves on winged petioles arising from a densely woolly crown and with 1–4 many-flowered *Vernonia*-like heads in a terminal corymbiform cluster. Involucral scales imbricate in a few series, glandular, the outer short, the inner much elongate and uniform in length. Receptacle flat, naked. Corolla tubular, regular, 5-cleft, gradually enlarged upwards, glandular-dotted. Anthers sagittate. Style-branches slender. Achenes prismatic, with 10 low ribs, glabrous or nearly so. Pappus capillary, of numerous bristles in one series.

Type species, *Lachnorhiza piloselloides* A. Rich.

1. **Lachnorhiza piloselloides** A. Rich.; *Sagra, Hist. Cuba* 11: 34. 1850.

Lachnorhiza asteroides Griseb. *Cat. Pl. Cub.* 152. 1866.

Vernonia piloselloides Maza, *Anal. Soc. Esp. Hist. Nat.* 19: 269. 1890.

Vernonia piloselloides asteroides Maza, *Anal. Soc. Esp. Hist. Nat.* 19: 269. 1890.

Leaf-blades linear-spatulate to oblong-spatulate, 5–14 cm. long including the petiole, 1–2 cm. wide, acute or obtuse, entire, gradually narrowed below into a margined pubescent petiole, essentially glabrous on both sides and more or less glandular-dotted, the lateral veins obscure; scape erect, puberulent, 15–40 cm. high, bearing a few subulate bracts; involucre campanulate, 8 mm. high; scales all erect, loosely imbricate in a few series, pubescent and glandular on the back, the outer triangular-lanceolate, the inner narrowly oblong to oblong-lanceolate, acute; achenes 4–5 mm. long, glabrous or nearly so on the ribs, densely resinous in the shallow furrows; pappus tawny, 7 mm. long.

TYPE LOCALITY: Isle of Pines.

DISTRIBUTION: Cuba and the Isle of Pines.

5. **LEIBOLDIA** Schlecht. *Linnaea* 19: 742. 1847.

Shrubs with pubescent or tomentose stems and large rugose leaves, usually scabrous above and tomentose beneath. Heads few, large, many (100 or more)-flowered, crowded in dense corymbiform clusters. Involucre broadly campanulate or hemispheric, the scales numerous, acuminate, imbricate in many series. Receptacle flat or subconvex, naked. Corolla regular, the tube slender, gradually enlarged upwards, with deeply 5-cleft limb. Anthers sagittate, obtuse at the base. Style-branches slender. Achenes glabrous, prominently 5-angled, without lower intermediate ribs, surmounted by a narrow or broad callus-ring. Pappus in 2–3 series, capillary, its bristles all equal or nearly so, at least not in two unequal series.

Type species, *Vernonia Leiboldiana* Schlecht.

Scales prominently carinately nerved; achenes tipped with a narrow callus-ring. 1. *L. Leiboldiana*.

Scales not prominently nerved; achenes usually tipped with a broad callus-ring. 2. *L. serrata*.

1. **Leiboldia Leiboldiana** (Schlecht.) Gleason, *Bull. N. Y. Bot. Gard.* 4: 103. 1906.

Vernonia Leiboldiana Schlecht. *Linnaea* 19: 742. 1847.

Leiboldia ovata Schlecht. *Linnaea* 19: 742, as synonym. 1847.

Cacalia Leiboldiana Kuntze, *Rev. Gen.* 970. 1891.

Stems stout, strongly angled, 1-2 m. high, sparingly branched, densely cinereous-tomentose; leaf-blades thick, subcoriaceous, obovate, 14-24 cm. long, 7-12 cm. wide, acute or abruptly short-acuminate, sharply mucronately serrate, regularly tapering to a rounded, truncate, or subcordate base, dull-green and scabrous above, densely and softly cinereous beneath, sessile or short-petioled, with prominent veins and reticulate veinlets; heads numerous, sessile or nearly so, crowded; involucre hemispheric to broadly campanulate, 16 mm. high, scales erect, tomentose, especially near the base, the outer ovate, the inner oblong-linear, regularly tapering to a long, acuminate, carinately veined tip; achenes 2.5 mm. long, sharply 5-angled, sometimes with secondary intermediate ribs, surmounted by a narrow callus-ring; pappus white, fragile, 10 mm. long.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico.

2. *Leiboldia serrata* (D. Don) Gleason, Bull. N. Y. Bot. Gard. 4:
164. 1906.

Diazeuxis serrata D. Don, Trans. Linn. Soc. 16: 254. 1830.
Vernonia arctioides Less. Linnaea 6: 400. 1831.
Leiboldia arctioides Schlecht. Linnaea 19: 743. 1847.

Stems shrubby, thinly cinereous-tomentose; leaf-blades firm, broadly obovate-elliptic, 12-18 cm. long, 5-8 cm. wide, acute, finely and sharply serrate, with an intramarginal row of brownish or purple callosities, rounded at the nearly sessile base, scabrellate above, densely gray-tomentose beneath, the veins prominent, reticulate; inflorescence crowded, 6-15 cm. broad; peduncles about 5 mm. long; involucre broadly campanulate, 15-18 mm. high; scales acute, thickly tomentose or arachnoid, closely imbricate in many series, not carinately veined, the outer triangular-ovate, acute, the inner linear, long-acuminate; achenes glabrous, 2.5 mm. long, surmounted by a yellowish callus-ring about 0.5 mm. wide; pappus pale-brown to nearly white, rather caducous, 10 mm. long.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico.

6. **CYANTHILLIUM** Blume, Bijdr. 889. 1826.

Isonema Cass. Bull. Soc. Philom. 1817: 152. 1817.
Cyanopsis Blume, Fl. Jav. 1: vi. 1828.
Cyanopsis Endl. Ench. 232. 1841.
Claotrachelus Zoll. & Mor.; Zoll. Nat. Arch. Neêrl.-Indië 2: 565. 1845.

Stems herbaceous, erect, leafy, freely branched. Leaves alternate, petiolate, pinnately veined. Heads small, homogamous, many-flowered, in loose corymbiform clusters at the ends of the branches. Involucre hemispheric, the scales imbricate in many series, rigid, aristate, erect. Receptacle flat, alveolate. Corolla blue or purple, 5-cleft. Anthers and styles as in *Vernonia*. Achenes glabrous, 4-5-angled, truncate. Pappus capillary, fragile or caducous, its bristles equal, minutely barbellate.

Type species, *Conyza chinensis* Lam.

1. *Cyanthillium chinense* (Lam.) Gleason, Bull. Torrey
Club 40: 306. 1913.

Conyza chinensis Lam. Encyc. 2: 83. 1786.
Conyza patula Ait. Hort. Kew. 3: 184. 1789.
Centratherum chinense Less. Linnaea 4: 320. 1829.
Vernonia chinensis Less. Linnaea 6: 105, 674. 1831.
Cacalia patula Kuntze, Rev. Gen. 324. 1891.

Stems erect, freely branched, 4-8 dm. high, glabrate or thinly pubescent; leaf-blades thin, spreading, broadly ovate, 6-10 cm. long, 3-7 cm. wide, acute, serrate, abruptly contracted at base into a petiole 2-3 cm. long, nearly glabrous above, thinly pubescent beneath; upper leaves smaller and narrower; heads peduncled in clusters of 2-5, or single at the end of long peduncles; involucre broadly campanulate to hemispheric, 6-7 mm. high; scales closely imbricate at base, erect or somewhat spreading at the apex, green with a scarious margin,

thinly strigose and resinous; achenes glabrous, 1.5–2 mm. long; pappus nearly white, 3 mm. long.

TYPE LOCALITY: East Indies and China.

DISTRIBUTION: Tropical Asia; introduced into Guadeloupe.

7. VERNONIA Schreb. Gen. 2: 541. 1791.

Suprago Gaertn. Fruct. 2: 402. 1791.

Baccharoides Moench, Meth. 578. 1794.

Ascaricida Cass. Dict. Sci. Nat. 3: Suppl. 38. 1816.

Lepidaploa Cass. Bull. Soc. Philom. 1817: 66. 1817.

?*Achyrocoma* Cass. Dict. Sci. Nat. 26: 21. 1823.

Seneciodes Post & Kuntze, Lex. Gen. Phan. 2: 515. 1903.

Annual or perennial herbs, shrubs, vines, or small trees, with alternate or scattered simple leaves. Stems usually leafy, branching at least above. Inflorescence typically of scorpioid cymes which are terminal or from the upper axils, by branching becoming paniculate or corymbiform, or reduced to solitary, terminal or axillary heads. Heads homogamous, 5–many-flowered. Involucre narrowly campanulate or subcylindric to broadly hemispheric; in most species urceolate with constricted throat but becoming campanulate to hemispheric under pressure. Involucral scales loosely or closely imbricate in few or many series, the inner progressively longer, persistent and spreading at maturity (except section *Stenocephalum*). Receptacle flat or subconvex. Corolla regular, the limb 5-cleft. Anthers sagittate at base, rounded or subacute, not prolonged into caudate appendages. Achenes ribbed or ribless, truncate. Pappus in two series, the outer short, of scales or bristles, the inner capillary, of terete or slightly flattened bristles.

Type species, *Serratula noveboracensis* L.

Involucral scales stiff, erect, appressed at base, prolonged into a spreading or recurved spinose tip; heads cylindrical, 5-flowered, opposite the axils; corolla-lobes with parallel sides and triangular tips.

Outer involucral scales appressed at base, terminated by a foliaceous, green, membranous, veiny, flattened appendage; heads many-flowered; leaves coarsely and sharply serrate; an Asiatic herb introduced into North America.

Involucral scales neither spiny nor green and foliaceous.

Achenes terete, ribless or faintly ribbed; inner pappus-bristles deciduous; annual herb.

Achenes 10-ribbed; inner pappus-bristles persistent.

I. STENOCEPHALUM.

II. STENGELIA.

III. TEPHRODES.

IV. LEPIDAPLOA.

I. STENOCEPHALUM

One species in Mexico.

1. *V. jucunda*.

II. STENGELIA

One species in the West Indies.

2. *V. anthelmintica*.

III. TEPHRODES

One species in Mexico, Central America, the West Indies, and southern Florida.

3. *V. cinerea*

IV. LEPIDAPLOA

Heads all or chiefly subtended by foliaceous bracts, in simple or compound racemiform or spiciform cymes or in capitate clusters.

Heads in elongate or contracted cymes.

Achenes pubescent or hirsute.

Involucral scales acute to subulate.

Leaf-blades glabrous or puberulent to densely sericeous beneath, but not tomentose.

Cymes elongate or contracted, many-headed; bracteal leaves smaller than the cauline.

Leaf-blades lanceolate or broader, flat or only slightly revolute; inflorescence ample, terminal or subterminal.

Heads 11–29-flowered.

Involucres 6–11 mm. high, the outer scales subulate and loosely spreading; species of Cuba, Mexico, and Central America.

Leaf-blades obtuse, bullate above, densely tomentose beneath.

Leaf-blades acute or acuminate, hirsute, pubescent, or glabrate beneath.

40. *V. pineticola*.

- Leaves of an oblong type, broadest above the middle, attenuate to an obtuse or acute base.
- Leaves 8-12 cm. long, softly and densely hirsute beneath. 4. *V. argyropappa*.
- Leaves 6 cm. long or less.
- Involucral scales and lower leaf-surface resinous-dotted. 5. *V. remotiflora*.
- Involucral scales and lower leaf-surface not resinous-dotted. 6. *V. acilepis*.
- Leaf-blades of an ovate or lanceolate type, broadest below the middle, obtuse or rounded at the base.
- Upper leaf-surface not resinous. 7. *V. hirsutivena*.
- Upper leaf-surface conspicuously dotted with resin. 8. *V. ctenophora*.
- Involucres 4-7 mm. high, the outer scales not distinctly spreading; species of the West Indies.
- Lower leaf-surface more or less strigose-pubescent or sericeous but not whitened.
- Pappus-bristles white.
- Outer involucral scales subulate-tipped, with a prominent carinate midnerve. 9. *V. icosantha*.
- Outer involucral scales lanceolate, acuminate, without a carinate midnerve. 12. *V. arborescens*.
- Pappus-bristles tawny or pale-brown.
- Leaf-blades firm, ovate to oblong-lanceolate, acute or acuminate. 11. *V. borinquensis*.
- Leaf-blades thin, elliptic, obtuse. 16. *V. membranacea*.
- Lower leaf-surface whitened beneath, densely sericeous or strigose-pubescent.
- Heads 11-13-flowered.
- Leaf-blades narrowly oblong-lanceolate to ovate; pappus-bristles usually tawny; species of Porto Rico and St. Thomas. 10. *V. sericea*.
- Leaf-blades broadly ovate, firm in texture; pappus-bristles white; species of Jamaica. 13. *V. permollis*.
- Heads 18-21-flowered; species of Cuba.
- Leaf-blades broadly elliptic to oblong-ovate, veiny. 14. *V. gnaphaliifolia*.
- Leaf-blades narrowly oblong with parallel sides, without conspicuous lateral veins. 15. *V. angustata*.
- Heads large, many-flowered; leaves without resinous dots; species of Mexico.
- Inner involucral scales obtuse or rounded, the outer only acute.
- Inner involucral scales constricted below a dilated tip 2-3 mm. wide; leaf-blades papillose-scabrous above. 17. *V. Schiedeana*.
- Inner involucral scales narrowed to a tip 1 mm. wide or less; leaf-blades glabrous and shining above. 18. *V. Seemanniana*.
- Inner involucral scales sharply acuminate. 19. *V. vernicosa*.
- Leaf-blades linear to linear-oblong, not more than 1 cm. wide, revolute, sericeous or pubescent beneath; inflorescence normally oblong, of short divaricately spreading cymes from the upper axils.
- Leaf-blades linear-lanceolate, 4-10 mm. wide, with evident lateral veins. 14. *V. gnaphaliifolia*.
- Leaf-blades linear-lanceolate, 3-5 mm. wide, one-nerved; middle and outer involucral scales glabrate; pappus-bristles pale purplish-brown. 20. *V. racemosa*.
- Leaf-blades linear, 1-4 mm. broad, one-nerved; involucral scales densely strigose; pappus-bristles pale-brown to nearly white.
- Leaf-blades merely pubescent beneath, not sericeous. 21. *V. commutata*.
- Leaf-blades densely sericeous beneath, not punctate above; heads 18-21-flowered.

- Involucral scales densely villous throughout, the inner ones frequently with a broad, pale, scarios margin; involucral glands none or concealed.
- Involucral scales thinly villous above, distinctly resinous-glandular, the scarios margin narrow or none.
- Leaf-blades revolute to the midvein, concealing the hairs, impressed-punctate above; heads 11-flowered.
- Cymes short and compact, few-headed, divaricately spreading from the upper axils; heads about 18-21-flowered.
- Leaves lanceolate or ovate-lanceolate, acuminate.
- Pappus-bristles pale-tawny, 4-5 mm. long.
- Pappus-bristles white, 6.5-7 mm. long.
- Leaves ovate-lanceolate to elliptic, subacute to obtuse or retuse.
- Cymes undifferentiated, the heads solitary or paired in the axils of the upper foliage leaves; corolla-lobes pubescent externally.
- Leaf-blades tomentose beneath.
- Leaf-blades not papillose-pubescent above; cymes much contracted and few-headed.
- Leaf-blades broadest much above the middle, gradually attenuate to the base.
- Leaf-blades spatulate.
- Leaf-blades obcordate.
- Leaf-blades broadest at or near the middle, not conspicuously attenuate to the base.
- Leaf-blades 10-20 mm. long, entire, flat, acute or mucronate.
- Leaf-blades rotund or nearly so, 5-15 mm. long and wide, undulate, sometimes complicate.
- Leaf-blades papillose-pubescent above; inflorescence of elongate or contracted cymes.
- Leaf-blades thin, flat, not prominently veined; bracteal leaves distinctly smaller than the cauline.
- Leaf-blades broadly elliptic.
- Leaf-blades narrowly oblong.
- Leaf-blades thick, reticulately veined, more or less rugose or bullate above; bracteal leaves nearly or quite equaling the cauline, or gradually reduced above.
- Cymes very flexuous; leaf-blades 10-20 mm. long.
- Cymes straight or nearly so.
- Leaf-blades oval to elliptic-oblong, obtuse or narrowed at the base, rugose and finely papillose-pubescent above.
- Leaf-blades less than twice as long as wide, very blunt or rounded at the apex.
- Leaf-blades about three times as long as wide, narrowed to an obtuse or subacute apex.
- Leaf-blades lanceolate or ovate, broadest near the truncate or subcordate base, strongly rugose and bullate above.
- Inner involucral scales broadest just below the middle; leaves acute or barely obtuse; cymes elongate.
- Inner involucral scales broadest near the base; leaves obtuse or rounded; cymes short.
- Leaf-blades brown-tomentose beneath; inner involucral scales merely acute.
- Leaf-blades gray-tomentose beneath; inner involucral scales sharply acuminate.
- Leaf-blades ovate-lanceolate, acuminate, flat; heads crowded.
- Involucral scales obtuse.
- Leaf-blades tomentose beneath.
- Leaf-blades glabrous to strigose-pubescent beneath.
- Heads 5-18-flowered; leaves resinous-dotted; pappus-bristles conspicuously flattened; Jamaican species.
22. *V. stenophylla*.
23. *V. angustissima*.
24. *V. corallophila*.
25. *V. longifolia*.
26. *V. Shaferi*.
27. *V. albicaulis*.
28. *V. gracilis*.
29. *V. bahamensis*.
30. *V. obcordata*.
31. *V. arbuscula*.
32. *V. complicata*.
14. *V. gnaphaliifolia*.
15. *V. angustata*.
33. *V. fruticosa*.
34. *V. calophylla*.
35. *V. vicina*.
36. *V. leptoclada*.
37. *V. calida*.
38. *V. semitalis*.
39. *V. parvuliceps*.
41. *V. desiliens*.

- Involucre campanulate, its scales more or less spreading when dry; heads 11-18-flowered.
Leaves acute or acuminate.
Leaf-blades lanceolate to ovate, acuminate; principal involucre scales villous throughout.
- Leaf-blades broadly ovate, acute or subacuminate; principal involucre scales thinly villous below to almost glabrous at the tip.
- Leaves very blunt; principal involucre scales ciliate at the apex with black hairs.
- Involucre subcylindric, its coriaceous scales not spreading when dry; heads 5-8-flowered.
- Heads many-flowered; leaves not resinous-dotted; pappus-bristles terete or nearly so; species of Mexico and Central America.
- Inner involucre scales constricted below a dilated tip 2-3 mm. wide; leaf-blades papillose-scabrous above.
- Inner involucre scales narrowed to a tip 1 mm. wide or less; leaf-blades glabrous and shining above.
- Achenes glabrous.
Achenes 1.5-2 mm. long; Porto Rican plant with slender flexuous cymes.
- Achenes 3-5 mm. long; species of Cuba and Hispaniola, with stout cymes.
- Heads all peduncled.
- Heads sessile.
- Involucre scales erect or appressed.
Leaf-blades thin or firm, not coriaceous and shining.
Leaf-blades glabrous or puberulent beneath.
Leaf-blades villous beneath.
Leaf-blades tomentose beneath.
Inner involucre scales obtuse or subacute.
Inner involucre scales apiculate.
Leaf-blades narrowly oblong, entire or nearly so.
Leaf-blades elliptic-oblong, sharply serrate.
- Leaf-blades thick, coriaceous and shining.
Involucre campanulate; heads with 18 or more flowers.
- Involucre cylindric; heads 8-flowered.
- Involucre scales loose and spreading, recurved, reflexed, or squarrose.
Leaf-blades thin, not coriaceous nor shining; involucre scales elongate, subulate.
- Leaf-blades thick, coriaceous, shining; inner involucre scales cuspidate.
- Heads closely aggregated in capitate or subcapitate clusters; bracteal leaves approximating the cauline in size; species of Cuba and Hispaniola.
- Leaf-blades glabrous above, tomentose beneath, not glandular-punctate.
- Leaf-blades glandular-punctate on one or both sides.
Achenes thinly pubescent; scales of the outer pappus nearly or quite 1 mm. long.
- Achenes glabrous or nearly so, frequently glandular; scales of the outer pappus 0.4-0.6 mm. long.
- Leaf-blades tomentulose beneath; heads 11-flowered; pappus strongly tinged with rose.
- Leaf-blades minutely puberulent or glabrous beneath; pappus yellowish or tawny; heads 8-flowered.
- Involucre subcylindric or narrowly campanulate, the inner scales erect.
- Involucre funnel-form, the inner scales widely spreading.
- Heads not bracteate, or with subulate bracts only, in simple or branched scorpioid cymes or in branched clusters.
- Heads chiefly or all sessile, in simple or branched scorpioid cymes; species all tropical.
- Cymes elongate, straight or curved, simple or only sparingly branched.
Outer pappus of bristles not wider than those of the inner series and not evidently flattened.
- Outer pappus of flattened scales.

42. *V. acuminata*.43. *V. expansa*.44. *V. rigida*.45. *V. pluvialis*.17. *V. Schiedeana*.18. *V. Seemanniana*.11. *V. borinquensis*.46. *V. Sprengeliana*.47. *V. Sagraeana*.48. *V. viminalis*.49. *V. fallax*.50. *V. aceratoides*.51. *V. inaequiserrata*.52. *V. Valenzuelana*.53. *V. purpurata*.54. *V. aronifolia*.55. *V. Wrightii*.56. *V. yunquensis*.57. *V. segregata*.58. *V. Tuerckheimii*.59. *V. domingensis*.60. *V. buxifolia*.61. *V. pallescens*.

- Cymes curved; leaf-blades abruptly narrowed to the base; pappus white, the scales of the outer series 0.7 mm. long.
- Cymes straight or nearly so; leaf-blades gradually narrowed to an obtuse base; pappus pale-brown, the scales of the outer series 0.3 mm. long.
- Cymes freely branched, numerous, forming a paniculate or corymbiform inflorescence.
- Involucral scales villous with ascending hairs, the middle ones triangular-subulate; pappus white.
- Leaf-blades sericeous-hirsute and resinous-dotted beneath.
- Leaf-blades tomentose beneath.
- Involucral scales arachnoid or ciliate, the middle ones acute to rounded, not subulate.
- Leaf-blades tomentose or tomentulose beneath; heads 18-21- (rarely 13-) flowered.
- Achenes pubescent but not glandular; pappus-bristles tawny, 4 mm. long.
- Achenes glandular and pubescent; pappus-bristles white or very pale-brown, 6 mm. long.
- Leaf-blades pubescent on the surface beneath with short conic hairs.
- Heads 11-flowered.
- Heads 21-flowered; leaf-blades firm in texture, the veins reticulate.
- Leaf-blades obtuse or subacute, about two-fifths as wide as long, tomentulose above, not olivaceous.
- Leaf-blades acuminate, one-third to one-sixth as wide as long, puberulent with conic hairs above, olivaceous.
- Heads chiefly or all peduncled, in corymbiform or paniculate clusters, never in definitely scorpioid cymes.
- Inflorescence repeatedly and somewhat dichotomously branched, the internodes successively and uniformly shorter, producing uniform rounded panicles; involucral scales resinous; species of Cuba and the Isle of Pines.
- Heads 11-29-flowered.
- Involucre 3-5 mm. high; heads 11-18-flowered; leaf-blades scabrellate or scabrous above.
- Leaf-blades oblong-lanceolate to ovate; inflorescence regularly dichotomous.
- Leaf-blades oblanceolate to obovate; inflorescence irregularly branched.
- Involucre 5-8 mm. high; heads 18-29-flowered; leaf-blades glabrous and usually punctate above.
- Heads 5-6-(rarely 8-) flowered.
- Inflorescence umbelliform, with few to many heads, its branches aggregated or separated by short internodes; peduncles all about the same length; species of Mexico and Central America.
- Principal scales of the involucre 3-8 mm. wide, loosely spreading at least at the tip.
- Tips of the involucral scales reticulately veined.
- Outer involucral scales appressed at base.
- Leaves green and strigose-pubescent beneath.
- Leaves densely white-tomentose beneath.
- Outer involucral scales foliaceous throughout.
- Tips of the involucral scales not prominently reticulate.
- Leaves prominently reticulate and densely pubescent beneath.
- Leaves thinly pubescent to glabrous beneath, not prominently reticulate.
- Principal scales of the involucre not more than 2 mm. wide.
- Heads with 18 flowers or more; involucres 7 mm. high, or larger.
- Principal involucral scales abruptly rounded and mucronate.
- Principal involucral scales subulate with straight sides and prominent midvein.
- Principal involucral scales acute to acuminate, the midvein not prominent.
- Leaves thin, not scabrous above.
- Leaves very thick and scabrous.
- Heads with 15 (rarely 18) flowers or less.
- Involucre 7-8 mm. high; inflorescence large, pyramidal.
- Involucre 3-5 mm. high; inflorescence usually broader or depressed.
- Pubescence of the lower leaf-surface of floccose tomentum.

62. *V. scorpioides*.63. *V. brachiata*.64. *V. canescens*.65. *V. mollis*.66. *V. stellaris*.67. *V. morelana*.68. *V. Aschenborniana*.69. *V. salamana*.70. *V. patens*.71. *V. menthaefolia*.72. *V. cubensis*.73. *V. havanensis*.74. *V. hieracioides*.75. *V. Salvinae*.76. *V. mexicana*.77. *V. callilepis*.78. *V. dictyophlebia*.79. *V. Alamani*.80. *V. Conzattii*.81. *V. corymbiformis*.82. *V. Karvinskiana*.83. *V. jaliscana*.84. *V. serratuloides*.85. *V. oaxacana*.

- Pubescence of the lower leaf-surface sparse, of long or short, straight, conic hairs.
- Pubescence of the lower leaf-surface chiefly or entirely of crooked, multilocular hairs.
- Principal involucre scales abruptly acute or sub-acuminate; leaves softly pubescent or subtomentose beneath, with prominent veins.
- Principal involucre scales sharply long-acute; leaves sparsely pubescent beneath, the veins not prominent.
- Inflorescence corymbiform, its branches irregular in length; heads few to many, on peduncles of irregular length or some nearly sessile; species of northern Mexico, the United States, and the Bahama Islands.
- Heads large and many-flowered, 15–20 mm. broad; involucre scales acuminate or filiform at the tip; leaf-blades linear to lanceolate.
- Leaf-blades about 3 mm. wide, revolute, lanate beneath.
- Leaf-blades 5–20 mm. wide, flat, glabrous or nearly so.
- Heads small or medium-sized, 4–12 mm. broad, with few to many flowers.
- Involucre scales rounded to acute or abruptly short-acuminate.
- Involucre scales tomentose on the back.
- Leaves revolute, densely white-woolly beneath.
- Leaves flat, not white-woolly beneath.
- Involucre campanulate; its scales sparsely ciliate.
- Involucre hemispheric; its scales densely arachnoid-ciliate.
- Involucre scales glabrous, thinly pubescent, or arachnoid on the back.
- Outer pappus of flattened scales, nearly uniform in length, and sharply differentiated from the bristles of the inner series.
- Pubescence on the lower leaf-surface of short, straight, conic hairs, with or without longer hairs on the veins; involucre scales glandless or rarely thinly resinous-dotted.
- Leaf-blades lanceolate to ovate.
- Pappus tawny or yellowish.
- Heads 34–55-flowered.
- Leaf-blades broadly obovate-oblong or oval; involucre scales acute.
- Leaf-blades oblong-lanceolate; involucre scales acuminate.
- Heads 18–29-flowered.
- Leaf-blades pitted beneath.
- Leaf-blades narrowly lanceolate.
- Leaf-blades lanceolate to elliptic.
- Leaf-blades not pitted beneath.
- Involucre 5–6 mm. high, its scales acute to short-acuminate.
- Involucre 3–4 mm. high, its scales rounded to subacute.
- Pappus purple.
- Heads 18–29-(rarely 13-) flowered.
- Heads 8–13-flowered.
- Leaf-blades linear.
- Leaf-blades scabrous above.
- Lower leaf-surface pitted; involucre scales glabrous or nearly so; pappus tawny.
- Lower leaf-surface not pitted; pappus usually purple.
- Inner involucre scales mucronate to subacute.
- Inner involucre scales obtuse to rounded.
- Leaf-blades glabrous above or nearly so.
- Pappus purple; heads 8–13-flowered.
- Involucre 3–4 mm. high.
- Involucre 6–7 mm. high.
- Pappus tawny to white; heads 18–29-flowered.
86. *V. capreaefolia*.
87. *V. Sinclairi*.
88. *V. liatroides*.
89. *V. Bolleana*.
90. *V. crinita*.
95. *V. Lindheimeri*.
96. *V. guadalupensis*.
97. *V. Reverchonii*.
92. *V. Schaffneri*.
93. *V. Greggii*.
94. *V. texana*.
91. *V. Ervendbergii*.
103. *V. ovalifolia*.
104. *V. flaccidifolia*.
105. *V. altissima*.
106. *V. gigantea*.
94. *V. texana*.
98. *V. angustifolia*.
99. *V. dissimilis*.
106. *V. gigantea*.
100. *V. concinna*.

- Leaves chiefly basal, the blades broadest above the middle; achenes dark-dotted. 101. *V. Blodgettii*.
- Leaves scattered, the blades broadest at or below the middle; achenes not dotted. 102. *V. insularis*.
- Pubescence on the lower leaf-surface and involucre scales none; leaf-blades 1-nerved, revolute, pitted beneath. 107. *V. Lettermanni*.
- Pubescence on the lower leaf-surface wholly or in part of long, crooked, slender hairs, more or less tomentose; achenes, involucre scales, and leaves resinous-dotted.
- Scales of the outer pappus very narrow, scarcely if any wider than the pappus-bristles; inner involucre scales resinous on each side of a prominent midvein.
- Heads with 34 flowers or fewer; achenes yellowish or brown.
- Principal involucre scales erect or slightly spreading, glabrous within. 108. *V. interior*.
- Principal involucre scales squarrose or recurved, pubescent within. 109. *V. Baldwini*.
- Heads with 55 flowers or more; achenes olivaceous. 110. *V. aborigina*.
- Scales of the outer pappus broad; midvein of the principal involucre scales not prominent. 111. *V. missurica*.
- Outer pappus of subulate bristles, irregular in length and not evidently differentiated from the inner bristles; leaves pitted beneath.
- Exposed portion of the largest involucre scales less than 2 mm. wide.
- Inner involucre scales subacute to rounded. 112. *V. fasciculata*.
- Inner involucre scales sharply acute to subacuminate. 113. *V. marginata*.
- Exposed portion of the largest involucre scales 2.5-3 mm. wide.
- Leaf-blades narrowly linear. 114. *V. tenuifolia*.
- Leaf-blades ovate-lanceolate. 115. *V. corymbosa*.
- Involucre scales, or some of them, long-acuminate to filiform.
- Leaves all or chiefly basal.
- Basal leaves oblong to obovate, 3-7 cm. wide. 116. *V. acaulis*.
- Basal leaves lanceolate, 1-2 cm. wide. 117. *V. georgiana*.
- Leaves all or chiefly cauline.
- Pappus tawny.
- Heads about 21-flowered; involucre scales and achenes not resinous.
- Leaf-blades 5-16 times as long as wide, serrulate or entire.
- Involucre scales loosely appressed at base, not recurved. 118. *V. scaberrima*.
- Involucre scales closely appressed at base, recurved at tip. 119. *V. recurva*.
- Leaf-blades 3-4 times as long as wide, serrate. 120. *V. pulchella*.
- Heads 34-47-flowered; achenes resinous. 121. *V. glauca*.
- Pappus purple.
- Innermost involucre scales with subulate tips 2 mm. long or less; achenes and involucre scales not resinous. 105. *V. altissima*.
- Innermost involucre scales with subulate tips 5 mm. long or more; achenes resinous.
- Heads 26-42-flowered; involucre scales ovate, abruptly tapering into the tip. 122. *V. noveboracensis*.
- Heads with 55 flowers or more; involucre scales lanceolate, gradually tapering to the tip. 123. *V. Harperi*.

1. *Vernonia jucunda* Gleason, Bull. Torrey Club 46: 248. 1919.

