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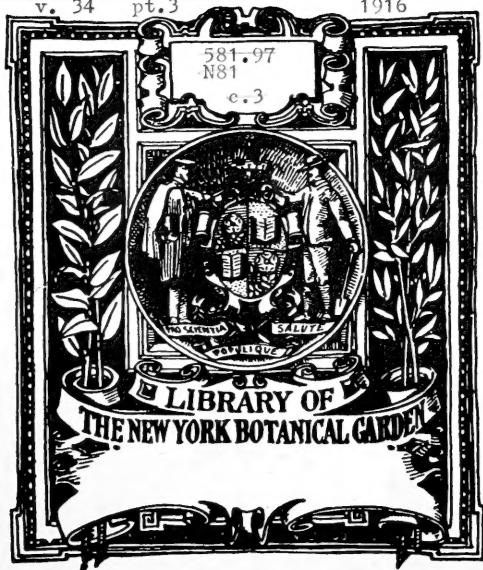
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VOLUME 34

PART 3

NORTH AMERICAN FLORA

(CARDUALES)

CARDUACEAE

TAGETEAE, ANTHEMIDEAE

PER AXEL RYDBERG



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Leaves simple.

Leaves clavate, fleshy.

Leaves filiform, slender.

Leaves pinnatifid.

Segments obliquely deltoid, acute, entire.

Segments cuneate, truncate, toothed.

1. *C. mexicana*.

2. *C. acerosa*.

3. *C. pinnata*.

4. *C. truncata*.

1. *Chrysactinia mexicana* A. Gray, Mem. Am. Acad. II. 4: 93.

1849.

Pectis taxifolia Greene, Leaflets 1: 148. 1905.

A shrub, 1-6 dm. high; branches erect, sulcate, glabrous, somewhat glutinous, in age roughened by the leaf-scars; leaves fleshy, simple, entire, linear, somewhat clavate, 8-15 cm. long, spinulose-tipped, copiously glandular; peduncles 1-4 cm. long, glabrous; involucre hemispheric, 5-6 mm. high, 8-10 mm. broad; bracts linear, each with a single large gland; ligules 8-10 mm. long, 2 mm. wide; disk-corollas 5 mm. long, cylindric, the tube and throat scarcely differentiated; lobes ovate; achenes linear, many-striate, hispid, 4 mm. long; pappus 5 mm. long.

TYPE LOCALITY: Saltillo, Chihuahua.

DISTRIBUTION: Texas and New Mexico to Vera Cruz and State of Mexico.

2. *Chrysactinia acerosa* Blake, Proc. Am. Acad. 51: 525. 1916.

A low shrub; branches erect, glabrous, grayish; leaves very slender, filiform, 1 cm. long or less, spinulose-tipped, with minute glands; peduncles 1-1.5 cm. long; involucre rounded-campanulate, 3-4 mm. high, 4-5 mm. broad; bracts oblong, obtuse, each with a single linear-oblong conspicuous gland; ligules 6 mm. long, 2 mm. wide; disk-corollas 4 mm. long; achenes 2 mm. long or more, hispidulous; pappus 4 mm. long.

TYPE LOCALITY: Sierra de Guascama, Minas de San Rafael, San Luis Potosí.

DISTRIBUTION: Known only from the type locality.

3. *Chrysactinia pinnata* S. Wats. Proc. Am. Acad. 25: 154. 1890.

A shrub, 3 dm. high or more; branches glabrous or nearly so, slender, striate; leaves opposite, lanceolate in outline, 3-6 cm. long, pinnately divided into 7-21 obliquely deltoid segments, the upper margins of which are at about right angles to the rachis; peduncles 3-6 cm. long; involucre hemispheric, 6 mm. high, 8-10 mm. broad; bracts 8, each with a single oblong gland, glabrous; ligules 5-6 mm. long, ochroleucous inside, bright-orange outside; disk-corollas 4.5 mm. long; tube shorter than the trumpet-shaped throat; lobes triangular; achenes 3 mm. long, striate, hispid; pappus tawny, 3.5 mm. long.

TYPE LOCALITY: Near Monterey, Nuevo León.

DISTRIBUTION: Nuevo León.

4. *Chrysactinia truncata* S. Wats. Proc. Am. Acad. 25: 154. 1890.

A low shrub, 2-3 dm. high; branches glabrous; leaves opposite or alternate, 1.5-3 cm. long, pinnately divided into 3-7 cuneate, truncate, few-toothed, mucronate segments, with a single gland at the base of the mucro; peduncles 2-4 cm. long; involucre hemispheric, 5 mm. high, 8 mm. broad; bracts about 12, each with a single gland; ligules bright-yellow, 7-8 mm. long; disk-corollas 5 mm. long; tube slightly gibbous at the base, shorter than the trumpet-shaped throat; lobes ovate; achenes 2.5 mm. long, strongly striate, hispid; pappus tawny, 4 mm. long.

TYPE LOCALITY: Summit of Sierra de la Sila, Nuevo León.

DISTRIBUTION: Coahuila and Nuevo León.

19. **POROPHYLLUM*** (Vaillant) Adans. Fam. Pl. 2: 122. 1763.

Kleinia Jacq. Enum. Pl. Carib. 8. 1760. Not *Kleinia* L.; Mill. 1754.

Hunteria Moc. & Sessé; DC. Prodr. 5: 649, as synonym. 1836. Not *Hunteria* Roxb. 1814.

Annual or perennial herbs, or low shrubs. Leaves alternate or opposite, or both, simple, their blades varying from broad, sinuate, and slender-petioled to filiform, entire-margined,

* Also written *Porophyllon*.

and sessile, with pellucid glands along the margins and sometimes also scattered ones on the surface. Heads discoid. Involucre cylindric or campanulate; bracts few, 5-9, linear, oblong, or obovate, distinct or connate only at the base, usually with 2 dorsal rows of glands. Receptacle small, naked. Flowers all hermaphrodite and fertile. Corollas yellowish or purplish, actinomorphic or slightly bilabiate, the limb being cleft more deeply on the two sides of a single lobe, the throat varying from funnelliform and much shorter than the tube to cylindric and longer than the tube. Arthers rounded at the base. Style-branches long, filiform-subulate, hirtellous. Achenes narrow, often tapering at the apex, many-striate, commonly hispidulous. Pappus of numerous scabrous or hispidulous bristles.

Type species, *Cacalia Porophyllum* L.

Throat of the corolla more or less funnelliform, usually much shorter than the slender tube; corollas from ochroleucous or white to purple.

Leaf-blades oval to elliptic or lanceolate, slender-petioled; corolla-tube several times as long as the broadly funnelliform throat (EUPOROPHYLLUM).

Annuals.

Peduncles clavate-thickened under the involucre; heads erect; involucre 15-25 mm. long.

Leaf-blades broadly oval or obovate, sinuate, crenate; achenes fully 1 cm. long; pappus sordid-brown; bracts acute or obtuse.

Achenes pubescent.

Achenes glabrous.

Leaf-blades elliptic or oblong, more gradually tapering at the base; achenes 7-8.5 mm. long; pappus straw-colored; bracts acuminate.

Peduncles filiform throughout; involucre 10-18 mm. long.

Heads and peduncles erect.

Involucre 15-18 mm. long, 2 mm. broad; flowers about 12, white.

Involucre 12-14 mm. long, 3-4 mm. broad; flowers 18-20, deep-purple.

Heads and peduncles spreading.

Perennials, mostly shrubby.

Flowers subracemose, in clusters with ascending branches; heads distinctly nodding; leaves without glands except along the margins; flowers greenish.

Leaves comparatively thick, distinctly reticulate.

Leaves thin, not conspicuously reticulate.

Flowers either in cymose clusters with spreading branches, or solitary; heads not nodding.

Corollas pale with darker lines or streaks.

Leaf-blades oval or elliptic, mostly rounded at the apex; bracts obtuse or acute (except in *P. Ervendbergii*).

Leaves with glands on the surface as well as along the margins.

Leaf-blades oval or broadly elliptic, rather firm.

Leaf-blades oblong or narrowly elliptic, thin.

Bracts acute; involucre 5 mm. broad.

Bracts acuminate; involucre 3 mm. broad.

Leaves with marginal glands only.

Heads mostly cymose.

Branches and peduncles divaricate; pappus straw-colored.

Branches and peduncles ascending; pappus sordid.

Heads solitary.

Leaf-blades lanceolate, acutish; bracts acuminate.

Corollas purple.

Leaf-blades more than 1 cm. long; bracts acute; peduncles elongate.

Leaf-blades less than 1 cm. long; bracts acuminate; peduncles short.

Leaf-blades oblanceolate, linear, or filiform, rarely lanceolate, short-petioled or sessile; corolla-tube not several times as long as the elongate-funnelform tube (HUNTERIA).

Leaves not filiform, more or less short-petioled.

Heads short-peduncled in dense cymes; bracts light-green, not carinate and scarcely gibbous at the base.

Corollas whitish.

Leaves (at least the lower) lanceolate, distinctly petioled.

Leaves narrowly linear-oblanceolate, subsessile.

Corollas ochroleucous.

1. *P. macrocephalum*.
2. *P. leiocarpum*.

3. *P. Porophyllum*.

4. *P. Pringlei*.

5. *P. calcicola*.

6. *P. quinqueflorum*.

7. *P. viridiflorum*.

8. *P. nutans*.

9. *P. nummularium*.

10. *P. oblongum*.

11. *P. Ervendbergii*.

12. *P. divaricalum*.

13. *P. Millspaughii*.

14. *P. jorullense*.

15. *P. Palmeri*.

16. *P. Nelsonii*.

17. *P. Pittieri*.

18. *P. brachypodum*.

19. *P. pausodynamum*.

- Leaves narrow, less than 2 mm. broad; involucre about 1 cm. high; bracts narrowly linear.
- Leaves more than 2 mm. broad; involucre 8-9 mm. high; bracts broader.
- Heads longer-peduncled, in open cymes or solitary; bracts more or less pink or purplish, round-keeled on the back and gibbous at the base.
- Plants decumbent; leaves oblong, rarely more than 1 cm. long; heads short-peduncled, nodding.
- Plants erect; leaves various, more than 1 cm. long; heads not nodding.
- Corollas white or pale; leaves often obtuse.
- Corollas more or less purple.
- Leaves elliptic or oblong, obtuse.
- Leaf-blades more than 1 cm. long; bracts acute; peduncles elongate.
- Leaf-blades less than 1 cm. long; bracts acuminate; peduncles short.
- Leaves narrowly oblanceolate to linear, acute.
- Bracts merely purple or purple-tinged, not dotted, acute.
- Annuals.
- Perennials.
- Leaves linear.
- Leaves oblong or oblanceolate.
- Leaves 2-3 cm. long; heads solitary or in clusters of 2 or 3 at the ends of the branches.
- Leaves 1-2 (rarely 3) cm. long; heads cymose.
- Bracts conspicuously purple-dotted, acuminate.
- Leaves filiform or nearly so.
- Leaves not fleshy; branches mostly erect.
- Bracts obovate, rounded or truncate at the apex, keeled only at the base, purple; corollas purple.
- Bracts linear or oblong, acute or obtuse, round-keeled on the back.
- Corollas purple, slightly tinged with orange on the lobes; heads nodding.
- Corollas white or straw-colored, merely streaked with purple on the throat, if at all.
- Glands of the involucre bracts narrow, linear.
- Plants decidedly glaucous; bracts only slightly pinkish on the margins; achenes light-colored.
- Plants scarcely glaucous; bracts more or less purple-tinged; achenes dark.
- Plants shrubby; achenes sparingly hispidulous; bracts linear.
- Plants herbaceous from a subterranean caespitose stem; achenes hirsute; bracts oblong-linear.
- Glands of the involucre bracts short, oblong or elliptic.
- Bracts broadly linear or oblong-oblanceolate; leaves rather stiff and fleshy; plants glaucous.
- Bracts narrowly linear; leaves slender and soft; plants light-green.
- Leaves decidedly fleshy; branches divaricate.
- Throat of the corolla cylindrical or nearly so, longer than the tube; lobes short, ovate; corollas mostly yellow (PSEUDO-CHRYSACTINIA).
- Leaves lanceolate, amplexicaul.
- Leaves not amplexicaul, sessile, linear, oblong, or cuneate.
- Glands of the bracts in dorsal lines; plants not depressed; leaves filiform.
- Bracts linear, acute, with linear glands.
- Branches erect or ascending; leaves more than 2 cm. long.
- Branches spreading, flexuose; leaves 1-1.5 cm. long.
- Bracts oblong or oblong-obovate, obtuse or rounded at the apex; branches flexuose.
- Glands of the oval or obovate bracts near the apex only; plants low and depressed.
- Leaves linear, simple.
- Leaves cuneate in outline, 3-lobed at the apex.
20. *P. confertum*.
21. *P. ochroleucum*.
22. *P. cedrense*.
23. *P. obtusifolium*.
16. *P. Nelsonii*.
17. *P. Pittieri*.
24. *P. coloratum*.
25. *P. Linaria*.
26. *P. Seemannii*.
27. *P. guatemalense*.
28. *P. simplex*.
29. *P. filiforme*.
30. *P. porphyreum*.
31. *P. leucospermum*.
32. *P. gracile*.
33. *P. Vaseyi*.
34. *P. junciforme*.
35. *P. pinifolium*.
36. *P. maritimum*.
37. *P. amplexicaule*.
38. *P. scoparium*.
39. *P. fruticulosum*.
40. *P. Greggii*.
41. *P. crassifolium*.
42. *P. tridentatum*.

1. *Porophyllum macrocephalum* DC. Prodr. 5: 648. 1836.

Kleinia glandulosa Moc. & Sessé; DC. Prodr. 5: 648, as synonym. 1836.

An erect annual; stem 5-10 dm. high, glabrous, branched above; leaves alternate; petioles slender, 1-2 cm. long; blades broadly oval or obovate, repand, 1-3 cm. long, thin and

pale; glands oblong, conspicuous, along the margins, one in each sinus; heads solitary at the ends of the branches; peduncles clavate, 2-7 cm. long; involucre at first cylindrical, 20-22 mm. high, 5-6 mm. broad, in age turbinate and broader; bracts mostly 5, linear, acute or obtuse, with 2 rows of linear glands; corollas about 12 mm. long; tube pale, many times longer than and gradually passing into the purple funnelliform throat; lobes lanceolate; achenes 12-13 mm. long, hispidulous; pappus sordid-brown, fully 1 cm. long; bristles minutely scabrous.

TYPE LOCALITY: Near Villalpando, Mexico.

DISTRIBUTION: Arizona, and throughout Mexico to Panama; also in Ecuador.

ILLUSTRATION: Hernandez, Nov. Pl. Mex. 434, f. 3.

2. *Porophyllum leiocarpum* (Urban) Rydberg, sp. nov.

Porophyllum macrocephalum leiocarpum Urban, Symb. Ant. 1: 466. 1900.

An erect annual; stem branched above, glabrous, often violet and glaucous, striate; leaves opposite or some alternate; petioles 1-2 cm. long; blades oval, thin, 1-4 cm. long, subentire or sinuate, usually rounded at both ends, with a few oblong glands near the sinuses of the margins and one at the apex; heads solitary at the ends of the branches; peduncles slightly clavate, erect, 4-5 cm. long; involucre at first cylindrical, 20-22 mm. high, 5-8 mm. broad, in age more turbinate and broader; bracts 5, linear, acute, with 2 rows of linear glands; corollas 10-12 mm. long; tube slender, much longer than the funnelliform dark-purple throat; lobes narrowly lanceolate; achenes dark, 10 mm. long, glabrous; pappus about 8 mm. long; bristles 20-80, minutely scabrous.

TYPE LOCALITY: Near Aybonito, Porto Rico.

DISTRIBUTION: Porto Rico.

3. *Porophyllum Porophyllum* (L.) Kuntze, Rev. Gen. 3²: 168.

1898.

Calcia Porophyllum L. Sp. Pl. 834. 1753.

Kleinia ruderalis Jacq. Enum. Pl. Carib. 28. 1760.

Calcia ruderalis Sw. Prodr. 110. 1788.

Kleinia Porophyllum Willd. Sp. Pl. 3: 1738. 1804.

Porophyllum ellipticum Cass. Dict. Sci. Nat. 43: 56. 1826.

Porophyllum ruderale Cass. Dict. Sci. Nat. 43: 56. 1826.

Porophyllum ellipticum genuinum Urban, Symb. Ant. 1: 467. 1900.

Porophyllum ellipticum ruderale Urban, Symb. Ant. 1: 468. 1900.

Porophyllum ruderale ellipticum B. L. Robinson, Proc. Am. Acad. 49: 509. 1913.

An erect annual; stem much branched above, glabrous, striate; leaves alternate or opposite; petioles slender, 1-2 cm. long; blades elliptic, thin, 1-6 cm. long, obtuse, mucronate, or acute at the apex, usually acute at the base, entire or sinuate, with conspicuous elongate glands along the margin, rarely a few scattered over the surface, or sometimes even glandless; heads solitary at the ends of the branches; peduncles 3-5 cm. long, somewhat clavate; involucre at first cylindrical, about 2 cm. high and 8 mm. broad, in age broader; bracts 5, linear, acuminate, with two rows of glands; corollas 12-14 mm. long; tube filiform, much longer than and gradually passing into the olive-green or purplish funnelliform throat; lobes lanceolate; achenes 8 mm. long, tapering at both ends, hispidulous; pappus straw-colored or yellowish, about 1 cm. long; bristles scabrous.

TYPE LOCALITY: America.

DISTRIBUTION: West Indies, Costa Rica, and Panama; in South America south to Argentina.

ILLUSTRATIONS: Morison, Hist. sect. 7, pl. 17, f. 7; Cav. Ic. pl. 222; Pluk. Phytogr. pl. 161, f. 1; Jacq. Sel. Stirp. Am. pl. 127 (Sel. Stirp. Am. Pict. pl. 193; Am. Gew. pl. 240); E. & P. Nat. Pfl. 4²: 61B, 126A.

4. *Porophyllum Pringlei* B. L. Robinson, Proc. Am. Acad. 27: 178.

1892.

A slender glaucous annual; stem 3-6 dm. high, terete, branched above; leaves of the stem opposite; petioles 1-2 cm. long, slender; blades oval or elliptic, subentire, rounded at the apex, acute at the base, very thin, 2-4 cm. long, 1-2 cm. wide; leaves of the branches smaller and alternate; glands marginal, few, elliptic; heads few, erect; peduncles erect, 1-3 cm. long; involucre cylindrical, about 18 mm. high; bracts 5, narrowly linear, acuminate, scarious-margined,

with a single median row of glands; flowers about 12; corollas nearly white, 7 mm. long; tube very slender, many times longer than the funnelliform throat; lobes lanceolate; achenes 7 mm. long, narrowly cylindrical, hispidulous; pappus straw-colored. 6-7 mm. long; bristles scabrous.

TYPE LOCALITY: Barranca near Guadalajara [Jalisco].

DISTRIBUTION: Jalisco.

5. *Porophyllum calcicola* Rob. & Greenm. Proc. Am. Acad. 39: 116.
1903.

A glabrous annual; stem erect, much branched, green or purplish, more or less glaucous; stem-leaves opposite; petioles 0.5-2 cm. long, slender; blades oblong or obovate, 0.5-3.5 cm. long, 0.3-1.5 cm. wide, rounded at the apex, cuneate at the base; glands few (1-5), marginal; heads few, erect; peduncles 1-3 cm. long; involucre about 12 mm. high, clavate; bracts 5, linear, acute, often purple- or blue-tinged; flowers 18-20; corollas 7 mm. long; tube yellowish, slender, passing into the dark-purple funnelliform throat; achenes 6-7 mm. long, hispidulous; pappus straw-colored, 5 mm. long; bristles scabrous.

TYPE LOCALITY: Mountains above Iguala, Guerrero.

DISTRIBUTION: Guerrero and Morelos.

6. *Porophyllum quinqueflorum* Brand. Zoe 5: 225. 1905.

A divaricately branched annual; stem 5-6 dm. high, branched above the middle, terete, somewhat striate; leaves alternate; petioles filiform, 2-3 cm. long; blades obovate or oblanceolate, rounded at the apex, tapering at the base, 2-5 cm. long, 1-2 cm. wide, very thin; glands 0-7, marginal; peduncles from the axils of the leaves, divaricate, 1-2.5 cm. long; involucre clavate-cylindrical, about 1.5 cm. high; bracts 5, narrowly linear, acute, green, with a single row of linear glands; flowers about 5; corollas 9 mm. long, ochroleucous; tube filiform, many times longer than the funnelliform throat; lobes lanceolate; achenes about 8 mm. long, hispidulous; pappus straw-colored, 7 mm. long; bristles scabrous.

TYPE LOCALITY: Cerro Colorado, Sinaloa.

DISTRIBUTION: Known only from the type locality.

7. *Porophyllum viridiflorum* (H. B. K.) DC. Prodr. 5: 648. 1836.

Kleinia viridiflora H. B. K. Nov. Gen. & Sp. 4: 157. 1820.

Porophyllum Lindeni Schultz-Bip.; Seem. Bot. Voy. Herald 308. 1857.

A shrub, 5-10 dm. high; stem branched, terete, glabrous, brown, striate; leaves alternate; petioles about 1 cm. long; blades oval or obovate, obtuse or rounded at the apex, abruptly contracted at the base, 1.5-4 cm. long, rather firm, reticulate, subentire or undulate on the margins, with few marginal glands; heads 1-4 at the ends of the branches, in subracemose bracteate clusters; peduncles erect, 1-2 cm. long; involucre cylindrical, 12-13 mm. high, greenish; bracts 5, linear, obtuse, with a single median row of linear glands; flowers 15-20; corollas greenish or yellowish-white, nearly 1 cm. long; tube slender, hispidulous, 2-3 times as long as the funnelliform throat; lobes lanceolate; achenes 8 mm. long, hispidulous; pappus straw-colored, 7 mm. long; bristles hispidulous.

TYPE LOCALITY: Valladolid [Morelia], Michoacan.

DISTRIBUTION: Tepic to Oaxaca and Vera Cruz.

8. *Porophyllum nutans* Rob. & Greenm. Proc. Am. Acad. 32: 31.
1896.

Porophyllum Holwayanum Greenman, Proc. Am. Acad. 40: 48. 1904.

A leafy shrub, with terete brownish branches; leaves mostly opposite; petioles filiform, 5-10 mm. long; blades thin, oval or elliptic, entire or sinuate, rounded but often mucronate at the apex, obtuse or acute at the base, 1.5-5 cm. long, with 4-8 oblong glands close to each margin; heads in sub-racemiform leafy clusters at the ends of the branches; involucre cylindrical, about 12 mm. high; bracts 5, linear, obtuse, green, with 2 rows of linear glands; flowers 15 or more; corollas ochroleucous or greenish-white, 8-9 mm. long; tube slender, about 4 times as

long as the turbinate throat; lobes deltoid; achenes 5-7 mm. long, hispidulous; pappus straw-colored, 5-6 mm. long; bristles hispidulous. (*P. Holwayanum* is a luxuriant form with longer involucre, larger leaves, and sometimes 8-12 glands on each leaf-margin.)

TYPE LOCALITY: Mountains near Lake Chapala, Michoacan.

DISTRIBUTION: Michoacan, Guerrero, Oaxaca, and Jalisco.

9. *Porophyllum nummularium* DC. Prodr. 5: 649. 1836.

A shrub, with long terete glabrous brownish branches; leaves mostly opposite; petioles about 1 cm. long; blades oval or rarely broadly elliptic, 1.5-3.5 cm. long, 1-2 cm. wide, sinuate, not very thin, glabrous; glands elliptic, 3-5 along each margin, one at the apex and a few scattered over the surface; heads cymose, with the peduncles more or less spreading in age; involucre at first cylindric, 10-14 mm. high; bracts linear, acute, with two rows of glands; corollas cream-colored, about 1 cm. long; tube slender, pubescent, several times as long as the funnellorm throat; lobes linear-lanceolate, puberulent; achenes 6 mm. long, hispidulous; pappus straw-colored, 7 mm. long; bristles hispidulous.

TYPE LOCALITY: Tehuantepec, Oaxaca.

DISTRIBUTION: Michoacan to Yucatan and Guatemala.

10. *Porophyllum oblongum* Rydberg, sp. nov.

A shrub, with slender, terete, striate, brownish branches; leaves mostly opposite; petioles slender, 1-1.5 cm. long; blades oblong or rarely elliptic, 2-4 cm. long, 0.5-1.5 cm. wide, very thin, sinuate-undulate, with 3-6 marginal glands on each side, 1 terminal one, and a few scattered over the surface; heads cymose; peduncles more or less spreading, 2-4 cm. long; involucre 12-13 mm. high, cylindric, pale; bracts mostly 5, linear, acute, with 2 rows of linear glands; corollas almost white, about 1 cm. long; tube slender, puberulent, much longer than the funnellorm throat; achenes pale, 6 mm. long, hairy; pappus straw-colored, 7 mm. long; bristles scabrous.

Type collected at Culiacan, 1891, *Palmer 1807* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sinaloa.

11. *Porophyllum Ervendbergii* A. Gray, Proc. Am. Acad. 19: 35. 1883.

A slender shrub, 5 dm. high or more, with terete, brown branches; leaves opposite; petioles slender, about 1 cm. long; blades elliptic, 2-3 cm. long, obtuse at the apex, acute at the base, sinuate, with 2-4 marginal glands on each side, 1 terminal one, and a few scattered over the surface; heads cymose, erect, 10-15-flowered; peduncles 2-3 cm. long, ascending-spreading; involucre cylindric, 11-12 mm. high, 3 mm. broad; bracts 5, narrowly linear, acuminate; glands few, linear, in 2 irregular rows; corollas pale with dark streaks, puberulent, 8 mm. long; tube much longer than the funnellorm throat; achenes 6.5 mm. long, hispidulous; pappus tawny, 6 mm. long; bristles hirsutulous.

TYPE LOCALITY: Wartenberg, Tamaulipas.

DISTRIBUTION: Tamaulipas; Yucatan (?).

12. *Porophyllum divaricatum* Rydberg, sp. nov.

A divaricately branched shrub, with terete, glabrous, brown branches; leaves opposite; petioles about 5 mm. long; blades rather thick, 1-2 cm. long, elliptic or rarely oval, glabrous, obtuse at the apex, abruptly acute at the base, with 1 or 2 glands along each margin and a single one at the apex; heads cymose-corymbose; peduncles spreading, 1-3 cm. long; involucre cylindric-campanulate, about 1 cm. high; bracts 5, linear, acute, greenish, with 2 rows of linear glands; corollas nearly white with darker veins, 9 mm. long; tube slender, puberulent, several times as long as the narrowly funnellorm throat; achenes 6 mm. long, hispidulous; pappus 6-7 mm. long, straw-colored or at first tinged with pink; bristles scabrous.

Type collected near Mazatlan, Sinaloa, 1899, *Goldman 386* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sinaloa to Vera Cruz (?).

13. *Porophyllum Millspaughii* B. L. Robinson; Millsp. Field Columb.
Mus. Publ. Bot. 2: 109. 1900.

A shrub, with terete, purplish, dichotomous branches; leaves opposite; petioles slender, about 5 mm. long; blades elliptic, rounded at each end, sinuate, thin, 2-3.5 cm. long, 1.5-2 cm. wide; glands 2 or 3 on each margin, lunate, and a single linear one at the apex; heads cymose; peduncles 1.5-2 cm. long; involucre about 12 mm. high, subcylindric; bracts 5, oblong-linear, scarious-margined, usually brown at the apex, with 2 rows of glands; flowers about 18; corollas greenish-white, 9 mm. long, puberulent; tube slender, much longer than the funnelliform throat; achenes black, hispidulous, somewhat tapering at the apex; pappus sordid.

TYPE LOCALITY: Progreso, Yucatan.

DISTRIBUTION: Yucatan and Guatemala.

14. *Porophyllum jorullense* (H. B. K.) Cass. Dict. Sci. Nat. 43: 57.
1826.

Kleinia jorullensis H. B. K. Nov. Gen. & Sp. 4: 156. 1820.

A branched shrub, with spreading terete brownish branches; leaves opposite or some of them alternate; petioles slender, about 1 cm. long; blades elliptic or oblong, rounded at the apex, abruptly acute at the base, 1-2.5 cm. long, repand, membranous, with 1 or 2 marginal glands on each side and a single terminal one, or sometimes glandless; heads solitary in the forks; peduncles 3-5 cm. long; involucre cylindro-campanulate, 10-12 mm. high; bracts 5, linear, acute, glabrous, green, with 2 rows of linear glands; flowers 25-30; corollas puberulent, about 1 cm. long, cream-colored; tube slender, many times as long as the funnelliform throat; achenes 7 mm. long, hispidulous; pappus straw-colored, 6 mm. long; bristles scabrous.

TYPE LOCALITY: On the eastern declivities of the volcano Jorullo.

DISTRIBUTION: Jalisco to Sinaloa.

ILLUSTRATION: H. B. K. Nov. Gen. & Sp. *pl.* 356.

15. *Porophyllum Palmeri* Rose, Contr. U. S. Nat. Herb. 1: 338.
1895.

A glabrous shrub, 1 m. or more high, divaricately branched, with reddish glabrous twigs; leaves opposite; petioles slender, 5-10 mm. long; blades firm, lanceolate or oblong, acute or obtuse at the apex, acute at the base, 1-4 cm. long, with 2-4 linear glands along each margin; heads cymose-corymbose; peduncles 1.5-2.5 cm. long; involucre cylindro-campanulate, about 12 mm. high; bracts 5, linear, greenish, acuminate, with 2 rows of linear glands; flowers about 20; corollas nearly white, about 1 cm. long; tube slender, several times as long as the funnelliform throat; lobes lanceolate; achenes 7 mm. long, hispidulous, somewhat tapering at the apex; pappus straw-colored, 7 mm. long; bristles scabrous.

TYPE LOCALITY: Colima.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Contr. U. S. Nat. Herb. 1: *pl.* 34.

16. *Porophyllum Nelsonii* Rob. & Greenm. Proc. Am. Acad. 32: 32.
1896.

A branching shrub, 3-6 dm. high; branches terete, purple; leaves opposite; petioles 4-6 mm. long; blades small, oblong or elliptic, obtuse, 1-1.5 cm. long, about 0.5 cm. wide, tapering at the base, with 0-2 marginal glands on each side and a single terminal one; heads cymose-corymbose; involucre narrowly campanulate, about 1 cm. high; bracts 5, linear-oblong, acute, purple, with 2 rows of linear glands; flowers about 30; corollas dark-purple, about 7 mm. long; tube puberulent, fully twice as long as the elongate-funnelform throat; achenes 6-7 mm. long, hispidulous, tapering at the apex.

TYPE LOCALITY: Between Panixtlahuaca and Jaquila, Oaxaca.

DISTRIBUTION: Oaxaca.

17. *Porophyllum Pittieri* Rydberg, sp. nov.

A slender glabrous shrub; branches slender, purple, striate; leaves opposite; petioles 2-5 mm. long; blades thick, elliptic, rounded at each end, less than 1 cm. long, usually with a single gland on each margin and one at the apex; heads in small cymes or solitary; peduncles 1-2 cm. long; involucre cylindro-campanulate, 1 cm. high, purplish or pink; bracts 5, linear, acuminate, with 2 rows of linear glands; flowers 15-20; corollas purplish, 8 mm. long; tube puberulent, several times as long as the funnelform throat; lobes narrowly lanceolate; achenes 7 mm. long, hispidulous, decidedly tapering above; pappus ochroleucous, slightly tinged with purple at the tips, 7 mm. long; bristles hispidulous.

TYPE LOCALITY: Cuesta de Quillihá, near Purulhá, Baja Verapaz, Guatemala, 1905, *Pittier 146* (U. S. Nat. Herb.).

18. *Porophyllum brachypodum* B. L. Robinson, Proc. Am. Acad.

35: 341. 1900.

A shrub, with strict shining stems, branched above; leaves alternate, short-petioled; blades thick, entire, lanceolate to linear, tapering at both ends, but blunt at the apex, 3-4 cm. long, 4-8 mm. wide; glands marginal; heads in dense corymbs; peduncles only 5-8 mm. long, slightly clavate, spreading; involucre campanulate, 8-9 mm. high; bracts oblong, obtuse, pale-green, with membranous margins, round-keeled on the back, with 2 rows of glands; flowers about 15; corollas 7 mm. long, whitish, pale with darker lines; tube puberulent, longer than the elongate-funnelform throat; achenes black, hispidulous, 7-8 mm. long; pappus 6-7 mm. long, straw-colored; bristles scabrous.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Known only from the type locality.

19. *Porophyllum pausodinum* Rob. & Greenm. Proc. Am. Acad.

32: 32. 1896.

Porophyllum Seemanni S. Wats. Proc. Am. Acad. 24: 57. 1889. Not *P. Seemanni* Schultz-Bip. 1857.

A shrub, with erect, at first green, later reddish branches, angled, sulcate and somewhat glaucous; leaves alternate, subsessile; blades narrowly linear-oblongate or linear, narrowed at both ends, but often blunt at the apex, slightly succulent, 4-6 cm. long, 2-5 mm. wide, entire; with 2 or 3 ellipsoid marginal glands on each side and one at the apex; heads in dense cymes; peduncles 0.5-2 cm. long; involucre campanulate, about 1 cm. high, pale-green; bracts 5, oblong, obtuse, with 2 rows of linear glands; flowers 25-30; corollas white, 7-8 mm. long; tube puberulent, much longer than the narrowly funnelform throat; lobes narrowly lanceolate; achenes light-colored, or at last dark, 7 mm. long, hispidulous; pappus straw-colored, 6-7 mm. long; bristles hispidulous.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Sonora.

20. *Porophyllum confertum* Greene, Leaflets 2: 155. 1911.

A suffrutescent perennial; stems 5 dm. high or more, green, terete, glabrous, striate, with ascending branches; leaves mostly alternate, subsessile; blades linear, narrow, 4-6 cm. long, less than 2 mm. wide; heads short-peduncled, in dense corymbs; peduncles usually less than 1 cm. long; involucre narrowly campanulate, about 1 cm. high, 3 mm. broad; bracts 5, linear, obtuse, green, glabrous, with 2 rows of oblong glands; flowers 5-7; corollas ochroleucous, 7 mm. long; tube slender, about twice as long as the funnelform throat; lobes lanceolate; achenes 7 mm. long, minutely puberulent, tapering at the apex; pappus 5 mm. long, straw-colored, sometimes tinged with purplish; bristles hispidulous.

TYPE LOCALITY: Cerralvo Island, Gulf of California.

DISTRIBUTION: Known only from the type locality.

21. *Porophyllum ochroleucum* Rydberg, sp. nov.

A shrubby perennial; stems 5 dm. high or more; branches green, terete, glabrous, striate, ascending; leaves short-petioled; blades narrowly oblanceolate, 3-5 cm. long, 2-4 mm. wide; heads in dense cymes; peduncles about 1 cm., rarely 1.5-2 cm. long; involucre campanulate, about 9 mm. high, 5-6 mm. broad; bracts 5, linear, with triangular acute tips, glabrous, with 2 rows of linear glands; flowers about 15; corollas ochroleucous, 6-7 mm. long; tube more than twice as long as the funnellform throat; achenes 7 mm. long, hispidulous; pappus yellowish, tinged with purple, about 6 mm. long; bristles hispidulous.

TYPE COLLECTED AT Sancito, Lower California, October 14, 1893, T. S. Brandegee (herb. N. Y. Bot. Gard.).

22. *Porophyllum cedrense* Rose & Standley, sp. nov.

A diffusely branched shrub, less than 5 dm. high; branches terete, slightly striate, often purplish; leaves alternate, sessile; blades fleshy, oblong, 1-2 cm. long, obtuse; heads usually solitary, usually nodding; peduncles 3-5 cm. long; involucre campanulate, fully 1 cm. high, 6 mm. broad; bracts 5, oblong, more or less purplish, abruptly short-acuminate, with 2 rows of linear glands; corollas pale, 5 mm. long; tube longer than the funnellform throat; achenes hispidulous on the angles; pappus tawny, 5 mm. long; bristles hispidulous.

TYPE COLLECTED ON Cedros Island, Lower California, March 10, 1911, J. N. Rose (U. S. Nat. Herb.).

23. *Porophyllum obtusifolium* DC. Prodr. 5: 650. 1836.

A suffruticose perennial; stems several, erect, strict, 4-5 dm. high, glabrous, striate; leaves alternate or some opposite, short-petioled, the lower blades oblanceolate, spatulate or oblong, rounded or obtuse at the apex, thick, the upper linear and acute, with 3-5 glands along the margins; heads many in a terminal subracemose or corymbose inflorescence; peduncles striate, 2-3 cm. long; involucre campanulate, 9-10 mm. high, purple; bracts oblong, with round-keeled backs, scarios margins, and 2 rows of linear glands, acute; corollas dirty-white or slightly pinkish, 6 mm. long; tube slender, puberulent; throat funnellform, very short; lobes long and linear-lanceolate; achenes 6 mm. long, glabrous; pappus straw-colored, tinged with purple, 4 mm. long; bristles hispidulous.

TYPE LOCALITY: Near Villalpando, Mexico.

DISTRIBUTION: Jalisco, Guanajuato, and Mexico (state).

24. *Porophyllum coloratum* (H.B.K.) DC. Prodr. 5: 650. 1836.

Kleinia colorata H. B. K. Nov. Gen. & Sp. 4: 158. 1820.

? *Kleinia tagetoides* H. B. K. Nov. Gen. & Sp. 4: 158. 1820.

? *Porophyllum tagetoides* DC. Prodr. 5: 650. 1836.

Hunteria fuscata Moc. & Sessé; DC. Prodr. 5: 650, as synonym. 1836.

A slender annual, sometimes glaucous; stem 3-5 dm. high, branched, glabrous, striate or somewhat angled; leaves mostly alternate, short-petioled; blades narrowly lance-linear or linear, 2-5 cm. long; heads solitary at the ends of the branches; peduncles 2-5 cm. long; involucre campanulate, 9-10 mm. high, dark-purple; bracts mostly 5, linear-oblong, round-keeled on the back, somewhat gibbous at the base, obtuse at the apex, with 2 rows of linear glands; corollas purple, 6 mm. long; tube puberulent, longer than the narrowly funnellform throat; lobes narrowly lanceolate; achenes 5 mm. long, hispidulous, black; pappus 7 mm. long, ochroleucous, often tinged with purple; bristles hispidulous.

TYPE LOCALITY: Guanajuato.

DISTRIBUTION: Sonora to San Luis Potosí and Oaxaca.

ILLUSTRATION: Mart. Moen. Monac. pl. 15.

25. *Porophyllum Linaria* (Cav.) DC. Prodr. 5: 649. 1836.

Cacalia Linaria Cav. Ic. 3: 29. 1794.

Hunteria columbina Moc. & Sessé; DC. Prodr. 5: 649, as synonym. 1836.

Porophyllum linariaefolium St.-Lag. Ann. Soc. Bot. Lyon 7: 132. 1880.

A suffruticose perennial; stem 3-5 dm. high, with light-green, grooved or striate, erect branches; leaves alternate, sessile; blades 2-5 cm. long, narrowly linear, somewhat fleshy, often revolute, with 2 rows of oblong glands; heads few, corymbose; involucre campanulate, about

1 cm. high and 7 mm. broad; bracts oblong, with triangular acute tips, dark-purple and often glaucous, with 2 rows of linear glands; corollas purple, puberulent, 6 mm. long; tube longer than the elongate-funnelform throat; lobes narrowly lanceolate; achenes 6 mm. long, hispidulous; pappus tinged with purple, 6 mm. long; bristles hispidulous.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Coahuila to State of Mexico.

ILLUSTRATION: Cav. Ic. *pl.* 257.

26. *Porophyllum Seemannii* Schultz-Bip.; Seem. Bot. Voy. Herald
308. 1857.

A fruticose perennial, glabrous; stem terete, striate, reddish-brown; branchlets green; leaves alternate or opposite, subsessile; blades linear-oblancoate, 2-5 cm. long, 4-8 mm. wide, acute or obtuse, with 3 or 4 glands on each side and one at the apex; heads solitary at the ends of the branches or in clusters of 2 or 3; peduncles 3-10 cm. long; involucre campanulate, nearly 1 cm. high; bracts 5, linear-oblong, round-keeled on the back, gibbous at the base, purple, or purple with green backs, with 2 rows of glands; corollas about 5 mm. long; tube yellowish, longer than the funnelform purple throat; lobes lanceolate; achenes 6 mm. long, somewhat tapering at each end, dark-brown, hispidulous; pappus straw-colored, tinged with purple, 5 mm. long; bristles hispidulous.

TYPE LOCALITY: Sierra Madre [Sinaloa].

DISTRIBUTION: Southwestern Chihuahua to Sinaloa and Jalisco.

27. *Porophyllum guatemalense* Rydberg, sp. nov.

A slender shrub; branches purplish-brown, terete, striate; leaves opposite, short-petioled; blades thick, narrowly oblanceolate, 1-3 cm. long, with 1 or 2 large oblong glands on each margin and one at the apex; heads many-flowered, cymose; peduncles 1-4 cm. long; involucre campanulate, about 1 cm. high, purple; bracts 5, oblong, acute, round-keeled and somewhat gibbous below; glands linear, in two rows; corollas purplish, 7-8 mm. long; tube much longer than the funnelform throat; lobes lanceolate; achenes dark, 6-7 mm. long, hispidulous; pappus 7 mm. long, tinged with purple.

Type collected near Newton, Guatemala, 1895, *E. W. Nelson* 3523 (U. S. Nat. Herb.).

28. *Porophyllum simplex* M. E. Jones, Contr. West. Bot. 12: 46.
1908.

An annual, or more probably a perennial; stems branched, striate, glaucous, 5 dm. high or more; leaves alternate, linear or narrowly oblanceolate, 1-5 cm. long, acute, with a few marginal glands or glandless; heads at the ends of the branches; peduncles 3-8 cm. long; involucre oblong-campanulate, 9-10 mm. high; bracts 5 or 6, linear, acuminate, strongly purple-dotted, round-keeled on the back, gibbous at the base; corollas purple, 6-7 mm. long; tube much longer than the funnelform throat; lobes lanceolate; achenes 5 mm. long, almost black, hispidulous, tapering above; pappus tawny, tinged with purple, 5 mm. long; bristles hispidulous.

TYPE LOCALITY: Guayanopa Cañon, Sierra Madre Mountains, Chihuahua.

DISTRIBUTION: Chihuahua.

29. *Porophyllum filiforme* Rydberg.

Porophyllum filifolium A. Gray (; S. Wats. Proc. Am. Acad. 18: 107, hyponym. 1882), Proc. Am. Acad. 19: 35. 1883. Not *P. filifolium* DC. 1836.

A perennial herb, with a slender woody caudex; stems rigid, branched above; leaves alternate, filiform, 1-5 cm. long; heads solitary at the ends of the branches; peduncles 2-5 cm. long; involucre campanulate, about 8 mm. high; bracts 5-8, obovate, rounded or truncate at the apex, dark-purple, with 2 rows of linear glands, round-keeled and gibbous at the base; corollas purple, 5 mm. long; tube shorter than the elongate-funnelform throat; lobes lanceolate; achenes 5 mm. long, hispidulous; pappus ochroleucous, purple-tinged, 3-4 mm. long; bristles hispidulous.

TYPE LOCALITY: Sierra Madre, south of Saltillo, Coahuila.

DISTRIBUTION: Coahuila.

30. *Porophyllum porfyreum* Rose & Standley, sp. nov.

A shrub, with slender spreading slightly angled branches; leaves linear-filiform, 4-6 cm. long, about 1 mm. wide; heads solitary at the ends of the branches; peduncles 2-4 cm. long, slightly thickened upwards; involucre campanulate, about 10 mm. high and 7 mm. broad; bracts elliptic, obtuse, light-brown, tinged with purple, striate, with small oblong, scattered glands; corollas hispidulous, 6 mm. long, purplish, the lanceolate lobes margined with yellow; tube longer than the elongate-funnelform throat; achenes 7 mm. long, hispidulous; pappus tinged with purple, 5 mm. long; bristles hispidulous.

TYPE LOCALITY: San José del Cabo, Lower California, March 26, 1911, *Rose 16478* (U. S. Nat. Herb.).

31. *Porophyllum leucospermum* Greene, Leaflets 2: 155. 1911.

An undershrub, about 3 dm. high; stem fastigiately branched from the base; branches stiff, sulcate, and decidedly glaucous; leaves almost filiform, 1-3 cm. long, with a few marginal glands; heads solitary at the ends of the branches; peduncles 1-4 cm. long; involucre campanulate, about 1 cm. high; bracts 5, broadly linear, somewhat round-keeled and gibbous at the base, with 2 rows of glands, green and glaucous, slightly tinged with pinkish; corollas 7 mm. long, white or nearly so, with purplish streaks; tube several times as long as the elongate-funnelform throat; lobes narrowly lanceolate; achenes 7 mm. long, straw-colored, hirsutulous, slightly tapering at the apex; pappus straw-colored or slightly tinged with rose, 6 mm. long; bristles hispidulous.

TYPE LOCALITY: Vegas Valley, Lincoln County, Nevada.

DISTRIBUTION: Nevada.

32. *Porophyllum gracile* Benth. Bot. Voy. Sulph. 29. 1844.

Porophyllum caesium Greene, Leaflets 2: 155. 1911.

A suffrutescent perennial, 2-5 dm. high; stems angled or sulcate, branched, scarcely glaucous; leaves scattered, filiform, 2-4 cm. long; heads solitary at the ends of the branches; peduncles 1-3 cm. long; involucre campanulate, 8-10 mm. high; bracts 5, broadly linear, mostly obtuse, purple and sometimes somewhat glaucous, rounded on the back and somewhat gibbous at the base, with few glands, usually in two rows; corollas 8 mm. long, straw-colored with purple streaks, puberulent; tube shorter than the elongate-funnelform or nearly trumpet-shaped throat; lobes lanceolate; achenes 8-9 mm. long, hispidulous, dark-brown, tapering at the summit; pappus straw-colored, sometimes tinged with rose.

TYPE LOCALITY: Bay of Magdalena, Lower California.

DISTRIBUTION: Lower California and southern California.

33. *Porophyllum Vaseyi* Greene, Leaflets 2: 154. 1911.

A perennial herb, with caespitose underground stem; stems 1.5-2 dm. high, glaucous, striate; leaves alternate, filiform, 1-2 cm. long; heads solitary at the end of the branches; involucre narrowly campanulate, 9-10 mm. long; bracts oblong-linear, obtuse, pale, pinkish on the margins, rounded on the back, and slightly gibbous at the base, with few linear or oblong glands in 2 rows; corollas 7 mm. long, pale with dark streaks, decidedly pubescent; tube longer than the trumpet-shaped throat; lobes lanceolate; achenes 8 mm. long, hirsute; pappus 6 mm. long, tinged with rose; bristles hispidulous. (Perhaps a depauperate form of the preceding.)

TYPE LOCALITY: Mountain Spring, San Diego County, California.

DISTRIBUTION: Known only from the type locality.

34. *Porophyllum junciforme* Greene, Leaflets 2: 154. 1911.

Porophyllum Greggii A. Gray, Pl. Wright. 1: 120, in part. 1852.

A shrub, 3-6 dm. high; stems with long and rush-like branches, sulcate, glaucous; leaves alternate, scattered, sessile, almost filiform, 2-4 cm. long; heads solitary at the ends of the branches; peduncles 2-3 cm. long; involucre oblong-campanulate, 10-12 mm. high; bracts 5, green and glaucous, slightly tinged with pink on the margins, broadly linear to oblong-oblan-

olate, obtuse at the apex, slightly round-keeled on the back, and gibbous at the base, with two rows of elliptic glands; corolla nearly white with purplish streaks, 7-8 mm. long; tube longer than the elongate-funnelform or nearly trumpet-shaped throat; lobes narrowly lanceolate; achenes 9 mm. long, brown, hispidulous, tapering at the summit; pappus straw-colored, 7 mm. long; bristles hispidulous.

TYPE LOCALITY: Mescal Mountain, Arizona.

DISTRIBUTION: Western Texas to southern California.

35. *Porophyllum pinifolium* Rydberg, sp. nov.

A low shrub, copiously branched at the base; branches slender, green, turning purple in age; leaves alternate, linear-filiform, 2-4 cm. long, light-green; heads solitary at the ends of the branches; peduncles 1-2 cm. long; involucre cylindro-campanulate, about 1 cm. high; bracts 5, linear, acutish, light-green, rounded on the back and slightly gibbous at the base, with two rows of ellipsoid glands; corollas cream-colored, streaked with purple, 8 mm. long, glabrous; tube longer than the trumpet-shaped throat; lobes lanceolate; achenes 6 mm. long, hispidulous; pappus as in the preceding, but shorter.

TYPE collected in the vicinity of Alamos, Sonora, *Rose, Standley & Russell 12757* (U. S. Nat. Herb. and herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sonora and the Cape region of Lower California.

36. *Porophyllum maritimum* Brand. *Zoe* 5: 162. 1903.

A perennial, fruticose at the base; stem about 2 dm. high, divaricately branched, striate, glaucous; leaves sessile, terete, fleshy, 2-3 cm. long, acuminate, with 2-4 glands; heads terminating the short branches, or solitary in the upper axils; peduncles 2-4 cm. long; involucre oblong, very glaucous, 10-12 mm. high; bracts 5, oblong, obtuse, with a double line of oblong or linear glands, purple-tinged, at last reflexed; floweres 15-20; corollas 7 mm. long, ochroleucous with dark streaks on the throat; tube shorter than throat; achenes 8 mm. long, tapering at the apex, hispidulous with yellow hairs; pappus 7 mm. long, yellow, tinged with rose; bristles hispidulous.

TYPE LOCALITY: Between Cabo San Lucas and San José del Cabo, Lower California.

DISTRIBUTION: Southern Lower California.

37. *Porophyllum amplexicaule* Engelm.; A. Gray, Pl. Wright.

1: 120. 1852.

A perennial, fruticose at the base; stem 5 dm. high or more, glabrous, terete, erect, more or less glaucous; leaves ovate-lanceolate, semi-amplexicaul, acute, fleshy, 2-3 cm. long; heads solitary at the end of the branches; peduncles 4-6 cm. long, abruptly thickened under the head; involucre turbinate, about 8 mm. high and 15-20 mm. broad; bracts 8-10, broadly linear, acuminate, but with a blunt apex; glands linear and oblong, irregularly disposed in 4 lines, 2 near the midrib and 2 along the margins; corollas about 7 mm. long; tube 3 mm. long; throat narrow, tubular-trumpet-shaped; lobes lanceolate; achenes 7 mm. long, hispidulous; pappus 7 mm. long, brown; bristles scabrous-hispidulous.

TYPE LOCALITY: Near Mesillas, Coahuila.

DISTRIBUTION: Coahuila.

38. *Porophyllum scoparium* A. Gray, Pl. Wright. 1: 119. 1852.

A suffruticose perennial; stems much branched, 3-6 dm. high; branches green, terete, scarcely striate, mostly erect; leaves filiform, thick, 2.5-4 cm. long, 1 mm. wide; heads terminating the branches; peduncles 2-5 cm. long; involucre campanulate, 8-10 mm. high and nearly as broad; bracts 6-9, linear or oblanceolate, acute, rounded on the back; glands linear, few, irregularly disposed, but mostly forming 1 or 2 dorsal lines, in some bracts occasionally wanting; corollas yellow, 6 mm. long; tube much shorter than the cylindric throat; lobes ovate; achenes 4 mm. long, cylindric, hispid; pappus yellow, 6 mm. long; bristles hispidulous.

TYPE LOCALITY: Banks of San Pedro River, Texas.

DISTRIBUTION: Texas, New Mexico, Chihuahua, and Coahuila.

39. *Porophyllum fruticosum* Rydberg, sp. nov.

A low shrub, less than 3 dm. high, with spreading flexuose terete branches; leaves filiform, fleshy, 1-1.5 cm. long; heads at the ends of the branches; peduncles 1-3 cm. long; involucre campanulate, 8-9 mm. high and as broad; bracts 7-9, oblong-linear, acute, rounded on the back, with few linear glands in 1 or 2 dorsal rows; corollas 6-7 mm. long, yellow, glabrous; tube much shorter than the cylindric throat; lobes short, ovate; achenes 5 mm. long, cylindric, hirsute; pappus yellow, 5-6 mm. long; bristles hispidulous.

Type collected near Saltillo, Coahuila, November, 1902, *Palmer 285* (herb. N. Y. Bot. Gard.).

40. *Porophyllum Greggii* A. Gray, Pl. Wright. 1: 120. 1852.

A perennial, with a suffruticose base; stems 2-3 dm. high, often flexuose, terete; leaves alternate, numerous, filiform, 2-4 cm. long; heads solitary at the ends of the branches; peduncles 4-5 cm. long; involucre broadly campanulate, 10-12 mm. high, pale; bracts 5-8, elliptic or obovate-oblong, rounded at the apex, scarious-margined, with 2 rows of long glands; flowers many; corollas yellowish, 8-10 mm. long; tube somewhat shorter than the cylindric throat; lobes ovate; achenes 7 mm. long, hispidulous; pappus yellowish, about 1 cm. long; bristles hispidulous.

TYPE LOCALITY: Valley of Parras, Coahuila.

DISTRIBUTION: Western Texas and Coahuila.

41. *Porophyllum crassifolium* S. Wats. Proc. Am. Acad. 24: 57. 1889.

A low undershrub; stem much branched, with terete spreading branches; leaves linear, fleshy, acute at each end, sessile, gland-tipped, 0.5-2.5 cm. long; heads solitary at the ends of the branches; peduncles about 1 cm. long; involucre broadly campanulate, 7-8 mm. high; bracts 5-8, oval, obtuse, with oval or rounded glands, rounded on the back; corollas 7 mm. long, yellow; tube much shorter than the cylindric throat; lobes ovate; achenes 3 mm. long, sparingly puberulent or glabrate; pappus tawny, 7 mm. long; bristles hispidulous.

TYPE LOCALITY: Muleje, Lower California.

DISTRIBUTION: Coast and islands of Lower California.

42. *Porophyllum tridentatum* Benth. Bot. Voy. Sulph. 30. 1844.

A low undershrub; stem decumbent, much branched, usually less than 1 dm. high; leaves sessile; blades fleshy, cuneate in outline, 0.5-1 cm. long, 3-cleft at the apex, with one conspicuous gland at the end of each lobe, often apiculate; heads short-peduncled and solitary at the end of the branches; involucre broadly campanulate or hemispheric, 8 mm. high; bracts oval, with scarious margins, with several glands near the apex; flowers about 40; corolla yellowish, 6 mm. long; tube shorter than the trumpet-shaped, nearly cylindric throat; lobes ovate; achenes 3.5 mm. long, sparingly hispidulous; pappus yellowish, 5 mm. long.

TYPE LOCALITY: Bay of Magdalena, Lower California.

DISTRIBUTION: Coast of Lower California.

EXCLUDED SPECIES

KLEINIA SELLOI Spreng. Syst. 3: 438 (1826) is *Stevia oxylaena*.

POROPHYLLUM DECUMBENS DC. Prodr. 5: 650. 1836. (*Kleinia suffruticosa* Lodd. Bot. Cab. pl. 1561. 1829. Not *K. suffruticosa* Willd. 1804. *Kleinia decumbens* Heynh. Nom. 1: 437. 1840.) This was described from cultivated material, and supposed to come from Mexico. It is more probably South American and the same as *Porophyllum linifolium brevifolium* (H. & A.) Baker. (See B. L. Robinson, Proc. Am. Acad. 49: 508. 1913.)

20. *LESCAILLEA* Griseb. Cat. Pl. Cub. 156. 1866.

Undershrubs, with opposite or subverticillate branches, *Ephedra*-like, glabrous. Leaves all reduced to small opposite scales. Heads small at the ends of the branches, long-peduncled, discoid. Involucre narrowly campanulate; bracts 5-8, oblong, distinct, with a large dorsal

gland. Flowers all hermaphrodite and fertile. Corolla-tube very short; throat cylindraceous; lobes 5, short. Anthers entire at the base. Style-branches elongate, subterete, obtuse at the apex. Achenes cylindrical, somewhat 5-angled, many-striate. Pappus of many distinct serrulate-barbellate bristles.

Type species, *Lescaillea equisetiformis* Griseb.

1. *Lescaillea equisetiformis* Griseb. Cat. Pl. Cub. 157. 1866.

Porophyllum equisetiforme Maza & Molinet; Maza, Anal. Soc. Esp. Hist. Nat. 19: 277. 1890.

An undershrub; leaves scale-like, about 1 mm. long; heads at the end of short branches, nodding; peduncles 5-10 mm. long; involucre 4 mm. high, and about as broad; bracts linear, obtuse, thick, with a single row of glands; flowers 5-8; corollas yellow, 4 mm. long; tube less than 0.5 mm. long; throat clavate; lobes broad, deltoid; achenes 3 mm. long, greenish; pappus brownish, 2 mm. long; bristles hispidulous.

TYPE LOCALITY: Western Cuba.
DISTRIBUTION: Pinar del Rio, Cuba.

Subtribe 2. **PECTIDANAE.** Heads radiate, rarely discoid. Involucre without calyculum; bracts in a single series, usually glandular-dotted, usually carinate at least at the base. Disk-corollas with a short tube, gradually passing into the elongate-funneliform or rarely trumpet-shaped throat. Leaves simple, sessile, often more or less clasping, in all (except in one species of *Pectis* and in *Hydropectis*) bristly-ciliate at least towards the base, the bristles rarely being inserted at the ends of small teeth. Style-branches of the hermaphrodite flowers short, oblong, obtuse.

Heads radiate; achenes linear; leaves usually conspicuously glandular-dotted; land-plants.

Heads discoid; achenes elongate-clavate, tapering downwards into a stipe-like base; leaves sparingly if at all glandular-dotted; water-plants.

21. PECTIS.

22. HYDROPECTIS.

21. PECTIS L. Syst. Nat. ed. 10. 1221. 1759.

Seala Adans. Fam. Pl. 2: 131. 1763.

Lorentea Lag. Gen. & Sp. Nov. 28. 1816.

Cryptopetalon Cass. (Bull. Soc. Philom. 1817: 12, hyponym. 1817) Dict. Sci. Nat. 12: 123. 1818.

Chthonia Cass. Dict. Sci. Nat. 9: 173. 1817.

Pectidium Less. Linnaea 6: 706. 1831.

Helioreos Raf. Atl. Jour. 145. 1832.

Pectidiopsis DC. Prodr. 5: 98. 1836.

Stammarium Willd.; DC. Prodr. 5: 102, as synonym. 1836.

Cheilodiscus Triana, Ann. Sci. Nat. IV. 9: 36. 1858.

Rather low, branching, mostly aromatic or strong-scented, annual or perennial herbs. Leaves opposite, glandular-dotted, mostly entire, usually with several pairs of marginal bristles near the base, or rarely along the whole margins. Heads usually small, solitary or cymose, radiate. Involucre from cylindrical or oblong to campanulate or turbinate; bracts 3-12, free, in a single series, without calyculum, usually glandular-dotted, rounded-carinate at least below, usually gibbous at the base, and partly surrounding the ray-achenes. Receptacle naked. Ray-flowers few, pistillate and fertile, usually of the same number as the bracts; ligules yellow or tinged with red or purple. Disk-flowers rather few, hermaphrodite and fertile; corollas yellow; tube usually short, gradually passing into the narrowly funnel-form or trumpet-shaped throat; limb 5-lobed, often somewhat bilabiate. Anthers entire and obtuse at the base. Style hispidulous, the short branches obtuse and without appendages. Achenes linear, terete or somewhat angled, pubescent or glabrate. Pappus various, of few or many squamellae, awns, or bristles, or rarely reduced to a mere crown.

