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VOLUME 24

PART I

NORTH AMERICAN FLORA

(ROSALES)

FABACEAE

PSORALEAE

✓ PER AXEL RYDBERG

EYSENHARDTIA

✓ FRANCIS WHITTIER PENNELL



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ANNOUNCEMENT

NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

- Volume 1. Myxomycetes, Schizophyta.
- Volumes 2 to 10. Fungi.
- Volumes 11 to 13. Algae.
- Volumes 14 and 15. Bryophyta.
- Volume 16. Pteridophyta and Gymnospermae.
- Volumes 17 to 19. Monocotyledones.
- Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. W. A. Murrill, and Dr. J. H. Barnhart.

Professor John M. Coulter, of the University of Chicago; Mr. Frederick V. Coville, of the United States Department of Agriculture; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or five parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK CITY

Family 24. FABACEAE

Tribe 6. PSORALEAE

BY PER AXEL RYDBERG

Herbs, shrubs, or rarely trees, with glandular-dotted foliage. Leaves odd-pinnately or palmately compound. Flowers perfect, in racemes, spikes, or panicles. Calyx usually campanulate, 5-toothed or 5-lobed, the lowest tooth or lobe usually somewhat longer. Corolla more or less papilionaceous, of 5 petals, or in *Amorpha* reduced to the banner and in *Parryella* wanting; petals when present inserted either on the hypanthium or lower or higher up on the staminal tube; banner usually broad, distinctly clawed, the other petals usually distinctly clawed if inserted on the hypanthium or on the lower part of the staminal tube, but if inserted at the mouth of the latter subsessile and the keel-petals free; otherwise the keel-petals are more or less adnate to each other along the lower margin of the blade. Stamens 9 or 10, or in *Petalostemon* and *Kuhmistera* 5, and in a few species of *Parosela* 7 or 8; filaments monadelphous or diadelphous, united into a tube split on the upper side, the tenth stamen when present being free or only partly united to the tube below, or in *Amorpha* and *Apoplanesia* all free to near the base, and in *Parryella* apparently wholly so. Fruit a 1-few-seeded pod, coriaceous or chartaceous and indehiscent, or more membranaceous and circumscissile or irregularly bursting, not valvate.

Petals distinct from the staminal tube, inserted on the hypanthium.

Ovary 1-ovuled and pod 1-seeded.

Calyx-lobes not much enlarging in fruit, erect; corolla papilionaceous.

Pod indehiscent.

Plants shrubby, with spinescent-tipped leaflets; leaves odd-pinnate with a sessile terminal leaflet or 3-foliolate.

1. PSORALEA.

Plants herbaceous or shrubby, with innocuous leaflets.

Pericarp adherent to the seed; leaves pinnately 1-3-foliolate; introduced genera.

2. CULLEN.

Pod conspicuously glandular-warty, with a short persistent beak; leaflets coarsely dentate.

3. ASPHALTHIUM.

Pod not conspicuously warty, with a long flat beak, which ultimately breaks off; leaflets entire.

Pericarp not adherent to the seed; indigenous genera.

Leaves pinnately 3-foliolate.

Pod coriaceous or bony, cross-wrinkled, neither hairy nor included in the calyx.

4. ORBEXILUM.

Pod membranous or leathery, not cross-wrinkled, hairy, included in the calyx.

5. HOITA.

Leaves digitately compound.

Pod crescent-shaped, flat, cross-ribbed; claw of banner twice bent.

6. RHYTIDOMENE.

Pod orbicular to oblong-ovate, slightly compressed, glandular-dotted but not cross-ribbed; claw of banner straight to the base of the blade.

7. PSORALIDIUM.

Pod circumscissile or bursting irregularly; beak long; leaves digitately compound, or the median leaflet petioled, and if 3-foliolate apparently pinnate.

8. PEDIOMELUM.

Calyx-lobes much enlarging and spreading in fruit, reticulate-veined; corolla scarcely papilionaceous, all petals distinct; shrubs, with odd-pinnate leaves and many leaflets.