Stems herbaceous, erect, 4 dm. high or more, sparingly branched, densely villous when young, becoming floccose when older and eventually glabrate; leaf-blades firm, ovate-oblong, 6-8 cm. long, 3-4 cm. wide, acute or short-acuminate into a subulate tip, undulate and irregular at the entire margin, or rarely serrate, frequently somewhat revolute, narrowed to a sessile base, dark-green, rugose, and scabrous with papillose hairs or hair-bases above,

closely gray- or white-tomentose beneath; upper and bracteal leaves similar but smaller; heads 5-flowered, standing opposite and a little below each bracteal leaf which later bears a secondary head in its axil; involucre 8–10 mm. high, cylindric or narrowly campanulate, scales stiff, imbricate and appressed at base, papillose-villous, lanceolate-oblong to ovate-oblong, long-acuminate into a squarrose, subulate, glabrous, terete, callous tip; achene pubescent on the ridges, 2.5 mm. long; pappus pale-tawny, the bristles 5 mm. long, the scales trough-shaped, 1–1.1 mm. long.

TYPE LOCALITY: Sierra de Tonalá, Chiapas.

DISTRIBUTION: Chiapas.

2. *Vernonia anthelmintica* (L.) Willd. Sp. Pl. 3: 1634. 1804.

Conyza anthelmintica L. Sp. Pl. ed. 2. 1207. 1763.

Baccharcides anthelmintica Moench, Meth. 578. 1794.

Ascaricida indica Cass. Dict. Sci. Nat. 3: Suppl. 38. 1816.

Ascaricida anthelmintica Sweet, Hort. Brit. 219. 1826.

Stems herbaceous, branching, glabrous or nearly so; leaf-blades thin, bright-green, obovate to oblanceolate, 8–18 cm. long, 2–6 cm. wide, acute or somewhat acuminate, coarsely and sharply serrate with mucronate teeth, gradually tapering into the narrow sessile base, very sparsely puberulent on both sides, or essentially glabrous; heads many-flowered, all pedicelled, forming a loose, few-headed, terminal, corymbose cluster; involucre hemispheric, 10–12 mm. high; scales erect, linear-oblong, acute, glabrous or puberulent, the inner colorless and appressed, the outer colorless at the appressed base, green and foliaceous above; achenes black, hirsute, 4 mm. long; pappus tawny tinged with rose, the inner series 6 mm. long, the outer minute, of narrowly triangular scales about 0.4 mm. long.

TYPE LOCALITY: India.

DISTRIBUTION: Tropics of the Old World; introduced into Jamaica.

ILLUSTRATION: Rheede, Hort. Mal. 2: pl. 24.

3. *Vernonia cinerea* (L.) Less. Linnaea 4: 291. 1829.

Conyza cinerea L. Sp. Pl. 862. 1753.

Cacalia cinerea Kuntze, Rev. Gen. 323. 1891.

Seneciodes cinereum Kuntze; Post & Kuntze, Lex. Gen. Phan. 515. 1904.

Stems herbaceous, erect, simple or freely branched, 1–8 dm. high, glabrate below, cinereous-pubescent above; leaf-blades thin, bright-green, spreading, variable in shape from narrowly elliptic or oblanceolate to broadly ovate or triangular, 2–5 cm. long, acute or obtuse, serrate, crenate, or entire, abruptly constricted at the base into a margined petiole, cinereous-pubescent beneath; inflorescence corymbose, 2–10 cm. wide; bracteal leaves subulate; heads about 13-flowered; involucre campanulate, 3–4 mm. high; scales loosely and irregularly imbricate, thinly pubescent, the outer subulate, the inner linear-oblong, acuminate, purplish at the apex; achenes pubescent; pappus white, the inner series 5 mm. long, the outer minute.

TYPE LOCALITY: India.

DISTRIBUTION: Tropics of the Old World; introduced throughout tropical America as far north as Mexico and southern Florida.

ILLUSTRATIONS: Rheede, Hort. Mal. 10: pl. 64; Wight, Illustr. pl. 134.

4. *Vernonia argyropappa* Buek, Index Prodr. 2: v. 1840.

Vernonia Poeppigiana DC. Prodr. 5: 55. 1836. Not *V. Poeppigiana* DC. Prodr. 5: 20.

Vernonia geminiflora Poepp.; Poepp. & Endl. Nov. Gen. & Sp. 3: 42. 1845.

• *Cacalia argyropappa* Kuntze, Rev. Gen. 969. 1891.

Stems herbaceous, at least 1 m. high, sparsely hirsute-pubescent with brown hairs; leaf-blades thin but firm, obovate-lanceolate to oblong-lanceolate, 8–12 cm. long, 2–3.5 cm. wide, acuminate, entire or minutely serrulate, gradually narrowed to the almost sessile base, rugose and papillate-pilose above, softly strigose-hirsute and resinous beneath; upper leaves similar but smaller; inflorescence sparingly branched, of several divaricately spreading cymes bearing each 4–10 heads; bracteal leaves oblong to oblong-lanceolate, otherwise like the cauline, the lowest 4 cm. long, 1.2 cm. wide, the upper smaller; heads 21–34-flowered, 2–3 cm. apart; involucre broadly obconic or nearly hemispheric, 8–10 mm. high; scales subulate or the inner narrowly linear, erect, sparsely pilose; pappus white, the bristles 6–8 mm. long, the outer scales 1–1.2 mm. long; achenes 3 mm. long, hirsute.

TYPE LOCALITY: Peru?

DISTRIBUTION: Veracruz to Costa Rica; southward into South America.

5. *Vernonia remotiflora* Rich. Act. Soc. Hist. Nat. Paris
1: 112. 1792.

Conyza uniflora Mill. Gard. Dict. ed. 8. Conyza no. 13. 1768. Not *Vernonia uniflora* Schultz-Bip. 1847.

Vernonia sessiliflora Willd.; Less. Linnaea 4: 309. 1829.

Vernonia tricholepis DC. Prodr. 5: 54. 1836.

Cacalia uniflora Kuntze, Rev. Gen. 969. 1891.

Cacalia remotiflora Kuntze, Rev. Gen. 970. 1891.

Stems herbaceous, branching above, 3–6 dm. high, puberulent; leaf-blades obovate-lanceolate, 3 cm. long, 1 cm. wide, varying to narrowly linear-oblong and broadly ovate, acuminate, subentire, attenuate to a sessile base, thinly papillose-pilose above, more abundantly pilose or even sericeous and resinous-dotted beneath; cymes 10–20 cm. long, straight, erect or ascending; upper and bracteal leaves resembling the lower but smaller, 5–20 mm. long; heads 13–18-flowered, 1–2 cm. apart; involucre campanulate, 7–8 mm. high; scales straight and erect, narrowly lanceolate, sharply subulate-tipped, resinous, sparsely pilose or glabrate; achenes densely pilose, 2 mm. long; pappus white, the bristles 5 mm. long, the scales oblong, 0.8 mm. long.

TYPE LOCALITY: Cayenne.

DISTRIBUTION: South America; apparently introduced into St. Thomas.

6. *Vernonia acilepis* Benth.; Oerst. Vidensk. Meddel.
1852: 68. 1852.

Cacalia acilepis Kuntze, Rev. Gen. 969. 1891.

Stems herbaceous, erect, 3–5 dm. high, thinly pubescent; leaf-blades thin, broadly elliptic or rhombic, 4–6 cm. long, 1.5–2.5 cm. wide, short-acuminate, entire, narrowed at the base into short margined petioles, papillose-pubescent above, becoming scabrellate with the persistent hair-bases, strigose-pilose and not resinous beneath; inflorescence of 3–5 loosely spreading cymes bearing each 4–8 heads; bracteal leaves oblong to oblanceolate, 2–3 cm. long, resembling the cauline but smaller; heads about 15-flowered, 2–3 cm. apart; involucre narrowly campanulate, 8–10 mm. high; scales all erect, lanceolate, subulate-tipped, scarious at the margin, arachnoid below, thinly villous and not resinous above; achenes densely pilose, 2 mm. long; pappus nearly white, 5 mm. long.

TYPE LOCALITY: Masaya volcano, alt. about 2000 meters, Costa Rica.

DISTRIBUTION: Costa Rica.

7. *Vernonia hirsutivena* Gleason, Bull. N. Y. Bot. Gard.
4: 175. 1906.

Stems herbaceous, appressed-pubescent; leaf-blades thin, ovate-lanceolate, 7–9 cm. long, 3–4 cm. wide, or the upper smaller, acute or short-acuminate, entire, obtuse to rounded at the base, papillose-pubescent or becoming scabrellate above, resinous-dotted and softly papillose-strigose to sericeous beneath, especially on the veins; petioles 3 mm. long; inflorescence small, of a few sparingly branched cymes from the upper axils; bracteal leaves small and frequently none; heads 21-flowered; involucre nearly hemispheric, 6–7 mm. high; scales loosely imbricate, erect or somewhat spreading, the outer narrow, subulate, densely hirsute, the inner narrowly oblong, acuminate, pubescent or subtomentose at the tip; achenes hirsute; pappus white, the bristles 6 mm. long, flattened and twisted, the scales broad and conspicuous, 1 mm. long.

TYPE LOCALITY: Yot Tzonot, Yucatan.

DISTRIBUTION: Yucatan.

8. *Vernonia ctenophora* Gleason, Bull. Torrey Club
46: 243. 1919.

Stems herbaceous, at least 4 dm. high, thinly pubescent and resinous-dotted; leaves sessile or with short petioles, the blades thin, ovate-lanceolate, acuminate, entire, obtuse or

rounded at the base, the largest 5 cm. long, 2 cm. wide, thinly puberulent and conspicuously glandular-dotted above, closely and finely gray-pubescent and resinous on the surface beneath and sparsely pubescent on the midvein and the obscure lateral veins; inflorescence of 2-3 elongate, erect, terminal or subterminal cymes; bracteal leaves resembling the cauline and progressively smaller, the upper only 15-20 mm. long; heads 2-3.5 cm. apart, 18-21-flowered; involucre campanulate, 6-7 mm. high scales irregularly but closely imbricate, thinly pubescent with dark hairs and sparsely resinous, the outer and middle with appressed bases and subulate tips, the inner linear-oblong, abruptly acuminate and usually subulate; achenes thinly pubescent, 1.5 mm. long; pappus white, the bristles 4 mm. long, the scales very narrow, 0.6 mm. long, sharply ciliate with salient teeth.

TYPE LOCALITY: Apazota, Campeche.

DISTRIBUTION: Campeche.

9. *Vernonia icosantha* DC. Prodr. 5: 49. 1836.

Vernonia divaricata Less. Linnaea 4: 306. 1829. Not *V. divaricata* Sw. 1806.

Vernonia arborescens divaricata Griseb. Fl. Brit. W. Ind. 353. 1861.

Cacalia arborescens divaricata Kuntze, Rev. Gen. 323. 1891.

Vernonia ventosa Gleason, Bull. N. Y. Bot. Gard. 4: 179. 1906.

Vernonia arborescens Ekman, Ark. Bot. 13¹⁵: 41. 1914. Not *V. arborescens* Sw. 1806.

Stems shrubby, branching above, 1-3 m. high, finely striate, appressed-pubescent; leaf-blades thin, oblong to ovate-lanceolate, 5-10 cm. long, 1.2-4 cm. wide, acute or short-acuminate, entire, broadly obtuse or rounded at the base, sparsely papillose-pubescent above, densely or thinly strigose-pubescent and more or less resinous-dotted beneath; cymes numerous, terminal and in the upper axils, 5-20 cm. long; bracteal leaves lanceolate to oblong, the lower much exceeding the involucre, the upper reduced in size; heads sessile, 1-2 cm. apart, 21-flowered, involucre broadly campanulate to hemispheric, 5-6 mm. high; scales loosely imbricate, erect or a little spreading, the outer linear-lanceolate, subulate, the inner oblong-lanceolate, sharply acute or acuminate; achenes pubescent; pappus-bristles white, 5 mm. long, the scales conspicuous, white, 1 mm. long.

TYPE LOCALITY: Martinique.

DISTRIBUTION: Martinique, Guadeloupe, St. Vincent, Santa Lucia, Bequia.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 2, f. 1.

10. *Vernonia sericea* Rich. Act. Soc. Hist. Nat. Paris 1: 112. 1792.

Lepidaploa phyllostachya Cass. Dict. Sci. Nat. 26: 16. 1823.

Vernonia arborescens DC. Prodr. 5: 48, in part. 1836.

Vernonia Berteriana DC. Prodr. 5: 52. 1836.

Vernonia arborescens Lessingiana Griseb. Fl. Brit. W. Ind. 353. 1861.

Cacalia arborescens Lessingiana Kuntze, Rev. Gen. 323. 1891.

Cacalia sericea Kuntze, Rev. Gen. 971. 1891.

Vernonia phyllostachya Gleason, Bull. N. Y. Bot. Gard. 4: 176. 1906.

Vernonia venusta Gleason, Bull. N. Y. Bot. Gard. 4: 177. 1906.

Stems herbaceous or suffruticose, erect, 6-10 dm. high, freely branched above, strigose-pubescent; leaf-blades thin, bright-green, divaricately spreading, narrowly oblong-lanceolate to ovate, 3-8 cm. long, 1-4 cm. wide, acute, entire, obtuse to rounded or rarely attenuate at the base, papillose-strigose above, sericeous-pubescent and resinous beneath, on petioles 2-5 mm. long; bracteal leaves oblong-elliptic, the uppermost equaling or somewhat exceeding the heads; cymes long and slender, forming a lax terminal panicle; heads 11-13-flowered; involucre campanulate, 4-5 mm. high; scales loosely and irregularly imbricate, narrowly oblong-lanceolate, sharply acute, thinly villous below, glabrate in the middle, puberulent or villous at the apex, not resinous; achenes 2 mm. long, hirsute; pappus brown or rarely white, 4-5 mm. long, the scales narrow, spreading, brown to white, 0.4-0.6 mm. long.

TYPE LOCALITY: French Guiana (error).

DISTRIBUTION: Porto Rico, American Virgin Islands, Tortola.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 4, f. 5.

11. *Vernonia borinquensis* Urban, Symb. Ant. 3: 390. 1903.

Vernonia borinquensis Stahlii Urban, Symb. Ant. 3: 391. 1903.

Vernonia borinquensis resinosa Gleason, Bull. Torrey Club 46: 236. 1919.

Vernonia borinquensis hirsuta Gleason, Bull. Torrey Club 46: 236. 1919.

Stems shrubby, climbing, 5–30 dm. high, branching above, striate, slender, glabrous or nearly so; leaves spreading or somewhat reflexed, the blades firm, ovate to oblong-lanceolate, 3–6 cm. long, 13–35 mm. wide, acuminate, entire, somewhat revolute, rounded or obtuse at the base, minutely and sparsely papillose-pubescent and becoming scabrous above, pubescent with short curved hairs or occasionally sericeous, and usually resinous-dotted beneath; petioles 2–5 mm. long; inflorescence lax and open, of numerous, divaricately spreading, freely branched, flexuous cymes 5–15 cm. long; bracteal leaves resembling the cauline in shape, the lower 2.5–3.5 cm. long, reduced above, the upper equaling or barely exceeding the involucre; heads 1–2 cm. apart, about 18-flowered; involucre 6 mm. high, turbinate-campanulate; scales loosely imbricate, the outer somewhat spreading, acuminate, glabrous or nearly so, the inner sparsely strigose-pubescent; achenes 1.5–2 mm. long, densely pubescent or rarely glabrous; pappus tawny, the bristles 5 mm., the scales 0.5–1.1 mm. long.

TYPE LOCALITY: Mt. Guvuy, near Utuado, Porto Rico.

DISTRIBUTION: Porto Rico.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 2, f. 7.

12. *Vernonia arborescens* (L.) Sw. Fl. Ind. Occ. 1320. 1806.

Conyza arborescens L. Syst. Nat. ed. 10. 1213. 1759.

Vernonia divaricata Sw. Fl. Ind. Occ. 1319. 1806.

Vernonia arborescens Swartziana Griseb. Fl. Brit. W. Ind. 353. 1861.

Vernonia intonsa Gleason, Bull. N. Y. Bot. Gard. 4: 182. 1906.

Vernonia albicoma Gleason, Bull. N. Y. Bot. Gard. 4: 185. 1906.

Vernonia amaranthina Gleason, Bull. Torrey Club 40: 307. 1913.

Cacalia arborescens Kuntze, Rev. Gen. 323. 1891.

Stems shrubby, tall and erect, freely branching above, pubescent, becoming glabrate or puberulent with age; leaf-blades very variable, thin or firm, elliptic or ovate-lanceolate, 2–10 cm. long, 1–4 cm. wide, obtuse to short-acuminate, entire or repand, acute or rounded at base, flat or somewhat rugose, papillose-pubescent with short strigose hairs or scabrellate with persistent hair-bases above, sparingly pubescent to sericeous with papillose hairs, resinous-dotted, and prominently reticulately veined beneath; inflorescence expanded or contracted, the cymes usually short and crowded; bracteal leaves much reduced in size or none; heads 11–29-flowered; involucre campanulate, 4–6 mm. high; scales loosely and irregularly imbricate in few series, not resinous, the outer sharply acute to nearly subulate, villous, the inner narrowly lanceolate, subacute to acuminate, villous at base and apex or throughout; achenes densely hirsute; pappus white, the bristles 4–5 mm. long, the scales 0.6–0.8 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 2, f. 6.

13. *Vernonia permollis* Gleason, Bull. N. Y. Bot. Gard. 4: 181. 1906.

Stems shrubby, branching, nearly terete, coarsely tomentose-pubescent; leaf-blades firm, broadly ovate, 6–9 cm. long, 3–5 cm. wide, acute or abruptly short-acuminate, entire, broadly rounded or subcordate at base, rugose above and finely scabrous-pubescent with impressed veins, softly and densely sericeous-villous beneath with gray or brown hairs, which are most abundant along the veins; petioles tomentose, 5–7 mm. long; upper leaves similar but smaller; inflorescence hemispheric or pyramidal; cymes short, crowded, irregularly branching, bearing few heads; bracteal leaves much shorter than the involucre or occasionally wanting; heads sessile, crowded, 11-flowered; involucre campanulate, 4–5 mm. high; scales loosely and irregularly imbricate, the outer lanceolate, acuminate, sparsely pubescent, the inner oblong-lanceolate, sharply acute to acuminate, the exposed portion glabrous or with a tuft of hairs near the tip; achenes densely pubescent; pappus-bristles white, 4–5 mm. long, the outer scales 0.6–0.8 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Higher mountains of Jamaica.

14. *Vernonia gnaphaliifolia* A. Rich. in Sagra, Hist.
Cuba 11: 34. 1850.

Vernonia arborescens Griseb. Cat. Pl. Cub. 144. 1866. Not *V. arborescens* Sw. 1806.

Vernonia sublanata Gleason, Bull. N. Y. Bot. Gard. 4: 177. 1906.

Vernonia crassinervia Wright; Gleason, Bull. N. Y. Bot. Gard. 4: 180. 1906.

Vernonia gnaphaliifolia platyphylla Gleason, Bull. Torrey Club 46: 238. 1919.

Stems herbaceous or suffruticose, 1 m. high or less, slender, thinly pubescent; leaf-blades broadly elliptic to oblong-obovate or oblong-lanceolate, 3–5 cm. long, 1–2 cm. wide or rarely narrower, acute or obtuse, entire or undulate, usually somewhat revolute, narrowed to an acute or obtuse base, rugose and papillose-hirsute above, or scabrous with the persistent hair-bases, closely gray-pubescent, resinous beneath the hairs, and veiny beneath (leaf-blades flat, broadly elliptic and tomentose beneath in the variety); petioles 3–4 mm. long; inflorescence divaricately branched, the cymes lax, 5–15 cm. long, somewhat crowded in the upper axils, bearing 3–6 heads; bracteal leaves oblong, the upper equaling the involucre, the lower twice as long; heads 1–2 cm. apart, about 21-flowered; involucre hemispheric, 7 mm. high; scales loosely and irregularly imbricate, narrowly lance-oblong, sharply acute, green with a scarious margin, villous below, becoming glabrate at the middle and puberulent at the apex; achenes densely pubescent, 3 mm. long; pappus white or very pale-brown, the bristles 5 mm., the scales 0.7 mm. long.

TYPE LOCALITY: Near Canasi, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 4, f. 1, 2

15. *Vernonia angustata* Gleason, Bull. Torrey Club 40: 309. 1913.

Vernonia sublanata angustata Gleason, Bull. N. Y. Bot. Gard. 4: 177. 1906.

Stems herbaceous, slender, puberulent or thinly pubescent, sparingly branched above; leaf-blades thin, flat, spreading, narrowly oblong with parallel sides, 3–5 cm. long, 4–8 mm. wide, obtuse or rounded, mucronate, entire, acute at the base, thinly pubescent above, thinly gray-tomentulose and resinous-dotted beneath, one-nerved; petioles 1–2 mm. long; cymes few, widely spreading or horizontal, simple or sparingly branched, bearing each 2–7 heads separated by internodes 1–2 cm. long, depressed or gently curved between the heads; bracteal leaves like the cauline but gradually reduced in size, the upper only 1 cm. long; heads about 18-flowered; involucre broadly campanulate, 6–7 mm. high; scales loosely and irregularly imbricate, strigose-pubescent especially at the base and apex, thinly resinous-dotted, acuminate or sharply acute, the outer lanceolate, the inner narrowly oblong; achenes pubescent, 2 mm. long; pappus white, the bristles 6 mm., the scales 0.9 mm. long.

TYPE LOCALITY: Santiago, Cuba.

DISTRIBUTION: Cuba.

16. *Vernonia membranacea* Griseb. Cat. Pl. Cub. 144. 1866.

Stems suffrutescent, 5–10 dm. high, freely branched above, finely pubescent or glabrate; leaf-blades thin, spreading, broadly elliptic or ovate-oblong, 5–8 cm. long, 2.5–4 cm. wide, obtuse or subacute, entire, obtuse at the base, sparsely papillose-puberulent and not resinous above, closely and finely appressed-pubescent and resinous beneath, on petioles 3–5 mm. long; bracteal leaves elliptic-oblong, the lower 2–3 cm. long, the upper equaling the heads; cymes short, spreading, sparingly branched; heads 1–2 cm. apart, secund, about 21-flowered; involucre campanulate, 6–7 mm. high; scales appressed, closely imbricate, green with a scarious margin, the outer lance-subulate, the inner linear-oblong, sharply acute, thinly villous or appressed-strigose and glandular at the tip; achenes hirsute, 2 mm. long; pappus-bristles pale-brown, 5.5 mm. long, the scales very irregular in width, paler in color, 0.5 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 4, f. 3.

17. *Vernonia Schiedeana* Less. *Linnaea* 6: 399. 1831.

? *Vernonia fragrans* Llave & Lex. *Nov. Veg. Descr.* 1: 24. 1824.

Cacalia Schiedeana Kuntze, *Rev. Gen.* 970. 1891.

? *Cacalia fragrans* Kuntze, *Rev. Gen.* 970. 1891.

Stems shrubby, climbing, 1–3 m. high, softly pubescent; leaf-blades thick, firm, coriaceous, oblong-lanceolate, 10–15 cm. long, 2–5 cm. wide, abruptly acuminate, entire, narrowed to an obtuse base, papillose-scabrous above and puberulent on the veins, papillose-strigose or merely puberulent beneath; petioles 5–10 mm. long; inflorescence freely branched, of numerous, lax, divaricate or recurved cymes; bracteal leaves resembling the cauline but much smaller; heads about 40-flowered; involucre broadly campanulate, 8–10 mm. high, the outer and middle scales sharply acute or acuminate with a prominent elevated midvein, essentially glabrous, the inner scales oblong, ciliate, somewhat constricted near the apex and terminated by a flat, broadly rounded or emarginate tip 2–3 mm. wide, incurved in bud and spreading at anthesis; achenes hirsute, 2.5 mm. long; pappus pale straw-color or nearly white, the bristles 7–8 mm. long, the outer scales linear, 1–2 mm. long.

TYPE LOCALITY: Papantla [Veracruz].

DISTRIBUTION: Vera Cruz to Honduras.

18. *Vernonia Seemanniana* Steetz; *Seem. Bot. Voy. Herald* 139.
1854.

Cacalia Seemanniana Kuntze, *Rev. Gen.* 970. 1891.

Stems shrubby, climbing, pubescent; leaf-blades subcoriaceous, ovate-lanceolate to oblong-lanceolate, 8–10 cm. long, 2.5–4 cm. wide, sharply acuminate, entire and frequently somewhat revolute, rounded or obtuse at the base, rugose, glabrous and shining above, resinous-dotted and minutely puberulent beneath, especially along the prominently reticulate veins; inflorescence of numerous spreading cymes 1–2 dm. long; heads 10–15 mm. apart; involucre broadly campanulate, 6–8 mm. high; scales closely imbricate, the outer triangular-lanceolate, ciliate and pubescent, with a prominent midvein, the inner narrowly lanceolate, gradually tapering to a flat, obtuse and mucronate or acute, abruptly spreading tip less than 1 mm. wide; achenes hirsute with erect white hairs, 2 mm. long; pappus nearly white, the bristles 5 mm. long, the scales white and shining, nearly 1 mm. long.

TYPE LOCALITY: Chiriqui volcano, Veraguas, Costa Rica.

DISTRIBUTION: Costa Rica.

19. *Vernonia vernicosa* Klatt, *Bull. Soc. Bot. Belg.*
35: 294. 1896.

Vernonia vernicosa comosa Greenman, *Proc. Am. Acad.* 30: 93. 1903.

Stems shrubby, glabrous or thinly pubescent; leaf-blades coriaceous, oblong-lanceolate to ovate, 6–10 cm. long, 2–4 cm. wide, acute or short-acuminate, entire, rounded at the base, glabrous on both sides, or rarely strigose-hirsute, pitted below; petioles 3–4 mm. long; upper leaves somewhat smaller; inflorescence loose, the cymes few, flexuous and spreading; bracteal leaves oblong, puberulent or pilose beneath, the largest 3 cm. long; heads about 50-flowered, 1–2 cm. apart; involucre campanulate, 10 mm. high; scales regularly imbricate, firm or coriaceous, with yellow margin and tip, the outer narrowly triangular-subulate, glabrous or sparsely villous, with prominent midvein, the inner narrowly oblong, erect or barely spreading, glabrous, acute or subacute; achenes densely hirsute; pappus white, the bristles 7 mm. long, the scales conspicuous, 1 mm. long.

TYPE LOCALITY: Banks of the Rio Varilla, Costa Rica.

DISTRIBUTION: Costa Rica.

20. *Vernonia racemosa* Delponte, *Mem. Accad. Torino*
II. 14: 396. 1854.

Vernonia araripensis Gleason, *Bull. N. Y. Bot. Gard.* 4: 181, in part. 1906. Not *V. araripensis* Gardn. 1846.

Vernonia sericea racemosa Ekman, *Ark. Bot.* 13¹⁵: 85. 1914.

Stems herbaceous or suffrutescent, 5–10 dm. high, branching above, puberulent; leaf-blades narrowly lanceolate, 4–5 cm. long, 3–5 mm. wide, long-acuminate, subentire, revolute, one-nerved, rugose and papillose-pubescent above, sericeous-pubescent and resinous beneath; lower bracteal leaves resembling the cauline, the upper much reduced; heads sessile, secund in short spreading axillary cymes, or solitary in the upper axils; involucre 5–6 mm. high, broadly campanulate; scales purplish or brown, very loosely and irregularly imbricate, lanceolate, sharply acute, the principal ones villous below to puberulent above, sparsely resinous-dotted; achenes hirsute; pappus pale purplish-brown, the bristles somewhat flattened, 3.5–4 mm. long, the scales prominent, 0.6 mm. long.

TYPE LOCALITY: Hispaniola.

DISTRIBUTION: Hispaniola.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 5, f. 4.

21. *Vernonia commutata* Ekman, Ark. Bot. 13¹⁵: 77. 1914.

Vernonia araripensis Gleason, Bull. N. Y. Bot. Gard. 4: 181, in part. 1906. Not *V. araripensis* Gardn. 1846.

Stems herbaceous or suffruticose, 7 dm. high, simple to the inflorescence, thinly appressed-pubescent; leaves linear, narrowed to the base, sessile or nearly so, acute, entire, revolute, papillose-pubescent or becoming scabrous above, dull-green and thickly resin-dotted beneath, the upper and bracteal leaves similar but reduced in size; inflorescence of numerous, short, divaricately spreading cymes from the upper axils; heads about 18-flowered; involucre turbinate, 5 mm. high, the scales loosely and irregularly imbricate in few series, sharply acute, the outer narrowly triangular, the inner narrowly lanceolate, the larger ones thinly villous and resin-dotted; achenes 2 mm. long, resinous and hirsute with erect hairs; pappus pale-brown or almost white, 4 mm. long, the scales 0.6–0.7 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Eastern Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 4, f. 4.

22. *Vernonia stenophylla* Less. Linnaea 6: 667. 1831.

Cacalia stenophylla Kuntze, Rev. Gen. 970. 1891.

Stems herbaceous or suffruticose, erect, branching above, closely pubescent; leaves numerous and crowded, linear, 3–5 cm. long, 2–4 mm. wide, entire and revolute, acuminate, sessile or nearly so, papillose-pilose above, densely sericeous and with a prominent midvein beneath; upper and bracteal leaves similar but smaller; heads 18–21-flowered, single in the upper axils or occasionally 2–3 in short cymes; involucre 4–5 mm. high, loosely and irregularly imbricate, the scales all narrowly triangular-lanceolate, subulate to narrowly acuminate, not prominently nerved, green or the inner with a broad pale margin, villous throughout, resin-dots none or concealed; achenes hirsute; pappus pale sordid-brown, 5 mm. long, the scales 0.8 mm. long.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Santo Domingo.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 5, f. 1.

23. *Vernonia angustissima* C. Wright; Ekman, Ark.
Bot. 13¹⁵: 78. 1914.

Vernonia remotiflora Griseb. Cat. Pl. Cub. 144. 1866. Not *V. remotiflora* Rich. 1792.

Vernonia stenophylla Gleason, Bull. N. Y. Bot. Gard. 4: 181, in part. 1906. Not *V. stenophylla* Less. 1831.

Stems herbaceous, erect, 4–5 dm. high, simple or sparingly branched, pubescent; leaves numerous and crowded, the blades linear, 2–5 cm. long, 1–3 mm. wide, obtuse or mucronulate, entire, revolute, one-nerved, papillose-pubescent and becoming scabrellate above, densely sericeous beneath; inflorescence of numerous short spreading cymes; bracteal leaves resembling the cauline, usually exceeding the 18–21-flowered heads, or the upper shorter; involucre campanulate or somewhat turbinate, 6–7 mm. high; scales pale-green, loosely and irregularly imbricate, villous throughout, the outer subulate, the inner narrowly lanceolate, long-acuminate;

achenes hirsute; pappus white or very pale yellowish-brown, the bristles 5–5.5 mm. long, the scales 0.7–0.8 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 6, f. 4.

24. *Vernonia corallophila* Gleason, Bull. Torrey Club
40: 309. 1918.

Stems erect, 4 dm. high, herbaceous, virgate, finely striate, strigose-pubescent; leaves sessile, narrowly linear, rigid, revolute to the midvein, 1–3 cm. long, strigose-hispid and impressed-punctate above, densely strigose-pubescent beneath, one-nerved; inflorescence slender, sparingly branched; heads 11-flowered, solitary in the axils of the upper leaves or rarely 2–3 together in a short ascending lateral cyme from the upper axils; bracteal leaves resembling the cauline but reduced in size and the uppermost barely exceeding the heads; involucre turbinate, 5–6 mm. high, the scales all straight, erect, very loosely and irregularly imbricate in few series, villous-pubescent and resinous, the outer subulate, the inner narrowly oblong, long-acuminate; achenes pubescent with erect hairs and resinous in the furrows, 2 mm. long; pappus nearly white, the bristles 4–5 mm. long, the scales 0.7–0.8 mm. long.

TYPE LOCALITY: United States Naval Station, Guantanamo Bay, Oriente, Cuba.

DISTRIBUTION: Eastern Cuba.

25. *Vernonia longifolia* Pers. Syn. Pl. 2: 404. 1807.

Lepidaploa lanceolata Cass. Dict. Sci. Nat. 26: 18. 1823.