Type species, *Pectis ciliaris* L.

Pappus of well-developed squamellae.

Squamellae few, 2-6.

Heads sessile or nearly so; involucre bracts 3-5; squamellae all lanceolate or subulate and awn-tipped.

Leaves obovate or elliptic to linear, with scattered glands beneath.

Involucre bracts equally round-keeled to near the apex; plants mostly prostrate.

Bracts 5; heads 9-12-flowered.

Leaves hispid-ciliate at the base.

Involucre bracts hispidulous on the back.

Involucre bracts glabrous.

Leaves hispid-ciliate to the tip.

Bracts 3; heads 7-9-flowered.

Leaves linear, about 2 cm. long; heads short-peduncled.

Leaves oblong or oblong-oblancoate, about 1 cm. long; heads sessile.

Involucre bracts strongly keeled only at the base.

Plants prostrate or procumbent.

Pappus with an outer row of minute bristles.

Pappus simple, uniform.

Leaves oblanceolate or obovate; heads 15-30-flowered.

Leaves linear or oblong; heads 10-17-flowered.

Leaves lax; glands conspicuous.

Leaves crowded; glands not conspicuous.

Plants erect or ascending.

Heads solitary in the axils.

Heads clustered towards the ends of the branches.

Stem simple or with erect branches; heads many in each cluster.

Stem 2.5-3.5 cm. high; heads 19-20-flowered.

Stem 15-45 cm. high; heads 12-14-flowered.

Stem with spreading branches; heads few in each cluster.

Leaves narrowly linear, with two rows of glands beneath, one near each margin.

Plants branched at the base; heads sessile.

Plants simple below, branched above; heads usually short-peduncled.

Heads distinctly peduncled.

Squamellae, at least some of them, not awned.

Squamellae very short, all mucous, or one or two produced into an awn; bracts 6-8; ligules inconspicuous.

Squamellae lanceolate, acuminate, half as long as the corollas; bracts 5; ligules conspicuous.

Squamellae lanceolate or subulate, all awn-tipped.

Bracts 5.

Peduncles shorter than the leaves.

Peduncles longer than the leaves.

Heads turbinate, 5-6.5 mm. long, 2-2.5 mm. broad, 11-18-flowered; bracts acute or acuminate.

Heads cylindrical, 7-8 mm. long, 1.2-1.8 mm. broad, 8-12-flowered; bracts obtuse or rounded at the apex.

Bracts 6-10.

Leaves linear-lanceolate; heads about 20-flowered.

Leaves lanceolate or oblanceolate; heads 30-50-flowered.

Leaves glabrous; bracts linear.

Leaves oblanceolate or oblong, mucronate; involucre 4-5 mm. high.

Leaves lanceolate, long-attenuate; involucre 5-6 mm. high.

Leaves hirtellous-pubescent; bracts oblong.

Squamellae 8-38.

Involucre 3-6 mm. high; plants not fleshy.

Plants diffuse; involucre 3-5 mm. high.

Leaves with scattered glands on the lower side; stem pubescent at least along 2 lines.

Peduncles 1-3 cm. long.

Peduncles mostly less than 1 cm. long.

Leaves with a single row of glands along each margin; stem glabrous.

Plants erect; involucre 5-6 mm. high.

Involucre 7-10 mm. high; plants fleshy, diffuse; heads 20-90-flowered.

Bracts keeled only at the base; leaves obtuse or rounded at the apex.

Bracts keeled throughout; leaves acute.

1. *P. urceolata.*
2. *P. prostrata.*
3. *P. multisetosa.*
4. *P. cylindrica.*
5. *P. tenuicaulis.*
6. *P. Schaffneri.*
7. *P. humifusa.*
8. *P. portoricensis.*
9. *P. multiceps.*
10. *P. martinicensis.*
11. *P. brevicaulis.*
12. *P. carthusianorum.*
13. *P. ciliaris.*
14. *P. linearifolia.*
15. *P. Swartziana.*
16. *P. propetes.*
17. *P. domingensis.*
17. *P. domingensis.*
18. *P. febrifuga.*
19. *P. leptocéphala.*
20. *P. Bonplandiana.*
21. *P. sinaloensis.*
22. *P. salina.*
23. *P. lancifolia.*
24. *P. depressa.*
25. *P. cubensis.*
26. *P. caymanensis.*
27. *P. erecta.*
28. *P. arenaria.*
29. *P. grandiflora.*

- Pappus (at least in the ray-flowers) of bristles or awns, only occasionally paleaceous at the base, rarely with an additional outer set of minute squamellae, or rarely reduced to a mere crown.
- Pappus of slender, filiform bristles, or rarely dilated below, erect, or a mere crown.
- Pappus-bristles usually 10 or more, at least in the disk-flowers.
- Perennials with a more or less woody caudex or rootstock; heads on long peduncles.
- Heads solitary.
- Involute 6-8 mm. high; leaves 1.5-10 mm. wide.
- Leaves ascending, the tips arcuate-spreading, long-attenuate; bracts 5, acute. 30. *P. diffusa*.
- Leaves spreading, neither arcuate nor attenuate. 31. *P. longipes*.
- Involutal bracts 12-15, narrowly linear.
- Involutal bracts 5-12, oblong to obovate.
- Leaves linear-lanceolate.
- Bracts 5-7, rounded at the apex.
- Involutal bracts 5, obovate or oval.
- Pappus of the ray-flowers of several bristles; bracts obovate, overlapping, ciliate. 32. *P. latisquama*.
- Pappus of the ray-flowers of two stout awns dilated at the base and about 20 slender bristles; bracts oval, pubescent at the apex. 33. *P. repens*.
- Involutal bracts 5-7, oblong or elliptic, not overlapping, usually puberulent; pappus of the ray-flowers of short squamellae. 34. *P. canescens*.
- Bracts 7-12, acutish.
- Involutal bracts puberulent, rather firm; pappus of the ray-flowers wanting.
- Involutal bracts glabrous, thin; pappus of the ray-flowers of a few bristles. 35. *P. saturejoides*.
- Leaves broadly oblanceolate.
- Involute 5 mm. high; leaves less than 1 mm. wide. 36. *P. polyantha*.
- Heads in leafy cymes; involucre 5 mm. high or less. 37. *P. Liebmannii*.
- Bracts 8; bristles of the ray-flowers 2. 38. *P. Leonis*.
- Bracts 5; bristles of the ray-flowers several. 39. *P. stenophylla*.
40. *P. capillipes*.
- Annuals.
- Peduncles longer than the leaves.
- Leaves stiff, spinulose-tipped, crowded; ray-flowers with many pappus-bristles.
- Stems 2-3.5 cm. high; leaves bristly-ciliate to near the apex, with 5-7 pairs of bristles; involucre 6-6.5 mm. high. 41. *P. pusilla*.
- Stems about 1 dm. high; leaves bristly-ciliate only below the middle, with 3-5 pairs of bristles; involucre 5-6 mm. high. 42. *P. juniperina*.
- Leaves soft, merely mucronate, scattered; ray-flowers with 2-6 pappus-bristles.
- Bracts 8-12.
- Stem puberulent; involutal bracts 4 mm. long. 43. *P. puberula*.
- Stem glabrous or nearly so; involutal bracts 5-6 mm. long.
- Leaves linear; stem leafy.
- Bracts acute. 44. *P. Palmeri*.
- Bracts obtuse. 45. *P. Mearnsii*.
- Leaves oblanceolate; stem leafy only at the base; bracts obtuse. 46. *P. Barberi*.
- Bracts about 5, 4-5 mm. long.
- Involutal bracts rounded at the apex. 47. *P. Haenkeana*.
- Involutal bracts acuminate. 48. *P. Schottii*.
- Peduncles shorter than the leaves.
- Plants tall, erect; bracts thin, keeled only at the base; ligules purple-tinged, erect; disk-corollas with short lobes. 49. *P. elongata*.
- Plants low and diffuse; bracts thick, round-keeled to the apex, strongly involute on the margins; ligules light-yellow, spreading; disk-corollas with long lobes. 50. *P. papposa*.
- Pappus-bristles few, 1-6, or represented by a mere crown.
- Involutal bracts about 8.
- Bracts narrow, strongly carinate and involute; corolla-tube as long as or longer than the throat and limb together; heads usually subsessile or short-peduncled.
- Pappus of a shallow cup or crown, with or without 1 or 2 bristles.
- Leaves not dilated, merely ciliate at the base. 50. *P. papposa*.
- Leaves dilated and lobed at the base. 51. *P. angustifolia*.
- Pappus merely 2-6 bristles.

- Peduncles less than 1 cm. long; pappus-bristles not dilated below.
- Peduncles more than 1 cm. long; pappus-bristles dilated at the base.
- Bracts flat at least above; corolla-tube shorter than the throat; lobes short; heads distinctly peduncled.
- Pappus of both ray- and disk-flowers at least partly bristly.
- Leaves 1-2 mm. wide.
- Plants pubescent; peduncles 3-5 cm. long.
- Stem hirsutulous.
- Stem finely puberulent.
- Plants glabrous; peduncles 1.5-2.5 cm. long.
- Leaves 4-8 mm. wide.
- Pappus of the disk-flowers squamellose or a mere crown.
- Bracts broadly linear, very obtuse; branches ascending.
- Bracts yellowish-green, rounded at the apex, with only the apical gland conspicuous.
- Bracts purple, with deltoid obtuse apex and several conspicuous glands.
- Bracts narrowly linear; pappus of 2 or 3 awns, with or without a squamellate cup; branches divaricate.
- Involucral bracts 3-5.
- Bracts more or less acuminate.
- Pappus consisting of several awns, slightly dilated at the base.
- Heads crowded on short branches.
- Heads not crowded.
- Leaves with only one row of glands close to each margin.
- Leaves with scattered glands or the smaller with a single row half way between the midrib and each margin.
- Peduncles 5-15 mm. long; plant with ascending branches.
- Peduncles 20-30 mm. long; plant diffusely branched.
- Pappus of a squamellate crown with or without awns.
- Awns 1 or 2.
- Awns wanting.
- Bracts obtuse; heads scattered on long peduncles.
- Pappus of the ray-flowers of subulate stout awns.
- Annuals; awns more or less spreading.
- Awns retrorsely barbed.
- Leaves oblanceolate, dentate; teeth ending in bristles; glands scattered.
- Leaves narrowly linear, merely setose-ciliate below or with a few lobes; glands in marginal rows.
- Pappus of the ray-flowers of 3-6 and of the disk-flowers of 2-5 awns.
- Pappus of the ray-flowers of 2 or 3 unequal awns, that of the disk-flowers a minute squamellae crown.
- Peduncles 2-3 cm. long; bracts 5 mm. long, broadened and rounded at the apex; leaves more than 1.5 cm. long.
- Peduncles 1 cm. long or less; bracts 3-4 mm. long, not broader at the apex, obtuse; leaves less than 1.5 cm. long.
- Awns smooth, divergent or reflexed.
- Perennials; awns, if present, erect.
52. *P. tenella*.
53. *P. Pringlei*.
54. *P. scabra*.
55. *P. biaristata*.
53. *P. Pringlei*.
21. *P. sinaloensis*.
56. *P. Rusbyi*.
57. *P. purpurea*.
58. *P. Rosei*.
59. *P. fasciculiflora*.
60. *P. Berlandieri*.
61. *P. Oerstediana*.
62. *P. capillaris*.
63. *P. uniaristata*.
64. *P. dichotoma*.
65. *P. filipes*.
66. *P. multiseta*.
67. *P. Coulteri*.
68. *P. Bennettii*.
69. *P. ambigua*.
70. *P. linifolia*.
71. *P. imberbis*.

1. *Pectis urceolata* (Fernald) Rydberg, sp. nov.

Pectis prostrata urceolata Fernald, Proc. Am. Acad. 33: 68. 1897.

A diffuse annual; stem branched at the base, 1-2 dm. high, mostly ascending, hirsute in decurrent lines; leaves oblanceolate, entire, 2-3 cm. long, 5-8 mm. wide, obtuse, hirsute on the midribs beneath, with 6-12 pairs of bristles below and numerous scattered small glands; heads in small terminal glomerules, sessile; involucre urceolate, 7-9 mm. high, 3 mm. broad; bracts 5, oblong, hispidulous on the back, round-carinate to the apex, with acute spreading tips; glands inconspicuous, near the apex; ray-flowers 5; ligules oblong, scarcely 2 mm. long; disk-flowers 4-8; corollas 2 mm. long; achenes 4 mm. long, hirsute; squamellae of the disk-flowers 5, lanceolate, awn-tipped; those of the ray-flowers 2 and somewhat larger.

TYPE LOCALITY: Hacienda San José, Chihuahua.

DISTRIBUTION: Known only from the type locality.

2. *Pectis prostrata* Cav. Ic. 4: 12. 1797.

Chthonia prostrata Cass.; DC. Prodr. 5: 100, as synonym. 1836.

Pectis costata Ser. & Merc.; DC. Prodr. 5: 100. 1836.

A diffuse annual; stem branched at the base; branches 4–20 cm. long, decumbent or prostrate, short-pilose in decurrent lines; leaves oblanceolate-linear, entire, 1–3 cm. long, 2–4.5 mm. wide, acute, often mucronate, ciliate with 5–9 pairs of bristles below, with many distinct, scattered glands; heads axillary and terminal, the lower solitary, the upper in 2–9-cephalous glomerules; peduncles 0–5 mm. long; involucre oblong, 5–6 mm. high, 2.5–3 mm. broad; bracts 5, oblong or linear-oblong, rounded or truncate at the apex, with a thick rounded keel extending to the apex; glands several, oblong, near the apex; ray-flowers 5; ligules oblong, 3 mm. long; disk-flowers 4–15; corollas 2–2.5 mm. long; achenes 3–4 mm. long, short-pubescent; squamellae of the ray-flowers 2, narrowly lanceolate, and 1–3 smaller bristles; those of the disk-flowers 5, unequal.

TYPE LOCALITY: Mexico.

DISTRIBUTION: New Mexico and Arizona to Colombia and Venezuela; Florida, Cuba, and Jamaica.

ILLUSTRATION: Cav. Ic. pl. 324.

3. *Pectis multisetosa* Rydberg, sp. nov.

A diffuse annual; stem branched at the base, prostrate, 1 dm. long or less, pilose on two decurrent lines; leaves linear-ob lanceolate, 1–2 cm. long, 2–3 mm. wide, short-acuminate, setose-ciliate to near the apex; glands conspicuous, numerous, irregularly scattered; heads mostly glomerate at the ends of the branches, sessile; involucre about 5 mm. high, 2 mm. broad; bracts 5, linear-oblong, obtuse, bluntly keeled to near the apex; ray-flowers 5; ligules 1.5 mm. long; disk-flowers 4 or 5; corollas 2–2.5 mm. long; achenes 3 mm. long, sparingly hirsute; squamellae of the disk-flowers 5, of the rays 2, linear-lanceolate, aristate-acuminate, 1.5–2 mm. long.

TYPE LOCALITY: Collected at Chupadero, Santa Rosa, Guatemala, 1892, *Heyde & Lux* [J. D. Smith distrib. no.] 4232 (herb. Columbia Univ.).

4. *Pectis cylindrica* (Fernald) Rydberg, sp. nov.

Pectis prostrata cylindrica Fernald, Proc. Am. Acad. 33: 68. 1897.

A diffuse annual; stem branched at the base, decumbent or ascending; branches 1–3 dm. long, pilose on decurrent lines; leaves linear, 1.5–3 cm. long, about 3 mm. wide, entire, obtuse or rounded at the apex, ciliate at the base with 2–5 pairs of bristles; glands numerous, small, scattered; heads axillary, mostly solitary, subsessile; involucre cylindric, 9 mm. high, 2–3 mm. broad; bracts 3, thin, striate, slightly round-keeled to near the rounded or retuse apex; glands few, scattered; ray-flowers 3; ligules oblong, 2 mm. long; disk-flowers 4–6; corollas 2 mm. long; achenes 4.5 mm. long, hirsute; squamellae 4–6, unequal, narrowly lanceolate, acuminate into a short awn.

TYPE LOCALITY: Arizona.

DISTRIBUTION: New Mexico, Arizona, and Sonora.

5. *Pectis tenuicaulis* Urban, Symb. Ant. 1: 468. 1900.

Pectis prostrata Griseb. Fl. Brit. W. Ind. 378, in part. 1861. Not *P. prostrata* Cav. 1797.

A diffuse annual; stem prostrate, branched at the base, 3–15 cm. long, dichotomously branched, short-pilose on two decurrent lines; leaves oblong-ob lanceolate or oblong-linear, 5–15 mm. long, 1.5–3.5 mm. wide, obtuse, mucronate or apiculate at the apex, with 3–5 pairs of bristles near the base; glands rather few, irregularly scattered; heads solitary in the forks, or 2–5 in small clusters at the ends, sessile or short-peduncled; peduncles 2 mm. long or less; involucre 4–5 mm. high, 1.5–2 mm. broad; bracts 3, obovate-oblong, obtuse or truncate, with thick obtuse keel to near the apex; glands few, mostly near the apex; ray-flowers 3; ligules nearly 3 mm. long; disk-flowers 4 or 5; corollas about 2 mm. long; achenes scarcely 3 mm. long, short-pilose; squamellae of the disk-flowers 3–5, of the ray-flowers 2, unequal, lanceolate, setaceous-acuminate, scarcely 1.5 mm. long.

TYPE LOCALITY: Near Peñuela, Porto Rico.

DISTRIBUTION: Porto Rico, Antigua, and Martinique.

6. *Pectis Schaffneri* Schultz-Bip.; (A. Gray, Proc. Am. Acad. 19: 45, hyponym. 1883) Fernald, Proc. Am. Acad. 33: 68. 1897.

A low diffuse annual, about 5 cm. high; stem puberulent; leaves linear, cuspidate, 1-2.5 cm. long, 1-2 mm. wide, distinctly connate at the base, with 5-8 pairs of bristles; glands small in a single submarginal row on each side; heads sessile in the axils; involucre oblong, 6 mm. high, 2 mm. broad; bracts 3 or 4, oblong, acute or acuminate, purple on the margin; glands 1-3, subapical; ray-flowers 3; ligules oblong, 2 mm. long; disk-flowers 5 or 6; corollas about 2 mm. long; achenes 4 mm. long, strigose; principal squamellae 5 or 6, 3-4 mm. long, with a narrowly linear-lanceolate body and a long scabrous awn-tip, surrounded by a crown of small subulate bristles.

TYPE LOCALITY: Valley of Mexico.

DISTRIBUTION: Known only from the type locality.

7. *Pectis humifusa* Sw. Prodr. 114. 1788.

Chthonia repens Cass. Dict. Sci. Nat. 27: 204. 1823.

Pectis prostrata Spreng. Syst. 3: 572, in part. 1826. Not *P. prostrata* Cav. 1797.

Pectis serpyllifolia Less. Linnaea 6: 715. 1831.

Pectis Sieberii Less. Linnaea 6: 717. 1831.

Lorentea humifusa Less. Linnaea 6: 719, in part. 1831.

Chthonia humifusa Cass.; Steud. Nom. Bot. ed. 2. 1: 360. 1840.

A diffuse annual; stem branched from the base, prostrate or procumbent, sometimes rooting, 5-40 cm. long, short-pilose along two decurrent lines; leaves oblanceolate to obovate, 3-12 mm. long, 2-4 mm. wide, usually rounded or obtuse at the apex, with 2-6 pairs of bristles towards the base, scabrous-ciliate on the margins, paler beneath; glands numerous, minute, irregularly scattered; heads solitary, sessile or subsessile at the ends of the branchlets; involucre 5-6 mm. high, 2-4.5 mm. broad; bracts 5 (rarely 3), elliptic or oval, obtuse, rounded or retuse at the apex, strongly keeled at the base, with several round glands at the apex; ray-flowers 5 (rarely 3); ligules 3-5 mm. long; disk-flowers 10-25; corollas about 3 mm. long; achenes 2.5-3 mm. long, sparingly pubescent or glabrate; squamellae of the disk-flowers 5-20, of the ray-flowers 2-10, lanceolate to subulate, aristate, incised, very unequal.

TYPE LOCALITY: Guadeloupe.

DISTRIBUTION: Santo Domingo to Barbados.

ILLUSTRATION: Plum. Pl. Am. pl. 95, f. 2.

8. *Pectis portoricensis* Urban, Symb. Ant. 5: 276. 1907.

A diffuse annual; stem branched at the base, prostrate or procumbent, rooting below, 7-15 cm. long, short-pilose along two decurrent lines; leaves oblong-linear or linear, 1-1.5 cm. long, 1.5-3 mm. wide, somewhat connate, with 5-12 pairs of bristles below the middle or along their whole length; glands small, irregularly scattered; heads solitary or in 2's or 3's in the forks or at the ends of the branches, sessile or on short peduncles less than 3 mm. long; involucre 4.5-5 mm. high, about 2 mm. broad; bracts 5, oblong, rounded or subtruncate at the apex; ray-flowers 5; ligules about 1.5 mm. long; disk-flowers 5 or 6; corollas 3 mm. long; achenes 3 mm. long; squamellae 5, those of the disk-flowers equal, of the ray-flowers very unequal.

TYPE LOCALITY: Guayamas, Porto Rico.

DISTRIBUTION: Known only from the type locality.

9. *Pectis multiceps* Urban, Symb. Ant. 5: 277. 1907.

A diffuse annual; stem branched from the base, 2-6 cm. long, cespitose, densely leafy; leaves linear, 1-2 cm. long, 1-2 mm. wide, connate at the base, with 3-5 pairs of bristles near the base; glands rather few, scattered, inconspicuous; heads sessile at the ends of the branchlets; involucre 5-6 mm. high, 2-2.5 mm. broad; bracts 5, linear-oblong, obtuse at the apex; ray-flowers 5; ligules about 2 mm. long; disk-flowers 10-12; corollas nearly 3 mm. long; achenes 3 mm. long; squamellae of the disk-flowers 5, subequal, lanceolate, aristate-acuminate, those of the ray-flowers 2 or with an additional much smaller third squamella.

TYPE LOCALITY: Near Barrabas, between Puerto Plata and Santiago, Santo Domingo.

DISTRIBUTION: Hispaniola.

10. *Pectis martinicensis* Urban, Symb. Ant. 5: 276. 1907.

Pectis carthusianorum Duss, Fl. Ant. Fr. 372. 1897. Not *P. carthusianorum* Less. 1831.

A leafy annual; stem ascending or recurved-erect, rarely procumbent, 3-6.5 dm. high, puberulent in lines, simple below, dichotomously or trichotomously branched; leaves oblong-linear or linear, 2-3.5 cm. long, 3-5 mm. wide, scarcely connate, with 2-8 pairs of bristles below; glands sparse, scattered; heads solitary in the axils, on peduncles 2-6 mm. long; involucre 6-6.5 mm. high; bracts 5, linear-oblong to obovate-oblong carinate at the base, obtuse or rounded at the apex; ray-flowers 5; ligules oblong, about 2 mm. long; disk-flowers 12 or 13; corollas about 2.5 mm. long; achenes 3.5 mm. long, hirsutulous on the angles; squamellae of the disk-flowers 5, of the rays 4 or 5, lanceolate, aristate-acuminate, equaling the disk-corollas.

TYPE LOCALITY: Sainte Anne, Martinique.

DISTRIBUTION: Martinique.

11. *Pectis brevicaulis* Urban, Symb. Ant. 5: 279. 1907.

A leafy annual; stem erect, 2.5-3.5 cm. long, simple, densely leafy above; leaves oblong-linear or linear, 1.5-2.5 cm. long, 2-3 mm. wide, connate at the base, ciliate their whole length, with up to 15 pairs of bristles; glands small and inconspicuous, irregularly scattered; heads numerous at the ends of the branches, congested among the leaves; involucre 6-6.5 mm. high; bracts 5, linear-oblong, acute or obtuse at the apex; ray-flowers 5; ligules oblong; disk-flowers 14 or 15; corollas 3 mm. long; achenes 3.5 mm. long; squamellae lanceolate, acuminate, those of the disk-flowers 5, rarely 4, of the ray-flowers 2 or 3.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Known only from the type locality.

12. *Pectis carthusianorum* Less. Linnaea 6: 712. 1831.

A stout leafy annual; stem erect, 1.5-4.5 dm. high, thick, simple or branched above, usually with short erect branches; leaves numerous, oblong-linear or linear, 1.5-4 cm. long, 2-5 mm. wide, connate at the base, with 2-9 pairs of bristles towards the base; glands scattered; heads clustered at the ends of the branches, sessile among the leaves; involucre 5-5.5 mm. high, 2.5-3 mm. broad; bracts 5, oblong-linear to broadly oblong, obtuse or subtruncate; ray-flowers 5; ligules 2-2.5 mm. long; disk-flowers 7-9; corollas about 3 mm. long; achenes 3.5-4 mm. long, hirsutulous on the angles; squamellae of the disk-flowers 5, of the ray-flowers 3 or rarely 4; linear-lanceolate, aristate-acuminate.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Cuba, Hispaniola, and Porto Rico; also in Venezuela.

13. *Pectis ciliaris* L. Syst. Nat. ed. 10. 1221. 1759.

Chthonia glaucescens Cass. Dict. Sci. Nat. 9: 173. 1817.

Pectis anceps Less. Linnaea 6: 715. 1831.

Chthonia ciliaris Cass.; Steud. Nom. Bot. ed. 2. 1: 360. 1840.

Pectis ciliata Steud. Nom. Bot. ed. 2. 1: 360, as synonym. 1840.

A branched annual; stem erect or ascending, 0.5-2.5 dm. high, with ascending branches, pilose along decurrent lines; leaves oblong-linear or linear, 1.5-3.5 cm. long, 1.5-5 mm. wide, connate at the base, with 4-12 pairs of bristles, mostly below the middle, but sometimes along the whole margin; glands scattered; heads clustered at the ends of the branches, 2-8 together, sessile or short-peduncled, the peduncles less than 3 mm. long; involucre 4.5-5.5 mm. high, 2-2.5 mm. broad; bracts oblong-linear to broadly oblong, obtuse or rounded at the apex; ray-flowers 5; ligules about 2 mm. long, ascending; disk-flowers 4-12; corollas 2-3 mm. long; achenes 2.5-3.5 mm. long, hirsutulous; squamellae of the disk-flowers usually 5, of the ray-flowers 2 or 3, linear-lanceolate, aristate-attenuate, as long as the disk-corollas.

TYPE LOCALITY: [Not given, but supplied in L. Pl. Jam. 24.] Jamaica.

DISTRIBUTION: Greater Antilles.

ILLUSTRATION: Plum. Pl. Am. pl. 151, f. 1 (?; poor).

14. *Pectis linearifolia* Urban, Symb. Ant. 5: 276. 1907.

Pectis linifolia Griseb. Fl. Brit. W. Ind. 378. 1861. Not *P. linifolia* L. 1759.
Pectis ciliaris Fernald, Proc. Am. Acad. 33: 66. 1897. Not *P. ciliaris* L. 1759.

A leafy annual; stem erect or ascending, 1-4 dm. high, with ascending or spreading branches, puberulent along two decurrent lines; leaves narrowly linear, 1.5-3 cm. long, 1-2 mm. wide, with more or less revolute margins, scarcely connate, with 3-6 pairs of bristles towards the base; glands in a single row along each margin; heads 1-5, clustered at the ends of the branches, subsessile or on peduncles less than 4 mm. long; involucre 4.5-5 mm. high, 2-3 mm. broad; bracts lance-linear, acute or obtuse; ray-flowers 5; ligules 2 mm. long; disk-flowers 6 or 7; corollas about 2.5 mm. long; achenes 2.8-3 mm. long; squamellae of the disk-flowers 5, of the ray-flowers 2, narrowly lanceolate, aristate-attenuate, as long as the disk-corollas.

TYPE LOCALITY: Tampa, Florida.
 DISTRIBUTION: Florida and Jamaica.

15. *Pectis Swartziana* Less. Linnaea 6: 711. 1831.

Pectis ciliaris Sw. Obs. 307, in part. 1791. Not *P. ciliaris* L. 1759.
Pectis Bonplandiana DC. Prodr. 5: 99, in part. 1836. Not *P. Bonplandiana* H. B. K. 1820.
Pectis patula L. f.; DC. Prodr. 5: 99, as synonym. 1836.
Pectis punctata Sw.; DC. Prodr. 5: 99, as synonym. 1836. Not *P. punctata* Jacq. 1760.
Pectis pratensis C. Wright; Sauv. Anal. Acad. Ci. Habana 6: 210. 1870.
Pectis linifolia Kuntze, Rev. Gen. 3: 166. 1898. Not *P. linifolia* L. 1759.
 ? *Pectis panamensis* Brand. Univ. Calif. Publ. Bot. 4: 192. 1911.

A slender annual; stem erect, 0.5-1.5 dm. high, dichotomously branched, with spreading branches, glabrous, often purplish, angled; leaves linear or lance-linear, 1-3.5 cm. long, 1.5-4 mm. wide, obtuse or acute, mostly mucronate, ciliate with 1-3 pairs of bristles near the base; glands scattered, rather few; heads solitary in the forks, on peduncles 2.5-3 cm. long; involucre about 4 mm. high, 3 mm. broad; bracts 7 or 8, oblong-linear, acute or obtuse, strongly but obtusely carinate at the base; ray-flowers 6-8 (rarely 9 or 10); ligules linear-oblong, 2.5 mm. long; disk-flowers 5-7; corollas 2 mm. long; achenes 2.5-3 mm. long, appressed-pilose or glabrate; squamellae of the disk-flowers 5-10, lance-linear, distinct or connate, incised at the apex, less than 1 mm. long, some of them sometimes awned, those of the ray-flowers smaller or reduced to a crown.

TYPE LOCALITY: Not given, probably Jamaica.
 DISTRIBUTION: Cuba; Jamaica; Tamaulipas to Bolivia.

16. *Pectis propetes* Greenman, Proc. Am. Acad. 40: 49. 1904.

A low annual; stem at last prostrate and branched, puberulent along two decurrent lines, purplish; leaves narrowly oblong or oblanceolate, 1-3.5 cm. long, 2-5 mm. wide, obtuse or mucronate, with 5-9 pairs of bristles towards the base, minutely scabrous-ciliate, pale-green; glands scattered; heads solitary in the axils; peduncles 2-4.5 cm. long; involucre campanulate-cylindric, 6-7.5 mm. high, about 4 mm. broad, glabrous; bracts 5, oblong, obtuse or truncate at the apex, carinate to above the middle, scarious-margined; ray-flowers 5; ligules oblong, about 7 mm. long, 2 mm. wide; disk-flowers 20-25; corollas 3-3.5 mm. long, sub-bilabiate; achenes about 4 mm. long, hirsutulous; squamellae of the disk-flowers 5, of the ray-flowers 2, lanceolate, acuminate, nearly 2 mm. long.

TYPE LOCALITY: Near San Juan Capistrano, Zacatecas.
 DISTRIBUTION: Known only from the type locality.

17. *Pectis domingensis* Urban, Symb. Ant. 7: 429. 1912.

A leafy annual; stem erect, 2-3 dm. high, with spreading branches, puberulent along two decurrent lines; leaves linear, 1.5-2.5 cm. long, 1-2.5 mm. wide, slightly if at all connate, with 4-10 pairs of bristles below the middle; glands in a single row along each margin, and a few scattered ones; heads more or less aggregate at the ends of the branches; peduncles 1-10 mm. long; involucre 5 mm. high, 2.5-3 mm. broad; bracts 5, narrowly oblong, obtuse; ray-

flowers 5; ligules fully 2 mm. long; disk-flowers 7-9; corollas 3 mm. long; achenes 3-3.5 mm. long, hirsutulous on the angles; squamellae of the disk-flowers 4 or 5, rarely 6 or 7, of the ray-flowers 2, lanceolate, aristate-acuminate, nearly as long as the disk-corollas.

TYPE LOCALITY: Near Santo Domingo [City], Santo Domingo.

DISTRIBUTION: Known only from the type locality.

18. *Pectis febrifuga* H. van Hall, Ann. Hort. & Bot.

4: 33. 1861.

Pectis linifolia Less. Linnaea 6: 709, in part. 1831. Not *P. linifolia* L. 1759.

Pectis graveolens Klatt, Bot. Jahrb. 8: 46. 1887.

An erect annual; stem diffusely and dichotomously branched, 0.5-2 dm. high, angled, scabrous-puberulent on the angles; leaves linear or the lower lance-linear, 0.5-2 cm. long, 0.5-2 mm. wide, acute or mucronate at the apex, with 3-5 pairs of bristles at the base; glands in a single row near each margin and in the lower and broader leaves a few additional scattered ones; heads solitary in the forks of the branches; peduncles 1.5-3 cm. long; involucre 4-4.5 mm. high, 2-2.5 mm. broad, narrowly turbinate; bracts 5, oblong or lance-linear, acuminate or apiculate, obtusely carinate below; ray-flowers 5; ligules oblong, 1-1.5 mm. long, yellow, tinged with red; disk-flowers 6-13; corollas about 2 mm. long; achenes 2-2.5 mm. long, short-pilose on the angles; squamellae of the disk-flowers 5 (rarely 4 or 6), with a lanceolate lacerate base, ending in an awn longer than the corollas; those of the ray-flowers 2 or with an additional third, much shorter and subulate squamella.

TYPE LOCALITY: Curaçao.

DISTRIBUTION: Jamaica, Porto Rico, St. Thomas, St. Croix, and Saba; Costa Rica to Venezuela.

ILLUSTRATION: Ann. Hort. & Bot. 4: 33. *pl.*

19. *Pectis leptoccephala* (Cass.) Urban, Sym. Ant. 5: 280. 1907.

Pectis ciliaris Sw. Obs. 307, in part. 1791. Not *P. ciliaris* 1759. L.

Chthonia leptoccephala Cass. Dict. Sci. Nat. 27: 206. 1823.

Pectis linifolia Less. Linnaea 6: 709, in part. 1831. Not *P. linifolia* L. 1759.

Pectis Lessingii Fernald, Proc. Am. Acad. 33: 67. 1897.

A leafy annual, or becoming perennial; stem diffusely branched, often procumbent, and rooting at the base, up to 2 cm. long, short-pilose along two decurrent lines; leaves linear, 0.7-2 cm. long, 0.5-1.5 mm. wide, acute or obtuse, mucronate at the apex, with 2-4 pairs of bristles towards the base; glands in a single row along each margin; heads solitary at the ends of the branches or in the forks; peduncles 1-3 cm. long; involucre cylindrical, 4-5 mm. high, 1.2-2 mm. broad; bracts 5, oblong-linear or linear, obtuse or rounded at the apex, obtusely carinate below; ray-flowers 5; ligules 2-2.5 mm. long, yellow, often tinged with red; disk-flowers 4-7; corollas 2-2.3 mm. long; achenes 2.5 mm. long, short-pilose; squamellae of the disk-flowers 5, rarely 4, and of the ray-flowers 2, with a lanceolate incised base and ending in an awn shorter than the disk-corollas.

TYPE LOCALITY: Not given.

DISTRIBUTION: Florida, Bahamas, Hispaniola, and Cuba.

20. *Pectis Bonplandiana* H. B. K. Nov. Gen. & Sp. 4: 263. 1820.

Pectis linearis Willd.; Less. Linnaea 6: 712. 1831.

Chthonia Bonplandiana Cass.; B. D. Jackson, Ind. Kew. 1: 532, as synonym. 1893.

A branched annual; stem erect, dichotomously branched, glabrous or nearly so, often purplish, 1-2 dm. high; leaves linear or linear-lanceolate, mucronate, entire or minutely serrulate towards the apex, 1-2.5 cm. long, 1-3 mm. wide, with 1-3 pairs of bristles near the base; glands scattered; heads solitary, terminal or in the forks; peduncles 2-3 cm. long; involucre 4-4.5 mm. high and about as broad, turbinate; bracts 6-8, linear-oblong-lanceolate, acutish or obtuse, minutely puberulent at the tips, keeled at least half their length; ray-flowers 6-8; ligules nearly 2 mm. long, ascending, yellow or tinged with red; disk-flowers 12-15; corollas 2 mm. long; achenes 3 mm. long, pilose; squamellae of the disk-flowers 5 or 6, those of the

ray-flowers 2, all lanceolate and lacerate at the base, often more or less splitting away from the awn, about equaling the disk-corollas.

TYPE LOCALITY: Near Querétaro, Querétaro.

DISTRIBUTION: Tamaulipas to Querétaro and Panama.

21. *Pectis sinaloensis* Fernald, Proc. Am. Acad. 33: 69. 1897.

A diffuse annual; stem 0.5-3 dm. high, glabrous or hirtellous; leaves oblanceolate or oblanceolate-oblong, mucronate, 1-2 cm. long, 2-8 mm. wide, entire, paler beneath, with 1 or 2 pairs of bristles near the base; glands scattered; heads solitary, terminal or in the forks; peduncles 2.5-6 cm. long; involucre turbinate, 4-5.5 mm. high and as broad; bracts 7-10, linear, more or less pubescent at the tips; ray-flowers 7-10; ligules oblong, 4-5 mm. long, yellow; disk-flowers 20-30; corollas 3.5 mm. long; achenes about 3.5 mm. long, sparingly appressed-pubescent or glabrate; squamellae of the disk-flowers 5 or 6, those of the ray-flowers mostly 2, with a paleaceous lanceolate lacerate base, often more or less splitting away from the awn, which fully equals the achene in length, or some of the squamellae, especially in the ray-flowers, awless and short.

TYPE LOCALITY: Mazatlan, Sinaloa.

DISTRIBUTION: Sinaloa and Tepic.

22. *Pectis salina* Brand. Zoe 5: 226. 1905.

A procumbent annual; stem purple, 2-4 dm. long, glabrous throughout; leaves narrowly lanceolate, long-attenuate, 2-5 cm. long, 6-8 mm. wide, glabrous, often somewhat toothed, with 1-6 pairs of bristles below the middle; glands small, in one row near each margin and usually some additional ones nearer the midribs, either in irregular rows or scattered; heads terminal, peduncled at the ends of the branches or from the upper axils; peduncles 2-6 cm. long; involucre turbinate, 5-6 mm. high; bracts 8-12, strongly keeled, especially below, linear, acute, with two rows of linear glands; ray-flowers 8-12; ligules bright-yellow, 5-6 mm. long; disk-flowers about 40; corollas 4 mm. long; achenes 3 mm. long, hispidulous; squamellae of the disk-flowers 3-6, awned, with lacerate squamellose bases; those of the ray-flowers only 2.

TYPE LOCALITY: Salt marshes about Altata, Sinaloa.

DISTRIBUTION: Sinaloa.

23. *Pectis lancifolia* (Greenman) Rydberg, sp. nov.

Pectis sinaloensis lancifolia Greenman, Proc. Am. Acad. 40: 50. 1904.

An annual; stem 2-4 dm. high, puberulent, purplish, with ascending branches; leaves lanceolate, 2-3 cm. long, 4-6 mm. wide, hirtellous on the upper surface and the midrib beneath, acute, entire, with 1-6 pairs of bristles towards the base; glands scattered; heads solitary in the forks; peduncles 7-10 cm. long; involucre turbinate, 5 mm. high, 6-7 mm. broad; bracts 8 or 9, oblong, abruptly short-acuminate, membranous-margined, pinkish, minutely puberulent; ray-flowers 8 or 9; ligules golden-yellow or at first copper-colored beneath, about 7 mm. long and 2 mm. wide; disk-flowers more than 20; corollas nearly 5 mm. long; achenes 4 mm. long, hirsutulous; squamellae of the disk-flowers about 5, with a squamellate, lanceolate, lacerate base, produced into a scabrous awn as long as the corolla; those of the ray-flowers 2, similar or with a few minute additional squamellae.

TYPE LOCALITY: Between Concepcion and Acaponeta, Tepic.

DISTRIBUTION: Known only from the type locality.

24. *Pectis depressa* Fernald, Proc. Am. Acad. 33: 71. 1897.

A depressed annual, branched at the base, forming mats 3-4 dm. across; stem villous, much branched; leaves linear-oblong, 1-2 cm. long, 1.5-5 mm. wide, mucronate, ciliate on the margin, slightly villous on the midrib beneath, with 3-5 pairs of bristles near the base; glands scattered; heads solitary in the forks and at the ends of the branches; peduncles slender, about 2 mm. long; involucre campanulate, 4-5 mm. high, 3-4 mm. broad; bracts 5, unequal, oblong-obovate, obtuse, thin, ciliate, rounded at the apex, striate, keeled at the base; ray-

flowers 5; ligules yellow, oblong, 3 mm. long; disk-flowers 30-35; corollas 2.5 mm. long; achenes 2-2.5 mm. long, short-hispid on the angles; pappus of the disk-flowers of 12-15, linear-subulate unequal squamellae, the longer 2 mm. long; that of the ray-flowers usually reduced to a short irregular crown of more or less united minute squamellae.

TYPE LOCALITY: Acapulco, Guerrero.

DISTRIBUTION: Known only from the type locality.

25. *Pectis cubensis* (A. Rich.) Griseb. Cat. Pl. Cub. 156. 1866.

Lorentea prostrata Lag. Gen. & Sp. Nov. 28. 1816. Not *Pectis prostrata* Cav. 1797.

Lorentea humifusa Less. Linnaea 6: 719, in part. 1831.

Lorentea cubensis A. Rich. in Sagra, Hist. Cuba 11: 36. 1850.

A diffuse annual, much branched; stem prostrate, but not rooting, pilose along two decurrent lines, 1-2 dm. long; leaves oblong or linear, 6-20 mm. long, 1-3 mm. wide, rounded and mucicous, or obtuse and mucronate or aristate at the apex, with 2-4 bristles near the base; glands scattered; heads in leafy cymes; peduncles 2-13 mm. long; involucre campanulate, 4.5-6 mm. high, 2-4 mm. broad; bracts 5, oblong or obovate-oblong, mostly obtuse or rounded at the apex, carinate at the base, with scattered linear glands; ray-flowers 5; ligules yellow, oblong, 3-4 mm. long; disk-flowers 3-12; corollas 3-3.5 mm. long; achenes 3-3.5 mm. long, short-pilose on the angles or glabrate; squamellae 8-38, unequal, the longest 3.5 mm. long, bristle-like and scabrous above, more or less dilated at the base.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

26. *Pectis caymanensis* (Urban) Rydberg, sp. nov.

Pectis cubensis Hitchc. Ann. Rep. Mo. Bot. Gard. 4: 101. 1893. Not *P. cubensis* Griseb. 1866.

Pectis cubensis caymanensis Urban, Symb. Ant. 5: 282. 1907.

A diffusely branched annual, prostrate; branches 1-3 dm. long, glabrous, rooting at the base; leaves linear, 5-8 mm. long, 1-1.5 mm. wide, usually acute and bristle-tipped, with 4-7 pairs of bristles, either below the middle or along nearly the whole margins; glands in a single row along each margin; heads in leafy cymes; peduncles 1-2 cm. long; involucre narrowly campanulate, 4-4.5 mm. high, 2-3 mm. broad; bracts 5, linear-oblong, acutish or obtuse, carinate at the base; ray-flowers 5; ligules 2-3 mm. long, yellow, ascending; disk-flowers 3-10; corollas 2.5 mm. long; achenes 3 mm. long, glabrous or sparingly strigose on the angles; squamellae 15-20, scabrous, bristle-like, 1-2 mm. long, lanceolate-dilated at the base.

TYPE LOCALITY: Grand Cayman.

DISTRIBUTION: Grand Cayman and keys off Cuba.

27. *Pectis erecta* Fernald, Proc. Am. Acad. 40: 57. 1904.

A perennial, with a slender woody caudex; stem erect, 1-2 dm. high, branching above, pulverulent; leaves linear, 1.5-3 cm. long, 1-2 mm. wide, pale-green, firm, acute, with 1 or 2 rows of glands on each side and 2-5 pairs of bristles towards the base; heads solitary at the ends of the branches; peduncles 3.5-6 cm. long; involucre 5-6 mm. high, 5-6 mm. broad, turbinate; bracts 5, oblong or oblanceolate, finely ciliate at the rounded apex; ligules oblong, 5-7 mm. long, yellow, turning crimson; disk-corollas 5 mm. long; achenes hispidulous; pappus of the disk-flowers of 6-8, of the ray-flowers of 2 or 3 bristle-like, hispidulous squamellae, more or less paleaceous and connate at the base, and 4-8 shorter ones.

TYPE LOCALITY: Grenada, Nicaragua.

DISTRIBUTION: Nicaragua.

28. *Pectis arenaria* Benth. Bot. Voy. Sulph. 110. 1844.

? *Lorentea multiflosculosa* DC. Prodr. 5: 102. 1836.

? *Pectis multiflosculosa* Schultz-Bip.; Seem. Bot. Voy. Herald 309. 1857.

Pectis bibracteata Klatt, Leopoldina 20: 92. 1884.

A prostrate perennial; stem thick, creeping, branched, 3-10 dm. long, glabrous; leaves linear or linear-spatulate, 1-4 cm. long, 3-6 mm. wide, rounded at the apex, slightly connate at the base, thick, pale beneath, with revolute margins and 3-7 pairs of bristles below; glands

minute, close, in a single marginal row on each side; heads solitary in the axils; peduncles erect, 1-7 cm. long, compressed, angled; involucre campanulate, 8-12 mm. high, 5-10 mm. broad; bracts 5-8, flat, striate, oblong or ovate-oblong, obtuse or acute, scarcely keeled below; ray-flowers 5-8; ligules oblong, 6-7 mm. long; disk-flowers 15-80; corollas 5-6 mm. long; tube 1 mm. long; achenes 6-7 mm. long, compressed, striate, glossy, glabrous or sparingly hirsutulous; squamellae 10-20, linear-subulate, attenuate into an awn, unequal, the longer 4 mm. long.

TYPE LOCALITY: Acapulco, Guerrero.

DISTRIBUTION: Sinaloa to Guerrero; Salvador (?); also in Ecuador (?).

29. *Pectis grandiflora* Klatt, Leopoldina 1895: Bot. Beibl. 6. 1895.

A decumbent perennial; stem branched, 3-10 dm. long, glabrous or puberulent along decurrent lines; branches erect; leaves linear, acute, mucronate, 2-4 cm. long, 2-3 mm. wide, thick, with 3-6 pairs of bristles near the base; glands small, close together in a single marginal row on each side; heads terminal, solitary; peduncles 2-3 cm. long, curved, angled; involucre campanulate, 9-10 mm. high, 5-8 mm. broad; bracts 5, broadly oblong, many-striate, ciliate, keeled to the apex; ray-flowers 5; ligules oblong, about 5 mm. long, 1.5 mm. wide, at first reddish; disk-flowers 30-35; corollas 5-6 mm. long; achenes 6 mm. long, short-setose; squamellae 12-15, subulate, scabrous, awn-like, the longer 4-5 mm. long.

TYPE LOCALITY: Hato-Viejo, Costa Rica.

DISTRIBUTION: Costa Rica and Panama.

30. *Pectis diffusa* H. & A. Bot. Beech. Voy. 296. 1837.

A perennial, with a suffruticose caudex; branches 1-2 dm. long, decumbent or nearly erect, densely leafy, angled, glabrous or puberulent; leaves ascending, arcuate, linear-subulate, attenuate, rather firm, with thick midrib and margins, glabrous or scabrous on both sides, 2-4 cm. long, 2-3 mm. wide, with 5-10 pairs of bristles below the middle; glands inconspicuous or even obsolete, in a single row along each margin; heads solitary from the upper axils; peduncles slender, 4-6 cm. long; involucre turbinate, 5-6 mm. high, 4 mm. broad; bracts 5, oblong, acute; ray-flowers 5; ligules oblong, yellow, 5-7 mm. long; disk-flowers 7-10; corollas 4 mm. long; achenes 4 mm. long, short-hispid or glabrate; pappus-bristles 5-20, very unequal, rarely a little dilated at the base, the longer 3 mm. long.

TYPE LOCALITY: Jalisco.

DISTRIBUTION: Jalisco and Colima.

31. *Pectis longipes* A. Gray, Pl. Wright. 2: 69. 1853.

A perennial, with a caespitose slender caudex; stem densely leafy below, 1-2 dm. high, glabrous, ascending; leaves linear, mucronate, thickish, 2-4 cm. long, 1.5-3 mm. wide, with 2-3 pairs of bristles near the base; glands conspicuous, in a single row along each margin; heads solitary at the ends of the branches or in the upper axils; peduncles 6-14 cm. long, slender; involucre campanulate-turbinate, 6-8 mm. high, 8-10 mm. broad; bracts 12-15, linear, plane above, keeled below, acute, bearing a large apical gland; ray-flowers 12-15; ligules yellow, narrowly oblong, 6-8 mm. long, 1.5-2 mm. wide; disk-flowers 40-75; corollas 4-5 mm. long; achenes 4-5 mm. long, more or less pubescent; pappus-bristles of the disk-flowers 20-40, very unequal, capillary, scabrous, the longest 4-6 mm. long; those of the ray-flowers 2, slender, 3-5 mm. long, and rarely a few additional reduced ones.

TYPE LOCALITY: Mountain valley between San Pedro and Santa Cruz, Sonora.

DISTRIBUTION: Western Texas to Arizona, Sonora, Durango, and Chihuahua.

32. *Pectis latisquama* Schultz-Bip.; (A. Gray, Proc. Am. Acad. 5: 181, hyponym. 1862) Fernald, Proc. Am. Acad. 39: 118. 1903.

A low prostrate perennial, with a suffruticose caespitose caudex; stem leafy, hirtellous-puberulent, 1-2 dm. long; leaves linear or lance-linear, 1-2 cm. long, 2-3 mm. wide, acute, revolute-margined, glabrous or nearly so, with 3-5 pairs of bristles near the base; heads solitary

at the end of the branches; peduncles 1-3 cm. long; involucre campanulate, 6-7 mm. high, 6-7 mm. broad; bracts 5, elliptic to oblong-obovate, rounded at the apex, obtusely keeled, ciliate, more or less purple-tinged, glabrous; ray-flowers 5; ligules orange, oblong, 6-7 mm. long, 3-4 mm. wide; disk-flowers 10-20; corollas 5-6 mm. long; achenes 5 mm. long, villous; pappus-bristles many, 3-4 mm. long.

TYPE LOCALITY: Valley of Mexico.

DISTRIBUTION: State of Mexico to Puebla.

33. *Pectis repens* Brand. Zoe 5: 241. 1906.

A prostrate spreading perennial; stem 2-3 dm. long, sometimes rooting at the nodes, slightly puberulent; leaves fasciculate, 1-2 cm. long, 1-2 mm. wide, serrate, with several pairs of long bristles below the middle, mucronate, revolute-margined, with 2-4 rows of small glands; peduncles 1-3, terminal or from short leafy branches, 10-12 cm. long; involucre campanulate, 8 mm. high; bracts 4 or 5, oval, obtuse, glandless, slightly pubescent at the purple apex, finely striate, scarious-margined, and keeled near the base; ray-flowers 5; ligules 8 mm. long, purple outside, yellow within; disk-flowers 15-25; corollas 6 mm. long, bilabiate with one of the lobes separated from the rest to near the middle; achenes 6 mm. long, crisp-pubescent; pappus of the ray-flowers of two awns, abruptly dilated at the base and about 20 shorter bristles; that of the disk-flowers of about 20 unequal bristles.

TYPE LOCALITY: Cofradia, Sinaloa.

DISTRIBUTION: KNOWN only from the type locality.

34. *Pectis canescens* H. B. K. Nov. Gen. & Sp. 4: 263. 1820.

Lorentea canescens Less. Linnaea 5: 135. 1830.

Stammarium hirsopifolium Willd.; Less. Linnaea 5: 135, as synonym. 1830.

Chthonia canescens Cass.; B. D. Jackson, Ind. Kew. 1: 532, as synonym. 1893.

A diffuse perennial, with a woody cespitose base; stem 1-2 dm. long, decumbent, canescent, pilose; leaves linear, about 2 cm. long, more or less hirsutulous, thick, with prominent midrib and revolute margins, often somewhat toothed, spinulose-tipped and with 3-6 pairs of bristles towards the base; glands inconspicuous, scattered; heads on solitary peduncles from the upper axils; peduncles 5-12 cm. long; involucre campanulate, 5-7 mm. high and nearly as broad; bracts 5-7, oblong or elliptic, rounded at the apex, usually puberulent; ray-flowers 5-7; ligules about 7 mm. long, 1.5 mm. wide; disk-flowers 15-20; corollas 6 mm. long; achenes 5 mm. long, hirsute; pappus of the disk-flowers of about 20 bristles, 5 mm. long; that of the ray-flowers similar but much shorter.

TYPE LOCALITY: Chilpancingo, Mexico.

DISTRIBUTION: San Luis Potosí and Tepic to Guerrero.

ILLUSTRATION: H. B. K. Nov. Gen. & Sp. *pl.* 393.

35. *Pectis saturejoides* (Mill.) Schultz-Bip.; Seem. Bot. Voy. Herald 309. 1857.

Inula saturejoides Mill. Gard. Dict. Ed. 8, Inula no. 8. 1768.

Inula Satureia Spreng. Syst. 3: 520. 1826.

Lorentea saturejoides Less. Linnaea 5: 135. 1830.

Lorentea auricularis DC. Prodr. 5: 102. 1836.

Pectis auricularis Schultz-Bip.; Seem. Bot. Voy. Herald 309. 1857.

Pectis canescens villosior Coult. Bot. Gaz. 20: 52. 1895.

A low diffuse perennial, with cespitose woody caudex; stem leafy, 1-2 dm. high, retrorsely canescent-hirsutulous; leaves linear, 1-2 cm. long, 1.5-2 mm. wide, spinulose-tipped, hirsutulous on both sides, rather thick, revolute-margined, with inconspicuous scattered glands and 4-6 pairs of bristles; heads solitary on axillary peduncles 4-7 cm. long; involucre campanulate, 6-7 mm. high, 7-8 mm. broad; bracts 7-12, linear, acute, hispidulous or rarely glabrate; ray-flowers as many; ligules oblong, 5-6 mm. long; disk-flowers many; corollas 5 mm. long; achenes 4 mm. long, hirsute; pappus of the disk-flowers of about 20 unequal hispidulous bristles, the longest 4-5 mm. long; that of the ray-flowers wanting or represented by a mere border.

TYPE LOCALITY: Vera Cruz.

DISTRIBUTION: Southern Mexico and Guatemala.

ILLUSTRATIONS: Houst. Reliq. *pl.* 19; Linnaea 5: *pl.* 2, *f.* 7-12.

36. *Pectis polyantha* Rydberg, sp. nov.

A diffuse perennial, with a caespitose woody caudex; stem 1-2 dm. long, hirsutulous-puberulent; leaves linear, 1-2.5 cm. long, 2-4 mm. wide, puberulent on both sides, spinulose-tipped or spinulose-mucronate, with scattered inconspicuous glands and 4-6 pairs of bristles towards the base; heads on solitary peduncles from the upper axils; peduncles 4-6 cm. long; involucre broadly campanulate, about 7 mm. high, 8-10 mm. broad; bracts 8-12, linear or linear-oblongate, keeled, gibbous at the base, often tinged with red, puberulent or glabrous, acute; ray-flowers 8-12; ligules 6-7 mm. long, 1.5-2 mm. wide; disk-flowers many; corollas 4 mm. long; achenes 3 mm. long, pubescent; pappus of all flowers of about 20 hirsutulous, yellowish or rose-tinged bristles, 3-4 mm. long.

Type collected on Aserradores Island, Nicaragua, 1903, C. F. Baker 2133 (Gray Herb.).

DISTRIBUTION: Nicaragua and Costa Rica (*Oersted 204*, referred by Bentham to *Lorentea multiflosculosa* DC. See Oerst. Vidensk. Meddel. 1852: 70).

37. *Pectis Liebmannii* Schultz-Bip.; Hemsl. Biol. Centr. Am. Bot.

2: 226. 1881.

Lorentea Liebmannii Schultz-Bip.; B. D. Jackson, Ind. Kew 3: 117, as synonym. 1893.

A perennial, suffruticose at the base; stem elongate, procumbent, canescent-tomentose, 2-3 dm. long; leaves thick, obovate or elliptic, 1.5-2.5 cm. long, 4-10 mm. wide, revolute-margined, cuspidate-mucronate, canescent-tomentose, with 2-4 pairs of basal bristles; heads solitary, terminating the branches or in the upper axils; peduncles 1-5 cm. long; involucre campanulate, 6-7 mm. high and as broad; bracts 6-8, linear-oblong, rose-tipped, scarios on the margins, canescent on the back, slightly carinate below; ray-flowers 6-8; ligules 3-4 mm. long; disk-flowers 10-20; corollas 5 mm. long; achenes 3-4 mm. long, minutely pubescent or glabrate; pappus-bristles of the disk-flowers 20-30, unequal, scabrous, the longest 4-5 mm. long; those of the ray-flowers wanting.

TYPE LOCALITY: "San Augustin, Mexico."

DISTRIBUTION: Jalisco.

38. *Pectis Leonis* Rydberg, sp. nov.

A diffusely branched perennial; stem decumbent, 1-2 dm. long, scaly below, rather slender, puberulent when young; leaves linear, 5-10 mm. long, less than 1 mm. wide, spinulose-tipped, with 3-4 pairs of bristles near the base; midrib rather prominent; glands in a single row along each margin; heads solitary at the ends of the branches; peduncles slender, 1-3 cm. long; involucre turbinate, 5 mm. high, 3-4 mm. broad; bracts 5, linear, acute, keeled on the back, gibbous at the base, with purplish-brown margins and irregularly scattered oblong glands; ray-flowers mostly 5; ligules 4-5 mm. long, tinged with brown; disk-flowers 6-9; corollas 3 mm. long; pappus-bristles of all the flowers 15-20, unequal, 3 mm. long or less, scabrous.

Type collected on a savanna north of St. Spiritus, Santa Clara, Cuba, *Brother León 5379* (herb. N. Y. Bot. Gard.).

39. *Pectis stenophylla* A. Gray, Proc. Am. Acad. 21: 393. 1886.

A diffusely branched perennial, with suffruticose base; branches purplish, 2-3 dm. long, glabrous; leaves narrowly linear, mucronate, 3-4 cm. long, 1-2 mm. wide, often strongly revolute, with 2-3 pairs of bristles towards the base; glands in a single row along each margin; heads solitary, terminal or in the upper axils; peduncles filiform, 5-6 cm. long; involucre 5 mm. high, 3-4 mm. broad; bracts 8, narrowly oblong, blunt, flat above, slightly keeled about two thirds their length; ray-flowers about 8; ligules yellow, narrow, 3 mm. long, 1 mm. wide; disk-flowers 8-10; corollas 3 mm. long; achenes 2.5-3 mm. long, sparingly hispidulous; pappus-bristles of the disk-flowers 20-40, unequal, scabrous, 2 mm. long; those of the ray-flowers only 2, smooth, 1.5 mm. long.