9. APOPLANESIA.

Ovary 2-6-ovuled.

Filaments distinct, or united only at the base; corolla wanting or reduced to the banner only.

Banner wanting; stamens free.

10. PARRYELLA.

Banner present; stamens united at the base.

11. AMORPHA.

Filaments united more than half their length into an elongate tube split on the upper side; corolla usually present.

Pod flat, exserted; stamens diadelphous.

12. EYSENHARDTIA.

Pod turgid; stamens monadelphous.

Corolla scarcely papilionaceous; petals all free and nearly clawless; stipules spinescent.

13. PSOROBATUS.

Corolla papilionaceous; petals clawed and those of the keel usually adnate or coherent.

Pod exserted; flowers pedicelled.

14. PSORODENDRON.

Pod not exserted; flowers sessile.

15. PSOROTHAMNUS.

Petals, except the banner, adnate to or inserted on the staminal tube.

Wings and keel-petals distinctly clawed, inserted some distance below the mouth of the staminal tube, the keel-petals (if present) inserted higher up than the wings, the former usually united along the lower edge of the blades.

16. PAROSELA.

Wings and keel-petals alike, clawless or short-clawed, all distinct and inserted at the mouth of the staminal tube; spikes dense, with persistent bracts.

Stamens 10, rarely 9.

17. THORNBERRA.

Stamens 5.

Banner much broader than the other petals; calyx-lobes not much if at all exceeding the tube; spikes not involucrate.

18. PETALOSTEMON.

Banner similar to the other petals but long-clawed; calyx-lobes about 3 times as long as the tube, plumose; spikes involucrate, *i. e.*, subtended by many conspicuous empty bracts.

19. KUHNISTERA.

1. PSORALEA* (Royen) L. Sp. Pl. 762. 1753.

Rutenia Medic. Vorles. Churpf. Phys.-Oek. Ges. 2: 381. 1787.

Shrubs, with densely leafy stems, conspicuously glandular-dotted. Leaves odd-pinnate with a sessile terminal leaflet or 3-foliolate, often with spinulose-tipped leaflets. Flowers axillary or in terminal sessile spikes, never in axillary long-peduncled spikes or racemes. Calyx usually strongly glandular-punctate and strongly ribbed, 5-lobed; tube campanulate, not gibbous; lobes elongate, subequal or the lowest one longer. Corolla usually longer than the calyx; petals conspicuously veined; banner distinct, broadly obovate, with the margins recurved-spreading, the blade usually bearing two more or less distinct rounded basal lobes above the short, narrow, straight or nearly straight claw; wings about as long as the banner; blades obliquely oblong or oblanceolate, with a basal lobe on the upper side, usually longer than the slender free claw; keel-petals shorter than the wings, the claws free, the blades broadly lunate, with a less distinct basal lobe, united only at the rounded apex, each slightly united with the blade of the adjacent wing at the base. Filaments of nine of the stamens united to near the apex into a 9-toothed tube, the alternate teeth usually shorter, the tenth filament either free except at the very base, or united with the tube high up, or wanting. Pod oval, or ovate, indehiscent, short-beaked, the pericarp free from the seed. Seed more or less kidney-shaped, smooth.

Type species, *Psoralea pinnata* L.

1. *Psoralea fruticans* (L.) Rydberg.

Trifolium fruticans L. Sp. Pl. 770. 1753.

Psoralea bracteata L. Mant. 264. 1771.

Psoralea fruticosa Kellogg, Proc. Calif. Acad. 7: 91. 1877.

Lotodes fruticans Kuntze, Rev. Gen. 194. 1891.