Vernonia punctata Sw.; Wikst. Sv. Vet.-Akad. Handl. 1827: 72. 1828.

Cacalia punctata Kuntze, Rev. Gen. 970. 1891.

Vernonia longifolia genuina Urban, Symb. Ant. 1: 456. 1899.

Stems shrubby, 1–2 m. high, freely branched, finely pubescent; leaves numerous, the blades thin, bright-green, narrowly elliptic, lanceolate, or ovate-lanceolate, 7–10 cm. long, 1.5–4.5 cm. wide, acuminate, entire, acute at the base, very minutely puberulent and resinous-dotted on both sides; petioles 5–10 mm. long; inflorescence terminal, depressed, of numerous short, crowded, curved, freely branched cymes; heads secund, about 18-flowered; bracteal leaves oblong, equaling or greatly exceeding the heads; involucre campanulate or subhemispheric, 5–6 mm. high; scales closely imbricate, appressed, strigose-pubescent, acuminate, the outer lanceolate, the inner linear-oblong and resinous near the apex; achenes hirsute; pappus pale-tawny, the bristles 4–5 mm. long, the scales slender, irregular, 0.5–1 mm. long.

TYPE LOCALITY: Guadeloupe.

DISTRIBUTION: Lesser Antilles.

26. *Vernonia Shaferi* Gleason, Bull. Torrey Club 46: 238. 1919.

Stems shrubby, 1–2 m. high, the young branches closely cinereous-pubescent, becoming glabrate the second year; leaf-blades ovate-lanceolate or elliptic, as much as 12 cm. long and 4 cm. wide, acuminate, entire, acute at the base, dark-green, minutely papillose-pubescent, and very sparsely resinous-dotted above, similar but paler-green below; heads about 18-flowered, crowded in leafy secund cymes at the end of the young branches; bracteal leaves oblong or oblong-ovate, acute, 5–10 mm. long; involucre broadly turbinate to campanulate, 6 mm. high; scales closely imbricate, erect or appressed, narrowly oblong-lanceolate, acuminate, irregularly pubescent and ciliate, usually resinous toward the apex; achenes hirsute; pappus white, the bristles 6.5–7 mm. long, the scales very irregular in length, as much as 2 mm. long, minutely ciliate.

TYPE LOCALITY: Montserrat.

DISTRIBUTION: Montserrat.

27. *Vernonia albicaulis* Pers. Syn. Pl. 2: 404. 1807.

Eupatorium obtusifolium Willd. Sp. Pl. 3: 1768. 1804. Not *Vernonia obtusifolia* Less. 1829.

Conyza glabra Willd. Sp. Pl. 3: 1940. 1804. Not *Vernonia glabra* Vatke, 1877.

Lepidaploa albicaulis Cass. Dict. Sci. Nat. 26: 17. 1823.

Vernonia emarginata Wikst. Sv. Vet.-Akad. Handl. 1827: 73. 1828.

- Vernonia Vahlia* Less. *Linnaea* 4: 306. 1829.
Vernonia Thomae Benth.; Oerst. *Vidensk. Meddel.* 1852: 66. 1852.
Cacalia Thomae Kuntze, *Rev. Gen.* 324. 1891.
Vernonia longifolia Vahlia Urban, *Symb. Ant.* 1: 456. 1899.
Vernonia longifolia Sintenisii Urban, *Symb. Ant.* 1: 456. 1899.
Vernonia Sintenisii Gleason, *Bull. N. Y. Bot. Gard.* 4: 187. 1906.

Stems shrubby, freely branched, closely cinereous-tomentulose; leaves numerous and crowded, the blades thin, pale-green, broadly elliptic to oblong, 3-7 cm. long, 1-4 cm. wide, subacute to obtuse, rounded, or retuse, entire, narrowed from below the middle to an acute or obtuse base, finely strigose-pubescent and resinous on both sides, especially beneath; petioles 3-8 mm. long; inflorescence of a few short leafy cymes forming a loose, spreading, terminal cluster; bracteal leaves resembling the cauline but reduced to 1 cm. long; heads crowded, about 21-flowered; involucre campanulate, 5 mm. high; scales rather closely imbricate in several ranks, pubescent or villous, frequently purplish, the inner sharply acute; achenes prominently ribbed, densely hirsute; pappus pale-brown or tawny, the bristles 4-5 mm. long.

TYPE LOCALITY: St. Croix.

DISTRIBUTION: Porto Rico, St. Croix, St. Thomas, and Tortola.

28. *Vernonia gracilis* H. B. K. *Nov. Gen. & Sp.* 4: 34. 1818.

- Vernonia Moritziana* Schultz-Bip. *Linnaea* 20: 511. 1847.
Cacalia gracilis Kuntze, *Rev. Gen.* 970. 1891.
Cacalia Moritziana Kuntze, *Rev. Gen.* 970. 1891.
Vernonia Coloneaster angustifolia Hieron. *Bot. Jahrb.* 23: 559. 1901.
Vernonia gracilis tomentosa Ekman, *Ark. Bot.* 13¹⁵: 25. 1914.

Stems herbaceous, sparingly branched, appressed-villous to pubescent; leaf-blades narrowly oblong-lanceolate, 5-9 cm. long, 1-15 mm. wide, acuminate, crenate to entire, acute at base, thinly pubescent and minutely red-glandular on both sides, but especially beneath and along the veins; inflorescence of single heads at the upper nodes, forming an undifferentiated cyme, the bracteal leaves not reduced; heads sessile, 21-26-flowered, 2-4 cm. apart; involucre broadly campanulate, 4-5 cm. high, the outer scales with a long subulate tip equaling or exceeding the narrowly triangular base, ciliate, somewhat pubescent along the prominent midvein, the inner broader, sharply acuminate or somewhat subulate, scarious-margined, puberulent, not prominently veined; achenes finely ribbed, thinly pubescent, 1.5 mm. long; pappus white, the bristles 4-5 mm. long, the scales broadly oblong, 0.8-1.1 mm. long.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Colombia; apparently introduced into Bequia.

29. *Vernonia bahamensis* Griseb. *Fl. Brit. W. Ind.* 352. 1861.

- Cacalia bahamensis* Kuntze, *Rev. Gen.* 969. 1891.

Stems shrubby, 2 m. high or more, repeatedly branched, thinly tomentose; leaves numerous, crowded, chiefly on the younger branches, the blades spatulate to oblanceolate or narrowly obovate, 20-35 mm. long, 5-12 mm. wide, entire, rounded at the tip and varying from mucronate to slightly retuse, narrowed at base into margined petioles, tomentose on both sides, especially beneath; heads few, 1-5 in each cyme, sessile among the upper leaves, 8-13-flowered; involucre campanulate, 3.5-5 mm. high, the scales loosely imbricate in few series, the inner ovate-lanceolate, sharply acute, white-tomentose, sometimes minutely resinous-glandular; achenes densely hirsute, 2-2.5 mm. long; pappus nearly white, the bristles 4-5 mm. long, the scales broad, fimbriate, 0.5-1 mm. long.

TYPE LOCALITY: Bahama Islands.

DISTRIBUTION: Bahama Islands.

ILLUSTRATIONS: *Bull. Torrey Club* 33: 185. f. 1, e, f, g; 186. f. 2; *Ark. Bot.* 13¹⁵: pl. 2, f. 2.

30. *Vernonia obcordata* Gleason, *Bull. Torrey Club* 33: 187. 1906.

Stems shrubby, 6-9 dm. tall, with stiff crowded branches, strongly angled and tomentose when young, becoming terete and glabrous with age; leaves numerous, crowded on the young shoots, the blades broadly obcordate, 8-15 mm. long, 7-15 mm. wide, entire, gradually narrowed

at the base, closely gray-tomentose on both sides; petioles 5–8 mm. long; heads few, single or in cymes of 2–4, sessile among the upper leaves, 8–13-flowered; involucre campanulate, 4–5 mm. high, the outer scales ovate, acute, tomentose, the inner ovate-lanceolate, sharply acute, pubescent, especially at the base and margin and densely resinous-glandular; achenes hirsute, 2 mm. long; pappus yellow, the bristles 4–5 mm. long, the scales fimbriate-ciliate, narrow, about 0.7 mm. long.

TYPE LOCALITY: Little Inagua.

DISTRIBUTION: Little Inagua, Bahama Islands.

ILLUSTRATION: Bull. Torrey Club 33: 185. f. 1, d.

31. *Vernonia arbuscula* Less. *Linnaea* 6: 664. 1831.

Vernonia arctata Gleason, Bull. Torrey Club 33: 185. 1906.

Stems shrubby, 3–20 dm. tall, with numerous crowded branches, thinly tomentose or glabrate; leaves numerous, spreading or somewhat reflexed, the blades broadly elliptic to obovate-oblong, 10–18 mm. long, 6–11 mm. wide, acute or mucronate, entire, acute or obtuse at the base, glabrate above, brown-tomentose beneath; petioles tomentose, 3–7 mm. long; inflorescence flattened, of several short, leafy, irregular, scorpioid cymes bearing each 1–5 sessile or short-peduncled 13-flowered heads; involucre campanulate, 4–5 mm. high; scales irregularly imbricate in a few series, lanceolate, acute, tomentose, the inner ones sparsely but conspicuously resinous; achenes pubescent, 2.5 mm. long; pappus nearly white, the bristles 5 mm. long, the scales fimbriate-ciliate, very broad, 0.6–1 mm. long.

TYPE LOCALITY: Mauritius (error).

DISTRIBUTION: New Providence and Andros islands, Bahama Islands.

ILLUSTRATIONS: Bull. Torrey Club 33: 185. f. 1, a, b, c; Ark. Bot. 13¹⁵: pl. 2, f. 3.

32. *Vernonia complicata* Griseb. *Cat. Pl. Cub.* 143. 1866.

Stems shrubby, densely branched, 5–10 dm. high, closely and softly tomentose; leaves numerous, crowded toward the end of the branches, the blades thick, rotund or broadly obovate, 5–15 mm. long and wide, entire, densely and finely tomentose on both sides, gray-green beneath, undulate, or flat on the young shoots, abruptly contracted into margined petioles 3–4 mm. long; heads 8-flowered, solitary, terminating the branches, partially concealed among the bracteal leaves, which resemble the cauline in size and shape; involucre campanulate, 5 mm. high; scales loosely and irregularly imbricate, the outer ovate-lanceolate, the inner oblong-lanceolate, sharply acute, white-pubescent, especially at the base and apex, or somewhat tomentose; achenes densely hirsute, 2 mm. long; pappus pale-tawny, the bristles 4 mm., the scales 0.7 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 2, f. 4.

33. *Vernonia fruticosa* (L.) Sw. *Fl. Ind. Occ.* 1323. 1806.

Conyza fruticosa L. *Sp. Pl.* ed. 2. 1209. 1763.

Cacalia fruticosa Kuntze, *Rev. Gen.* 968. 1891.

Stems shrubby or suffruticose, climbing, very slender, freely and loosely branched, glabrous or puberulent at the summit; leaf-blades firm, ovate-oblong, 1–2 cm. long, 5–10 mm. wide, obtuse or rounded, irregularly crenate or subentire, rounded or subcordate at base, dark-green and thinly but softly papillose-pubescent above, densely gray-tomentose beneath; petioles 1–2 mm. long; upper and terminal branches floriferous and strongly flexuous; bracteal leaves resembling the cauline in shape and size; heads 21-flowered; involucre broadly turbinate or campanulate, 5 mm. high; scales all erect or somewhat spreading, very loosely imbricate, puberulent or occasionally glabrous, the outer subulate, the inner narrowly lanceolate and long-acuminate with a subulate tip; achenes hirsute; pappus nearly white, the bristles 4 mm. long, the scales broad and conspicuous, 0.8 mm. long.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Santo Domingo.

ILLUSTRATIONS: Plumier, *Pl. Am.* 1: pl. 95; Ark. Bot. 13¹⁵: pl. 3, f. 2, 3.

34. *Vernonia calophylla* Gleason, Bull. Torrey Club 40: 317. 1913.

Stems shrubby, 1 m. high or less, freely and loosely branched, cinereous-puberulent below to tomentose among the branches; leaf-blades firm and rigid, ovate to subrotund, 20–25 mm. long, 13–18 mm. wide, rounded or obtuse, entire, somewhat revolute, rounded or subcordate at base, dark-green, rugose, and papillose-pubescent above, closely gray-tomentose beneath; veinlets prominently reticulate; petioles 1–2 mm. long; heads in the axils of the upper leaves, forming cymes 10–16 cm. long, sessile, 18–21-flowered; bracteal leaves resembling the cauline but smaller, 10–15 mm. long and more densely pubescent above; involucre campanulate, 5 mm. high; scales erect, not closely appressed, somewhat arachnoid-puberulent, especially near the apex, the outer narrowly triangular, subulate, the inner linear-oblong, acute; achenes pubescent, 2 mm. long; pappus nearly white, the bristles 4 mm., the scales 1 mm. long.

TYPE LOCALITY: Camp La Gloria, south of Sierra Moa, Oriente, Cuba.

DISTRIBUTION: Cuba.

35. *Vernonia vicina* Gleason, Bull. Torrey Club 40: 317. 1913.

Stems shrubby, erect, 3–6 dm. tall, sparingly branched, glabrate below, puberulent above, closely cinereous-tomentulose among the branches; leaf-blades firm and rigid, spreading, dark-green above, elliptic to elliptic-oblong, 3–4.5 cm. long, 1–1.5 cm. wide, broadest at or near the middle, narrowed to an obtuse or subacute tip and an acute base, entire, somewhat revolute, rugose above and papillose-pubescent when young, becoming glabrate with age, thinly and closely tomentose beneath; veinlets prominently reticulate; petioles tomentose, 1–2 mm. long; upper leaves like the lower, but smaller, eventually only 1 cm. long, bearing heads in the upper 4 or 5 axils; heads about 26-flowered; involucre campanulate, 5–6 mm. high; scales closely imbricate, pubescent or thinly tomentose, the outer subulate, somewhat spreading, the inner lance-oblong, sharply acute; achenes pubescent, 2 mm. long; pappus white, the bristles 4 mm., the broad outer scales 1 mm. long.

TYPE LOCALITY: Camp La Gloria, south of Sierra Moa, Oriente, Cuba.

DISTRIBUTION: Cuba.

36. *Vernonia leptoclada* Schultz-Bip. Jour. Bot. 1: 233. 1863.

Vernonia Wrightii Griseb. Cat. Pl. Cub. 144. 1866. Not *V. Wrightii* Schultz-Bip. 1863.

Vernonia gnaphaliifolia Gleason, Bull. N. Y. Bot. Gard. 4: 178. 1906. Not *V. gnaphaliifolia* A. Rich. 1850.

Vernonia neglecta Gleason, Bull. Torrey Club 40: 318. 1913.

Stems erect, suffrutescent, sparingly branched, 6–15 dm. high, finely gray-tomentulose; leaf-blades firm, flat, spreading, narrowly ovate-oblong to ovate-lanceolate, 6–7 cm. long, 2 cm. wide, acute, or obtuse and minutely apiculate, entire, rounded to truncate or subcordate at base, dark-green and strongly rugose above, papillose-puberulent when young, becoming glabrate and shining with age, but scabrellate with the persistent hair-bases, softly and loosely gray-tomentose beneath; veins prominently reticulate; petioles tomentose, 1–4 mm. long; cymes 2 or 3, terminal, straight, spreading; bracteal leaves resembling the cauline in shape but gradually reduced in size, the upper only 1.5 cm. long; heads about 21-flowered; involucre broadly campanulate, 6 mm. high; scales loosely and irregularly imbricate, the outer triangular and subulate, thinly villous or subtomentose, the inner lanceolate, sharply acute, glabrate at the middle, villous at the tip, somewhat scarious at the margin; achenes pubescent, 1.5 mm. long; pappus very pale-brown or almost white, the bristles 4 mm. long, somewhat flattened, the scales 0.8 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 3, f. 5.

37. *Vernonia calida* Gleason, Bull. Torrey Club 40: 318. 1913.

Stems shrubby, freely branched, 5 dm. tall, thinly puberulent or cinereous-tomentulose above; leaf-blades thick, rigid, ovate-oblong, 3.5–5 cm. long, 1.5–2 cm. wide, obtuse or rounded,

crenate or repand, broadly rounded or subcordate at the base, strongly bullate, dark-green, minutely papillose-pubescent when young, soon becoming glabrate or scabrellate and shining above, densely and softly brown-tomentose beneath; veins prominently reticulate; petioles 1-3 mm. long; cymes few, 6-12 cm. long; bracteal leaves resembling the cauline in shape, crenulate or entire, the upper 10-15 mm. long; heads rather crowded, frequently in pairs, 21-flowered; involucre broadly campanulate, 7 mm. high; scales densely pubescent, closely imbricate or somewhat spreading at the apex, the outer subulate, the inner narrowly triangular-lanceolate and acute; achenes pubescent, 1.5 mm. long; pappus yellowish-brown, the bristles 4 mm. long, the outer scales fimbriate, 0.7 mm. long.

TYPE LOCALITY: Sabanilla to Yamuri Arriba, Oriente, Cuba.

DISTRIBUTION: Cuba.

38. *Vernonia semitalis* Gleason, Bull. Torrey Club 40: 319. 1913.

Stems shrubby, 6-9 dm. high, freely branched above, thinly brown-tomentose, especially on the younger branches; leaves crowded, thick and rigid, the blades ovate or ovate-triangular, broadest near the base, 15-20 mm. long, 10-13 mm. wide, obtuse or rounded, entire and somewhat revolute, truncate or subcordate at the base, scabrellate, shining, and strongly bullate above, thinly gray-tomentose beneath; veinlets prominently reticulate; upper leaves resembling the lower in shape and scarcely reduced in size, bearing heads at their bases; heads in several crowded cymes 10-15 cm. long, 21-flowered, the upper approximate; involucre campanulate, 5-6 mm. high, the outer scales triangular-subulate and pubescent below, the inner scales narrowly triangular-lanceolate, sharply acuminate, tomentose near the base, glabrous or nearly so toward the apex; achenes pubescent, 1.5 mm. long; pappus nearly white, the bristles 4 mm. long, the scales 1 mm. long and as much as 0.3 mm. wide, ciliate.

TYPE LOCALITY: Along the trail from Rio Yamanigüey to Camp Toa, Oriente, Cuba.

DISTRIBUTION: Cuba.

39. *Vernonia parvuliceps* Ekman, Ark. Bot. 13¹⁵: 71. 1914.

Stems shrubby or herbaceous, erect, branching above, densely and finely tomentose; leaf-blades thin, firm, spreading, ovate-lanceolate, 3-5 cm. long, 13-18 mm. wide, acuminate, entire, flat or somewhat revolute, rounded or broadly acute at base, dark-green and glabrate above, densely tomentose and conspicuously veined beneath; petioles 2-4 mm. long; bracteal leaves resembling the cauline in shape, gradually reduced in size and the upper barely exceeding the heads; cymes few, spreading, curved; heads crowded, 21-flowered; involucre campanulate, 3-4 mm. high; scales erect and appressed, thinly pubescent, rather closely imbricate, the outer narrowly triangular-lanceolate with a carinate midvein, the inner lanceolate-oblong, abruptly acuminate; achenes densely sericeous-pubescent; pappus pale-brown, the bristles 3 mm. long, the scales broad, 0.6 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 3, f. 9.

40. *Vernonia pineticola* Gleason, Bull. N. Y. Bot. Gard.

4: 176. 1906.

Stems clustered, 2-4 dm. high, softly and densely pubescent; leaves spreading or somewhat reflexed, the blades firm, ovate to broadly ovate-oblong, 3-4 cm. long, 1.5-2 cm. wide, obtuse or subacute, entire, rounded at the sessile base, essentially glabrous and very rugose or bullate above with deeply impressed veins, prominently veined and densely pale-brown-tomentose beneath; bracteal leaves similar, little reduced; heads solitary and sessile in the axils of the upper leaves, forming a leafy cyme; involucre broadly campanulate, 10-12 mm. high; scales all loose, erect or somewhat spreading, linear-subulate, tomentose near the base, glabrate toward the apex; achenes densely hirsute-pubescent, 2 mm. long; pappus nearly white, the bristles 6 mm. long, the scales erect, ciliate, 1-1.2 mm. long.

TYPE LOCALITY: Baracoa, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 3, f. 7.

41. *Vernonia desiliens* Gleason, Bull. Torrey Club
40: 316. 1913.

Stems herbaceous, sparingly branched, 3-5 dm. tall, glabrous below, puberulent in the inflorescence; leaf-blades firm and coriaceous, ovate-lanceolate to narrowly elliptic, 7-9 cm. long, 2-3 cm. wide, obtuse, entire or nearly so, obtuse or rounded at the base, rugose, glabrous, and shining above, closely gray-tomentose between the prominently reticulate veinlets; petioles 1-3 mm. long; cymes 1 or 2, spreading, 1-2 dm. long, flexuous; bracteal leaves resembling the cauline but narrower in shape and gradually reduced in size, the uppermost oblong-linear, 2 cm. long; heads 21-flowered; involucre turbinate, thinly pubescent, 9-10 mm. high, the lower outer involucre scales short, minute, triangular, the inner scales much longer, linear-oblong, obtuse and apiculate; achenes strigose-pubescent; pappus light-brown, the bristles 6 mm. long, the scales conspicuously fimbriate, 0.7 mm. long.

TYPE LOCALITY: Arroyo del Medio, Oriente, Cuba.

DISTRIBUTION: Cuba.

42. *Vernonia acuminata* Less. Linnaea 6: 663. 1831.

Vernonia divaricata DC. Prodr. 5: 48. 1836. Not *V. divaricata* Sw. 1806.

Vernonia remotiflora divaricata Maza, Anal. Soc. Esp. Hist. Nat. 19: 269. 1890.

Cacalia acuminata Kuntze, Rev. Gen. 969. 1891.

Stems shrubby, 1-2 m. high, finely cinereous-puberulent; leaf-blades spreading, thin, bright-green, elliptic to broadly ovate-lanceolate, 4-9 cm. long, 1.5-4.5 cm. wide, acute to long-acuminate, entire, acute at the base, sparsely and minutely puberulent on both sides, resinous above, dark-dotted and resinous beneath, sessile or with petioles 1-5 mm. long; inflorescence of numerous, widely spreading, freely branched cymes, their ultimate branches bearing 3-15 heads; bracteal leaves oblong-lanceolate to linear, the upper gradually reduced in size and barely exceeding the 11-18-flowered heads; involucre campanulate, 4-5 mm. high; scales thinly villous-pubescent throughout, especially the outer series, all obtuse or the outermost acute; achenes densely pubescent; pappus brown, the bristles about 4 mm. long, flattened and twisted, the scales narrow, ciliate, irregular in length, 0.5-1.5 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 2, f. 8.

43. *Vernonia expansa* Gleason, Bull. N. Y. Bot. Gard 4:
186. 1906.

Stems slender, striate, puberulent, freely branching above, forming a straggling shrub 2-3 m. high; leaves numerous, rather crowded, the blades thin, divaricate, broadly ovate, 3-5 cm. long, 1.7-2.7 cm. wide, acute or subacuminate, entire, obtuse or broadly rounded at base, minutely pubescent and resinous on both sides, the veins white and conspicuous; petioles 3 mm. long; upper leaves smaller, broadly elliptic, obtuse; inflorescence of several short cymes terminating the branches and in the upper axils, bearing each 3-6 heads; bracteal leaves equaling or much shorter than the involucre; heads crowded, 11-flowered; involucre broadly campanulate, 4 mm. high; scales all appressed, closely imbricate, obtuse, the outer broadly ovate, the inner lance-oblong, thinly villous at the base to almost glabrous at the apex; achenes 2 mm. long, densely gray-pubescent; pappus brown, the bristles 4 mm. long, conspicuously flattened and twisted, the scales 0.8 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 3, f. 4.

44. *Vernonia rigida* Sw. Fl. Ind. Occ. 1322. 1806.

Conyza rigida Sw. Prodr. 113. 1788.

Stems weak, shrubby, up to 3 m. long, finely and closely tomentose and pubescent with black hairs; leaf-blades coriaceous, broadly elliptic, 25-45 mm. long, 15-28 mm. wide, rounded, obtuse, or minutely apiculate, entire, rounded to broadly cuneate at base, sparsely and minutely

pilose above, impressed-glandular, resinous, and minutely pilose beneath; lateral veins prominent, curved-ascending; petioles 3–6 mm. long, tomentose; cymes crowded, bearing each 2–6 heads; bracteal leaves resembling the cauline, but smaller; heads 11-flowered; involucre campanulate, 6–7 mm. high; scales well imbricate, strigose-pubescent and ciliate toward the tip with black hairs, the outer triangular-lanceolate to ovate, sharply acute, with a prominent midvein, the inner ovate-lanceolate, rounded at the tip; achenes strigose-pubescent, 2 mm. long; pappus brown, the bristles 5.5 mm. long, the scales broad, 0.8–1 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

ILLUSTRATIONS: Ark. Bot. 13¹⁵: *pl. 3, f. 1.*

45. *Vernonia pluvialis* Gleason, Bull. Torrey Club 40: 312. 1913.

Baccharis Myrsinites Griseb. Fl. Brit. W. Ind. 366, in part. 1861. Not *B. Myrsinites* Pers. 1807.

Vernonia proclivis Gleason, Bull. Torrey Club 40: 312. 1913.

Vernonia reducta Gleason, Bull. Torrey Club 40: 313. 1913.

Stems shrubby, erect or trailing, 5–20 dm. long, branched above, glabrate or thinly pubescent; leaf-blades elliptic-oblong to oblong-ovate or subrhomboid, broadest near or above the middle, 3–8 cm. long, 1–3 cm. wide, acute or acuminate, entire and frequently somewhat revolute, gradually narrowed to an acute or obtuse base, minutely puberulent and glandular-punctate or resinous on both sides, sessile or on petioles 1–5 mm. long; inflorescence of several short, few-headed cymes terminating the stem and upper branches and forming a compact leafy panicle; bracteal leaves barely exceeding the heads, ovate to ovate-lanceolate; heads crowded in clusters of 2–7, not secund, 5–8-flowered; involucre narrowly campanulate or subcylindric, 5–7 mm. high; scales coriaceous, glabrate or puberulent, closely imbricate in several series, the outer ovate-triangular, acute or apiculate, the inner oblong, obtuse or rounded; achenes densely hirsute; pappus pale-brown or tawny, the bristles flat and twisted, 4–5 mm. long, the scales irregular, 0.4–1 mm. long.

TYPE LOCALITY: Blue Mountain Peak, Jamaica.

DISTRIBUTION: Higher mountains of Jamaica.

ILLUSTRATION: Ark. Bot. 13¹⁵: *pl. 3, f. 8.*

46. *Vernonia Sprengeliana* Schultz-Bip. Jour. Bot. 1: 232. 1863.

Stems shrubby, sparingly branched, cinereous-tomentose; leaf-blades heavy and rigid, narrowly oblong to oblong-lanceolate, 5–9 cm. long, 1–2 cm. wide, acute, entire or irregularly crenate, somewhat revolute, narrowed from the middle to a truncate or subcordate base, bullate and scabrous above, closely gray-tomentose beneath; petioles 1–2 mm. long; cymes few, crowded at the summit of the stem, simple or sparingly branched, 4–7 cm. long, bearing 4–12 heads; bracteal leaves resembling the cauline but smaller, the upper 1 cm. long or less; heads rather crowded, 13–18-flowered; involucre campanulate-cylindric, 8–10 mm. high; scales closely and regularly imbricate, purplish, the outer triangular, subulate or narrowly acuminate, the inner oblong, thinly strigose on the back and densely so at the rounded or apiculate tip; pappus pale sordid-brown, the bristles 8 mm. long, the scales 0.8–1 mm. long.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Hispaniola.

ILLUSTRATION: Ark. Bot. 13¹⁵: *pl. 1, f. 8.*

47. *Vernonia Sagraeana* DC. Prodr. 5: 55. 1836.

Vernonia rigida Sagraeana Griseb. Cat. Pl. Cub. 144. 1866.

Vernonia angusticeps Ekman, Ark. Bot. 13¹⁵: 14. 1914.

Vernonia Sagraeana angusticeps Gleason, Bull. Torrey Club 46: 240. 1919.

Stems shrubby, branching above, 1–2 m. high, cinereous or becoming glabrate; leaf-blades firm, elliptic to ovate-oblong, 6–10 cm. long, 1.5–4 cm. wide, acute or short-acuminate, sharply denticulate with spinulose teeth to nearly entire, rugose, shining, and scabrellate or glabrous above, minutely puberulent on the veins beneath; cymes several, straight, leafy, 1–2 dm. long; bracteal leaves resembling the cauline, but gradually reduced to 1.5 cm. long; heads 1–2 cm. apart, 18–21-flowered; involucre campanulate, 6–8 mm. high; scales closely imbricate, villous-pubescent, the outer triangular-ovate, sharply acuminate, the inner ovate-oblong,

acute; achenes 4 mm. long; pappus pale sordid-purple, the bristles 7 mm., the linear outer scales 1-1.3 mm. long.

TYPE LOCALITY: Near Havana, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 1, f. 3, 5.

48. *Vernonia viminalis* Gleason, Bull. N. Y. Bot. Gard. 4: 184. 1906.

Stems suffrutescent, terete, finely striate, cinereous or tomentose, divaricately branching above; leaf-blades thin, ascending, narrowly oblong or elliptic-oblong, 8-14 cm. long, 1-3 cm. wide, somewhat falcate or asymmetric, long-acuminate, entire or minutely denticulate, attenuate at base, rugose and scabrellate above, appressed-villous with soft white hairs beneath; petioles none or very short; cymes numerous, 2-3 dm. long, flexuous; bracteal leaves resembling the cauline, 2-5 cm. long; heads about 29-flowered, sessile, 1.5-3 cm. apart; involucre campanulate, 9-10 mm. high; scales appressed, closely imbricate in many series, acuminate and sharply cuspidate the outer ovate-lanceolate, the inner narrowly oblong, the exposed portion densely tomentose, especially along the margin; achenes glabrous, sharply angled, 3.5 mm. long; pappus yellowish-white, the bristles 8 mm. long, the outer scales broad, fimbriate-ciliate, 0.5 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 1, f. 1.

49. *Vernonia fallax* Gleason, Bull. Torrey Club 40: 324. 1913.

Stems shrubby, erect, 1 m. high, sparingly branched, closely gray-tomentose; leaf-blades firm, narrowly elliptic-oblong, 5-10 cm. long, 1.5-2.5 cm. wide, acute, mucronate, entire or obscurely spinulose-denticulate, narrowed to an acute base, thinly puberulent, especially on the veins, and minutely glandular-punctate above, finely and closely gray-tomentose beneath; veins elevated and prominent, but not conspicuously reticulate; petioles 1-2 mm. long, tomentose; inflorescence terminal, pyramidal, of 4-10 short, spreading or recurved cymes bearing each 3-7 secund, 21-flowered heads; involucre broadly campanulate or subhemispheric, 6-7 mm. high; scales appressed, closely imbricate, the outer ovate-triangular, acute and cuspidate, the middle densely villous, the inner narrowly oblong-linear, minutely puberulent beneath the strigose pubescence of long white hairs; achenes with a few resinous glands; pappus pale-brown, the bristles 6 mm. long, the scales broad, 0.8 mm. long, finely fimbriate-ciliate.

TYPE LOCALITY: Trinidad Mountains, Santa Clara, Cuba.

DISTRIBUTION: Cuba.

50. *Vernonia aceratoides* Gleason, Bull. Torrey Club 40: 325. 1913.

Vernonia inaequiserrata angustifolia Griseb. Cat. Pl. Cub. 144. 1866.

Vernonia inaequiserrata obtusifolia Griseb. Cat. Pl. Cub. 144. 1866.

Vernonia linguaefolia Ekman, Ark. Bot. 13¹⁵: 19. 1914.