TYPE LOCALITY: Hillsides near Batopilas, Chihuahua.

DISTRIBUTION: Chihuahua and Sonora.

40. *Pectis capillipes* (Benth.) Hemsl. Biol. Centr. Am. Bot.

2: 225. 1881.

Lorentia capillipes Benth. in Oerst. Vidensk. Meddel. 1852: 70. 1852.

A suffruticose perennial; stem branched, erect, 7–12 cm. high, scarcely puberulent; leaves linear, ridged, 1.5–2 cm. long, about 2 mm. wide, with strong midrib and several bristles at the base; glands many; heads solitary in the forks; peduncles slender, 3–5 cm. long; involucre turbinate; bracts 5, oblong, obtuse; ray-flowers 5; pappus of the disk-flowers of 5 or 6 stouter bristles, somewhat dilated at the base, and many shorter ones; those of the ray-flowers somewhat fewer. (Description adapted from that of Benthham.)

TYPE LOCALITY: Chinotega, Segovia, Guatemala.

DISTRIBUTION: Guatemala.

41. *Pectis pusilla* Urban, Symb. Ant. 5: 282. 1907.

A prostrate or ascending annual; stem 2–3.5 cm. long, branched, retrorsely short-pilose, 4-angled above; leaves linear, 7–15 mm. long, 1–1.5 mm. wide, with 5–7 pairs of bristles along the margins from the base to near the apex; glands in a single row on each side or some scattered; heads solitary at the ends of the branches; peduncles 1–2 cm. long; involucre sub-cylindrical, 6–6.5 mm. high, 3–3.5 mm. broad; bracts 5, oblong-linear, acute or obtuse, obtusely carinate on the back, glandless; ray-flowers 5; ligules oblong-elliptic; disk-flowers about 10; corollas 3.5–4 mm. long, the limb 4-toothed; achenes 3.5 mm. long, short-pilose; pappus of 25–35 bristles, very unequal, 0.5–4 mm. long, the longer often somewhat dilated at the base, scabrous-hispidulous.

TYPE LOCALITY: Petite Rivière de Bayonnais, Haïti.

DISTRIBUTION: Known only from the type locality.

42. *Pectis juniperina* Rydberg, sp. nov.

An intricately branched annual, forming cushions; stem branched at the base, about 1 dm. high, puberulent; leaves linear or linear-subulate, 1–1.5 cm. long, arcuate, spreading, with thick midrib and margins, attenuate, bristle-tipped, with 3–5 pairs of bristles towards the base; glands inconspicuous, in a single row along each margin; heads solitary at the ends of the branches; peduncles 1–2 cm. long; involucre 5–6 cm. high, about 3 mm. broad, narrowly turbinate-campanulate; bracts 5, oblong-oblongate, rounded and mucronate at the apex, keeled below; ray-flowers not seen; disk-flowers 5 or 6; corollas 5 mm. long; achenes 4 mm. long, hirsutulous; pappus-bristles 30–40, about 4 mm. long.

Type collected between Laguna del Buefo and Laguna Alcatraz Grande, Pinar del Rio, Cuba, December 16, 1911, *J. A. Shafer 11013* (herb. N. Y. Bot. Gard.).

43. *Pectis puberula* Greenman, Proc. Am. Acad. 40: 49. 1904.

A slender annual; stem 1–2 dm. high, puberulent, often purplish; leaves linear or lance-linear, 1–3 cm. long, 2–4 mm. wide, acute, with a single row of glands on each side and 1–4 pairs of bristles near the base, glabrous on both sides, but slightly hirtellous on the margins and the midrib beneath; heads on solitary axillary peduncles 3–4 cm. long; involucre about 4 mm. high and 3 mm. broad, turbinate; bracts 8, obtusely keeled, blunt, glabrous; ray-flowers 8; ligules 2 mm. long; disk-flowers about 15; corollas 3 mm. long; achenes 2.5 mm. long, puberulent; pappus of the disk-flowers of many, of the ray-flowers of 2 slender bristles, about 2 mm. long.

TYPE LOCALITY: Lodiego, Sinaloa.

DISTRIBUTION: Sinaloa.

44. *Pectis Palmeri* S. Wats. Proc. Am. Acad. 24: 58. 1889.

A diffuse annual; stem 1–2 dm. high, dichotomously branched, glabrous; leaves linear, about 4 cm. long, 2–4 mm. wide, glabrous, with 1–2 pairs of basal bristles; glands rather conspicuous, in a single row along each margin; heads solitary in the forks; peduncles 3–8 cm. long;

involucre 5-6 mm. high, and as broad, turbinate; bracts 8-10, keeled below the middle; ray-flowers 8-10; ligules yellow, narrow, about 5 mm. long, 1.5-2 mm. broad; disk-flowers 25-40; corollas about 5 mm. long; achenes 4 mm. long, strigose; pappus-bristles of the disk-flowers 15-20, scabrous, 3 mm. long; those of the ray-flowers 2 or 3, somewhat dilated at the base.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Sonora and Lower California.

45. *Pectis Mearnsii* Rydberg, sp. nov.

A diffuse annual; stem branched, 1-1.5 dm. high, somewhat angled, reddish; leaves linear, 2-3 cm. long, 2-4 mm. wide, with 2-4 pairs of bristles near the base; glands in a single marginal row on each side; heads solitary at the ends of the branches; peduncles 2-4 cm. long; involucre campanulate, 5 mm. high and fully as broad; bracts about 8, oblong, obtuse, carinate on the back, with inconspicuous glands; ray-flowers about 8; ligules oblong, 8 mm. long, 3-4 mm. wide; disk-flowers 15-20; corollas 5-6 mm. long; achenes 5 mm. long, sparingly hirsute; pappus of the disk-flowers of about 30 unequal slender bristles, 1-4 mm. long; that of the ray-flowers of 2-5 stout bristles.

Type collected at Fort Verde, Arizona, October 1, 1887, *Dr. E. A. Mearns 184* (herb. N. Y. Bot. Gard.).

46. *Pectis Barberi* Greenman, Proc. Am. Acad. 40: 48. 1904.

A subscape annual; stem simple or branched at the base; leaves crowded at the base, oblanceolate, 1-2 cm. long, 2-5 mm. wide, obtuse at the apex, with 4-6 pairs of bristles at the narrow base, glabrous, paler beneath; glands in a single row along each margin; peduncles 5-15 cm. long, minutely bracteate; involucre campanulate, 5-6 mm. high and as broad, glabrous and purplish; bracts usually 13, oblanceolate or oblong, obtuse, scarious-margined, keeled towards the base; ray-flowers about 13; ligules 5-6 mm. long, about 2 mm. wide; disk-flowers 30-45; corollas 4 mm. long; achenes 3 mm. long, puberulent; pappus of the disk-flowers of 5 longer and many shorter bristles, often purplish; that of the ray-flowers of 2 bristles.

TYPE LOCALITY: Sierra Madre, near Colonia Garcia, Chihuahua.

DISTRIBUTION: Type locality and vicinity.

47. *Pectis Haenkeana* (DC.) Schultz-Bip.; Seem. Bot. Voy. Herald 309. 1857.

Lorentea Haenkeana DC. Prodr. 5: 102. 1836.

Lorentea Haenkeana hirsuta DC. Prodr. 5: 102. 1836.

? *Lorentea Haenkeana laeviuscula* DC. Prodr. 5: 102. 1836.

A diffuse annual, or perhaps sometimes more enduring; stem dichotomously branched, ascending or depressed, puberulent or pilose, 1-2 dm. high, often purplish; leaves linear or nearly so, 1-2.5 cm. long, 1.5-4 mm. wide, slightly pubescent or glabrate, with 2-5 pairs of bristles; glands in 1 or 2 rows on each side of the midrib, inconspicuous; heads solitary, in the forks or at the ends of the branches; peduncles 1-3 cm. long; involucre turbinate, 4-5 mm. high and nearly as broad; bracts 5, oblong, obtuse, keeled at the base, ciliate at the tip; ray-flowers 5; ligules 2.5-4 mm. long, yellow, or tinged with red outside; disk-flowers 20-25; corollas 4 mm. long; achenes 3-4 mm. long, hirsute on the angles or glabrate; pappus of 5 or 6 longer and stouter scabrous bristles, 4-5 mm. long, and many more slender, unequal, and shorter ones, those of the ray-flowers often fewer.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Oaxaca to Querétaro; Nicaragua (?).

48. *Pectis Schottii* (Fernald) Millsp. Field Columb. Mus. Publ. Bot. 3: 143. 1904.

Pectis elongata Schottii Fernald, Proc. Am. Acad. 33: 78. 1897.

An erect slender annual; stem paniculately branched, 3-4 dm. long, angled, scabrous or smooth; leaves linear-oblong, apiculate, 1-2.5 cm. long, 1-2 mm. wide, with 3-5 pairs of bristles near the base, and but 2 rows of glands beneath; peduncles solitary, terminal or in

the upper axils, 2-3 cm. long; heads nodding at first; involucre about 4 mm. high and 2.5 mm. broad; bracts 5, lanceolate, acuminate, bearing a few glands on the thickened midrib; ray-flowers 5; ligules greenish-white, slightly tinged with purple, oblong, 1 mm. long; disk-flowers 3 or 4; corollas whitish; achenes fully 2 mm. long, linear-oblanccolate, sparsely pubescent or glabrate; pappus of 15 unequal rufescent scabrous bristles, dilated below, 1-2 mm. long.

TYPE LOCALITY: [Sercania, near] Maxcanú, Yucatan.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Field Columb. Mus. Publ. Bot. 3: *pl.* opp. 143.

49. *Pectis elongata* H. B. K. Nov. Gen. & Sp. 4: 262. 1820.

Pectis stricta Willd.; Less. Linnaea 6: 710, as synonym. 1831.

Lorentea polycephala Gardn. Lond. Jour. Bot. 5: 240. 1846.

Pectis floribunda A. Rich. in Sagra, Hist. Cuba 11: 36. 1850.

Pectis ciliaris A. Rich. in Sagra, Hist. Cuba 11: 36. 1850.

Pectis Plumieri Griseb. Fl. Brit. W. Ind. 378, in part. 1861.

Cryptopetalon elongatum Cass.; Urban, Symb. Ant. 5: 283, as synonym. 1907.

An erect annual; stem 1.5-7.5 dm. high, more or less angled, scabrous under the nodes, with numerous spreading or ascending branches; leaves linear, 2-6 cm. long, 1.5-3 mm. wide, mucronate or bristle-tipped, with 3-10 pairs of bristles near the base; glands many, in 4-6 irregular rows; heads cymose-paniculate; peduncles slender, 0.5-2 cm. long; involucre 5-6 mm. high, 4-5 mm. broad, turbinate; bracts 5, purplish, linear, acuminate, obtusely keeled at the base, glabrous; ray-flowers 5; ligules 2.5-3 mm. long, yellow, tinged with purple; disk-flowers 5-7; corollas about 2.5 mm. long; achenes 2-2.5 mm. long, hirsutulous on the angles or glabrate; pappus-bristles of the disk-flowers 8-24, of the ray-flowers 5-20, capillary, scabrous, the longer 4 mm. long.

TYPE LOCALITY: Popayan, Colombia.

DISTRIBUTION: Cuba, Jamaica, and Hispaniola; Yucatan and Guatemala to Guiana and Peru.

ILLUSTRATION: H. B. K. Nov. Gen. & Sp. *pl.* 392.

50. *Pectis papposa* Harv. & Gray; A. Gray, Mem. Am. Acad. II.

4: 62. 1849.

Pectis tenella Rothr. Bot. Wheeler's Surv. 171. 1878. Not *P. tenella* DC. 1836.

Pectis Palmeri S. Wats. Proc. Am. Acad. 24: 58, in part. 1889.

A slender yellowish-green annual; stem dichotomous, with more or less spreading branches, 1-3 dm. high; leaves fleshy, filiform, 1-6 cm. long, 1-2 mm. wide, with 2-5 pairs of bristles near the base; glands conspicuous, marginal; heads in leafy cymes, subfastigate; peduncles 1-3 cm. long; involucre turbinate, 4.5-6 mm. high, 3-5 mm. broad; bracts 7-9, narrowly linear, strongly involute, strongly round-keeled and gibbous at the base, obtuse, with 3-7 conspicuous glands; ray-flowers 7-9; ligules 4-6 mm. long, 1.5-2 mm. wide; disk-flowers 10-15; corollas 4-5 mm. long, the lobes lanceolate; achenes 4-5 mm. long, hispidulous or strigose; pappus of the disk-flowers of 12-20 short-plumose bristles, about 4 mm. long, or rarely reduced to a crown; that of the ray-flowers a short oblique crown of united squamellae, one or two of which are rarely produced into an awn.

TYPE LOCALITY: California.

DISTRIBUTION: New Mexico to California, Lower California, and Sonora.

51. *Pectis angustifolia* Torr. Ann. Lyc. N. Y. 2: 214. 1827.

Helioreas angustifolius Raf. Atl. Jour. 145. 1832.

Pectidiopsis angustifolia DC. Prodr. 5: 98. 1836.

Pectis fastigiata A. Gray, Mem. Am. Acad. II, 4: 62. 1849.

Pectis angustifolia subaristata A. Gray, Pl. Wright. 1: 82. 1852.

Pectis papposa sessilis M. E. Jones, Contr. West. Bot. 12: 46. 1908.

A diffuse dichotomously branched annual; stem 1-2 dm. high, glabrous, slightly angled; leaves 1-4 cm. long, 1-1.5 (rarely 2) mm. wide, glabrous, fleshy, with (especially the upper) more or less dilated and scarios margins below, pectinately lobed into 3-5 pairs of lanceolate or subulate bristle-tipped lobes; glands conspicuous, marginal; heads fastigate at the ends of the branches; involucre turbinate, 4-5 mm. high and about as broad; bracts 8-10, narrowly linear, strongly involute and round-ribbed, gibbous at the base, with a conspicuous apical

gland; ray-flowers 8-10; ligules yellow, 3-4 mm. long; disk-flowers 10-15; corollas 3 mm. long, the lobes lanceolate; achenes 4 mm. long; pappus of a crown of 4 or 5 short squamellae or rarely with 1 or 2 additional short awns in the ray-flowers (var. *subaristata*), or in most of the flowers (*P. fastigiata*).

TYPE LOCALITY: Rocky Mountains.

DISTRIBUTION: Nebraska and Colorado to Arizona, Sonora, San Luis Potosí and Tamaulipas (Fernald gives also Lower California, but specimen cited, *Palmer 657*, belongs to *P. papposa*).

ILLUSTRATION: Bot. Mag. pl. 6286.

52. *Pectis tenella* DC. Prodr. 5: 99. 1836.

A low annual; stem 1 dm. high or less, dichotomously branched from the base, with ascending or spreading branches, angled, glabrous or slightly puberulent; leaves 1-4 cm. long, 1-2 mm. wide, linear, broadened at the base, pectinately divided (especially the lower) into 1-4 narrow lobes ending in bristles; glands conspicuous, marginal; heads fastigiate, sessile or short-peduncled; peduncles rarely 5 mm. long; involucre turbinate, 4-5 mm. high, 3-4 mm. broad; bracts 7-9, linear, prominently round-keeled, strongly involute, gibbous at the base, with a single conspicuous apical gland and sometimes 1 or 2 below; ray-flowers 7-9; ligules yellow, 3.5-5 mm. long, 1-1.5 mm. wide; disk-flowers 10-15; corollas about 3 mm. long; achenes about 3 mm. long, hirsutulous or glabrate; pappus of 2-6 unequal minutely scabrous awns.

TYPE LOCALITY: Near Laredo [Texas or Tamaulipas].

DISTRIBUTION: Texas to Chihuahua and Tamaulipas.

53. *Pectis Pringlei* Fernald, Proc. Am. Acad. 33: 76. 1897.

A low annual; stem 5-10 cm. high, angled, with numerous spreading branches, glabrous; leaves linear-filiform, 1-2 cm. long, barely 1 mm. wide, with 2-3 pairs of basal bristles; glands marginal; heads in corymbiform leafy cymes; peduncles 1.5-2.5 cm. long, angled; involucre 5-6 mm. high, 4-5 mm. broad; bracts about 8, strongly keeled below, flat above, linear, with a conspicuous apical gland and 1 or 2 smaller glands below; ray-flowers mostly 8; ligules oblong, yellow, 5-6 mm. long; disk-flowers 15-18; corollas 5 mm. long, the tube equaling the throat and limb together, the lobes ovate-lanceolate; achenes 4 mm. long, sparingly hirsute-strigose; pappus of 2-4 slender awns, 3-5 mm. long.

TYPE LOCALITY: Jimulco, Durango.

DISTRIBUTION: Type locality and vicinity.

54. *Pectis scabra* Brand. Zoe 5: 226. 1905.

A slender delicate annual; stem branching from the base, 1-1.5 dm. high, purple, scabrous-pubescent; leaves linear, 1-2 cm. long, 1-2 mm. wide, scabrous above, on the revolute margin and the midrib beneath, with 1 row of glands on each side of the midrib and 1 or 2 pairs of bristles at the base; heads on filiform peduncles from the upper axils; peduncles 2-4 cm. long; involucre turbinate, 3 mm. high and about as broad; bracts 6-8, linear, keeled below the middle, scarios-margined, with 5 or 6 glands, obtuse; ray-flowers 6-9; ligules linear, yellow, 2 mm. long; disk-flowers 10-15; corollas 2.5 mm. long; achenes slightly pubescent; pappus of 1-3 awns or bristles and as many small scales, the awns in the ray-flowers stouter than those of the disk.

TYPE LOCALITY: Cofradía, Sinaloa.

DISTRIBUTION: Known only from the type locality.

55. *Pectis biaristata* Rydberg, sp. nov.

A low diffuse annual; stem less than 1 dm. high, branched from the base, minutely puberulent; leaves linear, 1-2 cm. long, 1 mm. wide, minutely puberulent above or glabrate, with 1-3 pairs of small bristles near the base; heads peduncled, solitary at the ends of the branches and in the upper axils; peduncles 3-4 cm. long; involucre turbinate, 4-5 mm. high and nearly as broad; bracts about 8, round-carinate below, thin and flat above, acutish; glands in two lateral rows; ray-flowers 5-8; ligules elliptic, 5 mm. long, 2 mm. wide; disk-flowers 10-12; corollas

about 3 mm. long; achenes 3 mm. long, hirsute; pappus of 2 or 3 stout bristles, 2 mm. long, slightly dilated below.

Type collected in the vicinity of Fuerte, Sinaloa, March 26, 1910, *Rose, Standley & Russell 13537* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sinaloa.

56. *Pectis Rusbyi* Greene; A. Gray, Syn. Fl. 1²: 361. 1884.

A low annual; stem rather simple, about 1 dm. high, angled, glabrous; leaves flat, linear or linear-oblongate, mostly obtuse, 2-3.5 cm. long, 1-3 mm. wide, with 2-3 pairs of basal bristles; peduncles 3-6 cm. long; involucre 4-5 mm. high and as wide, turbinate; bracts about 8, flat, slightly keeled at the base, obtuse, with a conspicuous apical gland; ray-flowers about 8; ligules yellow, 6 mm. long, 2 mm. wide; disk-flowers 20-30; corollas 4 mm. long; achenes 4 mm. long, sparingly hirsutulous or glabrate; pappus of the disk-flowers of many minute awn-tipped squamellae; that of the ray-flowers of 2 or 3 slender awns, 2.5-3 mm. long.

TYPE LOCALITY: Beaver Creek, Arizona.

DISTRIBUTION: Known only from the type locality.

57. *Pectis purpurea* Brand. Zoe 5: 225. 1905.

A branched annual; stem 1-3 dm. high, angular, glabrous, purple; leaves linear or linear-lanceolate, 3-4 cm. long, 3-4 mm. wide, with revolute margins, with 1 or 2 rows of glands on each side of the midrib and 2 or 3 pairs of bristle-tipped lobes or teeth at the base; heads on elongate, axillary and terminal peduncles 5-8 cm. long; involucre turbinate-campanulate, 4-5 mm. high, purple; bracts oblongate, keeled below, with 2 rows of conspicuous glands and a deltoid obtuse apex; ray-flowers about 8; ligules linear, 6 mm. long, purple on the back; disk-flowers numerous; corollas 3 mm. long; achenes 3 mm. long, pubescent; pappus of a minute crown of short fimbriate acute squamellae.

TYPE LOCALITY: Near Cofradia, Sinaloa.

DISTRIBUTION: Sinaloa.

58. *Pectis Rosei* Fernald, Proc. Am. Acad. 33: 77. 1897.

A diffusely branched annual; stem purple, about 2 dm. high; leaves filiform, revolute, mucronate, 2-4 cm. long, 0.5-1 mm. wide, with 2 pairs of basal bristles; heads many, solitary, axillary; peduncles terete, 2-4 cm. long; involucre 3-4 mm. high, 3 mm. broad; bracts 8, acute-ish, strongly keeled and bearing conspicuous elongate black glands; ray-flowers about 8; ligules 3 mm. long, narrow, yellow, becoming rose-tinged; disk-flowers 10-15; corollas 2-2.5 mm. long; achenes barely 3 mm. long, hirsute; pappus of 2 or 3 slender awns, 2 mm. long, and often a minute squamellose cup.

TYPE LOCALITY: Alamos, Sonora.

DISTRIBUTION: Known only from the type locality.

59. *Pectis fasciculiflora* DC. Prodr. 5: 100. 1836.

An erect perennial, slightly fruticulose at the base; stem glabrous, 2-5 dm. high, branching above; leaves linear or linear-oblongate, obtuse or acute, 2-4 cm. long, 4-6 mm. wide, minutely serrulate under a lens, with scattered glands and 1-5 pairs of bristles towards the base; heads 8-12-flowered, crowded on short branches in the axils of reduced floral leaves; involucre 4-6 mm. high, 2-3 mm. broad; bracts linear, acuminate, keeled below the middle; ligules oblong, 3 mm. long; disk-corollas 2.5 mm. long; achenes minutely hispidulous or glabrate, 2.5 mm. long; pappus of 1-3 slender awns, 4-5 mm. long, with or without a small squamellate cup at the base.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Guerrero.

60. *Pectis Berlandieri* DC. Prodr. 5: 100. 1836.

A low annual; stem 1-2 dm. high, with many angled glabrous or minutely puberulent ascending branches above; leaves linear, 1-3 cm. long, about 1 mm. wide, acuminate, scabrous,

with 2-4 pairs of bristles below; glands marginal; heads in leafy cymes; peduncles 1 cm. long or less; involucre turbinate, 5 mm. high, 3 mm. broad; bracts 5, linear, acuminate, keeled towards the base; ray-flowers 5; ligules 2 mm. long; disk-flowers 5-7; corollas 2 mm. long; achenes 2.5-3.5 mm. long, minutely hispidulous or glabrate; pappus of subequal, slender awns, 4-5 mm. long, those of the disk-flowers 5-7, of the ray-flowers only 2 or 3.

TYPE LOCALITY: Tancoyuca, Vera Cruz.

DISTRIBUTION: Tamaulipas and Vera Cruz.

61. *Pectis Oerstediana* Rydberg, sp. nov.

Pectis taliscana Benth. in Oerst. Vidensk. Meddel. 1852: 69. 1852. Not *P. taliscana* H. & A. 1837.

A slender perennial; stem much branched, 3-6 dm. high, terete, purplish, glabrous; leaves linear, 3-5 cm. long, 2-3 mm. wide, acute, with scattered glands and 2-5 pairs of bristles at the base; heads axillary and terminal, solitary; peduncles slender, 1.5 cm. long or less; involucre turbinate, 5 mm. high, 3-4 mm. broad; bracts about 5, acuminate, linear, purplish, keeled; ray-flowers about 5; ligules oblong, often purplish, 1.5-2 mm. long; disk-flowers 3-6; corollas fully 2 mm. long; achenes 2.5 mm. long, hispidulous; pappus of the disk-flowers of 5 or 6 (rarely 7 or 8), of the ray-flowers of 3 or 4 (rarely 5), hispidulous bristles, 2-2.5 mm. long.

Type collected at Realejo, Nicaragua, 1903, C. F. Baker 2137 (U. S. Nat. Herb.).

DISTRIBUTION: Nicaragua and Costa Rica.

62. *Pectis capillaris* DC. Prodr. 5: 99. 1836.

Pectis taliscana H. & A. Bot. Beech. Voy. 296. 1837.

Pectis jaliscana Hemsl. Biol. Centr. Am. Bot. 2: 225. 1881.

Pectis Berlandieri ? Palmeri A. Gray, Proc. Am. Acad. 21: 393. 1885.

Pectis capillaris paucicapitata Fernald, Proc. Am. Acad. 33: 74. 1897.

An erect minutely puberulent or glabrate annual; stem 1-3 dm. high, diffusely branched above; leaves linear, mucronate, 2-5 cm. long, 2-3 mm. wide, scabrous-hirsutulous above, with prominent ribs beneath and 2-5 pairs of bristles below the middle; glands scattered or in the smaller leaves in a single row half way between the midrib and each margin; heads in the upper forks and terminal; peduncles 2-3 cm. long; involucre 4-5 mm. high, 3-4 mm. broad, turbinate; bracts about 5, acute or acuminate, purplish, keeled; ray-flowers 5; ligules 2-3 mm. long, yellow, tinged with purple outside; disk-flowers 5-10; corollas 3 mm. long; achenes 3 mm. long, short-hirsute or glabrate; pappus of 3-6 bristles about 4 mm. long, somewhat squamellate at the base, or partly of some minute squamellae, or in the ray-flowers the bristles only 1 or 2.

TYPE LOCALITY: Near Las Bacas, Oaxaca.

DISTRIBUTION: Chihuahua to Jalisco and Oaxaca; Panama.

63. *Pectis uniaristata* DC. Prodr. 5: 99. 1836.

A slender annual; stem angled, glabrous or somewhat scabrous under the nodes, diffusely branched but simple at the base, 1-3 dm. high; leaves linear, mucronate, scabrous above, 1.5-3 cm. long, with 3-5 pairs of bristles below; heads in leafy cymes; peduncles slender, 1-3 cm. long; involucre 4-5 mm. high and nearly as broad, turbinate, purplish; bracts linear, acute or short-acuminate; ray-flowers 5; ligules 2.5 mm. long; disk-flowers about 10; corollas 2 mm. long; achenes 2-2.5 mm. long, strigose; pappus of a shallow crown and 1 or 2 slender awns, 2 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Colima, Jalisco, and Morelos; Sonora (?).

64. *Pectis dichotoma* Klatt, Leopoldina 20: 92. 1884.

Pectis jaliscana Hemsl. Biol. Centr. Am. Bot. 4: 225, in part. 1881.

Pectis uniaristata holostemma A. Gray, Proc. Am. Acad. 19: 46. 1883.

Pectis filipes Schultz-Bip.; Fernald, Proc. Am. Acad. 33: 75, as synonym. 1897. Not *P. filipes* Harv. & Gray. 1849.

An erect annual; stem 0.5-1.5 dm. high, dichotomously branched; leaves linear or oblanceolate-linear, submucronate, 1-2 cm. long, 1-2 mm. wide, with 2-4 pairs of bristles towards the

base; glands in 2-4 rows; heads in leafy cymes; peduncles 1-2 cm. long; involucre 3-4 mm. high, nearly as broad, purplish; bracts linear, acute, only slightly carinate; ray-flowers 5; ligules 1.5-2 mm. long; disk-flowers 3-5; corollas less than 2 mm. long; achenes 2 mm. long, glabrate or short-hispid; pappus of a crown of short united squamellae.

TYPE LOCALITY: Consoquitlo, Mexico.

DISTRIBUTION: Southern Mexico to Guatemala.

65. *Pectis filipes* Harv. & Gray; A. Gray, Mem. Am. Acad. II.

4: 62. 1849.

Pectis filipes subnuda Fernald, Proc. Am. Acad. 33: 76. 1897.

A slender annual; stem 1-5 dm. high, diffusely branched, glabrous or scabrous, shining; leaves glabrous or slightly scabrous, 3-6 cm. long, 1-3 mm. wide, with 1-5 pairs of basal bristles; glands marginal; heads in leafy cymes; peduncles 2-8 cm. long; involucre turbinate, 4-6 mm. high, 3-5 mm. broad; bracts oblanceolate, obtuse, slightly keeled below, often glandless; ray-flowers 5 or 6; ligules 5-6 mm. long, 1-1.5 mm. wide; disk-flowers about 5; corollas 3 mm. long; achenes 4-5 mm. long, hispidulous; pappus of 1-4 awns, 2.5-4 mm. long, and sometimes a few blunt squamellae at their base.

TYPE LOCALITY: "California."

DISTRIBUTION: Western Texas to Arizona, Sonora, and Chihuahua.

66. *Pectis multiseta* Benth. Bot. Voy. Sulph. 20. 1844.

A diffuse annual; stem 1-3 dm. high, puberulent, much branched; leaves lanceolate, 1-2.5 cm. long, 2-4 mm. wide, serrulate, with bristle-tipped teeth; glands scattered, of various sizes; heads in leafy cymes; peduncles 1-3 cm. long; involucre turbinate, about 4.5 mm. high; bracts 5, obovate-cuneate, ciliate, with several elongate glands; ray-flowers about 5; ligules 4-6 mm. long, 2.5-3 mm. wide; disk-flowers 15-20; corollas 3 mm. long; achenes 3-4 mm. long, hispidulous-puberulent; pappus of the ray-flowers of 3, of the disk-flowers of 1 or 2, stout, subulate, retrorsely scabrous awns, or sometimes reduced to a mere crown of short united squamellae.

TYPE LOCALITY: Cape San Lucas, Lower California.

DISTRIBUTION: Lower California.

67. *Pectis Coulteri* Harv. & Gray; A. Gray, Mem. Am. Acad. II.

4: 62. 1849.

A slender annual, or perhaps sometimes perennial; stem diffusely branched, 1-2 dm. high, puberulent; leaves narrowly linear, 1-3 cm. long, 1-2 mm. wide, usually pectinately divided towards the base into 3-5 pairs of linear-subulate bristle-tipped lobes; glands usually in single marginal rows; heads in leafy cymes; peduncles 0.3-3.5 cm. long; involucre cylindroturbinate, 5-7 mm. high, 4-5 mm. broad; bracts 5, rarely 6, linear-oblong, ciliate; ray-flowers 5 or 6; ligules 5-7 mm. long, 2 mm. wide; disk-flowers 7-15; corollas 3 mm. long; achenes slender, 4-5 mm. long, strigose; pappus of the ray-flowers of 3-6, of the disk-flowers of 2-5, stout, subulate, spreading awns about 1.5 mm. long.

TYPE LOCALITY: "California" [probably on the Gila River, Arizona*].

DISTRIBUTION: Arizona and Sonora.

68. *Pectis Bennettii* Klatt, Leopoldina 25: 108. 1889.

A diffusely branched annual; stem terete, puberulent, 1-2 dm. high; leaves linear-oblancoate, acute, sinuate-dentate or entire, 1-2.5 cm. long, 3-4 mm. wide, with 3-5 pairs of bristles and glands in 2 rows on each side of the midrib; heads in leafy cymes; peduncles 2-3 cm. long; involucre campanulate, 4 mm. high and nearly as broad; bracts 5, oblong-oblancoate, strongly keeled, conspicuously glandular-dotted, puberulent; ray-flowers 5; ligules about 5 mm. long and 2 mm. wide; disk-flowers about 8; corollas 3 mm. long; achenes 3.5-4 mm.

* See Coville, Bot. Gaz. 20: 528.

long, pubescent; pappus of the disk-flowers of 2 or 3 minute erect squamellae; that of the ray-flowers of 2 or 3 stout, spreading, retrorsely barbed, subulate awns.

TYPE LOCALITY: Cape San Lucas, Lower California.

DISTRIBUTION: Known only from the type locality.

69. *Pectis ambigua* Fernald, Proc. Am. Acad. 33: 84. 1897.

Pectis multisetata [misprint for *P. multisetata*] Vasey & Rose, Contr. U. S. Nat. Herb. 1: 72. 1890.
Not *P. multisetata* Benth. 1844.

A diffuse annual, or perhaps sometimes perennial; stem rarely more than 1 dm. high, branched from the base, puberulent; leaves linear or linear-oblong, entire, 1.5 cm. long or less, with 1 or 2 pairs of basal bristles; glands usually irregularly scattered; heads in leafy cymes; peduncles 2-10 mm. long; involucre oblong, 3-4 mm. high, 2-3 mm. broad; bracts 5, linear-oblong, strongly keeled, glandular-dotted; ray-flowers mostly 5; ligules 3-4 mm. long; disk-flowers 5-7; corollas 2.5 mm. long; achenes 3 mm. long, sparingly hispidulous; pappus of the disk-flowers of a crown of minute squamellae; that of the ray-flowers of 3 unequal, subulate, retrorsely scabrous, spreading awns.

TYPE LOCALITY: San Gregorio, Lower California.

DISTRIBUTION: Lower California.

70. *Pectis linifolia* L. Syst. Nat. ed. 10. 1221. 1759.

Verbesina linifolia L. Syst. Nat. ed. 10. 1226. 1759.

Pectis punctata Jacq. Enum. Pl. Carib. 28. 1760.

Pectidium punctatum Less., Linnaea 6: 707. 1831.

Tetracanthus linearifolius A. Rich. in Sagra, Hist. Cuba 11: 60. 1850.

Pectis punctata S. Wats. Proc. Am. Acad. 24: 58. 1889.

Pectis linifolia marginalis Fernald, Proc. Am. Acad. 33: 85. 1897.

A tall slender annual; stem 3-10 dm. high, dichotomously branched, glabrous, angled; leaves mostly plane, linear or narrowly linear-lanceolate, 4-6 cm. long, 2-5 mm. wide, dark-green above, glaucous beneath, with or sometimes without 1 or 2 pairs of bristles at the base; glands various, some or all elongate, along the margins, others smaller, usually scattered; peduncles 1-3 cm. long; involucre glabrous or minutely puberulent, 5-6 mm. high, 2-4 mm. broad; bracts 4 or 5, linear, blunt, becoming involute, with long linear black submarginal glands; ray-flowers 4 or 5; ligules about 1 mm. long; disk-flowers 2-5; corollas 2-3 mm. long; achenes 4-7 mm. long, puberulent or glabrate; pappus of 2 or 3 subulate stout divaricate smooth awns, 2-2.5 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Arizona to Lower California, Colombia, Venezuela, and West Indies.

ILLUSTRATIONS: Sloane, Hist. Jam. pl. 149, f. 3; Lam. Tab. Encyc. pl. 684; Jacq. Stirp. Am. pl. 128 (Stirp. Am. Pict. pl. 190; Am. Gew. 3: pl. 234); Plum. Pl. Am. pl. 86, f. 1 (?; poor).

71. *Pectis imberbis* A. Gray, Pl. Wright. 2: 70. 1853.

A rigid perennial with woody root; stem sulcate, 3-10 dm. high, branched, sparingly leafy; leaves thick, linear, 5-7 cm. long, with prominent midrib beneath, with or without 1 or 2 pairs of basal bristles; glands marginal; peduncles 2-4 cm. long; involucre subcylindrical, 7-8 mm. high, 3-4 mm. broad; bracts 5 or 6, linear, blunt, soon involute, with linear glands; ray-flowers 5 or 6; ligules yellow, 6-9 mm. long; disk-flowers 5 or 6; corollas 5-6 mm. long, each lobe with a dark gland; achenes puberulent, 5-6 mm. long; pappus various, usually partly of erect, stout, subulate awns, and partly of small squamellae more or less toothed.

TYPE LOCALITY: On the Sonoita, Sonora.

DISTRIBUTION: Arizona, Sonora, and Chihuahua.

EXCLUDED AND LITTLE-KNOWN SPECIES

PECTIS PASCICULATA Poir. in Lam. Encyc. 5: 120 (1804), of unknown origin, may have come from Mexico or Central America, but no specimens have been seen from there that fully agree with the description. De Candolle referred it to *P. prostrata*.

PECTIS GIBBOSA Llave, Reg. Trim. 1: 451 (1832) is indeterminate.

PECTIS LINEARIS Llave, Reg. Trim. 1: 451 (1832) (not *P. linearis* Willd. 1831) is indeterminable.

LORENTEA AURICULARIS ACAPULCENSIS DC. Prodr. 5: 102 (1836) has not been identified.

PECTIS LATISQUAMA BERLANDIERI A. Gray, Proc. Am. Acad. 5: 181 (1862) has not been identified.

PECTIS BRACTEATA S. Wats. Proc. Am. Acad. 25: 155 (1890) is *Leucactinea bracteata* (S. Wats.) Rydb., belonging to preceding subtribe (see page 180).

PECTIS MULTIFLORA M. E. Jones, Contr. West. Bot. 12: 45 (1908), according to the description, agrees with *P. longipes* A. Gray, except that it is said to be annual.

22. HYDROPECTIS Rydberg, gen. nov.

Aquatic glabrous herbs, sparingly if at all glandular-punctate.* Leaves opposite, linear, fleshy. Heads solitary and short-peduncled in the upper axils, discoid. Involucre turbinate; bracts mostly 5, obovate, somewhat overlapping, slightly concave but not at all carinate. Flowers all hermaphrodite and fertile, included. Corollas yellow; tube short, gradually passing into the narrowly funnelliform throat; lobes short, ovate. Style minutely puberulent; branches linear-oblong, obtuse, arcuate-spreading. Achenes elongate-clavate, somewhat compressed, pubescent, produced at the base into a long stipe. Pappus of 10-12 unequal scabrous bristles.

Type species, *Pectis aquatica* S. Wats.

1. *Hydropectis aquatica* (S. Wats.) Rydberg.

Pectis aquatica S. Wats. Proc. Am. Acad. 23: 279. 1888.

A glabrous water-plant; stem 3 dm. long or more; leaves thick, linear, entire, blunt, 3-4 cm. long; heads solitary in the axils; peduncles less than 1 cm. long, in age recurved; involucre turbinate, about 1 cm. high, 4 mm. broad; bracts 5, obovate, rounded at the apex, somewhat purple-tipped; flowers about 12; corollas 2 mm. long; achenes 8 mm. long, hirsute-strigose; pappus-bristles 10-12, the longer 2 mm. long.

TYPE LOCALITY: Base of Sierra Madre, Chihuahua.

DISTRIBUTION: Known only from the type locality.

* On the specimens examined no glands were seen and the genus may not belong to this tribe.

Tribe 12. ANTHEMIDEAE

PER AXEL RYDBERG

Heads radiate or discoid. Ray-flowers when present pistillate or rarely (among ours only in *Maruta*) neutral; corolla ligulate, or tubular and 2-4-lobed, or (in *Lancisia*, *Gymnostyles*, and *Soliva*) wanting. Disk-flowers hermaphrodite and fertile, or in some species of *Artemisia* sterile, with actinomorphic 4- or 5-lobed corollas. Involucral bracts herbaceous with dry scarious margins and tips. Receptacle with or without chaff, from nearly plane to high-conic. Anthers inserted at the rounded or obtuse base, without basal appendages, the connective produced into a short obtuse or a longer subulate tip. Style-branches of the hermaphrodite flowers short, truncate and hispidulous, fimbriate at the apex, without appendages, or in some species of *Artemisia* the style undivided; style-branches of the pistillate flowers short, oblong, obtuse or truncate at the apex, rarely filiform. Achenes small, cylindrical-oblong or more or less flattened, often unequally ribbed. Pappus wanting or a crown of united squamellae, seldom stronger and unilaterally developed. Leaves usually alternate and often dissected.

Receptacle with chaff, this usually consisting of membranous, more or less concave elongate scale-like paleae.

Style-branches with short appendages; achenes large, obpyramidal (See *Leucampyx* in Tribe HELENIEAE, page 55).

Style-branches without appendages, in the hermaphrodite flowers truncate and hispidulous, fimbriate at the apex; achenes small, oblong or cylindro-prismatic.

Heads usually radiate; disk-corollas with a cylindrical tube and elongate-funnelform throat; anthers with short ovate tips.

Achenes more or less obcompressed, sub-rhombic or obliquely triquetrous in cross-section; tube of the disk-corollas more or less flattened.

Heads small, corymbose-paniculate; involucre campanulate to hemispheric; ligules few, 5-12, short and broad; pappus wanting.

Heads large, solitary at the ends of the branches; involucre saucer-shaped; ligules 10-30, elongate, linear; pappus of a short membranous crown.

Achenes terete, cylindrical or ellipsoid; tube of the disk-corollas cylindrical.

Ray-flowers fertile; paleae of the receptacle membranous, subtending all disk-flowers.

Tube of the disk-corollas produced into a spur-like appendage at the base; ligules in ours white with yellow bases.

Tube of the disk-corollas not appendaged at the base; ligules white or wanting.

Ray-flowers sterile; paleae of the receptacle subulate, stiff, subtending only the upper disk-flowers.

Heads discoid, numerous; corollas funnelform without a distinct tube; anthers with subulate tips.

Receptacle without chaff.

Style-branches with conic or subulate appendages (See HYMENOPAPANAE in Tribe HELENIEAE, page 43).

Style-branches without appendages.

Style-branches linear-filiform (See PALAFOXIANAE in Tribe HELENIEAE, page 58).

Style-branches at least of the disk-flowers short and truncate at the apex.

Heads radiate, with well-developed usually flattened ligules; anther-tips ovate, mostly obtuse.

1. ACHILLEA.

2. COTA.

3. ORMENIS.

4. ANTHEMIS.

5. MARUTA.

18. ARTEMISIASTRUM.

- Pappus represented in both disk- and ray-flowers by a more or less developed crown or margin.
 Receptacle high, hemispheric or conic; achenes with 3-5 ribs on the inner half and nerveless on the back; ligules white.
 Receptacle flat or slightly convex; achenes equally 3-10-angled or 3-10-ribbed.
 Achenes all 5-10-ribbed or 5-10-angled; bracts of the involucre more or less imbricate, the outer shorter; ligules in ours white.
 Achenes of the ray-flowers 3-angled; bracts of the involucre nearly equal; ligules yellow.
- Pappus at least in the disk-flowers wholly wanting.
 Achenes all 10-ribbed or 10-angled; ligules white.
 Achenes of the ray-flowers with 2 or 3 wing-angles; ligules yellow.
- Heads discoid or apparently so; pistillate ray-flowers, if present, without well-developed ligules.
 Marginal pistillate flowers, if present, with corollas; achenes not flattened.
 Anthers with ovate, mostly obtuse tips; heads solitary at the ends of the branches or in a corymbiform inflorescence.
 Heads discoid, homogamous, *i. e.*, ray-flowers wholly wanting.
 Receptacle high, hemispheric or conic; involucre bracts subequal in 2-3 series; achenes 3-5-ribbed on the inner side and nerveless on the back; leaves pinnatifid into narrow divisions.
 Receptacle merely convex; involucre bracts in 4-5 series, distinctly imbricate, the outer much shorter; achenes 10-ribbed; leaves broad, merely crenate or broadly lobed at the base, conspicuously punctate.
- Heads heterogamous; marginal pistillate flowers present.
 Corollas of the marginal flowers oblique, with a somewhat developed ascending convex short ligule; pappus coroniform.
 Corollas of the marginal flowers cylindric or nearly so, 3- or 4-lobed, the limb not oblique; pappus wanting.
 Achenes subcylindric, neither utricular nor swelling in water, equally 5-10-angled; receptacle naked.
 Achenes obovoid, utricular, swelling and becoming gelatinous in water; those of the disk 5-angled, those of the rays 3-angled and 2-winged at the apex; receptacle pubescent.
- Anthers with subulate tips; heads racemose or racemose-paniculate, rarely solitary.
 Pappus present.
 Pappus of 5 subulate squamellae; heads solitary; receptacle naked.
 Pappus of a dentate or lacerate crown; heads paniculate; receptacle pubescent.
- Pappus wanting.
 Corollas and achenes densely arachnoid-villose; spinescent shrubs.
 Corollas and achenes glabrous, glandular-granuliferous, or the limb of the former rarely somewhat pubescent; plant not spinescent.
- Marginal pistillate flowers without corollas; achenes strongly flattened, obcompressed.
 Heads peduncled; marginal flowers pedicelled; style deciduous or only the very base persistent.
 Heads sessile; marginal flowers sessile; style persistent, forming a spine-like beak.
 Achenes not hairy at the apex, with thin plane wings; disk-corollas cylindric, without differentiation between tube and throat.
 Achenes villous at the apex, with thick corky wings; disk-corollas with a slender tube and elongate-funneliform throat.
6. CHAMOMILLA.
 7. MATRICARIA.
 11. TANACETUM.
 8. LEUCANTHEMUM.
 9. CHRYSANTHEMUM.
 6. CHAMOMILLA.
 10. BALSAMITA.
 11. TANACETUM.
 12. SPHAEROMERIA.
 13. VESICARPA.
 14. CHAMARTEMISIA.
 15. CROSSOSTEPHIUM.
 16. Picrothamnus.
 17. ARTEMISIA.
 19. LANCISIA.
 20. SOLIVA.
 21. GYMNOSTYLES.

1. **ACHILLEA** (Vaillant) L. Sp. Pl. 896. 1753.*Millefolium* (Tourn.) Adans. Fam. Pl. 2: 128. 1763.*Pтарmica* (Tourn.) Neck. Elem. 1: 14. 1790.*Alitubus* Dulac, Fl. Hautes-Pyr. 499. 1867.

Perennial caulescent, usually villous, herbs. Leaves alternate, from serrate to tri-pinnatifid. Heads several or many in corymbs or corymbiform panicles, usually radiate. Involucre campanulate to hemispheric; bracts imbricate in 3-4 series, the outer usually much shorter. Receptacle conic or convex, chaffy; paleae membranous, in ours oblong and acute or acutish and nearly equaling the disk-flowers. Ray-flowers few, 5-12, pistillate and fertile; ligules short and broad, in most species white or sometimes pink or purple, in a few yellow. Disk-flowers 15-75, hermaphrodite and fertile; corollas yellowish-white or straw-colored, rarely bright-yellow, equaling or slightly longer than the narrowly funnelform throat; lobes 5. Anthers with ovate obtuse tips. Style slightly exerted or included; branches in the pistillate flowers oblong, obtuse, in the hermaphrodite ones with truncate, fimbriate tips. Achenes oblong or obovate, obcompressed, callous-margined, glabrous. Pappus wanting.

Type species, *Achillea santolina* L.

Leaves pinnatifid to tripinnatifid.

Ligules yellow.

Ligules white, pink, or purplish.

Rachis of the leaves not dentate.

Bracts with dark-brown, almost black margins.

Involucre 5-6 mm. high, 4-5 mm. broad.

Ultimate segments of the leaves long and linear, not thickened at the apex; bracts all acute.

Ultimate segments of the leaves ovate, lanceolate, or oblanceolate, short, often thickened at the apex; bracts except the outermost obtuse.

Leaves and stem sparingly villous.

Upper leaves 1-2 cm. broad, with spreading not densely crowded divisions.

Plant low, 2-4 dm. high; bracts and branches of the inflorescence densely villous; ligules about 3 mm. long.

Plant tall, 3-6 dm. high; bracts nearly glabrous; branches of the inflorescence sparingly pubescent and glandular; ligules about 4 mm. long.

Upper leaves 5-10 mm. broad, with short densely crowded divisions.

Leaves and stem densely long-villous, almost white.

Involucre 3.5-4 mm. high, about 3 mm. broad.

Bracts with light-brown, yellowish, or straw-colored margins.

Involucre 5-8 mm. high, 4 mm. broad or more.

Plant glabrous or sparingly pubescent; inflorescence open; involucre about 8 mm. high; ligules 5 mm. long.

Plant long-villous; inflorescence dense; involucre campanulate, 5-6 mm. high; ligules 4 mm. long or less.

Ligules 3-4 mm. long.

Stem very stout, densely villous; heads and leaf-segments densely crowded.

Stem more slender, not densely villous; heads not densely crowded.

Ultimate divisions of the leaves linear, not thickened, spreading, not crowded; bracts with light-brown margins.

Ultimate divisions lanceolate or ovate, usually thickened towards the apex, ascending and crowded; bracts and their margins of the same color, light-yellowish or straw-colored.

Ligules 1-1.5 mm. long.

Involucre 4-4.5, rarely 5 mm. high, 2.5-4 mm. broad.

Plant puberulent, not villous.

Plant more or less villous.

Ultimate leaf-segments linear; rachis merely margined.

Ligules 2.5-4 mm. long; leaf-segments ascending, crowded.

Ligules 1.5-2.5 mm. long; leaf-segments more or less spreading, not crowded.

Margins of the bracts light-brown, darker than the body of the bracts; ligules fully 2 mm. long.

Margins of the bracts of the same color as the bracts, yellowish or straw-colored.

1. *A. tomentosa*.2. *A. borealis*.3. *A. nigrescens*.4. *A. Palmeri*.5. *A. fusca*.6. *A. arenicola*.7. *A. subalpina*.8. *A. laxiflora*.6. *A. arenicola*.9. *A. californica*.10. *A. pacifica*.11. *A. gigantea*.12. *A. puberula*.13. *A. lanulosa*.14. *A. Pecten-Veneris*.

- Bracts dull, yellowish. 15. *A. occidentalis*.
 Bracts shining, greenish on the back. 16. *A. setacea*.
- Ultimate leaf-segments ovate or lanceolate.
 Plant densely white-villous with long hairs; inflorescence very dense; ligules about 1.5 mm. long; leaf-segments crowded. 17. *A. pannonica*.
- Plant sparingly villous or glabrate; inflorescence open; ligules 2-3 mm. long.
 Leaves 2-4 mm. wide; segments densely crowded, ascending. 18. *A. angustissima*.
- Leaves 1-4 cm. wide; segments not crowded, spreading; rachis distinctly winged.
 Stem-leaves linear to lance-oblong in outline, with numerous pairs of primary divisions; outer bracts obtuse.
 Leaves conspicuously punctate, their ultimate segments strongly callous-thickened towards the apex; ligules purplish. 19. *A. asplenifolia*.
- Leaves not conspicuously punctate, their ultimate segments not callous-thickened towards the apex; ligules white, rarely pink. 20. *A. Millefolium*.
- Stem-leaves oval or ovate in outline with 6-8 pairs of primary divisions; outer bracts acute. 21. *A. ligustica*.
- Rachis of the leaves dentate throughout, broadly winged; leaves lanceolate in outline, with broad obovate ultimate divisions. 22. *A. dentifera*.
- Leaves serrate or incised, not pinnatifid. 23. *A. multiflora*.
 Ligules about 1 mm. long; leaves incised. 24. *A. Ptarmica*.
 Ligules about 5 mm. long; leaves serrate.

1. *Achillea tomentosa* L. Sp. Pl. 897. 1753.

Alitubus tomentosus Dulac, Fl. Hautes-Pyr. 500. 1867.

Millefolium tomentosum Fourr. Ann. Soc. Linn. Lyon II. 17: 91. 1869.

A low perennial, with a rootstock; stem 1-2.5 dm. high, erect or ascending, sulcate, simple, villous; leaves 2-5 cm. long, 3-5 mm. wide, linear in outline, densely villous, bipinnatifid, with short crowded divisions, the ultimate ones narrowly lanceolate, spinulose-mucronate; heads rather few, in a dense corymbiform panicle; involucre 3-4 mm. high, 2-3 mm. broad, villous; bracts about 15, in 3-4 series, oval to elliptic, rounded at the apex, yellowish with borders of the same color; ray-flowers 3-5; ligules bright-yellow, flabelliform or suborbicular, with 3-5 rounded lobes, 1.5-2 mm. long; disk-flowers 20-25; corollas yellow, 3 mm. long; achenes nearly 2 mm. long, scarcely margined.

TYPE LOCALITY: France.

DISTRIBUTION: Westford, Massachusetts; adventive from the mountains of southern Europe. ILLUSTRATIONS: Engl. Bot. pl. 2532; Bot. Mag. pl. 498; Reichenb. Ic. Fl. Germ. 16: pl. 1022, II-III; Coste, Fl. Fr. f. 1967; Fl. Deuts. ed. 5. pl. 3026.

2. *Achillea borealis* Bong. Mém. Acad. St.-Pétersb. VI. 2: 149. 1832.

Ptarmica borealis DC. Prodr. 6: 21. 1837.

Achillea Millefolium occidentale Ledeb. Fl. Ross. 2: 532. 1846. Not *A. Millefolium occidentale* DC. 1837.

Achillea anethifolia Fisch.; Herder, Bull. Soc. Nat. Mosc. 38: 404, as synonym. 1865.

A perennial, with a rootstock; stem 3-8 dm. high, striate or grooved, sparingly long-villous; leaves bi- or tri-pinnatifid, sparingly villous, the lower petioled, often 2-3 dm. long, 2-6 cm. wide; upper leaves sessile, lanceolate with a broad base, 1-2 cm. wide; primary divisions ovate in outline, spreading; ultimate divisions linear, spinulose-mucronate; heads numerous, in more or less compound corymbiform panicles; involucre fully 5 mm. high and 4 mm. broad; bracts 20-25, ovate or ovate-lanceolate, all acute, the outer ones half as long as the innermost; margins dark-brown or nearly black; ray-flowers 5 or 6; ligules white or pink, 3-4 mm. long, nearly orbicular, round-lobed; disk-flowers 20-25; corollas yellowish-white, 3 mm. long, glandular-glanduliferous; achenes nearly 3 mm. long, strongly wing-margined.

TYPE LOCALITY: Island of Sitka, Alaska.

DISTRIBUTION: Vancouver Island to Alaska and Yellowstone Park; California (?); also in eastern Siberia.

3. *Achillea nigrescens* (E. Meyer) Rydberg, sp. nov.

Achillea Millefolium nigrescens E. Meyer, Pl. Labrad. 65. 1830.

Achillea borealis Britton, Man. 1013, in part. 1901.

A perennial, with a creeping rootstock; stem 2-4 dm. high, sulcate, villous, often branched above; leaves bi- or tri-pinnatifid, 5-10 cm. long, 1-1.5 cm. wide, the lower oblanceolate and petioled, the upper lanceolate in outline and broadly sessile; primary divisions ovate in outline and spreading, the ultimate ones lanceolate or oblanceolate and with somewhat callous mucronate tips; heads in more or less compound corymbiform panicles; involucre campanulate, about 5 mm. high, villous; bracts 20-25, in 4 series, the outer lance-ovate and acutish, the inner oblong and obtuse; margins dark-brown; ray-flowers about 5; ligules white or pinkish, about 3 mm. long, suborbicular; disk-flowers about 25; corollas about 3 mm. long, yellowish-white; achenes 2.5 mm. long, with thick margins.

TYPE LOCALITY: Labrador.

DISTRIBUTION: Greenland and Newfoundland to Mt. Washington, New Hampshire, Hudson Bay, and Mackenzie; Iceland; apparently also on St. Paul's Island, Alaska.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 4555 (as *A. borealis*).

4. *Achillea Palmeri* Rydberg, sp. nov.

A stout perennial, with a creeping rootstock; stem 3-6 dm. high, sulcate, sparingly villous, branched above; leaves usually less than 1 dm. long, 1-2 cm. wide, bipinnatifid, sparingly villous; primary divisions ovate, spreading, the ultimate ones lanceolate, rather conspicuously punctate, callous-thickened towards the spinulose-mucronate tips; heads numerous, in broad, branched, corymbiform, rather flat-topped panicles; involucre broadly campanulate, fully 5 mm. high and about as broad, nearly glabrous; bracts about 20, the outer ovate and acutish, the inner elliptic and obtuse; margins narrow, dark-brown; ray-flowers usually 5; ligules suborbicular, about 4 mm. long, white; disk-flowers about 25; corollas fully 3 mm. long, yellowish-white; achenes more than 2 mm. long, thick-margined.

Type collected at Saltillo, Coahuila, or vicinity, November 10-20, 1902, *Edward Palmer 326* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Coahuila to Vera Cruz and Hidalgo; apparently also southwestern Colorado, southeastern Utah, and central California.

5. *Achillea fusca* Rydberg, sp. nov.

A stout perennial, with a creeping rootstock; stem 3-6 dm. high, sulcate, simple, long-villous; leaves 1-2 dm. long, 5-10 mm. wide, or the basal ones 2-3 cm. wide, bipinnatifid, linear or the lower linear-oblanceolate in outline, long-villous; primary divisions short, ascending, ovate in outline, the ultimate ones lanceolate or ovate, callous-thickened towards the spinulose-mucronate tip; heads in a rather dense rounded corymbiform panicle; involucre about 5 mm. high and 4 mm. broad, villous; bracts about 20, in 4 series, the outer oval, the inner elliptic, all rounded or obtuse at the apex; margins dark-brown, almost black; ray-flowers about 5; ligules white or pinkish, suborbicular, round-lobed, 3-4 mm. long; disk-flowers 20-25; corollas yellowish-white or pinkish, 3 mm. long; achenes nearly 3 mm. long, strongly margined.

Type collected on hillsides, Mt. Paddo, [Washington.] September 28, 1893, *Suksdorf 1606* (herb. Columbia Univ.).

DISTRIBUTION: Washington to Alberta, Vancouver Island, and Yukon.

6. *Achillea arenicola* A. Heller, *Muhlenbergia* 1: 61. 1904.

A stout perennial, with a long creeping rootstock; stem 3-5 dm. high, densely covered by silky-villous white pubescence; leaves bipinnatifid, densely white-villous, 5-10 cm. long, usually less than 1 cm. wide, the lower linear-oblanceolate in outline; divisions densely crowded and ascending, the ultimate ones ovate or lanceolate, with callous mucronate tips; heads in dense round-topped corymbiform panicles; involucre campanulate, 5-6 mm. high, 4-5 mm. broad; bracts densely villous, 20 or more in 4 series, the outer ovate, acute, the inner elliptic or oblong, obtuse; margins dark-brown; ray-flowers about 5; ligules white, nearly orbicular,

2.5-3 mm. long; disk-flowers 20 or more; corollas cream-colored, 3 mm. long; achenes 2 mm. long, slightly margined.

TYPE LOCALITY: Sandhills at the upper end of Bodega Bay, Sonoma County, California.

DISTRIBUTION: Coast and islands of California; apparently also in subalpine situations, Nevada County, California, and on Vancouver Island.

7. *Achillea subalpina* Greene, Leaflets 1: 145. 1905.

Achillea lanulosa alpicola Rydb. Mem. N. Y. Bot. Gard. 1: 426. 1900.

Achillea alpicola Rydb. Bull. Torrey Club 33: 157. 1906.

Achillea Millefolium alpicola Garrett, Spring Fl. Wasatch Reg. 101. 1911.

A low perennial, with a creeping rootstock; stem 1-3 dm. high, striate, sparingly villous, simple; leaves 5-10 cm. long, 4-10 mm. wide, bipinnatifid, sparingly villous, the lower linear, oblanceolate in outline and petioled, the upper sessile and linear; primary divisions ovate in outline, short, usually ascending and crowded, the ultimate ones lanceolate or lance-linear, spinulose-mucronate; heads not numerous, in small congested, round-topped corymbs with short branches; involucre campanulate, 3.5-4 mm. high and about 3 mm. broad, sparingly villous; bracts about 20, in 4 series, the outer ovate, the inner elliptic, all obtuse and with dark-brown or almost black margins; ray-flowers 5; ligules suborbicular, round-lobed, 2-3 mm. long, white or pinkish; disk-flowers 15-20; corollas yellowish-white, 2.5 mm. long; achenes 2 mm. long, narrowly margined.