A low shrub, erect or decumbent, densely leafy; twigs subcanescent; leaves digitately 3-foliolate; stipules 1 cm. long, lanceolate, acuminate, striate; petioles very short; leaflets broadly obovate, retrorsely spinulose-mucronate, 1-2.5 cm. long, conspicuously punctate, pubescent or in age glabrate; spikes terminal, sessile, densely-flowered, subcapitate; bracts membranous, lanceolate or ovate, acuminate, nearly as long as the flowers; calyx densely pubescent and glandular; tube 3 mm. long; lobes lanceolate, acute, 4 mm. long, the lowest slightly longer than the rest; corolla purple-blue, or whitish, or the banner purple and wings

* Also spelled *Psoralia*.

whitish; banner broadly obovate, retuse, with rounded basal lobes; blades of the wings oblong, with an ovate basal lobe, those of the keel-petals broadly lunate, with a rounded basal lobe; tenth filament free half its length; pod glabrous, ovate-oblong, wrinkled.

TYPE LOCALITY: Cape of Good Hope.

DISTRIBUTION: Adventive on Mt. Tamalpais, California; native of South Africa.

ILLUSTRATIONS: Commelin, Hort. Med. Amst. 2: pl. 106; Bot. Mag. pl. 440; Bot. Cab. pl. 1559.

EXCLUDED SPECIES

PSORALEA LONGIFOLIA Pursh, Fl. Am. Sept. 741. 1814. A species of *Phaca*.

PSORALEA PARVIFLORA Poir. in Lam. Encyc. Suppl. 4: 590. 1816. A species of *Microphacos*.

PSORALEA MULTIJUGA Ell. Bot. S. C. & Ga. 2: 198. 1822. Unknown to the author, but evidently not belonging to *Psoralea*, or any of its segregates.

PSORALEA ALNIFOLIA Bertol. Mem. Accad. Bologna 2: 274. 1850. A species of *Rhynchosia*.

PSORALEA ALOPECURINA Bertol. Mem. Accad. Bologna 2: 275. 1850. A species of *Rhynchosia*.

PSORALEA LUTEOLA Sessé & Moc. Pl. Nov. Hisp. 121. 1889. Unknown; perhaps a species of *Parosela*.

PSORALEA POLYSTACHYA Sessé & Moc. Pl. Nov. Hisp. 121. 1889. Unknown; perhaps a species of *Parosela*.

PSORALEA PURPUREA Sessé & Moc. Fl. Mex. 185. 1896. Unknown.

2. CULLEN Medic. Vorles. Churpf. Phys.-Oek. Ges. 2: 380. 1787.

Dorychnium (Royen) Moench, Meth. 109. 1794. Not *Dorychnium* Mill. 1754.

Lolodes (Siegesb.) Kuntze, Rev. Gen. 193. 1891.

Annual or perennial herbs, shrubby if at all only at the base. Leaves pinnately 1-3-foliolate, conspicuously glandular-dotted; leaflets coarsely dentate. Flowers in axillary peduncled spikes. Calyx strongly glandular-punctate; tube campanulate, not gibbous, 5-lobed; lowest lobe usually longest and the upper two often more or less united. Corolla scarcely spreading; wings equaling the banner, the blades rather narrow, mostly oblong, with a prominent basal lobe, longer than the free claws; keel-petals shorter than the wings, the blades broadly obliquely lunate, united at the rounded apex, each slightly united with the adjacent wing at the base, the claws free. Filaments of nine of the stamens united into a split 9-toothed tube, the teeth subequal, the tenth filament free except at the base. Style merely curved towards the end; stigma capitate. Pod conspicuously glandular-warty, with a short erect beak; pericarp thin, adherent to the seed. Seed obliquely reniform.

Type species, *Psoralea corylifolia* L.

1. Cullen americanum (L.) Rydberg.

Psoralea americana L., Sp. Pl. 763. 1753.

Psoralea dentata DC. Prodr. 2: 221. 1825.

Lolodes americanum Kuntze, Rev. Gen. 193. 1891.