Stems slender, apparently herbaceous, closely gray-tomentose; leaf-blades firm, narrowly oblong-lanceolate to lance-linear, 7-8 cm. long, 1-1.2 cm. wide, acute and mucronulate or obtuse, entire or somewhat repand, obtuse or rounded at base, minutely scabrellate and resinous above, and puberulent along the midvein, finely brown-tomentose beneath; veins prominent beneath and conspicuously reticulate; petioles 2-3 mm. long; cymes few, short, divaricate, bearing 6-12 heads each; bracteal leaves oblong, proportionately narrower than the cauline, the upper not exceeding the 11-13-flowered heads; involucre narrowly campanulate, 5-6 mm. high; scales closely and regularly imbricate, appressed, tomentose toward the tip, finely and softly villous at the base and middle, the outer ovate-triangular, cuspidate, the inner oblong-ovate, subacute and apiculate; pappus nearly white.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATIONS: Ark. Bot. 13¹⁵: pl. 1, f. 6, 7.

51. *Vernonia inaequiserrata* Schultz-Bip. Jour. Bot.

1: 232. 1863.

Vernonia rubricaulis Griseb. Mem. Am. Acad. II. 8: 511. 1862. Not *V. rubricaulis* Humb. & Bonpl. 1810.

Stems apparently herbaceous, 1-2 m. high, thinly cinerous-tomentose; leaf-blades firm, narrowly oblong to elliptic-oblong, 6-9 cm. long, 1-2.5 cm. wide, acute or short-acuminate, irregularly serrate to subentire, narrowed or subobtuse at base, rugose and nearly glabrous above, prominently reticulate and cinerous-tomentose beneath; cymes spreading, terminal and subterminal; lower bracteal leaves resembling the cauline, gradually reduced above, the upper twice as long as the 13-flowered heads; involucre campanulate-cylindric, 8 mm. high; scales closely imbricate, appressed, thinly arachnoid or pubescent and frequently densely glandular near the tip, the outer subacute and mucronate, the inner obtuse, rounded, or mucronulate; achenes 3.5 mm. long; pappus-bristles sordid-purple or tawny, 6 mm. long, the outer scales white, 1 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 1, f. 4.

52. *Vernonia Valenzuelana* A. Rich. in Sagra, Hist. Cuba

11: 33. 1850.

Vernonia rigida Valenzuelana Griseb. Cat. Pl. Cub. 144. 1866.

Stems woody, 10-15 dm. high, thinly pubescent, freely branched; leaf-blades rigid, coriaceous, narrowly oblong to elliptic-oblong, 8-10 cm. long, 8-17 mm. wide, acute, entire, or remotely denticulate with spinulose teeth, somewhat revolute, truncate to rounded or subcordate at base, rugose, but glabrous and shining above, puberulent and prominently reticulately veined beneath; cymes numerous, erect or ascending, sparingly branched; bracteal leaves resembling the cauline, but gradually reduced, the uppermost 1 cm. long; heads about 21-flowered; involucre campanulate-cylindric, 8-9 mm. high; scales all appressed, closely and regularly imbricate, arachnoid-ciliate, pubescent, the outer ovate, the inner ovate-lanceolate, acute and cuspidate; achenes glabrous; pappus nearly white, the bristles 6 mm. long, the scales erect, white, narrowly linear, 1-1.2 mm. long.

TYPE LOCALITY: Vuelta de Abajo, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 1, f. 2.

53. *Vernonia purpurata* Gleason, Bull. Torrey Club 40: 322. 1913.

Stems shrubby, 2-2.5 m. tall, thinly tomentose below, becoming densely so in the inflorescence; leaf-blades heavy, rigid, coriaceous, elliptic-oblong, 5-7 cm. long, 2-3 cm. wide, obtuse or subacute, entire or irregularly repand, obtuse or rounded at base, strongly rugose, but shining and essentially glabrous above, minutely puberulent on the veins beneath; petioles 2-4 mm. long; inflorescence small, irregular, composed of several short leafy cymes bearing each 4-10 heads; bracteal leaves narrowly oblong or oblong-linear, not present below many heads; heads secund, or aggregated at the tips of the cymes, 8-flowered; involucre narrowly cylindrical, 6 mm. high; scales closely imbricate, appressed, sharply acute, thinly strigose, the outer ovate-triangular, the inner microscopically spinulose-serrulate, purple-brown at the exposed tip; pappus pale yellow-brown, the bristles 7 mm. long, the scales narrowly linear, 1.2-1.4 mm. long.

TYPE LOCALITY: Jiquarito mountain, Sierra Maestro, Oriente, Cuba.

DISTRIBUTION: Eastern Cuba.*

54. *Vernonia aronifolia* Gleason, Bull. Torrey Club

40: 323. 1913.

Stems suffrutescent or shrubby, stout, freely branched, 12-15 dm. high, finely and thinly tomentose, especially above and in the axils; leaf-blades thin but firm, obovate-oblong, 8 cm.

long, 4 cm. wide, abruptly acuminate, remotely denticulate with subulate or spinulose teeth, obtuse or subacute at base, glabrous above, minutely puberulent beneath; veins prominent, reticulate; cymes terminal and lateral, spreading, unbranched, 15–20 cm. long, very leafy, bearing 6–10 heads; bracteal leaves resembling the cauline in shape, or varying to broadly oblong-elliptic, the upper gradually reduced to half the size of the cauline; heads 34–47-flowered; involucre hemispheric or broadly campanulate, 8–9 mm. high; scales imbricate only at base, the outer linear-lanceolate, the middle broadly ovate-oblong, the inner linear-oblong, and all terminated by an erect, spreading, or somewhat reflexed, linear, spinulose-serrulate tip; achenes dark-brown to nearly black; pappus pale-tawny, the bristles 8 mm., the scales 0.8 mm. long.

TYPE LOCALITY: Vicinity of Sumidero, Pinar del Rio, Cuba.

DISTRIBUTION: Cuba.

55. *Vernonia Wrightii* Schultz-Bip. Jour. Bot. 1: 234. 1863.

Vernonia arborescens Wrightii Maza, Anal. Soc. Esp. Hist. Nat. 19: 268. 1890.

Vernonia leptoclada Gleason, Bull. N. Y. Bot. Gard. 4: 183. 1906. Not *V. leptoclada* Schultz-Bip. 1863.

Stems shrubby, 1–4 m. high, freely branched above, pubescent; leaf-blades heavy and coriaceous, dark-green, spreading or ascending, oblong to broadly elliptic, 5–10 cm. long, 1.5–3 cm. wide, sharply acute or mucronate, revolute, entire or with a few remote spinose teeth, rounded to subcordate at base, rugose, scabrous, and shining above, glabrate beneath or minutely puberulent, especially on the veins; petioles 1–2 mm. long, pubescent; cymes long and spreading, with numerous heads; bracteal leaves resembling the cauline, but gradually reduced to 1 cm. long; heads 1–3 cm. apart, about 21-flowered; involucre campanulate, 6–8 mm. high; scales pubescent and ciliate, the outer ovate, acuminate into mucronate, squarrose or erect tips, the inner erect or somewhat spreading, sharply acute or subulate; pappus pale-brown, the bristles 6 mm., the broad scales 0.8 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Eastern Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁶: pl. 1, f. 9.

56. *Vernonia yunquensis* Gleason, Bull. N. Y. Bot. Gard.
4: 191. 1906.

Stems erect, sparingly branched, 1.2 m. tall, very thinly but closely canescent; leaf-blades firm, dull-green above, pale beneath, broadly elliptic, 4–5 cm. long, 1.8–2.7 cm. wide, obtuse or mucronate, entire, obtuse or acute at base, glabrous, glandular-punctate and somewhat rugose above, closely and densely gray-tomentose with prominently reticulate veins beneath; heads about 5, sessile or nearly so in a terminal capitate cluster, about 34-flowered; involucre campanulate, 7 mm. high; scales closely and regularly imbricate in several series, red or purple, gray-tomentose on the back, acute or subacute and mucronate, the outer broadly ovate, the inner ovate-lanceolate to lanceolate; achenes hirsute with appressed hairs; pappus nearly white, the bristles flattened, 4.5 mm. long, the scales 0.9–1 mm. long.

TYPE LOCALITY: El Yunque mountain, Baracoa, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁶: pl. 3, f. 6.

57. *Vernonia segregata* Gleason, Bull. Torrey Club
40: 327. 1913.

Stems shrubby, 1–2.5 m. high, closely pubescent to finely tomentulose; leaves numerous, crowded, the blades firm, oblong to elliptic-obovate, broadest at or above the middle, 2.5–4 cm. long, 1–1.5 cm. wide, obtuse or subacute, entire, obtuse or rounded at base, scabrellate and resinous above, glabrous and densely resinous beneath and puberulent on the midvein; petioles 1–2 mm. long; inflorescence terminal, irregular, of several short, simple or sparingly branched cymes bearing each 2–8 heads in a terminal subcapitate cluster or at the base of the branches; heads 8-flowered; involucre campanulate, 3–4 mm. high; scales loosely and irregularly im-

bricate, appressed at base, spreading at the apex, stiff and firm, the outer narrowly triangular-lanceolate, long-acuminate, the inner narrowly oblong-linear, tapering gradually to the acuminate pubescent apex; achenes thinly pubescent, 2 mm. long; pappus nearly white, the bristles 4 mm. long, flattened, the scales broad, nearly or quite 1 mm. long.

TYPE LOCALITY: Vicinity of Camp San Benito, Oriente, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 5, f. 3.

58. *Vernonia Tuerckheimii* Urban, Symb. Ant. 7: 421. 1912.

Stems shrubby, erect, 1-1.5 m. tall, freely branched above, thinly and closely canescent; leaf-blades firm and shining, obovate to subrotund, 3-10 mm. long, 2-6 mm. wide, acute, entire, abruptly narrowed at base, impressed-punctate and minutely puberulent above, very closely and finely tomentulose beneath; petioles 1-2 mm. long; heads about 11-flowered, crowded in subcapitate clusters of 2-8 at the ends of the branches and forming a large compound inflorescence; involucre narrowly campanulate to turbinate, 7 mm. high, narrowed at the base, the outer scales ovate, subacute, glabrous or nearly so, the inner oblong, obtuse or acute, purple at the glabrous tip, puberulent and glandular below; achenes pale-brown, glabrous and glandular, 2.5 mm. long; pappus tawny tinged with rose, the bristles 6 mm. long, the scales narrow, 0.6 mm. long.

TYPE LOCALITY: Near Constanza, Santo Domingo, alt. 1250 meters.

DISTRIBUTION: Santo Domingo.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 1, f. 10.

59. *Vernonia domingensis* (Spreng.) DC. Prodr. 5: 30. 1836.

Proustia domingensis Spreng. Syst. 3: 502. 1826.

Vernonia montana Gleason, Bull. N. Y. Bot. Gard. 4: 191. 1906.

Stems shrubby, climbing, 6 m. long, puberulent when young, becoming glabrate with age; leaves crowded, the blades firm or coriaceous, oblong-elliptic to rhomboid or oblong-obovate, 8-16 mm. long, 5-8 mm. wide, acute or rounded, entire, somewhat revolute, cuneate at base, dark-green, glabrous, and glandular above, minutely puberulent and glandular beneath, sessile or with petioles 1-2 mm. long; inflorescence subcapitate; heads 2-5, sessile or nearly so, 8-flowered; involucre 5 mm. high, campanulate, rounded at base, regularly imbricate; scales appressed, obtuse to subacute, glabrous, or puberulent at the tip, the outer broadly ovate, the inner ovate-lanceolate to lanceolate; achenes obscurely ribbed, glabrous, glandular, 3 mm. long; pappus yellow-brown, the bristles 3.5-4 mm. long, the scales narrow, almost entire, 0.4-0.5 mm. long.

TYPE LOCALITY: Hispaniola.

DISTRIBUTION: Hispaniola.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 1, f. 11.

60. *Vernonia buxifolia* (Cass.) Less. Linnaea 4: 313. 1829.

Lepidaploa buxifolia Cass. Dict. Sci. Nat. 26: 18. 1823.

Cacalia buxifolia Kuntze, Rev. Gen. 968. 1891.

Stems shrubby, climbing, pubescent when young, becoming glabrous with age; leaf-blades coriaceous, elliptic-oblong or oblong-obovate, 2-4 cm. long, 8-18 mm. wide, acute, entire, somewhat revolute, narrowed at base into petioles 1-2 mm. long, glabrous or nearly so and impressed-punctate on both sides, shining above; heads about 8-flowered, 3-6 in a subcapitate cluster, sessile or on short scaly peduncles; involucre funnelform or narrowly turbinate, 8-9 mm. high, attenuate at base; scales closely and regularly imbricate in spiral series, glabrous, the outer ovate, obtuse to subacute, somewhat fimbriate, the inner ovate-lanceolate, the innermost linear-oblong, acuminate, widely spreading or horizontal at tip; achenes obtusely ribbed, minutely resinous; pappus tawny, the bristles 5.5 mm. long, the scales barely ciliate, narrow, 0.7-0.8 mm. long.

TYPE LOCALITY: Haïti.

DISTRIBUTION: Hispaniola.

61. *Vernonia pallescens* Gleason, Bull. N. Y. Bot. Gard.
4: 192. 1906.

Stems shrubby, branching above, thinly puberulent or glabrate; leaf-blades thin and membranous, elliptic, 8–10 cm. long, 2.5–4.5 cm. wide, long-acuminate, sharply serrate on the upper half, less serrate or entire below, narrowed at the base into short petioles, very minutely puberulent and resinous-dotted on both sides, pale-green and glaucescent beneath; inflorescence sparingly branched, leafless; heads about 11-flowered; involucre obconic or narrowly campanulate, 4–5 mm. high; scales few, loosely imbricate, the outer erect, narrowly lanceolate, thinly villous-pubescent, especially toward the apex, conspicuously glandular, sharply acuminate and cuspidate, the inner oblong-lanceolate, thinly short-villous, resinous-dotted, abruptly short-acuminate; achenes obscurely angled, 2 mm. long, densely strigose-pubescent; pappus rufescent, the bristles 5 mm. long, strongly barbellate, the outer series of very slender barbellate bristles, about 0.6 mm. long, not flattened.

TYPE LOCALITY: St. Vincent.

DISTRIBUTION: St. Vincent.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 6, f. 3.

62. *Vernonia scorpioides* (Lam.) Pers. Syn. Pl. 2: 404. 1807.

Conyza scorpioides Lam. Encyc. 2: 88. 1786.

Lepidaploa scorpioides Cass. Dict. Sci. Nat. 26: 16. 1823.

Chrysocoma repanda Vell. Fl. Flum. 327. 1825.

Cacalia scorpioides Kuntze, Rev. Gen. 970. 1891.

Stems shrubby, distantly branched, softly and closely pubescent; leaf-blades thin, ovate to elliptic, 5–12 cm. long, 2–7 cm. wide, acute or acuminate, entire, abruptly narrowed into a short cuneate base, softly papillose-pubescent or glabrate above, thinly pilose to densely sericeous or almost tomentose beneath, not resinous; petioles 1–2 cm. long; cymes few, crowded, short, curved or spreading, forming a compact, depressed, terminal panicle; heads about 21-flowered; involucre campanulate, 4 mm. high; scales loosely imbricate in few series, lanceolate, acuminate, villous; achenes pubescent; pappus white, the bristles 5 mm. long, the scales very narrow, 0.7 mm. long.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Nicaragua; tropical South America.

ILLUSTRATION: Vell. Fl. Flum. Ic. 8: pl. 13.

63. *Vernonia brachiata* Benth.; Oerst. Vidensk. Meddel.
1852: 67. 1852.

Cacalia brachiata Kuntze, Rev. Gen. 969. 1891.

Stems apparently herbaceous, glabrous or nearly so, strongly angled; leaf-blades thin, broadly elliptic, 10–20 cm. long, 4–8 cm. wide, acute to acuminate, serrulate or entire, gradually attenuate to an obtuse base, nearly glabrous on both sides, short-petioled, the upper leaves gradually reduced; inflorescence leafless, 1–3 dm. high, freely branched, the cymes very numerous, 1–2 dm. long, straight or slightly curved; heads 21-flowered, contiguous or nearly so; involucre broadly campanulate, 3–4 mm. high; scales loosely imbricate, ciliate, the outer triangular-lanceolate, sharply acute and somewhat cuspidate with a thickened midvein, the inner oblong to oblanceolate, acute or subacute, thin and scarious, with a colored midvein and purple tip; achenes sparsely hirsute; pappus pale-brown, the bristles 5 mm., the scales 0.3 mm. long.

TYPE LOCALITY: Mt. Aguacate, Costa Rica.

DISTRIBUTION: Costa Rica; northern South America.

64. *Vernonia canescens* H. B. K. Nov. Gen. & Sp. 4: 35. 1818.

Lepidaploa canescens Cass. Dict. Sci. Nat. 26: 18. 1823.

Vernonia bullata Benth.; Oerst. Vidensk. Meddel. 1852: 67. 1852.

Cacalia bullata Kuntze, Rev. Gen. 969. 1891.

Cacalia canescens Kuntze, Rev. Gen. 969. 1891.

Vernonia Purpusii Brand. Univ. Calif. Publ. Bot. 6: 197. 1915.

Stems suffrutescent, erect, 1–3 m. high, branching above, pubescent or becoming glabrous; leaf-blades thin, oblong-lanceolate to broadly ovate, 4–11 cm. long, 2–4 cm. wide, short-acuminate, entire, rounded or obtuse at base, rugose or nearly flat, scabrellate above, softly strigose-pubescent and resinous-dotted beneath, with prominently reticulate veins; petioles 3–5 mm. long; inflorescence large and loose, 1–3 dm. wide, with comparatively few spreading branches 8–20 cm. long; heads about 1 cm. apart, 21-flowered; involucre campanulate, 4–5 mm. high; scales loosely imbricate, erect, thinly villous, the middle and outer narrowly triangular-subulate, the inner lanceolate, acuminate; achenes 2 mm. long, hirsute; pappus white, the bristles 4 mm. long, the scales narrow, variable in length from 0.4–1.1 mm.

TYPE LOCALITY: Peru.

DISTRIBUTION: Southern Mexico to tropical South America.

ILLUSTRATION: H. B. K. Nov. Gen. & Sp. *pl.* 317.

65. *Vernonia mollis* H. B. K. Nov. Gen. & Sp. 4: 36. 1818.

Cacalia mollis Kuntze, Rev. Gen. 970. 1891.

Stems shrubby, closely cinereous-tomentose; leaf-blades firm, flat, sessile or nearly so, 4–6 cm. long, 2–3 cm. wide, acuminate, entire or undulate, obtuse or rounded at base, thinly sericeous-hirsute above, finely gray-tomentose beneath, the tomentum concealing the resinous glands, the lateral veins obscure and reticulate; cymes short and crowded, terminating the stem and upper branches; heads 21-flowered; involucre broadly campanulate, 4–5 mm. high; scales regularly imbricate, appressed at base, somewhat spreading at the apex, narrowly linear-triangular, villous throughout, the prominent midvein prolonged into a glabrous subulate tip; achenes hirsute; pappus white, the bristles 4.5 mm. long, the scales very broad, 0.8–0.9 mm. long.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Guatemala; also in tropical South America.

66. *Vernonia stellaris* Llave & Lex. Nov. Veg. Descr. 1: 23. 1824.

Vernonia Deppeana Less. Linnaea 6: 398. 1831.

Cacalia Deppeana Kuntze, Rev. Gen. 969. 1891.

Cacalia stellaris Kuntze, Rev. Gen. 970. 1891.

Stems shrubby, freely branched, pubescent or tomentose, 2–5 m. high; leaf-blades thin, oblong or narrowly elliptic, 8–10 cm. long, 2.5–3.5 cm. wide, acute, entire or obscurely serrate, narrowed or rounded at base, scabrellate with papillose hairs above, tomentose or floccose with ferruginous hairs beneath, on petioles 8–12 mm. long; inflorescence widely branched, pyramidal or hemispheric, 1–3 dm. broad; heads 18–21- (rarely 11-) flowered; involucre campanulate, 3–4 mm. high; scales loosely but regularly imbricate, erect or appressed, the outer ovate, acute or acuminate, pubescent, the inner oblong, acute or subacute, glabrous or puberulent, arachnoid-ciliate; achenes sharply ribbed, 2.5 mm. long, pubescent; pappus tawny, the bristles 4 mm. long, the scales very narrow, about 0.5 mm. long.

TYPE LOCALITY: San José del Corral [near Cordoba, Veracruz].

DISTRIBUTION: Central Mexico to Costa Rica.

67. *Vernonia morelana* Gleason, Bull. Torrey Club 46: 241. 1919.

Stems shrubby, branching above, 3–5 m. high, closely gray-tomentose, becoming glabrate with age; leaf-blades firm, dull-green, ovate-oblong, 6–8 cm. long, 2.5–3 cm. wide, entire or remotely serrate, obtuse or rounded at each end, closely scabrous-pubescent above, finely gray-tomentose beneath, on tomentose petioles 8 mm. long, the upper leaf-blades similar but smaller and more densely tomentose, those in the cymes broadly ovate to subrotund, 5–15 mm. long; cymes freely branched, forming a hemispheric cluster 2 dm. broad; heads 21-flowered; involucre campanulate, 4–4.5 mm. high; scales regularly imbricate, all appressed or barely spreading, the outer and middle ovate to ovate-oblong, sharply acute or cuspidate, tomentose-ciliate and frequently puberulent, the inner lanceolate, sharply acute to sub-acuminate, nearly or quite glabrous; achenes thinly pubescent and densely resinous-glandular; pappus white or pale-tawny, the bristles 6 mm., the narrow scales 0.6–0.8 mm. long.

TYPE LOCALITY: Cuernavaca, Morelos.

DISTRIBUTION: Morelos.

68. *Vernonia Aschenborniana* S. Schauer; Nees & Schauer,
Linnaea 19: 714. 1847.

Cacalia Aschenborniana Kuntze, Rev. Gen. 969. 1891.

Stems shrubby, 2-5 m. tall, ferruginous-pubescent; leaf-blades firm or thin, brownish-green or olivaceous, oblong to lance-oblong, 6-10 cm. long, 2-3 cm. wide, acute, entire or remotely serrulate, frequently somewhat revolute, narrowed at base, roughly papillose-pubescent above, thinly pubescent with rusty hairs beneath, especially on the veins; petioles 2-3 mm. long; inflorescence hemispheric or pyramidal, freely branched, 2-3 dm. wide; heads 11-flowered, all sessile or nearly so; involucre broadly campanulate to hemispheric, 3 mm. high; scales regularly imbricate in few series, more or less pubescent and ciliate, the outer broadly ovate, acute, the inner ovate-lanceolate, subacute or obtuse, the midvein thickened at the apex; achenes sharply ribbed, hirsute, 2 mm. long; pappus tawny or rufescent, the bristles 5 mm. long, the scales very narrow, 0.4-0.5 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southern Mexico, Guatemala, and Nicaragua.

69. *Vernonia salamana* Gleason, Bull. Torrey Club
46: 242. 1919.

Stems shrubby, branched above, 2-2.5 m. high, thinly cinereous-pubescent or becoming glabrate with age; leaf-blades thin but firm, pale-olivaceous, ovate-elliptic, 5-7 cm. long, 2-3 cm. wide, obtuse or subacute, undulate, entire, or remotely denticulate, obtuse or rounded at base, distinctly pubescent or subtomentose above, finely pubescent beneath, especially on the prominent reticulate veins, on petioles 4-8 mm. long, or the upper leaves nearly sessile; inflorescence of freely branched cymes, terminating the stem and upper branches, forming a pyramidal panicle 2.5 dm. broad, the cyme-branches leafless, straight, bearing each 3-6 21-flowered heads; involucre broadly campanulate, 4-5 mm. high; scales loosely but regularly imbricate, pale-green with a dark spot near the apex, ciliate, puberulent, obtuse to broadly rounded, the midvein prominent apically and usually prolonged into a minute mucro; achenes finely pubescent; pappus pale-tawny, the bristles 4 mm. long, the scales narrowly linear, 0.4 mm. long.

TYPE LOCALITY: Near Salamá, Guatemala.

DISTRIBUTION: Guatemala.

70. *Vernonia patens* H. B. K. Nov. Gen. & Sp. 4: 41. 1818.

Vernonia lanceolaris DC. Prodr. 5: 37. 1836.

Vernonia pacchensis Benth. Pl. Hartw. 134. 1844.

Cacalia lanceolaris Kuntze, Rev. Gen. 970. 1891.

Cacalia patens Kuntze, Rev. Gen. 970. 1891.

Stems shrubby, 3-5 m. high, glabrate or puberulent; leaf-blades spreading, thick and firm, brownish-green or olivaceous, narrowly lanceolate, 8-15 cm. long, 1.5-2.5 cm. wide, acuminate or sharply acute, entire or serrulate, gradually narrowed to the base, minutely puberulent, shining, and rugose above, puberulent beneath, especially on the prominently reticulate veins; petioles 5-10 mm. long; cymes very numerous, freely branched, forming a compact, hemispheric, terminal panicle; heads 21-flowered; involucre campanulate, 4-5 mm. high; scales closely and regularly imbricate in numerous series, appressed, pale-green with brown center, glabrous or puberulent on the back, tomentose-ciliate, subacuminate or acute to rounded and minutely cuspidate, the middle and outer sharper; achenes minutely pubescent; pappus pale-brown, the bristles 5 mm. long, the scales narrowly linear, 0.3-0.8 mm. long, irregular.

TYPE LOCALITY: Central America.

DISTRIBUTION: Southern Mexico to tropical South America.

71. *Vernonia menthaefolia* (Poepp.) Less. *Linnaea* 4: 168. 1829.

Eupatorium menthaefolium Poepp.; Spreng. Syst. 3: 412. 1826.

Vernonia Ottonis Schultz-Bip. *Linnaea* 20: 508. 1847.

Vernonia Grisebachii Schultz-Bip. Jour. Bot. 1: 231. 1863.

Stems shrubby, erect, 1–5 m. high, minutely puberulent; leaf-blades thin, varying from narrowly oblong-lanceolate, acuminate at each end, to ovate, rounded at base and acute at apex, entire, undulate, or sparsely serrate with low teeth, bright-green and scabrellate above, closely and finely puberulent and dull-green beneath; petioles 10–15 mm. long; inflorescence loosely pyramidal, 2–3 dm. wide, dichotomously branched; heads 11–18 flowered, on peduncles 3–5 mm. long; involucre broadly campanulate, closely imbricate, 4–5 mm. high; scales coriaceous, puberulent, the outer short, ovate, obtuse or acute, the inner oblong-lanceolate, rounded with thickened midvein, glandular; achenes 3 mm. long, minutely pubescent, glandular; pappus yellowish-brown to nearly white, the bristles 6 mm. long, the scales narrow, 0.4–0.5 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 6, f. 1.

72. *Vernonia cubensis* Griseb. Cat. Pl. Cub. 144. 1866.

Vernonia hieracioides cubensis Maza, Anal. Soc. Esp. Hist. Nat. 19: 268. 1890.

Stems shrubby, 2 m. high, closely and finely pubescent; leaf-blades firm, dull-green or olivaceous, obovate to obovate-oblong or oblanceolate, 4–7 cm. long, 1.5–3.5 cm. wide, acute or abruptly acuminate, obscurely denticulate, obtuse or acute at base, scabrous above, puberulent with brown hairs beneath, especially on the veins; inflorescence spreading, freely branched, bearing numerous, crowded, 11–13-flowered heads; involucre campanulate or somewhat turbinate, 3–4 mm. high; scales nearly glabrous, purple at least at the apex, resinous-glandular, the outer ovate, acute, the inner ovate-oblong, obtuse or subacute; achenes pubescent, frequently glandular in the furrows; pappus pale-brown, the bristles 4 mm. long, the scales linear, 0.4 mm. long.

TYPE LOCALITY: Western Cuba.

DISTRIBUTION: Central and western Cuba and Isle of Pines.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 5, f. 2.

73. *Vernonia havanensis* DC. Prodr. 5: 37. 1836.

Vernonia stictophylla C. Wright; Sauv. Anal. Acad. Ci. Habana 6: 176. 1869.

Cacalia havanensis Kuntze, Rev. Gen. 970. 1891.

Stems shrubby, freely branched, 1–2 m. high, thinly pubescent or glabrate; leaf-blades thin, spreading, bright-green, 6–11 cm. long, 2–5 cm. wide, narrowly oblanceolate to obovate, acute or abruptly acuminate, entire or sparingly denticulate, attenuate at base, sessile or petioled, glabrous and usually punctate above, minutely puberulent and resinous beneath; inflorescence loose, open, freely branched, 1–3 dm. broad; heads 18–29-flowered; involucre 5–8 mm. high, broadly campanulate, tinged with purple; scales closely but irregularly imbricate in few series, resinous-glandular, otherwise nearly glabrous, the outer ovate, acute, the inner oblong, obtuse or rounded; achenes pubescent on the ribs, glandular in the furrows; pappus white or pale-brown, the bristles 6 mm. long, the scales very slender, 0.6 mm. long.

TYPE LOCALITY: Havana, Cuba.

DISTRIBUTION: Central and western Cuba.

ILLUSTRATIONS: Ark. Bot. 13¹⁵: pl. 5, f. 6, 7.

74. *Vernonia hieracioides* Griseb. Mem. Am. Acad.

II. 8: 511. 1860.

Cacalia hieracioides Kuntze, Rev. Gen. 970. 1891.

Vernonia Orientis Gleason, Bull. Torrey Club 40: 330. 1913.

Stems shrubby, 3–6 m. tall, sparingly branched, glabrate below, cinereous-puberulent in the inflorescence; leaf-blades rigid, dark-green, spreading, oblanceolate, 9–11 cm. long, 2.5–3.5 cm. wide, abruptly short-acuminate or sharply acute, remotely dentate with sharp salient teeth, chiefly above the middle, attenuate below to a cuneate base, scabrous to glabrate and somewhat rugose above, minutely puberulent beneath, glandular-dotted on both sides; petioles 5–10 mm. long; inflorescence terminal, broadly pyramidal or hemispheric, the cymes freely branched, bearing 2–6 heads crowded toward the tip; heads 5–6-flowered; involucre

campanulate, 3.5–4.5 mm. high; scales ovate to ovate-oblong, erect or somewhat spreading, sharply acute or subacuminate, nearly glabrous, resinous on the back; achenes thinly pubescent, resinous in the furrows; pappus pale yellowish-brown, the bristles 4–4.5 mm. long, the scales slender, 0.4–0.5 mm. long.

TYPE LOCALITY: Monte Verde, Cuba.

DISTRIBUTION: Eastern Cuba.

ILLUSTRATION: Ark. Bot. 13¹⁵: pl. 5, f. 5.

75. *Vernonia Salvinae* Hemsl. Biol. Centr. Am. Bot.
2: 73. 1881.

Cacalia Salvinae Kuntze, Rev. Gen. 970. 1891.

Leiboldia Salvinae Gleason, Bull. N. Y. Bot. Gard. 4: 162. 1906.

Stems shrubby, densely and closely brown-tomentose, becoming glabrate in age; leaf-blades membranous, oblong-oblongate to narrowly obovate, 10–25 cm. long, 2.5–7 cm. wide, acuminate to an obtuse mucronate tip, entire or remotely denticulate, gradually narrowed below into petioles 1 cm. long, thinly and minutely papillose-pilose and glandular-punctate above, becoming nearly glabrous, thinly strigose and punctate on the surface beneath and conspicuously brown-strigose on the veins; heads 1–5, on peduncles 2–7 cm. long, many-flowered; involucre broadly campanulate or hemispheric, 12–15 mm. high; scales loosely imbricate, thin and membranous, the outer squarrose, purple-brown, broadly ovate and glabrous at the coriaceous appressed base, dilated above into a thin, ovate, acute, mucronate, pubescent, veiny tip, the inner oblong, barely dilated if at all into the triangular, ovate, mucronate, veiny tip; achenes black, glabrous; pappus pale-tawny, the bristles 5 mm. long, the scales subulate, very deciduous, 0.8–1.1 mm. long.

TYPE LOCALITY: Las Nubes, Cerro de Zunil, Guatemala, alt. 1300 meters.

DISTRIBUTION: Chiapas to Costa Rica.

ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. pl. 41.

76. *Vernonia mexicana* Less. Linnaea 6: 680. 1831.

Cacalia mexicana Kuntze, Rev. Gen. 970. 1891.

? *Vernonia Salvinae canescens* Coult. Bot. Gaz. 16: 95. 1891.

Leiboldia mexicana Gleason, Bull. N. Y. Bot. Gard. 4: 163. 1906.