TYPE LOCALITY: Subalpine slopes of Mount Ouray, Colorado.

DISTRIBUTION: High mountains, from Hudson Bay and Alberta to New Mexico, California, British Columbia, and Yukon; Gaspé Peninsula, Quebec.

8. *Achillea laxiflora* Pollard & Cockerell, Proc. Biol. Soc. Wash. 15: 179. 1902.

A stout perennial, with a rootstock; stem about 5 dm. high, glabrous or sparingly villous; leaves coarsely pinnatifid, the upper 5-6 cm. long, glabrous; divisions cleft or lobed; rachis conspicuously wing-margined; ultimate divisions lance-linear, acute; heads numerous, in loose corymbs, long-peduncled; involucre turbinate, about 8 mm. high and 6 mm. broad; bracts about 25, in 4 series, scarious, with green keel, the outer acutish, ovate, the inner obtuse or rounded at the apex; ray-flowers about 5; ligules white, suborbicular, about 5 mm. long; disk-flowers 40 or more; corollas 3 mm. long, yellowish-white; achenes linear, prominently winged towards the apex.

TYPE LOCALITY: Sandia Mountains, New Mexico.

DISTRIBUTION: New Mexico and northeastern Arizona.

9. *Achillea californica* Pollard, Bull. Torrey Club 26: 369. 1899.

Achillea Millefolium f. *californica* H. M. Hall, Univ. Calif. Publ. Bot. 3: 211. 1907.

A robust perennial, with a creeping rootstock; stem 5-10 dm. high, usually branched above, striate or sulcate, villous, especially above, with long hairs; leaves numerous, bi- or tri-pinnatifid, sparingly villous, the lower petioled, 10-15 cm. long, 2-3 cm. wide, the upper sessile and clasping, lanceolate in outline, 1-2 cm. wide; rachis merely margined; primary divisions ovate in outline, spreading, the ultimate ones linear or lance-linear, spinulose-tipped; heads numerous, in compound corymbiform panicles; involucre 5-6 mm. high, 4 mm. broad, rather densely villous; bracts about 20, in 4 series, all obtuse or rounded at the apex, the outer oval, the inner oblong; margins brown; ray-flowers 5 or 6; ligules white, orbicular or rounded-oval, 3-4 mm. long; disk-flowers 25-30; corollas 3 mm. long, yellowish-white; achenes 2 mm. long, thick-margined.

TYPE LOCALITY: Sea coast at Santa Isabel, California.

DISTRIBUTION: California to Washington and Idaho.

10. *Achillea pacifica* Rydberg, sp. nov.

A stout perennial, with a creeping rootstock; stem 3-7 dm. high, sulcate, usually decidedly long-villous, simple or branched above; leaves 1-2 dm. long, 5-10 mm. wide, linear in outline,

villous, bipinnatifid; primary divisions ovate in outline, short, ascending, rather crowded, the ultimate ones lanceolate or ovate, strongly punctate, callous-thickened towards the spinulose-mucronate tips; heads numerous, in round-topped corymbiform panicles; involucre about 5 mm. high and 4 mm. broad, villous, campanulate; bracts about 20, yellowish or straw-colored, with margins of the same color, the outer ones ovate, the inner elliptic or oblong, all obtuse or rounded at the apex; ray-flowers about 5; ligules suborbicular, round-lobed, 3-4 mm. long; disk-flowers 20 or more; corollas yellowish-white, nearly 3 mm. long; achenes fully 2 mm. long, thick-margined.

Type collected at Grenada, Siskiyou County, California, June 19, 1905, *A. A. Heller 8067* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Washington and Idaho to southern California.

11. *Achillea gigantea* Pollard, Bull. Torrey Club 26: 370. 1899.

A robust perennial, with a rootstock; stem nearly 1 m. high, often much branched, sulcate, densely long-villous; stem-leaves 5-10 cm. long, bipinnatifid, linear-lanceolate in outline, densely long-villous; primary divisions short, crowded, the ultimate ones linear to ovate, usually obtuse, 1-2 mm. long; heads in dense many-branched corymbiform panicles, with densely pubescent branches; involucre 5-6 mm. high, about 4 mm. broad; bracts greenish-yellow throughout, the outer acutish, ovate, the inner oblong, rounded at the apex; ray-flowers about 5; ligules very small, 1-1.5 mm. long; disk-flowers about 30; corollas yellowish-white; achenes elliptic, obscurely margined.

TYPE LOCALITY: Tulare Lake, California.

DISTRIBUTION: Type locality, in Owen's Valley, and near Fort Tejon, California.

12. *Achillea puberula* Rydberg, sp. nov.

A stout perennial; stem about 5 dm. high, sulcate, puberulent; leaves linear or linear-oblancoate in outline, 5-10 cm. long, less than 1 cm. wide, bipinnatifid, puberulent, not villous, conspicuously punctate; rachis distinctly winged, about 1 mm. wide; primary divisions ovate, short, ascending, the ultimate ones oblanceolate or obovate, thickened towards the spinulose-mucronate tips; heads numerous, in compound corymbiform panicles; involucre about 4 mm. high and 3 mm. broad, nearly glabrous, minutely puberulent; bracts about 20, the outer lanceolate or lance-ovate, less than half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers about 5; ligules white, suborbicular, 2 mm. long; disk-flowers about 20; corollas yellowish-white, 2.5 mm. long, densely glandular-granuliferous; achenes 2 mm. long, with thick margins.

Type collected in Suisun Marsh, California, July 6, 1913, *Alice Eastwood 3460* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Central California.

13. *Achillea lanulosa* Nutt. Jour. Acad. Phila. 7: 36. 1834.

Achillea tomentosa Pursh, Fl. Am. Sept. 563. 1814. Not *A. tomentosa* L. 1753.

Achillea Millefolium lanulosa Piper, Mazama 2: 97. 1901.

Achillea lanulosa arachnoidea Lunell, Am. Midl. Nat. 1: 235. 1910.

A perennial, with a creeping rootstock; stem 3-5 dm. high, more or less densely villous, simple, striate; leaves 5-10 cm. long, rarely more than 1 cm. wide, the lower oblanceolate in outline and petioled, the upper sessile and clasping, linear in outline; primary divisions lanceolate in outline, ascending, crowded, the ultimate ones linear, spinulose-mucronate; rachis scarcely margined; heads in flat-topped corymbiform panicles; involucre campanulate, 4-4.5 mm. high, 3-4 mm. broad, villous; bracts about 20, in 4 series, the outer lance-ovate, obtusish, the inner elliptic or oblong, obtuse; margins light-brown; ray-flowers commonly 5; ligules white, 2.5-3.5 mm. long, nearly orbicular, round-lobed; disk-flowers about 20; corollas 2.5 mm. long, yellowish-white; achenes 2 mm. long, with thick margins.

TYPE LOCALITY: Banks of the Kooskoosky [Clearwater River, Idaho].

DISTRIBUTION: Minnesota and Saskatchewan to Kansas, Chihuahua, California, and British Columbia; occasionally introduced eastward to Ontario.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2, f. 4554.

14. *Achillea Pecten-Veneris* Pollard, Bull. Torrey Club 26: 371. 1899.

A perennial, with a creeping rootstock; stem 3-6 dm. high, simple, sulcate, sparingly villous; leaves 8-12 cm. long, about 1 cm. wide, the lower oblanceolate and petioled, the upper lance-oblong and sessile, bipinnatifid, sparingly pubescent; primary divisions ovate in outline, somewhat ascending or spreading; ultimate divisions linear or nearly filiform, spinulose-mucronate; heads in branched corymbiform flat-topped panicles; involucre 4-4.5 mm. high, 3-4 mm. broad; bracts 18-20, in 4 series, the outermost ovate, acutish, half as long as the elliptic, obtuse innermost; margins narrow, light-brown; ray-flowers about 5; ligules white, nearly orbicular, 2-2.5 mm. long, round-lobed; disk-flowers about 20; corollas 2.5 mm. long, yellowish-white, glandular-granuliferous; achenes broadly margined.

TYPE LOCALITY: Guanajuato.

DISTRIBUTION: Central and southern Mexico.

15. *Achillea occidentalis* Raf.; (DC. Prodr. 6: 24, as synonym. 1837) Rydb. Bull. Torrey Club 37: 456. 1910.

Achillea setacea Schw. in Keating, Narr. Exp. Long 2: 396. 1824. Not *A. setacea* Waldst. & Kit. 1802.

Achillea Millefolium occidentale DC. Prodr. 6: 24. 1837.

A perennial, with a creeping rootstock; stem 3-5 dm. high, striate, silky-villous, mostly simple; leaves thrice pinnatifid, sparingly villous, the lower about 1 dm. long, 1-2 cm. wide, oblanceolate in outline, petioled, the upper lance-oblong, sessile, about 1 cm. wide; rachis merely margined; primary divisions ovate in outline, spreading, the ultimate ones linear and spinulose-tipped; heads numerous, in corymbiform panicles; involucre campanulate, 4 mm. high, 2.5-3 mm. broad, villous; bracts 18-20, in 4 series, all acutish, the outer lanceolate, half as long as the oblong innermost; margins yellowish or straw-colored; ray-flowers 4 or 5; ligules white, less than 2 mm. long, nearly orbicular; disk-flowers about 20; corollas yellowish-white, 2.5 mm. long; achenes 2 mm. long, with narrowed margins. (Closely related to the following species.)

TYPE LOCALITY: Illinois.

DISTRIBUTION: Common from Indiana to Tennessee, Arkansas, Nebraska, and Minnesota, but ranging from Massachusetts to Florida and Colorado.

16. *Achillea setacea* Waldst. & Kit. Pl. Rar. Hung. 1: 82. 1802.

A perennial, with a creeping slender rootstock; stem 2-4 dm. high, striate, green, sparingly silky-villous, decumbent at the base; leaves twice pinnatifid, green, sparingly pubescent, the lower 1-1.5 dm. long, narrowly oblanceolate, petioled, the upper linear, sessile, 5-8 cm. long; rachis margined; primary divisions obovate in outline, spreading, the ultimate ones linear, spinulose-tipped; heads in open corymbiform panicles; involucre campanulate, 3-4 mm. high; bracts 18-20, in 4 series, elliptic, obtuse, the midrib prominent, straw-colored, bordered by light-green on both sides; margins straw-colored; ray-flowers 4 or 5; ligules white, less than 2 mm. long, suborbicular; disk-flowers 10-15; corollas yellowish-white.

TYPE LOCALITY: Near Pest, Hungary.

DISTRIBUTION: Edgartown, Massachusetts, and Saguinay County, Quebec; adventive from Europe.

ILLUSTRATIONS: Waldst. & Kit. Pl. Rar. Hung. pl. 80; A. Dietr. Fl. Boruss. pl. 776.

17. *Achillea pannonica* Scheele, Linnaea 18: 471. 1844.

Achillea lanata Spreng.; Willd. Enum. 915. 1809. Not *A. lanata* Lam. 1778.

Achillea Millefolium lanata Koch, Syn. Fl. Germ. ed. 2. 411. 1844.

A perennial, with a creeping cylindrical rootstock; stem erect, simple, 3-6 dm. high, densely silky-villous, grooved; leaves bipinnatifid, densely silky-villous, 4-10 cm. long, the lower petioled, linear-oblanceolate in outline, 1-2 cm. wide, the upper linear, sessile, 0.5-1 cm. wide; primary divisions short, usually close together and ascending; rachis narrowly winged; secondary segments densely crowded, usually cleft into a few ovate, callous-mucronate lobes; heads in

dense rounded corymbiform panicles; involucre campanulate, 4 mm. high, 2-2.5 mm. broad; bracts 15-18, villous, in 4 series, the outer ovate, acute, half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers usually 5; ligules white, almost orbicular, 1.5 mm. long, roundly 3-lobed; disk-flowers about 12; corollas yellowish-white, 2.5 mm. long, sparingly glandular-granuliferous; tube about equaling the trumpet-shaped throat.

TYPE LOCALITY: Near Pest, Hungary.

DISTRIBUTION: Nantucket Island, Massachusetts, and Gaspé Peninsula, Quebec; adventive from Europe.

ILLUSTRATION: Reichenb. Ic. Fl. Germ. 16: *pl.* 1028, 11.

18. *Achillea angustissima* Rydberg, sp. nov.

A slender perennial, with a rootstock; stem striate, sparingly long-villous, simple; leaves narrowly linear in outline, bipinnatifid, 5-10 cm. long, 2-4 mm. wide; primary divisions short and crowded, ovate, the ultimate ones short, lanceolate, callous towards the spinulose-mucronate tips; heads many, in rather open flat-topped corymbs; involucre about 4.5 mm. high and 3 mm. broad; bracts sparingly villous, 18-20, in 4 series, light-brown or straw-colored with margins of the same color, the outer lanceolate, the inner oblong, all acutish; ray-flowers usually 5; ligules white, broadly oval, about 4 mm. long, 2.5-3 mm. wide; disk-flowers 15-20; corollas yellowish-white, 2.5 mm. long; achenes fully 2 mm. long, narrowly margined.

Type collected at Nasqually, Oregon, *Wilkes Expedition 41* (Torrey Herbarium; herb. Columbia Univ.).

19. *Achillea asplenifolia* Vent. Descr. Pl. Cels *pl.* 95. 1803.

Achillea rosea Desf. Tabl. 105. 1804.

Achillea Millefolium crustata Rochel, Pl. Banat. 71. 1828.

Achillea crispata Lam.; DC. Prodr. 6: 26, as synonym. 1837.

? *Achillea Millefolium rosea* Rand & Redf. Fl. Mt. Desert 118. 1894.

Achillea Millefolium asplenifolia Farwell, Asa Gray Bull. 3: 21. 1895.

A perennial, with a creeping cylindrical rootstock; stem erect, 3-6 dm. high, sparingly silky-villous to nearly glabrous, simple or branched above; leaves glabrous and conspicuously punctate above, sparingly villous beneath, bi- or tri-pinnatifid, 4-15 cm. long, the lower petioled, oblanceolate, the upper sessile, linear, 1-1.5 cm. wide; primary divisions ovate in outline, spreading, the secondary ones lanceolate or ovate, entire or few-lobed, the segments or lobes with callous lanceolate tips; heads in rather open, round-topped, corymbiform panicles; involucre campanulate, 4-4.5 mm. high, 3-4.5 mm. broad; bracts in about 4 series, nearly glabrous, keeled, the outer ovate, half as long as the oblong acute inner ones; margins light-brown; ray-flowers about 5; ligules nearly orbicular, rose or purple, rarely white, about 2.5 mm. long; disk-flowers 20 or more; corollas yellowish-white, 2.5 mm. long, nearly glabrous; achenes 2 mm. long, with thick margins.

TYPE LOCALITY: Garden of J. M. Cels, Paris, from seed supposed to come from North America.

DISTRIBUTION: Nova Scotia to South Dakota and North Carolina; escaped from cultivation.

ILLUSTRATIONS: Vent. Descr. Pl. Cels *pl.* 95; Rochel, Pl. Banat. *f.* 65; Fl. Dan. *pl.* 1937.

20. *Achillea Millefolium* L. Sp. Pl. 899. 1753.

Alitubus Millefolium Dulac, Fl. Hautes-Pyr. 500. 1867.

A perennial, with a creeping rootstock; stem 3-6 dm. high, simple or branched above, sparingly villous, striate; leaves sparingly villous, bi- or tri-pinnatifid, the lower oblanceolate in outline, 1-2 dm. long, 2-4 mm. wide, petioled, the upper sessile, linear, oblong, 1-2.5 cm. wide; primary divisions ovate in outline, divaricate; rachis winged, 1-2 mm. broad; ultimate divisions linear-lanceolate, spinulose-tipped; heads many, in corymbiform panicles; involucre 4-5 mm. high, 3-5 mm. broad, villous; bracts about 20, in 4 series, the outer ovate, obtuse, about half as long as the innermost; inner bracts oblong, obtuse; margins light-brown, rarely dark-brown; ray-flowers mostly 5; ligules white or rarely pink or rose-colored, orbicular, 2.5-3 mm. long; disk-flowers 20-25; corollas 2.5-3 mm. long, yellowish-white; achenes 2 mm. long, with thick wing-margins.

TYPE LOCALITY: Europe.

DISTRIBUTION: Naturalized or native (?) from Nova Scotia and Quebec to New Jersey and Pennsylvania, occasionally found as far as Florida, Illinois, and Alberta; Yukon; Bermudas; native of Europe and Asia.

ILLUSTRATIONS: Curt. Fl. Lond. 6: *pl.* 61 [2: *pl.* 177]; Engl. Bot. *pl.* 758; Fl. Dan. *pl.* 737; Sv. Bot. *pl.* 74; Schrank, Fl. Monac. *pl.* 9; Hayne, Arzn. Gew. 9: *pl.* 45; Woodv. Med. Bot. *pl.* 15; Reichenb. Ic. Fl. Germ. 16: *pl.* 1026; Coste, Fl. Fr. *f.* 1979; Fl. Deuts. ed. 5. *pl.* 3027; Britt. & Brown, Ill. Fl. *f.* 3983; ed. 2. *f.* 4553.

21. *Achillea ligustica* All. Fl. Ped. 1: 181. 1785.

A robust perennial, with a short creeping rootstock; stem 2-8 dm. high, erect, sparingly villous or puberulent, simple, or branched above; leaves oval or ovate in outline, 2-6 cm. long, 1-2 cm. wide, bipinnatifid, with 6-8 pairs of primary divisions, the lower petioled, the upper sessile, sparingly pubescent; primary divisions ovate in outline, spreading; rachis winged, 1-2 mm. wide; ultimate divisions lanceolate or ovate, callous-tipped; heads in rather small flat-topped panicles; involucre campanulate, about 4 mm. high and 3 mm. broad; bracts sparingly villous, keeled, the outer lance-ovate, acute, half as long as the oblong acute innermost ones; margins light-brown; ray-flowers about 5; ligules nearly orbicular, 2-3 mm. long, usually white, obtusely lobed; disk-flowers about 20; corollas yellowish-white, sparingly glandular-puberulent, 2.5 mm. long; achenes 1.5 mm. long, bluntly margined.

TYPE LOCALITY: Piedmont, Italy.

DISTRIBUTION: Nova Scotia to Massachusetts, the Catskill Mountains of New York, and Michigan; adventive from southern Europe.

ILLUSTRATIONS: All. Fl. Ped. *pl.* 53. *f.* 2; Sibth. Fl. Graeca *pl.* 897; Reichenb. Ic. Fl. Germ. 16: *pl.* 1023, III.

22. *Achillea dentifera* DC. Fl. Fr. 6: 485. 1815.

A perennial, with a creeping rootstock; stem 4-8 dm. high, sulcate, villous, more or less branched; leaves pubescent, bipinnately divided, the lower oblanceolate, petioled, 1-1.5 dm. long, 1-3 cm. wide, the upper lanceolate or oblong-lanceolate, 5-8 cm. long, 1.5-2 cm. wide; rachis with a broad dentate wing; primary and secondary divisions obovate, more or less spreading, the latter usually dentate and the teeth callous-tipped and mucronate; heads very numerous, in compound corymbiform panicles; involucre rounded-campanulate, about 4 mm. high and as broad; bracts 20-25, in 4 series, villous, elliptic, rounded at the apex, with light-brown margins, the outer about half as long as the innermost; ray-flowers about 5; ligules white or pink, 2.5-3 mm. long, suborbicular, obscurely lobed; disk-flowers about 25; corollas yellowish-white, 2.5 mm. long; achenes 2 mm. long, narrowly margined.

TYPE LOCALITY: Alps in Provence and Piedmont.

DISTRIBUTION: Gaspé Peninsula (Quebec), Massachusetts, and New York; adventive from the Alps.

ILLUSTRATION: Coste, Fl. Fr. *f.* 1977.

23. *Achillea multiflora* Hook. Fl. Bor. Am. 1: 318. 1833.

Achillea Ptarmica Richards. in Frankl. Journey ed. 2. App. 33. 1823. Not *A. Ptarmica* L. 1753.

A perennial, with a rootstock; stem usually 5-8 dm. high, sulcate, sparingly villous or in age glabrate; leaves linear, 5-10 cm. long, 4-8 mm. wide, incised or doubly serrate, sparingly villous or glabrate; heads numerous, in compound corymbiform panicles; involucre rounded-campanulate, about 5 mm. high and broad; bracts about 25, in 4 series, sparingly villous or glabrate, the outer lanceolate, acute, half as long as the oblong obtuse innermost ones; ray-flowers 6-12; ligules white, broader than long, 1-1.2 mm. long, 2 mm. wide; disk-flowers 25-30; corollas yellowish-white, 2.5 mm. long; achenes 2.5 mm. long, broadly wing-margined.

TYPE LOCALITY: Wooded country as far north as Fort Franklin, British America.

DISTRIBUTION: Manitoba to Alberta, Alaska, and the Arctic coast.

24. *Achillea Ptarmica* L. Sp. Pl. 898. 1753.

Ptarmica integrifolia Gilib. Fl. Lithuan. 216. 1782.

Achillea sylvestris S. F. Gray, Nat. Arr. Brit. Pl. 2: 458. 1821.

Ptarmica vulgaris DC. Prodr. 6: 23. 1837.

A perennial, with a creeping rootstock; stem 3-6 dm. high, erect, sulcate, branched above, glabrous, or pubescent above; leaves glabrous or nearly so, linear, 4-10 cm. long, 3-5 mm.

wide, closely and finely serrate; heads few in open simple or compound corymbs; involucre hemispheric, villous, 4-5 mm. high, 8 mm. broad; bracts 25-30, in about 3 series, the outer lanceolate, the inner oblong, all acutish and with pale margins; ray-flowers 8-10; ligules white, 4-5 mm. long, suborbicular, round-lobed; disk-flowers 50-75; corollas 3 mm. long; achenes 2 mm. long, broadly wing-margined.

TYPE LOCALITY: Temperate Europe.

DISTRIBUTION: Labrador to New York, Missouri, and Michigan; adventive or naturalized from northern Europe and Asia.

ILLUSTRATIONS: Curt. Fl. Lond. 5: *pl. 60* [2: *pl. 176*]; Engl. Bot. *pl. 757*; Fl. Dan. *pl. 643*; Sv. Bot. *pl. 207*; Hayne, *Arzn. Gew. 9: pl. 44*; Baxter, *Brit. Bot. pl. 36*; Reichenb. *ic. Fl. Germ. 16: pl. 1014*; Coste, *Fl. Fran. f. 1969*; *Fl. Deuts. ed. 5. pl. 3016*; Britt. & Brown, *Ill. Fl. f. 3982*; ed. 2. *f. 4552*.

2. COTA J. Gay; Guss. Fl. Sic. Syn. 2: 866. 1844.

Annual or perennial herbs. Leaves alternate, pinnatifid or bipinnatifid. Heads solitary at the ends of the branches, usually radiate. Involucre saucer-shaped; bracts in about 3 series, rather firm, the outer somewhat shorter. Receptacle convex, chaffy; paleae membranous, cuspidate. Ray-flowers 10-30, pistillate and fertile; corolla-tube obcompressed and acutely margined, at least below; ligules white or yellow. Disk-flowers hermaphroditic and fertile; corolla-tube obcompressed, at least equaling the elongate-funnelform throat; lobes 5, lanceolate, spreading. Anthers with ovate acute tips. Style-branches in both kinds of flowers truncate at the apex. Achenes obcompressed, somewhat triquetrous, the lateral angles prominent, the two faces each about 10-nerved. Pappus a short membranous crown, in ours entire.

Type species, *Anthemis Cota* L.

Ligules white; leaves bipinnatifid.
Ligules yellow; leaves pinnatifid.

1. *C. altissima*.
2. *C. tinctoria*.

1. *Cota altissima* (L.) J. Gay; Guss. Fl. Sic. Syn. 2: 867. 1844.

Anthemis altissima L. Sp. Pl. 893. 1753.

A tall leafy annual; stem 3-8 dm. high, terete, glabrous or nearly so, branched; leaves 3-6 cm. long, obovate in outline, bipinnatifid into linear, entire or toothed, spinulose-tipped divisions, sparingly hirsutulous; heads solitary at the ends of the branches, radiate; involucre 8 mm. high, 15-18 mm. broad; bracts pilose, the outer somewhat shorter, ovate, acute, the inner oblong, obtuse; receptacle convex; paleae obovate-spatulate or cuneate, abruptly cuspidate, equaling the disk-flowers; ray-flowers 15-20; ligules white, about 12 mm. long, 3-3.5 mm. wide; tube somewhat obcompressed below, longer than the throat; achenes 3 mm. long.

TYPE LOCALITY: Italy.

DISTRIBUTION: Oregon; adventive from the Mediterranean region.

ILLUSTRATION: Coste, *Fl. Fr. f. 1959*.

2. *Cota tinctoria* (L.) J. Gay; Guss. Fl. Sic. Syn. 2: 867. 1844.

Anthemis tinctoria L. Sp. Pl. 896. 1753.

Chamaemelum tinctorium Schreb. Spicil. Fl. Lips. 145. 1771.

A leafy perennial; stem 3-6 dm. high, more or less hirsute-villous, somewhat branched, striate, often purple-tinged; leaves 2-5 cm. long, pinnatifid, with a winged and toothed rachis, hirsute-villous; divisions oblong, and cleft, incised, or sharply serrate, with cuspidate teeth; involucre saucer-shaped, 5-6 mm. high, 12-18 mm. broad; bracts villous, lanceolate, acute, the outer slightly shorter; disk convex; paleae linear-lanceolate, aristate-tipped, equaling the disk-flowers; ray-flowers 20-30; ligules yellow, 12-15 mm. long, 3-4 mm. wide; disk-corollas 3.5-4 mm. long; tube fully equaling the throat; achenes 2 mm. long.

TYPE LOCALITY: Sweden.

DISTRIBUTION: Maine and Quebec to New Jersey and Ohio; naturalized from Europe.

ILLUSTRATIONS: Fl. Dan. *pl. 741*; Sv. Bot. *pl. 62*; Engl. Bot. *pl. 1472*; A. Dietr. *Fl. Boruss. pl. 641*; Reichenb. *ic. Fl. Germ. 16: pl. 1010, f. 1*; *Fl. Deuts. ed. 5. pl. 3031*; Coste, *Fl. Fr. f. 1957*; Britt. & Brown, *Ill. Fl. f. 3987*; ed. 2. *f. 4559*.

3. *ORMENIS* Cass. Bull. Soc. Philom. 1818: 167. 1818.

Leafy annuals. Leaves alternate, pinnatifid. Heads solitary at the ends of the branches, radiate. Involucre saucer-shaped; bracts in 2-3 series, nearly equal. Receptacle conic, chaffy; paleae cartilaginous, boat-shaped and surrounding the achenes, pointed at the apex. Ray-flowers hermaphrodite and fertile; ligules yellow or (in our species) white with yellow base. Disk-flowers numerous, hermaphrodite and fertile; tube cylindric, produced at the base into an appendage partly covering the achene on the inner side; throat campanulate; lobes 5, ovate. Anthers with ovate obtuse tips. Style-branches with truncate fimbriate tips. Achenes ellipsoid with 3 firm ribs on the inner side. Pappus wanting.

Type species, *Anthemis mixta* L.

1. *Ormenis mixta* (L.) Dumort. Fl. Belg. 69. 1827.

Anthemis mixta L. Sp. Pl. 894. 1753.

Chamaemelum mixtum All. Fl. Ped. 1: 185. 1785.

Ormenis bicolor Cass. Dict. Sci. Nat. 36: 356. 1825.

A low leafy fragrant annual; stem 1-4 dm. high, villous-pubescent with spreading branches; leaves 1-3 cm. long, villous-pubescent, cuneate-oblong in outline, pinnatifid, with a broad rachis and entire or toothed oblanceolate divisions, the teeth callous- or spinulose-tipped; involucre 4 mm. high and 8-10 mm. broad; bracts oblong, obtuse, villous; ray-flowers 10-15; ligules white with a yellow base, 6-8 mm. long, about 3 mm. wide; disk-corollas yellow; tube longer than the throat; achenes 1 mm. long, yellowish.

TYPE LOCALITY: Italy.

DISTRIBUTION: New Jersey; Pennsylvania; Florida; Vancouver Island; adventive from the Mediterranean region.

ILLUSTRATIONS: Reichenb. Ic. Fl. Germ. 16: pl. 1001, f. 1; Durieu, Expl. Sci. Algér. Bot. pl. 61, f. 2; Coste, Fl. Fr. f. 1949.

4. *ANTHEMIS* L. Sp. Pl. 893. 1753.

Chamaemelum (Tourn.) Mill. Gard. Dict. Abr. ed. 4. 1754.

Marcelia Cass. Dict. Sci. Nat. 34: 107. 1825.

Chamomilla Godron, Fl. Lorr. 2: 19. 1843. Not *Chamomilla* Cilib. 1792.

Annual or perennial herbs. Leaves alternate, mostly pinnatifid or bipinnatifid. Heads solitary at the ends of the branches, usually radiate. Involucre saucer-shaped; bracts in about 3 series of nearly the same length, usually thin. Receptacle conic to hemispheric, chaffy; paleae membranous with a distinct midrib. Ray-flowers pistillate and fertile; ligules white. Disk-flowers hermaphrodite and fertile; corollas yellow; tube cylindric, equaling or longer than the elongate-funnelform throat; lobes 5. Anthers with ovate obtuse tips. Style-branches truncate and fimbriate at the apex. Achenes subcylindric or somewhat obovoid, not angled, with filiform ribs. Pappus wanting, or a minute crown.

Type species, *Anthemis nobilis* L.

Paleae of the receptacle cuspidate-acuminate; achenes equally 10-nerved.

Paleae of the receptacle obtuse; achenes 3-nerved on the inner side.

1. *A. arvensis*.
2. *A. nobilis*.

1. *Anthemis arvensis* L. Sp. Pl. 894. 1753.

Chamaemelum arvense Schreb. Spicil. Fl. Lips. 18. 1771.

Matricaria arvensis Baillon, Hist. Pl. 8: 310. 1882.

A leafy annual; stem 2-5 dm. high, ascending or erect, branched, striate, hirsute-villous; leaves 3-5 cm. long, bipinnatifid, with linear-lanceolate cuspidate lobes, hirsute-villous; heads solitary at the ends of the branches; involucre 4-5 mm. high, 7-12 mm. broad; bracts villous-hirsute, the outer shorter, lanceolate and acute, the inner oblong and rounded at the apex; receptacle conic; paleae linear-lanceolate, abruptly cuspidate, usually equaling the disk-flowers; ray-flowers 15-20; ligules white, 7-12 mm. long, 3-4 mm. wide; disk-corollas 3 mm. long; tube cylindric, equaling the throat; achenes 1.5-2 mm. long, shining, subcylindric, 10-ribbed; pappus a minute border.

TYPE LOCALITY: Sweden.

DISTRIBUTION: Maine and Quebec to Pennsylvania and Georgia; British Columbia to Oregon; adventive from Europe and the Orient.

ILLUSTRATIONS: Fl. Dan. pl. 685, 1178; Engl. Bot. pl. 602; Hayne, Arzn. Gew. 1: pl. 5; Schrank, Fl. Monac. pl. 312; Reichenb. Ic. Fl. Germ. 16: pl. 1004; Fl. Deuts. ed. 2. pl. 3033; Coste, Fl. Fr. f. 1953; Britt. & Brown, Ill. Fl. f. 3985; ed. 2. f. 4557.

2. *Anthemis nobilis* L. Sp. Pl. 894. 1753.

Anthemis odorata Lam. Fl. Fr. 2: 163. 1778.
Chamaemelum nobile All. Fl. Ped. 1: 185. 1785.
Chamomilla nobilis Godron, Fl. Lorr. 2: 19. 1843.
Ormenis nobilis J. Gay.; Coss. & Germ. Syn. Fl. Par. 153. 1845.
Matricaria nobilis Baillon, Hist. Pl. 8: 309. 1882.

A perennial aromatic leafy herb; stems 1-3 dm. high, pubescent, branched, decumbent to erect; leaves 2-4 cm. long, villous-hirsute, pinnatifid or bipinnatifid, with short linear-lanceolate cuspidate divisions; heads solitary at the ends of the branches; involucre saucer-shaped, about 5 mm. high and 10 mm. broad; outer bracts lance-ovate, obtuse, the inner elliptic, rounded at the apex, with white scarios margins; receptacle conic; paleae membranous, concave, oblong, obtuse, often erose at the apex; ligules white, 6-10 mm. long, 2-3 mm. wide; disk-corollas 3 mm. long; tube cylindric, longer than the throat; achenes somewhat pyriform, 1-1.5 mm. long, yellowish, with 3 filiform ridges on the inner side; pappus none.

TYPE LOCALITY: Europe.

DISTRIBUTION: Rhode Island to North Carolina, escaped from cultivation; native of western Europe.

ILLUSTRATIONS: Hayne, Arzn. Gew. 10: pl. 47; Engl. Bot. pl. 980; Woodv. Med. Bot. pl. 19; Guimp. & Schlecht. Abb. Pharm. Boruss. pl. 192; Reichenb. Ic. Fl. Germ. 16: pl. 1001, f. 11; Fl. Deuts. ed. 5. pl. 3036; Coste, Fl. Fr. f. 1950; Britt. & Brown, Ill. Fl. f. 3986; ed. 2. f. 4558.

5. *MARUTA* Cass. Bull. Soc. Philom. 1818: 167. 1818.

Leafy annuals. Leaves alternate, bipinnatifid, with narrow divisions. Heads radiate, solitary at the ends of the branches. Involucre saucer-shaped; bracts in 2 series, subequal. Receptacle conic, chaffy towards the apex; paleae subulate, stiff, rather persistent. Ray-flowers 10-15, neutral; ligules white. Disk-flowers hermaphrodite and fertile; corolla-tube cylindric, longer than the funnellform throat; lobes 5, ovate, spreading. Anthers with ovate obtuse tips. Style included, with short branches truncate and fimbriate at the apex. Achenes nearly cylindric, 10-ribbed, glandular-tuberclad. Pappus wanting.

Type species, *Anthemis Cotula* L.

1. *Maruta Cotula* (L.) DC. Prodr. 6: 13. 1837.

Anthemis Cotula L. Sp. Pl. 894. 1753.
Anthemis foetida Lam. Fl. Fr. 2: 164. 1778.
Chamaemelum Cotula All. Fl. Ped. 1: 186. 1785.
Chamaemelum foetidum Hall.; Baumg. Enum. Stirp. Transsilv. 3: 144. 1816.
Maruta foetida S. F. Gray, Nat. Arr. Brit. Fl. 2: 456. 1821.
Maruta vulgaris Bluff & Fingerh. Comp. Fl. Germ. 2: 392. 1825.
Anthemis cotuloides Raf.; DC. Prodr. 6: 13, as synonym. 1837.
Matricaria pubescens Schultz-Bip. Bonplandia 8: 369. 1860.
Matricaria Cotula Baillon, Hist. Pl. 8: 310. 1882.

An ill-scented leafy annual; stem 2-5 dm. high, much branched, erect or ascending, striate, more or less pubescent; leaves sparingly pubescent, 2-6 cm. long, bipinnatifid into linear-filiform, entire or incised, cuspidate divisions; involucre about 3 mm. high, 6-8 mm. broad; bracts elliptic, obtuse or acutish, pubescent; ligules 6-8 mm. long, 2 mm. wide; disk-corollas greenish-yellow, glandular-granuliferous, 2 mm. long; achenes 1-1.5 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Newfoundland to Florida, California, and Alaska, thoroughly naturalized; native of Europe, northern Africa, and the Orient.

ILLUSTRATIONS: Curt. Fl. Lond. 5: pl. 61 [2: pl. 179]; Fl. Dan. pl. 1179; Schkuhr, Handb. pl. 254; Hayne, Arzn. Gew. 1: pl. 6; Sv. Bot. pl. 429; Engl. Bot. pl. 1772; W. Barton, Veg. Mat. Med. pl. 14; Baxter, Brit. Bot. pl. 328; Reichenb. Ic. Fl. Germ. 16: pl. 1000, f. 1; Fl. Deuts. ed. 5. pl. 3035; Coste, Fl. Fr. f. 1954; Britt. & Brown, Ill. Fl. f. 3984; ed. 2. f. 4556; Clark & Fletcher, Farm Weeds Can. pl. 25; ed. 2. pl. 59.

6. *CHAMOMILLA* (Hall.) Gilib. Exerc. Phyt. 178. 1792.

Matricaria L. Sp. Pl. 891, in part. 1753.
Lepidanthus Nutt. Trans. Am. Phil. Soc. II. 7: 396. 1841. Not *Lepidanthus* Nees. 1830.
Tripleurospermum Schultz-Bip. Tanac. 31. 1844.

Dibothrospermum Knaf, Flora 29: 298. 1846.
Trallesia Zumag, Fl. Ped. 1: 361. 1849.
Akylopsis Lehm. Ind. Sem. Hort. Hamb. 1850: 3. 1850.

Mostly annual glabrous herbs. Leaves alternate, once to thrice pinnatifid into narrow divisions. Heads solitary or corymbose, radiate or discoid. Involucre saucer-shaped to hemispheric; bracts in 2-4 series, somewhat imbricate, but usually of nearly the same length, oblong to elliptic, obtuse, scarious-margined. Receptacle conic, hemispheric, or subglobose, naked. Ray-flowers, if present, pistillate and fertile; ligules white; style exerted, with short truncate branches. Disk-flowers numerous, hermaphrodite and fertile; corollas yellow; tube cylindric or nearly so; throat campanulate; lobes 4 or 5, ovate or lanceolate; anthers with ovate obtuse tips; style included; branches short with truncate tips. Achenes usually asymmetric, with 3-5 ribs on the inner half, the back being nerveless. Pappus of a more or less developed crown or margin.

Type species, *Matricaria Chamomilla* L.

Heads radiate; disk-corollas 5-lobed; involucre bracts subequal.

Receptacle hemispheric, or nearly so, rounded at the summit, solid; achenes 3-ribbed on the inner side, rugose or muricate on the back and between the ribs; plant inodorous.

Bracts with white or light-brown scarious margins.

Leaf-segments slender, not fleshy, elongate; stem erect; pappus-crown usually entire.

Leaf-segments short, fleshy, divaricate; stem usually diffuse; pappus distinctly toothed.

Bracts with dark-brown almost black scarious margins.

Receptacle conic, acute, hollow; achenes 5-ribbed on the inner side, smooth on the back and between the ribs; plant sweet-scented.

Pappus a minute entire crown.

Pappus a conspicuous fimbriate crown, as long as the width of the achene.

Heads discoid; disk-corollas 4-lobed; receptacle conic.

Involucre saucer-shaped; bracts in 2-3 series, subequal; receptacle hollow.

Involucre 5-8 mm. broad; pappus-crown minute, entire.

Involucre 8-12 mm. broad; pappus-crown with a conspicuous lobe on each side.

Involucre hemispheric; bracts imbricate, in 3-4 series, the outer shorter; receptacle solid.

1. *C. inodora*.
2. *C. maritima*.
3. *C. Hookeri*.
4. *C. Chamomilla*.
5. *C. Courrantiana*.
6. *C. suaveolens*.
7. *C. occidentalis*.
8. *C. suffruticosa*.

1. *Chamomilla inodora* (L.) Gilib. Exerc. Phyt. 179. 1792.

Matricaria inodora L. Fl. Suec. ed. 2. 297. 1755.
Chrysanthemum inodorum L. Sp. Pl. ed. 2. 1253. 1763.
Pyrethrum inodorum Moench, Meth. 597. 1794.
Trypleurospermum inodorum Schultz-Bip. Tanac. 32. 1844.
Dibothrospermum agreste Knaf, Flora 29: 299. 1846.
Chamaemelum inodorum Vis. Osserv. Matric. 13. 1844.—Fl. Dalm. 2: 85. 1847.
Trallesia matricarioides Zumag, Fl. Ped. 1: 361. 1849.

A leafy annual; stem 2-4 dm. high, glabrous, striate, branched; leaves bipinnatifid, 3-6 cm. long, with linear-filiform, long and flaccid divisions, glabrous or nearly so; heads several, solitary at the ends of the branches; involucre saucer-shaped, 4 mm. high, 10-15 mm. broad; bracts in 2-3 series, subequal, linear or linear-oblong, obtuse, with white or light-brown scarious margins; receptacle convex, obtuse; ray-flowers 15-25; ligules white, 7-10 mm. long, 2-3 mm. wide; style-branches truncate; disk-corollas yellow, 2.5 mm. long; tube equaling the campanulate throat; lobes 5, lanceolate; achenes 1.5-2 mm. long, dark-brown when ripe, oblique, with 3 strong ribs on the inner side, rugose on the back and between the ribs; crown of pappus well developed, usually entire.

TYPE LOCALITY: Sweden.

DISTRIBUTION: Newfoundland to Pennsylvania and Ontario; Oregon and Idaho; adventive or naturalized from Europe.

ILLUSTRATIONS: Reichenb. Ic. Fl. Germ. 16: pl. 985, f. I; Engl. Bot. pl. 676; Fl. Dan. pl. 1936; Fl. Deuts. ed. 5. pl. 3047; Coste, Fl. Fr. f. 1948; Britt. & Brown, Ill. Fl. f. 3992; ed. 2. f. 4565.

2. *Chamomilla maritima* (L.) Rydberg.

Matricaria maritima L. Sp. Pl. 891. 1753.
Pyrethrum maritimum Smith, Fl. Brit. 901. 1800.
Chrysanthemum maritimum Pers. Syn. Pl. 2: 462. 1807.

- Matricaria inodora maritima* Wahlenb. Fl. Suec. 533. 1826.
Matricaria inodora salina DC. Prodr. 6: 52. 1837.
Tripleurospermum inodorum maritimum Schultz-Bip. Tanac. 33. 1844.
Tripleurospermum maritimum Koch, Syn. Fl. Germ. ed. 2. 1026. 1844.

A leafy annual; stem often decumbent, 1-3 dm. high, striate, glabrous with spreading branches; leaves 2-4 cm. long, bipinnatifid with short, spreading, fleshy divisions; heads several, usually few, solitary at the ends of the branches; involucre saucer-shaped, 4 mm. high, 10-12 mm. broad; receptacle convex to hemispheric, obtuse, solid; bracts in 2-3 subequal series, oblong, rounded at the apex, with light-brown scarios margins; ray-flowers 15-20; ligules white, 8-10 mm. long, 2 mm. wide; disk-corollas yellow, 2.5 mm. long; tube equaling the campanulate throat; lobes 5, lanceolate; achenes brown, with 3 corky ribs on the inner side, rugose on the back and between the ribs; pappus-crown distinctly dentate.

TYPE LOCALITY: Sea-shores of northern Europe.

DISTRIBUTION: On ballast and along the coast, Massachusetts to Pennsylvania; Alabama; adventive from Europe.

ILLUSTRATION: Engl. Bot. *pl.* 979.

3. *Chamomilla Hookeri* (Schultz-Bip.) Rydberg.

- Chrysanthemum grandiflorum* Hook. in W. E. Parry, Jour. Second Voy. App. 398. 1825. Not *C. grandiflorum* Bous. 1804.
Pyrethrum inodorum Hook. Fl. Bor. Am. 1: 320, in part. 1833.
Pyrethrum inodorum nanum Hook. Fl. Bor. Am. 1: 320. 1833.
Matricaria inodora nana T. & G. Fl. N. Am. 2: 412. 1843.
Tripleurospermum inodorum monocephalum Schultz-Bip. Tanac. 33. 1844.
Tripleurospermum Hookeri Schultz-Bip. Bonplandia 1: 151. 1853.
Matricaria grandiflora Britton, Mem. Torrey Club 5: 340. 1894. Not *M. grandiflora* Poir. 1813.
Matricaria inodora grandiflora Ostenf. Skr. Vid.-Selsk. Christiania 1909: 25. 1910.

An annual; stem erect, 1-4 dm. high, angled and grooved, glabrous, simple or with a few ascending branches; leaves 3-7 cm. long, glabrous, bipinnatifid, with somewhat fleshy filiform divisions; heads solitary, or few; involucre saucer-shaped, 3-4 mm. high, 10-20 mm. broad; bracts in 2-3 subequal series, oblong, obtuse, with dark-brown or almost black scarios margins; ray-flowers 15-25; ligules white, 8-10 mm. long, 2-3 mm. wide; disk-corollas light-yellow, 2.5 mm. long; tube equaling the campanulate throat; lobes 5, lance-ovate; achenes brown, 2 mm. long, with 3 ribs on the inner side, muricate on the back and between the ribs; pappus-crown slightly lobed.

TYPE LOCALITY: York Factory [Manitoba].

DISTRIBUTION: Arctic coast from Greenland to Alaska; also arctic and subarctic Europe.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3993; ed. 2. f. 4566.

4. *Chamomilla Chamomilla* (L.) Rydberg.

- Matricaria Chamomilla* L. Sp. Pl. 891. 1753.
Matricaria suaveolens L. Fl. Suec. ed. 2. 297. 1755.
Leucanthemum Chamaemelum Lam. Fl. Fr. 2: 139. 1778.
Matricaria patens Gilib. Fl. Lithuan. 220. 1782.
Chamomilla patens Gilib. Exerc. Phyt. 178. 1792.
Chrysanthemum Chamomilla Bernh. Syst. Verz. Erf. 145. 1800.
Chamomilla vulgaris S. F. Gray, Nat. Arr. Brit. Pl. 2: 454. 1821.
Matricaria obliqua Dulac, Fl. Hautes-Pyr. 505. 1867.

A leafy annual; stem 2-5 dm. high, grooved and angled, glabrous, branching; leaves 4-6 cm. long, bipinnatifid into nearly filiform divisions, glabrous or nearly so; heads several or many, solitary at the ends of the branches, radiate; involucre saucer-shaped, or in age rotate, about 3 mm. high, 6-10 mm. broad; bracts in 2-3 subequal series, linear to oblong, obtuse or rounded at the apex, broadly scarios; receptacle conic, acute, hollow; ray-flowers 15-20; ligules white, 5-8 mm. long, about 2 mm. wide, in age reflexed; style-branches short, truncate; disk-corollas about 2 mm. long; tube equaling the campanulate throat; lobes 5, ovate; anthers with ovate obtuse tips; achenes oblique, yellowish-white, with 5 slender ribs on the inner side, smooth on the back and between the ribs; crown of pappus usually small, entire.

TYPE LOCALITY: Europe.

DISTRIBUTION: Greenland; Maine to New Jersey and Ohio; Texas and California; adventive from Europe and the Orient.

ILLUSTRATIONS: Curt. Fl. Lond. 5: *pl.* 63 [2: *pl.* 180]; Engl. Bot. *pl.* 1232; Baxter, Brit. Bot. *pl.* 335; Fl. Dan. *pl.* 1764; Sv. Bot. *pl.* 50; Schkuhr, Handb. *pl.* 253b; Hayne, Arn. Gew. 1: *pl.* 3; Guimp. & Schechtl. Abb. Pharm. Boruss. *pl.* 122; Reichenb. Ic. Fl. Germ. 16: *pl.* 997, *f.* 1; Fl. Deuts. ed. 5. *pl.* 3049; Coste, Fl. Fr. *f.* 1947; Britt. & Brown, Ill. Fl. *f.* 3994; ed. 2. *f.* 4567.

5. *Chamomilla Courrantiana* (DC.) C. Koch, *Linnaea* 24: 338.

1851.

Matricaria Courrantiana DC. Prodr. 6: 52. 1837.

Matricaria pyrethroides DC. Prodr. 6: 52. 1837.

Matricaria Chamomilla coronata Boiss. Voy. Bot. Esp. 2: 316. 1840.

Matricaria coronata J. Gay; Koch, Syn. Fl. Germ. ed. 2: 416. 1843.

A leafy annual; stem 2-4 dm. high, slender, branched, glabrous; leaves 4-6 cm. long, bipinnatifid into narrow filiform divisions, glabrous; heads solitary at the ends of the branches, radiate; involucre about 2.5 mm. high, 6-8 mm. broad; bracts in 2 series, oblong or elliptic, rounded at the apex, broadly scarious; receptacle conic, acute, hollow; ray-flowers 10-15; ligules white, about 6 mm. long, 2 mm. wide; disk-corollas about 2 mm. long; tube equaling the campanulate throat; achenes elliptic, with 5 slender ribs on the inner side, smooth on the back and between the ribs; pappus of a membranous, erose or fimbriate crown, sometimes 0.5 mm. long.

TYPE LOCALITY: Teneriffe.

DISTRIBUTION: Texas to Arizona, Sinaloa, Zacatecas, and Mexico (state); Bolivia; adventive from Spain.

ILLUSTRATION: Webb & Berth. Hist. Nat. Canar. *pl.* 89.

6. *Chamomilla suaveolens* (Pursh) Rydberg.

Santolina suaveolens Pursh, Fl. Am. Sept. 520. 1814.

Artemisia matricarioides Less. *Linnaea* 6: 210. 1831.

Cotula matricarioides Bong. Mém. Acad. St.-Pétersb. VI, 2: 147. 1832.

Tanacetum suaveolens Hook. Fl. Bor. Am. 1: 327. 1833.

Matricaria discoidea DC. Prodr. 6: 50. 1837.

Tanacetum pauciflorum DC. Prodr. 6: 131. 1837. Not *T. pauciflorum* Richards. 1823.

Matricaria tanacetoides Fisch. & Mey. Ind. Sem. Hort. Petrop. 7: 52. 1840.

Lepidanthus suaveolens Nutt. Trans. Am. Phil. Soc. II, 7: 397. 1841.

Cenocline pauciflora C. Koch, Bot. Zeit. 1: 41, in part. 1843.

Lepidotheca suaveolens Nutt.; T. & G. Fl. N. Am. 2: 413, as synonym. 1843.

Tanacetum matricarioides Less.; Ledeb. Fl. Ross. 2: 544, as synonym. 1846.

Akyloptis suaveolens Lehm. Ind. Sem. Hort. Hamb. 1850: 3. 1850.

Chamomilla discoidea J. Gay; A. Br. Bot. Zeit. 10: 650. 1852.

Matricaria matricarioides Porter, Mem. Torrey Club 5: 341. 1894.

Matricaria suaveolens Buch. Fl. Brem. ed. 4: 142. 1894. Not *M. suaveolens* L. 1755.

A leafy annual; stem 1-3 dm. high, striate, branched, glabrous; leaves 2-4 cm. long, glabrous, bi- or tri-pinnatifid into short linear-filiform divisions; heads numerous, discoid; involucre saucer-shaped, 3 mm. high, 5-8 mm. broad; bracts in 2-3 series, subequal, elliptic, rounded at the apex, with white, scarious margins; receptacle conic, hollow; ray-flowers wanting; disk-corollas greenish-yellow, 1.5 mm. long; tube slightly longer than the campanulate throat; lobes 4, ovate; achenes greenish-brown, oblique, with 4 ribs on the inner side, smooth on the back and between the ribs; crown of the pappus minute or obsolete.

TYPE LOCALITY: Banks of the Kooskoosky [Clearwater River, Idaho].

DISTRIBUTION: Native from Alaska to Montana, Arizona, and Lower California; naturalized eastward to Newfoundland, New Jersey, and Missouri; also in eastern Siberia; adventive in Europe.

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl.* 110; Reichenb. Ic. Fl. Germ. 16: *pl.* 997, *f.* 11; Fl. Deuts. ed. 2. *pl.* 3050; Britt. & Brown, Ill. Fl. *f.* 3995; ed. 2. *f.* 4568.

7. *Chamomilla occidentalis* (Greene) Rydberg.

Matricaria occidentalis Greene, Bull. Calif. Acad. 2: 150. 1887.

A very leafy stout annual; stem 3-7 dm. high, angled, branched; leaves 3-6 dm. long, glabrous, bi- or tri-pinnatifid, with linear-filiform fleshy segments; heads in leafy corymbs, discoid; involucre saucer-shaped, 4 mm. high, 8-12 mm. broad; bracts subequal, in 2-3 series, elliptic, rounded at the apex, with white scarious margins; receptacle conic, acute, hollow; ray-flowers wanting; disk-corollas greenish-yellow, 1.5 mm. long; tube somewhat gibbous, longer than the campanulate throat; lobes 4, ovate; achenes 1.5 mm. long, 4-angled on the

inner side, smooth on the back and between the ribs; pappus-crown with two lateral dark-brown conspicuous lobes.

TYPE LOCALITY: Grain fields of the lower San Joaquin and Sacramento region, California.
DISTRIBUTION: Middle California to southern Oregon.

8. *Chamomilla suffruticosa* (L.) Rydberg.

Tanacetum suffruticosum L. Sp. Pl. 843. 1753.

Tanacetum multiflorum Thunb. Prodr. Fl. Cap. 147. 1794.

Matricaria multiflora Fenzl; Harv. & Sond. Fl. Cap. 3: 166. 1864.

A leafy annual; stem much branched, often ligneous at the base, erect or diffuse, glabrous or thinly pubescent, terete; leaves 2-4 cm. long, sparingly pubescent, bipinnatifid, with short divergent linear acute divisions; heads very numerous in leafy corymbiform panicles; involucre hemispheric, 3 mm. high, 5-6 mm. broad; bracts imbricate, in 3-4 series, the outer shorter, all elliptic and obtuse, yellowish, with white scarios margins; receptacle conic; ray-flowers wanting; disk-corollas yellow, 2 mm. long; tube somewhat inflated, longer than the campanulate throat; lobes 4, lanceolate; achenes 1.5 mm. long; pappus a short crown.

TYPE LOCALITY: Cape of Good Hope.

DISTRIBUTION: Oregon; adventive from South Africa.

ILLUSTRATION: Commelin, Hort. Amst. 2: pl. 100.

7. MATRICARIA (Tourn.) L. Sp. Pl. 891. 1753.

Pyrethrum (Hall.) Zinn, Cat. Pl. Gott. 414. 1757.

Dendranthema Des Moul. Act. Soc. Linn. Bordeaux 20: 561. 1859.

Annual or perennial herbs, sometimes shrubby, never strong-scented. Leaves alternate, usually more or less dissected or lobed, in ours pinnately divided. Heads corymbose, radiate, rarely discoid. Involucre saucer-shaped to hemispheric; bracts narrow, in 2-4 series, somewhat imbricate. Receptacle convex, naked. Ray-flowers several, in a single series, pistillate and fertile; ligules linear or oblong, in our species white. Disk-flowers numerous, hermaphrodite and fertile; corollas cylindro-campanulate, 5-lobed, the tube and throat poorly differentiated. Anthers with obtuse tips. Style of the ray-flowers short-exserted, that of the disk-flowers included; branches of the former oblong and obtuse, of the latter short and with truncate tips. Achenes subcylindric, 5-10-angled or 5-10-ribbed. Pappus of both disk- and ray-flowers of a toothed or lobed crown.

Type species, *Matricaria Parthenium* L.

Primary divisions of the leaves 7-21, incised-serrate; ligules 12-15 mm. long.

Primary divisions of the leaves 3-7, cleft; ligules 5-8 mm. long.

Leaf-blades obovate or rhombic in outline; divisions also obovate, short; ligules usually shorter than the width of the disk.

Leaf-blades oval or elliptic in outline; divisions oblanceolate; ligules usually longer than the width of the disk.

1. *M. corymbosa*.

2. *M. Parthenium*.

3. *M. praecox*.

1. *Matricaria corymbosa* (L.) Desr. in Lam. Encyc. 3: 734. 1791.

Chrysanthemum corymbosum L. Sp. Pl. 890. 1753.

Pyrethrum corymbosum Scop. Fl. Carn. ed. 2. 2: 148. 1772.

Matricaria inodora Lam. Fl. Fr. 2: 136. 1778. Not *M. inodora* L. 1753.

Leucanthemum corymbosum Gren. & Godr. Fl. Fr. 2: 145. 1850.

A perennial herb, with a short cylindric rootstock; stem erect, 5-10 dm. high, angled and grooved, sparingly hairy; leaves pinnatifid, sparingly hirsute, the lower long-petioled, the upper sessile; blades 5-20 cm. long, ovate or oval in outline; primary divisions 7-21, lanceolate in outline, deeply divided into 5-13 oblong serrate divisions or those of the uppermost leaves merely serrate; heads several, corymbose; involucre deeply saucer-shaped or hemispheric, 5-6 mm. high, 10-12 mm. broad; bracts in about 4 series, imbricate, the outer lanceolate, the innermost nearly as long, oblong, obtuse, with light-brown scarios crose tips; ray-flowers 12-20; ligules white, 12-15 mm. long, 4-5 mm. wide; disk-corollas yellow, 3 mm. long, glandular-granuliferous, cylindro-campanulate, with 5 ascending lobes; style included; branches short, truncate; achenes 5-angled, 3 mm. long; pappus of a cup-shaped round-lobed crown, about 1 mm. long.

TYPE LOCALITY: Thuringia, Germany.

DISTRIBUTION: Escaped from cultivation in Oregon; native of southern Europe.

ILLUSTRATION: Reichenb. Ic. Pl. Germ. 16: pl. 993, f. 11; Schrank, Fl. Monac. pl. 158; A. Dietr. Fl. Boruss. pl. 744; Jacq. Fl. Austr. pl. 379; Coste, Fl. Fr. f. 1945.

2. *Matricaria Parthenium* L. Sp. Pl. 800. 1753.

Matricaria odorata Lam. Fl. Fr. 2: 135. 1778.
Matricaria latifolia Gilib. Fl. Lithuan. 220. 1782.
Matricaria florida Salisb. Prodr. 203. 1796.
Chrysanthemum Parthenium Bernh. Syst. Verz. Erfurt 145. 1800.
Pyrethrum Parthenium Smith, Fl. Brit. 900. 1800.
Matricaria vulgaris S. F. Gray, Nat. Arr. Brit. Pl. 2: 454. 1821.
Tanacetum Parthenium Schultz-Bip. Tanac. 55. 1844.
Leucanthemum Parthenium Gren. & Godr. Fl. Fr. 2: 145. 1850.
Dendranthema Parthenium Des Moul. Act. Soc. Linn. Bordeaux 20: 516. 1859.
Leucanthemum odoratum Dulac, Fl. Hautes-Pyr. 504. 1867.

A perennial herb, with a taproot; stem erect, 3-6 dm. high, puberulent or glabrate below, striate; leaves petioled, 4-10 cm. long, finely pilose, pinnatifid; primary divisions 3-5, obovate or the terminal one rhombic in outline, usually deeply cleft into crenate-dentate divisions; heads several or many, corymbose-paniculate; peduncles 2-7 cm. long; involucre saucer-shaped, 2 mm. high, 7-10 mm. broad; bracts many, in 2-3 series, only slightly imbricate, the outer lance-linear, acute, the inner linear-oblong, obtuse, with erose scarious tips; receptacle strongly convex, tubercled; ray-flowers 12-20; ligules linear or oblong, white, 5-8 mm. long, 1.5-3 mm. wide; style-branches oblong, obtuse; disk-corollas yellow, 2 mm. long, cylindro-campanulate, with 5 short erect lobes and thickened tube; style-branches short, truncate, penicillate; achenes 1.5 mm. long, 8-10-ribbed, glabrous; pappus of a short dentate crown.