A perennial herb, somewhat shrubby at the base; stem erect, 5 dm. high or more, branched, glabrous or nearly so, usually conspicuously glandular-dotted; leaves pinnately 3-foliolate; stipules lanceolate, acuminate; petioles 4-6 cm. long; leaflets 2-6 cm. long, irregularly dentate, mucronate, nearly glabrous, pubescent only on the veins beneath, with numerous minute glands, the terminal one rounded-oval or suborbicular, the lateral ones obliquely rounded-ovate; peduncles 5-8 cm. long; spikes 2-5 cm. long; rachis hirsutulous-canescens; bracts lanceolate, acuminate, 3 mm. long; pedicels 1 mm. long or less; calyx hirsute, conspicuously punctate; tube 2.5 mm. long; upper 4 lobes lanceolate, acute, 3 mm. long, the lowest lobe oblong-lanceolate, 4.5 mm. long, the upper two united half their length; banner obovate, retuse; wings semihastate, nearly 4 mm. long, with oblong blades and a large ovate basal lobe; blades of

the keel-petals 3 mm. long, the claws 3 mm. long; pod glabrous, obliquely rounded-ellipsoid, shorter than the calyx, with a short slender erect beak; seed 3 mm. long, reniform, brown.

TYPE LOCALITY: "America?" [erroneous, probably Madeira].

DISTRIBUTION: Escaped from cultivation, Florida to Mississippi, Cuba; native of Madeira and Spain.

ILLUSTRATIONS: Lob. Ic. 2: 31 (left figure); Jacq. Hort. Schoenb. 2: pl. 227; E. & P. Nat. Pl. 3: f. 115, L. M.

EXCLUDED SPECIES

PSORALEA CORYLIFOLIA L. Sp. Pl. 764. 1753. This, the type of the genus, has been reported (Bull. Torrey Club 17: 313. 1890) from Appalachicola, Florida, but the specimens on which this record was made belong to the preceding species.

3. ASPHALTHIUM Medic. Vorles. Churpf. Phys.-Oek. Ges. 2: 380. 1787.

Rhynchodium Presl, Bot. Bemerk. 54. 1846.

Glandular-dotted herbaceous perennials. Leaves usually pinnately trifoliolate. Flowers in head-like spikes on elongate axillary peduncles. Calyx inconspicuously or obsoletely glandular-punctate, 5-cleft; tube campanulate, not gibbous; lobes unequal, lanceolate, subulate-tipped, the lowest much longer than the rest. Banner narrow, oblanceolate-sagittate, with a broad short claw and small basal lobes; wings shorter, the blades semisagittate, longer than the claws, and with long lanceolate-semilunate basal lobes, the lower part of the blade adnate to the blade of the adjacent keel-petal; keel-petals shorter, the blades oblanceolate-oblong, rounded and adnate to each other at the apex, truncate at the base on the upper side. Stamens monadelphous at the base, but the tenth stamen free above, the other nine united to near the apex, alternately longer and shorter. Pod indehiscent, with a long sword-shaped beak, which usually ultimately breaks off; pericarp adnate to the seed.

Type species, *Psoralea bituminosa* L.

1. *Asphaltium bituminosum* (L.) Kuntze; Post & Kuntze, Lex. Gen. Phan. 48. 1903.

Psoralea bituminosa L. Sp. Pl. 763. 1753.

Asphaltium frutescens Medic. Vorles. Churpf. Phys.-Oek. Ges. 2: 380. 1787.

Rhynchodium bituminosum Presl, Bot. Bemerk. 54. 1846.

Stem 5-10 dm. high, decumbent at the base, strigose and striate; stipules distinct, subulate, 5-10 mm. long; petioles 1-2 cm. long; leaflets lanceolate, 4-6 cm. long, sparingly striate, conspicuously veined, entire, acute; peduncles 1-2.5 dm. long; spikes 1.5-2.5 cm. long; bracts ovate, caudate-acuminate; calyx strigose; tube 5-6 mm. long; lobes lance-subulate, the lowest 9-10 mm. long, the rest 6-7 mm. long; corolla lilac or rose, with purple-tipped keel; banner about 5 mm. long; beak of the pod about 7 mm. long.