Stems shrubby, ferruginous-tomentose; leaf-blades thin, broadly obovate, 20 cm. long, 15 cm. wide, abruptly short-acuminate, mucronulately serrulate, tapering regularly to the base, dark-green and nearly glabrous above, thinly gray-tomentose beneath, with prominent veins; heads few, large, many-flowered; involucre broadly hemispheric, 20 mm. high, 30 mm. broad; scales thin and glabrous, the outer ovate, appressed at base, broadly rounded and somewhat spreading above, the inner loosely imbricate, acute or subacute, the exposed portion of the principal scales reticulately veined, 4–5 mm. wide; achenes glabrous; pappus pale-brown.

TYPE LOCALITY: Chiconquiaco [Veracruz].

DISTRIBUTION: Southern Mexico.

77. *Vernonia callilepis* Gleason, sp. nov.

Stems shrubby, closely cinereous-pubescent; leaf-blades elliptic, broadest at the middle, 21 cm. long, 7.5 cm. wide, acute or somewhat acuminate, entire, gradually tapering at base into a margined or winged petiole 3.5 cm. long, conspicuously pubescent on both sides, especially on the veins and beneath, the upper leaves somewhat reduced; heads few, many-flowered, 25 mm. high, on peduncles 5 cm. long; involucre broadly hemispheric, about 15 mm. high; outer scales foliaceous, loosely spreading at the apex, somewhat appressed below, long-triangular, 12–18 mm. long, broadly rounded or truncate at base, 4–8 mm. wide, tapering regularly to the acute purple tip, densely pubescent; inner scales chartaceous, purple, the base convex and appressed, glabrous, 10 mm. long, 5 mm. wide, the tip thin, ascending, 6–8 mm. wide and long, broadly oblong, rounded or subacute, purple, veiny, puberulent; corolla red or red-purple, sparsely glandular, the tube 13 mm. long; pappus pale-brown.

Type collected at La Liberia, Michoacan or Guerrero, *Langlassé* 978 (United States National Herbarium, no. 386310).

DISTRIBUTION: Known only from the type locality.

78. *Vernonia dictyophlebia* Gleason, Bull. N. Y. Bot. Gard. 4: 203. 1906.

Stems shrubby, erect, 1-2 m. high, puberulent or thinly tomentose; leaf-blades firm, spreading, ovate or ovate-elliptic, 6-10 cm. long, 3-6 cm. wide, broadest below the middle, acute or subacuminate, sharply and irregularly serrate, obtuse to broadly rounded or subcordate at base, scabrous above, subtomentose beneath, the veins very prominently reticulate; inflorescence depressed-hemispheric, 1-2 dm. wide; heads many-flowered, 15-20 mm. wide, on peduncles 2-4 cm. long; involucre broadly campanulate, 12-15 mm. high; scales loosely but regularly imbricate in several series, glabrous, purple or purplish-green, the outer spreading or reflexed, the inner erect or loose, narrowly oblong, subacute to rounded, with an awn 1 mm. long or shorter; achenes 4 mm. long, densely glandular; pappus white, the bristles 8 mm. long, the scales subulate, 1 mm. long or more.

TYPE LOCALITY: Michoacan.

DISTRIBUTION: Southern Mexico, from Guanajuato to Oaxaca.

79. *Vernonia Alamani* DC. Prodr. 5: 61. 1836.

? *Vernonia inuloides* D. C. Prodr. 5: 62. 1836.
Cacalia Alamani Kuntze, Rev. Gen. 969. 1891.

Stems shrubby, erect, 1-2 m. high, branched above, glabrate; leaf-blades firm, dull-green, elliptic or elliptic-oblong, 9-14 cm. long, 3-7 cm. wide, broadest at the middle and tapering regularly to each end, finely serrulate to subentire, scabrellate above, thinly puberulent and sometimes resinous beneath, veinlets obscurely reticulate; heads few, large, many-flowered, on peduncles 2-8 cm. long; involucre broadly campanulate to depressed-hemispheric, 15-20 mm. high; scales erect or somewhat spreading, oblong with parallel sides, short-acuminate, acute, or rarely rounded at the apex, terminated by a mucro 2 mm. long, glabrous or scabrellate, the outer reflexed or spreading, the inner loose, erect; achenes 4 mm. long, thinly glandular in the furrows; pappus white, the bristles 8 mm. long, the scales subulate, 1.1-1.4 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southern Mexico, from Guanajuato to Oaxaca.

80. *Vernonia Conzattii* B. L. Robinson, Proc. Am. Acad. 44: 615. 1909.

Stems herbaceous, erect, thinly tomentose, corymbosely branched above; leaf-blades firm, ovate-oblong or elliptic to ovate-lanceolate, 5-7 cm. long, 2-3 cm. wide, acuminate, obscurely serrulate or entire, acute or obtuse at the base, short-petioled, rugose and scabrous above, paler, densely pubescent or subtomentose, and resinous-dotted beneath; veins reticulate; inflorescence umbelliform, depressed-hemispheric, 8-20 cm. wide; peduncles 12-30 mm. long, tomentose, with subulate bracteoles; heads about 34-flowered, 12 mm. in diameter; involucre broadly campanulate, 8-10 mm. high, the scales imbricate in several series, purple, mucronate, ciliate, the outer lanceolate to lance-linear, the middle oblong, mostly rounded at the cuspidate apex, the inner subacute; achenes glabrate, somewhat glandular; pappus nearly white, the bristles 6 mm. long, the scales narrowly linear, 1 mm. long.

TYPE LOCALITY: Santa Ines del Monte, Zimatlan, Oaxaca, alt. 2700 meters.

DISTRIBUTION: Oaxaca.

81. *Vernonia corymbiformis* DC. Prodr. 5: 62. 1836.

Cacalia corymbiformis Kuntze, Rev. Gen. 969. 1891.

Stems shrubby, erect, divaricately branched above, glabrous or puberulent; leaf-blades thin, bright-green, elliptic, 8-14 cm. long, 3.5-6 cm. wide, acute or subacuminate, entire, narrowed at the base, almost glabrous on both sides, resinous beneath, prominently veined, on petioles 1-2 cm. long; upper leaves similar but smaller; inflorescence depressed-hemispheric, 3 dm. wide; heads about 26-flowered; involucre obconic-campanulate, 8 mm. high, the scales loosely imbricate, straight, erect or the outer spreading, purple-tinged, glabrous, narrowly

triangular-subulate with a prominent midvein; achenes glabrous but glandular; pappus almost white, the bristles 6 mm. long, the scales narrowly linear, about 1 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Jalisco.

82. *Vernonia Karvinskiana* DC. Prodr. 5: 62. 1836.

Cacalia Karvinskiana Kuntze, Rev. Gen. 970. 1891.

Stems purple, herbaceous, erect, 1 m. high, glabrous to puberulent; leaf-blades firm, ovate-lanceolate to oblong, 3–10 cm. long, 1.5–3 cm. wide, acuminate, entire or remotely denticulate, acute or obtuse at base, scabrous above, puberulent beneath with short conic hairs, very minutely pitted on both sides, nearly sessile; inflorescence depressed-hemispheric, 1 dm. wide; involucre campanulate, 8 mm. high, the scales thin, glabrous, purple, appressed below, loose and somewhat spreading above, linear-lanceolate or narrowly oblong, tapering regularly to the sharply acute tip or rarely rounded and mucronulate, the midvein not prominent; achenes glabrous, glandular in the furrows, 2.5–3 mm. long; pappus almost white, the bristles 6.5 mm. long, the scales narrowly linear, 0.8–0.9 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Oaxaca.

83. *Vernonia jaliscana* Gleason, Bull. N. Y. Bot.

Gard. 4: 198. 1906.

Stems suffrutescent, erect, 1 m. high, simple to the inflorescence, scabrellate or becoming glabrous; leaf-blades thick, coriaceous, usually pale-green, elliptic-oblong or ovate-oblong, 7–11 cm. long, 2.5–4.5 cm. wide, obtuse or subacute, entire or undulate, obtuse to rounded or subcordate at base, scabrous, especially above, and minutely pitted on both sides; petioles about 5 mm. long; inflorescence hemispheric or depressed, pubescent; heads 18–21-flowered; involucre broadly campanulate, 7 mm. high; scales closely but irregularly imbricate, glabrous, purple-tipped, the outermost spreading or recurved, lanceolate, cuspidate, the inner appressed, narrowly oblong, attenuate or sharply acute, mucronulate; achenes 2.5 mm. long, glabrous and densely glandular; pappus nearly white, the bristles 7–8 mm. long, the scales irregular, ciliate, 0.9–1.1 mm. long.

TYPE LOCALITY: Guadalajara, Jalisco.

DISTRIBUTION: Jalisco.

84. *Vernonia serratuloides* H.B.K. Nov. Gen. & Sp. 4: 33. 1818.

Perezia paniculata A. Gray, Proc. Am. Acad. 21: 393. 1886.

Cacalia serratulodes Kuntze, Rev. Gen. 970. 1891.

Vernonia umbellifera Gleason, Bull. N. Y. Bot. Gard. 4: 199. 1906.

Stems erect, suffrutescent, freely branched above, glabrous or puberulent; leaf-blades thick, firm, narrowly lanceolate to oblong, 5–10 cm. long, 1–3 cm. wide, or the upper smaller, acute or acuminate, entire or irregularly serrate, frequently somewhat revolute, scabrellate or glabrous and minutely pitted above, pubescent or puberulent and minutely pitted beneath, short-petioled; inflorescence subhemispheric to pyramidal, 1 dm. wide; heads 8–11-flowered; involucre campanulate, 7–8 mm. high; scales loosely and irregularly imbricate, erect or appressed, purple-tipped, subacute to short-acuminate, cuspidate, frequently glandular, the outer ovate, thinly ciliate, the inner oblong, glabrous or nearly so; achenes 2.5 mm. long, glandular, glabrous or puberulent; pappus pale-brown, the bristles 6.5 mm. long, the scales narrowly linear, irregular, 0.5–1 mm. long.

TYPE LOCALITY: Valladolid [Morelia], Michoacan, alt. 1900 meters.

DISTRIBUTION: Chihuahua to Jalisco.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. pl. 316.

85. *Vernonia oaxacana* Schultz-Bip.; Klatt, Leopoldina 20: 74. 1894.

Stems shrubby, puberulent or pubescent; leaf-blades elliptic-oblong, 7–10 cm. long, 2–3 cm. wide, acute, entire or remotely denticulate, narrowed at base, scabrellate above, prom-

inently floccose-tomentose beneath, on petioles 5–12 mm. long; upper leaves similar but smaller; inflorescence compact, hemispheric; heads about 11-flowered; involucre broadly campanulate, 5 mm. high; scales glabrous, subacute, cuspidate; achenes minutely pubescent, resinous in the furrows, 3 mm. long; pappus very pale-tawny, the bristles 6 mm. long, the scales narrowly linear, 1 mm. long.

TYPE LOCALITY: [Oaxaca,] Mexico.

DISTRIBUTION: Oaxaca and Chiapas.

86. *Vernonia capreaefolia* (Schultz-Bip.) Gleason,
Bull. N. Y. Bot. Gard. 4: 200. 1906.

Vernonia Ehrenbergiana capreaefolia Schultz-Bip.; Gleason, Bull. N. Y. Bot. Gard. 4: 200, as synonym. 1906.

Stems erect, suffrutescent, at least 1 m. high, simple to the inflorescence, scabrous-puberulent or glabrate; leaf-blades coarse, firm, usually bright-green, broadly elliptic, 9–20 cm. long, 2.5–9 cm. wide, tapering regularly to an acute tip, serrulate or coarsely serrate, narrowed or cuneate at base, scabrous and frequently rugose above, glabrate or puberulent with short conic hairs beneath, the veins prominently reticulate; petioles 2–10 mm. long; upper leaves similar but smaller; inflorescence broadly pyramidal or hemispheric, 1–3 dm. wide, puberulent; heads 11–18-flowered; involucre campanulate, 5–6 mm. high; scales loosely and irregularly imbricate, glabrous or nearly so, minutely ciliate or entire, purple or purple-tinged, the outer lanceolate, acuminate and cuspidate, the inner acute or subacute, mucronulate; achenes 2.5 mm. long, resinous in the furrows; pappus pale-tawny, 4.5–5 mm. long, the scales very irregular, 0.6–1.4 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Western Mexico, from Durango to Oaxaca.

87. *Vernonia Sinclairi* Benth. Bot. Voy. Sulph. 109. 1845.

Vernonia Ehrenbergiana Schultz-Bip. Linnaea 20: 513. 1847.

Cacalia Ehrenbergiana Kuntze, Rev. Gen. 969. 1891.

Cacalia Sinclairi Kuntze, Rev. Gen. 970. 1891.

Stems herbaceous, erect, 10–25 dm. high, cinereous-pubescent or becoming glabrate in age; leaf-blades elliptic to obovate, 3–8 cm. long, 1.2–4 cm. wide, acute or short-acuminate, serrate to nearly entire, scabrous above, cinereous-pubescent or subtomentose beneath, especially along the prominent veins, on petioles 3–10 mm. long; upper leaves similar but smaller; inflorescence hemispheric or depressed-pyramidal, 1–2 dm. wide; heads 8–11-flowered, on peduncles 3–6 mm. long; involucre campanulate, 4–5 mm. high; scales appressed, loosely imbricate, purple-tipped, the outer triangular-lanceolate, cuspidate, ciliate, the inner oblong-lanceolate, abruptly acute or subacuminate, cuspidate, entire; achenes 2.5 mm. long, glandular in the furrows; pappus nearly white, 4–5 mm. long, the scales narrowly linear, 0.8 mm. long.

TYPE LOCALITY: San Blas, Tepic.

DISTRIBUTION: Tepic and Michoacan to Veracruz.

88. *Vernonia liatroides* DC. Prodr. 5: 34. 1836.

Eupatorium tulanum Klatt, Abh. Nat. Ges. Halle 15: 324. 1882.

Cacalia liatroides Kuntze, Rev. Gen. 970. 1891.

Stems herbaceous or suffrutescent, erect, puberulent; leaf-blades firm, elliptic-oblong or oblong-lanceolate, 5–8 cm. long, 1.5–2 cm. wide, acute or short-acuminate, sharply serrate, especially above, acute or cuneate at base, scabrellate above, ferruginous-puberulent beneath, especially on the veins, sessile or short-petioled; upper leaves similar but smaller; inflorescence depressed-hemispheric; heads about 11-flowered, on peduncles 3–5 mm. long; involucre campanulate, 3–4 mm. high; scales loosely imbricate in few series, lanceolate or oblong-lanceolate, glabrous or finely ciliate, regularly tapering to an acute, cuspidate, purple tip; achenes 1.5–2 mm. long, resinous in the furrows; pappus pale-tawny, the bristles 4 mm. long, the narrow scales irregular, averaging 0.8 mm. long.

TYPE LOCALITY: Between Tula and Tampico [Tamaulipas].

DISTRIBUTION: Tamaulipas and San Luis Potosí to Veracruz.

89. *Vernonia Bolleana* Schultz-Bip.; Seemann, Bot.
Voy. Herald 297. 1856.

Cacalia Bolleana Kuntze, Rev. Gen. 969. 1891.

Stems simple, floccose; leaf-blades thick, narrowly linear, 6–8 cm. long, 3 mm. wide, glabrous and dark-green above, lanate beneath, one-nerved, revolute; heads few, many-flowered, on subulately bracted peduncles 4–6 cm. long from the upper axils; involucre turbinate-campanulate, 15 mm. high; scales imbricate in several series, closely appressed, straight and erect, linear or nearly so, long-acuminate, floccose near the base, becoming glabrate toward the purple tip and resinous in two lines along the midvein; achenes 3 mm. long, densely canescent, obtusely ribbed; pappus nearly white, the bristles 8 mm. long, the scales linear, 1–1.3 mm. long.

TYPE LOCALITY: Sierra Madre, northwestern Mexico.

DISTRIBUTION: Northwestern Mexico.

90. *Vernonia crinita* Raf. New Fl. 4: 77. [?O] 1838.

Vernonia arkansana DC. Prodr. 7: 264. [?D] 1838.

Cacalia arkansana Kuntze, Rev. Gen. 969. 1891.

Stems erect, simple or sparingly branched, leafy, glabrous and somewhat glaucous to minutely puberulent, 1–3 m. high; leaf-blades narrowly lanceolate to broadly linear, 8–15 cm. long, 5–20 mm. wide, acuminate, entire or with scattered callous teeth, tapering to the base, glabrous or sparingly pubescent; inflorescence with 5–40 heads; peduncles stout, thickened above; heads 55–89-flowered; involucre broadly hemispheric, 12–20 mm. wide; scales glabrous or pubescent, especially at the tip, lanceolate or ovate at the appressed base, acuminate into long, flexuous, subulate, erect or spreading tips, involute below, becoming filiform above; achenes strongly ribbed, glabrous or nearly so, usually resinous in the furrows, 5–6 mm. long; pappus dull-purple, the bristles 6–7 mm. long.

TYPE LOCALITY: Arkansas.

DISTRIBUTION: Missouri, Kansas, Arkansas, and Oklahoma.

ILLUSTRATIONS: Sitgreaves, Rep. Exp. Bot. *pl.* 2; Britt. & Brown, Ill. Fl. *f.* 3602; ed. 2. *f.* 4140.

91. *Vernonia Ervendbergii* A. Gray, Proc. Am. Acad. 17: 203. 1882.

Stems erect, branched above, 5–9 dm. high, glabrous; leaf-blades firm, lanceolate or oblong-lanceolate to elliptic, 5–10 cm. long, 1–4 cm. wide, acute to acuminate, remotely serrulate, narrowed to a sessile base, puberulent beneath, especially on the veins, and sometimes pitted; inflorescence open, very loose and irregular; heads 21–29-flowered; involucre broadly campanulate to nearly hemispheric, 4–5 mm. high; scales appressed, irregularly imbricate in few series, glabrous or arachnoid on the back, thinly ciliate, lanceolate or oblong-lanceolate, purple, at least at the short-acuminate or sharply acute apex; achenes sharply ribbed, 3.5 mm. long, sparsely pubescent on the ribs, resinous in the furrows; pappus tawny; the bristles 5–6 mm. long, the outer scales very narrow, 0.6–0.7 mm. long.

TYPE LOCALITY: Near Tantoyuca [Veracruz].

DISTRIBUTION: Eastern Mexico.

92. *Vernonia Schaffneri* A. Gray, Proc. Am. Acad.
17: 204. 1882.

Stems erect, simple to the inflorescence, 3–7 dm. high, glabrous below, pubescent above; leaves numerous, the blades thin, bright-green, obovate, oblong, or broadly elliptic, 5–8 cm. long, 2–3.5 cm. wide, obtuse, entire, or serrulate toward the apex, tapering to a sessile base, papillose-scabrellate above, glabrous and pitted on the surface beneath, pubescent on the prominent reticulate veins; upper leaves but little smaller; inflorescence open, flattened, 1 dm. wide; heads about 40-flowered; involucre campanulate-hemispheric, 7–8 mm. high; scales purple, appressed, regularly and closely imbricate, glabrous or minutely ciliate, the outer lanceolate, acute, the inner oblong-lanceolate, obtuse; achenes puberulent, resinous in the furrows, 3 mm. long; pappus tawny, the bristles 6 mm. long, the scales narrowly linear, 1.1–1.3 mm. long,

TYPE LOCALITY: Mountains near Morales, San Luis Potosí.

DISTRIBUTION: San Luis Potosí and Hidalgo.

93. *Vernonia Greggii* A. Gray, Proc. Am. Acad. 17: 204. 1882.

Vernonia Greggii Palmeri A. Gray, Proc. Am. Acad. 17: 204. 1882.

Stems erect, simple to the inflorescence, puberulent or glabrate; leaf-blades firm, oblong-lanceolate to narrowly elliptic, 8–10 cm. long, 1.5–2.5 cm. wide, broadest at the middle and tapering regularly to each end, acute, serrulate, scabrously puberulent above, glabrous and black-dotted on the surface and puberulent on the veins beneath, sessile or short-petioled, the upper leaves gradually reduced; inflorescence very loose and open, with few many-flowered heads on stout, subulately bracted peduncles 1–5 cm. long; involucre hemispheric to broadly campanulate, 8–10 mm. high; scales closely imbricate, appressed, glabrous, pulverulent, or slightly arachnoid-tomentose, the outer triangular-ovate, sharply acute, the inner elongate, acuminate; achenes 4–5 mm. long, essentially glabrous, sparsely resinous in the furrows; pappus tawny, the bristles 7 mm. long, the scales linear, 1–2 mm. long.

TYPE LOCALITY: Northern Mexico.

DISTRIBUTION: Coahuila.

94. *Vernonia texana* (A. Gray) Small, Fl. SE. U. S. 1160. 1903.

Vernonia angustifolia T. & G. Fl. N. Am. 2: 59. 1841.

Vernonia angustifolia texana A. Gray, Syn. Fl. N. Am. 1²: 91. 1884.

Vernonia graminifolia texana Trel.; Brann. & Cov. Rep. Geol. Surv. Ark. 1888⁴: 189. 1891.

Cacalia angustifolia texana Kuntze, Rev. Gen. 323. 1891.

Stems erect, simple to the inflorescence, 4–8 dm. tall, glabrous or minutely puberulent; leaves firm, ascending, chiefly on the lower portion of the stem, the blades linear-lanceolate, 6–12 cm. long, 1–2 cm. wide, acute, sharply dentate with low salient teeth to nearly entire, attenuate to a sessile base, scabrous above, puberulent, especially along the veins, and usually pitted beneath; upper leaves much reduced, bractlike, linear to subulate; inflorescence 1–2 dm. wide, open, bearing few 18–21-flowered heads; involucre broadly campanulate, 5–6 mm. high; scales irregularly imbricate, appressed or the upper slightly spreading, tinged with purple, puberulent or glabrate, acute, the outer ovate, the inner oblong; achenes pubescent on the ribs, resinous in the furrows, 2.5 mm. long; pappus tawny, the bristles 6–7 mm. long, the scales narrowly linear, 0.8–0.9 mm. long.

TYPE LOCALITY: Texas.

DISTRIBUTION: Arkansas, Louisiana, and Texas.

95. *Vernonia Lindheimeri* Gray & Engelm. Proc. Am. Acad. 1: 46. 1846.

Cacalia Lindheimeri Kuntze, Rev. Gen. 970. 1891.

Stems erect, simple to the inflorescence, 2–6 dm. high, tomentose or canescent; leaves numerous and crowded, the blades narrowly linear, 5–8 cm. long, entire, revolute, 1-nerved, glabrous above, densely white-woolly beneath; inflorescence freely branched, compact; heads about 21-flowered; involucre campanulate, 7–9 mm. high; scales loosely and irregularly imbricate, purple, densely gray-tomentose on the back, the outer ovate-lanceolate, acute, the inner narrowly oblong, obtuse to rounded or mucronulate; achenes glabrous, 4 mm. long, frequently resinous or dark-dotted in the furrows; pappus-bristles 7 mm. long, purple, the scales very narrow, white, 0.8 mm. long.

TYPE LOCALITY: New Braunfels, Texas.

DISTRIBUTION: Texas.

96. *Vernonia guadalupensis* A. Heller, Muhlenbergia 1: 28. 1901.

Stems erect, simple to the inflorescence, thinly white pubescent to nearly glabrous; leaves numerous, crowded, the blades thin or firm, usually falcate, narrowly linear-lanceolate to linear, 8–15 cm. long, 5–10 mm. wide, acute or acuminate, entire or sparsely toothed, narrowed at base, glabrous above, thinly pubescent beneath; inflorescence irregular, rather compact;

heads all peduncled or a few sessile, about 21-flowered; involucre campanulate, 6 mm. high; scales appressed, irregularly imbricate, white-tomentose and resinous on the back, glabrous near the purple margin, ciliate or arachnoid, rounded or obtuse to subacute and apiculate or mucronate; achenes pubescent and resinous; pappus purple, the bristles 6 mm., the scales 0.8 mm. long.

TYPE LOCALITY: Kerrville, Texas.

DISTRIBUTION: Texas.

97. *Vernonia Reverchonii* Gleason, Bull. N. Y. Bot. Gard.
4: 208. 1906.

Stems erect, 5 dm. high, simple to the inflorescence, glabrous or sparsely pubescent; leaves numerous, crowded, the blades firm, spreading, narrowly oblong-lanceolate, 5–8 cm. long, 4–7 mm. wide, gradually tapering to the acute and mucronate tip, entire, flat or slightly revolute, narrowed at base, minutely scabrous above, thinly pubescent to glabrous and pitted beneath, 1-nerved with faint lateral veinlets; inflorescence flattened, compact; heads about 21-flowered; involucre broadly campanulate to hemispheric, 6–8 mm. high; scales appressed, oblong, rounded and cuspidate to subacuminate, tomentose except near the margin, densely arachnoid-ciliate; achenes minutely pubescent, resinous in the furrows; pappus tawny-purple, the bristles 7 mm. long, the conspicuous scales 1–1.3 mm. long.

TYPE LOCALITY: Seymour, Texas.

DISTRIBUTION: Texas.

98. *Vernonia angustifolia* Michx. Fl. Bor. Am. 2: 94. 1803.

Chrysocoma graminifolia Walt. Fl. Car. 196. 1788.

Liatris umbellata Bertol. Nov. Comm. Bonon. 8: 79. 1846.

Vernonia graminifolia Trel.; Brann. & Cov. Rep. Geol. Surv. Ark. 1888: 189. Pl 1891.

Cacalia graminifolia Kuntze, Rev. Gen. 968. N 1891.

Stems erect, simple to the inflorescence, 5–10 dm. high, glabrous, pubescent, or short-hirsute; leaves crowded, narrowly linear, 5–10 cm. long, revolute, 1-nerved, or the lower flat, narrowly oblong, and 5–10 mm. wide, scabrous above, sparsely pubescent beneath, especially on the midvein, sparsely glandular-dotted; inflorescence ample, rather compact, 5–30 cm. wide; heads 11–21-flowered; involucre campanulate, 6 mm. high; scales usually red or purple, appressed or slightly spreading, glabrous or puberulent on the back, ciliate or entire, the outer triangular-subulate, the inner lance-ovate, subacute to acuminate; achenes pubescent on the ribs, resinous and dark-dotted in the furrows, 3 mm. long; pappus usually purple, the bristles 6.5 mm., the narrow scales 0.5–0.7 mm. long.

TYPE LOCALITY: Carolina.

DISTRIBUTION: North Carolina to Florida and Mississippi.

ILLUSTRATION: Nov. Comm. Bonon. 8: pl. 4.

99. *Vernonia dissimilis* Gleason, Bull. N. Y. Bot.
Gard. 4: 224. 1906.

Stems stout, erect, 8–11 dm. high, glabrous above, pubescent or short-hirsute below; leaf-blades firm, sessile, narrowly lanceolate, 10–15 cm. long, 1–2 cm. wide, acuminate at each end, sharply serrate, flat, scabrous above, especially near the margin, sparsely pubescent beneath, pinnately veined with conspicuous lateral veinlets; inflorescence dense, flattened; heads 21-flowered, sessile or short-peduncled; involucre campanulate, 4 mm. high; scales closely imbricate in few series, appressed, dark-red, the inner ovate-lanceolate, strongly arachnoid-ciliate, puberulent on the back, obtuse or rounded, the outer subacute to sharply acute; achenes pubescent on the ribs, somewhat resinous in the furrows, 2.5 mm. long; pappus bright-purple, the bristles 6 mm. long, the scales 0.5–0.7 mm. long.

TYPE LOCALITY: Auburn, Alabama.

DISTRIBUTION: Alabama.

100. *Vernonia concinna* Gleason, Bull. N. Y. Bot. Gard.
4: 225. 1906.

Stems erect, simple, 8 dm. high, glabrous; leaves numerous, the blades thin, spreading, oblong-linear or narrowly oblanceolate, flat, acute, entire or minutely denticulate, narrowed

to a sessile base, bright-green and glabrous or minutely pubescent above, paler beneath and sparsely pubescent with short white hairs, 10–12 cm. long, 8–12 mm. wide; inflorescence loose, subumbellate, flattened, 1 dm. broad; heads 13-flowered; involucre campanulate-turbinate, 6–7 mm. high; scales loosely imbricate in few series, purple, at least at the margin, glabrous or nearly so on the back, thinly ciliate, the outer sharply acute, the inner subacute and mucronate to sharply acute, resinous; achenes minutely pubescent on the ribs, resinous in the furrows, 3 mm. long; pappus purple, the bristles 5–6 mm., the scales 0.5–0.6 mm. long.

TYPE LOCALITY: Eustis, Lake County, Florida.

DISTRIBUTION: Florida.

101. *Vernonia Blodgettii* Small, Fl. SE. U. S. 1160. 1903.

Vernonia angustifolia pumila Chapm. Bot. Gaz. 3: 5. 1878.

Stems slender, erect, simple or branched at the base, 2–6 dm. high, glabrous or nearly so; leaves numerous and crowded below, few and scattered above, the largest at or near the base, the blades firm, linear or narrowly lanceolate, 4–8 cm. long, 3–8 cm. wide, obtuse or acute, entire or minutely denticulate, glabrous above, sparsely short-pubescent and frequently glandular beneath; inflorescence loose, irregular; heads about 21-flowered; involucre broadly campanulate or hemispheric, 5 mm. high; scales few, appressed, loosely and irregularly imbricate, deltoid to lanceolate, glabrous or minutely puberulent at the tip, the outer sharply acute to subacuminate, the inner subacute to sharply acute, purple, or green at the center; achenes 2.5 mm. long, pubescent on the ribs, very resinous and dark-dotted in the furrows; pappus tawny to almost white, the bristles 6 mm. long, the irregular scales 0.5–0.8 mm. long.

TYPE LOCALITY: [Pine Key,] Florida.

DISTRIBUTION: Southern Florida.

102. *Vernonia insularis* Gleason, Bull. Torrey Club 33: 184. 1906.

Stems herbaceous or suffruticose, erect, 6–10 dm. high, simple or sparingly branched, glabrous or minutely puberulent above; leaf-blades narrowly oblong-linear, 6–10 cm. long, 8–12 mm. wide, obtuse or subacute, mucronate, entire, acute or narrowed at the sessile base, green and essentially glabrous above, minutely puberulent and glandular-dotted beneath; inflorescence loose; heads 4–25, 18–29-flowered; involucre broadly campanulate or depressed-hemispheric, 5 mm. high; scales essentially glabrous, purple-tinged, membranous at the margin, the outer lanceolate, sharply acuminate, the inner oblong, abruptly acuminate or mucronate; achenes 2 mm. long, sparsely pubescent on the ribs, resinous in the furrows; pappus tawny, the bristles 6 mm., the scales 0.5 mm. long.

TYPE LOCALITY: Eight Mile Rocks, Great Bahama.

DISTRIBUTION: Bahama Islands.

103. *Vernonia ovalifolia* T. & G. Fl. N. Am. 2: 59. 1841.

Vernonia noveboracensis latifolia A. Gray, Syn. Fl. N. Am. 1²: 89, in part. 1884.

Vernonia ovalifolia purpurea Gleason, Bull. Torrey Club 46: 248. 1919.

Stems erect, simple or sparingly branched, 8–12 dm. high, glabrous or puberulent; leaf-blades variable in size and shape, typically elliptic-oblong to lance-ovate, 8–10 cm. long, 2–5 cm. wide, acute or short-acuminate, coarsely serrate, or entire toward the acute to obtuse or rounded base, smooth or scabrous above, glabrous, pale and glaucescent, or puberulent on the veins beneath, short-petioled or sessile; inflorescence flattened, loose; heads 18–21-flowered; involucre broadly campanulate, 5–6 mm. high; scales rather regularly imbricate, glabrous or minutely puberulent, ciliate, appressed at base, somewhat spreading at the carinately thickened, short-acuminate, cuspidate apex; achenes pubescent on the ribs, glabrous or sparsely resinous in the furrows, 3 mm. long; pappus tawny or rarely purple, the bristles 6 mm. long, the scales linear to oblong, 0.6–0.8 mm. long.

TYPE LOCALITY: Middle Florida.

DISTRIBUTION: Georgia, Florida, and Alabama.