TYPE LOCALITY: Europe.

DISTRIBUTION: Escaped from cultivation, adventive or naturalized from New Brunswick to New Jersey and Ohio, and from California to Washington; West Indies; Mexico and Central America; native of Europe.

ILLUSTRATIONS: Reichenb. Ic. Fl. Germ. 16: pl. 992, f. II, III, 3, 4; Engl. Bot. pl. 1231; Baxter, Brit. Bot. pl. 20; Sv. Bot. pl. 285; Hayne, Arn. Gew. 6: pl. 20; A. Diétr. Fl. Boruss. pl. 743; Fl. Deuts. ed. 5, pl. 3044; Coste, Fl. Fr. f. 1946; Britt. & Brown, Ill. Fl. f. 3990; ed. 2, f. 4563; Woodv. Med. Bot. pl. 30; Fl. Dan. pl. 674.

3. *Matricaria praealta* (Vent.) Poir. in Lam. Encyc. Suppl. 3: 602. 1814.

Chrysanthemum praealtum Vent. Descr. Pl. Cels pl. 43. 1801.
Pyrethrum parthenifolium Willd. Sp. Pl. 3: 2156. 1804.
Chrysanthemum parthenifolium Pers. Syn. Pl. 2: 462. 1807.

A perennial herb; stem erect, 3-6 dm. high, slightly pubescent when young, glabrous in age; leaves petioled, 5-15 cm. long, sparingly and finely pilose when young, glabrate in age; blades oval or elliptic in outline, pinnatifid; primary divisions 3-7, oblanceolate in outline, acute, cleft with oblanceolate lobes; heads several, long-peduncled; involucre saucer-shaped, 3 mm. high, 6-8 mm. broad; bracts many, in 2-3 series, straw-colored, the outer slightly shorter, lance-linear, acute, slightly pubescent, with scarious tips; receptacle convex; ray-flowers 20-25; ligules oblong, white, 7-10 mm. long; disk-corollas yellow, 2.5 mm. long; achenes 1.5 mm. long, usually 10-ribbed, glabrous; pappus of a short entire crown.

TYPE LOCALITY: Garden plant, from Persian seeds.

DISTRIBUTION: Escaped from cultivation on Vancouver Island; native of Persia, Armenia, and Caucasus.

ILLUSTRATION: Vent. Hort. Cels pl. 43.

8. *LEUCANTHEMUM* (Tourn.) Mill. Gard. Dict. Abr. ed. 4. 1754.

Perennial herbs with rootstocks. Leaves alternate, dentate or entire or in some exotic species pinnatifid. Heads radiate, rarely discoid, solitary, rather long-peduncled at the ends of the stems. Involucre saucer-shaped; bracts many, rather narrow, in 2-4 series, somewhat imbricate, the outer somewhat shorter. Receptacle flat or convex, naked. Ray-flowers 10-25, in a single series, pistillate and fertile; ligules usually well-developed, white. Disk-flowers numerous; corollas yellow; tube usually thicker than the ovary, often slightly gibbous at the base, narrowed upwards, usually somewhat shorter than the elongate-funneliform throat; lobes 5, lanceolate. Anthers with ovate tips. Style of the ray-flowers slightly exerted, with short oblong branches; that of the disk-flowers included and with short branches, truncate

and fimbriate at the apex. Achenes all cylindric or subcylindric, 10-ribbed or 10-angled. Pappus wanting, or rarely in the ray-flowers represented by a crown.

Type species, *Chrysanthemum Leucanthemum* L.

Involucral bracts with darker margins; achenes all without pappus.

Leaves entire-margined; plant dwarf.

Leaves serrate or dentate, or rarely pinnately lobed.

1. *L. integrifolium*.

Leaves fleshy, coarsely dentate or lobed with few broad triangular teeth or lobes; bracts with almost black margins.

2. *L. arcticum*.

Leaves not fleshy, serrate or dentate with numerous smaller teeth, or if lobed or cleft with oblong divisions; bracts with brown margins.

3. *L. Leucanthemum*.

Involucral bracts with white margins; ray-achenes with a coroniform pappus.

4. *L. pallens*.

1: *Leucanthemum integrifolium* (Richards.) DC. Prodr. 6: 45. 1837.

Chrysanthemum integrifolium Richards. in Frankl. Journey ed. 2. App. 33. 1823.

Tanacetum integrifolium Schultz-Bip. Tanac. 35. 1844.

Leucanthemum algidum Fisch.; Herder, Bull. Soc. Nat. Mosc. 38: 416, as synonym. 1865.

A tufted perennial, with a rootstock; stem 2-10 cm. high, often scapiform, villous; leaves mostly basal, linear, entire, 5-20 mm. long, 1-3 mm. wide, sparingly hairy or glabrate; head solitary; involucre saucer-shaped, about 6 mm. high, 10-12 mm. broad, sparingly villous at the base; bracts in 3 series, oblong, obtuse or rounded at the apex, with almost black scarious margins; ray-flowers 10-15; ligules white, about 10 mm. long, 3-4 mm. wide; disk-corollas yellow, about 2.5 mm. long; tube shorter than the elongate-funnelform throat; achenes subcylindric, 10-angled; pappus wanting.

TYPE LOCALITY: Copper Mountains, Arctic Canada.

DISTRIBUTION: Arctic coast and islands from Melville Peninsula to Alaska and eastern Siberia.

ILLUSTRATION: Hook. Fl. Bor. Am. pl. 109.

2. *Leucanthemum arcticum* (L.) DC: Prodr. 6: 45. 1837.

Chrysanthemum arcticum L. Sp. Pl. 889. 1753.

Matricaria arctica Desr. in Lam. Encyc. 3: 735. 1791.

Tanacetum arcticum Schultz-Bip. Tanac. 35. 1844.

Chrysanthemum Gmelini Ledeb. Fl. Ross. 2: 541. 1845.

Leucanthemum adustum Fisch.; Herder, Bull. Soc. Nat. Mosc. 38: 415, as synonym. 1865.

A low perennial, with a rootstock; stem 1-3 dm. high, glabrous, or slightly villous above; leaves fleshy, glabrous, all except the uppermost cuneate or obovate-spatulate; lower leaves distinctly petioled, coarsely dentate or lobed, sometimes 3-cleft, the middle stem-leaves short-petioled, often 3-lobed, the upper ones sometimes entire and linear; heads solitary at the end of the stems; involucre saucer-shaped, 7-8 mm. high, 10-20 mm. broad, slightly villous at the base; bracts in 3 series, brownish, with broad, almost black, erose, scarious margins, the outer oblong, the inner elliptic; ray-flowers 15-25; ligules white, 10-13 mm. long, about 3 mm. wide; disk-corollas yellow, 3 mm. long; tube thicker than the achenes, equaling the elongate-funnelform throat; lobes lance-ovate; achenes subcylindric, slightly 10-ribbed, glabrous, 2 mm. long; pappus wanting.

TYPE LOCALITY: Kamchatka.

DISTRIBUTION: Arctic America from Hudson Bay to Alaska; also Siberia and Russia.

ILLUSTRATIONS: Gmel. Fl. Sib. 2: pl. 84; Willd. Hort. Berol. pl. 33 (?); Bot. Cab. pl. 785; Britt. & Brown, Ill. Fl. f. 3989; ed. 2. f. 4561.

3. *Leucanthemum Leucanthemum* (L.) Rydberg.

Chrysanthemum Leucanthemum L. Sp. Pl. 888. 1753.

Matricaria Leucanthemum Scop. Fl. Carn. ed. 2. 2: 147. 1772.

Leucanthemum vulgare Lam. Fl. Fr. 2: 137. 1778.

Chrysanthemum dentatum Gilib. Fl. Lithuan. 219. 1782.

Chrysanthemum pratense Salisb. Prodr. 203. 1796.

Tanacetum Leucanthemum Schultz-Bip. Tanac. 35. 1844.

Chrysanthemum Leucanthemum pinnatifidum Lecoq & Lamotte, Cat. Pl. Vasc. Fr. 227. 1848.

Pyrethrum Leucanthemum Franch. Fl. Cher-et-Loire 307. 1885.

Chrysanthemum Leucanthemum subpinnatifidum Fernald, Rhodora 5: 181. 1903.

A perennial herb, with a rootstock; stem 2-8 dm. high, simple, sparingly hairy or glabrate; leaves glabrous, the basal ones long-petioled, 5-15 cm. long, spatulate, serrate or dentate,

or in the form more common in America (*Chrysanthemum Leucanthemum pinnatifidum* or *sub-pinnatifidum*) oblanceolate and variously lobed or cleft, as well as toothed; stem-leaves sessile, auriculate at the base, oblanceolate, coarsely dentate or pinnately lobed; heads solitary at the end of the stems; involucre saucer-shaped, 4-5 mm. high, 12-18 mm. broad; bracts in 3-4 series, narrow, straw-colored, with brown margins, the outer linear-lanceolate, acute, the inner oblong and obtuse; ray-flowers 15-30; ligules white, 1-1.5 cm. long, 2-4 mm. wide; style-branches oblong, obtuse; disk-corollas yellow, 3 mm. long; tube thicker than the achene, cylindrical, a little shorter than the narrowly funnelform throat; lobes ascending, lanceolate; style included; branches short, truncate and fimbriate at the apex; achenes 1.5 mm. long, cylindrical, 10-ribbed; pappus wanting. Occasionally a monstrous form is found with elongate-tubular or trumpet-shaped ray-corollas.

TYPE LOCALITY: Europe.

DISTRIBUTION: Naturalized from Labrador and Newfoundland to Florida, California, and British Columbia; Bermudas; native of Europe and Asia.

ILLUSTRATIONS: Reichenb. Ic. Fl. Germ. 16: pl. 987, f. 1, 1, 2; 988, f. 1, 1-14; Fl. Dan. pl. 994; Curt. Fl. Lond. 5: pl. 62 [2: pl. 174]; Engl. Bot. pl. 601; Sv. Bot. pl. 346; Schrank, Fl. Monac. pl. 194; A. Dietr. Fl. Boruss. pl. 545; Fl. Deuts. ed. 5. pl. 3040; Thomé, Fl. Deuts. pl. 584; Coste, Fl. Fr. f. 1939; Britt. & Brown, Ill. Fl. f. 3988; ed. 2. f. 4560; Clark & Fletcher, Farm Weeds Can. pl. 26; ed. 2. pl. 60.

4. *Leucanthemum pallens* (J. Gay) DC. Prodr. 6: 47. 1837.

Chrysanthemum pallens J. Gay; Perreye, Fl. Fréjus 91. 1833.—Arch. Bot. 2: 545. 1833.
Tanacetum pallens Schultz-Bip. Tanac. 35. 1844.

A perennial, with a rootstock; stem 3-6 dm. high, sparingly long-villous or glabrous, straw-colored; leaves all oblanceolate or the upper linear, 3-6 cm. long, serrate, obtuse or rounded at the apex, the lower petioled, the upper sessile; heads solitary at the ends of the stems; involucre saucer-shaped, 5-6 mm. high, 12-15 mm. broad; bracts in 3-4 series, straw-colored or light-brownish, with white scarios margins, the outer lanceolate and obtuse, the inner oblong and rounded at the apex; ray-flowers 15-20; ligules white, 10-12 mm. long, 3-4 mm. wide; disk-corollas yellow, 4 mm. long; tube thicker than the achenes, contracted above, about equaling the narrowly funnelform throat; lobes lanceolate; achenes subcylindric, strongly 10-angled, slightly scabrous or glabrous; pappus of the disk-achenes wanting, that of the ray-flowers of a crown of united squamellae.

TYPE LOCALITY: L'Esterel, near Fréjus, France.

DISTRIBUTION: Sparingly adventive in New Jersey; native of southern France, Spain, and Italy.

ILLUSTRATIONS: Reichenb. Ic. Fl. Germ. 16: pl. 989, f. 1, 1, 2; Coste, Fl. Fr. f. 1941.

9. CHRYSANTHEMUM L. Sp. Pl. 887. 1753.

Pinardia Cass. Dict. Sci. Nat. 41: 38. 1826. Not *Pinardia* Neck. 1790.
Glebionis Cass. Dict. Sci. Nat. 41: 41. 1826.

Leafy annuals. Leaves alternate, from dentate to pinnatifid. Heads radiate, solitary at the ends of the branches. Involucre hemispheric; bracts imbricate, in about 3 series, broad, thin, almost papery. Receptacle convex, naked. Ray-flowers 10-20, pistillate and fertile; ligules well-developed, golden-yellow. Disk-flowers numerous, hermaphrodite and fertile; corollas yellow, glabrous; tube cylindrical, narrower than the achenes, about equaling the elongate-funnelform throat; lobes 5. Anthers with ovate tips. Style of the ray-flowers slightly exerted, with short oblong obtuse or truncate branches; that of the disk-flowers included, with short branches truncate or somewhat peltate and fimbriate at the apex. Achenes of two kinds, those of the ray-flowers short and obpyramidal, with 2 or 3 wing-angles; those of the disk cylindrical or prismatic, 8-10-ribbed. Pappus wanting.

Type species, *Chrysanthemum coronarium* L.

Leaves deeply dissected, bipinnatifid; ray-achenes 3-quetrous, the median angle with broader wing-margin.

Leaves dentate or pinnately lobed; ray-achenes with two lateral wings.

1. *C. coronarium*.
2. *C. segetum*.

1. *Chrysanthemum coronarium* L. Sp. Pl. 890. 1753.

Matricaria coronaria Desr. in Lam. Encyc. 3: 737. 1791.
Pyrethrum brevibradiatum Ledeb. Mém. Acad. St.-Pétersb. 5: 577. 1815.
Pinnardia coronaria Less. Syn. Comp. 255. 1832.
Chrysanthemum segetum Forsk.; DC. Prodr. 6: 64, as synonym. 1837. Not *C. segetum* L. 1753.
Glebionis coronaria Cass.; Spach, Hist. Vég. 10: 181. 1841.

A leafy annual; stem 3-6 dm. high, glabrous, branched, grooved; leaves mostly twice pinnatifid, 3-6 cm. long, glabrous, the cauline sessile and auricled at the base, obovate in outline, the primary divisions oblanceolate, the secondary ones lance-linear in outline; heads solitary at the ends of the branches; peduncles 5-15 cm. long; involucre hemispheric, 8-10 mm. high, 12-18 mm. broad; bracts yellow, with broad light-brown scarious margins, the outer ones ovate, the inner elliptic and much longer; ray-flowers 15-20; ligules 10-15 mm. long, 4-5 mm. wide; disk-corollas 5 mm. long; ray-achenes obpyramidal, as broad as long, 3-angled, the middle angle winged; disk-achenes 4-angled, the inner angle produced into a short spur.

TYPE LOCALITY: Crete.

DISTRIBUTION: Escaped from cultivation and on ballast in Ontario, Alabama, and the Bermudas; native of the Mediterranean region.

ILLUSTRATIONS: Coste, Fl. Fr. f. 1931; Sibth. Fl. Graeca pl. 877; Reichenb. Ic. Fl. Germ. 16: pl. 986, f. 11, 5-13.

2. *Chrysanthemum segetum* L. Sp. Pl. 889. 1753.

Chrysanthemum laciniatum Gilib. Fl. Lithuan. 218. 1782.
Matricaria segetum Schrank, Baier. Fl. 2: 406. 1789.
Pyrethrum segetum Moench, Meth. 597. 1794.
Glebionis segetum Fourr. Ann. Soc. Linn. Lyon II. 17: 90. 1869.

A leafy annual; stem glabrous, striate, 2-5 dm. high; lower leaves glabrous, spatulate or oblanceolate in outline, narrowed into winged petioles, pinnatifid into oblanceolate to cuneate toothed divisions, the middle ones oblong, with toothed lobes, the uppermost lanceolate, dentate or entire; heads several, solitary at the ends of the branches; peduncles 1-5 cm. long; involucre nearly hemispheric, about 1 cm. high, 17-20 mm. broad; bracts yellow, with broad brown margins, elliptic or oval, rounded at the apex; ray-flowers 12-15; ligules 1-2 cm. long, 4-7 mm. wide; disk-corollas yellow, 4 mm. long; ray-achenes as broad as long, with two lateral wings; disk-achenes cylindric, 10-ribbed.

TYPE LOCALITY: Skåne, Sweden.

DISTRIBUTION: Adventive, especially on ballast, from Maine to Florida; California and Oregon; native of Europe, northern Africa, and the Orient.

ILLUSTRATIONS: Coste, Fl. Fr. f. 1932; Fl. Dan. pl. 995; Curt. Fl. Lond. 6: pl. 60 [2: pl. 175]; Engl. Bot. pl. 540; Sv. Bot. pl. 496; Baxter, Brit. Bot. pl. 306; A. Dietr. Fl. Boruss. pl. 632; Reichenb. Ic. Fl. Germ. 16: pl. 986, f. 1, 1-8; Fl. Deuts. ed. 5. pl. 3048; Britt. & Brown, Ill. Fl. ed. 2. f. 4562.

DOUBTFUL AND EXCLUDED SPECIES

CHRYSANTHEMUM MEXICANUM H. B. K. Nov. Gen. & Sp. 4: 299. 1820.

CHRYSANTHEMUM ANGUSTIFOLIUM Raf. Atl. Jour. 178. 1833. Both are insufficiently described and no plants answering the descriptions known to be found in Mexico and Texas, respectively. Both are described as having white ligules and hence to be excluded from the genus.

10. BALSAMITA Desf. Act. Soc. Hist. Nat. Paris 1: 1. 1792.

Aromatic perennial herbs. Leaves alternate, conspicuously punctate, broad, crenate, or lobed at the base. Heads many, corymbose, discoid or radiate. Involucre hemispheric; bracts 25-35, in 4-5 series, distinctly imbricate, the outer much shorter and wholly green. Receptacle convex. Ray-flowers in ours wanting, if present pistillate and fertile; ligules if present oblong, white. Disk-flowers many, hermaphrodite and fertile; corollas yellow, glandular-granuliferous, nearly cylindric, the tube and throat scarcely differentiated; lobes 5, erect, ovate. Anthers with ovate obtuse tips. Style of the disk-flowers included; branches short, truncate and fimbriate at the tip. Achenes oblong-cylindric, 10-nerved; pappus a mere denticulate border.

Type species, *Tanacetum Balsamita* L.

1. *Balsamita Balsamita* (L.) Rydberg.

- Tanacetum Balsamita* L. Sp. Pl. 845. 1753.
Balsamita major Desf. Act. Soc. Hist. Nat. Paris 1: 3. 1792.
Tanacetum simplicifolium Salisb. Prodr. 190. 1796.
Balsamita vulgaris Willd. Sp. Pl. 3: 1802. 1804.
Balsamita suaveolens Pers. Syn. Pl. 2: 408. 1807.
Pyrethrum Tanacetum DC. Prodr. 6: 63. 1837.
Chrysanthemum Tanacetum Vis. Fl. Dalm. 2: 89. 1847.
Pyrethrum Balsamita tanacetoides Boiss. Fl. Orient. 3: 346. 1875.
Tanacetum balsamitum St.-Lag. Ann. Soc. Bot. Lyon 7: 136. 1880.
Chrysanthemum Balsamita Baillon, Hist. Pl. 8: 311. 1882. Not *C. Balsamita* L. 1753.
Chrysanthemum Santa-Maria Maza, Anal. Soc. Esp. Hist. Nat. 19: 277. 1890.
Chrysanthemum Balsamita tanacetoides Boiss.; W. Miller, Cycl. Am. Hort. 313. 1900.

A leafy herbaceous perennial; stem 5-12 dm. high, angled and grooved, puberulent; lower leaves 1-2 dm. long, petioled; blades puberulent or finely pilose, often somewhat canescent, obovate or oblanceolate, crenate or dentate, rounded at the apex; upper leaves 3-5 cm. long, subsessile, obovate or ovate in outline, crenate, obtuse, often incised or lobed towards the base; involucre 4 mm. high, 6-7 mm. broad; bracts 25-30, the outer linear, wholly green, the inner oblong with scarious erose tips; ray-flowers usually wanting; disk-corollas 2.5 mm. long; achenes fully 1 mm. long.

TYPE LOCALITY: Etruria [Tuscany], Italy.

DISTRIBUTION: Escaped from cultivation from Maine to New York, Indiana, and Michigan; native of southern Europe and the Orient.

ILLUSTRATIONS: Cycl. Am. Hort. f. 464; Schkuhr, Handb. pl. 240; Reichenb. Ic. Fl. Germ. 16: pl. 995, f. 11, 4, 5; Hayne, Arzn. Gew. 2: pl. 5; Britt. & Brown, Ill. Fl. f. 3991; ed. 2. f. 4564.

11. *TANACETUM* (Tourn.) L. Sp. Pl. 843. 1753.

- Omalanthus* Less. Syn. Comp. 260. 1832. Not *Omalanthus* A. Juss. 1824.
Omalotes DC. Prodr. 6: 83. 1837.
 ? *Hemipappus* C. Koch, Linnaea 24: 340. 1851.

Strongly aromatic, leafy, mostly perennial herbs, with rootstocks. Leaves alternate, once to three pinnatifid, conspicuously punctate. Heads corymbose, usually several or many, in one species sometimes solitary, radiate, but the rays often inconspicuous and not exceeding the disk. Involucre hemispheric or in ours often broader; bracts in 2-3 series, usually narrow, not very unequal in length. Receptacle convex, naked. Ray-flowers 5-20, in a single series, pistillate and fertile; ligules yellow, varying from erect, 3-lobed, concave, and scarcely exceeding the disk to spreading, flat, and well developed. Disk-flowers many, hermaphrodite and fertile; corolla cylindric, 5-lobed, with the tube and throat poorly differentiated. Style in the ray-flowers slightly exerted, in the disk-flowers included. Anthers with obtuse tips. Achenes subcylindric, those of the ray-flowers mostly 3-angled, those of the disk-flowers 5-angled. Pappus-squamellae united into a short crown.

Type species, *Tanacetum vulgare* L.

Ray-flowers scarcely surpassing the disk; ligules inconspicuous, erect, 3-lobed, very concave.

Segments of the leaves acute or obtuse, not densely crowded; involucre 6-8 mm. broad.

Segments of the leaves rounded at the apex, the secondary ones very crowded; involucre 10-16 mm. broad.

Ray-flowers distinctly longer than the disk-flowers.

Ligules erect or ascending, decidedly concave; heads several.

Ligules obscurely lobed; divisions of the leaves acute, the ultimate ones lanceolate.

Ligules deeply 3-lobed; divisions of the leaves obtuse or rounded at the apex, the ultimate ones oblong.

Ligules spreading, flat; heads 1-4.

1. *T. vulgare*.

5. *T. camphoratum*.

2. *T. huronense*.

3. *T. Douglasii*.

4. *T. bipinnatum*.

1. *Tanacetum vulgare* L. Sp. Pl. 844. 1753.

- Tanacetum vulgare crispum* L. Sp. Pl. 845. 1753.
Tanacetum officinarum Crantz, Inst. 1: 273. 1766.
Tanacetum elatum Salisb. Prodr. 190. 1796.
Tanacetum crispum Steud. Nom. Bot. Phan. 325. 1821.
Pyrethrum vulgare Boiss. Fl. Orient. 3: 352. 1875.
Chrysanthemum Tanacetum Baillon, Hist. Pl. 8: 311. 1882. Not *C. Tanacetum* Vis. 1847.

A stout perennial, with a rootstock; stem 4-10 dm. high, often reddish, simple, round-angled, more or less puberulent; leaves 1-3 dm. long, twice pinnately divided, glandular-punctate and more or less puberulent; primary divisions 2-5 cm. long, linear, acute or in var. *crispum* oblong and obtuse, more or less decurrent on the more or less winged and lobed rachis, the upper confluent; secondary divisions lanceolate or oblong-lanceolate, acute or in the variety obovate and obtuse, sharply serrate; heads many, in compound corymbs; involucre hemispheric, about 4 mm. high, 6-8 mm. broad; bracts 30-40, in 2-3 series, sparingly puberulent or glabrate, the outer lanceolate, acute, the inner oblong and obtuse; ray-flowers in a single series; corollas tubular, flattened, split on one side, 3-lobed, glabrous, 2 mm. long; disk-flowers 200-400; corollas 2 mm. long, glabrous; achenes 3-5-angled, 1 mm. long; pappus a small 3-5-toothed crown.

TYPE LOCALITY: Europe.

DISTRIBUTION: Introduced and naturalized, Nova Scotia to South Carolina, Mississippi, California, and Washington; Bermudas; native of Europe and Asia.

ILLUSTRATIONS: Fl. Dan. *pl.* 871; Sv. Bot. *pl.* 81; Engl. Bot. *pl.* 1229; Baxter, Brit. Bot. *pl.* 24; Coste, Fl. Fr. *f.* 1903; Hayne, Arzn. Gew. 2: *pl.* 6; Reichenb. Ic. Fl. Germ. 16: *pl.* 996; A. Dietr. Fl. Boruss. *pl.* 666; Fl. Deuts. ed. 5. *pl.* 3014; Thomé, Fl. Deuts. *pl.* 536; Britt. & Brown, Ill. Fl. *f.* 3996; ed. 2. *f.* 4569.

2. *Tanacetum huronense* Nutt. Gen. 2: 141. 1818.

A stout perennial, with a branched rootstock; stem 3-6 dm. high, simple or branched above, more or less villous; leaves elliptic or oval in outline, 1-3 dm. long, twice or thrice interruptedly pinnatifid, more or less villous; primary divisions oblong in outline, acute, 2-6 cm. long, with smaller ones interposed on the narrowly winged rachis; secondary divisions elliptic, acute, toothed or often cleft into lanceolate lobes; heads few, 1-8, corymbose; involucre hemispheric or depressed, 5 mm. high, 10-15 mm. broad; bracts 20-30, in 2 series, lanceolate, acute, with brownish or purplish scarious tips; ray-flowers in a single series, pistillate; corollas about 4 mm. long; ligules oval, 2-2.5 mm. long, with enrolled margins, slightly 3-lobed; disk-flowers very numerous; corollas 3 mm. long; achenes 3 mm. long, somewhat angled; pappus a 3-5-lobed erose crown.

TYPE LOCALITY: Shores of Lake Huron, near Michilimackinack.

DISTRIBUTION: New Brunswick and Maine to Michigan and Hudson Bay.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. *f.* 3997; ed. 2. *f.* 4570.

3. *Tanacetum Douglasii* DC. Prodr. 6: 128. 1837.

Tanacetum huronense A. Gray, Syn. Fl. N. Am. 1: 366, in part. 1884.

A stout perennial, with a branched rootstock; stem 3-5 dm. high, more or less villous; leaves 1-2 dm. long, obovate or oblong-ob lanceolate in outline, twice or thrice interruptedly pinnatifid, villous; primary divisions oblong in outline, obtuse, 2-5 cm. long, the secondary ones obovate, toothed or cleft, the teeth or lobes oblong, obtuse; heads few, 3-10, corymbose; involucre depressed-hemispheric, 5 mm. high, 10-15 mm. broad; bracts 25-30, in 2 series, villous, the outer lanceolate, acute, the inner elliptic or ovate, mostly obtuse, with brown tips; ray-flowers few; corollas about 5 mm. long; ligules flabelliform, deeply 3-lobed, as long as the tube; style-branches short, oblong; disk-flowers very numerous; corollas 4 mm. long; achenes 3 mm. long, obtusely angled; pappus a short crown.

TYPE LOCALITY: Western North America.

DISTRIBUTION: British Columbia to Oregon.

4. *Tanacetum bipinnatum* (L.) Schultz-Bip. Tanac. 48. 1844.

Chrysanthemum bipinnatum L. Sp. Pl. 890. 1753.

Matricaria bipinnata Desr. in Lam. Encyc. 3: 736. 1791.

Pyrethrum bipinnatum Willd. Sp. Pl. 3: 2160. 1804.

Tanacetum pauciflorum Richards. in Frankl. Journey ed. 2. App. 30. 1823. Not *T. pauciflorum* Fisch. 1812.

Artemisia kotzebuensis Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 80. 1834.

Tanacetum kotzebuense Besser, Bull. Soc. Nat. Mosc. 9: 107. 1836.

Tanacetum boreale Nutt. Trans. Am. Phil. Soc. II. 7: 401. 1841. Not *T. boreale* Fisch. 1822.

Pyrethrum velutinum Fisch.; Herder, Bull. Soc. Nat. Mosc. 38: 419. 1865.

A stout perennial, with a creeping rootstock; stem 2-3 dm. high, striate, round-angled, more or less hirsute with flat crisp hairs; leaves 5-15 cm. long, oval or elliptic in outline, twice

pinnatifid, more or less villous; primary divisions oblong in outline, acute, 2-4 cm. long; rachis narrowly winged; secondary segments lance-oblong, with lanceolate teeth; heads 1 or 2, rarely 3 or 4; involucre depressed-hemispheric, about 6 mm. high, 12-15 mm. broad; bracts 20-25, in 2 series, hirsute, with brown scarios lacerate margins, the outer lanceolate and obtuse, the inner oblong and rounded at the apex; ray-flowers 15-20, in a single series, pistillate; corollas 6-7 mm. long, yellow; ligules broadly obovate, obtusely 3-lobed, 2.5-4 mm. long, about 3 mm. wide; disk-flowers numerous; corollas 4 mm. long; achenes 3 mm. long, somewhat angled; pappus a 3-5-lobed erose crown.

TYPE LOCALITY: Siberia.

DISTRIBUTION: Alaska, Yukon, and Mackenzie; also eastern Siberia.

ILLUSTRATION: Gmel. Fl. Sib. 2: pl. 85, f. 1.

5. *Tanacetum camphoratum* Less. *Linnaea* 6: 521. 1831.

Omalanthus camphoratus Less. Syn. Comp. 260. 1832.

Omalotes camphorata DC. Prodr. 6: 84. 1837.

Tanacetum huronense Nutt. Trans. Am. Phil. Soc. II. 7: 401, in part. 1841.

Tanacetum elegans Decaisne, Fl. Serres 12: 19. 1857.

A stout perennial, with a branched rootstock; stem 3-5 dm. high, arachnoid-villous; leaves 1-2 dm. long, twice pinnatifid, arachnoid-villous, oval in outline, obtuse; primary divisions oblong, obtuse, 2-5 cm. long; secondary divisions crowded, oblong, obtuse, cleft into short oblong lobes; heads few, 3-12, in a congested corymb, short-peduncled; involucre depressed-hemispheric, 5-6 mm. high, 10-16 mm. broad; bracts 25-30, densely arachnoid-villous, the outer lanceolate, the inner oblong, obtusish; ray-flowers few, in a single series; corollas tubular, flattened, oblique, 3-lobed, 4 mm. long, not longer than the disk-flowers; style shorter than the corolla; branches oblong, obtuse; disk-corollas tubular, 5-toothed, 4 mm. long, glabrous; style included; branches short, truncate; achenes 4 mm. long, bluntly 3-5-angled, densely glandular-granuliferous; pappus a bluntly toothed erose crown.

TYPE LOCALITY: California.

DISTRIBUTION: Beaches, California and Oregon.

ILLUSTRATION: Fl. Serres pl. 1191.

12. *SPHAEROMERIA* Nutt. Trans. Am. Phil. Soc. II. 7: 402. 1841.

Low caespitose perennials, with a woody base, or small shrubs. Leaves alternate, often crowded at the base, pinnately or pedately divided or simple, usually (except in one species) silvery-canescens. Heads heterogamous but apparently discoid, few, corymbose, or in one species in subcapitate clusters and in another solitary. Involucre hemispheric to broadly campanulate; bracts few, in 2 subequal series, usually broad. Receptacle conic or convex, naked. Marginal flowers (functionally ray-flowers) few, pistillate and fertile, but without ligules; corollas cylindrical to lance-ovoid, 3- or 4-lobed, slightly if at all oblique; lobes often somewhat unequal, if 4 the alternating ones smaller. Disk-flowers many, hermaphrodite and fertile; corollas with the usually short tube passing into the campanulate or cylindrical-campanulate throat. Anthers with ovate obtusish tips. Style of the ray-flowers short-exserted, that of the disk included; branches of the former oblong, obtuse, of the latter short, truncate and penicillate at the apex. Achenes subcylindrical, tapering at the base, 5-10-ribbed. Pappus wanting.

Type species, *Sphaeromeria capitata* Nutt.

Low caespitose perennials, with a tufted woody caudex; plant rarely 3 dm. high.

Heads solitary; leaves or their segments linear.

Heads several.

Heads in capitate clusters; leaf-segments linear or nearly so.

Heads corymbose; leaf-segments obovate.

Small shrubs, 2-6 dm. high.

Leaves silvery-canescens; corolla-lobes short-villous.

Leaves glabrous or nearly so; corolla-lobes glabrous.

1. *S. simplex*.

2. *S. capitata*.

3. *S. argentea*.

4. *S. cana*.

5. *S. diversifolia*.

1. *Sphaeromeria simplex* (A. Nelson) A. Heller, Muhlenbergia

1: 7. 1900.

Tanacetum simplex A. Nelson, Bull. Torrey Club 26: 484. 1899.

A tufted perennial, with a short cespitose woody caudex; stems about 1 dm. high, silky-canescenscent; leaves crowded at the base, closely and finely silky-canescenscent, simple and linear, 2-4 cm. long, 1-2 mm. wide, or bifid or trifid at the apex; stem-leaves few and linear, entire; heads solitary at the end of the stems; involucre 5-6 mm. high, 8-10 mm. broad; bracts about 25, in two series, light-yellow with green midrib, shining, silky, oval or obovate, or the outer ovate-lanceolate; ray-flowers few; corollas 3-4-lobed, lance-ovoid, 3 mm. long; disk-corollas campanulate with a short tube, glabrous, 3-3.5 mm. long; achenes about 2 mm. long, truncate at the apex.

TYPE LOCALITY: Near Laramie, Wyoming.

DISTRIBUTION: Wyoming.

2. *Sphaeromeria capitata* Nutt. Trans. Am. Phil. Soc. II. 7: 402.

1841.

Tanacetum capitatum T. & G. Fl. N. Am. 2: 415. 1843.

A cespitose tufted perennial, suffruticose at the base; stems about 1 dm. high, finely canescenscent; leaves mostly crowded at the base, 1-3 cm. long, silvery-canescenscent, ternately or biternately divided into linear or linear-oblanccolate divisions; heads few, capitately clustered at the end of the stems or sometimes 1 or 2 in the upper axils below the terminal cluster; involucre broadly campanulate, 4-5 mm. high and about as broad; bracts 6-8, obovate, light-yellow, erose, silky; ray-flowers 5-6; corollas 2 mm. long, ovoid, 3-4-lobed; disk-flowers 12-15; corollas campanulate, with a short tube, 2.5 mm. long, glandular-puberulent; achenes 2 mm. long, subcylindric, tapering at the base, 5-ribbed, truncate at the summit, glabrous.

TYPE LOCALITY: Red Buttes on the Platte, Wyoming.

DISTRIBUTION: Wyoming and southern Montana.

3. *Sphaeromeria argentea* Nutt. Trans. Am. Phil. Soc. II. 7: 402.

1841.

Tanacetum Nuttallii T. & G. Fl. N. Am. 2: 415. 1843.

A suffruticose perennial; stems cespitose and decumbent at the base, 1-2 dm. high; leaves broadly cuneate, obtusely 3-5-lobed at the summit, densely silvery-white; heads few, corymbose; involucre rounded-campanulate tonearly hemispheric, 3.5 mm. high, 5-6 mm. broad; bracts about 12, light yellowish-brown with darker midrib, scarious and erose on the margins, the outer ovate and acute, the inner oval and obtuse; ray-corollas ovoid, 1.5 mm. long, 4-lobed, glandular-puberulent; disk-flowers many; corollas campanulate, with a short tube, 2 mm. long, glandular-puberulent; achenes 2 mm. long, subcylindric, truncate at the apex, 10-ribbed.

TYPE LOCALITY: Near the sources of the Platte, Wyoming.

DISTRIBUTION: Arid hills, Wyoming and Montana.

4. *Sphaeromeria cana* (D. C. Eaton) A. Heller, Muhlenbergia

1: 7. 1900.

Tanacetum canum D. C. Eaton, in S. Wats. Bot. King's Expl. 179. 1871.

A low shrub, 2-6 dm. high; branches silky-canescenscent when young; leaves silvery-canescenscent, 1-5 cm. long, the lower pedately 3-5-fid into oblanccolate divisions, the upper lanccolate or oblanccolate, undivided; heads several, corymbose; involucre hemispheric, 3 mm. high, 5-6 mm. broad; bracts 10-12, canescenscent, yellowish, elliptic to obovate, obtuse; ray-flowers 4-8; corollas nearly 2 mm. long, cylindric, obscurely 3-4-lobed; lobes short-villous; disk-flowers 50-60; corollas campanulate, with a short tube, 2 mm. long, with short-villous lobes; achenes 1.5 mm. long, cylindric, 10-ribbed, truncate at the apex.

TYPE LOCALITY: East Humboldt Mountains, Nevada.

DISTRIBUTION: Nevada, eastern California, and Oregon.

ILLUSTRATION: S. Wats. Bot. King's Expl. pl. 19, f. 8-14.

5. *Sphaeromeria diversifolia* (D. C. Eaton) Rydberg.

Tanacetum diversifolium D. C. Eaton, in S. Wats. Bot. King's Expl. 180. 1871.

A low shrub; stem about 3 dm. high, angled, grooved, sparingly pilose or glabrate; leaves 3-5 cm. long, distinctly punctate, sparingly pilose or glabrous, pinnatifid into linear divisions, or some of them linear, entire; heads corymbose; involucre hemispheric, 2.5-3 mm. high, 4-6 mm. broad; bracts 12-14, in two series, puberulent, yellowish with brownish midrib, elliptic, obtuse; ray-flowers 8-10; corollas tubular, 3-4-toothed, 2.5 mm. long, glandular-granuliferous; disk-flowers many; corollas 2.5 mm. long, glandular-granuliferous, with a cylindric tube and campanulate throat; achenes subcylindric, tapering somewhat at the base, truncate at the apex.

TYPE LOCALITY: Canyon of Cottonwood Creek, Utah.

DISTRIBUTION: Central Utah.

ILLUSTRATION: S. Wats. Bot. King's Expl. *pl. 19, f. 1-7.*

13. *VESICARPA* Rydberg, gen. nov.

Perennial silvery-canescens herbs. Leaves alternate, pinnatifid into linear divisions. Heads several, corymbose, apparently discoid. Involucre hemispheric or nearly so; bracts few in two subequal series, broad. Receptacle pubescent, convex. Marginal flowers (functionally ray-flowers) few, pistillate and fertile; corollas cylindric, 4-lobed, glandular-granuliferous. Disk-flowers numerous, hermaphrodite and fertile; corollas campanulate, 5-lobed, glandular-granuliferous. Anthers with ovate-lanceolate tips. Style of the ray-flowers short-exserted, with short, oblong, obtuse branches; that of the disk-flowers equaling the corolla, with short truncate branches. Achenes obovoid, of thin texture, utricular, swelling up and becoming gelatinous in water, those of the disk-flowers equally 5-angled, those of the ray-flowers 3-angled, the 2 lateral angles wing-margined towards the apex.

Type species, *Artemisia potentilloides* A. Gray.

1. *Vesicarpa potentilloides* (A. Gray) Rydberg.

Artemisia potentilloides A. Gray, Proc. Am. Acad. 6: 551. 1865.

Tanacetum potentilloides A. Gray, Proc. Am. Acad. 9: 204. 1874.

Sphaeromeria potentilloides A. Heller, Muhlenbergia 1: 7. 1900.

A perennial herb, with a woody root; stems decumbent or ascending, 1-3 dm. high, more or less silky; leaves bi- or tri-pinnatifid, or the upper only pinnatifid, with linear or linear-oblongate divisions, silvery-sericeous; heads several or many, corymbose-paniculate; involucre 3-4 mm. high, 6-8 mm. broad; bracts 12-14, obovate, rounded or obtuse at the apex, sericeous, light-brown with yellowish margins; ray-flowers few; corollas 2 mm. long; disk-corollas 2 mm. long.

TYPE LOCALITY: Near Carson City, Nevada.

DISTRIBUTION: California, Oregon, and Nevada.

14. *CHAMARTEMISIA* Rydberg, gen. nov.

Dwarf tufted silvery-canescens perennials, with a short caespitose woody caudex. Leaves alternate but mostly clustered at the base, pedately 3-5-divided. Heads apparently discoid, solitary, or rarely 2, at the end of the stems. Involucre hemispheric; bracts in 2 nearly equal series. Receptacle convex, naked. Marginal flowers (functionally ray-flowers) pistillate and fertile, but without ligules; corollas nearly tubular, tapering upwards, 3-toothed. Disk-flowers many; corollas straw-colored, tubular-cylindric, glabrous, with 5 pubescent lobes. Anthers with subulate tips. Style in the ray-flowers exserted, in the disk-flowers included; branches of the former linear, of the latter short and truncate at the apex. Achenes subcylindric, glabrous; pappus of 5 subulate squamellae.

Type, *Tanacetum compactum* H. M. Hall.

1. *Chamartemisia compacta* (H. M. Hall) Rydberg.

Tanacetum compactum H. M. Hall, *Muhlenbergia* 2: 343. 1916.

A dwarf perennial; stems 2-5 cm. high, white-silky-villous; leaves 1-2 cm. long, silvery-canescens, divided into oblanceolate divisions; involucre about 5 mm. high, 8-10 mm. broad; bracts 18-20, in 2 series, silky-villous, white with dark-brown midrib, lance-ovate or elliptic, acute; ray-flowers 5-10; corollas 3 mm. long; disk-flowers about 50.

TYPE LOCALITY: Head of Lee Canyon, Charleston Mountains, Nevada.

DISTRIBUTION: Known only from the type locality.

15. *CROSSOSTEPHIUM* Less. *Linnaea* 6: 220. 1831.

Artemisia § *Tanacetum* Nutt. *Trans. Am. Phil. Soc. II.* 7: 399. 1841.

Shrubs. Leaves alternate, entire or pinnatifid with narrow divisions. Heads small, panicled, apparently discoid, the marginal flowers without ligules. Involucre mostly hemispheric; bracts in 2-3 series, the inner more or less scarious. Receptacle in ours hairy. Marginal flowers (functionally ray-flowers) pistillate and fertile; corollas cylindric, 3-4-toothed, almost regular; style barely exerted, with obtuse branches. Disk-flowers hermaphrodite and fertile; corollas campanulate, 5-toothed; anthers oblong, subulate-tipped, cordate at the base; style barely exerted; branches truncate. Achenes truncate at the apex, 3-5-ribbed, with a coroniform, dentate or lacinate pappus.

Type species, *Crossostephium artemisioides* Less. (based on *Artemisia chinensis* Vahl, not L.).

Leaf-segments less than 1 mm. wide, usually revolute.

Plant almost silvery-white; some of the leaves ternately cleft at the apex;

leaves or leaf-segments less than 0.5 mm. wide.

1. *C. foliosum*.

Plant merely grayish; some of the leaves pinnatifid; leaves or leaf-segments

0.5-1 mm. wide.

2. *C. californicum*.

Leaf-segments 1-3 mm. wide, not revolute; lower leaves irregularly pinnatifid.

3. *C. insulare*.

1. *Crossostephium foliosum* (Nutt.) Rydberg.

? *Artemisia Fisheriana vegetior* Besser, *Nouv. Mém. Soc. Nat. Mosc.* 3: 88. 1834.

Artemisia foliosa Nutt. *Trans. Am. Phil. Soc. II.* 7: 397. 1841.

A shrub 1-2 m. high; branches densely canescent; leaves 2-4 cm. long, densely canescent, the upper filiform, less than 0.5 mm. broad, revolute, the lower 3-fid above the middle; heads numerous, in leafy raceme-like panicles; involucre hemispheric, about 3 mm. high, 4-5 mm. broad; bracts 12-15, the outer ones elliptic, canescent, scarcely scarious-margined, the inner ones oval, less pubescent, and with broad scarious margins; ray-flowers 7-10; corollas cylindric, somewhat flattened, 3-4-lobed; disk-flowers 15-20; corollas cylindro-campanulate, 5-toothed, 1.5 mm. long; achenes 3-5-ribbed, becoming glutinous in wetting; pappus coroniform.

TYPE LOCALITY: Monterey, California.

DISTRIBUTION: California and adjacent islands.

2. *Crossostephium californicum* (Less.) Rydberg.

Artemisia californica Less. *Linnaea* 6: 523. 1831.

Artemisia Fisheriana Besser, *Nouv. Mém. Soc. Nat. Mosc.* 3: 21. 1834.

Artemisia abrolanoides Nutt. *Trans. Am. Phil. Soc. II.* 7: 399. 1841.

A shrub 1-3 m. high; branches grayish-strigose; leaves 2-5 cm. long, fascicled, pinnately divided into filiform divisions or the upper entire and filiform, revolute, canescent, fleshy; heads numerous, nodding, in dense panicles with racemiform branches; peduncles 1-5 mm. long; involucre depressed-hemispheric, 3 cm. high, 5-6 mm. broad; bracts 15-20, in about 3 series, somewhat canescent, the outermost oblong, fleshy, somewhat shorter, the inner ones with thick backs and broad scarious margins, obovate or rounded-spatulate; ray-flowers 8-10; corollas cylindric, short, regular, 4-toothed, glandular-granuliferous; disk-flowers 15-20; corollas campanulate, 5-toothed, 2 mm. long; achenes 3-5-ribbed; pappus dentate.

TYPE LOCALITY: California.

DISTRIBUTION: Central and southern California, along the coast.

3. *Crossostephium insulare* Rydberg, sp. nov.

A shrub, 0.5–2 dm. high; branches densely canescent; leaves 5–10 cm. long, very fleshy, densely canescent, the lower irregularly pinnatifid into linear divisions, the upper entire; leaves and their segments 1–3 mm. wide; heads mostly solitary at the ends of short leafy branches, more or less nodding; involucre hemispheric, 3 mm. high, 4–5 mm. broad; bracts 15–18, in 3 series, all oval, densely canescent on the back, more or less scarious-margined, especially the innermost, the outer only slightly shorter; ray-flowers 10–15; corollas cylindric, slightly flattened, minutely 3–4-toothed, 1 mm. long, glandular-granuliferous; disk-flowers 30–40; corollas cylindro-campanulate, 5-toothed, fully 1.5 mm. long; achenes with 3–5 thick ribs, becoming glutinous in wetting; pappus coroniform.

Type collected along Pot's Trail, San Clemente Island, California, June, 1903, *Blanche Trask* 286 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: San Clemente and San Nicolas islands, California.

16. *Picrothamnus* Nutt. Trans. Am. Phil. Soc. II. 7: 417. 1841.

Low spiny shrubs. Leaves alternate, pedately divided and again lobed, with narrow divisions. Heads solitary or in small racemes in the axils and at the ends of the short branches, apparently discoid, the marginal flowers without ligules. Involucre saucer-shaped; bracts obovate-cuneate, scarious, in two more or less distinct subequal series. Receptacle naked. Marginal flowers (functionally ray-flowers) few, pistillate, fertile; corolla short, deeply 2-cleft, villous; style long-exserted, with long linear obtuse branches. Disk-flowers hermaphrodite but sterile; corollas with a narrow obconic tube, a turbinate throat, and a 5-lobed limb, densely arachnoid-hairy; anthers oblong, with subulate tips and obtuse bases; style slender, with a peltate, erose stigma. Achenes ellipsoid, densely arachnoid-hairy.

Type species, *Picrothamnus desertorum* Nutt.

1. *Picrothamnus desertorum* Nutt. Trans. Am. Phil. Soc. II. 7: 417. 1841.

Artemisia spinescens D.C. Eaton, in S. Wats. Bot. King's Expl. 180. 1871.

A low spiny villous shrub, 1–3 dm. high; leaves crowded, villous, 1–2 cm. long, pedately 3–5-divided and the divisions usually 3-cleft into linear-spatulate divisions; heads few; involucre 2 mm. high, 4–5 mm. broad; bracts 5–8, obovate-cuneate, villous; ray-flowers 1–4; corollas less than 1 mm. long; style 2–2.5 mm. long; disk-flowers 2.5–3 mm. long; style included; achenes fully 1.5 mm. long.

TYPE LOCALITY: Rocky Mountain plains, in arid deserts, towards the north sources of the Platte.

DISTRIBUTION: Wyoming to New Mexico, Oregon, and California.

ILLUSTRATION: S. Wats. Bot. King's Expl. *pl. 19, f. 15–21.*

17. *ARTEMISIA* L. Sp. Pl. 845. 1753.

Absinthium (Tourn.) Lam. Fl. Fr. 2: 45. 1778.

Abrotanum (Tourn.) Neck. Elem. 1: 98. 1790.

Oligosporus Cass. Bull. Soc. Philom. 1817: 33. 1817.

Perennial or annual herbs, or shrubs, usually bitter-aromatic. Leaves alternate, mostly dissected, lobed, or toothed, sometimes entire. Heads small, most commonly paniced and nodding when young, apparently discoid, the marginal flowers without ligules or wanting. Involucre campanulate to hemispheric; bracts in 2–4 series, at least the inner ones more or less scarious. Receptacle naked or hairy, convex or conic. Marginal flowers (functionally ray-flowers) pistillate and fertile or wanting; corollas cylindric or subcylindric and somewhat tapering upwards, 2–3-, rarely 4-toothed, often somewhat oblique; stamens wanting; style more or less exserted, 2-cleft; style-branches linear-filiform and subterete to oblong and somewhat flattened. Disk-flowers hermaphrodite, fertile or sterile; corollas campanulate, funnel-form, or trumpet-shaped, 5-toothed, regular; anthers longer than the short filaments, oblong,

obtuse or subcordate at the base, the connective produced into a lanceolate or subulate tip; style mostly included or short-exserted, either 2-cleft and the branches more or less recurved, truncate at the apex, with an erose or fimbriate apex, or else entire and surmounted by an erose or fimbriate cup; achenes ellipsoid, terete, usually glabrous, without pappus.

Type species, *Artemisia vulgaris* L.

Disk-flowers sterile, their styles undivided or with short erect branches; receptacle naked. (Genus *Oligosporus* Cass.) **A. Dracunculus.**

Annual or perennial herbs; style of the disk-flowers undivided, ending in a cup-shaped penicillate appendix.

Low shrubs or undershrubs; style of the disk-flowers usually more or less 2-cleft, each branch erect with truncate penicillate or erose apex.

Disk-flowers fertile, their styles 2-cleft; branches more or less recurved.

Marginal pistillate flowers present.

Receptacle hairy. B. Absinthium.

Heads numerous, usually paniculate; plant more or less shrubby at the base.

Heads few, 1-12, racemose; plant low, herbaceous, from a rootstock, 1-3 dm. high.

Receptacle naked. C. Abrotanum.

Annual or biennial herbs with bipinnatifid leaves.

Leaves green; divisions not filiform.

Leaves white-tomentose; divisions filiform.

Perennials.

Plant low, rarely more than 1 dm. high, pulvinate-cespitose; heads many-flowered, in capitate clusters.

Plant taller, more than 1 dm. high, not pulvinate-cespitose, either with a rootstock or with a suffruticose base.

Leaves silvery or silky or glabrate, but not tomentose beneath.

Plant low, perennial, herbaceous, with rootstocks; heads many-flowered, nodding in a simple racemose inflorescence; leaves divided into linear or oblong divisions.

Plant more or less shrubby at the base; heads paniculate.

Leaves pinnately dissected into narrow divisions (glabrate forms of *A. Abrotanum*, *A. graveolens*, and *A. tenuis*).

Leaves cuneate, 3-toothed at the apex or the upper entire.

Leaves more or less tomentose beneath.

Leaves not dissected into narrowly linear more or less divergent divisions; these, if narrow, very few, directed-forward and entire.

Leaves greener and glabrate above, at least in age.

Heads 60-100-flowered; leaves twice pinnatifid with obtuse divisions, the lower long-petioled.

Heads 5-50-flowered; leaves simple or once pinnatifid, or, if bipinnatifid, with acute lobes and sessile or short-petioled.

Leaves entire or with a few lobes, if dissected to near the midrib, the lobes rather broad [except in *A. mexicana*].

Leaves deeply dissected to near the midrib; divisions linear or oblong, usually more or less cleft.

Leaves white-tomentose on both sides.

Involucre 3-5 mm. high; leaves entire or divided into lanceolate, linear-lanceolate, or oblong divisions.

Involucre 5-6 mm. high; leaves obovate in outline, with short elliptic or ovate divisions; plant stout.

Leaves once or twice dissected into linear or filiform, more or less spreading divisions.

Leaf-segments broadly linear or linear-lanceolate, usually again lobed or toothed.

Leaf-segments narrowly linear or filiform, mostly revolute.

I. DRACUNCULOIDES.

II. FILIFOLIAE.

III. FRIGIDAE.

IV. LANATAE.

V. ANNUAE.

VI. KLOTZSCHIANAE.

VII. GLOMERATAE.

VIII. NORVEGICAE.

XVII. BIGELOVIANAE.

IX. FRANSERIOIDES.

X. VULGARES.

XIII. DISCOLORES.

XI. GNAPHALODES.

XII. STELLERTIANAE.

XIII. DISCOLORES.

- Leaves once pinnatifid; plant herbaceous, woody only at the base, if at all; style of the ray-flowers long-exserted.
- Leaves twice pinnatifid; plant suffrutescent; style of the ray-flowers short-exserted.
- Heads numerous, small, less than 5 mm. broad, in leafy panicles; leaves twice pinnatifid, with filiform divisions.
- Heads fewer, comparatively large, 5 mm. broad or more; primary divisions of the leaves ternately cleft into linear or oblong divisions.
- Marginal pistillate flowers wanting; receptacle naked. D. Seriphidium.**
- Shrubs, 1-50 dm. high; leaves canescent, not with raised midribs.
- Heads in terminal panicles; leaves entire, or 3-5-toothed to 3-5-divided at the apex.
- Heads axillary; leaves pinnatifid into linear divisions.
- Dwarf undershrubs, scarcely more than 1 dm. high; leaves pinnatifid into linear-spatulate divisions, green, with the ribs raised beneath.
- Subgenus **A. Dracunculus**
I. DRACUNCULOIDES
- Leaves all entire or the lower 3-fid.
- Heads in dense panicles with erect or ascending branches.
- Leaves densely pubescent when young.
- Leaves glabrous.
- Involucre 3-4 mm. broad; lower stem-leaves 3-12 mm. wide.
- Outermost involucre bracts about half as long as the innermost; heads 20-40-flowered.
- Outermost involucre bracts almost as long as the innermost; heads 30-100-flowered.
- Involucre 2-3 mm. broad; leaves 1-3 mm. wide; heads 20-40-flowered; outer bracts much shorter than the inner.
- Branches of the inflorescence strict.
- Branches of the inflorescence drooping at the apex.
- Heads in open panicles, 20-25-flowered.
- Branches ascending, nodding at the apex; plant glabrous from the beginning.
- Branches spreading; leaves and stem often pubescent when young, glabrate in age.
- Pubescence of long loose hairs.
- Pubescence of short appressed hairs.
- Leaves, at least the lower, pinnatifid or bipinnatifid.
- Heads very small, 2-3 mm. broad, numerous in large leafy panicles; plants mostly tall, 3-10 dm. high.
- Biennials; heads mostly erect, the outer bracts acute.
- Plant glabrous or nearly so.
- Plant decidedly pubescent.
- Perennials, with a rootstock or caudex; heads nodding at least at first.
- Plant 3-10 dm. high; stem leafy.
- Stem tall, very leafy, 4-10 dm. high; bracts acute or acutish.
- Stem lower, 3-5 dm. high; stem-leaves rather small and scattered; bracts obtuse or rounded at the apex.
- Plant decidedly appressed-silky; inflorescence dense.
- Plant glabrate; inflorescence open.
- Plant less than 1 dm. high; stem scapiform; stem-leaves minute.
- Heads larger, 4-5 mm. broad, not very numerous (except in *A. Bourgeauana*), in narrow spike-like panicles; plants low, rarely 3 dm. high.
- Involucral bracts glabrous or nearly so; disk-corollas glabrous.
- Outer involucre bracts about half as long as the inner; stem strict.
- Outer involucre bracts nearly as long as the inner; stem decumbent at the base.
- Involucral bracts more or less villous; disk-corollas usually with a few hairs on the lobes.
- Leaves silky-canescens with appressed hairs.
- Plant 3-4 dm. high; heads very numerous in a dense panicle.
- Plant 1-3 dm. high; heads fewer, usually a spike-like panicle or racemose.
- Segments of the basal leaves linear-oblancoolate.
- Basal leaves 2-4 cm. long, usually not densely white-silky; stem 1-2.5 dm. high.
- Basal leaves 1-2 cm. long, densely and finely white-silky; stem 5-6 cm. high.
- XIV. WRIGHTIANAE.
- XV. PONTICAE.
- XVI. RUTAEOFOLIAE.
- XVIII. TRIDENTATAE.
- XIX. RIGIDAE.
- XX. PYGMÆAE.
1. *A. glauca*.
2. *A. Dracunculus*.
3. *A. aromatica*.
4. *A. dracunculoides*.
5. *A. cernua*.
5. *A. cernua*.
6. *A. dracunculina*.
7. *A. gracillima*.
8. *A. caudata*.
9. *A. Forwoodii*.
10. *A. pacifica*.
11. *A. camporum*.
12. *A. campestris*.
34. *A. minuta*.
13. *A. MacCallae*.
14. *A. canadensis*.
15. *A. Bourgeauana*.
16. *A. spithamea*.
17. *A. manca*.

Segments of the basal leaves narrowly linear.

Plant sparingly silky; inner bracts broadly oval, rounded at the apex; corollas mostly purplish.

Plant densely silvery-silky; inner bracts ovate, acutish; corollas yellow.

Leaves loosely villous; heads in dense narrow panicles; bracts acutish.

18. *A. borealis*.

19. *A. ripicola*.

20. *A. pycnocephala*.

II. FILIFOLIAE

Taller shrubs 3-10 dm. high, with numerous heads in leafy panicles; heads 3-7-flowered.

Low undershrubs less than 1.5 dm. high, with racemose inflorescence; heads 10-15-flowered.

Leaves ternate or biternate.

Leaves pinnatifid with 5-7 divisions.

21. *A. filifolia*.

22. *A. pedatifida*.

34. *A. minuta*.

Subgenus B. Absinthium

III. FRIGIDAE

Plant tall, 6-10 dm. high, erect; leaves twice or thrice pinnatifid.

Plant lower, 2-4 dm. high, often decumbent at base; leaves twice ternate.

23. *A. Absinthium*.

24. *A. frigida*.

IV. LANATAE

Basal leaves twice pinnatifid into several linear divisions; stem-leaves pinnate; heads 5-12.

Basal leaves pinnatifid into 3-5 linear-oblongate approximate divisions; stem-leaves ternately cleft or entire; heads 1-4.

25. *A. scopulorum*.

26. *A. Pattersonii*.

Subgenus C. Abrotanum

V. ANNUAE

Heads 2-3 mm. high and 2-4 mm. broad, in dense mostly axillary spikes.

Heads 1.5 mm. high and 1.5-2.5 mm. broad, in lax racemes ending the branches.

27. *A. biennis*.

28. *A. annua*.

One species.