TYPE LOCALITY: Sicily.

DISTRIBUTION: Southern Europe, northern Africa, and the Orient; occasionally escaped from cultivation (as "asphalt clover") in the southern states.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 614, f. 1; Schkuhr, Handb. pl. 210; Sibth. Fl. Graeca pl. 738.

4. ORBEXILUM Raf. Atl. Jour. 145. 1832.

Psoralea § *Poikadenia* Ell. Bot. S. C. & Ga. 2: 197. 1822.

Perennial herbs, with rootstocks or fusiform roots, rarely shrubby below. Leaves alternate, scattered, usually glandular-dotted, pinnately 1-3-foliolate, rarely 5-foliolate. Flowers in long-peduncled axillary spikes or racemes. Calyx campanulate, not gibbous at the base usually glandular-dotted, rarely glandless, 5-lobed, the lowest lobe often somewhat longer than the rest. Corolla mostly blue or purple, not strongly veined; banner broadly obovate or suborbicular, with recurved or spreading sides and a straight or slightly curved narrow claw, often with small basal lobes at the base of the blade; wings about as long as the banner, the blades mostly obliquely lunate, rounded at the apex and each with a small basal lobe, about

twice as long as the free claws; keel-petals shorter than the wings, usually with a dark tip, the blades united at the rounded apex, similar to those of the wings but the basal lobe less prominent, each slightly united with the adjacent wing at the base, the claws free. Filaments of nine of the stamens united into a split or sometimes closed tube, 9-toothed at the apex, the teeth short, alternately longer and shorter, the anthers of the shorter teeth sometimes smaller; tenth stamen free except at the base, or united to the tube high up, or wanting. Style curved, rarely abruptly bent towards the apex; stigma capitate. Pod ovate or orbicular, not included in the calyx, somewhat flattened, indehiscent, with an incurved short beak; pericarp thick, wrinkled, not coherent to the seed. Seed from suborbicular to reniform.

Type species, *Psoralea latifolia* Torr.

Pod obliquely ovate; leaflets ovate to lanceolate; perennials with rootstocks.

EURBEXILUM.

Stem erect, wholly herbaceous.

Stipules and bracts subulate or lanceolate, the latter shorter than the flowers.

Leaflets cuneate at the base; corollas 6-7 mm. long.

Leaflets cordate or truncate at the base; corollas 8-9 mm. long.

Stipules and bracts ovate or obovate, the latter longer than the flowers.

Stem spreading or trailing, woody at the base.

Pod suborbicular; leaflets linear or linear-lanceolate; perennials with fusiform roots. POIKADENIA.

Leaves 1-foliolate.

Leaves 3-foliolate.

Bracts lanceolate; corolla 7 mm. long.

Bracts broadly ovate, acuminate; corolla 4-6 mm. long.

Upper 4 calyx-lobes lanceolate, longer than the tube.

Upper 4 calyx-lobes triangular, shorter than the tube.

1. *O. Onobrychis*.
2. *O. macrophyllum*.
3. *O. stipulatum*.
4. *O. melanocarpum*.
5. *O. virgatum*.
6. *O. simplex*.
7. *O. pedunculatum*.
8. *O. gracile*.

1. *Orbexilum Onobrychis* (Nutt.) Rydberg.

Psoralea Onobrychis Nutt. Gen. 2: 104. 1818.

Psoralea latifolia Torr. Ann. Lyc. N. Y. 2: 176. 1827.

Lotodes Onobrychis Kuntze, Rev. Gen. 194. 1891.