104. *Vernonia flaccidifolia* Small, Bull. Torrey Club 25: 144. 1898.

Vernonia flaccidifolia angustifolia Gleason, Bull. Torrey Club 46: 248. 1919.

Stems erect, glabrous, 8–15 dm. high; leaf-blades thin, bright-green, lanceolate to ovate, 12–20 cm. long, 3–6 cm. wide, or rarely narrower, long-acuminate, sharply and saliently serrate, abruptly narrowed at base into margined petioles, minutely puberulent on both sides; inflorescence flattened, loose, irregular, 1–3 dm. wide; heads about 21-flowered; involucre broadly hemispheric, 3.5–4 mm. high; scales appressed, regularly and closely imbricate, green with a purple apex or margin, glabrous on the back, minutely ciliate, obtuse to broadly rounded, or the outermost subacute; achenes 3.5 mm. long, thinly pubescent on the ridges, dark-dotted in the furrows; pappus tawny, the bristles 6 mm., the scales 0.5–0.6 mm. long.

TYPE LOCALITY: Ringgold, Georgia.

DISTRIBUTION: Tennessee, South Carolina, Georgia, and Alabama.

105. *Vernonia altissima* Nutt. Gen. 2: 134. 1818.

Vernonia albiflora Raf. Herb. Raf. 29. 1833.

Vernonia fasciculata γ T. & G. Fl. N. Am. 2: 58. 1841.

Vernonia fasciculata δ T. & G. Fl. N. Am. 2: 58. 1841.

Vernonia gigantea Britton, Bull. Torrey Club 20: 485, in part. 1893.

Vernonia maxima Small, Bull. Torrey Club 27: 280. 1900.

Vernonia gigantea pubescens Morris, Proc. Biol. Soc. Wash. 13: 179. 1900.

Vernonia maxima pubescens Morris; Britton, Man. 919. 1901.

Vernonia altissima pubescens Daniels, Univ. Missouri Stud. Sci. 1: 402. 1907.

Vernonia altissima taeniotricha Blake, Rhodora 19: 167. 1917.

Vernonia altissima brevipappa Gleason, Bull. Torrey Club 46: 248. 1919.

Vernonia altissima laxa Gleason, Bull. Torrey Club 46: 248. 1919.

Stems erect, 10–30 dm. high, branched above, glabrous or nearly so; leaf-blades thin, bright-green, narrowly elliptic, lanceolate, or lance-ovate, 15–25 cm. long, 3–7 cm. wide, long-acuminate, gradually attenuate at base, sharply and irregularly serrate to nearly entire, essentially glabrous above, minutely puberulent on the surface beneath, or tomentose along the principal veins; inflorescence flattened or concave, 2–5 dm. broad, loose and open; heads (13–)21–29-flowered; involucre campanulate, 4–5 mm. high, or rarely larger; scales appressed, regularly imbricate, ovate to oblong-ovate, glabrous or puberulent, sparsely ciliate or entire, obtuse or rounded to acute or short-cuspidate; achenes thinly puberulent, rarely sparsely resinous in the furrows; pappus purple, the bristles 5–7 mm. long, the scales 0.1–0.8 mm. long.

TYPE LOCALITY: Near Savannah, Georgia.

DISTRIBUTION: New York to Ohio and Missouri, south to South Carolina, Georgia, and Louisiana.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3605; ed. 2. f. 4144.

106. *Vernonia gigantea* (Walt.) Trel.; Brann. & Cov.
Rep. Geol. Surv. Ark. 1888⁴: 189. 1891.

Chrysocoma gigantea Walt. Fl. Car. 196. 1788.

Vernonia altissima Less. Linnaea 6: 639, in part. 1831. Not *V. altissima* Nutt. 1818.

Vernonia ovalifolia T. & G. Fl. N. Am. 2: 59, in part. 1841.

Vernonia altissima parviflora A. Gray, Syn. Fl. N. Am. 1²: 90. 1884.

Cacalia gigantea Kuntze, Rev. Gen. 324. 1891.

Vernonia oligantha Greene, Pittonia 5: 56. 1902.

Vernonia gigantea praealta Daniels, Univ. Missouri Stud. Sci. 1: 402. 1907.

Stems erect, branched above, 5–20 dm. high, glabrous or nearly so; leaf-blades thin, bright-green, lanceolate to elliptic or elliptic-oblong, 8–20 cm. long, 1–7 cm. wide, acute to acuminate, sharply serrate or the upper nearly entire, narrowed to an acute or acuminate base, glabrous, minutely puberulent, or scabrellate at the margin, minutely puberulent and resinous beneath; petioles 5–20 mm. long; inflorescence flattened, loose, irregular, 5–40 cm. broad; heads 8–13-flowered; involucre obpyramidal, 3–4 mm. high; scales loosely and irregularly imbricate in few series, oblong to oblong-ovate, obtuse and rounded to sharply acute, glabrous or puberulent, frequently ciliate; achenes thinly pubescent on the ridges, resinous in the furrows, 3–3.5 mm. long; pappus dull-purple, the bristles 5–6 mm. long, the scales narrow, 0.6–0.7 mm. long.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: South Carolina, Georgia, and Florida.

107. **Vernonia Lettermanni** Engelm.; A. Gray, Proc. Am. Acad. 16: 78. 1880.

Cacalia Lettermannii Kuntze, Rev. Gen. 970. 1891.

Stems erect, 2-5 dm. tall; glabrous; leaves crowded, ascending, the blades linear, 3-6 cm. long, 1-3 mm. wide, somewhat revolute, glabrous, glandular-punctate beneath, 1-nerved; inflorescence terminal, compact, 2-5 cm. wide; heads crowded, 8-13-flowered; involucre cylindric or narrowly campanulate, about 8 mm. high; scales closely imbricate and appressed, purple, glabrous on the back, ciliate, the outer triangular and sharply acute, the inner oblong, acute or acuminate; achenes glabrous, resinous, 4-5 mm. long; pappus-bristles purple, 7 mm. long, the scales nearly white, 0.7 mm. long.

TYPE LOCALITY: Sandbars of the Washita, Arkansas.

DISTRIBUTION: Arkansas and Oklahoma.

108. **Vernonia interior** Small, Bull. Torrey Club 27: 279. 1900.

Stems erect, simple to the inflorescence, 1-2 m. tall, finely and closely pubescent; leaf-blades firm, elliptic to elliptic-lanceolate, 6-20 cm. long, 2-6 cm. wide, acuminate, sharply serrate, narrowed to the base, glabrous to scabrellate above, thinly tomentose to nearly glabrous and resinous-dotted beneath; inflorescence loose, 1-3 dm. wide, bearing numerous 21-(18-29-)flowered heads; involucre narrowly campanulate, 6-7 mm. high; scales regularly imbricate, purple or green with purple margin, appressed at base, erect or slightly spreading, the outer triangular, sharply acute to cuspidate, the inner elongate, sharply acute to acuminate, resinous on the back, with prominent carinate midvein; achenes puberulent on the ribs, glandular in the furrows, 3 mm. long; pappus purple, the bristles 6 mm. long, the outer scales narrowly linear.

TYPE LOCALITY: Jackson County, Missouri.

DISTRIBUTION: Iowa and eastern Nebraska to Arkansas and Texas.

109. **Vernonia Baldwini** Torr. Ann. Lyc. N. Y. 2: 211. 1827.

Vernonia sphaeroidea Nutt. Trans. Am. Phil. Soc. II. 7: 283. 1840.

Cacalia gigantea Baldwini Kuntze, Rev. Gen. 324. 1891.

Cacalia Baldwini Kuntze, Rev. Gen. 969. 1891.

Vernonia interior Baldwini Mackenzie & Bush, Man. Fl. Jackson Co. 190. 1902.

Vernonia Duggariana Daniels, Univ. Missouri Stud. Sci. 1: 360. 1907.

Vernonia flavipapposa Daniels, Univ. Missouri Stud. Sci. 1: 360. 1907.

Vernonia parthenioides Daniels, Univ. Missouri Stud. Sci. 1: 360. 1907.

Vernonia peralta Daniels, Univ. Missouri Stud. Sci. 1: 362. 1907.

Vernonia Pseudobaldwinii Daniels, Univ. Missouri Stud. Sci. 1: 362. 1907.

Vernonia Pseudodrummondii Daniels, Univ. Missouri Stud. Sci. 1: 363. 1907.

Stems erect, 6-15 dm. tall, pubescent or tomentose; leaf-blades firm, ovate-lanceolate, 8-15 cm. long, 2.5-5 cm. wide, acuminate, sharply serrate, narrowed to an acute base, puberulent above, tomentose and resinous beneath, sessile or nearly so; inflorescence freely branched, open, irregular, 1-2 dm. broad; heads 18-34-flowered; involucre campanulate or thick-cylindric, 5-7 mm. high; scales closely and regularly imbricate, green with purple margin, thinly pubescent and resinous on the back, arachnoid-ciliate, pubescent within at the acuminate squarrose or reflexed tip; achenes thinly pubescent and resinous, yellowish or brown, 3 mm. long; pappus tawny, tinged with purple, the bristles 6 mm. long, the scales narrowly linear.

TYPE LOCALITY: On the Missouri, above St. Louis.

DISTRIBUTION: Illinois to Arkansas and Oklahoma.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3603; ed. 2. f. 4146.

110. **Vernonia aborigina** Gleason, Bull. Torrey Club 46: 246. 1919.

Stems stout, herbaceous, brown-tomentose, especially above; leaf-blades ovate-lanceolate, 8-15 cm. long, 2-4 cm. wide, acuminate, remotely denticulate with low ascending callous teeth, narrowed below into an obtuse or rounded sessile or subsessile base, scabrous above with short papillose hairs, densely brown-tomentose beneath; inflorescence compact, 11-13 cm. wide, with relatively few heads; heads large, with 55 flowers or more; involucre broadly campanulate, 7-8 mm. high, the scales closely and regularly imbricate, lanceolate to linear-

oblong, squarrose or recurved at the apex, acute, thinly ciliate at the brown margin, resinous and thinly puberulent at the purple center, elsewhere green and glabrous, the midvein prominent and frequently prolonged into a short mucro; achenes olivaceous, 3.5 mm. long, pubescent on the ribs, resinous in the furrows; pappus red-tawny, the bristles 7 mm. long, the linear scales as long as the diameter of the achene.

TYPE LOCALITY: Oklahoma, west of Fort Smith, Arkansas.

DISTRIBUTION: Oklahoma.

111. *Vernonia missurica* Raf. Herb. Raf. 28. 1833.

Vernonia fasciculata β T. & G. Fl. N. Am. 2: 58. 1841.

Vernonia altissima grandiflora A. Gray, Syn. Fl. N. Am. 1²: 90. 1884.

Vernonia Drummondii Shuttlew.; Werner, Jour. Cinc. Soc. Nat. Hist. 16: 171. 1894.

Vernonia interior Drummondii Mackenzie & Bush, Man. Fl. Jackson Co. 190. 1902.

Vernonia illinoensis Gleason, Bull. N. Y. Bot. Gard. 4: 211. 1906.

Vernonia Reedii Daniels, Univ. Missouri Stud. Sci. 1: 364. 1907.

Vernonia michiganensis Daniels, Univ. Missouri Stud. Sci. 1: 402. 1907.

Vernonia missurica austroriparia Gleason, Bull. Torrey Club 46: 245. 1919.

Stems erect, 10–15 dm. tall; branched above, gray-tomentose; leaves numerous, the blades spreading, firm, sessile or short-petioled, lanceolate to ovate-lanceolate, 6–15 cm. long, 1.5–5 cm. wide, long-acuminate, sharply and coarsely serrate to nearly entire, acute or rounded at base, dark-green and scabrelate above, tomentose beneath, at least along the veins; inflorescence flattened or concave, 1–5 dm. broad; heads 34–55-flowered; involucre broadly campanulate, short-cylindric, or hemispheric, 6–8 mm. high; scales appressed, closely and regularly imbricate, purple, or greenish along the midvein, glabrous or puberulent and resinous on the back, arachnoid-ciliate, rounded, obtuse, acute, or mucronate; achenes 4–4.5 mm. long, puberulent to nearly glabrous on the ribs, resinous in the furrows; pappus purple or becoming tawny, the bristles 6–8 mm. long, the scales usually paler, 0.8–0.9 mm. long.

TYPE LOCALITY: Missouri.

DISTRIBUTION: Ontario and Iowa to Alabama, Mississippi, and New Mexico.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3607; ed. 2. f. 4147.

112. *Vernonia fasciculata* Michx. Fl. Bor. Am. 2: 94. 1803.

Cacalia fasciculata Kuntze, Rev. Gen. 970. 1891.

Vernonia fasciculata nebraskensis Gleason, Bull. Torrey Club 46: 247. 1919.

Stems erect, glabrous, purple or greenish-purple, 6–12 dm. high; leaves numerous, erect or ascending, the blades thin, bright-green, linear to narrowly lanceolate, or broadly lanceolate in some forms, 8–15 cm. long, 4–7 mm. wide, long-acuminate or acute, denticulate to sharply dentate with ascending or salient teeth, narrowed to a sessile base, glabrous on both sides or minutely puberulent, deeply pitted beneath; inflorescence dense, hemispheric or flattened, 4–10 cm. wide; heads crowded, sessile or short-peduncled, 18–21-flowered; involucre narrowly campanulate to subcylindric, 6 mm. high, red or purple; scales appressed and regularly imbricate, subacute to rounded, glabrous, sparsely ciliate, or rarely puberulent, the exposed portion not more than 2 mm. wide; achenes 3 mm. long, puberulent on the ribs, resinous in the furrows; pappus purple, the inner bristles 7–8 mm. long, the outer series similar but shorter.

TYPE LOCALITY: Illinois.

DISTRIBUTION: Ohio to Minnesota and Oklahoma.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3606; ed. 2. f. 4145.

113. *Vernonia marginata* (Torr.) Raf. Atl. Jour. 146. 1832.

Vernonia altissima marginata Torr. Ann. Lyc. N. Y. 2: 210. 1827.

Vernonia Jamesii T. & G. Fl. N. Am. 2: 58. 1841.

Cacalia marginata Kuntze, Rev. Gen. 968. 1891.

Stems erect, simple to the inflorescence or rarely branched, 4–8 dm. high, glabrous or minutely puberulent; leaf-blades pale-green, firm, crowded, linear-lanceolate, 6–10 cm. long, 4–8 mm. wide, acute or acuminate, entire or remotely denticulate, 1-nerved or with faint lateral veins, glabrous on both sides or scabrelate above, conspicuously pitted beneath; inflorescence flat, compact, 5–15 cm. wide; heads about 18-flowered; involucre campanulate or thick-cylindric, 8–10 mm. high; scales appressed, closely and regularly imbricate, glabrous or

puberulent on the back, arachnoid-ciliate, purple, the outer triangular-ovate, the inner oblong, sharply acute to acuminate; achenes glabrous, prominently ribbed, resinous in the furrows, 5 mm. long; pappus purple, the inner bristles 6–7 mm. long, the outer series similar but shorter.

TYPE LOCALITY: Arkansas River [Oklahoma or Kansas].

DISTRIBUTION: Kansas, Oklahoma, Texas, and New Mexico.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3608; ed. 2. f. 4143.

114. *Vernonia tenuifolia* Small, Bull. Torrey Club 25: 145. 1898.

Stems erect, simple to the inflorescence, 5–10 dm. tall, glabrous; leaves numerous, the blades firm, linear or narrowly lanceolate, 5–9 cm. long, 3–8 mm. wide, acute, sharply and remotely dentate to entire, 1-nerved, essentially glabrous, impressed-punctate beneath, sessile; inflorescence 5–10 cm. broad, flattened, bearing relatively few 21-flowered heads; involucre broadly campanulate, 8 mm. broad, 7–9 mm. high, purple; scales appressed, regularly imbricate in 4 or 5 series, glabrous or nearly so, acute or mucronate, the outer ovate, the inner oblong, 2–2.5 mm. wide; achenes glabrous, resinous in the furrows, 4 mm. long; pappus purple to tawny-purple, the inner bristles 7–8 mm. long, the outer series similar but shorter.

TYPE LOCALITY: Texas.

DISTRIBUTION: Texas.

115. *Vernonia corymbosa* Schw. in Keating, Narr. Exp. Long 2: 394. 1824.

Vernonia Schweinitzii Steud. Nom. Bot. ed. 2. 2: 755. 1841.

Vernonia fasciculata corymbosa Daniels, Univ. Missouri Stud. Sci. 1: 403. 1907.

Stems erect, usually red, 4–8 dm. high, glabrous; leaf-blades firm, pale-green, erect or ascending, sessile, ovate-lanceolate, 4–7 cm. long, 1–2.5 cm. wide, acute, regularly serrate with low teeth, somewhat scabrous above, especially near the margin, glabrous and deeply pitted beneath, pinnately veined; inflorescence hemispheric, very dense, 4–6 cm. broad; heads sessile or short-peduncled, 21-flowered; involucre broadly campanulate to hemispheric, 8 mm. high; scales regularly imbricate, appressed, purple, ovate-oblong, glabrous or thinly ciliate, rounded to obtuse or subacute, the inner 2.5–3 mm. wide; achenes 3.5 mm. long, glabrous, resinous in the furrows; pappus purple, the inner bristles 6–7 mm. long, the outer series similar but shorter.

TYPE LOCALITY: Northwestern Territory.

DISTRIBUTION: Manitoba, Minnesota, North Dakota, and South Dakota.

116. *Vernonia acaulis* (Walt.) Gleason, Bull. N. Y. Bot. Gard. 4: 222. 1906.

Chrysocoma acaulis Walt. Fl. Car. 196. 1788.

Vernonia oligophylla Michx. Fl. Bor. Am. 2: 94. 1803.

Cacalia acaulis Kuntze, Rev. Gen. 968. 1891.

Stems 3–10 dm. tall, glabrous or thinly puberulent, leafy at base, simple to the inflorescence; basal leaf-blades oblong to obovate, 10–30 cm. long, 2–8 cm. wide, acute, coarsely and irregularly serrate, attenuate at base into a short petiole, sparsely pubescent or scabrellate above, nearly glabrous and glandular-dotted on the lower surface, and pubescent along the veins; cauline leaves much smaller, bractlike, linear-oblong; inflorescence freely branched, loose and open, 1–3 dm. broad, with few 34-flowered heads; involucre broadly campanulate to hemispheric, 5–7 mm. high; scales glabrate or puberulent on the back, thinly arachnoid-ciliate, not resinous, the outer closely appressed at base, caudate-acuminate to a filiform tip, the inner erect, acute to acuminate; achenes strongly ribbed, sparsely pubescent, resinous and dark-dotted, 3 mm. long; pappus pale-tawny, the bristles 5 mm., the scales 0.4–0.8 mm. long.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: North Carolina, South Carolina, Georgia, and Florida.

117. *Vernonia georgiana* Bartlett, Rhodora 12: 172. 1910.

Stems herbaceous, erect, 2–10 dm. tall, simple to the inflorescence, green or purple, puberulent; basal leaves lanceolate, 5–15 cm. long, 1–2 cm. wide, acute or obtuse, denticulate,

narrowed to the base, scabrous, puberulent beneath; cauline leaves narrower, linear, becoming bractlike in the inflorescence; inflorescence loose, with relatively few 29-flowered heads; involucre campanulate, 6-7 mm. high; scales glabrous or obscurely ciliate, irregularly imbricate, the outer slightly spreading at the tip, the inner appressed; achenes thinly pubescent and dark-dotted; pappus pale-tawny or yellow.

TYPE LOCALITY: Vicinity of Thompson, McDuffie County, Georgia.

DISTRIBUTION: Georgia and South Carolina.

118. *Vernonia scaberrima* Nutt. Gen. 2: 134. 1818.

Vernonia brevifolia Raf. New Fl. 4: 77. 1838.

Veronia angustifolia β T. & G. Fl. N. Am. 2: 59. 1841.

Vernonia angustifolia scaberrima A. Gray, Syn. Fl. N. Am. 1: 91. 1884.

Stems erect, simple or sparingly branched, glabrous, or puberulent below; leaf-blades narrowly oblong, closely sessile, 2.5-7 cm. long, 2-10 mm. wide, acute or cuspidate, remotely denticulate, dilated and rounded or truncate at base, scabrous above, glandular-dotted and sparsely pubescent to nearly glabrous beneath, the upper leaves gradually reduced; inflorescence loose, open, subumbellate; involucre campanulate, 6-7 mm. high; scales loosely imbricate, essentially glabrous on the back, minutely ciliate, lanceolate, long-acuminate into straight, erect or spreading tips; achenes densely short-pubescent, 2.5 mm. long, dark-dotted; pappus tawny, the bristles 5 mm. long, the scales narrow, 0.6 mm. long.

TYPE LOCALITY: South Carolina, Georgia, or Florida.

DISTRIBUTION: North Carolina, South Carolina, Georgia, and Florida.

119. *Vernonia recurva* Gleason, Bull. N. Y. Bot. Gard.
4: 222. 1906.

Stems erect, brown, 7 dm. high, simple to the inflorescence, pubescent below, glabrate above; leaves mostly near the base, the blades firm, linear to oblong-linear, 5-7 cm. long, 4-9 mm. wide, acute, revolute with a few minute callous teeth, rounded at the closely sessile, somewhat dilated base, scabrous and puberulent above, minutely puberulent beneath; inflorescence open, loosely branched, 15 cm. across; heads 21-flowered; involucre 8 mm. high, campanulate-cylindric; scales dull-purple, nearly glabrous on the back, minutely arachnoid-ciliate, appressed at base, the outer short, loose, linear, the inner lanceolate, acuminate into a loose, spreading or recurved, filiform appendage 3-6 mm. long; achenes minutely hispid on the angles, dark-dotted in the furrows, 3.5 mm. long; pappus tawny, the bristles 6 mm., the scales 0.6-1 mm. long,

TYPE LOCALITY: Hortense, Wayne County, Georgia.

DISTRIBUTION: Georgia.

120. *Vernonia pulchella* Small, Bull. Torrey Club 25: 145. 1898.

Stems erect, simple to the inflorescence, pubescent, 4-7 dm. tall; leaf-blades oblong to oblong-lanceolate, 4-7 cm. long, 10-16 mm. wide, acute, coarsely and irregularly toothed, rounded to subcordate at the sessile base, scabrous on both sides, glandular-dotted and pubescent on the veins beneath, the upper narrower, acute at the base, nearly entire; inflorescence loose, depressed; heads about 21-flowered; involucre campanulate, 5-7 mm. high; scales loosely imbricate in few series, lanceolate, appressed below, thinly puberulent on the back, strongly arachnoid-ciliate, green with purple margin, or the inner purple, the midvein becoming prominent above and prolonged into the squarrose or recurved filiform tip; achenes strongly ribbed, pubescent and dark-dotted, 3 mm. long; pappus tawny, the bristles 6.5 mm. long, the scales very narrow, 1 mm. long.

TYPE LOCALITY: Liberty County, Georgia.

DISTRIBUTION: Georgia and South Carolina.

121 *Vernonia glauca* (L.) Willd. Sp. Pl. 3: 1633. 1804.

Serratula glauca L. Sp. Pl. 818. 1753.

Suprago glauca Gaertn. Fruct. 2: 402. 1791.

Vernonia noveboracensis latifolia A. Gray, Syn. Fl. N. Am. 1: 89, in part. 1884.

Vernonia noveboracensis tomentosa Britton; Britt. & Brown, Ill. Fl. 3: 302, excl. syn. 1898.

Stems erect, 10–16 dm. high, glabrous or nearly so; leaf-blades narrowly ovate-lanceolate or elliptic-lanceolate to almost ovate, 10–25 cm. long, 2–10 cm. wide, short-acuminate, sharply and saliently dentate, abruptly narrowed at base into a short margined petiole, glabrous or scabrellate above, paler and thinly puberulent beneath and frequently brown-pubescent on the veins; inflorescence loose, flattened, 1–3 dm. wide; heads 34–47-flowered; involucre broadly campanulate to hemispheric, 6–7 mm. high; scales closely imbricate, glabrous or puberulent on the back, arachnoid-ciliate, frequently resinous, lanceolate to triangular-ovate at the appressed base, some or all acuminate into a filiform tip 2–5 mm. long; achenes nearly glabrous on the prominent ribs, sparsely glandular in the furrows, 3.5 mm. long; pappus tawny or straw-colored, the bristles 6–7 mm., the outer scales 0.5–1 mm. long.

TYPE LOCALITY: Maryland.

DISTRIBUTION: Pennsylvania to Georgia and Alabama.

ILLUSTRATIONS: Dill. Hort. Elth. *pl.* 262; Pluk. Phyt. *pl.* 280, *f.* 6; Gaertn. Fruct. *pl.* 166; Britt. & Brown, Ill. Fl. *f.* 3604; ed. 2. *f.* 4142.

122. *Vernonia noveboracensis* (L.) Michx. Fl. Bor. Am. 2: 95. 1803.

Serratula noveboracensis L. Sp. Pl. 818. 1753.

Serratula praealta L. Sp. Pl. 818. 1753.

Behen noveboracense Hill, Hort. Kew. 68. 1768.

Behen praealtum Hill, Hort. Kew. 68. 1768.

Serratula caroliniana Mill. Gard. Dict. ed. 8. *Serratula* no. 7. 1768.

Chrysocoma tomentosa Walt. Fl. Car. 196. 1788.

Vernonia praealta Michx. Fl. Bor. Am. 2: 95. 1803.

Vernonia tomentosa Ell. Bot. S. C. & Ga. 2: 288. 1821.

Vernonia Rugeliana Shuttlew.; A. Gray, Pl. Wright. 1: 82. 1852.

Cacalia noveboracensis Kuntze, Rev. Gen. 324. 1891.

Vernonia noveboracensis tomentosa Britton; Porter & Britton, Mem. Torrey Club 5: 311. 1894.

Stems erect, 10–20 dm. tall, glabrous or thinly pubescent; leaf-blades lanceolate, 10–18 cm. long, 1.5–4 cm. wide, acuminate, sharply serrate to nearly entire, narrowed below, sessile or short-petioled, glabrous or scabrellate above, puberulent or thinly tomentose beneath, especially on the veins; inflorescence flattened, loose, 1–3 dm. wide; heads 29–47-flowered; involucre campanulate, 6–7 mm. high; scales regularly and closely imbricate, arachnoid-ciliate, frequently pubescent on the back, usually resinous, the outer subulate with spreading tips, the middle and inner with triangular or ovate purple tips ending in a flexuous filiform appendage 1–5 mm. long; achenes pubescent on the ribs, sparsely resinous in the furrows, 4–4.5 mm. long; pappus purple or rarely tawny-purple, the bristles 6–7 mm. long, the linear scales 0.4–0.8 mm. long.

TYPE LOCALITY: New York.

DISTRIBUTION: Massachusetts to Ohio, West Virginia, and Mississippi, mostly near the coast.

ILLUSTRATIONS: Pluk. Phyt. *pl.* 109, *f.* 3; Dill. Hort. Elth. *pl.* 263, 264; Hill, Veg. Syst. 4: *pl.* 39, *f.* 3; Mathews, Fam. Fl. 234; Lounsbury, Guide Wild Fl. *pl.* 162; Dana, Wild Fl. ed. 1900. *pl.* 149; Mathews, Field Book 467; Britt. & Brown, Ill. Fl. *f.* 3601; ed. 2, *f.* 4141.

123. *Vernonia Harperi* Gleason, Bull. N. Y. Bot. Gard.
4: 221. 1906.

Stems stout, erect, divaricately branched above, 1 m. tall or more, puberulent; leaf-blades thin, spreading or ascending, lanceolate, 12–18 cm. long, 1.5–3 cm. wide, acuminate, sharply dentate, narrowed below into short petioles, scabrous above, especially near the margin, pubescent beneath; inflorescence very large, 3 dm. across, lax, open, irregular; heads with 55 flowers or more; involucre broadly campanulate, 7–9 mm. high; scales green with purple margin, closely and regularly imbricate, appressed and arachnoid-ciliate at the triangular-ovate base, not resinous, gradually tapering into long, erect awns; achenes minutely pubescent on the ribs, resinous in the furrows, 3.5–4 mm. long; pappus dull-purple, the bristles 6 mm., the scales 0.6–0.7 mm. long.

TYPE LOCALITY: Coffee County, Georgia.

DISTRIBUTION: Georgia.

UNCERTAIN OR EXCLUDED SPECIES

VERNONIA ACHYROCOMA Less. Linnaea 4:313. 1829. (*Achyrocoma tomentosa* Cass. Dict. Sci. Nat. 26:21. 1823.)

VERNONIA ARISTATA (Cass.) Less. *Linnaea* 4:313. 1829. (*Lepidaploa aristata* Cass. *Dict. Sci. Nat.* 26:17. 1823.)

VERNONIA CHRYSOPAPPA Daniels, *Univ. Missouri Stud. Sci.* 1:364. 1907.

VERNONIA HYPOLEUCA DC. *Prodr.* 5:27. 1836.

VERNONIA PROFUGA De-Not. *Ind. Sem. Hort. Genuen.* 1840.

VERNONIA TOLUCCANA DC. *Prodr.* 5:30. 1836.

8. EREMOSIS (DC.) Gleason, *Bull. N. Y. Bot. Gard.* 4: 227. 1906.

Turpinia Llave & Lex. *Nov. Veg. Descr.* 1: 22. 1824. Not *Turpinia* Humbl. & Bonpl. 1807.

Monosis § *Eremosis* DC. *Prodr.* 5: 77. 1836.

? *Llerasia* Triana, *Ann. Sci. Nat. IV.* 9: 37. 1858.

? *Critoniopsis* Schultz-Bip. *Pollichia* 20-21: 430. 1863.

Stems frutescent or arborescent, freely branching and usually more or less tomentose. Leaves alternate, pinnately veined, entire or denticulate. Inflorescence of close, compact, round-topped, corymbiform clusters terminating the branches and forming a compound panicle. Heads 1-8-flowered, homogamous, sessile or short-peduncled. Involucre cylindric to narrowly campanulate, the scales appressed, imbricate in several series, the inner much prolonged, broadest usually above the middle, deciduous at maturity and not spreading. Receptacle naked, subconvex. Corolla blue or purple, tubular, regularly 5-cleft. Anthers sagittate, the lobes obtuse or acute at base. Style-branches slender. Achenes 3-10-ribbed, truncate, usually pubescent. Pappus capillary, in two series, the inner of barbellate bristles, the outer similar, shorter, irregular in length.

Type species, *Monosis salicifolia* DC.

Achenes with 5-10 prominent ribs, glabrous to hirsute; heads 1-8-flowered.

Heads 3- or 4-flowered.

Middle and inner involucre scales obtuse to acuminate.

Leaf-blades glabrous or nearly so beneath.

Leaf-blades pubescent to tomentose beneath, at least on the veins.

Leaf-blades glabrous to subtomentose on the lower surface (excluding the veins); pappus 4-5 mm. long; heads 3-flowered.

Leaf-blades lanceolate, not especially tomentose on the veins.

Leaf-blades elliptic, densely tomentose on the veins alone.

Leaf-blades densely tomentose on the surface beneath; pappus 8 mm. long; heads 3-4-flowered.

Middle and inner involucre scales broadly rounded; heads 4-flowered; achenes thinly strigose-pubescent.

Heads 1- or 2-flowered.

Leaf-blades of a narrow type, usually less than one-third as wide as long, gradually narrowed to an acute base.

Involucre campanulate, the inner scales not mucronate, at least 1.5 mm. wide.

Achenes densely pubescent or hirsute.

Leaves pubescent or subtomentose beneath, at least with tufts of tomentum in the axils of the veins.

Leaves glabrous or nearly so on both sides.

Achenes thinly pubescent to glabrate, glandular; leaf-blades white-tomentose beneath.

Involucre narrowly cylindric, the inner scales mucronate, less than 1 mm. wide.

Leaf-blades of a broad type, usually two-fifths, or more, as wide as long, abruptly narrowed to an acute, obtuse, or rounded base.

Principal involucre scales, or some of them, prominently mucronate.

Leaf-blades of an ovate type, broadest below the middle, silvery-tomentose beneath.

Leaf-blades of an ovate type, broadest usually above the middle, merely puberulent beneath.

Principal involucre scales not mucronate.