VI. KLOTZSCHIANAE

VII. GLOMERATAE

Corollas more or less villous; leaves twice or thrice ternate; involucre 5-6 mm. broad.

Corollas glabrous or glandular-granuliferous; leaves simply ternate or quinate, rarely twice ternate.

Plant densely long-hirsute; involucre 4-5 mm. broad.

Plant sparingly silky; involucre 5-7 mm. broad.

30. *A. glomerata*.

31. *A. senjavinenensis*.

32. *A. globularia*.

VIII. NORVEGICAE

Heads 6-10 mm. broad, usually more than 40-flowered; corollas hairy or rarely glabrous; bracts with fuscous margins (except in nos. 34 and 35).

Plant more or less pubescent, at least on the leaves and peduncles.

Plant canescent, low; basal leaves 6 cm. long or less, pinnatifid or bipinnatifid with few divisions.

Plant hoary with rather loose pubescence.

Plant silvery-silky with closely appressed pubescence.

Involucral bracts with inconspicuous light-brown margins; plant less than 1 dm. high; leaves 1-1.5 cm. long.

Heads erect; involucre slightly tomentose, soon glabrous.

Heads nodding; involucre densely tomentose.

Involucral bracts with conspicuous dark-brown or blackish scarious margins; leaves 2-6 cm. long.

Plant densely and finely silky; pubescence of the inflorescence like that of the rest of the plant.

Stems less than 1 dm. high; inflorescence a short, dense spike, somewhat interrupted below; bracts of the involucre broadly oval or obovate.

Stems 2-3 dm. high; inflorescence an elongate leafy raceme; bracts of the involucre oblong.

Plant rather sparingly silky; pubescence of the inflorescence long and loose.

Plant green; leaves twice pinnatifid, the basal ones more than 1 cm. long.

Leaf-segments ascending, all acute

Inflorescence dense, spike-like, conspicuously pubescent with long white hairs on the peduncle and its branches; individual peduncles very short; plant less than 1.5 dm. high.

33. *A. Richardsoniana*.

34. *A. minuta*.

35. *A. tacomensis*.

36. *A. hyperborea*.

37. *A. Tyrrellii*.

38. *A. heterophylla*.

39. *A. comata*.

Inflorescence open, slightly pubescent; branches or individual peduncles, at least the lower ones, elongate.

Leaves and stem decidedly hairy; inner bracts ovate, acute, with a narrowly lanceolate green center.

Leaves sparingly pubescent or glabrate; stem glabrous or nearly so; inner bracts obovate, obtuse or rarely acutish, with a broadly lanceolate green center.

Leaf-segments spreading, those of the lower leaves obtuse.

Plant glabrous.

Heads 5-6 mm. broad, 30-40-flowered; corollas glandular-granuliferous; plant glabrous; bracts with light-brown margins.

Leaf-segments linear, obtuse or acute.

Leaf-segments linear-lanceolate, acuminate or attenuate.

40. *A. saxicola*.

41. *A. arctica*.

42. *A. macrobotrys*.

43. *A. laevigata*.

44. *A. Parryi*.

45. *A. Cooleyae*.

One species

IX. FRANSERIOIDES

46. *A. franserioides*.

X. VULGARES

Leaf-segments again divided or lobed.

Inflorescence much branched, pyramidal; heads very numerous; involucre campanulate, 4 mm. high, 10-30-flowered.

Primary segments of the lower leaves obovate in outline, again lobed.

Primary segments of the lower leaves narrowly lanceolate, entire or with a few coarse teeth.

Inflorescence narrow, cylindrical; heads fewer; involucre hemispheric.

Heads 3 mm. high, 25-35-flowered; leaf-segments lanceolate, short, acute.

Heads about 5 mm. high and broad, usually 35-50-flowered; leaf-segments attenuate or acuminate.

Leaf-segments lanceolate, acuminate.

Leaf-segments lance-linear, attenuate.

Leaves or their segments entire or nearly so.

Heads not very numerous, comparatively large, 25-50-flowered; involucre hemispheric.

Inflorescence spike-like.

Suffruticose with a woody base; leaves coarse toothed.

Herbaceous with a rootstock; leaves deeply lobed.

Inflorescence open-paniculate.

Leaves lanceolate, thin, deeply lobed; involucre glabrous or nearly so.

Lobes of the leaves lanceolate, entire.

Lobes of the leaves linear-lanceolate, again cleft with narrow lobes.

Leaves linear-lanceolate, entire or short-lobed, thicker, sparingly floccose above; involucre arachnoid.

Heads very numerous, in dense compound panicles (except in *A. Lindleyana*), 5-25-flowered; involucre campanulate or ellipsoid.

Leaves not finely serrate.

Upper leaves lanceolate or oblanceolate, usually more than 4 mm. wide.

Involucre 4 mm. high; leaves large, 5-15 cm. long, lanceolate or ovate-lanceolate in outline, with very few divisions.

Lower leaves deeply divided into more or less falcate divisions.

Lower leaves with shorter lobes or teeth directed forward.

Head nodding in anthesis, 15-25-flowered; involucre rounded-campanulate, rather permanently tomentose.

Heads erect in anthesis, 5-15-flowered; involucre oblong or subcylindric.

Involucral bracts densely tomentose.

Involucral bracts glabrate and shining.

Involucre 3 mm. high; leaves shorter; lobes of the lower leaves often spreading.

Leaves of a lanceolate type; involucre campanulate, usually less than 3 mm. broad.

Leaves mostly entire, conspicuously veined beneath.

Leaves or at least most of them somewhat lobed or toothed, not strongly veined beneath.

Plant about 1 m. high; lower leaves dissected to near the midrib.

Plant 3-6 dm. high; lower leaves cleft or lobed.

Leaves granuliferous above; inflorescence dense, with almost erect branches.

Leaves not granuliferous above; inflorescence open, with ascending branches.

Leaves of a cuneate type; involucre hemispheric, 3-4 mm. broad.

47. *A. vulgaris*.

48. *A. selengensis*.

50. *A. incompta*.

49. *A. unalaskensis*.

54. *A. Gormanii*.

51. *A. Leibergii*.

52. *A. Tilesii*.

53. *A. elatior*.

54. *A. Gormanii*.

55. *A. arachnoidea*.

56. *A. Hookeriana*.

57. *A. Douglasiana*.

58. *A. Herriotii*.

59. *A. Suksdorfii*.

66. *A. Muellieri*.

48. *A. selengensis*.

60. *A. atomifera*.

61. *A. ludoviciana*.

- Leaves with 3-5 ovate teeth at the apex, dark-green.
 Leaves with 3-7 lanceolate lobes, yellowish-green.
 Upper leaves linear or narrowly linear-oblongate, less than 4 mm. wide (except sometimes in *A. Muelleri*).
 Heads numerous, paniced; leaves usually more than 5 cm. long; plant not suffruticose.
 Leaves not revolute; head more or less nodding.
 Inflorescence loose; branches long and heads scattered.
 Involucre shining, almost glabrous; stem yellowish-green, glabrous or nearly so, strongly grooved.
 Involucre decidedly tomentose, dull; stem more or less tomentose, if glabrate not strongly grooved.
 Involucre about 3 mm. high.
 Involucre campanulate, about 2 mm. broad; lower leaves pinnatifid, the upper entire.
 Involucre hemispheric, 2.5-4 mm. broad.
 Stem-leaves or some of them 3- (rarely 5-) cleft, with long lateral lobes, not strongly veined beneath.
 Stem-leaves mostly entire or rarely short-lobed, strongly veined beneath.
 Involucre 4-5 mm. high and wide.
 Leaves entire or the lower coarsely toothed or with short lanceolate lobes.
 Leaves, at least some of them, with long narrow lobes.
 Lobes of the leaves several, alternate, salient, falcate.
 Lobes of the leaves 2 or 3 above the middle, not falcate.
 Inflorescence dense and narrow; branches short; heads crowded; stem-leaves mostly pinnatifid.
 Bracts and upper surface of the leaves nearly glabrous; lower surface minutely tomentulose.
 Bracts and upper surface of the leaves tomentulose; lower surface white-tomentose.
 Leaves or their divisions revolute-margined; heads erect.
 Heads less numerous, in narrow spikes or spike-like panicles; leaves narrow, usually less than 5 cm. long, the lower toothed or rarely lobed towards the apex, the upper entire, linear or nearly so; plant suffruticose at the base.
 Leaves finely serrate throughout.
62. *A. cuneata*.
 86. *A. rhicomatica*.
 63. *A. sulcata*.
 64. *A. Lindheimeriana*.
 65. *A. mexicana*.
 66. *A. Muelleri*.
 67. *A. silvicola*.
 68. *A. falcata*.
 69. *A. Ghiesbreghtii*.
 70. *A. potens*.
 71. *A. Underwoodii*.
 72. *A. revoluta*.
 73. *A. Lindleyana*.
 74. *A. serrata*.

XI. GNAPHALODES

- Leaves all entire or the basal ones merely toothed.
 Involucre 3-4 mm. high, 2-3.5 mm. broad; heads less than 25-flowered.
 Inflorescence open, with spreading branches; leaves thin, silky. (Tomentose form of)
 Inflorescence dense, with ascending or erect branches; leaves thicker with looser tomentum.
 Corollas dark-brown or purplish; leaves usually less tomentose above, the lower serrate towards the apex.
 Corollas light-brown or yellow; leaves equally white-tomentose on both sides.
 Involucre 2-2.5 mm. broad; leaves very narrow, linear or lance-linear, acute.
 Involucre 2.5-3.5 mm. broad; leaves broader, if lance-linear, more or less acuminate.
 Upper leaves ovate to lanceolate, acute; heads densely crowded and usually erect.
 Upper leaves lanceolate to lance-linear, acuminate; heads less crowded, mostly spreading. (Entire-leaved forms of)
 Involucre 4-5 mm. high, 4-7 mm. broad; heads 25-40-flowered (in *A. longifolia* sometimes 20-25-flowered).
 Heads nodding or spreading; leaves equally floccose on both sides, not revolute, acute.
 Heads nodding, rather long-peduncled on elongate racemiform branches; leaves linear.
 Heads spreading, subsessile or short-peduncled on shorter branches; stem-leaves lanceolate.
 Heads erect, peduncled; stem-leaves linear-lanceolate, caudate-attenuate, often revolute-margined and greener above.
 Leaves, at least the lower ones, more or less lobed or divided.
 Lower leaves with simple divisions mostly directed forward.
 Lower leaves with oblong obtuse lobes.
 Lower leaves with acute or acuminate lobes.
75. *A. mexicana*.
 76. *A. gnaphalodes*.
 77. *A. pabularis*.
 78. *A. Purshiana*.
 79. *A. argophylla*.
 80. *A. longifolia*.
 81. *A. obtusa*.

Lower leaves with long and narrow lobes directed forward.

Involucre 3-4 mm. high, 2-4 mm. broad.

Lower leaves 3-cleft; involucre 2-3 mm. broad.

Lower leaves pinnately lobed; involucre 3-4 mm. broad.

Involucre 4-5 mm. high, 5-7 mm. broad.

Lower leaves with short and broad, often salient lobes.

Leaves 5-8 cm. long; involucre 4-5 mm. high and about as broad.

Leaves 1-5 cm. long; involucre 3-4 mm. high, 2-3 mm. broad. Stem simple up to the inflorescence.

Inflorescence dense and much branched; heads clustered.

Inflorescence lax, narrow, spike-like, with short racemiform branches.

Stem conspicuously branched, the branches ending in small simple or branched racemes.

Lower leaves and often the upper with narrow, again cleft or toothed, spreading divisions.

Heads 25-50-flowered; involucre 4-5 mm. high, 5-8 mm. broad.

Heads erect, borne singly on peduncles 1-12 mm. long; leaves equally tomentose on both sides.

Heads borne in small glomerules, sessile, only the terminal one erect; leaves less tomentose above.

Heads 20-30-flowered; involucre 3 mm. high, 2.5-3.5 mm. broad.

82. *A. texana*.

83. *A. diversifolia*.

79. *A. argophylla*.

84. *A. platyphylla*.

85. *A. Brittonii*.

86. *A. rhizomata*.

87. *A. albulata*.

88. *A. floccosa*.

89. *A. candicans*.

90. *A. Flodmanii*.

XII. STELLERIANAE

One species.

91. *A. Stelleriana*.

XIII. DISCOLORES

Ray-flowers less numerous than the disk-flowers; inner bracts obtuse.

Leaves densely white-tomentose beneath, loosely floccose above, at least when young.

Heads very numerous in a branched leafy panicle; leaves not revolute-margined.

Heads fewer, usually in a narrow spike-like or racemiform inflorescence; leaves revolute-margined.

Leaves minutely tomentulose beneath, glabrous above.

Heads hemispheric, nodding at least in anthesis.

Heads campanulate, erect in anthesis.

Ray-flowers more numerous than the disk-flowers; bracts all acutish.

92. *A. discolor*.

93. *A. Michauxiana*.

94. *A. graveolens*.

95. *A. tenuis*.

96. *A. redolens*.

XIV. WRIGHTIANAE

Leaves sparingly pubescent or glabrous and green above.

Leaves not revolute; involucre fully 4 mm. wide.

Leaves revolute.

Inflorescence racemiform; involucre 4-5 mm. high and broad.

Inflorescence paniculate; involucre about 3 mm. high, 2-3 mm. broad.

Heads erect; involucre about 2 mm. broad.

Heads nodding; involucre about 3 mm. broad.

Leaves white-tomentose on both sides.

Involucre 3-4 mm. high, 4-5 mm. broad; stems simple, virgate.

Involucre 2.5-3 mm. high, about 2 mm. broad; stems branched.

98. *A. neomexicana*.

97. *A. Prescottiana*.

99. *A. Wrightii*.

100. *A. Bakeri*.

101. *A. Pringlei*.

102. *A. Carruthii*.

XV. PONTICAE

Leaves green above.

Leaves white on both sides.

103. *A. Abrotanum*.

104. *A. pontica*.

XVI. RUTAEFOLIAE

One species.

105. *A. alaskana*.

XVII. BIGELOVIANAE

One species.

106. *A. Bigelovii*.

Subgenus D. Seriphidium

XVIII. TRIDENTATAE

Branches of the inflorescence erect, not nodding at the ends; achenes glabrous.

Involucre 4-5 mm. high, 3-5 mm. broad; heads 7-15-flowered (rarely 5- or 6-flowered).

Leaves mostly entire; heads numerous in a dense but not spike-like panicle.

Pubescence loose; inner bracts linear.

Pubescence close; inner bracts broadly elliptic.

Leaves, at least some of them, 3-5-toothed at the apex; heads fewer in a narrow spike-like panicle.

Outer bracts lanceolate or narrowly ovate, half as long as the innermost or longer.

Plant greener, not densely canescent, more or less viscid.

Plant densely canescent, not viscid.

107. *A. Bolanderi*.

108. *A. cana*.

109. *A. Rothrockii*.

- Plant 1-3 dm. high; branches decumbent or spreading at the base. 110. *A. arbuscula*.
 Plant about 5 dm. high, with erect strict branches. 111. *A. spiciformis*.
 Outer bracts broadly ovate, less than half as long as the innermost. 112. *A. Vaseyana*.
 Involucre 2-4 mm. high, 2-2.5 mm. broad; heads 1-8-flowered.
 Leaves, at least some of them, 3-toothed at the apex.
 Shrubs 5-50 dm. high; heads numerous in ample panicles. 113. *A. tridentata*.
 Leaves cuneate. 114. *A. angusta*.
 Leaves narrowly linear-cuneate or linear.
 Shrubs 1-4 dm. high; heads fewer. 106. *A. Bigelovii*.
 Heads glomerate in dense panicles; involucre turbinate.
 Heads in simple, raceme-like panicles; involucre campanulate.
 Heads 7-9-flowered; involucre densely canescent. 110. *A. arbuscula*.
 Heads 1-6-flowered; involucre nearly glabrous. 115. *A. nova*.
 Leaves 3-cleft into linear-filiform divisions. 116. *A. tripartita*.
 Branches of the inflorescence nodding at the ends; achenes sparingly arachnoid-pubescent. 117. *A. Parishii*.
 XIX. RIGIDAE 118. *A. rigida*.
 One species.
 XX. PYGMAEAE 119. *A. pygmaea*.
 One species.

Subgenus A. DRACUNCULUS

Heads heterogamous. Marginal flowers pistillate; corollas subcylindric, usually 2-3-toothed, somewhat tapering upwards. Disk-flowers hermaphrodite but sterile; corollas funnel-form or campanulate. Receptacle glabrous.

I. *Dracunculoides*. Style of the disk-flowers undivided, ending in a cup-shaped penicillate appendix, that of the ray-flowers exerted, cleft about one third its length into linear ascending branches. Corollas of the ray-flowers 2-3-toothed, somewhat curved, and cleft on one side, usually glandular-granuliferous; those of the disk-flowers cylindro-campanulate or somewhat funnell-form, glabrous or sometimes hairy. Annual or perennial herbs, glabrous or appressed silky-pubescent, not tomentose.

1. *Artemisia glauca* Pall.; Willd. Sp. Pl. 3: 1831. 1804.

Artemisia Dracunculus glauca Besser; Hook. Fl. Bor. Am. 1: 326. 1833.
Artemisia glauca fastigiata Besser, Bull. Soc. Hist. Nat. Mosc. 8: 59. 1835.
Artemisia dracunculoides brevifolia T. & G. Fl. N. Am. 2: 416. 1843.
Artemisia dracunculoides incana T. & G. Fl. N. Am. 2: 416, in part. 1843.

A tall perennial, with a thick root and short rootstock; stem 3-6 dm. high, striate, silky-pilose when young, with ascending branches; lower leaves 3-cleft above, the rest entire, linear, 2-4 cm. long, 1-3 mm. wide, often fascicled, silky-canescens, turning brown; heads very numerous in leafy panicles, heterogamous; involucre hemispheric, 2 mm. high and 2-2.5 mm. broad; bracts 10-15, in 2-3 series, sparingly pubescent, the outer lanceolate, about two thirds as long as the inner, acute, with narrow margins, the inner oval, rounded at the apex, broadly scariosus-margined; ray-flowers 10-15; corollas nearly 1 mm. long, curved, glandular-puberulent; achenes 0.5 mm. long; disk-flowers 8-13; corollas campanulate, 1.5 mm. high; style 0.6 mm. long, somewhat clavate.

TYPE LOCALITY: Siberia.

DISTRIBUTION: Manitoba to Alberta, Nebraska, and Wisconsin; Santa Barbara, California; also in Siberia.

ILLUSTRATION: Britt. & Brown, Ill. Fl. f. 4002; ed. 2. f. 4575.

2. *Artemisia Dracunculus* L. Sp. Pl. 849. 1753.

Artemisia inodora Willd., Enum. 864. 1809. Not *A. inodora* Mill. 1768.
Oligosporus condimentarius Cass. Dict. Sci. Nat. 36: 26. 1825.

A perennial, with strong rhizome; stem 5-10 dm. high, glabrous, grooved, reddish-brown below; leaves sessile, entire, spreading or at last reflexed, 3-8 cm. long, 4-12 mm. wide; heads numerous in leafy panicles, heterogamous; peduncles 1-2 mm. long; involucre hemispheric, glabrous, about 2.5 mm. high, 3-4 mm. broad; bracts 10-12 in 3 series, the outermost oblong, lanceolate, obtuse, green or brown, half as long as the inner ones, the middle ones elliptic, the

innermost broadly oval, rounded at the apex, broadly scarious-margined; ray-flowers 6-15; corollas nearly 1 mm. long; achenes 0.7 mm. long; disk-flowers 15-20; corollas 2 mm. long, deeply campanulate; style 1.5 mm. long, tapering from the summit.

TYPE LOCALITY: Siberia.

DISTRIBUTION: Northern and central Asia and eastern Europe; cultivated and rarely escaped in the eastern States.

ILLUSTRATIONS: Fl. Deuts. ed. 5. pl. 3012; Reichenb. Ic. Fl. Germ. 16: pl. 1041, f. IV.

3. *Artemisia aromatica* A. Nelson, Bull. Torrey Club 27: 273. 1900.

Artemisia inodora H. & A. Bot. Beech. Voy. 150. 1833. Not *A. inodora* Mill. 1768.
Artemisia dracunculoides Wolfii Rydb. Bull. Torrey Club 32: 128. 1905.

A perennial, with a woody branched rootstock; stem green, glabrous, striate, 4-8 dm. high, with ascending branches; leaves all entire or the lower 3-cleft, linear, 2-8 cm. long, 2-8 mm. wide, glabrous; heads numerous in leafy panicles, heterogamous, nodding on short peduncles; involucre 2-2.5 mm. high, 3-4 mm. broad; bracts glabrous, about 20, in about 3 series, the outer linear-oblong, obtuse or acute, almost as long as the inner ones, with narrow scarious margins, the inner ones broadly oval and with broad margins; ray-flowers 10-45; corollas glandular-puberulent, 1.5 mm. long; achenes 0.7 mm. long; disk-flowers 20-60; corollas dark-brown, deeply campanulate, glabrous, 2 mm. long; style nearly 2 mm. long, tapering from the summit.

TYPE LOCALITY: Yellowstone Lake, Wyoming.

DISTRIBUTION: Colorado and Wyoming to Washington, Lower California, and Sonora.

4. *Artemisia dracunculoides* Pursh, Fl. Am. Sept. 742. 1814.

Artemisia Dracunculus Pursh, Fl. Am. Sept. 521. 1814. Not *A. Dracunculus* L. 1753.
Artemisia nutans Fraser; Pursh, Fl. Am. Sept. 742, as synonym. 1814. Not *A. nutans* Willd. 1804.
Artemisia Nuttalliana Besser; Hook. Fl. Bor. Am. 1: 326. 1833.

A perennial, with a thick root; stem 3-10 dm. high, glabrous, striate, with ascending branches; lower leaves 3-cleft, the rest entire, linear, often spreading, 2-6 cm. long, 1-3 mm. wide, glabrous, acute; heads very numerous in a dense leafy panicle, nodding on short peduncles, heterogamous; involucre hemispheric, about 2 mm. high, 2-3 mm. broad; bracts 8-15, glabrous, in about 3 series, the outer elliptic, one half to three fourths as long as the inner, mostly obtuse, the inner oval, rounded at the apex, broadly scarious-margined; ray-flowers 10-20; corollas 1 mm. long, glandular-puberulent; achenes about 0.5 mm. long; disk-flowers 10-20; corollas campanulate, 1.5 mm. long; style 0.7 mm. long, slightly thickened above.

TYPE LOCALITY: Upper Louisiana [now South Dakota].

DISTRIBUTION: Manitoba to British Columbia, California, Texas, and Missouri.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4001; ed. 2. f. 4574.

5. *Artemisia cernua* Nutt. Gen. 2: 142. 1818.

A perennial, with a taproot; stem erect, simple below, much branched above, striate, glabrous, often tinged with red; branches long and slender, drooping at the ends; lower leaves pinnately divided into linear-filiform divisions, glabrous, the upper, especially those of the branches, simple; peduncles slender, 3-6 mm. long; involucre hemispheric, 2 mm. high and broad; bracts yellowish with a greenish midrib, the outer oblong, obtuse, two thirds as long as the oval inner ones; ray-flowers about 15; corollas scarcely 1 mm. long; disk-flowers 15-20; corollas cylindro-campanulate, glabrous, about 1.5 mm. long; style 1 mm. long.

TYPE LOCALITY: St. Louis, Missouri.

DISTRIBUTION: Missouri and Kansas.

6. *Artemisia dracunculina* S. Wats. Proc. Am. Acad. 23: 279. 1888.

A perennial, with a short woody rootstock; stem erect, 5-8 dm. high, striate, long-villous when young, in age glabrate; leaves numerous, entire or the lower 3-cleft, linear, 2-6 cm. long,

1-6 mm. wide, rather soft, long-villous with fine soft hairs, in age glabrous; heads ascending or nodding in an open leafy panicle with spreading branches; peduncles slender, 2-3 mm. long; involucre hemispheric, scarcely 2 mm. high, fully 2 mm. broad; bracts 10-12, in 3 series, glabrous or with a few hairs, the outermost linear-lanceolate, acutish, two thirds to three fourths as long as the inner ones; bracts oval, rounded at the apex, broadly scarious-margined, thin; ray-flowers about 15; corollas glandular-puberulent, less than 1 mm. long; achenes 0.5 mm. long; disk-flowers 7-8; corollas deeply campanulate, 1-5 mm. long, glabrous; style tapering from the summit.

TYPE LOCALITY: Sierra Madre, Chihuahua.

DISTRIBUTION: New Mexico, Arizona, and Chihuahua.

7. *Artemisia gracillima* Rydberg, sp. nov.

A slender perennial, with branched rootstock; stem about 5 dm. high, finely canescent, puberulent when young, in age glabrous, striate, with slender divergent branches; leaves linear, 1-4 cm. long, 1-2 mm. wide, spreading or reflexed, finely silky-canescens with short appressed hairs, or in age glabrate; heads heterogamous, scattered in open panicles; peduncles 2-4 mm. long; involucre glabrous or sparingly puberulent, hemispheric, 2 mm. high, 2-2.5 mm. broad; bracts 12-15, in about 3 series, the outermost lance-linear, acute, not scarious, about two thirds as long as the inner ones, the rest scarious-margined and rounded at the apex, the innermost broadly oval; ray-flowers 10-12; corollas nearly 1 mm. long; achenes 0.7 mm. long; disk-flowers about 10; corollas deeply campanulate, nearly 2 mm. long, glabrous; style 1 mm. long.

Type collected one mile west of Hillsboro, Sierra County, New Mexico, October 2, 1900, *Metcalfe 1444* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Southern New Mexico and Texas.

8. *Artemisia caudata* Michx. Fl. Bor. Am. 2: 129. 1803.

Artemisia variabilis americana Besser, Bull. Soc. Nat. Mosc. 8: 24. 1835.

A biennial; stem 3-10 dm. high, grooved, glabrous, often purplish; basal leaves petioled, about 1 cm. long, bipinnatifid into linear divisions, glabrous or somewhat long-hairy when young; stem-leaves sessile, pinnatifid into 7-11 linear-filiform divisions about 1 mm. wide; heads very numerous, erect or rarely nodding, in a dense leafy panicle, heterogamous; involucre hemispheric to campanulate, 3-4 mm. high, 3 mm. broad; bracts glabrous, about 15, in 3-4 series, scarious-margined, the outer ovate, acute, about half as long as the inner oval acutish or obtusish ones; ray-flowers 6-8; corollas 1.5 mm. long; achenes nearly 1 mm. long; disk-flowers 10-15; corollas cylindro-campanulate, 2 mm. long, purplish, glabrous, obtuse at the base; style 1.5 mm. long, slightly thicker above.

TYPE LOCALITY: Banks of the Missouri River [Missouri?].

DISTRIBUTION: New Brunswick and Maine to North Dakota, Wyoming, Texas, and Florida.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 3998; ed. 2. f. 4571.

9. *Artemisia Forwoodii* S. Wats. Proc. Am. Acad. 25: 133. 1890.

Artemisia desertorum Hookeriana Besser; Hook. Fl. Bor. Am. 1: 325, at least in part. 1833.

Artemisia commutata Hookeriana Besser, Bull. Soc. Nat. Mosc. 8: 70. 1835.

Artemisia caudata calvens Lunell, Am. Midl. Nat. 2: 188. 1912.

A strict biennial, with a taproot; stem 4-7 dm. high, somewhat pubescent when young, glabrous in age; basal leaves 5-10 cm. long, petioled, bi- or tri-pinnatifid into narrowly linear divisions, loosely silky-canescens at least when young; stem-leaves numerous, often fascicled, mostly sessile, pinnatifid into linear-filiform divisions, silky-canescens, or in age glabrate; heads numerous in a dense panicle, mostly erect, heterogamous; peduncles 1-2 cm. long; involucre subglobose, 2-2.5 mm. high, 2.5-3 mm. broad; bracts 12-15, in 3-4 series, the outermost lanceolate or ovate, acute, half as long as the innermost ones; innermost bracts oval, obtuse or acutish, broadly scarious-margined; ray-flowers 15-20; corollas 1.5 mm. long; achenes 0.7 mm. long; disk-flowers 10-15; corollas 2 mm. long; style fully 1.5 mm. long.

TYPE LOCALITY: Black Hills of South Dakota.

DISTRIBUTION: Ontario and Michigan to Saskatchewan and Nebraska; Washington.

10. *Artemisia pacifica* Nutt. Trans. Am. Phil. Soc. II. 7: 401.
1841.

Artemisia desertorum Scouleriana Besser; Hook. Fl. Bor. Am. 1: 325. 1833.
Artemisia Scouleriana Rydb. Bull. Torrey Club 33: 157. 1906.

A strict perennial; stem 4–10 dm. high, glabrate or sparingly pubescent when young, often purplish; basal leaves clustered, petioled, 1–2 cm. long, twice pinnatifid, with narrowly linear divisions, more or less silky-pubescent; stem-leaves numerous, mostly sessile, often fascicled, pinnatifid, with narrowly linear or filiform divisions; heads very numerous in a leafy panicle, at first nodding, soon erect; pedicels 1–3 mm. long; involucre subglobose, about 2.5 mm. high, 2.5–3 mm. broad; bracts 10–12, in 3–4 series, glabrous or sparingly short-hairy, scaribus-margined; outermost bracts ovate, acute, about half as long as the inner ones; inner bracts oval, acutish; ray-flowers 8–12; corollas 1.5 mm. long, glabrous; disk-flowers 8–12; corollas cylindro-campanulate, 2 mm. long, glabrous; style 1.5 mm. long.

TYPE LOCALITY: Shores of the Pacific at the outlet of the Oregon [Columbia River].
DISTRIBUTION: Alberta and British Columbia to Oregon and Colorado (?) and New Mexico (?).

11. *Artemisia camporum* Rydberg, sp. nov.

? *Artemisia campestris* Pursh, Fl. Am. Sept. 521. 1814. Not *A. campestris* L. 1753.
Artemisia canadensis Nutt. Gen. 2: 144. 1818. Not *A. canadensis* Michx. 1803.
Artemisia desertorum Douglasiana Besser; Hook. Fl. Bor. Am. 1: 325. 1833.
Artemisia commutata Douglasiana Besser, Bull. Soc. Nat. Mosc. 8: 70. 1835.
Artemisia Forwoodii Rydb. Fl. Colo. 385. 1906. Not *A. Forwoodii* S. Wats. 1890.

A perennial, with thick root and short caudex; stem 3–5 dm. high, striate, often purplish; basal leaves clustered, 4–10 cm. long, petioled, twice or thrice pinnatifid into linear or oblong divisions, more or less silky-canescens; stem-leaves scattered, the lower similar to the basal ones but smaller; upper stem-leaves sessile, pinnatifid with narrowly linear divisions, in age sometimes glabrate; heads numerous in a narrow leafy panicle, nodding, heterogamous; peduncles 1–3 mm. long; involucre hemispheric, 2.5–3 mm. high and fully as broad; bracts about 15, in 3–4 series, scarious-margined, the outermost ovate, obtuse, a little more than half as long as the innermost ones, the latter oval with rounded apex; ray-flowers 15–20; corollas 1.5 mm. long; achenes 0.7 mm. long; disk-flowers about 10; corollas cylindro-campanulate, 2 mm. long, glabrous; style 1.5 mm. long.

TYPE LOCALITY: (of *A. desertorum Douglasiana*) Saskatchewan.
DISTRIBUTION: Ontario to Saskatchewan, Yukon, Arizona, and Nebraska.

12. *Artemisia campestris* L. Sp. Pl. 846. 1753.

A perennial, with a thick root and short caudex; stem 3–6 dm. high, striate, glabrous; basal leaves clustered, 5–10 cm. long, somewhat pubescent at first, soon glabrate, twice pinnatifid into linear-filiform divisions; stem-leaves scattered, mostly sessile, pinnate or the uppermost entire, glabrous; heads numerous in an open panicle, nodding; involucre hemispheric, 2–2.5 mm. high and broad; bracts about 15, in 3 or 4 series, scarious-margined, the outer ovate, obtuse, half as long as the oval inner ones, which are rounded at the apex; ray-flowers 6–10; corollas 1 mm. long; achenes 0.6 mm. long; disk-flowers about 10; corollas cylindro-campanulate, 1.5 mm. long, glabrous; style 1 mm. long.

TYPE LOCALITY: Europe.
DISTRIBUTION: Stratford and North Haven, Connecticut, and Aiken, South Carolina; adventive from Europe.
ILLUSTRATIONS: A. Dietr. Fl. Boruss. pl. 635; Fl. Dan. pl. 1175; Engl. Bot. pl. 338; Hayne, Arzn. Gew. 2: pl. 9.

13. *Artemisia MacCallae* Rydberg, sp. nov.

Artemisia desertorum Richardsoniana Besser; Hook. Fl. Bor. Am. 1: 325. 1833. Not *A. Richardsoniana* Besser. 1836.
Artemisia commutata Richardsoniana Besser, Bull. Soc. Nat. Mosc. 8: 74. 1835.

A perennial, with a caespitose woody caudex or rootstock; stem 2–3 dm. high, rather strict, more or less canescent, sometimes purplish; basal leaves 5–10 cm. long, petioled; blades

ovate in outline, twice pinnatifid, with rather few linear or narrowly oblanceolate divisions, more or less silky-canescens; lower stem-leaves similar but smaller, the upper less divided and those of the inflorescence often simple; heads rather numerous in narrow panicles, soon ascending or erect, short-peduncled or sessile; peduncles rarely more than 2 mm. long; involucre hemispheric, 3 mm. high, 4-5 mm. broad; bracts 10-14, in about 3 series, green with yellowish scarious margins, acutish, sparingly long-hairy or glabrous; outer bracts ovate, about half as long as the inner broadly oval ones; ray-flowers 10-15; corollas more than 1.5 mm. long; achenes more than 1 mm. long; disk-flowers about 15; corollas cylindro-campanulate, 2.5 mm. long, glabrous; style 2 mm. long, filiform.

Type collected on gravelly slopes of Tunnel Mountain, vicinity of Banff, Alberta, 1899, *MacCalla 2016* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Alberta to Yukon and Washington; Colorado.

14. *Artemisia canadensis* Michx. Fl. Bor. Am. 2: 128. 1803.

Artemisia peucedanifolia Juss.; Besser, Bull. Soc. Nat. Mosc. 8: 91. 1835.

A perennial, with a caespitose rootstock; stem ascending or decumbent at the base, 1-3 dm. high, sparingly long-hairy or glabrate, striate; basal leaves clustered, 5-10 cm. long, petioled, appressed-silky, twice pinnatifid into narrowly linear to oblanceolate divisions rarely more than 1 mm. wide; stem-leaves smaller, rather few, pinnately divided into linear divisions or the upper ternate or simple; heads rather few in a narrow panicle, sessile or short-peduncled, nodding; peduncles 2 mm. long or less; involucre hemispheric, 2.5-3 mm. high, 4-6 mm. broad; bracts 10-12, in about 3 series, glabrous, broadly scarious-margined, all broadly oval and acutish, the outer scarcely shorter; ray-flowers 10-15; corollas nearly 2 mm. long, glabrous; disk-flowers 20-25; corollas cylindro-campanulate, 5-toothed, glabrous, 2.5 mm. long; style 2 mm. long.

TYPE LOCALITY: Hudson Bay.

DISTRIBUTION: Newfoundland to Vermont, Michigan, and Western Ontario; Yukon (?).

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4000; ed. 2. f. 4573.

15. *Artemisia Bourgeauana* Rydb. Bull. Torrey Club 37: 454. 1910.

A strict perennial, with a taproot and short caudex; stem 3-4 dm. high, rather densely silky-villous, more or less tinged with red; basal leaves clustered, 4-6 dm. long, petioled, sericeous-canescens on both sides, twice pinnatifid with oblanceolate divisions; stem-leaves mostly sessile, rather small, pinnatifid with linear divisions, or those of the inflorescence 3-fid or entire; heads very numerous in dense leafy panicles, horizontal or nodding, sessile or short-peduncled; involucre hemispheric, about 4 mm. high and 5 mm. broad; bracts 12-15, in about 3 series, yellowish, silky-villous, scarious-margined, the outermost about half as long as the innermost, ovate, acute; inner bracts oval, rounded at the apex; ray-flowers about 20; corollas 1.5 mm. long; achenes fully 1 mm. long; disk-corollas 2.5 mm. long, elongate-campanulate, the teeth sparingly long-hairy; style slightly tapering from the summit.

TYPE LOCALITY: Saskatchewan.

DISTRIBUTION: Saskatchewan and North Dakota.

16. *Artemisia spithamea* Pursh, Fl. Am. Sept. 522. 1814.

Artemisia groenlandica Wormsk. Fl. Dan. 27: 10. 1818.

Artemisia borealis Purshii Besser; Hook. Fl. Bor. Am. 1: 326. 1833.

Artemisia borealis Wormskjoldii Besser, Bull. Soc. Nat. Mosc. 8: 84, in part. 1835.

Artemisia borealis Besseri T. & G. Fl. N. Am. 2: 417. 1843.

Artemisia borealis spithamea T. & G. Fl. N. Am. 2: 417. 1843.

A perennial, with a caespitose rootstock; stem often decumbent at the base, more or less silky-canescens or in age glabrate, 1-2.5 dm. high; basal leaves clustered, 4-8 cm. long, petioled, silky-canescens; blades ovate or obovate in outline, usually twice pinnatifid into linear-oblanceolate divisions; lower stem-leaves similar but smaller or pinnatifid with linear divisions, those of the inflorescence 3-fid or simple; heads heterogamous, erect, sessile, usually in narrow spike-like panicles, or the panicle in larger specimens more open and branched; involucre

hemispheric, 3-3.5 mm. high, 4-6 mm. broad; bracts 12-18, in about 3 series, more or less villous, at least when young, yellowish- or purplish-brown, scarious-margined, acutish or the innermost rounded at the apex, the outer ovate, somewhat shorter than the inner oval ones; ray-flowers 12-15; corollas 1.5 mm. long; achenes nearly 1.5 mm. long; disk-flowers 25-40; corollas cylindro-campanulate, 2.5 mm. long, usually slightly hairy; style filiform.

TYPE LOCALITY: Labrador.

DISTRIBUTION: Greenland and the arctic coast, southward to Quebec, and in the mountains to Colorado and Washington.

ILLUSTRATIONS: Fl. Dan. *pl.* 1585; Britt. & Brown, Ill. Fl. f. 3999; ed. 2. f. 4572 (as *A. borealis*).

17. *Artemisia manca* Rydberg, sp. nov.

A low caespitose perennial, almost acaulescent; stems 5-7 cm. high, decumbent at the base, with a few reduced leaves, purple, sparingly villous when young, soon glabrate; leaves mostly basal, 1-2 cm. long, bipinnatifid, silvery-silky; primary divisions 3-5, the secondary ones mostly 3, narrowly linear-oblancheolate; stem-leaves small, mostly ternate or the upper simple, linear or with linear divisions; inflorescence spike-like; heads short-peduncled or subsessile, subtended by small linear leaves, the upper ones crowded; involucre hemispheric, 4-5 mm. broad, and nearly as high; bracts about 25, purplish, sparingly pubescent, with a prominent midrib, the outer oblong, nearly as long as the inner ones, which are broadly oval, rounded at the apex; ray-flowers 12-15; corollas 1.5 mm. long; achenes 1.5 mm. long; disk-flowers 25-30; corollas cylindro-campanulate, 2 mm. long, tipped with brown-purple; style 1.5 mm. long.

Type collected at Cold Bay, Alaska, July 31, 1904, C. V. Piper 4223 (U. S. Nat. Herb. no. 420675).

18. *Artemisia borealis* Pall. Reise 3: 755. 1776.

Artemisia violacea Ledeb. Mém. Acad. St.-Petersb. 5: 567. 1815.

Artemisia borealis Wormskjoldii Besser; Hook. Fl. Bor. Am. 1: 327. 1833.

Artemisia borealis Ledebourii Besser, Bull. Soc. Nat. Mosc. 8: 85. 1835.

Artemisia borealis Pallasii Besser, Bull. Soc. Nat. Mosc. 8: 87. 1835.

Artemisia camtschatica Schlecht.; Ledeb. Fl. Ross. 2: 568, as synonym. 1846.

A perennial, with a caespitose rootstock; stems rather loosely silky or in age glabrate, 1-3 dm. high; basal leaves clustered, 3-7 cm. long, petioled, twice pinnatifid with linear divisions, silky-villous; stem-leaves pinnatifid into linear-filiform divisions or those of the inflorescence entire; heads in a usually narrow panicle, erect, subsessile or the lower peduncled; involucre hemispheric, 3-4 mm. high, 5-6 mm. broad; bracts 12-20, in about 3 series, slightly villous, brown with dark purplish-brown centers; ray-flowers 15-25; corollas fully 1.5 mm. long; achenes about 1.5 mm. long; disk-flowers 25-40; corollas more funnelliform, nearly 3 mm. long, the teeth sparingly long hairy; style filiform, fully 2 mm. long.

TYPE LOCALITY: Siberia.

DISTRIBUTION: Eastern Siberia and Alaska to Hudson Bay and Greenland.

ILLUSTRATIONS: Pall. Reise 3: *pl. hh, f. 1*; Ledeb. Ic. Fl. Ross. *pl. 475*.

19. *Artemisia ripicola* Rydberg, sp. nov.

A tufted perennial, with a caespitose woody caudex; stems erect, 1-2 dm. high, silky-canescenscent; basal leaves clustered, 3-5 cm. long, silky-canescenscent with appressed hairs, pinnatifid or bi-pinnatifid into narrowly linear-oblancheolate divisions, petioled; stem-leaves pinnatifid into 3-5 narrowly linear divisions or those of the inflorescence entire; heads subsessile or very short-peduncled, erect, in a simple raceme or a narrow spike-like panicle; involucre hemispheric, 3-3.5 mm. high, 4-5 mm. broad; bracts about 15, yellowish, lanceolate or ovate-lanceolate, acute, scarious-margined, sparingly silky; ray-flowers about 15; corollas 1.5 mm. long; achenes fully 1.5 mm. long; disk-flowers 10-15; corollas deeply campanulate, 2 mm. long, the teeth sparingly hairy; style cylindric, 1.5 mm. long.

Type collected at Biggs, Sherman County, Oregon, 1910, A. A. Heller 10117 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Oregon and Washington, along the Columbia River.

20. *Artemisia pycnocephala* (Less.) DC. Prodr. 6: 99. 1837.

Oligosporus pycnocephalus Less. Linnaea 6: 524. 1831.

Artemisia pachystachya DC. Prodr. 6: 114. 1837.

Artemisia pycnostachya Nutt. Trans. Am. Phil. Soc. II. 7: 401. 1841.

A perennial, with a caespitose woody caudex or rootstock; stems decumbent at the base, 2-4 dm. high, densely villous; basal leaves numerous, crowded, 3-7 cm. long, petioled; blades obovate in outline, twice pinnatifid, with rather short, oblanceolate or linear-oblanceolate divisions, densely silky-villous; stem-leaves numerous, similar but shorter, short-petioled and less divided; heads in a very dense, spike-like, leafy panicle, erect, sessile; involucre hemispheric, about 3 mm. high and 4 mm. broad; bracts broadly ovate, acutish, densely villous, the outer somewhat shorter; ray-flowers 8-10; corollas fully 1.5 mm. long; achenes 1.5 mm. long; disk-flowers 12-15; corollas elongate-funnelform, 2.5 mm. long, the teeth usually sparingly long-hairy; style tapering from the summit.

TYPE LOCALITY: California.

DISTRIBUTION: Sandy beaches from central Oregon to Monterey, California.

II. *Filifoliae*. Style of the disk-flowers slightly cleft, but the branches erect or ascending, truncate, ending in penicillate appendages on the outer border; that of the ray-flowers more or less exerted, with linear-filiform spreading branches. Corollas more or less glandular-granuliferous, those of the ray-flowers subcylindric, 2-3-toothed, split on one side and somewhat tapering towards the apex, those of the disk-flowers elongate-turbinate or narrowly funnelform, 5-toothed. Low shrubs or undershrubs, with canescent leaves ternately or bi-ternately divided into linear-filiform divisions.

21. *Artemisia filifolia* Torr. Ann. Lyc. N. Y. 2: 211. 1827.

Artemisia plattensis Nutt. Trans. Am. Phil. Soc. II. 7: 397. 1841.

A shrub 3-10 dm. high, with ascending, slender, canescent branches; leaves 3-8 cm. long, ternately divided into filiform divisions or entire and filiform, strigulose-canescant, often fasciated; heads very numerous in leafy panicles, nodding; involucre subglobose, 1.5-2 mm. high and as broad; bracts 8-9, suborbicular, in about 3 series, the outer much shorter, densely canescent; ray-flowers 2 or 3; corollas 1 mm. long; achenes about 1 mm. long; disk-flowers 1-4; corollas elongate-turbinate, scarcely 2 mm. long; style 1.5 mm. long, 2-cleft at the apex.

TYPE LOCALITY: Not given.

DISTRIBUTION: Nebraska and Wyoming to Nevada, Chihuahua, and Texas.

ILLUSTRATIONS: Torr. in Marcy, Expl. pl. 12; Britt. & Brown, Ill. Fl. f. 4003; ed. 2. f. 4576.

22. *Artemisia pedatifida* Nutt. Trans. Am. Phil. Soc. II. 7: 399. 1841.

A caespitose undershrub, with a thick woody caudex, 1-1.5 cm. high; branches erect, finely canescent; leaves 1-2 cm. long, ternately or the lower sometimes bi-ternately divided into linear to linear-spatulate short divisions, strigose-canescant; those of the inflorescence often entire; heads racemose, short-peduncled or sessile, erect, heterogamous; peduncles 0-10 mm. long; involucre hemispheric, 2.5 mm. high, 3-4 mm. broad; bracts 5-7, in 2-3 series, rounded-oval, obtuse, densely canescent; ray-flowers 5-7; corollas 2 mm. long; achenes nearly 2 mm. long; disk-flowers 5-7; corollas rose-purple at the summit, narrowly funnelform, 3.5 mm. long; style tapering gradually from the 2-cleft summit.

TYPE LOCALITY: Arid plains of Lewis River [Snake River, Idaho].

DISTRIBUTION: Wyoming, Montana, and Idaho.

Subgenus B. ABSINTHIUM

Heads heterogamous. Marginal flowers pistillate; corollas subcylindric, 2-3-toothed, tapering upwards. Disk-flowers hermaphrodite, fertile; corolla deeply campanulate or elongate-funnelform, 5-toothed. Style in both 2-cleft, in the ray-flowers usually decidedly

exserted, in the disk-flowers included to barely exerted; branches in the ray-flowers elongate-filiform, spreading; in the disk-flowers recurved and truncate at the apex, with an erose or penicillate apex. Receptacle woolly.

III. *Frigidae*. Canescent plants, more or less woody at the base. Heads numerous, paniculate. Corollas glandular-granuliferous.

23. *Artemisia Absinthium* L. Sp. Pl. 848. 1753.

Absinthium vulgare Lam. Fl. Fr. 2: 45. 1778.

Artemisia absinthia St.-Lag. Ann. Soc. Bot. Lyon 7: 119. 1880.

A frutescent perennial; stem 6–10 dm. high, finely cinereous-puberulent, branched; lower leaves petioled, 5–15 cm. long; blades rounded-ovate in outline, twice or thrice pinnately divided into linear-oblancoleate divisions, canescent on both sides but often less so on the upper side; upper leaves less divided, with indistinct petioles or those of the inflorescence merely cleft or entire and sessile; heads numerous in a leafy panicle, heterogamous, nodding; peduncles 1–3 mm. long; involucre hemispheric, 3–3.5 mm. high, about 5 mm. broad; bracts 12–15, in 3 series, canescent, the outermost lanceolate, not scarious-margined; inner bracts ovate, with yellow scarious margins; ray-flowers about 10; corollas 1.5 mm. long; disk-flowers about 15; corollas deeply campanulate, 2 mm. long; achenes 1.3 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Newfoundland to British Columbia, Utah, and North Carolina; escaped from cultivation; native of Europe.

ILLUSTRATIONS: Sv. Bot. pl. 106; Engl. Bot. pl. 1230; Fl. Dan. pl. 1654; Hayne, Arzn. Gew. 2: pl. 11; A. Dietr. Fl. Boruss. pl. 633; Fl. Deuts. ed. 5. pl. 3001; Reichenb. Ic. Fl. Germ. 16: pl. 1029, f. 1, 1–3; Britt. & Brown, Ill. Fl. f. 4005; ed. 2. f. 4578.

24. *Artemisia frigida* Willd. Sp. Pl. 3: 1838. 1804.

Artemisia procumbens Schrad.; DC. Hort. Monsp. 80. 1813.

Artemisia sericea Nutt. Gen. 2: 143. 1818. Not *A. sericea* Weber. 1775.

Artemisia pumila Link, Enum. 2: 316, as synonym. 1822.

Artemisia virgata Richards. in Frankl. Journey App. 747. 1823.

Artemisia jenseensis Willd.; Spreng. Syst. 3: 489. 1826.

Absinthium frigidum Besser, Bull. Soc. Nat. Mosc. 1: 251. 1829.

A perennial herb, with a caespitose woody caudex, or suffruticose with decumbent or ascending stems, 2–4 dm. high; annual branches erect, rather simple, silky- or villous-canescenscent; leaves 1–3 cm. long, silvery-canescenscent, twice ternately or quaternately dissected into linear or linear-oblancoleate divisions, the basal ones crowded, the cauline ones often with fascicles of smaller ones in their axils; heads nodding, subsessile or short-peduncled, heterogamous, in narrow leafy panicles, with erect racemiform branches, or sometimes in simple racemes; involucre hemispheric, 3–4 mm. high, 5–6 mm. or in the racemose form even 7 mm. broad; bracts white-villous, about 20, in 3 series, sub-equal in length, those of the outermost series linear and herbaceous, the rest lanceolate, acute, with yellow or brown scarious margins; ray-flowers 12–15; corollas 1.5 mm. long; disk-flowers 30–50; corollas narrowly funnelliform, 2–2.5 mm. long; achenes about 1 mm. long, striate.

TYPE LOCALITY: Davuria [Eastern Siberia].

DISTRIBUTION: Minnesota and Manitoba to Alaska, British Columbia, Arizona, and Texas; introduced in the east from Nova Scotia to Ontario and New Jersey; also native of Siberia.

ILLUSTRATIONS: Ledeb. Ic. Fl. Ross. pl. 462; Britt. & Brown, Ill. Fl. f. 4004; ed. 2. f. 4577.

IV. *Lanatae*. Low sericeous herbs with rootstocks. Heads few in interrupted racemes or spikes, or solitary. Disk-corollas funnelliform.

25. *Artemisia scopulorum* A. Gray, Proc. Acad. Phila. 1863: 66. 1863.

A perennial herb, with a simple or branched rootstock; stem 1–3 dm. high, simple, somewhat silky-canescenscent; basal leaves petioled, 3–7 cm. long, silky-canescenscent, twice pinnatifid into linear divisions; lower stem-leaves similar but smaller, the upper less divided, and those

of the inflorescence often simple; heads heterogamous, 5-12, in an interrupted raceme, scattered below, crowded at the apex; involucre hemispheric or broader, 4 mm. high, 6-7 mm. broad; bracts about 20, in 3 series, densely villous, with gray backs and blackish scarious margins, ovate or broadly lanceolate, acute; ray-flowers 10-15; corollas nearly 2 mm. long; disk-flowers 20-25; corollas 2.5 mm. long; achenes 1.5 mm. long, striate.

TYPE LOCALITY: Rocky Mountains, Colorado [probably on the headwaters of Clear Creek].

DISTRIBUTION: Rocky Mountains, from Montana to New Mexico and Utah.

26. *Artemisia Pattersonii* A. Gray, Syn. Fl. N. Am. ed. 2.

1²: 453. 1886.

Artemisia scopulorum monocephala A. Gray, Proc. Acad. Phila. 1863: 66. 1863.

Artemisia monocephala A. Heller, Muhlenbergia 1: 118. 1905.

A perennial herb, with a simple or caespitose rootstock; stem 1-1.5 dm. high, silky-canescens, simple; basal leaves 2-4 cm. long, silky-canescens, pinnately divided into 3-5 linear-oblongolate, approximate divisions; stem-leaves 3-cleft or entire; heads solitary, or 2-4 in a dense congested spike, heterogamous; involucre broadly hemispheric, 4-5 mm. high, 7-12 mm. broad; bracts 20-30, lanceolate, ovate, or oblong, acute or obtuse, in about 3 series, villous, with greenish or gray backs and dark-brown or black scarious margins; ray-flowers 10 or less; corollas about 3 mm. long; disk-flowers 40-60; corollas dark-brown, 3 mm. long.

TYPE LOCALITY: Rocky Mountains, Colorado [probably on the headwaters of Clear Creek].

DISTRIBUTION: Colorado.

Subgenus C. ABROTANUM

Heads heterogamous. Marginal flowers pistillate; corollas subcylindric, 2-4-toothed, tapering upwards. Disk-flowers hermaphrodite, fertile; corolla deeply campanulate to funnel-form, 5-toothed. Style in both 2-cleft and exserted, with filiform spreading branches or in the disk-flowers often included or less exserted and with truncate penicillate tips. Receptacle glabrous.

V. *Annuae*. Annual or biennial herbs, with bipinnatifid green leaves and numerous small heads. Ray-corollas subcylindric, tapering upwards, indistinctly 2-toothed, sparingly glandular-granuliferous; style slightly exserted. Disk-corollas campanulate, 5-toothed, glandular-granuliferous; style included.

27. *Artemisia biennis* Willd. Phytogr. 11. 1794.

Artemisia annua β Lam. Encyc. 1: 266. 1783.

Artemisia hispanica Jacq. Ic. Pl. Rar. 1: 17. 1786. Not *A. hispanica* Lam. 1783.

Artemisia Jacquini Raeusch. Nom. ed. 3. 237, hyponym. 1797.

Artemisia australis Ehrh.; DC. Prodr. 6: 120, as synonym. 1837.

A glabrous biennial or annual; stem strict, very leafy, 3-10 dm. high, often tinged with purple; leaves 5-15 cm. long, bipinnately divided into oblong or lanceolate, cleft or lacinate divisions; heads numerous in small axillary clustered spikes confluent at the top of the stem; involucre hemispheric, 2-3 mm. high, 2-4 mm. broad; bracts about 8, subequal, in 2 series, elliptic, obtuse, striate, scarious-margined; ray-flowers 10-15; corollas 1 mm. long; disk-flowers 10-15; corollas yellow, 1 mm. long; achenes 1 mm. long.

TYPE LOCALITY: "New Zealand."

DISTRIBUTION: Nova Scotia to New Jersey, California, and British Columbia; also Kamtchatka.

ILLUSTRATIONS: Jacq. Ic. Pl. Rar. pl. 172; Britt. & Brown, Ill. Fl. f. 4008; ed. 2. f. 4581.

28. *Artemisia annua* L. Sp. Pl. 847. 1753.

A tall glabrous annual; stem branched, 3-10 dm. high, striate; leaves 2-7 cm. long, pinnately or bipinnately divided into lance-oblong lacinate divisions; heads numerous in small racemes ending the numerous branches, nodding; involucre hemispheric, 1.5 mm. high, 1.5-2.5 mm. broad; bracts about 8, in 2 series, glabrous, the outer oblong, the inner elliptic, with green backs and scarious margins; ray-flowers 5 or 6; corollas greenish-yellow, less than 1 mm. long; disk-flowers 5 or 6; corollas yellow, 1 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Siberia.

DISTRIBUTION: Prince Edward Island to Ontario; New Hampshire to Virginia, Arkansas, and Iowa; California; naturalized from the Old World.

ILLUSTRATIONS: Amman, *Stirp. Rar. Rut. Ic. pl. 23*; Britt. & Brown, *Ill. Fl. f. 4007*; ed. 2. f. 4580.

VI. *Klotzschianae*. Strict annual herbs. Leaves numerous, pinnately or bi-pinnately dissected into linear-filiform divisions, canescent-tomentose. Heads small, numerous in a narrow leafy panicle; involucre subglobose; bracts in 3 series, subequal, the outer narrow. Ray-flowers numerous; corollas subcylindric, glandular-granuliferous, 2-toothed; style slightly exerted. Disk-flowers few; corollas campanulate, 5-toothed; style included, with short recurved, truncate erose branches.

29. *Artemisia Klotzschiana* Besser, *Linnaea* 15: 107. 1841.

Artemisia mexicana Less. in Schlecht. & Cham. *Linnaea* 5: 163. 1830. Not *A. mexicana* Willd. 1826.

A strict annual; stem simple or with erect branches, 5-7 dm. high, floccose; leaves many, canescent, pinnately or bipinnately divided into 5-11 linear-filiform, revolute divisions; heads very numerous in a narrow spike-like, dense, leafy panicle, erect and sessile on the short branches; involucre subglobose, 3 mm. high and broad; bracts about 15, in 2-3 series, floccose, the outer linear-lanceolate, acute or obtuse, nearly as long as the inner; inner bracts linear-oblong, only slightly scarious, acutish; ray-flowers about 50; corollas scarcely 1 mm. long; disk-flowers 6-10, fertile; corollas campanulate, fully 1 mm. long; achenes 0.8 mm. long.

TYPE LOCALITY: Plains of Perote, Vera Cruz.

DISTRIBUTION: Coahuila and San Luis Potosí to Vera Cruz and Hidalgo.

VII. *Glomeratae*. Low caespitose pulvinate perennials. Leaves from once to thrice ternately divided into linear or linear-spatulate divisions, more or less silky, clustered at the base. Heads few, 15-60-flowered, clustered at the ends of the short stems in capitate clusters. Ray-flowers 5-8, pistillate; corollas cylindric, with 2-4 rather conspicuous teeth; style short-exserted, with rather short oblong branches. Disk-flowers 10-50, hairy or glabrous, or glandular-granuliferous, 5-toothed, trumpet-shaped or with a cylindric tube and campanulate throat; style scarcely exerted, with short, recurved branches, truncate and erose at the apex.

30. *Artemisia glomerata* Ledeb. *Mém. Acad. St.-Pétersb.*
5: 564. 1815.

Artemisia leontopodioides Fisch.; Besser, *Nouv. Mém. Soc. Nat. Mosc.* 3: 63. 1834.

? *Artemisia corymbosa* Fisch.; Besser, *Nouv. Mém. Soc. Nat. Mosc.* 3: 74. 1834.

Artemisia globularia Ledeb.; Maxim. *Bull. Acad. St.-Pétersb.* 17: 435, as synonym. 1872. Not *A. globularia* Cham. 1832.

A perennial, with a caespitose rootstock; stems simple, about 1 dm. high or less, silky-villous; basal leaves 1-2 cm. long, twice or thrice ternately divided into linear divisions, silky-canescenscent; stem-leaves few, pedately 3-5-cleft; heads few in a capitate or corymbiform dense cluster; involucre depressed-hemispheric, 3 mm. high, 5-6 mm. broad, silky-villous; bracts 10-12, subequal, in 3 series, elliptic to oval, obtuse or acute, with brown margins; ray-flowers 5 or 6; corollas usually with 3 conspicuous teeth, villous, 2 mm. long; disk-flowers 10-15; corollas yellow, pubescent, 3 mm. long, with a cylindric tube and campanulate throat; achenes 1.5 mm. long, glabrous.