A perennial, with a stoloniferous rootstock; stem erect, 1-1.5 m. high, more or less finely pubescent, angled and striate; leaves 3-foliolate; stipules 8-10 mm. long, subulate or setaceous; petioles 4-8 cm. long; leaflets 5-10 cm. long, 2.5-6 cm. wide, rhombic-ovate or rhombic-lanceolate, acuminate, ciliate on the margins, glabrous and minutely glandular-punctate above, more or less pubescent beneath, especially on the veins; peduncles 6-12 cm. long; racemes about 1 cm. long; bracts subulate, 3 mm. long; calyx 3 mm. long, glabrate; lobes triangular, shorter than the tube; corolla 6-7 mm. long, pale with purple-tipped keel; banner suborbicular; blades of the wings with an acute basal lobe, those of the keel-petals broader, two-thirds as long, with a rounded lobe; pod obliquely ovate, flat, strongly transversely rugose-reticulate, and sometimes tubercled, with an incurved beak, nearly 1 cm. long; seeds elliptic, 6 mm. long, red-brown, smooth.

TYPE LOCALITY: Banks of the Merrimek, a few miles from St. Louis.

DISTRIBUTION: Ohio to Illinois, Missouri, and Tennessee.

ILLUSTRATIONS: Bot. Reg. 6: pl. 453; Britt. & Brown III. Fl. f. 2100; ed. 2. f. 2503.

2. *Orbexilum macrophyllum* (Rowlee) Rydberg.

Psoralea macrophylla Rowlee; Small, Fl. SE. U. S. 623. 1903.

A perennial; stem erect, 5-10 dm. high, angled, striate, retrorsely pubescent; leaves 3-foliolate; stipules subulate or setaceous, fully 1 cm. long; petioles 3-8 cm. long; leaflets 6-10 cm. long, 4-6 cm. wide, broadly ovate, blunt at the apex, subcordate at the base, finely pubescent on both sides, finely reticulate beneath; peduncles 10-15 cm. long; racemes lax, about 1 cm. long; rachis densely pubescent and with stalked glands; bracts lanceolate; pedicels 2-3 mm. long; calyx densely pubescent and glandular; tube 2 mm. long; lobes lanceolate, the upper 2.5 mm., the lowest 3 mm. long; corolla 8-9 mm. long, purple; banner orbicular; blades of the wings and the keel-petals broadly lunate, obtuse, those of the latter a little shorter.

TYPE LOCALITY: Tryon Mountain, North Carolina.

DISTRIBUTION: Known only from the type locality.

3. *Orbexilum stipulatum* (T. & G.) Rydberg.

Psoralea stipulata T. & G. Fl. N. Am. 1: 688. 1840.
Lotodes stipulatum Kuntze, Rev. Gen. 194. 1891.

A perennial; stem branched at the base, ascending, striate, glabrous or nearly so; leaves 3-foliolate; stipules ovate, herbaceous, fully 1 cm. long; petioles 1-3 cm. long; leaflets ovate-elliptic, obtuse, mucronate, 2-5 cm. long, glabrous, not glandular-punctate, reticulate beneath; peduncles 4-5 cm. long; racemes dense, short, 1-2 cm. long; bracts broadly ovate, acuminate, longer than the flowers, soon deciduous; pedicels 1 mm. long; calyx sparingly strigose, not glandular-punctate; tube 2.5 mm. long; upper 4 lobes lanceolate, acute, 2.5 mm. long, the lowest linear-lanceolate, acuminate, 3-3.5 mm. long; corolla nearly 1 cm. long; banner broadly obovate; blades of the wings oblanceolate-lunate, with a linear basal lobe, those of the keel-petals two-thirds as long, broader, with a rounded basal lobe.

TYPE LOCALITY: Falls of the Ohio [Indiana].

DISTRIBUTION: Indiana and Kentucky, near the type locality.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2098; ed. 2. f. 2501.

4. *Orbexilum melanocarpum* (Benth.) Rydberg.

Psoralea melanocarpa Benth.; Hemsl. Biol. Centr. Am. Bot. 1: 234. 1880.
Lotodes melanocarpum Kuntze, Rev. Gen. 194. 1891.