Inner scales obtuse or rounded, ciliate; achenes glabrous or nearly so.

Inner scales acute; achenes hirsute.

Leaves pubescent on the veins beneath.

1. *E. triflosculosa.*
2. *E. Palmeri.*
3. *E. barbinervis.*
4. *E. ovata.*
5. *E. oolepis.*
6. *E. salicifolia.*
7. *E. pallens.*
8. *E. tarchonanthifolia.*
9. *E. angusta.*
10. *E. callilepis.*
11. *E. foliosa.*
12. *E. obtusa.*
13. *E. Steetzii.*

- Leaves densely gray-tomentose beneath.
 Heads 5-8-flowered; achenes glabrous.
 Heads 5-6-flowered; leaf-blades ovate-lanceolate.
 Heads 7-8-flowered; leaf-blades broadly ovate.
 Achenes with 3 prominent ribs on the ventral face only, glabrous or nearly so; heads 3-7-flowered.
 Leaf-blades thinly puberulent or tomentulose to nearly glabrous beneath.
 Leaf-blades densely tomentose beneath.
 Achenes pale-brown; corolla-tube hairy without.
 Achenes dark-purple to black; corolla-tube glabrous without.
14. *E. tomentosa*.
 15. *E. Shannoni*.
 16. *E. littoralis*.
 17. *E. Heydeana*.
 18. *E. leiocarpa*.
 19. *E. melanocarpa*.

1. ***Eremosis triflosculosa*** (H.B.K.) Gleason, Bull.

N. Y. Bot. Gard. 4: 233. 1906.

- Vernonia triflosculosa* H.B.K. Nov. Gen. & Sp. 4: 40. 1818.
Gymnanthemum congestum Cass. Dict. Sci. Nat. 20: 110. 1821.
Vernonia triantha S. Schauer; Nees & Schauer, Linnaea 19: 714. 1847.
Cacalia triantha Kuntze, Rev. Gen. 970. 1891.
Cacalia triflosculosa Kuntze, Rev. Gen. 970. 1891.
Vernonia luxensis Coult. Bot. Gaz. 20: 41. 1895.
Vernonia dumeta Klatt, Bull. Soc. Bot. Belg. 35: 277. 1896.

Stems 3 m. high, freely branched, thinly pubescent, or glabrate in age; leaf-blades thin, oblanceolate to elliptic, 8-12 cm. long, 1.5-3 cm. wide, acute or acuminate, entire or nearly so, tapering at the base, bright-green above, essentially glabrous on both sides, paler and glandular-punctate beneath; inflorescence large, conic or hemispheric; heads 3-flowered, sessile or nearly so in groups of 2-5; involucre cylindrical, pale-brown, 4-5 mm. high; scales loosely imbricate, the outer subrotund or ovate, subacute, the inner oblong, sharply acute or subacuminate, glabrous or nearly so on the back, minutely ciliate; achenes 3 mm. long, pubescent; pappus white, 5-6 mm. long, the outer series capillary, irregular in length.

TYPE LOCALITY: Acahuitzotla, Guerrero.

DISTRIBUTION: Southern Mexico and Central America.

2. ***Eremosis Palmeri*** (Rose) Gleason, Bull. N. Y.

Bot. Gard. 4: 233. 1906.

- Vernonia Palmeri* Rose, Contr. U. S. Nat. Herb. 1: 101. 1891.
Vernonia chacalana S. F. Blake, Contr. Gray Herb. 52: 19. 1917.

Stems freely branched, 2-5 m. high, closely sericeous-pubescent, becoming glabrous in age; leaf-blades lanceolate, 7-16 cm. long, 2-3 cm. wide, acute, entire or remotely serrulate, obtuse or subacute at base, thinly pubescent and resinous above, pubescent to subtomentose and resinous beneath, becoming glabrate when old; heads 3- or 4-flowered, short-peduncled, in large pyramidal or depressed clusters; involucre cylindrical to narrowly campanulate, 5-6 mm. high; scales loosely imbricate, the outer broadly triangular, obtuse, densely ciliate, the inner progressively longer, scarious, glabrous on the back, pale-green or straw-colored with a green midvein, conspicuously ciliate, obtuse to subacute, resinous near the apex; achenes hirsute, 2 mm. long; pappus white, 4 mm. long, the outer series filiform, irregular, 1-1.5 mm. long.

TYPE LOCALITY: Alamos, Sonora.

DISTRIBUTION: Sonora and Durango.

3. ***Eremosis barbinervis*** (Schultz-Bip.) Gleason, Bull.

N. Y. Bot. Gard. 4: 232. 1906.

- Vernonia barbinervis* Schultz-Bip.; Seem. Bot. Voy. Herald 297. 1856.
Cacalia barbinervis Kuntze, Rev. Gen. 969. 1891.

Stems nearly glabrous; leaf-blades thick, firm, broadly elliptic, 9-12 cm. long, 4-5 cm. wide, obtuse or subacute, entire, narrowed at the base, nearly glabrous above, beneath densely tomentose along the midvein, thinly and interruptedly pubescent or tomentose on the lateral veins, resinous and essentially glabrous on the surface; inflorescence hemispheric; heads 3-flowered; involucre narrowly campanulate, 7 mm. high; scales thin, straw-colored, scarious at the margin, the outer ovate, sharply acute, somewhat arachnoid, the middle conspicuously

ciliate, the inner acute, glabrous; achenes thinly pubescent; pappus white, the bristles 5 mm. long.

TYPE LOCALITY: Sierra Madre, northwestern Mexico.
DISTRIBUTION: Western Mexico.

4. **Eremosis ovata** Gleason, Bull. Torrey Club 40: 331. 1913.

Vernonia Gleasoni S. F. Blake, Contr. Gray Herb. 52: 17. 1917.

Stems shrubby, closely cinereous-pubescent, or tomentulose in the inflorescence; leaf-blades thick, firm, ovate to ovate-elliptic, 7–10 cm. long, 4–5 cm. wide, obtuse or subacute, entire, obtuse at base, dull-green and minutely and softly tomentulose above, densely cinereous-tomentulose beneath, the veins elevated beneath and prominent; petioles 8–13 mm. long; inflorescence broadly pyramidal to hemispheric, about 2 dm. wide, the bracteal leaves elliptic, 2–6 cm. long; heads 3-flowered or more often 4-flowered, in small clusters, on peduncles 2–5 mm. long; involucre narrowly campanulate, straw-colored or pale-brown, 5–6 mm. high; outer scales short, broadly ovate, obtuse to subacute and apiculate, irregularly arachnoid or tomentulose; inner scales oblong or ovate-oblong, acute, glabrous or thinly arachnoid-tomentulose at the tip; achenes pale-brown, 3 mm. long, thinly hirsute; pappus white, 8 mm. long, the outer series of flattened bristles 1–2 mm. long.

TYPE LOCALITY: San Ramon, Durango.
DISTRIBUTION: Durango.

5. **Eremosis oolepis** (S. F. Blake) Gleason.

Vernonia oolepis S. F. Blake, Contr. Gray Herb. 52: 20. 1917.

Stems frutescent, branched, prominently striate, thinly tomentulose, or glabrate in age; leaf-blades thin, ovate-lanceolate to elliptic-lanceolate, 6–9 cm. long, 2.5–3.5 cm. wide, acuminate, entire, tapering to an acute base, dark-green and essentially glabrous above, pale-green and thinly brown-tomentulose beneath, the lateral veins concealed when young, becoming prominent in age; inflorescence elongate-pyramidal or subcylindric, of numerous rounded clusters terminating the lateral branches; heads 4-flowered, sessile or short-peduncled; involucre brown, narrowly campanulate, 6 mm. high, the outer scales broadly ovate, rounded, tomentulose, the inner prolonged, broadly obtuse or rounded, puberulent on the back, arachnoid-ciliate, dark-spotted at the apex; achenes thinly strigose, brown to nearly black, 2.5 mm. long; pappus pale-brown, 5–6 mm. long, the outer series filiform, irregular, 0.5–1.5 mm. long.

TYPE LOCALITY: Izamal, Yucatan.
DISTRIBUTION: Yucatan.

6. **Eremosis salicifolia** (DC.) Gleason, Bull. N. Y.

Bot. Gard. 4: 231. 1906.

Monosis salicifolia DC. Prodr. 5: 77. 1836.

Vernonia uniflora Schultz-Bip. Linnaea 20: 506. 1847.

Vernonia salicifolia Schultz-Bip. Linnaea 20: 507. 1847.

Stems freely branched, covered with a thin gray arachnoid tomentum; leaf-blades narrowly oblong-lanceolate or elliptic-lanceolate, 4–8 cm. long, 1–2 cm. wide, acute or subacute, entire or slightly undulate, gradually narrowed below into a petiole 4–6 mm. long, glandular-punctate or thinly tomentulose on both sides; lateral veins ascending, with tufts of brown tomentum in their axils; inflorescence hemispheric; heads 1-flowered, on peduncles 1–3 mm. long; involucre campanulate, 6 mm. high; scales ovate to oblong, acute or subacute, purplish, the outer thinly tomentulose, the middle and inner glabrous or with a terminal tuft of tomentum; achenes villous, 2.5 mm. long; pappus nearly white, 6 mm. long, the outer series capillary, irregular, about 2 mm. long.

TYPE LOCALITY: "Guchinapa" [? Guchilaque, Morelos].
DISTRIBUTION: Southern Mexico, from Jalisco and Veracruz to Oaxaca.

7. **Eremosis pallens** (Schultz-Bip.) Gleason, Bull. N. Y.

Bot. Gard. 4: 228. 1906.

Vernonia pallens Schultz-Bip. Pollichia 18-19: 161. 1861.

Eremosis leiophylla Gleason, Bull. N. Y. Bot. Gard. 4: 231. 1906.

Vernonia leiophylla S. F. Blake, Contr. Gray Herb. 52: 18. 1917.

Stems 3–5 m. high, with glabrous branches and foliage; leaves numerous, the blades oblong or elliptic-oblong, 3–4 cm. long, 1–1.5 cm. wide, acute, entire or with a few minute callous teeth, narrowed to an acute base, glandular-punctate on both sides, on petioles 3–4 mm. long; inflorescence large, hemispheric, glabrous except a little pubescence on the peduncles; heads short-peduncled, 1-flowered; involucre campanulate, pale-brown or straw-colored, 5–6 mm. high; scales glabrous on the back, ciliate, sharply acute, the outer ovate, the inner oblong; achenes villous, 2.5–3 mm. long; pappus white, 7–8 mm. long, the outer series capillary irregular in length.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Michoacan, Morelos, and Guerrero.

8. *Eremosis tarchonanthifolia* (DC.) Gleason, Bull. N. Y.
Bot. Gard. 4: 230. 1906.

Monosis tarchonanthifolia DC. Prodr. 5: 77. 1836.

Oliganthes Karwinskii Schultz-Bip. Linnaea 20: 505. 1847.

Vernonia tarchonanthifolia Schultz-Bip. Linnaea 20: 507. 1847.

Cacalia tarchonanthifolia Kuntze, Rev. Gen. 970. 1891.

Stems 3–6 m. high, the branches closely gray-tomentose when young, becoming thinly tomentose or glabrate with age; leaf-blades lanceolate to elliptic-lanceolate, 5–10 cm. long, 1.5–3 cm. wide, short-acuminate or acute, entire or remotely and minutely denticulate, narrowed at base to a petiole 4–10 mm. long, glabrous and glandular to finely tomentose above, finely gray-tomentose beneath and on the petioles; inflorescence pyramidal or hemispheric, 5–10 cm. wide; heads crowded, sessile or short-peduncled, 1- or 2-flowered; involucre campanulate to narrowly turbinate, 5–6 mm. high; outer scales triangular-ovate, the inner longer, sharply acute or subacuminate, purplish, glabrous, or slightly tomentose and resinous; achenes thinly pubescent and glandular, 2.5 mm. long; pappus yellowish-white, the bristles 7 mm. long, the outer series capillary, about 1 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Oaxaca.

9. *Eremosis angusta* Gleason, sp. nov.

Stems shrubby, branched, closely and finely cinereous-tomentulose; leaf-blades thin, firm, elliptic-lanceolate, the largest 7 cm. long, 18 mm. wide, acute, entire, gradually narrowed to an acute base, minutely scabrous-puberulent above, thinly tomentulose and resinous beneath, with prominent veins; petioles tomentulose, 5–10 mm. long; inflorescence compact, hemispheric, 10 cm. broad, with tomentulose branches; heads 1-flowered, crowded, sessile or short-peduncled; involucre narrowly cylindrical, 7–8 mm. high, straw-colored; outer scales thinly tomentose, broadly ovate to subrotund, obtuse or rounded, darker brown at tip, minutely cuspidate, with prominent midvein; inner scales prolonged, appressed, narrow, less than 1 mm. wide, acute, scarious-margined, sparsely tomentulose near the edge, minutely puberulent to almost glabrous on the back, the midvein prominent and extending into a mucro; achenes black, 2 mm. long, hirsute; pappus white, 6 mm. long, the outer series filiform, irregular in length.

Type collected at Gualan, Zacapa, Guatemala, alt. 125 meters, *Kellerman 6132* (herb. Field Museum no. 195639).

10. *Eremosis callilepis* (Schultz-Bip.) Gleason.

Vernonia Steetzii callilepis Schultz-Bip.; Seeman, Bot. Voy. Herald 297. 1856.

Eremosis foliosa Gleason, Bull. N. Y. Bot. Gard. 4: 228, excl. syn. 1906.

Stems shrubby, freely branched, somewhat flexuous, white-tomentose above, becoming glabrate with age; leaf-blades thick and firm, ovate or ovate-oblong, 4.5–6.5 cm. long, 2–4 cm. wide, or the upper much reduced, broadest at or below the middle, acute or abruptly subacuminate, entire or remotely denticulate with low, sharp, callous teeth, obtuse, rounded, or subcordate at base, finely reticulate above and silvery-tomentose when young, becoming floccose or glabrate in age, closely and permanently silvery-tomentose beneath; petioles 2–4 mm. long; inflorescence small, compact, hemispheric, 5–10 cm. wide, its branches closely

tomentulose; heads crowded, 1-flowered, sessile or short-peduncled; involucre narrowly campanulate, 6–7 mm. long; outer scales ovate to ovate-lanceolate, sharply acute, thinly and irregularly puberulent, the inner prolonged, purple or rarely straw-colored, not scarious, gradually narrowed to a sharply acute or acuminate tip, thinly arachnoid, puberulent and resinous near the apex, usually prominently mucronate; achenes densely hirsute, 2 mm. long; pappus white, 7–8 mm. long, the outer series filiform, irregular.

TYPE LOCALITY: Sierra Madre, northwestern Mexico.

DISTRIBUTION: Western Mexico.

11. *Eremosis foliosa* (Benth.) Gleason, Bull. N. Y. Bot. Gard. 4: 228. 1906.

Monosis foliosa Benth. Pl. Hartw. 19. 1839.

Vernonia foliosa Schultz-Bip. Pollichia 18-19: 161. 1861. Not *V. foliosa* Gardn. 1846.

Vernonia mucronata S. F. Blake, Contr. Gray Herb. 52: 19. 1917.

Stems shrubby, freely branched, finely and closely gray-tomentose, becoming glabrate with age; leaf-blades firm, rather rigid, oblong-obovate, 4–7 cm. long, 1.5–4 cm. wide, broadest above the middle, acute or abruptly short-acuminate, entire or sharply denticulate with low callous teeth, narrowed to an acute base, puberulent to thinly tomentose with crooked hairs or becoming glabrate with age above, silvery-puberulent beneath and finely reticulate, not resinous, the lateral veins prominent, curved-ascending; petioles 3–8 mm. long; inflorescence compact, depressed or short-pyramidal, 5–10 cm. across, the branches closely tomentose; heads 1-flowered, sessile or short-peduncled; involucre narrowly campanulate, 7–8 mm. high; scales thin but not scarious, purple, at least at the tip, the outer ovate, subacute, irregularly tomentose, the inner prolonged, acute, frequently short-mucronate, thinly arachnoid, resinous at the tip; achenes densely hirsute, 2 mm. long; pappus white, the bristles 6 mm. long, the outer series filiform, 1–2 mm. long.

TYPE LOCALITY: [Bolanos, Tepic.]

DISTRIBUTION: Tepic to San Luis Potosí.

12. *Eremosis obtusa* Gleason, sp. nov.

Stems shrubby, slender, thinly and loosely white-tomentose, becoming tardily glabrate in age; leaf-blades thin, oblong-elliptic, 5–7 cm. long, 2–3.5 cm. wide, the upper gradually smaller, abruptly narrowed to an acute, cuspidate tip, entire, or rarely denticulate with low callous teeth, acute at base, dark green, finely pubescent, and resinous above, dull-green and loosely cinereous-tomentose beneath, the lateral veins curved-ascending, the veinlets obscure; petioles 4–8 mm. long; inflorescence compact, short-pyramidal, 7–9 cm. wide, the branches tomentose; heads crowded, 1-flowered, sessile or with peduncles 1–2 mm. long; involucre narrowly campanulate, 6 mm. high; scales thin but not scarious, brown or purple, at least at the tip, the outer ovate, obtuse or rounded, tomentose, the middle and inner prolonged, gradually narrowed to an obtuse or rounded tip, glabrous or nearly so on the back, prominently ciliate, resinous near the apex; achenes glabrous or nearly so, resinous, brown, 2 mm. long; pappus white, 7 mm. long, the outer series filiform, irregular, much shorter; corolla-tube glandular, the lobes puberulent.

Type collected at Minas de Rafael, San Luis Potosí. July 1911, *Purpus* 4811 (herb. N. Y. Bot. Gard.)

DISTRIBUTION: Known only from the type locality.

13. *Eremosis Steetzii* (Schultz-Bip.) Gleason, Bull. N. Y. Bot. Gard. 4: 230. 1906.

Vernonia Steetzii Schultz-Bip.; Seem. Bot. Voy. Herald 297. 1856.

Cacalia Steetzii Kuntze, Rev. Gen. 970. 1891.

Stems stout, shrubby, pubescent or subtomentose; leaf-blades thin, broadly ovate or ovate-elliptic, 6–12 cm. long, 3.5–5 cm. wide, broadest below the middle, subacute to short-acuminate, denticulate with low callous teeth, acute to rounded at base, minutely puberulent and sparsely resinous above, paler green, distinctly resinous, and short-pubescent along the

veins beneath, or becoming glabrous; petioles 2 mm. long; inflorescence hemispheric or pyramidal, 2–2.5 dm. wide, its branches pubescent or subtomentose; heads mostly peduncled, 1-flowered; involucre narrowly campanulate, 5 mm. high; outer scales subacute to obtuse, minutely cuspidate, almost glabrous, the inner prolonged, thin and scarious above, pale-brown or rarely purplish, subacute, rarely minutely cuspidate, glabrous or thinly puberulent; achenes hirsute, 2 mm. long; pappus white, 6–7 mm. long, the outer series filiform, irregular, 1–2 mm. long.

TYPE LOCALITY: Sierra Madre northwestern Mexico.

DISTRIBUTION: Northwestern Mexico.

14. **Eremosis tomentosa** (Llave & Lex.) Gleason, Bull.

N. Y. Bot. Gard. 4: 229. 1906.

Turpinia tomentosa Llave & Lex. Nov. Veg. Descr. 1: 24. 1824.

? *Vernonia paniculata* DC. Prodr. 5: 23. 1836.

Monosis tomentosa DC. Prodr. 5: 77. 1836.

Vernonia purpurascens Schultz-Bip.; Walp. Rep. 2: 945. 1843.

Vernonia Monosis Schultz-Bip. Linnaea 20: 507. 1847.

Cacalia tomentosa Kuntze, Rev. Gen. 969. 1891.

Cacalia paniculata Kuntze, Rev. Gen. 970. 1891.

Cacalia Monosis Kuntze, Rev. Gen. 970. 1891.

Eremosis purpurascens Gleason, Bull. N. Y. Bot. Gard. 4: 233. 1906.

Stems 1–3 m. high, closely and densely gray-tomentose; leaf-blades firm, oblong to oblong-ovate, 8–12 cm. long, 4–5 cm. wide, acute, entire, abruptly narrowed to truncate at base, pubescent or tomentulose above, densely gray-tomentose beneath, on short petioles; inflorescence hemispheric to pyramidal, leafy, 2–4 dm. long, 1–3 dm. wide; heads sessile or short-peduncled, 1-flowered; involucre cylindric or narrowly campanulate, 5–6 mm. high; outer scales ovate, acute, tomentose or ciliate, the inner oblong, acute, glabrous, or thinly pubescent and glandular at the margin and purple apex; achenes 3 mm. long, villous; pappus white, 6–7 mm. long—the outer series capillary, irregular.

TYPE LOCALITY: Pico de Quinceo, near Valladolid [Morelia, Michoacan].

DISTRIBUTION: Jalisco and Guanajuato to Oaxaca.

15. **Eremosis Shannoni** (Coult.) Gleason, Bull. N. Y.

Bot. Gard. 4: 234. 1906.

Vernonia Shannoni Coult. Bot. Gaz. 20: 42. 1895.

Stems arborescent, as much as 10 m. high, the twigs glabrous; leaf-blades thin but firm, ovate-lanceolate, 12–14 cm. long, 4–4.5 cm. wide, acuminate, entire, acuminate at base, floccose or arachnoid-tomentose on both sides when young, glabrous at maturity, on petioles 2 cm. long; inflorescence broad, freely branched; heads short-peduncled, 5–6-flowered; involucre narrowly campanulate, 8 mm. high, dark straw-colored or brown; outer scales broadly ovate, obtuse or subacute, glabrous on the back, arachnoid-ciliate; inner scales prolonged, deciduous, rounded at the tip, ciliate, glabrous or with a little terminal tomentum; achenes 4 mm. long, glabrous and glandular; pappus white, 7 mm. long, the outer series filiform, 1–2 mm. long.

TYPE LOCALITY: Dept. San Marcos, Guatemala.

DISTRIBUTION: Guatemala.

16. **Eremosis littoralis** (Brand.) Gleason.

Vernonia littoralis Brand. Erythea 7: 3. 1899.

Stems shrubby, slightly pubescent, especially above; leaf-blades broadly ovate, 4–8 cm. long, 3–5 cm. wide, short-acuminate, almost entire, obtuse or broadly acute at base, very minutely pilose above, softly pubescent and resinous-dotted on the surface beneath and pilose with spreading brown hairs on the veins; petioles 1–2 cm. long; inflorescence freely branched, essentially leafless, loose and open; heads (7–)8-flowered, on short peduncles; involucre broadly turbinate, 7 mm. high; middle and outer scales subacute to acute, mucronate or barely apiculate, ciliate; inner scales oblanceolate, 6.5 mm. long, rounded at the apex, almost scarious at the margin, thinly ciliate, minutely puberulent and sparsely resinous on

the back, pale straw-colored with green midvein; achenes broadly turbinate, glabrous; pappus white, fragile, deciduous, 5.5 mm. long, the outer series filiform, 1-1.3 mm. long.

TYPE LOCALITY: Socorro Island, Colima.

DISTRIBUTION: Socorro Island.

17. **Eremosis Heydeana** (Coul.) Gleason, Bull. N. Y.
Bot. Gard. 4: 234. 1906.

Vernonia Heydeana Coul. Bot. Gaz. 20: 42. 1895.

Stems shrubby or arborescent, the branches puberulent or glabrate; leaf-blades elliptic to ovate, 8-10 cm. long, 4.5-6 cm. wide, acute or abruptly short-acuminate, entire or remotely denticulate, acute at base, thinly subpapillose-puberulent or glabrous above, thinly tomentulose and resinous beneath; petioles 1-2 cm. long; inflorescence hemispheric to pyramidal; heads 3-flowered, crowded, on short tomentose peduncles; involucre narrowly campanulate, 6 mm. high; outer scales short, blunt, ovate, conspicuously tomentose-ciliate; inner scales prolonged, brown with green center, obtuse or subacute, glabrous on the back, with thin, scarious, glabrous or finely ciliate margin; achenes brown, 3 mm. long, glabrous or minutely glandular; pappus white, deciduous, 6 mm. long, the outer series filiform, 1-2 mm. long.

TYPE LOCALITY: San Miguel Uspantán, Quiché, Guatemala, alt. 1800-3600 meters.

DISTRIBUTION: Southern Mexico and Guatemala.

18. **Eremosis leiocarpa** (DC.) Gleason, Bull. N. Y.
Bot. Gard. 4: 232. 1906.

Vernonia leiocarpa DC. Prodr. 5: 34. 1836.

Cacalia leiocarpa Kuntze, Rev. Gen. 970. 1891.

Stems shrubby or arborescent, the twigs tomentose when young, becoming glabrate in age; leaf-blades ovate-lanceolate to ovate, 8-14 cm. long, 2-6 cm. wide, acute, entire or dentate, narrowed at base, puberulent to nearly glabrous above, densely cinereous-tomentose beneath, on petioles 1.5 cm. long; inflorescence large, leafy, pyramidal, 1.5-2 dm. long and wide; heads very numerous, densely aggregated, sessile or minutely pedunculate, mostly 3- (rarely 4-7-) flowered; involucre cylindric or narrowly campanulate, 4-5 mm. long; outer scales broadly triangular-ovate, obtuse, densely tomentose, the inner oblong, tomentose only at the tip; corolla-tube hairy, its lobes one-fifth as long as wide; achenes pale-brown, glabrous, 2.5-3 mm. long, turbinate, with 3 principal ribs and some smaller intermediate ones; pappus white, 6-7 mm. long, the outer series filiform, 1-3 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southern Mexico and Guatemala.

19. **Eremosis melanocarpa** Gleason, Bull. N. Y. Bot.
Gard. 4: 232. 1906.

Vernonia melanocarpa S. F. Blake, Contr. Gray Herb. 52: 18. 1917.

Stems shrubby or arborescent, the twigs densely tomentose when young, becoming thinly tomentose or glabrate in age; leaf-blades ovate or ovate-lanceolate, 7-11 cm. long, 3-4 cm. wide, acute or acuminate, entire or undulate, narrowed at base, scabrous-pubescent or thinly tomentose above, densely cinereous-tomentose beneath, especially along the veins; petioles 1.5-2.5 cm. long; inflorescence pyramidal, terminating the stem and upper branches, with a few bracteal leaves; heads mostly 3- (rarely 4-6-) flowered, crowded, sessile or nearly so; involucre narrowly campanulate, 3-4 mm. high; scales all obtuse or rounded, the outer broadly ovate or triangular, densely tomentose, persistent, the inner oblong, tomentose at apex and margin, early deciduous; corolla-tube 2.5-4 mm. long, glabrous, its lobes one-fourth as long as wide; achenes 2.5 mm. long, glabrous, dilated above, dark-purple or black; pappus white, 6 mm. long, the outer series filamentous, 1-3 mm. long.

TYPE LOCALITY: Dept. Santa Rosa, Guatemala.

DISTRIBUTION: Southern Mexico and Guatemala.

9. **OLIGANTHES** Cass. Bull. Soc. Philom. 1817: 10.
1817; 1818: 58. 1818.

Dialesta H.B.K. Nov. Gen. & Sp. 4: 44. 1818.

Shrubs or small trees, with broad, alternate, petiolate, tomentose leaves. Heads 1-8-flowered, aggregated in dense corymbiform panicles terminating the stem and branches. Involucre cylindric or narrowly campanulate; involucre scales few, membranous or scarious, imbricate in several series. Receptacle subconvex, naked. Corolla tubular, regular, the limb deeply 5-cleft. Anthers sagittate, obtuse at base. Style-branches slender. Achenes striated or ribbed. Pappus typically in two series, the inner or both sometimes caducous, of linear flat scales, twisted toward the apex, or of scales more or less united into a cup.

Type species, *Oliganthes triflora* Cass.

Lower leaf-surface tomentose; middle involucre scales obtuse or rounded.

1. *O. discolor*.

Lower leaf-surface glabrous, the veins alone pubescent; middle involucre scales sharply acute or acuminate.

2. *O. ferruginea*.

1. **Oliganthes discolor** (H.B.K.) Schultz-Bip. *Linnaea*
20: 502. 1847.

Dialesta discolor H.B.K. Nov. Gen. & Sp. 4: 45. 1818.

Tall shrub or small tree; twigs closely cinereous-tomentose; leaf-blades thin, elliptic, 10-18 cm. long, 4.5-6 cm. wide, acuminate, entire, narrowed at base, dark-green and essentially glabrous on the surface above, puberulent on the veins, closely and thinly white-tomentose on the surface and brown-tomentose on the veins and veinlets beneath; lateral veins curved-ascending, veinlets conspicuously reticulate; petioles 15-25 mm. long, somewhat dilated below into a base 2-3 mm. wide; inflorescence irregularly branched, tomentose; heads 2-flowered, on peduncles 3-4 mm. long; involucre narrowly campanulate to subcylindric, 5 mm. high; scales pale-green or brownish-green, frequently purple at tip, closely appressed, concave or trough-shaped, the outermost semicircular, rounded, the inner progressively longer to oblong-elliptic, obtuse or rounded, the innermost subacute, all thinly short-ciliate, glabrous on the back, or the innermost minutely puberulent; achenes obconic, plump, flat on one side, 10-striate, 2 mm. long; inner pappus-scales about 5, pale-brown, flat, 3.5 mm. long; outer pappus-scales 5-10, about 0.3 mm. long.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Panama and Colombia.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. *pl.* 320.

2. **Oliganthes ferruginea** Gleason, *sp. nov.*

Tall shrub or small tree, 10-12 m. high, 20-30 cm. in diameter; twigs closely ferruginous-tomentose; leaf-blades elliptic, 10-15 cm. long, 3-5.5 cm. wide, acuminate, entire, narrowed to an acute base, slightly rugose and essentially glabrous on the surface or occasionally puberulent on the midvein above, resinous and essentially glabrous on the surface beneath and tomentulose along the veins; petioles 10-15 mm. long, barely dilated at base; inflorescence irregularly branched, tomentose, with numerous 2-flowered heads on short peduncles; involucre narrowly turbinate-cylindric to ellipsoid, 7 mm. high; scales pale-brown, appressed, the outer depressed-triangular, broadly acute, arachnoid-ciliate, the inner progressively longer, entire or minutely ciliate at the middle to conspicuously arachnoid-ciliate toward the sharply acute or acuminate tip, glabrous on the back or thinly pubescent apically; achenes obovoid, 2 mm. long, 2-striate on the flat ventral side, 8-striate on the convex dorsal side; inner pappus-scales about 5, easily deciduous, 3.5 mm. long, pale-brown, flat, somewhat twisted, minutely ciliate; outer pappus scales 5-10, nearly white, scarious, about 0.3 mm. long, ovate-triangular, fimbriate.

Type collected in the forests of Alto de Mano Tigre, Diquis valley, Costa Rica, altitude 700 meters, *H. Pittier 12138*, sheet 1 (U. S. Nat. Herb no. 577547).

DISTRIBUTION: Costa Rica.

EXCLUDED SPECIES

OLIGANTHES OXYLEPIS Benth.; Benth. & Hook. *Gen. Pl.* 2: 233. 1873.

10. **EKMANIA** Gleason, Bull. Torrey Club 46: 250. 1919.

Stems shrubby, weak, lepidote. Leaves alternate, entire, pinnately veined, lepidote. Inflorescence a corymbiform cluster, freely branched. Heads homogamous, few-flowered. Involucre of a few series of closely appressed boat-shaped scales. Corolla tubular, regular, enlarged above, 5-cleft, glandular without. Style and anthers of *Vernonia*. Achenes glabrous, 10-ribbed, truncate. Pappus biseriate, the inner series of a few stout flattened bristles, the outer a cylindrical tube with lacerate margin.

Type species, *Vernonia lepidota* Griseb.

1. **Ekmania lepidota** (Griseb.) Gleason, Bull. Torrey Club 46: 250. 1919.

Vernonia lepidota Griseb. Cat. Pl. Cub. 145. 1866.