TYPE LOCALITY: St. Lawrence Bay, Siberia.

DISTRIBUTION: Alaska and eastern Siberia.

31. *Artemisia senjavinensis* Besser, *Nouv. Mém. Soc. Nat. Mosc.*
3: 65. 1834.*

Artemisia glomerata H. & A. *Bot. Beech. Voy.* 125. 1832. Not *A. glomerata* Ledeb. 1805.

Artemisia androsacea Seem. *Bot. Voy. Herald* 34. 1852.

A caespitose perennial, with a thick caudex, forming dense tufts; stems scapiform, about 1 dm. high, densely silky-hirsute; basal leaves numerous, clustered, cuneate in outline, 3-5-fid,

* Originally published as *A. semavinensis*, but spelling corrected in *Bull. Soc. Nat. Mosc.* 9: 64. 1836.

densely silky-hirsute, about 1 cm. long; lobes oblong, acutish; lower stem-leaves similar but shorter and broader, with ovate lobes, the upper entire; heads few in a dense capitate cluster; involucre hemispheric, 3-4 mm. high, 4-5 mm. broad; bracts about 15, ovate, acutish, in 3 series, with dark-brown or black margins, densely hirsute on the back; ray-flowers 5-8; corollas 3-4-toothed, glabrous or sparingly glandular-granuliferous, 2 mm. long; disk-flowers 10-20; corollas trumpet-shaped with a somewhat campanulate throat, glandular-granuliferous, 3 mm. long; achenes 2 mm. long.

TYPE LOCALITY: Senjavin Sound [eastern Siberia].
DISTRIBUTION: Western Alaska and eastern Siberia.
ILLUSTRATION: Seem. Bot. Voy. Herald *pl. 6*.

32. *Artemisia globularia* Cham.; Besser, Nouv. Mém. Soc. Nat.
Mosc. 3: 64. 1834.

A perennial, with a short caespitose caudex; stems less than 1 dm. high, villous; leaves mostly basal, once or twice ternate, 1-3 cm. long, once or twice ternately divided into linear or oblong divisions, silky-villous; heads few in a dense head-like cluster; involucre hemispheric, 4-5 mm. high, 5-7 mm. broad; bracts 10-12, silky-villous, subequal, elliptic to broadly oval, obtuse, with black or dark-brown margins; ray-flowers few; corollas 2-3-toothed, glabrous; disk-flowers 40-50; corollas glabrous, yellow or purplish, trumpet-shaped, 5-toothed, 3-4 mm. long, glabrous or sparingly hairy; style-branches truncate, erose.

TYPE LOCALITY: St. Lawrence Bay, Siberia.
DISTRIBUTION: Alaska and eastern Siberia.

VIII. *Norvegicae*. Low perennial herbs with rootstocks, either more or less silky or glabrous, not tomentose. Heads comparatively large, 30-60-flowered, nodding in a simple racemose inflorescence (except in *A. Parryi*); involucre depressed-hemispheric; bracts in 3 series, the outer somewhat shorter, the inner with a herbaceous central portion and broad colored scarious margins. Corollas more or less villous or rarely glabrous, in a few species glandular-granuliferous; those of the ray-flowers 2-toothed, subcylindric, those of the disk-flowers 5-toothed, funnelliform or trumpet-shaped. Style of the ray-flowers short-exserted with oblong branches; that of the disk-flowers included or equaling the corolla; branches short, recurved, truncate and erose at the apex.

33. *Artemisia Richardsoniana* Besser (; Hook. Fl. Bor. Am. 1: 323,
as synonym. 1833), Bull. Soc. Nat. Mosc. 9: 64. 1836.

Artemisia arctica Besser; Hook. Fl. Bor. Am. 1: 323. 1833. Not *A. arctica* Less. 1831.
Artemisia caespitosa Besser; Hook. Fl. Bor. Am. 1: 324, in part. 1833. Not *A. caespitosa* Ledeb. 1833.

A perennial, with a caespitose rootstock; stems 0.5-2 dm. high, coarsely villous; basal leaves loosely and coarsely silky-villous, 3-5 cm. long, twice ternate or quinate, with linear or linear-oblong divisions; stem-leaves mostly 3-cleft or the upper entire and narrowly linear; heads several or many in a dense spike, interrupted below; involucre depressed-hemispheric, 4 mm. high, 6-7 mm. broad; bracts about 10, subequal, oval or ovate, rounded at the apex, densely villous on the backs, with dark-brown scarious erose margins; ray-flowers few; corollas villous, 1.5 mm. long; disk-flowers 30-50; corollas slightly villous at the apex or wholly glabrous, with purplish limb, 2.5 mm. long.

TYPE LOCALITY: Arctic coast, Canada.
DISTRIBUTION: Northwest Territory and northern Alberta.

34. *Artemisia minuta* Rydberg, sp. nov.

A low undershrub, woody at the base; stems 1 dm. high or less, at first slightly tomentose, in age glabrate and reddish; leaves mostly basal, silvery-silky, about 1 cm. long, pinnatifid with 5-7 narrowly oblanceolate approximate divisions; stem-leaves smaller, with linear-filiform divisions; inflorescence simple, spike-like, 2-4 cm. long; involucre hemispheric, 2.5 mm. high;

bracts about 10, light-brown, slightly tomentose, in age glabrate, ovate, acutish, scarious-margined; flowers unknown, and therefore its place in the genus uncertain.

Type collected about 50 miles north of Medicine Hat, Alberta, in May, 1914, *Ernest Thompson Seton* (herb. N. Y. Bot. Gard.).

35. *Artemisia tacomensis* Rydberg, sp. nov.

A dwarf caespitose perennial, with a stout caudex; stems about 7 cm. high, silvery-canescens, almost leafless; basal leaves numerous, 1-1.5 cm. long, silvery-canescens, dissected into 3-5 divisions, which are either simple or again 3-cleft into short oblanceolate lobes; stem-leaves small, simple, linear; inflorescence spike-like; heads short-peduncled, nodding; involucre hemispheric, 6-7 mm. broad, 5 mm. high, densely white-villous; bracts about 15, elliptic, yellow, with brown, erose margins, acutish; receptacle naked; ray-flowers few; corollas cylindrical, 2 mm. long, glandular-puberulent; disk-flowers about 30; corollas yellow, 3 mm. long, with a cylindrical tube, campanulate throat, and 5-lobed pilose limb; achenes 1.5 mm. long.

Type collected on Mt. Rainier, Washington, August 27, 1896, *J. B. Flett* (U. S. Nat. Herb. no. 353961).

36. *Artemisia hyperborea* Rydberg, sp. nov.

? *Artemisia arctica* Besser; Hook. Fl. Bor. Am. 1: 323, in part. 1833. Not *A. arctica* Less. 1831.

A perennial, with a caespitose caudex or rootstock; stems 5-10 cm. high, finely white-tomentose, decumbent at the base; basal leaves numerous, 2-4 cm. long, finely silvery-tomentose, twice pinnatifid into approximate linear divisions; primary divisions 5-7, the secondary ones mostly 3-5; stem-leaves smaller, less divided, the primary divisions often entire; heads mostly conglomerate in a short spike at the end of the stems and a few remote solitary ones in the upper axils; involucre depressed-hemispheric, about 5 mm. high and 6 mm. broad; bracts 10-12, broadly oval or obovate, white-tomentose on the back, with broad dark-brown erose scarious margins; ray-flowers 10 or more; corollas 2 mm. long, slightly glandular-granuliferous, 3- or 4-lobed; style slightly exserted; branches oblong; disk-flowers 20-30; corollas yellow, deeply campanulate, slightly villous at the apex, 2.5 mm. long.

Type collected on sand-dunes at Bernard Harbor, North West Territory, Canada, August 14, 1915, *Frits Johansen 304* (herb. Geol. Surv. Canada no. 89997).

DISTRIBUTION: Arctic shores to Great Slave Lake, Canada.

37. *Artemisia Tyrrellii* Rydberg, sp. nov.

A more or less tufted perennial; stems 2-3 dm. high, densely silky-canescens; leaves 1.5-3 cm. long, white-silvery silky on both sides; the basal ones twice pinnatifid, with 3-5 crowded primary divisions, which are 3-5-cleft into oblanceolate or spatulate divisions; lower stem-leaves mostly twice ternate and the upper ternate to entire and linear; heads racemose, nodding; peduncles 2-10 mm. long; involucre hemispheric, about 5 mm. high and 7 mm. broad; bracts 12-15, elliptic, densely canescens on the back, with conspicuous dark-brown scarious margins; ray-flowers about 10; corollas about 2 mm. long; disk-flowers about 30; corollas trumpet-shaped, 2.5 mm. long, glandular-granuliferous and somewhat hairy; achenes 1.5 mm. long.

Type collected on the Selkirk Trail, northern British Columbia, September 6, 1898, *J. B. Tyrrell* (herb. Geol. Surv. Canada no. 19439).

38. *Artemisia heterophylla* Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 74. 1834.

? *Artemisia caespitosa* Besser; Hook. Fl. Bor. Am. 1: 324, in part. 1833. Not *A. caespitosa* Ledeb. 1833.

A caespitose perennial, with a woody caudex; stems 1-2 dm. high, ascending at the base, silky-villous; basal leaves numerous, 3-6 cm. long, petioled; blades broadly obovate in outline, sericeous, twice dissected into linear divisions; primary divisions mostly 5, approximate, sometimes 3, again divided into 3, rarely 4 or 5, divisions; stem-leaves smaller, mostly pinnately

3-5-dissected or the uppermost simple; inflorescence spike-like, leafy below, crowded above; heads short-peduncled or sessile, nodding; involucre hemispheric, densely villous, 6-7 mm. broad and nearly as high; bracts about 15, in 3 series, densely villous, the outer ovate, the inner oval, acute, with a lanceolate or elliptic median portion and brown scarious erose margins, acute; ray-flowers 7-9; corollas glandular-puberulent, 3 mm. long; disk-flowers 15-20; corollas yellow, glabrous or slightly pilose, 3.5 mm. long, funnelliform; achenes 2 mm. long.

TYPE LOCALITY: St. Lawrence Bay, Bering Strait, eastern Siberia.

DISTRIBUTION: Vicinity of Port Clarence, Alaska, and eastern Siberia.

39. *Artemisia comata* Rydberg, sp. nov.

A low perennial, with a caespitose caudex or rootstock; stems 1-1.5 dm. high, decumbent at the base, sparingly villous below, densely so in the inflorescence, with long white hairs; lower leaves crowded, 2-5 cm. long, mostly twice pinnatifid into linear-lanceolate, acute divisions, sparingly long-hairy or in age glabrate; stem-leaves several, less divided, the upper simply pinnatifid into linear divisions; inflorescence dense, spike-like, somewhat interrupted below; individual peduncles 1-5 mm. long; heads nodding; involucre depressed-hemispheric, 5 mm. high, 6-7 mm. broad; bracts about 12, glabrous, oblong-ovate, obtuse, dark greenish-brown, with very dark purplish-brown, almost black, erose, scarious margins; ray-flowers 12-15; corollas 2 mm. long, slightly glandular-granuliferous, 3-lobed; disk-flowers 30-40; corollas deeply funnelliform, nearly 3 mm. long, tinged with purple, slightly villous at the apex.

Type collected on a gravel tundra at Collinson Point, arctic Alaska, July 17, 1914, *Frits Johansen 122* (herb. Geol. Surv. Canada no. 89994).

DISTRIBUTION: Arctic coast of Alaska, and Herschell Island.

40. *Artemisia saxicola* Rydb. Bull. Torrey Club 32: 128. 1905.

Artemisia Chamissoniana saxatilis Besser; Hook. Fl. Bor. Am. 324. 1833. Not *A. saxatilis* Waldst. & Kit. 1804.

Artemisia Richardsoniana A. Gray, Am. Jour. Sci. II. 33: 239. 1862. Not *A. Richardsoniana* Besser. 1836.

Artemisia arctica A. Gray, Proc. Acad. Phila. 1863: 66. 1863. Not *A. arctica* Less. 1831.

Artemisia norvegica A. Gray, Syn. Fl. N. Am. 1^o: 371, mainly. 1884. Not *A. norvegica* Fries. 1817.

A low perennial, with a thick caespitose rootstock; stems 2-3 dm. high, very leafy towards the base, more or less villous; basal leaves distinctly petioled, villous on both sides, ovate or obovate in outline, twice pinnatifid, 5-12 cm. long; primary divisions oblanceolate in outline, the secondary linear, acute; upper leaves reduced, sessile, once pinnatifid; heads several or many, nodding, in a racemiform inflorescence; individual peduncles erect, 5-70 mm. long; involucre depressed-hemispheric, 4-5 mm. high, 7-10 mm. broad; bracts 12-18, in 3 series, villous, ovate, acute, with a narrowly lanceolate median portion and broad, black or dark-brown, erose margins; ray-flowers 8-10; corollas villous, 2.5 mm. long; disk-flowers 30-50; corollas light-brown, funnelliform, villous, fully 3 mm. long; achenes 2 mm. long.

TYPE LOCALITY: Rocky Mountains [Canadian].

DISTRIBUTION: Rocky Mountains, from Colorado to Alberta; Sierra Nevada, near Lake Tahoe (a form with the dark margins of the bracts less conspicuous).

41. *Artemisia arctica* Less. Linnaea 6: 213. 1831.

Artemisia Chamissoniana Besser; Hook. Fl. Am. Bor. 1: 324. 1833.

Artemisia longepedunculata Rudolphi; Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 77. 1834.

Artemisia Chamissoniana unalaschensis Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 78. 1834.

Artemisia Chamissoniana kolzebuensis Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 78. 1834.

Artemisia montana Schlecht.; Ledeb. Fl. Ross. 2: 591, as synonym. 1846.

Artemisia norvegica Maxim. Bull. Acad. St.-Pétersb. 17: 435. 1872.

Artemisia norvegica pacifica A. Gray, Syn. Fl. N. Am. 1^o: 371. 1884.

A perennial, with a thick caespitose rootstock; stems 2-5 dm. high, glabrate or sparingly villous; basal leaves distinctly petioled, twice or thrice pinnatifid, 5-20 cm. long, sparingly hairy or glabrous, broadly obovate in outline; primary divisions obovate in outline, the ultimate ones lance-linear, acute; upper leaves sessile and less divided; heads several or many,

nodding, in a raceme; individual peduncles 1-10 cm. long, erect; involucre depressed-hemispheric, 4-5 mm. high, 7-10 mm. broad; bracts 12-15, in 3 series, glabrous or nearly so, nearly equal, the outer ovate and acute, the inner obovate and obtuse or acutish, with a lanceolate green central portion and broad black erose margins; ray-flowers 5-10; corollas villous, 2.5 mm. long; disk-flowers 40-90; corollas trumpet-shaped, villous, 3 mm. long; achenes 2 mm. long.

TYPE LOCALITY: Unalashka.

DISTRIBUTION: Alaska to Washington; also in eastern Siberia.

ILLUSTRATION: *Nouv. Mém. Soc. Nat. Mosc.* 3: *pl. 4, f. 7, 8*.

42. *Artemisia macrobotrys* Ledeb. *Fl. Alt.* 4: 73. 1833.

Artemisia tanacetifolia L. *Sp. Pl.* 848, in part. 1753.

Artemisia laciniata β Willd. *Sp. Pl.* 3: 1843. 1804.

Artemisia latifolia Ledeb. *Mém. Acad. St.-Pétersb.* 5: 569, in part. 1815.

Artemisia Krasheninnikowiana Besser, *Nouv. Mém. Soc. Nat. Mosc.* 3: 41. 1834.

A perennial, with a creeping rootstock; stem 2-4 dm. high, glabrous or sparingly pilose; lower leaves petioled; blades broadly ovate in outline, twice or thrice pinnately divided, sparingly pilose or glabrate; principal divisions spreading, obovate in outline, the ultimate ones linear-oblong, obtuse or acutish, spreading; upper leaves less divided with narrower acute divisions; heads many or several in simple or branched racemes, nodding; individual peduncles short; involucre depressed-hemispheric, 3-4 mm. high, 5-6 mm. broad; bracts sparingly villous, 15-18, in 3 series, oval, obtuse, with dark-brown or black erose margins, the outer slightly shorter; ray-flowers 10-12; corollas villous, nearly 2 mm. long; disk-flowers 30-40; corollas yellow, villous, trumpet-shaped, 3 mm. long; achenes nearly 2 mm. long.

TYPE LOCALITY: Plains on the Kerlyk River, Siberia.

DISTRIBUTION: Yukon, Alaska, and Siberia.

ILLUSTRATIONS: *Gmel. Fl. Sib.* 2: *p. 58*; *Ledeb. Ic. Fl. Ross.* *pl. 467*.

43. *Artemisia laevigata* Standley, *Smiths. Misc. Coll.* 56³³: 2. 1912.

A low perennial, with a rootstock; stems 2.5-3 dm. high, glabrous, reddish, striate; basal leaves slender-petioled, twice pinnatifid into oblong-linear, acute divisions, glabrous, bright-green, 2-6 cm. long; stem-leaves mostly once pinnatifid into narrow acute divisions or those of the inflorescence linear-oblong and entire; heads 5-8, nodding, in a racemose inflorescence; peduncles 7-16 mm. long; involucre 8-10 mm. broad; bracts glabrous, in 2 or 3 series, ovate, obtuse, green on the back, with broad dark-brown erose margins; receptacle glabrous; ray-flowers 5-10, pistillate; corollas nearly 2 mm. long; disk-flowers fertile; corollas trumpet-shaped, fully 2 mm. long, glabrous or slightly villous near the base, yellowish, tinged with reddish-purple.

TYPE LOCALITY: Smoky River, Alberta.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: *Can. Alp. Jour. Special Number* 1912: *pl. 5*.

44. *Artemisia Parryi* A. Gray, *Proc. Am. Acad.* 7: 361. 1868.

Artemisia saxicola Parryi A. Nelson; *Coult. & Nels. Man.* 568. 1909.

A perennial, with a caespitose rootstock or caudex; stems glabrous, 2-3 dm. high; leaves obovate in outline, bi- or tri-pinnatifid into linear divisions, glabrous, 4-10 cm. long; heads many, nodding, in a racemiform or paniculate inflorescence; involucre depressed-hemispheric, 3 mm. high, 5-6 mm. broad; bracts 15-18, in 3 series, the outer somewhat shorter, oblong or elliptic, glabrous, obtuse with brown scarious margins; ray-flowers few; corollas 1.5 mm. long, glandular-granuliferous; disk-flowers about 30; corollas deeply campanulate, glandular-granuliferous, 2 mm. long; achenes nearly 2 mm. long.

TYPE LOCALITY: Huerfano Mountains, "New Mexico" [Colorado].

DISTRIBUTION: Mountains of Colorado (and eastern Utah?).

45. *Artemisia Cooleyae* Rydberg, sp. nov.

A perennial; stems 3 dm. high or more, angled, glabrous; basal leaves 2-3 dm. long, long-petioled, twice or thrice pinnatifid into narrowly linear-lanceolate attenuate divisions, green and glabrous on both sides; those of the stem similar, smaller, short-petioled, less divided with narrower segments; inflorescence paniculate; heads nodding, on slender peduncles 1-5 cm. long; involucre hemispheric, about 5 mm. high, 5-6 mm. broad; bracts about 12, glabrous, oval, obtuse or rounded at the apex, greenish with broad brown scarious margins; ray-flowers 6-10; corollas cylindric, 2 mm. long, 3-toothed at the apex, slightly glandular-granuliferous; disk-flowers about 25; corollas 2.5 mm. long, elongate-funnelform, slightly glandular-granuliferous, usually sparingly hairy below; achenes 1 mm. long.

Type collected above Silver Bow Basin, Juneau, Alaska, August 6, 1891, *Grace E. Cooley* (herb. Geol. Surv. Canada).

IX. Franserioides. Herbaceous perennials, with creeping rootstocks. Leaves (the lower slender-petioled) bipinnatifid into 5-9 elliptic or obovate primary and oblong obtuse secondary divisions, green above, white-tomentulose beneath. Heads rather few, nodding, in a lax narrow panicle, 60-100-flowered. Corollas conspicuously glandular-granuliferous, those of the ray-flowers 2-toothed, subcylindric, tapering upwards, those of the disk-flowers 5-toothed and elongate-campanulate. Style of the former short-exserted, of the latter included.

46. *Artemisia franserioides* Greene, Bull. Torrey Club 10: 42.
1883.

Artemisia discolor T. & G. Pacif. R. R. Rep. 2: 127. 1855.

A herbaceous perennial, with a creeping rootstock; stem 3-10 dm. high, simple, glabrous, striate, usually purplish; leaves, except those of the inflorescence, petioled, bipinnately divided, ovate or obovate in outline, light-green and glabrous or sparingly puberulent above, very finely grayish-tomentulose beneath, 5-20 cm. long; primary divisions 5-9, elliptic to obovate in outline, the secondary ones oblong, obtuse; heads nodding, in a lax but narrow panicle; peduncles 1-3 mm. long; involucre hemispheric, 3-4 mm. high, 6-7 mm. broad; bracts about 12, in 2 series, elliptic or oval, rounded and erose at the apex, scarious-margined, finely tomentulose, the outer ones only slightly shorter; ray-flowers 5-12; corollas 1.5 mm. long; disk-flowers 60-90; corollas 2 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Piños Altos Mountains, New Mexico.
DISTRIBUTION: Colorado to Arizona and Chihuahua.

X. Vulgares. Perennial herbs, mostly with rootstocks, rarely somewhat woody at the base. Leaves subsessile, or the lower short-petioled, entire or more or less lobed, or divided, glabrate above, white-tomentulose beneath, the lobes acute. Heads in most species numerous and small, in dense leafy panicles, or rarely fewer and larger, in laxer panicles or in spicate or racemose inflorescences; involucre in the former case campanulate, in the latter more hemispheric. Corollas glandular-granuliferous, in the ray-flowers subcylindric, tapering upwards, 2-toothed, in the disk-flowers 5-toothed, trumpet-shaped or somewhat funnelform. Style of the former long-exserted, with linear-filiform divisions, and of the latter included or scarcely exerted, with recurved branches, truncate and erose at the apex.

47. *Artemisia vulgaris* L. Sp. Pl. 848. 1753.

Artemisia indica canadensis Besser; Hook. Fl. Bor. Am. 1: 323. 1833.
Absinthium vulgare Dulac, Fl. Hautes-Pyr. 502. 1867.

A stout perennial, with a rootstock; stem 5-15 dm. high, sparingly tomentulose when young, striate, often purplish; lower and middle leaves ovate in outline, pinnately or bipinnately divided to near the midrib, green and glabrate above, white-tomentulose beneath, 5-10 cm. long; primary divisions 5-7, obovate, oblong or oblanceolate, acute, the ultimate lanceolate, often few-toothed; upper leaves pinnatifid with lanceolate or linear divisions, or those of the inflorescences simple; heads very numerous, at first nodding, soon erect, narrow, in a leafy

panicle, with racemose branches; involucre campanulate, about 4 mm. high, 3-4 mm. broad, more or less tomentose; bracts 8-10, in about 3 series; outermost bracts ovate, about half as long as the innermost; inner bracts oblong, obtuse; ray-flowers 6-12; corollas 2 mm. long; disk-flowers 5-15; corollas 2.5 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Newfoundland to Manitoba, Wisconsin, Alabama, and Georgia; British Columbia; Martinique; escaped from cultivation and naturalized; native of the Old World.

ILLUSTRATIONS: A. Dietr. Fl. Boruss. *pl.* 634; Fl. Dan. *pl.* 1176; Sv. Bot. *pl.* 417; Engl. Bot. *pl.* 978; Hayne, Arzn. Gew. 2: *pl.* 12; Reichenb. Ic. Fl. Germ. 16: *pl.* 1038, *f.* 1, 1-11; Fl. Deuts. ed. 5. *pl.* 3011; Britt. & Brown, Ill. Fl. *f.* 4010; ed. 2. *f.* 4583.

48. *Artemisia selengensis* Turcz.; Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 50. 1834.

Artemisia umbrosa Verlot, Cat. Gr. Jard. Grenoble 1875: 12. 1875. Not *A. umbrosa* Turcz. 1834. *Artemisia Verlotorum* Lamotte, Assoc. Fr. Av. Sci. Compte Rendu 5: 513. 1877.

A stout perennial, with a rootstock; stem a meter high or more, striate, sparingly tomentose; lower leaves pinnately quinately divided to near the midrib, 1 dm. long or more, green or glabrate above, white-tomentose beneath; middle leaves ternately divided and the uppermost entire; leaves or their lobes narrowly lanceolate, acuminate, usually entire, rarely few-toothed; heads numerous, paniculate; involucre about 4 mm. high and 3 mm. broad, sparingly floccose, soon glabrate; bracts 12-15, oval, obtuse, in 3 series, yellowish-green; ray-flowers 5-7; corollas 1.5 mm. long; disk-flowers 5-7; corollas brownish, glandular-puberulent, 2.5 mm. long, funnel-form; achenes 1.5 mm. long.

TYPE LOCALITY: On islands of Selenga River, near Selenginsk, Transbaikal Siberia.

DISTRIBUTION: Near Portland, Oregon, probably escaped from cultivation; native of Siberia.

49. *Artemisia unalaskensis* Rydberg, sp. nov.

? *Artemisia vulgaris kamtschatica* Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 54. 1834.

A tall perennial; stem probably 1 m. high, glabrate, angled and striate; leaves numerous, green and glabrous above, white-tomentose beneath, the lower stem-leaves bipinnately cleft, 1 cm. long or more, the upper ones pinnately divided or some in the inflorescence entire; primary divisions mostly 5, in the lower leaves cleft into lanceolate divisions, in the upper ones entire, linear-lanceolate, acuminate; heads numerous in a leafy panicle, mostly nodding; involucre hemispheric, about 5 mm. high and fully that broad, sparingly tomentose; bracts about 15, light-green and scarious-margined, ovate or oval, the inner obtuse, the outer acute and shorter; ray-flowers about 10; corollas 2 mm. long; disk-flowers 25-50, fertile; corollas 3 mm. long, purplish; achenes 1.5 mm. long.

Type collected on the Island of Unalaska, August 22, 1891, *J. M. Macoun* (herb. Geol. Surv. Canada no. 20625).

50. *Artemisia incompta* Nutt. Trans. Am. Phil. Soc. II. 7: 400. 1841.

Artemisia discolor incompta A. Gray, Syn. Fl. N. Am. 1^o: 373. 1884.

A perennial, with a caespitose rootstock; stem glabrous, green, striate, simple, 3-5 cm. long; leaves subsessile, obovate in outline, pinnately divided to near the midrib, green and glabrate or slightly floccose when young above, finely white-tomentose beneath, 4-6 cm. long; lobes at least of the lower leaves again cleft or toothed, with lanceolate lobes or teeth; heads usually many in a narrow panicle, at first nodding, erect in age; involucre hemispheric, 3 mm. high, 3-4 mm. broad; bracts about 12, in about 3 series, glabrate or nearly so, yellowish; the outer ovate, half as long as the innermost; inner bracts elliptic, broadly scarious-margined, obtuse; ray-flowers 5-8; corollas 1.5 mm. long; disk-flowers 20-25; corollas 2 mm. long; achenes fully 1 mm. long.

TYPE LOCALITY: In the central chain of the Rocky Mountains, in Thornberg's Pass [Wyoming?].

DISTRIBUTION: Montana and British Columbia to Utah and Colorado.

51. *Artemisia Leibergii* Rydberg, sp. nov.

A suffrutescent perennial, 3-6 dm. high, with a woody caudex and short perennial stems; branches erect, simple, sparingly tomentulose or glabrate, striate; leaves sessile, 3-6 cm. long, oblanceolate, coarsely toothed or lobed towards the apex, or the upper entire, glabrous and yellowish-green above, finely floccose beneath; heads many in a dense spike-like panicle, mostly erect; involucre hemispheric, about 4 mm. high, 4-5 mm. broad; bracts 10-12, yellowish, only sparingly floccose, in about 3 series, the outer ovate, acute, about half as long as the innermost; inner bracts oval, acutish, broadly scarious-margined; ray-flowers 5-7; corollas 1.5 mm. long; disk-flowers 20-25; corollas yellow, 2 mm. long; achenes fully 1 mm. long.

Type collected at Fish Hook Ferry, Washington, September 18, 1894, *Leiberg 935* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Washington and Northern Idaho.

52. *Artemisia Tilesii* Ledeb. Mém. Acad. St.-Pétersb. 5: 568. 1805.

Artemisia Tilesii arctica Besser; Hook. Fl. Bor. Am. 1: 324. 1831.

Artemisia Tilesii unalashkensis Besser, Linnaea 15: 106. 1841.

Artemisia vulgaris Tilesii Ledeb. Fl. Ross. 2: 586. 1846.

A stout perennial, with a rootstock; stem 2-4 dm. high, floccose when young, striate, often purplish; leaves sessile, ovate in outline, 5-10 cm. long, acuminate, pinnatifid, sparingly floccose when young but soon glabrate above, white-tomentose beneath; divisions 3-5, linear-lanceolate, acuminate, or in var. *arctica* obtuse, often again cleft or toothed; heads nodding, sessile, in a dense short spike-like panicle, sometimes spicate; involucre hemispheric, about 4 mm. high, 6-8 mm. broad; bracts 10-12, in 3 series, fuscous, with brown scarious margins, nearly glabrous, the outer ovate, acute, only slightly shorter than the inner; inner bracts oval, acute; ray-flowers 10-12; corollas 2.5 mm. long; disk-flowers 25-40; corollas purplish-brown, rarely yellowish, funnellform, 2.5 mm. long; achenes fully 1.5 mm. long.

TYPE LOCALITY: Kamchatka.

DISTRIBUTION: Alaska to Hudson Bay; also in eastern Siberia.

53. *Artemisia elatior* (T. & G.) Rydb. Mem. N. Y. Bot. Gard. 1: 430. 1900.

Artemisia vulgaris americana Besser, Linnaea 15: 105, in part. 1841.

Artemisia Tilesii elatior T. & G. Fl. N. Am. 2: 422. 1843.

A tall perennial, with a rootstock; stem 3-6 dm. high, soon glabrous, striate, often purple-tinted; leaves many, lanceolate, acuminate, 5-10 cm. long, glabrous above, densely white-tomentose beneath, 3-5-cleft into narrowly lanceolate divisions or the upper entire; heads many in a loose panicle, peduncled, at first nodding, in age erect; involucre hemispheric, 4 mm. high, 5-7 mm. broad, glabrous or nearly so; bracts 12-15, in 3 series, the outermost ovate, fully half as long as the innermost; inner bracts broadly oval, obtuse, yellowish-green, with brown scarious margins; ray-flowers about 10; corollas 2 mm. long; disk-flowers 25-50; corollas 3 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Subarctic America.

DISTRIBUTION: Hudson Bay to Mackenzie, Alaska, Washington, and Montana.

54. *Artemisia Gormanii* Rydberg, sp. nov.

A perennial, with a rootstock; stem 3-5 dm. high, sparingly tomentose, soon glabrate, green or purplish; leaves lanceolate in outline, green and glabrate above, white-tomentose beneath, 5-10 cm. long, caudate-acuminate, divided to near the midrib into narrow, linear-lanceolate divisions, which are usually again divided into 2-4 narrow lobes; inflorescence loose, paniculate; involucre subglobose, about 5 mm. broad and high; bracts 10-12, broadly oval, sparingly villous, green, with brown scarious margins; ray-flowers about 10; corollas 2.5 mm. long, glandular-granuliferous; disk-flowers about 10; corollas funnellform, 3 mm. long, glabrous; achenes 1.5 mm. long.

Type collected in the Lake Iliamna Region, Alaska, September 1, 1902, *Gorman 281* (U. S. Nat. Herb. no. 420345).

DISTRIBUTION: Alaska.

55. *Artemisia arachnoidea* Sheldon, Bull. Torrey Club 30: 310.
1903.

A perennial, with a branched rootstock or caudex; stems 5-10 dm. high, striate, arachnoid-floccose; leaves linear-lanceolate, acuminate or acute, sessile, sparingly floccose but soon glabrate above, permanently floccose beneath, 3-8 cm. long, 5-8 mm. broad, the lower with a few lanceolate short lobes, the upper entire; heads many in a lax panicle, often sub-second and nodding; involucre hemispheric, about 4 mm. high and 6 mm. broad; bracts about 10, in about 3 series, sparingly floccose, yellowish-green, the outer ovate, acute, about half as long as the innermost; inner elliptic, acute or obtuse, scarious-margined; ray-flowers 8-10; corollas 1.5 mm. long; disk-flowers 25-30; corollas bright-yellow; achenes more than 1 mm. long.

TYPE LOCALITY: Banks of the Columbia, one mile west of Vancouver, Washington.
DISTRIBUTION: Washington, Oregon, and northwestern Idaho.

56. *Artemisia Hookeriana* Besser; Hook. Fl. Bor. Am. 1: 322.
1833.

A tall perennial, with a rootstock; stem 3-6 dm. high, sparingly floccose when young, soon glabrate, striate; leaves lanceolate or ovate in outline, glabrate above, densely white-tomentose beneath, the upper entire, the lower deeply cleft into 3-7 lanceolate often falcate divisions; heads numerous in very dense elongate panicles, mostly erect; involucre campanulate, about 4 mm. high and 3 mm. broad, more or less tomentose; bracts about 12, in about 3 series, the outer ones ovate, half as long as the innermost; inner bracts elliptic, obtuse, scarious-margined, yellow; ray-flowers 5 or 6; corollas 2 mm. long; disk-flowers 5 or 6, fertile; corollas nearly 3 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Rocky Mountains [Canada].
DISTRIBUTION: Saskatchewan to British Columbia and Oregon.

57. *Artemisia Douglasiana* Besser; Hook. Fl. Bor. Am. 1: 323.
1833.

Artemisia integrifolia Less. Linnaea 6: 523. 1831. Not *A. integrifolia* L. 1753.
Artemisia vulgaris californica Besser, Linnaea 15: 91. 1841.
Artemisia vulgaris Douglasiana D.C. Eaton, in S. Wats. Bot. King's Expl. 183. 1871.
Artemisia Kennedyi A. Nelson, Proc. Biol. Soc. Wash. 18: 175. 1905.

A stout perennial, with a rootstock; stem 6-10 dm. high, simple, striate, somewhat tomentose; leaves numerous, 5-15 cm. long, lanceolate, acuminate, the lower more or less lobed or toothed, with few lanceolate lobes or teeth, the upper ones entire, all somewhat grayish-floccose above when young, glabrate in age, permanently white-tomentose beneath; heads numerous, at first nodding, in a large dense narrow leafy panicle 3-5 dm. long; involucre rounded-campanulate, 4 mm. high, 3-4 mm. broad; bracts 10-12, in 3-4 series, tomentose, at least when young, the outer lanceolate, acutish, half as long as the innermost, the inner elliptic, obtuse, broadly scarious-margined above; ray-flowers 6-8; corollas 2 mm. long; disk-flowers 10-18; corollas 2-2.5 mm. long; achenes 1.5 mm. long, oblong, striate.

TYPE LOCALITY: Northwest America.
DISTRIBUTION: Southern Washington and Idaho to southern California.

58. *Artemisia Herriotii* Rydb. Bull. Torrey Club 37: 455. 1910.

A tall perennial herb, with a rootstock; stem simple, 6-10 dm. high, finely tomentose; leaves entire or sparingly and sharply toothed, 5-20 cm. long, 5-15 mm. wide, glabrate and green above, densely white-tomentose beneath, rather thin, the teeth lanceolate and directed forward; heads very numerous, erect, in a narrow dense panicle; branches erect; involucre oblong, 4-5 mm. high, 2.5-3 mm. broad; bracts 10-14, in 3-4 series, tomentose, the outer ovate-lanceolate, acute, half as long as the innermost; inner bracts elliptic, mostly obtuse; ray-flowers 6-8; corollas 2 mm. long; disk-flowers 5-7; corollas 2.5 mm. long; style-branches truncate, erose at the tips; achenes 1.5 mm. long, finely striate.

TYPE LOCALITY: Edmonton, Alberta.
DISTRIBUTION: Alberta and Saskatchewan to South Dakota.

59. *Artemisia Suksdorfii* Piper, Bull. Torrey Club 28: 42. 1901.

Artemisia heterophylla Nutt. Trans. Am. Phil. Soc. II. 400. 1841. Not *A. heterophylla* Besser. 1834.

Artemisia vulgaris californica A. Gray, Syn. Fl. N. Am. 1^o: 373, in part. 1884.

Artemisia vulgaris litoralis Suksd. Deuts. Bot. Monats. 18: 98. 1900.

A stout tall perennial herb, with a rootstock; stem usually simple, 1-1.5 m. high, terete, striate, sparingly pubescent when young, soon glabrate; leaves many, lanceolate or ovate-lanceolate, the lower coarsely dentate or lobed, with few lanceolate divisions, 6-10 cm. long, acuminate, green and glabrate above, densely white-tomentose beneath; heads very numerous in a dense elongate panicle 6-8 dm. long; involucre oblong or subcylindric, about 4 mm. high, scarcely 2 mm. broad, only slightly floccose when young, soon glabrous, yellow and shining; bracts about 10, in 3-4 series, the outer lanceolate, acute, half as long as the innermost, the inner oblong or elliptic, obtuse, scarious-margined; ray-flowers 3-6; corollas 2 mm. long; disk-flowers 3-6; corollas 3 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Fairhaven, Washington.

DISTRIBUTION: British Columbia to northern California along the coast.

60. *Artemisia atomifera* Piper, Contr. U. S. Nat. Herb. 11: 588. 1906.

A caespitose perennial; stem suffrutescent at the base, 6-12 dm. high, striate, somewhat floccose or glabrate; leaves numerous, firm, green and nearly glabrous, but dotted with numerous resinous granules above, white-tomentose beneath, variable in shape, mostly lanceolate in outline, 5-8 cm. long, the lower usually pinnatifid, with 5-7 lanceolate lobes, the upper usually entire; panicles oblong, 1-2 dm. long, dense and narrow, leafy-bracted; involucre campanulate, tomentose, 3-3.5 mm. high, 3 mm. broad; bracts about 10, oval, obtuse; ray-flowers 5-8; corollas 1 mm. long; disk-flowers 5-16; corollas funnelliform, glandular-granuliferous, 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Wawawai, Washington.

DISTRIBUTION: Eastern Washington.

61. *Artemisia ludoviciana* Nutt. Gen. 2: 143. 1818.

A perennial, with a branched rootstock; stem 3-6 dm. high, usually much branched, white-tomentose; leaves numerous, sessile, 3-10 cm. long, lanceolate in outline, entire or the lower pinnatifid, with lanceolate or linear-lanceolate, often falcate divisions, dark-green but slightly floccose when young and soon glabrate above, white-tomentose beneath; heads very numerous in a leafy panicle, horizontal or nodding; involucre campanulate, about 3 mm. high, 2-3 mm. broad; bracts 6-8, in three series, more or less tomentose; outer bracts ovate, half as long as the innermost, acute; inner bracts elliptic, obtuse, broadly scarious-margined; ray-flowers 6-8; corollas 1.2 mm. long; disk-flowers 10-15; corollas 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Banks of the Mississippi, near St. Louis.

DISTRIBUTION: Missouri to Utah, Arizona, and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 4588.

62. *Artemisia cuneata* Rydberg, sp. nov.

A perennial, with a creeping rootstock; stem 5-10 dm. high, tomentose, branched; leaves sessile, 2-4 cm. long, grayish-floccose above, white-tomentose beneath, those of the stem cuneate-obovate, pinnatifid, or coarsely toothed towards the apex, the lobes or teeth ovate, often mucronate, those of the inflorescence lanceolate and entire; heads numerous, very short-peduncled or subsessile, hemispheric, about 3 mm. broad; bracts 10-12, straw-colored, oval, obtuse, tomentose, the inner scarious-margined; ray-flowers 6 or 7; corollas 1.5 mm. long, glandular-granuliferous; disk-flowers 6 or 7; corollas nearly 2 mm. long.

Type collected at Idaho Springs, Colorado, August 27, 1895, C. L. Shear 4617 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Texas to Colorado.

63. *Artemisia sulcata* Rydberg, sp. nov.

A perennial, with a rootstock; stem 5 dm. high or more, glabrous or nearly so, strongly grooved, yellowish-green; leaves 5-10 cm. long, green and glabrate above, white-tomentose beneath, the lower pinnately divided into narrowly lance-linear lobes, the upper entire and lance-linear; inflorescence paniculate; branches elongate and raceme-like; involucre broadly campanulate, 3 mm. high and fully as broad, slightly tomentose when young, soon glabrate, shining and yellowish; bracts about 10, in 3 series, broadly oval, obtuse; ray-flowers 6 or 7; corollas 1 mm. long; disk-flowers 12-15; corollas yellow, 2 mm. long, funnellform; achenes 1 mm. long.

Type collected at Casas Grandes, Chihuahua, August 30, 1899, *Townsend & Barber 437* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: New Mexico to San Luis Potosí, Durango, and Arizona.

64. *Artemisia Lindheimeriana* Scheele, *Linnaea* 22: 163. 1849.

Artemisia vulgaris americana Besser, *Linnaea* 15: 105, in part. 1841.

Artemisia cuneifolia Scheele, *Linnaea* 22: 162. 1849. Not *A. cuneifolia* DC. 1837.

A perennial herb, with a rootstock; stem 3-10 dm. high, striate, sparingly floccose or in age glabrous, branched; lower leaves pinnatifid, with narrow linear divisions, 4-5 cm. long, slightly floccose but soon glabrate and green above, white-tomentose beneath; upper stem-leaves entire, narrowly linear-lanceolate, those of the branches narrowly linear; heads very numerous in a branching panicle, mostly nodding; involucre campanulate, 3 mm. high, 2 mm. broad; bracts 10-12, in about 3 series, usually densely tomentose, the outer ovate and half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 5-7; corollas cylindric, 1.5 mm. long; disk-flowers 6-10; corollas yellow, 2 mm. long; achenes 1 mm. long. (Intermediate between *A. ludoviciana* and *A. mexicana*.)

TYPE LOCALITY: In the dry river bed of the Cibolo, fifteen miles west of New Braunfels, Texas.

DISTRIBUTION: Missouri and Oklahoma to Texas.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 4589 (as *A. mexicana*).

65. *Artemisia mexicana* Willd.; Spreng. Syst. 3: 490. 1826.

Oligosporus mexicanus Less. Syn. Comp. 264. 1832.

Artemisia indica mexicana Besser, Nouv. Mém. Soc. Nat. Mosc. 3: 56. 1834.

Artemisia vulgaris mexicana T. & G. Fl. N. Am. 2: 421. 1843.

A perennial, with a rootstock; stem 3-10 dm. high, more or less floccose, at least when young, striate; leaves numerous, 5-10 cm. long, loosely floccose when young, but soon glabrate and green above, densely white-tomentose beneath, those of the stem ternately divided, or the lower sometimes pinnately 5-divided, into linear attenuate almost equally long divisions 2-4 mm. wide; heads numerous in a rather dense panicle, mostly nodding; involucre hemispheric, about 3 mm. high and as broad; bracts about 10, straw-colored, sparingly arachnoid-tomentose, in about 3 series, the outermost ovate, acute, half as long as the innermost; inner bracts oval, obtuse, broadly scarioso-margined; ray-flowers 8-10; corollas 1.5 mm. long; disk-flowers 10-15; corollas and achenes as in the preceding.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Texas and New Mexico to San Luis Potosí and Jalisco.

66. *Artemisia Muelleri* Rydberg, sp. nov.

Artemisia mexicana latifolia Schultz-Bip. in herb.

A tall perennial, with a rootstock; stem about 1 m. high, finely tomentose-striate; leaves alternate, sessile, linear-lanceolate, 5-10 cm. long, 5-15 mm. wide, usually entire, rarely with a few narrow lobes, loosely floccose and glabrate above, densely white-tomentose beneath; heads numerous in a leafy panicle, nodding; involucre hemispheric or turbinate, 3 mm. high and broad; bracts 10-12, in about 3 series, arachnoid-tomentose, the outer ovate, half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 10-12; corollas 1.5 mm. long; disk-flowers 5-8; corollas 2 mm. long; achenes about 1 mm. long.

Type collected at Orizaba, 1853, *Fred. Mueller 1868* [field no.] or 235 [distrib. no.] (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Vera Cruz to Hidalgo and Jalisco.

67. *Artemisia silvicola* Osterhout, Bull. Torrey Club 28: 645.
1901.

Artemisia mexicana silvicola A. Nelson; Coult. & Nels. Man. 569. 1909.

A perennial herb, with a creeping rootstock; stem 4-6 dm. high, slender, finely white-tomentose, striate; leaves many, narrowly linear-lanceolate, 4-6 cm. long, 4-8 mm. wide, all entire or the lower with a few short lobes or teeth, acuminate, sessile, loosely floccose but soon glabrate and green above, densely white-tomentose beneath; heads numerous in a loose leafy panicle, often nodding when young; involucre hemispheric, 4-5 mm. high and about as broad; bracts 10-12, in 3 series, grayish, sparingly arachnoid-tomentose, the outer ones ovate, half as long as the innermost; inner bracts oval, obtuse, broadly scarios-margined; ray-flowers 10-15; corollas cylindric, 1.5 mm. long; disk-flowers 10-20; corollas 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: MacIntyre Creek, a branch of Laramie River, Colorado.

DISTRIBUTION: Texas, Colorado, and Utah to California and Chihuahua.

68. *Artemisia falcata* Rydberg, sp. nov.

A tall perennial, with a rootstock; stem 6-10 dm. high, loosely floccose; leaves linear or narrowly linear-lanceolate, 10-15 cm. long, 2-4 mm. wide, green and glabrate above, white-tomentose beneath, the upper simple, falcate, the lower usually with several alternate, spreading and strongly falcate, narrow lobes; panicle very large with many ascending, elongate, racemiform branches; involucre broadly campanulate, about 4 mm. high and fully as broad, densely floccose; bracts 16-18, in 3 series, the outer ovate, acute, half as long as the inner which are oval and obtuse; ray-flowers 5-7; corollas 1 mm. long; disk-flowers 15-18; corollas funnellform, glandular-granuliferous, 2 mm. long; achenes 1 mm. long.

Type collected at Fort Pierre, South Dakota, September 29, 1897, *Griffiths 757* (U. S. Nat. Herb. no. 592673).

DISTRIBUTION: South Dakota to Athabasca River, Saskatchewan.

69. *Artemisia Ghiesbreghtii* Rydberg, sp. nov.

A tall perennial, with a rootstock; stem grooved, sparingly tomentose, 5 dm. high or more; leaves narrowly lance-linear, 2-8 mm. broad, 5-15 cm. long, green and slightly floccose or glabrate above, white-tomentose beneath, the upper entire, the lower often 2- or 3-lobed above the middle, if 3-lobed the lateral lobes usually opposite and spreading; inflorescence large, open, with elongate racemiform branches and nodding heads; involucre broadly campanulate, 4-5 mm. high and fully as broad, sparingly floccose; bracts 13-15, in 3 series, ovate or oval, obtuse, with yellow scarios margins; ray-flowers 5-7; corollas 1 mm. long; disk-flowers 10; corollas yellow, funnellform, glandular-granuliferous below, 2 mm. long; achenes 1 mm. long.

Type collected in Chiapas, *Ghiesbreght 1551* (herb. Columbia Univ.).

DISTRIBUTION: Chiapas to State of Mexico.

70. *Artemisia potens* A. Nelson, Bot. Gaz. 54: 418. 1912.

A perennial, with a creeping rootstock; stem simple up to the inflorescence, minutely tomentose, pale-green, striate, 4-8 dm. high; leaves alternate, 3-6 cm. long, sessile, pale and glabrate above, thinly tomentose beneath, with somewhat revolute margins, linear, simple or pinnatifid, with 2-4 divaricate lobes; heads numerous in a dense narrow panicle, crowded; involucre 3 mm. high and as broad, hemispheric; bracts 8-10, in 3 series, nearly glabrous, the outer ovate, acute, fully half as long as the innermost; inner bracts oval, obtuse; ray-flowers 10-12; corollas 1.5 mm. long; disk-flowers 10-20; corollas glandular-granuliferous, 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Mackay, Idaho.

DISTRIBUTION: Nevada and California to Montana and British Columbia.

71. *Artemisia Underwoodii* Rydb. Bull. Torrey Club 32: 129.
1905.

A perennial, with a horizontal branched rootstock; stem slender, 2-6 dm. high, somewhat floccose, simple up to the inflorescence; leaves alternate, 3-5 cm. long, pinnately parted, with 3-7 (usually 5) linear or lance-linear acute divisions, green and slightly floccose but soon glabrate above, densely white-tomentose beneath; heads very numerous in a leafy narrow panicle, nodding; involucre campanulate, 2.5-3 mm. high and about as broad; bracts 10-12, in about 3 series, more or less floccose, the outermost bracts ovate, half as long as the innermost, acute; inner bracts oval, obtuse, scarious-margined; ray-flowers 8-10; corollas 1.5 mm. long; disk-flowers 10-15; corollas 2 mm. long; achenes fully 1 mm. long.

TYPE LOCALITY: Ouray, Colorado.

DISTRIBUTION: Colorado to Nevada, California, and Arizona.

72. *Artemisia revoluta* Rydberg, sp. nov.

Artemisia mexicana angustifolia Schultz-Bip.; Urbina, Cat. Pl. Mex. 187, hyponym. 1897.

A tall perennial, with a rootstock; stem 4-10 dm. high, appressed-arachnoid, strict, striate; leaves numerous, 5-7 cm. long, irregularly pinnatifid into narrowly linear, revolute segments or the upper entire, pilose and green above, densely white-tomentose beneath; heads numerous in narrow leafy panicles, erect; involucre campanulate, 4 mm. high, 2-3 mm. broad, sparingly arachnoid-tomentose; bracts about 12, in 3-4 series, the outer ovate, acute, half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers about 10; corollas 1.5 mm. long; disk-flowers 3-5; corolla 2 mm. long; achenes 1 mm. long.

Type collected near city of Chihuahua, November 4, 1885, *Pringle 290* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Chihuahua to San Luis Potosí, Zacatecas, and Sonora.

73. *Artemisia Lindleyana* Besser; Hook. Fl. Bor. Am. 1: 322.
1833.

Artemisia pumila Nutt. Trans. Am. Phil. Soc. II. 7: 399. 1841. Not *A. pumila* Link. 1822.

A perennial, suffruticose at the base, with a thick woody base; stem 1.5-4 dm. high, with erect branches, slightly tomentose; lower leaves 2-4 cm. long, oblanceolate in outline, with 3-7 short lanceolate lobes, more or less floccose, or in age glabrate above, white-tomentose beneath; upper leaves linear or linear-oblanceolate, usually entire; heads comparatively few in a lax, narrow, spike-like panicle; involucre campanulate, about 3 mm. high, nearly as broad; bracts 10-14, in about 3 series, more or less densely tomentose, the outer lanceolate, half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers about 6; corollas 1.5 mm. long; disk-flowers 12-15; corollas 2-2.5 mm. long.

TYPE LOCALITY: Northwest coast of America.

DISTRIBUTION: Montana to Washington, northern California, Arizona, and western New Mexico.

74. *Artemisia serrata* Nutt. Gen. 2: 142. 1818.

Artemisia ludoviciana serrata T. & G. Fl. N. Am. 2: 420. 1843.

A tall perennial, with a rootstock; stem 1-3 m. high, slightly floccose when young, but soon glabrous, striate; leaves numerous, lanceolate to linear-lanceolate, acuminate, closely and sharply serrate, green and glabrous above, white-tomentose beneath, 7-15 cm. long, 6-25 mm. wide; heads very numerous in a leafy panicle, mostly erect; involucre campanulate, about 3 mm. high and 2 mm. broad, slightly floccose; bracts about 10, in 3 series, the outer ovate, acute, about half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 6-8; corollas about 1 mm. long; disk-flowers 10-12; corollas nearly 2 cm. long; achenes 1 mm. long.

TYPE LOCALITY: Near the Prairie du Chien, on the banks of the Mississippi.

DISTRIBUTION: Illinois to Kansas, and North Dakota; introduced in northern New York.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4013; ed. 2. f. 4586.

XI. *Gnaphalodes*. Perennial herbs, with rootstocks or rarely with a ligneous caudex. Leaves densely white-tomentose on both sides, from entire to pinnatifid. Heads numerous in dense leafy panicles, small, usually less than 40-flowered. Involucre campanulate to almost hemispheric, 3-5 mm. high. Corollas glandular-granuliferous, those of the ray-flowers cylindrical or nearly so, 2-toothed; those of the disk-flowers trumpet-shaped and 5-toothed. Style of the former long-exserted, with linear filiform branches; that of the latter included or barely exserted, with short recurved branches, truncate and erose at the apex.

75. *Artemisia gnaphalodes* Nutt. Gen. 2: 143. 1818.

Artemisia rhizomata A. Nelson, Bull. Torrey Club 27: 34, in part. 1900.

A perennial, with a caespitose rootstock; stem 3-10 dm. high, white-tomentose, striate; leaves numerous, the lower oblanceolate, 5-10 cm. long, serrate towards the apex, tomentose on both sides, but usually less densely so and darker above, the upper linear and entire; heads very numerous in leafy panicles; involucre campanulate, 3-4 mm. high, 2-3 mm. broad, densely tomentose; bracts 10-12, in 3-4 series, the outer ovate, half as long as the innermost; inner bracts elliptic or oval, obtuse; ray-flowers 6-8; corollas 1.5 mm. long; disk-flowers 10-15; corollas dark-brown or purplish, 2-2.5 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Dry savannas about Green Bay, Wisconsin.

DISTRIBUTION: Michigan and Ontario to Saskatchewan, Colorado, and Missouri; introduced in New Hampshire and Massachusetts.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4015; ed. 2. f. 4590.

76. *Artemisia pabularis* (A. Nelson) Rydb. Bull. Torrey Club 33: 157. 1906.

Artemisia rhizomata pabularis A. Nelson, Bull. Torrey Club 27: 34. 1900.

A perennial, with a caespitose rootstock; stem slender, densely white-tomentose, 3-6 dm. high; leaves many, linear or lanceolate, 3-6 cm. long, 2-5 mm. wide, white-tomentose on both sides, the lower often dentate towards the apex; heads many in a leafy panicle; involucre campanulate, densely floccose, 3-3.5 mm. high and 2-2.5 mm. broad; bracts about 10, in 3-4 series; outer bracts lance-ovate, acute, half as long as the innermost; inner bracts elliptic or ovate; ray-flowers 4-6; corollas 1.5 mm. long; disk-flowers 10-15; corollas light-brown, 2 mm. long; achenes about 1 mm. long.

TYPE LOCALITY: Red Desert near Creston, Wyoming.

DISTRIBUTION: South Dakota, Nebraska, Colorado, and Wyoming.

77. *Artemisia Purshiana* Besser; Hook. Fl. Bor. Am. 1: 323. 1833.

Artemisia Purshiana latifolia Besser; Hook. Fl. Bor. Am. 1: 323. 1833.

Artemisia ludoviciana latifolia T. & G. Fl. N. Am. 2: 420. 1843.

A perennial, with a rootstock; stem simple, 3-5 dm. high, white-tomentose, simple; leaves many, white-tomentose on both sides, entire or the lower coarsely toothed; lower leaves broadly oblanceolate or spatulate, the upper ovate-lanceolate, 3-6 cm. long; heads numerous in a dense leafy panicle; involucre broadly campanulate, 3-3.5 mm. high and about as broad, densely floccose; bracts about 10, in 3-4 series, the outer ovate, acute, half as long as the innermost; inner bracts elliptic-obtuse; ray-flowers 6-8; corollas 1.5 mm. long; disk-flowers 5-8; corollas light-brown or yellowish, 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Plains of the Saskatchewan.

DISTRIBUTION: Saskatchewan to British Columbia, California, and Nebraska.

78. *Artemisia pudica* Rydb. Bull. Torrey Club 32: 130. 1905.

A perennial, with a horizontal rootstock; stem 4-6 dm. high, simple up to the inflorescence, white floccose; leaves linear or narrowly lance-linear, 6-8 cm. long, 6-8 mm. wide, entire, white-floccose on both sides; heads numerous, nodding, peduncled on the many long erect racemiform branches of the lax panicle; involucre broadly campanulate, about 5 mm. high, 4-5 mm. broad; bracts about 12, in 3 series, ovate, all acutish or the innermost obtusish,

densely floccose, the outer more than half as long as the innermost; ray-flowers about 12; corollas 1.5 mm. long; disk-flowers 25-30; corollas nearly 3 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Gunnison, Colorado.

DISTRIBUTION: Known only from the type locality.

79. *Artemisia argophylla* Rydberg, sp. nov.

A perennial, with a strong rootstock; stem 5-10 dm. high, white-tomentose, angled; leaves many, lanceolate, entire or the lower oblanceolate, sometimes coarsely toothed or with lanceolate lobes, 5-10 cm. long, 8-20 mm. wide, white-tomentose on both sides, acute; heads numerous in a leafy panicle; involucre hemispheric, 4-5 mm. high, 5-7 mm. broad, densely tomentose; bracts 12-14, the outer lanceolate, acute, more than half as long as the innermost; inner bracts elliptic or oval, obtusish; ray-flowers 12-16; corollas nearly 2 mm. long; disk-flowers 15-25; corollas yellow, 2.5 mm. long; achenes 1.5 mm. long.

Type collected near Longs Peak, August 14, 1907, *F. E. Clements* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Colorado and Wyoming to Northern California and Washington.

80. *Artemisia longifolia* Nutt. Gen. 2: 142. 1818.

Artemisia integrifolia Pursh, Fl. Am. Sept. 520. 1814. Not *A. integrifolia* L. 1753.

Artemisia ludoviciana integrifolia A. Nelson, First Rep. Fl. Wyo. 138. 1896.

Artemisia natronensis A. Nelson, Bull. Torrey Club 26: 485. 1899.

A perennial, with a horizontal rootstock; stem 3-10 dm. high, white-tomentose; leaves linear or linear-lanceolate, 6-15 cm. long, often revolute, loosely floccose or in age glabrate above, white-tomentose beneath, sometimes caudate-attenuate; heads many in a narrow panicle, mostly erect and peduncled; involucre rounded-campanulate, 4-5 mm. high, 3-4 mm. broad, densely tomentose; bracts about 12, in about 3 series; outer bracts ovate, acute, fully half as long as the innermost; inner bracts oval, acute; ray-flowers 5-8; corollas nearly 2 mm. long; disk-flowers 15-25; corollas light-yellow, nearly 3 mm. long; achenes nearly 2 mm. long. (*A. natronensis* is a form with somewhat broader and shorter leaves.)

TYPE LOCALITY: Banks of the Missouri, at the confluence of White River, South Dakota.

DISTRIBUTION: Manitoba to Nebraska, Oregon, and Washington.

ILLUSTRATION: Britt. & Brown, Ill. Fl. f. 4014; ed. 2. f. 4587.

81. *Artemisia obtusa* Rydberg, sp. nov.

Artemisia longifolia Besser; Hook. Fl. Bor. Am. 1: 323, in part. 1833.

Artemisia ludoviciana latiloba T. & G. Fl. N. Am. 2: 420, in part. 1843. Not *A. ludoviciana latiloba* Nutt. 1841.