Stems ascending over bushes, 3 m. long, fulvous-lepidote; leaf-blades firm, elliptic-oblong, 5-8 cm. long, 2-3.5 cm. wide, obtuse to subacute, entire, narrowed at the base, thinly silvery-lepidote above, densely fulvous-lepidote beneath, prominently veined; inflorescence a corymbiform cluster 5 cm. wide, freely branched with short angled branches; lower bracteal leaves petiolate, 10-13 mm. long, 1-nerved, the upper gradually reduced to short subterete lepidote scales 2 mm. long closely appressed to the involucre; heads (?) 8-flowered; involucre broadly ovoid or subspheric, 3 mm. high; scales incurved, closely appressed in few series, boat-shaped, brown, acute, pubescent or scurfy on the back.

TYPE LOCALITY: Summit of El Yunque, near Baracoa, Cuba.

DISTRIBUTION: Cuba.

11. **PIPTOCOMA** Cass. Bull. Soc. Philom. 1817: 10. 1817.

Stems shrubby; branches strongly angled. Leaves alternate, entire or undulate, pinnately veined, ferruginous-lepidote beneath. Heads 5-8-flowered, in terminal, convex, corymbiform clusters. Involucre campanulate, the scales appressed, imbricate in several series. Receptacle flat, naked. Corolla blue, tubular, regularly 5-cleft, the tube gradually enlarged upwards. Anthers sagittate, obtuse at the base. Style-branches slender. Achenes irregularly 5-angled, with or without obscure intermediate ribs. Pappus biseriate, the outer series of few short, broad, fimbriate scales, the inner of elongate, linear, somewhat twisted, caducous scales.

Type species, *Piptocoma rufescens* Cass.

1. **Piptocoma rufescens** Cass. Bull. Soc. Philom. 1817: 10. 1817.

Eupatorium domingense Spreng. Syst. 3: 412. 1826.

Oliganthes rufescens Schultz-Bip. Pollichia 20-21: 338. 1863.

Piptocoma rufescens latifolia Gleason, Bull. Torrey Club 46: 251. 1919.

Stems shrubby, freely branched, 2-3 m. high, thinly cinereous or canescent when young, becoming glabrate with age; the young shoots strongly angled and ferruginous; leaf-blades firm, dull-green, lanceolate-oblong to elliptic or narrowly ovate, 4-7 cm. long, 1-3 cm. wide, rounded, obtuse or acute, entire or undulate, narrowed to an acute base, thinly and softly stellate-pubescent or glabrate above, reticulately veined and densely ferruginous-lepidote beneath; petioles 3-10 mm. long; inflorescence rather loose, 3-10 cm. wide; involucre campanulate, 4 mm. high; scales closely imbricate in few series, or spreading in age, obtuse or rounded, the outer ovate, the inner oblong-ovate, ciliate, glabrous below, tomentose and resinous at the tip; achenes nearly glabrous, 2 mm. long; pappus yellowish-white, the inner series 5 mm., the outer 0.4-0.5 (or 1) mm. long.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Santo Domingo, Porto Rico, St. Thomas, and Tortola.

12. **PIPTOCARPHA** R. Br.; Cass. Dict. Sci. Nat. 41: 109. 1826.

Carphobolus Schott; Spreng. Syst. 4: Cur. Post. 409. 1827.

Monanthemum Griseb. Fl. Brit. W. Ind. 354. 1861.

Stems shrubby, frequently climbing, stellate-pubescent or lepidote. Leaves large, alternate, pinnately veined, usually entire, coriaceous, tomentose with stellate hairs or scaly

beneath. Heads 3–20-flowered, aggregated in axillary or terminal corymbs, umbels, or panicles, or sessile in axillary clusters. Involucre ovoid or campanulate, the scales imbricate in several series, the outer smaller, the inner frequently falling with the achenes. Receptacle convex, naked. Corolla regular, tubular, 5-cleft. Anthers sharply subcaudate at base. Style-branches slender. Achenes truncate, 10-ribbed. Pappus-bristles in two series, the inner long, equal, the outer shorter, unequal, inconspicuous, or in some species lacking.

Type species, *Piptocarpha brasiliana* Cass.

Heads mostly 6-flowered, corymbose in the axils.
Heads 2–4-flowered, in terminal corymbiform clusters.

1. *P. chontalensis*.
2. *P. tetrantha*.

1. *Piptocarpha chontalensis* Baker, in Mart. Fl. Bras. 6²:

132. 1873.

Piptocarpha costaricensis Klatt, Bull. Soc. Bot. Belg. 31¹: 184. 1892.

Stems shrubby, 6 m. high, faintly striate or terete, slightly flexuous, thinly cinereous-tomentose; leaf-blades coriaceous, oblong-ovate to ovate, 10–18 cm. long, 4.5–10 cm. wide, acute or abruptly short-acuminate, entire or remotely denticulate, obliquely and unequally rounded at base, dark-green, glabrous and shining above, dull-green and closely cinereous-tomentose beneath with stalked stellate hairs, on petioles 10–15 mm. long; bracteal leaves similar but smaller; heads numerous, 6-flowered, crowded in axillary corymbiform clusters, sessile in groups of 2 or 3 terminating tomentose peduncles; involucre ovoid, 3–4 mm. high; scales closely imbricate, appressed, ovate, acute to obtuse or rounded, the outer tomentose, the inner glabrous except at the tomentose tip, deciduous; achenes sharply 5-ribbed with 5 secondary less prominent ribs, 3 mm. long, glabrous or sparsely pubescent; pappus white, the inner bristles 6–7 mm. long, the outer bristles 1–2 mm. long, irregular, filiform.

TYPE LOCALITY: Chontales district, Nicaragua.

DISTRIBUTION: Central America.

2. *Piptocarpha tetrantha* Urban, Symb. Ant. 1: 457. 1899.

Stems shrubby or vine-like, 6 m. tall, closely and finely cinereous-pubescent; leaf-blades coriaceous, broadly elliptic to elliptic-oblong, 3.5–13 cm. long, 2–7 cm. wide, subacute, obtuse, or rounded, entire, rounded at base, dark-green, glabrous, and shining above, finely and closely cinereous-lepidote beneath, prominently reticulately veined, on petioles 10–15 mm. long; heads 2–4-flowered, sessile, aggregated in clusters of 2–4 in dense panicles terminating the stem and in the upper axils; involucre ovoid, 6 mm. long; scales closely imbricate in few series, appressed, the outer short, ovate, tomentose, the inner oblong, glabrous below, tomentose at the tip; achenes 3–4 mm. long, 10-ribbed, glabrous or glandular; pappus tawny-white, the inner bristles 6 mm. long, the outer 1–2 mm. long.

TYPE LOCALITY: Mt. Jimenes, Sierra de Luquillo, Porto Rico.

DISTRIBUTION: Porto Rico.

13. *Bolanosa* A. Gray, Pl. Wright. 1: 82. 1852.

Stems herbaceous, floccose or tomentose. Leaves alternate, sessile, pinnately veined. Heads large, many-flowered, 1–2 cm. across, solitary or in dense corymbiform clusters of 2–5, terminating the stem and branches. Involucre broadly hemispheric, floccose, the scales imbricate in several series. Receptacle flat, chaffy with narrow, conduplicate, scarious scales. Corolla tubular, regular, 5-cleft, gradually enlarged upwards. Anthers sagittate, obtuse at base. Style-branches slender. Achenes irregularly angled, obtusely 10-ribbed, turbinate, truncate. Pappus biseriate, the outer of flat, linear, acuminate scales, the inner of long, linear, flattened bristles.

Type species, *Bolanosa Coulteri* A. Gray.

1. *Bolanosa Coulteri* A. Gray, Pl. Wright. 1: 82. 1852.

Stems erect, 10–15 dm. high, simple to the inflorescence or with a few branches from the upper axils, floccose above with white wool, becoming glabrous below; leaf-blades ovate-

lanceolate to narrowly elliptic-oblong, 5–10 cm. long, 1.5–3 cm. wide, acute, remotely denticulate, narrowed to a subsessile base, glabrous above, or floccose when young, densely fulvous-tomentose beneath, the upper leaves gradually reduced to 2–3 cm. long; involucre white-floccose; scales oblong-lanceolate, the inner glabrous and red at the apex; chaff of the receptacle narrowly oblong, purple at the acuminate apex; corolla 1 cm. long, red-purple, glandular on the tube; achenes 3 mm. long, densely hirsute with white hairs; pappus white, the inner series 9 mm., the outer 4 mm. long.

TYPE LOCALITY: Bolaños, Tepic.

DISTRIBUTION: Tepic.

14. *STOKESIA* L'Hér. Sert. Angl. 16. 1788.

Stems herbaceous, perennial. Leaves alternate, the lower petioled, the upper sessile and clasping, pinnately veined. Heads large, many-flowered, on terminal peduncles. Involucre depressed-hemispheric, the scales imbricate in several series, the outer coriaceous and appressed at base with foliaceous spreading tips, the inner membranous, appressed. Receptacle flat, naked. Corolla blue, 5-cleft, the central ones nearly regular, the marginal ones much larger, with short tube and conspicuous, flattened, ligulate tip. Anthers sagittate, obtuse at base. Style-branches slender. Achenes 3–4-angled, truncate. Pappus of 4 or 5 narrow caducous scales.

Type species, *Carthamus laevis* Hill.

1. *Stokesia laevis* (Hill) Greene, *Erythea* 1: 3. 1893.

Carthamus laevis Hill, Hort. Kew. 57. 1768.

Stokesia cyanea L'Hér. Sert. Angl. 17. 1788.

Cartesia centauroides Cass. Bull. Soc. Philom. 1816: 198. 1816.

Stems erect, 3–6 dm. tall, sparingly branched above, cinereous-tomentose, becoming glabrous with age; lower leaf-blades glabrous, narrowly oblanceolate to elliptic, 6–16 cm. long, 1–4 cm. wide, acute, entire, tapering at base into a margined petiole nearly equaling the blade; upper leaf-blades narrowly lanceolate to broadly oblong, acute, entire, or with several prominent, salient, spinose teeth near the base, sessile, glabrous; heads 1–5, 4–6 cm. wide, terminating the branches, subtended by spinulose bracteal leaves 1–3 cm. long; involucre 1–2 cm. high; outer involucral scales broadly ovate at the appressed base, with narrowly lanceolate, foliaceous, mucronate, spinulose-ciliate tips; inner scales appressed; achenes 5 mm. long.

TYPE LOCALITY: Carolina.

DISTRIBUTION: South Carolina to Florida and Louisiana.

ILLUSTRATIONS: Bot. Mag. pl. 4966; Rev. Hort. 1857: 211; Hill, Hort. Kew. pl. 5; Stand. Cycl. Hort. f. 3699.

15. *ORTHOPAPPUS* Gleason, Bull. N. Y. Bot. Gard. 4: 237. 1906.

Stems herbaceous. Principal leaves basal, the cauline alternate, reduced or bract-like. Inflorescence spicate or the lower glomerules peduncled. Heads 4-flowered, aggregated into glomerules subtended by 1 or 2 bract-like leaves. Involucre oblong, of 8 scales arranged in decussate pairs, the two outer pairs much shorter than the inner, and the alternate pairs conduplicate. Corolla, anthers, and styles as in *Elephantopus*. Achenes 10-striate. Pappus of about 30 uniform bristles, very slightly enlarged at base.

Type species, *Elephantopus angustifolius* Sw.

1. *Orthopappus angustifolius* (Sw.) Gleason, Bull. N. Y.

Bot. Gard. 4: 238. 1906.

Elephantopus angustifolius Sw. Prodr. 115. 1788.

Elephantopus nudiflorus Willd. Sp. Pl. 3: 2390. 1804.

Elephantosis quadriflora Less. Linnaea 4: 323. 1829.

Elephantosis angustifolia DC. Prodr. 5: 87. 1836.

Elephantopus quadriflorus D. Dietr. Syn. Pl. 4: 1372. 1847.

Stems erect, 3–10 dm. tall, hirsute with white hairs; blades of the basal leaves narrowly oblanceolate, 10–25 cm. long, 1.5–4 cm. wide, obtuse or subacute, shallowly and irregularly

crenate, long-acuminate at the base into a margined petiole, thinly strigose-pubescent on both sides, especially on the veins beneath; cauline leaves bract-like, their blades linear to oblong; inflorescence spicate or with a few short branches, the rachis densely villous; bracteal leaves oblong-linear, 1 cm. long, or deciduous; glomerules 10–15 mm. high; involucre about 10 mm. long; scales sharply acuminate, glabrous or thinly strigose; achenes dark-brown, pubescent, 2 mm. long; pappus pale-brown or silvery, 7–8 mm. long, of flattened bristles tapering from base to apex.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: West Indies, Mexico, and Central America; also in tropical South America.

ILLUSTRATION: Trans. Acad. St. Louis 12: 56. *pl. 9, f. D.*

16. ELEPHANTOPUS L. Sp. Pl. 814. 1753.

Herbs with leafy or scapiform stems. Leaves alternate or basal, entire or toothed, pinnately veined. Inflorescence of corymbed pedunculate glomerules of 1–several heads subtended by 1–3 foliaceous bracts. Heads 1–5-flowered. Involucre of 4 decussate pairs of scales, the two outer pairs shorter, the alternate pairs conduplicate. Receptacle flat or nearly so. Corolla-tube slender, the limb unequally 5-cleft with a much deeper fissure on the inner side. Anthers sagittate, obtuse at base. Style-branches slender. Achenes truncate, mostly 10-ribbed. Pappus of 5–8 rigid flattened scales, usually prolonged into terminal bristles.

Type species, *Elephantopus scaber* L.

Pappus of irregular scales without terminal bristles; bracts prolonged at the apex into a ligulate tip.

Leaves flat, 2–8 mm. wide; ligules 2–5 mm. wide.

Leaves involute, 1 mm. wide; ligules linear.

Pappus of about 5 scales prolonged into terminal bristles; bracts acute to acuminate, not prolonged at the apex.

Leaves all or chiefly basal, those on the stem reduced to mere bracts subtending the branches.

Longest involucreal scales 9–12 mm. long, thinly resinous; pappus-bristles 6–7.5 mm. long, gradually dilated below; leaves pubescent on the midvein beneath with spreading or reflexed hairs.

Longest involucreal scales 8 mm. long or less; pappus-bristles 3.5–5 mm. long; leaf-pubescent not reflexed.

Pappus-bristles abruptly dilated below into broadly triangular bases; involucreal scales densely resinous; leaves thinly pilose-pubescent beneath with appressed hairs.

Pappus-bristles gradually dilated below into narrowly triangular bases.

Bracts, involucreal scales, and peduncles densely villous with long white hairs.

Bracts, involucreal scales, and peduncles thinly pilose.

Leaves cauline, or both cauline and basal.

Pappus-bristles abruptly dilated at base into triangular scales not more than twice as long as wide.

Leaf-blades oblong-elliptic to ovate, more than 2 cm. wide.

Leaf-blades narrowly oblong-lanceolate, about 1 cm. wide.

Pappus-bristles gradually dilated at base into narrowly triangular scales.

Leaves softly pubescent beneath with erect hairs.

Leaves thinly pilose beneath with scattered hairs, chiefly along the veins.

1. *E. pratensis*.

2. *E. arenarius*.

3. *E. tomentosus*.

4. *E. nudatus*.

5. *E. elatus*.

6. *E. scaber*.

7. *E. mollis*.

8. *E. dilatatus*.

9. *E. hypomalacus*.

10. *E. carolinianus*.

1. *Elephantopus pratensis* C. Wright; Sauv. Anal. Acad. Ci.

Habana 6: 177. 1869.

Stems weak and slender, branching from the base, erect or ascending, 1–4 dm. high, pilose-pubescent, especially below, or becoming glabrate; leaf-blades flat, narrowly oblanceolate or nearly linear, 3–7 cm. long, 2–8 mm. wide, obtuse, entire, acuminate at base into a winged petiole, glabrous, or pilose on both sides, especially along the veins, resinous or glandular-punctate; glomerules few or solitary, on long peduncles, 5–8 mm. high; bracts 2 or 3, cordate-orbicular with a prominent broad ligulate tip 5–10 mm. long; involucreal scales 3-nerved, 4–5 mm. long, scarious at the margin, glabrous or minutely resinous-dotted; achenes prominently ribbed, glabrous, 3 mm. long; pappus of 6–8 triangular-ovate, ciliate scales about 1 mm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba and Isle of Pines.

2. **Elephantopus arenarius** Britton & Wilson; Britton,
Bull. Torrey Club **43**: 468. 1916.

Stems 6–8 cm. high, branched from the base, glabrous or sparsely pilose; leaves erect, the blades narrowly linear, entire, involute, 2–4 cm. long, 1 mm. wide, essentially glabrous, conspicuously glandular-punctate, flat and pilose-ciliate at the slightly dilated clasping base; peduncles 2–3 cm. long; glomerules 2–5, 5–6 mm. high; bracts 2, broadly ovate to nearly orbicular, reticulately veined, glandular-punctate, acuminate into a linear tip 5–15 mm. long and 1 mm. wide; involucre scales short-acuminate, glabrous, 3 mm. long; achenes conspicuously ribbed, glabrous; pappus of several unequal triangular-lanceolate ciliate scales, about 0.5 mm. long.

TYPE LOCALITY: Vicinity of Los Indios, Isle of Pines.

DISTRIBUTION: Isle of Pines.

3. **Elephantopus tomentosus** L. Sp. Pl. 814. 1753.

Elephantopus nudicaulis Poir. in Lam. Encyc. Suppl. 2: 543. 1812.

Elephantopus carolinianus simplex Nutt. Gen. 2: 187. 1818.

Stems stout, erect, hispid, freely branched above, 3–8 dm. high; blades of the basal leaves broadly elliptic to obovate-oblong, 10–20 cm. long, 3–9 cm. wide, obtuse or rounded, crenate, gradually narrowed or tapering to the sessile base, thinly pilose-pubescent or glabrate above, softly pilose beneath on the surface and densely comose with spreading or reflexed hairs on the midvein; cauline leaves few or none, the blades narrowly oblong, 2–5 cm. long; inflorescence broad, freely branched; bracts triangular-ovate, hirsute, equaling or somewhat exceeding the glomerules; involucre scales thinly strigose-pubescent, usually green, thinly resinous, 9–12 mm. long; achenes 4–4.5 mm. long; pappus-bristles gradually dilated at base, 6–7.5 mm. long.

TYPE LOCALITY: Virginia.

DISTRIBUTION: North Carolina to Kentucky, Florida, and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3611; ed. 2. f. 4150.

4. **Elephantopus nudatus** A. Gray, Proc. Am. Acad. **15**: 47. 1879.

Stems slender, erect, branched above, 2–7 dm. high, glabrate to softly pilose; basal leaf-blades oblong-oblongate, 10–24 cm. long, 2–6 cm. wide, acute or obtuse, crenate-serrate, mostly beyond the middle with low ascending teeth, gradually attenuate from above the middle to the narrow sessile base, glabrate or sparsely papillose-pilose above, thinly pilose-pubescent, especially on the veins, and minutely resinous beneath; glomerules small, 5–10 mm. high; bracts little exceeding the glomerules, lanceolate or narrowly triangular-ovate, hirsute on the back along the midvein; involucre scales thinly strigose, densely resinous, acute, frequently purple-tinged; achenes 3–3.5 mm. long; pappus-bristles 4–5 mm. long, abruptly dilated below into a depressed-deltoid base.

TYPE LOCALITY: Oxford, Delaware.

DISTRIBUTION: Delaware to Florida, Arkansas, and Louisiana.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3610; ed. 2. f. 4149.

5. **Elephantopus elatus** Bertol. Mem. Accad. Bologna **2**: 607. 1851.

Elephantopus elatus intermedius Gleason, Bull. Torrey Club **46**: 252. 1919.

Stems erect, rather sparingly branched, 5–10 dm. tall, leafless or with 1 or 2 cauline leaves, hirsute-pubescent, especially above; blades of the basal leaves spatulate to elliptic or oblong, 12–25 cm. long, 3–6 cm. wide, obtuse, crenate, thinly papillose-pilose above, more or less pilose on the lower surface and densely comose with stout ascending hairs on the veins; cauline leaves much reduced, seldom more than 5 cm. long; glomerules very loosely corymbed, 10–15 mm. high, about equaled by the broadly ovate or triangular, short-acuminate, densely gray-hirsute bracts; involucre scales 5.5–8 mm. long, densely hirsute with erect white hairs concealing the surface; achenes 3.5–4 mm. long; pappus-bristles 3.5–4.5 mm. long, dilated below into a narrowly triangular base.

TYPE LOCALITY: Alabama.

DISTRIBUTION: South Carolina to Florida, Louisiana, and southern Arkansas.

ILLUSTRATION: Mem. Accad. Bologna **2**: pl. 5.

6. **Elephantopus scaber** L. Sp. Pl. 814. 1753.

Stems erect, 1–4 dm. tall, branched at the base and in the inflorescence, hispid; leaves mostly basal, the blades firm, oblong-obovate, 8–12 cm. long, 4–6 cm. wide, obtuse, obscurely and irregularly crenate, gradually narrowed toward the base, scabrellate above and pubescent along the veins, resinous and densely pubescent, especially on the veins, beneath; upper leaves much reduced, elliptic-oblong, papillose-pubescent above; inflorescence freely branched, with stout peduncles; bracts broadly ovate, acute, reticulate, shorter than the heads or rarely longer; involucre scales 8 mm. long, green, scarious-margined, sharply acuminate, sparsely pilose near the apex; achenes 2.5 mm. long, pubescent; pappus-bristles 4.5 mm. long, gradually dilated into a long, narrowly triangular base.

TYPE LOCALITY: India.

DISTRIBUTION: Introduced into Costa Rica and Guatemala from the East Indies.

7. **Elephantopus mollis** H.B.K. Nov. Gen. & Sp. 4: 26. 1818.

Stems erect, freely branched above, 3–10 dm. high, pilose or hirsute; leaf-blades firm, dull-green, oblong to obovate or broadly elliptic, 8–15 cm. long, 3–6 cm. wide, acute, crenate, narrowed at base into a winged petiole, thinly pilose or scabrellate above, resinous-dotted and softly and closely pubescent beneath, especially on the veins; glomerules about 10 mm. high, mostly exceeding the triangular-cordate hirsute bracts; involucre scales thinly strigose, sharply acuminate; achenes minutely pilose, 3 mm. long; pappus-bristles 4 mm. long, dilated below into a triangular base at least half as wide as long.

TYPE LOCALITY: Venezuela.

DISTRIBUTION: Cuba and Mexico, and south into tropical South America.

ILLUSTRATION: Trans. Acad. St. Louis 12: pl. 9, f. F.

8. **Elephantopus dilatatus** Gleason, Bull. N. Y. Bot.

Gard. 4: 240. 1906.

Stems erect, 3 dm. high, hirsute with brown hairs, especially below; leaves crowded below, scattered above, the blades thick, narrowly oblong-obovate, 6–10 cm. long, 9–12 mm. wide, acute to subacute, remotely serrulate, long-attenuate below, very sparsely pilose with stiff appressed hairs on both sides, but especially on the veins beneath; inflorescence freely branching, with numerous glomerules; bracts 3, broadly ovate, abruptly short-acuminate, pilose, resinous-dotted, equaling or shorter than the heads; involucre 7 mm. high, the scales abruptly acuminate into a cuspidate tip, glabrate at base, slightly glandular and sparsely short-pilose toward the tip; achenes 2 mm. long, minutely pubescent; pappus-bristles 4 mm. long, abruptly dilated below into a broadly depressed-triangular base.

TYPE LOCALITY: Banks of the Rio Ceibo, Buenos Aires, Costa Rica.

DISTRIBUTION: Costa Rica.

9. **Elephantopus hypomalacus** Blake, Contr. Gray Herb.

52: 20. 1917.

Stems erect, branched above, 5–8 dm. tall, pilose or hispid; leaves chiefly cauline, the blades broadly obovate to oblong-obovate, 10–20 cm. long, 4–9 cm. wide, acute, serrate with low teeth, attenuate at base, dark-green and thinly papillose-pilose above, densely and softly pubescent, especially along the veins, and resinous-dotted beneath, reticulately veined; glomerules numerous, 10 mm. high; bracts 2–4, ovate, acute or mucronate, reticulately veined; involucre 8 mm. high, the scales acuminate, scarious-margined, papillose-pilose; achenes 3.5 mm. long, sharply ribbed, pilose; pappus-bristles 4–5 mm. long, gradually dilated below to a triangular base about twice as long as wide.

TYPE LOCALITY: Orotina, Costa Rica, alt. about 180 meters.

DISTRIBUTION: Mexico, Guatemala, and Costa Rica.

10. **Elephantopus carolinianus** Willd. Sp. Pl. 3: 2390. 1804.

Elephantopus violaceus Schultz-Bip. Linnaea 20: 517. 1847.

Stems erect, branched, 3–8 dm. tall, densely hirsute below, pilose or becoming glabrate above; leaf-blades spreading, thin, bright-green, broadly elliptic to obovate, 10–20 cm. long,

3-10 cm. wide, obtuse to subacute, crenate, abruptly narrowed at base or tapering into a winged petiole, very thinly papillose-pilose or nearly glabrous above, resinous-dotted and thinly pilose with long spreading hairs beneath, numerous on the veins and veinlets, scattered on the surface; glomerules numerous, 10-15 mm. high; bracts triangular-ovate, thinly pilose and resinous-dotted; involucre about 8 mm. high, the scales acuminate, thinly strigose-pubescent and resinous, green with colorless margins; achenes 4 mm. long, hispid; pappus-bristles purplish, 6 mm. long, gradually dilated into a narrowly triangular base.

TYPE LOCALITY: Carolina.

DISTRIBUTION: New Jersey to Florida, Kansas, and Texas; Cuba and Porto Rico.

ILLUSTRATIONS: Trans. Acad. St. Louis 12: *pl. 9, f. A*; Britt. & Brown, Ill. Fl. *f. 3609*; ed. 2. *f. 4148*.

17. PSEUDELEPHANTOPUS Rohr, Skr. Nat.-Selsk.

Kjøb. 2: 213. 1792.

Distreptus Cass. Bull. Soc. Philom. 1817: 66. 1817; Dict. Sci. Nat. 13: 366. 1819.

Matamoria Llave & Lex. Nov. Veg. Descr. 1: 8. 1824.

Stems leafy, freely branching, herbaceous, the alternate leaves dilated and clasping at the base. Inflorescence terminal, of slender paniced spikes. Glomerules sessile, with 1-5 heads, subtended by usually 2 bract-like leaves. Heads 4-flowered. Involucre of 4 pairs of decussate scales, the first and third pairs conduplicate, the outer two pairs shorter than the inner. Corolla, styles, and stamens as in *Elephantopus*. Achenes 10-striate, flattened. Pappus of 10-15 bristles, with 2 long stout lateral ones plicate at the tip, 2 straight ones almost as long, and several short scarious bristles, all gradually dilated and fimbriate-ciliate at base.

Type species, *Elephantopus spicatus* Juss.

1. *Pseudelephantopus spicatus* (Juss.) Rohr, Skr. Nat.-

Selsk. Kjøb. 2: 213. 1792.

Elephantopus spicatus Juss.; Aubl. Pl. Guian. 2: 808. 1775.

Distreptus spicatus Cass. Dict. Sci. Nat. 13: 367. 1819.

Matamoria spicata Llave & Lex. Nov. Veg. Descr. 1: 8. 1824.

Distreptus spiralis Less. Linnaea 6: 690. 1831.

Elephantopus crispus D. Dietr. Syn. Pl. 4: 1372. 1847.

Stems herbaceous, erect, 3-10 dm. high, simple or freely branched, thinly pubescent or glabrate; leaf-blades ascending, variable in shape from narrowly oblong-linear to broadly elliptic or obovate, 5-15 cm. long, 1-4 cm. wide, acute or obtuse, crenulate to entire, narrowed to a sessile clasping base, thinly papillose-pilose, especially on the veins, or glabrous, the upper leaf-blades oblong-linear or narrowly elliptic, much reduced in size; spikes numerous, terminating the stem and branches and forming a loose open panicle; bracteal leaves linear or narrowly oblong, barely exceeding the heads, or none; involucre narrowly campanulate or cylindrical, about 1 cm. high, the scales appressed, sharply acuminate, green with colorless margins, glabrous or thinly pilose and frequently resinous; achenes densely hirsute on the ribs, resinous in the furrows, 7-8 mm. long; pappus pale-brown, 5-6 mm. long, the plicate bristles exerted from the involucre.

TYPE LOCALITY: French Guiana.

DISTRIBUTION: Cuba and Mexico to tropical South America; tropics of the Old World.

ILLUSTRATIONS: Lam. Tab. Encyc. *pl. 718, f. 2*; Gaertn. Fruct. *pl. 165*; Bot. Zeit. 14: *pl. 11, f. 84-89*; Trans. Acad. St. Louis 12: *pl. 9, f. G*.

18. ROLANDRA Rottb. Coll. Soc. Med. Havn. 2: 256. 1775.

Stems herbaceous, leafy. Leaves alternate, white-tomentose beneath, pinnately veined. Heads 1-flowered, subtended each by a scarious bract and aggregated into dense axillary glomerules. Involucre of two complicate, aristate scales, the outer larger and enclosing the inner. Corolla tubular, regularly 4-lobed. Anthers sagittate. Styles 2-cleft, the branches scarcely separate. Achenes 4-5-angled. Pappus a short, irregularly toothed crown.

Type species, *Echinops fruticosa* L.

1. *Rolandra fruticosa* (L.) Kuntze, Rev. Gen. 360. 1891.

Echinops fruticosa L. Sp. Pl. 815. 1753.

Rolandra argentea Rottb. Coll. Soc. Med. Havn. 2: 258. 1775.

Rolandra diacantha Cass. Dict. Sci. Nat. 46: 171. 1827.

Rolandra monacantha Cass. Dict. Sci. Nat. 46: 171. 1827.

Stems erect, sparingly branched, 2–10 dm. high, finely puberulent; leaf-blades firm, oblong to elliptic, 3–14 cm. long, 1–5 cm. wide, acute or short-acuminate, entire or undulate, narrowed at base into a short pubescent petiole, scabrellate or glabrate above, closely gray-tomentose and pilose on the veins beneath; veins prominent, ascending; glomerules numerous, terminal and in the upper axils, dense, hemispheric to subglobose, 10–15 mm. in diameter, the shortened axes densely hirsute among the oblong, scarious, subulate bracts; involucre 4–5 mm. high, the scales ovate to ovate-lanceolate, thinly pubescent to glabrous, usually glandular on the back, tipped with a short, straight or bent spine, the outer slightly exceeding the inner, ciliate near the tip; achenes glabrous and glandular, 2 mm. long; pappus 0.5–1 mm. long, of numerous unequal fimbriate segments.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Porto Rico and Honduras, and south to Brazil.

ILLUSTRATION: Sw. Fl. Ind. Occ. *pl.* 27.

19. *SPIRACANTHA* H.B.K. Nov. Gen. & Sp. 4: 28. 1818.

Stems suffruticose, branching. Leaves alternate, pinnately veined. Inflorescence capitate, of several glomerules, subtended by 3 or 4 foliaceous bracts. Heads 1-flowered, aggregated into glomerules of 12–20 heads, each subtended by a coriaceous spinose bract. Involucre of 5 or 6 scales in two series. Corolla tubular, regularly 4- or 5-lobed. Anthers sagittate, obtuse at base. Style 2-lobed, with short branches. Achenes slightly compressed, obscurely 5-nerved. Pappus of numerous, stout, erect, unequal scales.

Type species, *Spiracantha cornifolia* H. B. K.

1. *Spiracantha cornifolia* H.B.K. Nov. Gen. & Sp. 4: 29. 1818.

Stems low, 2–4 dm. high, loosely branched, pubescent; leaf-blades on short petioles, ovate, 2–4 cm. long, 1–2 cm. wide, acute, entire or denticulate, sparsely papillose-pilose above, pale and thinly tomentose on the surface beneath, pilose with long hairs on the prominent veins; peduncles densely hirsute, the subtending leaves thin, ovate; glomerules ovoid, 5–8 mm. long; bracts oblong, hirsute above, broadly rounded at the apex and bearing a squarrose spine one-third to one-half the length of the bract; heads not exerted, 3–4 mm. high; involucre scales linear, thin and scarious, glabrous, sharply acuminate, 1-nerved, 3 mm. long, beset at base with hairs of the same length; achenes obovoid, glabrous, 2 mm. long.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Yucatan to Colombia.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. *pl.* 313.