A perennial, with a rootstock; stem floccose, about 5 dm. high, simple, leafy; leaves thick, 4-10 cm. long, loosely floccose above, more glabrate in age, densely white-tomentose beneath, the lower ones pinnately parted into 3-7 oblong obtuse divisions, the upper entire; heads many in a dense, narrow, and rather short panicle; involucre round-campanulate, about 3 mm. long and nearly as broad; bracts 10-12, densely tomentose, in 3 series, the outer ovate, half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 5 or 6; corollas 1.5 mm. long; disk-flowers 6-8; corollas light-brown, 2 mm. long.

Type collected on the Columbia, *Scouler 234* (herb. Columbia Univ.).

DISTRIBUTION: Washington.

82. *Artemisia texana* Rydberg, sp. nov.

A perennial; stem 3-5 dm. high, white-tomentose; leaves white-tomentose on both sides, 2-5 cm. long, 5-10 mm. wide, the upper linear-lanceolate, the lower 3-cleft to near the midrib into linear lanceolate lobes; inflorescence paniculate, leafy, the branches raceme-like; involucre broadly campanulate, densely tomentose, 3 mm. high and broad; bracts about 10, in 3 series, the outer ovate, half as long as the inner ones, which are oval, obtuse; ray-flowers 5 or 6; corollas about 1 mm. long; disk-flowers 8-10; corollas yellow, glandular-granuliferous below, funnellform, nearly 2 mm. long; achenes less than 1 cm. long.

Type collected at Colorado, Texas, October 16, 1902, *Tracy 8141* (U. S. Nat. Herb.).

DISTRIBUTION: Texas.

83. *Artemisia diversifolia* Rydb. Bull. Torrey Club 28: 20. 1901.

Artemisia gnaphalodes diversifolia A. Nelson; Coult. & Nels. Man. 569. 1909.

A perennial, with a horizontal rootstock; stem simple, white-tomentose, leafy, 3-10 dm. high; leaves densely tomentose on both sides, sessile, 5-10 cm. long, the lower pinnately cleft into 3-7 narrowly lanceolate, acuminate, rarely acute, lobes, which are directed forward, the upper or rarely all entire, lance-linear, attenuate; heads numerous, conglomerate and subsessile, in a narrow leafy panicle; involucre hemispheric or round-campanulate, 3-4 mm. high and about as broad; bracts about 10, densely floccose, in 3 series, the outer ovate, acute, fully half as long as the innermost; inner bracts oval, obtuse; ray-flowers about 10; corollas 1.5 mm. long; disk-flowers about 10; corollas yellow, 2-2.5 mm. long; achenes about 1.5 mm. long.

TYPE LOCALITY: Priest River, Idaho.

DISTRIBUTION: Northwestern Ontario (James Bay) to British Columbia, California, and Colorado.

84. *Artemisia platyphylla* Rydberg, sp. nov.

Artemisia lucoviciana latiloba Nutt. Trans. Am. Phil. Soc. II. 7: 400. 1841.

A perennial, with a creeping rootstock; stem 4-6 dm. high, finely tomentose, simple; lower leaves cuneate-obovate, 5-8 cm. long, with rounded-ovate mucronate lobes above the middle, equally tomentose on both sides; middle leaves similar, but the lobes deeper, triangular or lanceolate; upper leaves ovate or lanceolate, with 3 lanceolate lobes or entire; heads many, conglomerate, in a narrow, spike-like panicle; involucre hemispheric, 4-5 mm. high and nearly as broad; bracts 10-12, in 3 series, densely floccose; outer bracts ovate, acute, half as long as the innermost; inner bracts oval, obtuse; ray-flowers 5-8; corollas nearly 2 mm. long; disk-flowers 10-15; corollas fully 3 mm. long; achenes 1.5 mm. long.

Type collected on sandy or gravelly banks of Spokane River, Spokane, Washington, June 1897, *Elmer 867* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Washington and Oregon to Montana.

85. *Artemisia Brittonii* Rydb. Bull. Torrey Club 32: 129. 1905.

A perennial, with a horizontal rootstock; stem stout, 3-6 dm. high, white-floccose; lower leaves thick, cuneate or oblong-oblancoate, 3-5 cm. long, with 3-5 short, lanceolate, often somewhat divergent lobes, mostly above the middle, white-tomentose on both sides; upper leaves ovate-lanceolate, 3-lobed or entire; heads numerous in a dense leafy panicle; involucre campanulate, densely floccose, about 3 mm. high and 2 mm. broad; bracts about 12, in 3-4 series, the outer ovate, acute, scarcely half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 8-10; corollas 1.5 mm. long; disk-flowers about 10; corollas 2 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Golden, Colorado.

DISTRIBUTION: Wyoming to Oregon and Coahuila.

86. *Artemisia rhizomata* A. Nelson, Bull. Torrey Club 27: 34. 1900.

A perennial, with a caespitose rootstock; stem 4-6 dm. high, simple, white-tomentose, terete; leaves white-tomentose on both sides, 2-4 cm. long, the lower elliptic, oblanceolate, or oblong-cuneate, usually with 3-5 short ovate or lanceolate lobes, the upper lanceolate and entire; heads comparatively few in a narrow, spike-like panicle; branches of the latter short, with 2-6 erect heads; involucre campanulate, about 3.5 mm. high and 3 mm. broad, densely tomentose; bracts about 10, in 3 series, the outer ovate, half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 7 or 8; corollas nearly 1.5 mm. long; disk-flowers 7 or 8; corollas light-brown, 2 mm. long; achenes 1.5 mm. long.

TYPE LOCALITY: Sweet Water, Wyoming.

DISTRIBUTION: Wyoming to New Mexico.

87. *Artemisia albula* Wooton, Contr. U. S. Nat. Herb. 16: 193.
1913.

Artemisia microcephala Wooton, Bull. Torrey Club 25: 455. 1898. Not *A. microcephala* Hillebr. 1888.

A perennial, with a caespitose rootstock; stem 3-7 dm. high, branching, white-floccose; leaves white-tomentose on both sides, 1-5 cm. long, sessile; lower leaves ovate or obovate in outline, usually with 3-5 lanceolate lobes, the upper ones linear to oblong-lanceolate, entire or toothed, acute at both ends; heads many in few-headed leafy racemes either paniculate or simple at the ends of the branches; involucre densely tomentose, campanulate, about 3 mm. high and 2 mm. broad; bracts about 10, in 3 series, the outer ones ovate, half as long as the innermost; inner bracts oval, obtuse; ray-flowers about 8; corollas 2-toothed, nearly 1.5 mm. long; disk-flowers 10-12; corollas 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Organ Mountains, New Mexico.

DISTRIBUTION: Texas to Colorado, southern California, Sonora, and Chihuahua.

88. *Artemisia floccosa* Rydb. Bull. Torrey Club 24: 297. 1897.

Artemisia paucicephala A. Nelson, Bull. Torrey Club 27: 35. 1900.

Artemisia gracilentia A. Nelson, Bull. Torrey Club 27: 35. 1900.

A perennial, with a rootstock; stem floccose, striate, 4-8 dm. high, strict; leaves numerous, pinnately divided into linear or linear-oblong, sometimes toothed or lobed, divergent divisions, loosely white-tomentose on both sides, 4-7 cm. long; heads many in a narrow leafy panicle, erect; peduncles 1-12 mm. long; involucre hemispheric, 4-5 mm. high, 5-7 mm. broad, tomentose; bracts about 12, in 3 series, the outer lance-ovate, more than half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 6-10; corollas 1.5 mm. long; disk-flowers 20-40; corollas 2.5 mm. long; achenes 1.5 mm. long. (*A. gracilentia* is a form with somewhat narrower leaf-segments; *A. paucicephala* is one with more entire leaves and fewer heads.)

TYPE LOCALITY: Lima, Montana.

DISTRIBUTION: Southern Montana and northern Wyoming to Oregon.

89. *Artemisia candicans* Rydb. Bull. Torrey Club 24: 296. 1897.

A stout perennial, with a rootstock; stem 5-10 dm. high, floccose, striate, branched; leaves 5-10 cm. long, pinnatifid, with oblong or lanceolate, often again cleft segments, or those of the branches entire and lance-linear, tomentose on both sides but less densely so above; heads many, clustered, sessile, the clusters in interrupted spikes, forming a leafy panicle; involucre hemispheric, 4-5 mm. high, 5-8 mm. broad; bracts 12-14, in 3 series, tomentose, the outer lance-ovate, more than half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 6-10; corollas nearly 2 mm. long; disk-flowers 20-30; corollas 2.5 mm. long; achenes more than 1 mm. long.

TYPE LOCALITY: Little Belt Mountains, Montana.

DISTRIBUTION: Montana to Oregon.

90. *Artemisia Flodmanii* Rydberg, sp. nov.

A perennial, with a branched rootstock; stem slender, 3-5 dm. high, tomentose, grooved, simple up to the inflorescence; leaves many, 3-7 cm. long, white-tomentose on both sides, usually twice pinnatifid into lanceolate or linear divisions, those of the inflorescence less divided or simple; heads numerous in a rather dense leafy panicle; involucre hemispheric or narrower, about 3 mm. high, 2.5-3.5 mm. broad; bracts 10-12, in 3 series, floccose, the outer lance-ovate, acute, half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers 8-10; corollas 1.5 mm. long; disk-flowers 15-20; corollas 2 mm. long; achenes fully 1 mm. long.

Type collected in Little Belt Mountains, Montana, 9 miles east of Barker, August 18, 1896, J. H. Flodman 883 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Montana, Wyoming, and Oregon (and Utah?).

XII. *Stellerianae*. Stout perennials, with creeping woody rootstocks or decumbent bases, densely white-tomentose. Leaves obovate in outline, pinnately divided into elliptic obtuse divisions. Heads comparatively few and large. Involucre 5-6 mm. high, subhemispheric, as high as broad, 40-50-flowered. Corollas glandular-granuliferous, those of the ray-flowers subcylindric, 2-toothed, those of the disk-flowers trumpet-shaped, 5-toothed. Styles in both short-exserted, two-cleft; branches in the former linear-oblong, obtuse, in the latter reflexed, truncate and erose at the apex.

91. *Artemisia Stelleriana* Besser, *Nouv. Mém. Soc. Nat. Mosc.*
3: 79. 1834.

Artemisia chinensis Pursh, *Fl. Am. Sept.* 521. 1814. Not *A. chinensis* L. 1753.

A stout perennial, with a creeping cespitose woody rootstock or decumbent base; stems 3-5 dm. high, densely white-floccose; leaves 3-10 cm. long, short-petioled or sessile, obovate in outline, white-tomentose on both sides, pinnately lobed; lobes 3-9, elliptic or ovate, obtuse; heads in a dense, narrow, spike-like panicle; involucre hemispheric, 5-6 mm. high and as broad; bracts densely floccose, in 3 series, the outer lanceolate or ovate, acute, fully half as long as the innermost; inner bracts elliptic, acutish; ray-flowers about 10; corollas 2.5 mm. long; disk-flowers 30-40; corollas yellow, 4 mm. long; achenes fully 2 mm. long.

TYPE LOCALITY: Port of Petropaulovski, Kamchatka.

DISTRIBUTION: Sandy shores along the coast from Quebec to New Jersey, and also inland in New York, Ontario, Michigan, and Wisconsin; escaped from cultivation and naturalized; native of eastern Asia.

ILLUSTRATIONS: *Nouv. Mém. Soc. Nat. Mosc.* 3: pl. 5; Britt. & Brown, *Ill. Fl. f.* 4009; ed. 2. f. 4582.

XIII. *Discolores*. Rather low perennial herbs, with branched rootstocks, or stems somewhat suffruticose at the base. Leaves pinnately dissected, with linear more or less spreading divisions, usually again cleft or toothed, often somewhat revolute on the margins, green above, more or less tomentose beneath. Heads not very numerous, nodding; inflorescence racemiform or with racemiform branches. Involucre hemispheric, sparingly arachnoid. Corollas glandular-granuliferous, those of the ray-flowers cylindric or subcylindric, tapering upwards, 2-toothed, those of the disk-flowers trumpet-shaped, 5-toothed. Style of the former exserted, with linear-filiform branches, that of the latter mostly included, with short recurved branches, truncate and erose at the apex.

92. *Artemisia discolor* Dougl.; (*Hook. Fl. Bor. Am.* 1: 322, as
synonym. 1833) Besser, *Bull. Soc. Nat. Mosc.* 9: 46. 1836.

Artemisia ludoviciana Besser; *Hook. Fl. Bor. Am.* 1: 322. 1833. Not *A. ludoviciana* Nutt. 1818.

A perennial, with a horizontal rootstock; stems 5-7 dm. high, striate, slightly floccose when young, glabrate in age; leaves 4-7 cm. long, sessile, ovate in outline, loosely floccose when young, but soon glabrous above, white-tomentose beneath, thin, not revolute-margined, pinnatifid, with linear or linear-lanceolate acute divisions; divisions of the larger leaves again cleft or toothed; heads numerous in a leafy panicle with racemiform branches, nodding; involucre hemispheric, 3.5-4 mm. high and as broad; bracts 10-12, in three series, more or less arachnoid-tomentose, yellowish, the outer linear-lanceolate, nearly as long as the innermost; inner bracts elliptic, acutish; ray-flowers 10-12; corollas 1.5 mm. long; disk-flowers 25-40; corollas fully 2 mm. long; achenes about 1 mm. long.

TYPE LOCALITY: Rocky situations near Spokane and Kettle Falls, Washington.

DISTRIBUTION: Southern Montana and eastern Idaho to Washington and British Columbia.

93. *Artemisia Michauxiana* Besser; *Hook. Fl. Bor. Am.* 1: 324.
1833.

Artemisia discolor A. Gray, *Syn. Fl. N. Am.* 1²: 373, mainly. 1884. Not *A. discolor* Dougl. 1837.

A perennial, more or less suffruticose at the base, with a much branched caudex; stems 2-4 dm. high, floccose when young, glabrate in age, mostly simple; leaves 3-6 cm. long, sub-

sessile, pinnately or bipinnately divided or cleft into linear or lanceolate or rarely broader often toothed divisions, sparingly floccose above when young, glabrate in age, white-tomentose beneath; heads usually in a simple spike- or raceme-like inflorescence, at first nodding; involucre hemispheric, 3-4 mm. high, 5-7 mm. broad; bracts 10-12, in 3 series, the outer linear-lanceolate, acute, shorter than the innermost; inner bracts oval, obtuse; ray-flowers 10-12; corollas 1.5 mm. long; disk-flowers 15-30; corollas about 2 mm. long.

TYPE LOCALITY: Rocky Mountains [Canadian].

DISTRIBUTION: Saskatchewan to British Columbia, Washington, Utah, and Colorado.

94. *Artemisia graveolens* Rydb. Bull. Torrey Club 24: 296. 1897.

Artemisia subglabra A. Nelson, Bull. Torrey Club 27: 36. 1900.

A perennial, with a caespitose caudex or rootstock, sometimes suffruticose at the base; stems simple, 2-5 dm. high, striate, glabrous; leaves mostly bipinnatifid, with spreading, narrow, often toothed divisions, revolute-margined, glabrous on both sides or slightly and finely tomentulose beneath; heads numerous in a narrow spike-like panicle, nodding at least when young; involucre hemispheric, 3.5-4 mm. high, 4-6 mm. broad; bracts 10-12, in 3 series, glabrous, yellowish, the outer ovate, much shorter than the innermost; inner bracts oval, obtuse or acutish; ray-flowers about 10; corollas 1.5 mm. long; disk-flowers 20-50; corollas 2 mm. long; achenes fully 1 mm. long.

TYPE LOCALITY: Long Baldy, Little Belt Mountains, Montana.

DISTRIBUTION: Alberta and British Columbia to Oregon, Nevada, and Wyoming.

95. *Artemisia tenuis* Rydb. Mem. N. Y. Bot. Gard. 1: 431. 1900.

Artemisia tenuis integerrima Rydb. Mem. N. Y. Bot. Gard. 1: 431. 1900.

A perennial, with a caespitose rootstock, sometimes somewhat suffruticose at the base; stems slender, glabrous or minutely puberulent, branched; leaves 2-4 cm. long, green and glabrous above, slightly tomentulose beneath, deeply pinnatifid or bipinnatifid into linear, diverging, revolute-margined segments; heads in a lax narrow panicle with short raceme-like branches, peduncled, erect; involucre campanulate, about 4 mm. high, 2-3 mm. broad; bracts 7-8, in 3 series, glabrous, light-brown, the outer lanceolate, half as long as the innermost; inner bracts oval, obtuse; ray-flowers 3-5; corollas 1.5 mm. long; disk-flowers 8-15; corollas 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Emigrant Gulch, Montana.

DISTRIBUTION: Montana and northern Wyoming; (Nevada?).

96. *Artemisia redolens* A. Gray, Proc. Am. Acad. 21: 393. 1886.

A perennial, with a thick root and short caudex; stems 4-6 dm. high, somewhat tomentose; lower leaves once or twice pinnately 3-5-cleft into linear or lanceolate divisions, somewhat silky but green above, finely and sparingly tomentulose beneath, or those of the basal shoots more densely pubescent and white beneath; leaves of the branches linear and entire; heads numerous in an open, loose, leafy panicle; involucre 3.5 mm. high, 3 mm. broad; bracts 10-12, in 3-4 series, sparingly silky-tomentose or nearly glabrous, the outer lanceolate, half as long as the innermost; inner bracts elliptic, acutish; ray-flowers about 10; corollas 1.5 mm. long; disk-flowers 4 or 5; corollas 2 mm. long; achenes 1 mm. long, striate. (In the original description referred to the section *Dracunculus*, but evidently erroneously so.)

TYPE LOCALITY: Chihuahua on cool slopes under cliffs [rocky hills near the city].

DISTRIBUTION: Chihuahua and Durango.

XIV. *Wrightianae*. Perennial herbs, somewhat suffruticose at the base. Leaves pinnately dissected into linear-filiform or narrowly linear, revolute, spreading divisions, tomentose on the lower or on both surfaces. Heads small, in dense leafy panicles; involucre campanulate, 2-3 mm. broad. Corollas glandular-granuliferous, those of the ray-flowers nearly cylindrical, 2-toothed, those of the disk-flowers trumpet-shaped, 5-toothed. Style of the former long-exserted, with linear-filiform branches, that of the latter included or barely equalling the corolla, with short recurved branches truncate and erose at the apex.

97. *Artemisia Prescottiana* Besser; Hook. Fl. Bor. Am. 1: 324.
1833.

A perennial, branched at the base; stems about 4 dm. high, slender; leaves 3-5 cm. long, pinnatifid or those of the inflorescence entire and filiform; divisions 3-7, filiform, divergent, revolute-margined, green and glabrous above, minutely white-tomentose beneath; inflorescence racemiform, 1-2 dm. long, simple; heads short-peduncled, erect; involucre hemispheric, about 5 mm. broad; bracts 10-12, nearly glabrous, light-brown, shining, the inner broadly obovate, rounded at the apex, scarious on the margins; ray-corollas 2 mm. long, tubular; disk-corollas yellowish, 3 mm. long, with a campanulate throat.

TYPE LOCALITY: Northwest America [Quick Sand River, near the Grand Rapids of the Columbia].

DISTRIBUTION: Known only from the type locality.

98. *Artemisia neomexicana* Greene, sp. nov.

Artemisia redolens Wootton & Standley, Contr. U. S. Nat. Herb. 19: 739. 1915. Not *A. redolens* A. Gray. 1886.

A perennial, with a creeping rootstock; stems about 5 dm. high, slightly floccose when young, soon glabrous, striate; leaves alternate, numerous, sessile, 3-7 cm. long, pinnately divided into few linear divisions, 1-2 mm. wide, or some entire, light-green and glabrate above, white-tomentose beneath; heads very numerous in a narrow dense leafy panicle, crowded; involucre hemispheric, 3 mm. high and 4 mm. broad; bracts about 10, in 3-4 series, yellowish, only slightly arachnoid when young, the outermost narrowly lanceolate, not much shorter than the innermost; inner bracts oval, obtuse, broadly scarious-margined; ray-flowers 12-15; corollas 1.5 mm. long; disk-flowers 12-18; corollas yellow; achenes nearly 1.5 mm. long.

Type collected in a grassy glade, Hillsboro Peak, Black Range, New Mexico, August 25, 1904, Metcalfe 1248 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Southern New Mexico and northern Chihuahua.

99. *Artemisia Wrightii* A. Gray, Proc. Am. Acad. 19: 48. 1883.

A perennial, with a branched rootstock; stems mostly simple, 3-5 dm. high, sparingly floccose or glabrate, strict; leaves numerous, 1-4 cm. long, pinnatifid into 3-7 linear-filiform spreading revolute divisions, slightly pubescent and conspicuously punctate above, white-tomentose beneath; heads numerous in a leafy, often narrow panicle, erect; involucre campanulate, about 3 mm. high, 2 mm. broad; bracts 10-12, in 4 series, glabrate or sparingly floccose, the outer ovate, about one third as long as the inner; inner bracts elliptic, obtuse; ray-flowers 10-12; corollas 1 mm. long; disk-flowers about 10; corollas nearly 2 mm. long; achenes about 1 mm. long.

TYPE LOCALITY: "Plains of S. Colorado and New Mexico" [but the type was collected at Santa Rita del Cobre, New Mexico].

DISTRIBUTION: New Mexico and Arizona; (Colorado?).

100. *Artemisia Bakeri* Greene, Pl. Baker. 3: 31. 1901.

Artemisia mexicana Bakeri A. Nelson; Coult. & Nels. Man. 569. 1909.

A perennial, somewhat suffruticose at the caespitose base; stems branched, 3-6 dm. high, glabrous or nearly so, striate; leaves 2-5 cm. long, pinnately divided into 3-7 linear-filiform, divergent, revolute divisions, or the upper entire, glabrate and green above, finely white-tomentulose beneath; heads numerous in a leafy panicle, nodding; involucre hemispheric, about 3 mm. high and as broad; bracts about 10, in about 3 series, sparingly arachnoid, the outermost lanceolate, about half as long as the innermost; inner bracts elliptic, obtuse; ray-flowers about 10; corollas 1 mm. long; disk-flowers about 10; corollas 1.5 mm. long.

TYPE LOCALITY: Cañon of the Gunnison, near Cimarron, Colorado.

DISTRIBUTION: Central Colorado and eastern Utah to Arizona and New Mexico.

101. *Artemisia Pringlei* Greenman, Proc. Am. Acad. 40: 50. 1904.

A herb, described as annual or biennial (?), but probably perennial; stems several from the base, 4-8 dm. high, sparingly villous-tomentose; lower leaves 2-6 cm. long, pinnatifid and tomentose on both sides, but less so above; heads numerous in a narrow racemiform panicle, nodding; involucre hemispheric, 3-4 mm. high, 4-5 mm. broad; bracts 12-15, in 3 series, tomentose, the outer ovate, acute, only slightly shorter than the innermost; inner bracts oval, obtuse or rounded, broadly scarious on the margins; ray-flowers 10-15; corollas 1.5 mm. long; disk-flowers 10-25; corollas narrowly funnellform, fully 2 mm. long.

TYPE LOCALITY: Plains near city of Chihuahua.
DISTRIBUTION: Chihuahua.

102. *Artemisia Carruthii* Wood; Carruth, Trans. Kans. Acad. Sci. 5: 51. 1877.

Artemisia kansana Britton; Britt. & Brown, Ill. Fl. 3: 466. 1898.

Artemisia coloradensis Osterhout, Bull. Torrey Club 27: 506. 1900.

A perennial, with a caespitose rootstock; stems branched near the woody base, white-tomentose, 2-5 dm. high; leaves 2-5 cm. long, pinnatifid into 3-7 filiform or linear, revolute, spreading divisions, or the upper entire, white-tomentose on both sides; heads numerous in a leafy panicle; involucre campanulate, 2.5-3 mm. high, 2 mm. broad; bracts 10-12, in 3 series, white-tomentose, the outer lanceolate, half as long as the innermost; inner bracts oval, obtuse; ray-flowers 6-8; corollas 1.5 mm. long; disk-flowers 4-8; corollas nearly 2 mm. long; achenes 1 mm. long. (*A. coloradensis* is a form with somewhat broader leaf-segments.)

TYPE LOCALITY: Kansas.
DISTRIBUTION: Missouri to Colorado, Arizona, and Texas.
ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4012; ed. 2. f. 4585.

XV. *Ponticae*. Shrubby or at least suffrutescent perennials. Leaves twice pinnatifid into linear narrow divisions more or less tomentose at least beneath. Heads small, numerous in leafy panicles. Involucre hemispheric. Corollas glandular-granuliferous or glandular-puberulent; those of the ray-flowers short, cylindric, 3-4-toothed; those of the disk-flowers campanulate or funnellform, 5-toothed. Style of the ray-flowers short-exserted, with oblong branches, that of the disk-flowers included or equaling the corolla, with short recurved branches truncate and erose at the apex.

103. *Artemisia Abrotanum* L. Sp. Pl. 845. 1753.

A much branched shrub, 5-10 dm. high; lower leaves petioled, 4-6 cm. long, twice pinnately dissected into linear-filiform divisions, with revolute margins, green, finely puberulent or glabrous above, slightly tomentose beneath; leaves of the inflorescence merely 3-cleft, or simple and linear; heads numerous, nodding, in leafy panicles with racemiform branches; involucre hemispheric, about 3 mm. high and 5 mm. broad; bracts about 15, in 3 series, canescent, arachnoid, those of the outer series linear-lanceolate, nearly as long as the inner ones, the rest equal in length, broadly oval, scarious; ray-flowers about 10; corollas 1.5 mm. long; disk-flowers 15-20; corollas campanulate, nearly 2 mm. long; achenes 1 mm. long, glabrous.

TYPE LOCALITY: Syria.
DISTRIBUTION: Cultivated and sparingly established, New Brunswick to Massachusetts, North Carolina, Colorado, and Nebraska; native of southern Europe and the Orient.
ILLUSTRATIONS: Fl. Deuts. ed. 5. pl. 3006; Hayne, Arn. Gew. 11: pl. 22; Woodv. Med. Bot. pl. 21; Reichenb. Ic. Fl. Germ. 16: pl. 1041, f. 11; Britt. & Brown, Ill. Fl. f. 4006; ed. 2. f. 4579.

104. *Artemisia pontica* L. Sp. Pl. 847. 1753.

Absinthium ponticum Besser, Enum. Pl. Volh. 76. 1822.

A suffruticose perennial, about 5 dm. high, with creeping rootstock; stems canescent-tomentulose; leaves 1-3 cm. long, twice pinnatifid into linear short divisions, grayish-tomentulose on both sides, the lower petioled, the upper sessile; heads numerous, nodding, in leafy

panicles, with more or less racemiform branches; involucre hemispheric, about 3 mm. high and 5 mm. broad; bracts about 15, in 3 series, tomentulose, the outermost lanceolate, herbaceous, acute, shorter than the inner, the rest obovate, scarious, erose, rounded at the apex; ray-flowers 10-15; corollas usually 4-toothed, 1 mm. long; disk-flowers 25-30; corollas funnel-form-campanulate, less than 1.5 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Hungary.

DISTRIBUTION: Cultivated and escaped, sparingly established from Maine to Pennsylvania, Ohio, and Manitoba; native of Europe.

ILLUSTRATIONS: Fl. Deuts. ed. 5, pl. 3007; Jacq. Fl. Austr. pl. 99; Hayne, Arzn. Gew. 2: pl. 10; Reichenb. Ic. Fl. Germ. 16: pl. 1041, f. 111; Britt. & Brown, Ill. Fl. f. 4011; ed. 2, f. 4584.

XVI. *Rutaefoliae*. Low shrubs or undershrubs. Leaves tomentose on both sides, at least the lower ones twice dissected, the primary divisions ternately cleft. Heads rather large, 5 mm. broad or more, mostly racemose, nodding; involucre hemispheric. Corollas glandular-granuliferous; those of the ray-flowers short, cylindric; those of the disk-flowers funnel-form, 5-toothed. Style of the ray-flowers short-exserted, that of the disk-flowers about equaling the corolla.

105. *Artemisia alaskana* Rydberg, sp. nov.

A low shrub, 3-5 dm. high; branches simple, sparingly tomentose; lower leaves twice dissected, first pinnate with 5 divisions, each ternately cleft into oblong or linear obtuse divisions, white-tomentose on both sides, the middle leaves twice ternate, the uppermost ternate, with linear divisions, or entire and linear; inflorescence racemiform; branches simple or with 2 or 3 heads, elongate, 1-7 cm. long; heads nodding; involucre hemispheric, about 5 mm. high, 6-7 mm. broad; bracts about 15, in 3 series, the outer linear-oblong, villous-tomentose, the inner oval, with scarious erose margins; ray-flowers 7-10; corollas tubular, 1.5 mm. long, glandular-puberulent; disk-flowers about 50; corollas glandular-granuliferous below, funnel-form; achenes 1.5 mm. long. (Closely related to the Siberian *A. Turczaninoviiana* Besser.)

Type collected on the Yukon River, between Nulata and Nowikakat, in July, 1889, I. C. Russell (U. S. Nat. Herb. no. 417571).

XVII. *Bigelovianae*. Low undershrubs of the habit of the *Tridentatae*, but the 1 or 2 ray-flowers usually present. Leaves, at least the lower, cuneate, 3-toothed at the apex, canescent. Heads small, 3-5-flowered; involucre turbinate. Corollas slightly glandular-granuliferous or glabrous; those of the ray-flowers sub-cylindric, tapering upwards, 2-toothed; those of the disk-flowers narrowly funnel-form, 5-toothed. Style of the former short-exserted; that of the latter included, slightly 2-cleft with truncate erose tips.

106. *Artemisia Bigelovii* A. Gray, in Torr. Pacif. R. R. Rep. 4: 110. 1857.

Artemisia petrophila Wooton & Standley, Contr. U. S. Nat. Herb. 16: 193. 1913.

A low shrub 2-4 dm. high, with erect branches; leaves canescent on both sides, narrowly cuneate, 3-toothed at the apex, 0.5-3 cm. long, or the upper ones entire and linear; heads many, glomerate in dense panicles; involucre turbinate, 2-2.5 mm. high and as broad, densely tomentose; bracts 12-15, imbricate in 3 series, the outer ovate, thick, half as long as the inner; inner bracts oblong, obtuse; ray-flower 1, sometimes 2, or wanting; corolla 1 mm. long; disk-flowers 2 or 3; corollas 2 mm. long; achenes 1 mm. long.

TYPE LOCALITY: Rocks and canyons on the Upper Canadian, Texas.

DISTRIBUTION: Western Texas to (Kansas?) southern Colorado, Utah, and Arizona.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4016; ed. 2, f. 4591.

Subgenus D. SERIPHIDIUM

Heads homogamous. Flowers all alike, hermaphrodite and fertile. Corollas in ours trumpet-shaped or with a campanulate throat and cylindric tube, sparingly glandular-granuliferous or glabrous, in one species slightly villous. Styles 2-cleft; branches recurved, truncate and erose at the apex. Receptacle naked. All our species fruticose or suffruticose.

XVIII. *Tridentatae*. Shrubs or undershrubs. Leaves canescent, entire or 3-5-toothed or 3-5-cleft at the apex. Heads more or less paniculate; involucre more distinctly imbricate. Style included or slightly exerted.

107. *Artemisia Bolanderi* A. Gray, Proc. Am. Acad. 19: 50. 1883.

Artemisia trifida A. Gray, Bot. Calif. 1: 405, in part. 1876.

A low shrub, 3-6 dm. high; branches loosely villous-tomentose; leaves linear, loosely tomentose, 2-3 cm. long, 1-2 mm. wide, acute, entire or the earlier slightly 3-lobed at the apex; heads in dense leafy panicles; involucre campanulate, about 3 mm. high and nearly as broad, densely tomentose; bracts 12-15, oblong, obtuse; flowers about 14; corollas about 2 mm. long, with a glandular-granuliferous tube; style included; achenes 1.5 mm. long.

TYPE LOCALITY: Mona Pass in the Sierra Nevada, California.

DISTRIBUTION: Type locality and vicinity.

108. *Artemisia cana* Pursh, Fl. Am. Sept. 521. 1814.

Artemisia columbiensis Nutt. Trans. Am. Phil. Soc. II. 7: 398. 1841.

Artemisia cana viscidula Osterhout, Bull. Torrey Club 27: 507. 1900.

Artemisia viscidula Rydb. Bull. Torrey Club 33: 157. 1906.

A low shrub, 3-10 dm. high, with yellowish or greenish bark; leaves linear or oblong-linear, acute, 2-5 cm. long, 2-4 mm. wide, silky-canescenscent, or sometimes glabrate in age and subviscid; heads conglomerate in a dense leafy panicle; involucre campanulate, 5 mm. high, 3-4 mm. broad; bracts about 12, imbricate in 3 series, the outer thick, canescent, one or two often with an acuminate foliaceous tip, the inner elliptic, scarious; flowers 5-15; corollas about 3 mm. long, with a cylindric glandular-granuliferous tube, equaling the cylindro-campanulate throat; style included; achenes ellipsoid, 2 mm. long.

TYPE LOCALITY: On the Missouri.

DISTRIBUTION: Saskatchewan and Alberta to Nebraska, Colorado, Utah, and Oregon.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4018; ed. 2. f. 4593.

109. *Artemisia Rothrockii* A. Gray, Bot. Calif. 1: 618. 1876.

Artemisia trifida A. Gray, Bot. Calif. 1: 405, in part. 1876.

A low shrub, 2-4 dm. high; bark light-brown; leaves mostly narrowly cuneate and 3-4-cleft into oblong lobes, and some of them entire and oblong, 1-2 cm. long, sparingly and finely cinereously canescent, often glabrate, more or less viscid; heads rather few in an interrupted spike-like inflorescence, 1-3 short-peduncled or subsessile at each internode; involucre hemispheric-campanulate, about 4 mm. high, 4-5 mm. broad; bracts 10-12, imbricate in 3-4 series, brown, shining, one of the outer bracts often a little foliaceous, abruptly acuminate, the rest ovate, acute, half as long as the innermost; inner bracts elliptic, obtuse, scarious; flowers 10-12; corollas trumpet-shaped, 3 mm. long, 5-toothed, sparingly glandular-granuliferous; style slightly exerted; achenes nearly 2 mm. long.

TYPE LOCALITY: Sierras of Tulare County, California.

DISTRIBUTION: Sierra Nevada, California and Nevada.

110. *Artemisia arbuscula* Nutt. Trans. Am. Phil. Soc. II. 7: 398.

1841.

A low shrub, 1-3 dm. high, with stout, often decumbent base and slender branches; leaves short, 1-2 cm. long, canescent, cuneate or flabellate in outline, 3-5-lobed or 3-5-parted at the apex, with spatulate to linear divisions, or those of the inflorescence often entire; heads several in a strict simple racemiform panicle; involucre campanulate, 4-5 mm. high, 3-4 mm. broad; bracts about 10, the outer lanceolate, acute, somewhat herbaceous, half as long as the innermost; inner bracts oblong, obtuse, scarious with green midrib; flowers 7-9; corollas trumpet-shaped, sparingly glandular-granuliferous, 3 mm. long; style included; achenes nearly 2 mm. long.

TYPE LOCALITY: Arid plains of Lewis River [Snake River].

DISTRIBUTION: Wyoming to Oregon and central California.

111. *Artemisia spiciformis* Osterhout, Bull. Torrey Club 27: 507.
1900.

Artemisia spiciformis longiloba Osterhout, Muhlenbergia 4: 69. 1908.

A shrub, about 5 dm. high; bark grayish; leaves narrowly cuneate or oblanceolate, 2-3.5 cm. long, petioled, irregularly 3-5-toothed at the apex, or sometimes 3-fid with toothed divisions, cinerous-canescenscent; heads comparatively few in a racemose inflorescence; involucre turbinate, 5-6 mm. high, 3-4 mm. broad; bracts about 15, imbricate in 4 series, somewhat floccose, one or two of the outer more or less foliaceous, lanceolate, acute, the rest ovate, acute, half as long as the innermost; inner bracts elliptic, scarious with a green midrib, obtuse or acutish; flowers about 12; corollas trumpet-shaped, nearly glabrous, fully 3 mm. long; style slightly exserted; achenes about 2 mm. long.

TYPE LOCALITY: North Park, Colorado.

DISTRIBUTION: Colorado and Utah.

112. *Artemisia Vaseyana* Rydberg, sp. nov.

A shrub, 5 dm. high or more; bark yellowish or brown; leaves narrowly cuneate, 3-5-dentate at the apex, 1-3 cm. long, canescent, rather conspicuously triple-veined; heads many in a narrow panicle, with erect short branches; involucre broadly campanulate, 5 mm. high, 3-4 mm. broad; bracts about 12, in about 4 series, canescent, the outer ones broadly ovate, less than half as long as the innermost; inner bracts broadly elliptic, obtuse, scarious with a green midrib; flowers 5-8; corollas trumpet-shaped, 3 mm. long, sparingly glandular-granuliferous; style barely equaling the corolla; achenes nearly 2 mm. long.

Type collected in the state of Washington in 1889, G. R. Vasey 480 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Washington, Oregon, and western Nevada.

113. *Artemisia tridentata* Nutt. Trans. Am. Phil. Soc. II. 7: 398.
1841.

A shrub, 5-50 dm. high, much branched, with straw-colored bark; leaves canescent, 1-4 cm. long, narrowly cuneate, obtusely 3-toothed (rarely 4-7-toothed) at the apex, or the uppermost entire, linear or oblanceolate; heads numerous, sessile, clustered in dense leafy panicles; involucre campanulate, 3-4 mm. high, about 2 mm. broad; bracts about 15, in 4-5 series, imbricate, canescent, the outermost short, thick, ovate, acute, less than a fourth as long as the innermost; inner bracts oblong, obtuse, thinner with scarious margins; flowers 4-8; corollas trumpet-shaped, 5-toothed, 2.5-3 mm. long; tube densely glandular-granuliferous, equaling the almost glabrous throat; style equaling the corolla; achenes about 1.5 mm. long.

TYPE LOCALITY: Plains of the Oregon [Columbia River].

DISTRIBUTION: South Dakota and Montana to British Columbia, Lower California, and New Mexico.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 4017; ed. 2. f. 4592.

114. *Artemisia angusta* Rydberg, sp. nov.

Artemisia tridentata angustifolia A. Gray, Proc. Am. Acad. 19: 49. 1883.

A shrub, 10-12 dm. high, with erect branches; bark straw-colored; leaves canescent, 2-4 cm. long, 1-4 mm. wide, linear and entire, or linear-cuneate and merely 3-toothed at the apex; heads numerous, sessile, clustered in leafy panicles; involucre canescent, 3.5-4 mm. high, 2 mm. broad; bracts 12-15, imbricate in 4-5 series, the outer thick, ovate, less than one fourth as long as the innermost; inner bracts oblong, obtuse, scarious-margined; flowers 4-6; corollas trumpet-shaped, about 2 mm. long, glandular-granuliferous; achenes 1.5 mm. long.

TYPE LOCALITY: South Idaho.

DISTRIBUTION: Washington, Oregon, Idaho, Nevada, and northern California.

115. *Artemisia nova* A. Nelson, Bull. Torrey Club 27: 274. 1900.

Artemisia arbuscula Nutt. Trans. Am. Phil. Soc. II. 7: 398, in part. 1841.

A low shrub, 1-3 dm. high, with numerous branches decumbent or spreading at the base; bark grayish, shreddy; leaves canescent, narrowly cuneate, 1-2 cm. long, 3-toothed at the apex; heads many in a strict, narrow, leafy panicle; involucre campanulate, 3-3.5 mm. high, about 2 mm. broad, slightly puberulent and somewhat viscid; bracts 12-15, the outer ovate, one fourth as long as the innermost, thick; inner bracts oblong, obtuse, thin, scarious-margined; flowers 1-6; corolla trumpet-shaped, glandular-granuliferous, 2.5 mm. long; style equaling the corolla; achenes about 1.5 mm. long.

TYPE LOCALITY: Medicine Bow, Wyoming.

DISTRIBUTION: Wyoming and Idaho to New Mexico and Arizona.

116. *Artemisia tripartita* Rydb. Mem. N. Y. Bot. Gard. 1: 432. 1900.

Artemisia trifida Nutt. Trans. Am. Phil. Soc. II. 7: 398. 1841. Not *A. trifida* Turcz. 1832.

A low shrub, 2-6 dm. high, much branched; bark grayish; leaves canescent, 1-4 cm. long, deeply 3-cleft into linear or narrowly linear-oblancoelate divisions, or the upper entire and linear; heads numerous in narrow leafy panicles; involucre campanulate, about 3.5 mm. high and 2 mm. broad, canescent; bracts 12-15, the outer ovate, thick, fully one third as long as the innermost; inner bracts oblong, scarious; flowers 6-8; corollas trumpet-shaped, 2 mm. long, sparingly glandular-granuliferous; style not exerted; achenes 1.5 mm. long.

TYPE LOCALITY: Plains of the Rocky Mountains.

DISTRIBUTION: Montana to Colorado, Nevada, Oregon, and Washington.

117. *Artemisia Parishii* A. Gray, Proc. Am. Acad. 17: 220. 1882.

A shrub, 8-12 dm. high; bark straw-colored or grayish; leaves canescent, 2-3 cm. long, linear and entire or some dilated at the apex and 3-toothed; heads numerous in a lax panicle with the branches more or less nodding at the apex; involucre turbinate, 3.5-4 mm. high, 3 mm. broad; bracts 12-15, in 3 series, the outer thick, ovate, about one third as long as the innermost; inner bracts elliptic, obtuse, thinner and scarious-margined; flowers 6 or 7; corollas 2 mm. long, with a short glandular-granuliferous tube and glabrous campanulate throat; style short-exserted; achenes 1.5 mm. long, sparingly arachnoid-hairy.

TYPE LOCALITY: Newhall, Los Angeles County, California.

DISTRIBUTION: Southern California.

XIX. *Rigidae*. Low shrubs. Leaves silvery-canescant, pinnatifid into narrow revolute divisions. Heads solitary or few together in the leaf-axils. Involucre imbricate. Style included.

118. *Artemisia rigida* (Nutt.) A. Gray, Proc. Am. Acad. 19: 49. 1883.

Artemisia trifida rigida Nutt. Trans. Am. Phil. Soc. II. 7: 398. 1841.

A low shrub, with woody base and erect branches, 1-4 dm. high, leafy to the top; leaves silvery-canescant, 2-4 cm. long, pinnatifid into 3-5 linear filiform, revolute-margined divisions, or some of them linear and entire; heads solitary or in small glomerules in the axils of the leaves; involucre campanulate, 4 mm. high and 3 mm. broad; bracts about 15, canescent, in 3 or 4 series, the outer lanceolate, acute, less than one half as long as the innermost; inner bracts linear-oblong, obtuse; flowers 5-12; corollas narrowly funneliform, glandular-granuliferous; style mostly included; achenes 1.5 mm. long, glabrous.

TYPE LOCALITY: Plains of Lewis River [Snake River, Idaho].

DISTRIBUTION: Oregon, Washington, and western Idaho.

XX. *Pygmaeae*. Low undershrub. Leaves pinnatifid into 3-7 narrow segments, strongly ribbed beneath, rigid, glabrous or slightly canescent beneath. Heads few, spicate. Style included.

119. *Artemisia pygmaea* A. Gray, Proc. Am. Acad. 21: 413. 1886.

A low undershrub, with a thick caespitose woody caudex; stems about 1 dm. high, glabrous; leaves less than 1 cm. long, glabrous, or slightly canescent, pinnately dissected into 3-7 short linear-spatulate rigid divisions, with strong midribs; heads few in a spike-like inflorescence; involucre turbinate, 4 mm. high, 3 mm. broad; bracts 12-15, in 3 or 4 series; the outer ovate or lanceolate, acute, somewhat keeled, herbaceous, slightly puberulent; inner bracts linear, oblong, obtuse, yellowish, thin; flowers 3-4; corollas elongate-funnelform, 3 mm. long, glandular-granuliferous; style included; achenes glabrous, 1 mm. long or more.

TYPE LOCALITY: Fish Creek, near Eureka, Nevada.
DISTRIBUTION: Nevada and Utah.

120. *Artemisia domingensis* Urban, Symb. Ant. 7: 430. 1912.

An annual; stem erect, 2-3.5 dm. high, branched at the base, villosulous when young; lower and middle leaves ovate in outline, up to 3 cm. long and 2.5 cm. wide, bipinnatifid into lanceolate or linear ultimate segments 5 mm. long, whitish with appressed pubescence beneath, green above; upper leaves pinnatifid or the uppermost 3-cleft or simple; inflorescence terminal and axillary, with spicate-racemose branches which bear about 8 nodding heads; involucre 2-2.5 mm. high; bracts about 10, in two series, the inner oval or oblong, obtuse, the outer smaller; flowers about 15; achenes 1 mm. long. (No specimens have been seen, and position in the genus is uncertain, as the long description gives no indication whether the plant belongs to the subgenus *Dracunculus* or to *Abrotanum*.)

TYPE LOCALITY: Near Constanza, Santo Domingo.
DISTRIBUTION: Santo Domingo.

DOUBTFUL SPECIES

ARTEMISIA AMORPHA Raf. Fl. Ludov. 69 (1817) is insufficiently described for identification.

18. *ARTEMISIASTRUM* Rydberg, gen. nov.

Herbaceous perennials, more or less grayish-puberulent. Leaves alternate, pinnatifid into linear divisions. Heads discoid, small, numerous in open panicles, nodding. Involucre turbinate; bracts in 2 series, scarios-membranous. Receptacle convex, with most of the flowers subtended by scarios paleae. Flowers all alike hermaphrodite and fertile. Corollas funnelform; anthers oblong, subulate-tipped; styles included, shortly 2-lobed, the lobes truncate and erose at the apex. Achenes truncate at the apex, striate and bordered by a small crown.

Type species, *Artemisia Palmeri* A. Gray.

1. *Artemisiastrum Palmeri* (A. Gray) Rydberg.

Artemisia Palmeri A. Gray, Proc. Am. Acad. 11: 79. 1876.

A herbaceous perennial; stem 5 dm. high or more, striate, reddish, grayish-puberulent; leaves 5-7 cm. long, pinnatifid into 3-5 linear divisions, with revolute margins, finely tomentose beneath, green but minutely puberulent above; heads numerous, conglomerate, in open panicles; involucre turbinate, 3 mm. high and 4 mm. broad; bracts 10-12, in about 2 series, sparingly arachnoid-pubescent, the outer slightly shorter, all broadly ovate, acutish, scarios-membranous; paleae of the receptacle resembling the bracts, the inner smaller and narrower; flowers about 20; achenes 1.5 mm. long, glandular-granuliferous.

TYPE LOCALITY: Jamuel Valley, 20 miles below San Diego, California.
DISTRIBUTION: Southern California and northern Lower California.

19. LANCISIA (Pontedera) Adans. Fam. Pl. 2: 126. 1763.

Cotula L. Sp. Pl. 892, in part. 1753.

? *Baldingeria* Neck. Elem. 1: 88. 1790.

Strongylosperma Less. Syn. Comp. 261. 1832.

Pleioogyne C. Koch, Bot. Zeit. 1: 40. 1843.

Annual or perennial strong-scented herbs. Leaves alternate, usually more or less dissected. Heads solitary on terminal or axillary peduncles, apparently discoid. Involucres rotate or saucer-shaped; bracts subequal in 1-3 series. Receptacle flat or convex, papillose. Marginal flowers (functionally ray-flowers) pistillate and fertile, without corolla, distinctly pedicelled; style with persistent base; branches oblong, obtuse. Disk-flowers hermaphrodite and usually fertile; corollas yellow, tubular, with a short campanulate throat; lobes 4, mostly obtuse. Anthers with ovate tips. Style included; branches with truncate, fimbriate tips. Achenes obcompressed, margined or winged, those of the marginal achenes much broader. Pappus wanting.

Type species, *Cotula coronopifolia* L.

Leaves pinnately cleft or entire; plant succulent; marginal flowers in a single series.

1. *L. coronopifolia*.

Leaves pinnatifid or bipinnatifid; plant not succulent.

Involucral bracts 15-20; marginal flowers many, in 2-3 series; their achenes elliptic, truncate at the base.

2. *L. australis*.

Involucral bracts 7-10; marginal flowers 7-10; their achenes cuneate-obovate.

3. *L. minuta*.

1. *Lancisia coronopifolia* (L.) Rydberg.

Cotula coronopifolia L. Sp. Pl. 892. 1753.

Cotula montesidensis Spreng. Syst. 3: 497. 1826.

A glabrous annual; stem succulent, creeping to ascending, rooting at the nodes, 1-3 dm. long; leaves glabrous, somewhat succulent, 4-7 cm. long, lanceolate or broadly linear, lacinate-pinnatifid or toothed, or the upper entire, with the broad base sheathing or clasping; heads solitary at the ends of the branches; peduncles 1-5 cm. long; involucre rotate, 8-12 mm. broad; bracts in 3 subequal series, oblong-lanceolate to elliptic, obtuse; pistillate marginal flowers in a single series, on a winged stalk in fruit 1 mm. long; corollas wanting; disk-flowers short-stalked; corollas yellow, tubular, 1.5 mm. long, glandular-granuliferous, with 4 short lobes; marginal achenes with broad wings, oval in outline, emarginate at each end, glandular-hispidulous on the faces; disk-achenes oblong with narrower margins, 1 mm. long.

TYPE LOCALITY: Africa.

DISTRIBUTION: Perfectly naturalized from British Columbia to Lower California; also adventive on Prince Edward's Island and in Massachusetts; native of southern Africa and widely spread over the southern hemisphere.

ILLUSTRATIONS: Fl. Dan. pl. 341; Schkuhr, Handb. pl. 254; Dill. Hort. Elth. pl. 23, f. 26; Reich-
enb. Ic. Fl. Germ. 16: pl. 998, f. I, II, 1-19; Bot. Zeit. 20: pl. I, B; Fl. Deuts. ed. 5. pl. 3015.

2. *Lancisia australis* (Sieber) Rydberg.

Anacyclus australis Sieber; Spreng. Syst. 3: 497. 1826.

Strongylosperma australe Less. Syn. Comp. 261. 1832.

Cotula australis Hook. f. Fl. Nov. Zeland. 1: 128. 1852.

A low annual; stem diffuse and much branched, rarely more than 1 dm. high; leaves 1-2 cm. long, once or twice pinnatifid with lanceolate or linear divisions, more or less hirsute; heads solitary at the ends of the branches; peduncles 2-5 cm. long; involucre rotate, 5-6 mm. broad; bracts oblong, in 2 series, rounded at the apex, with white scarios margins; marginal flowers with slightly winged pedicels, in 2 or 3 series; disk-flowers short-pedicelled; corollas cylindrical, glandular-granuliferous, 1.5 mm. long; lobes 4, rounded-ovate; marginal achenes with broad wing-margins, broadly oval, truncate at the base, emarginate at the apex, glandular-hispidulous on the faces, 1.5 mm. long; disk-achenes oblong, merely margined.

TYPE LOCALITY: Australia.

DISTRIBUTION: California to Utah and British Columbia; Maine; adventive from Australia and New Zealand.

ILLUSTRATION: Hook. f. Fl. Tasm. pl. 50, f. A.

3. *Lancisia minuta* (L. f.) Rydberg.

- Hippia minuta* L. f. Suppl. 389. 1781.
Soliva pygmaea H. B. K. Nov. Gen. & Sp. 4: 303. 1820.
Gymnostyles minuta Spreng. Syst. 3: 500. 1826.
Soliva minuta Sweet, Hort. Brit. ed. 2. 317. 1830.
Soliva mexicana DC. Prodr. 6: 143. 1837.
Gymnostyles pedunculata Moc.; DC. Prodr. 6: 143, as synonym. 1837.
Soliva pedunculata R. & P.; Steud. Nom. Bot. ed. 2. 2: 609. 1841.
Cotula pygmaea Benth. & Hook.; Hemsl. Biol. Centr. Am. Bot. 2: 230. 1881. Not *Cotula pygmaea* Poir. 1812.
Cotula minuta Schinz, Mem. Soc. Neuchât. Sci. Nat. 5: 429. 1913.

A low procumbent herb, probably perennial; stem 1 dm. long or less, glabrous; leaves pinnatifid or bipinnatifid, with oblong or oblanceolate divisions; peduncles axillary, 1-3 cm. long; involucre 3 mm. broad; bracts 7-10, elliptic, obtuse; marginal flowers 7-10, short-pedicelled; disk-flowers 4-6; marginal achenes cuneate-obovate, emarginate at the apex, 1.5 mm. long, glabrous; mature disk-achenes not seen.

TYPE LOCALITY: Central America.

DISTRIBUTION: Mexico to Bolivia.

ILLUSTRATION: Moc. & Sessé, Calq. Dess. pl. 589.

20. *SOLIVA* R. & P. Prodr. Fl. Per. 113. 1794.

Low decumbent diffusely branched annuals. Leaves alternate, pinnatifid to tripinnatifid. Heads sessile in the axils of the leaves, apparently discoid, heterogamous. Involucre rotate or saucer-shaped; bracts in 2 subequal series. Receptacle conic, naked. Marginal flowers (functionally ray-flowers) numerous in several series, pistillate, without corolla. Style persistent, in fruit forming a spine-like beak; branches short, oblong. Disk-flowers very few, hermaphrodite but sterile. Corollas tubular, cylindric, without differentiation between tube and throat; lobes 4. Anthers with obtuse tips. Style exerted, barely 2-lobed, truncate and fimbriate at the apex. Achenes flattened, not villous at the apex, bordered with very thin plane wings, which are produced into lanceolate cuspidate lobes at the apex.

Type species, *Soliva sessilis* R. & P.

Achenes with two broad lobes at the base.

Achenes unlobed below.

1. *S. sessilis*.

2. *S. daucifolia*.

1. *Soliva sessilis* R. & P. Prodr. Fl. Per. 113. 1794.

Gymnostyles chilensis Spreng. Syst. 3: 500. 1826.

A low annual; stem 1 dm. long or less, branched from the base, decumbent or creeping, sparingly hirsute; leaves bipinnate, with 3-7 leaflets, hirsute; primary divisions usually with 3-cleft secondary oblanceolate lobes; involucre 6-8 mm. broad; bracts 6-8, obovate, acuminate, hirsute; hermaphrodite flowers few; corollas cylindric, 4-lobed, 1.5 mm. long; body of the achenes 3 mm. long, hispidulous, with the wing 4 mm. broad; beak 2-2.5 mm. long; wing glabrous, with two broad lobes at the base, produced at the apex into two lanceolate lobes at first somewhat incurved and with erect cuspidate tips.

TYPE LOCALITY: Concepcion, Chile.

DISTRIBUTION: Mississippi; (California ?); adventive from South America.

ILLUSTRATION: R. & P. Prodr. Fl. Per. pl. 24.

2. *Soliva daucifolia* Nutt. Trans. Am. Phil. Soc. II. 7: 403. 1841.

A low annual; stem rarely 1.5 dm. long, diffusely branched from the base, decumbent, hirsute; leaves 1-2 cm. long, bipinnatifid into linear, acute, entire or 3-divided segments; involucre 4-6 mm. broad, hirsute; bracts 8-10, obovate, acuminate; hermaphrodite flowers very few; corollas cylindric, 1.5 mm. long, 4-lobed; body of the achenes 3 mm. long, hirsutulous, with the wing 2-3 mm. broad; wings in the outer achenes very broad, in the inner ones narrower, entire on the sides, at the apex produced into two lanceolate at first incurved lobes, ending in a nearly erect cusp.

TYPE LOCALITY: Vicinity of Santa Barbara, California.

DISTRIBUTION: California and Oregon.

UNKNOWN SPECIES

SOLIVA BARCLAYANA DC. Prodr. 6: 143. 1837. (*Gymnostyles Barclayana* Steud. Nom. ed. 2. 1: 713. 1841.) This was described from cultivated specimens said to come from Central America without indicated locality. The plant was described as having 6-lobed achenes.

21. *GYMNOSTYLES* A. Juss. Ann. Mus. Paris 4: 258. 1804.

Low subcaulescent annuals, the internodes of the stem very short. Leaves alternate, pinnatifid to tripinnatifid. Heads sessile in the axils of the leaves, apparently discoid, heterogamous. Involucre rotate or saucer-shaped; bracts in 2 subequal series. Receptacle convex, naked. Marginal flowers (functionally ray-flowers) numerous in several series, pistillate, without corolla. Style persistent, villous, in fruit forming a spine-like beak; branches short, oblong. Disk-flowers few, hermaphrodite but sterile. Corollas villous, with a slender tube, gradually tapering into the elongate-funnelform throat; lobes 4. Anthers with obtuse tips. Achenes flattened, villous at the apex, bordered by thick corky transversely reticulate wings, not cuspidately lobed at the apex.

Type species, *Gymnostyles anthemifolia* A. Juss.

Wings of the achenes not reticulate at the subconic round-shouldered apex; leaves bi- or tri-pinnatifid. 1. *G. anthemifolia*.
Wings of the achenes reticulate clear to the truncate apex with acute shoulders; leaves simply pinnatifid. 2. *G. nasturtiifolia*.

1. *Gymnostyles anthemifolia* A. Juss. Ann. Mus. Paris 4: 262. 1804.

Soliva anthemifolia R. Br.; Less. Syn. Comp. 268. 1832.

A low subcaulescent annual, branched from the base, the branches usually less than 5 cm. long, sometimes almost none, hirsute; leaves hirsute, 3-6 cm. long, bipinnatifid into linear or linear-oblanccolate, gradually acute, divisions; involucre 8-10 mm. broad; bracts 15-20, lanceolate; corollas of the hermaphrodite flowers pubescent, 3 mm. long; tube slender, gradually tapering into the narrow elongate-funnelform throat; lobes 4; achenes obovate in outline, 3.5 mm. long, 2 mm. wide; body puberulent, narrow; wing thick, transversely reticulate, except the broadly subconic villous apex; beak 2 mm. long.

TYPE LOCALITY: "Australasia" [?].

DISTRIBUTION: Southern Mexico to Paraguay; adventive in Louisiana and Texas.

ILLUSTRATIONS: Ann. Mus. Paris 4: pl. 61, f. 1; Tratt. Arch. pl. 57.

2. *Gymnostyles nasturtiifolia* A. Juss. Ann. Mus. Paris 4: 262. 1804.

Soliva nasturtiifolia DC. Prodr. 6: 142. 1837.

Soliva urbica Philippi, Linnaea 29: 7. 1857.

A dwarf annual, subcaulescent, producing offsets; leaves 1-3 cm. long, sparingly pubescent, pinnatifid, with 7-9 oblanceolate divisions; involucre 4-6 mm. broad; bracts 12-18, linear or linear-lanceolate, sparingly pubescent; hermaphrodite flowers very few; corolla villous, 2.5 mm. long; tube gradually tapering into the elongate-trumpet-shaped throat; achenes cuneate in outline, 2.5-3 mm. long, nearly 2 mm. wide; body puberulent; wing transversely reticulate to the truncate apex, which has acute shoulders; beak fully 1.5 mm. long.

TYPE LOCALITY: Buenos Aires.

DISTRIBUTION: North Carolina to Florida; Louisiana; naturalized from South America.

ILLUSTRATION: Ann. Mus. Paris 4: pl. 61, f. 2.

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