A perennial, shrubby at the base; stem spreading or trailing, sparingly pubescent with appressed white hairs; leaves 3-foliolate; stipules 6-10 mm. long, subulate, long-acuminate; petioles 3-6 cm. long; leaflets 4-7 cm. long, ovate-lanceolate, acute, mucronate, sparingly pubescent on both sides, thin; peduncles about 1 dm. long; racemes about 5 cm. long; bracts 6 mm. long, ovate, acuminate; pedicels 1-2 mm. long; calyx sparingly strigose; tube 2 mm. long; lobes linear, acuminate, 3-4 mm. long in anthesis, 5-6 mm. long in fruit; corolla 8-9 mm. long, dark-purple; pod obliquely ovate, flat, about 1 cm. long, with an incurved beak; seed 3-4 mm. long, reniform, dark-brown.

TYPE LOCALITY: Zimapan, Hidalgo.

DISTRIBUTION: Nuevo León and San Luis Potosí to Hidalgo and Chiapas.

5. *Orbexilum virgatum* (Nutt.) Rydberg.

Psoralea virgata Nutt. Gen. 2: 104. 1818.
Psoralea simplicifolia Baldw.; T. & G. Fl. N. Am. 1: 303, as synonym. 1838.
Lotodes virgatum Kuntze, Rev. Gen. 194. 1891.

A perennial, with a fusiform root; stem erect, 2-6 dm. high, mostly simple, angled, glabrate, or strigose above; leaves 1-foliolate or the basal ones pinnately 3-foliolate; stipules setaceous, 5-8 mm. long; petioles 1-2 cm. long; leaflets linear, 3-10 cm. long, 4-10 mm. wide, minutely glandular-punctate, sparingly pubescent on the margins and veins; peduncles short, rarely more than 1 cm. long; racemes 1-3 cm. long; bracts subulate; pedicels 1-3 mm. long; calyx sparingly hirsute; tube less than 1.5 mm. long; lobes lanceolate, the lowest one 2.5 mm. long, the rest 1.5 mm. long; corolla 5-6 mm. long, purple; banner broadly obovate, with blunt basal lobes; blades of the wings oblong-lunate, obtuse, with a rounded basal lobe, those of the keel-petals broader, without basal lobes, only slightly shorter; pod flattened, suborbicular, oblique, transversely wrinkled, 5 mm. long, with a short incurved beak; seed flat, brownish-black.

TYPE LOCALITY: West Florida, between St. Mary's and Satilla River [southeastern Georgia].

DISTRIBUTION: Southern Georgia and northern Florida.

6. *Orbexilum simplex* (Nutt.) Rydberg.

Psoralea simplex Nutt.; T. & G. Fl. N. Am. 1: 303. 1838.
Lotodes simplex Kuntze, Rev. Gen. 194. 1891.
Psoralea palustris Bush, Rep. Mo. Bot. Gard. 17: 121. 1906.

A perennial, with a fusiform tuberous root; stem erect, simple, 3-9 dm. high, more or less strigose throughout; stipules subulate, about 1 cm. long; leaves pinnately 3-foliolate, the lower petioled, the upper sessile; petioles 5 cm. long or less; leaflets 2-7 cm. long, 5-15 mm. wide, linear or linear-lanceolate, acute or mucronate, glandular-dotted above, strigose beneath;

peduncles 4–10 cm. long; racemes 2–5 cm. long, dense; bracts small, linear-lanceolate; calyx sparingly strigose, purple, 3–4 mm. long; lobes lanceolate, acute, a little longer than the tube, the lowest one a little longer than the rest; corolla purple, about 7 mm. long; banner, wings, keel-petals, and stamens as in the preceding; pod obliquely orbicular, flat, transversely wrinkled, with a short incurved beak; seed brown, 2.5 mm. long.

TYPE LOCALITY: Plains of Red River, Arkansas.
DISTRIBUTION: Alabama to Oklahoma and Texas.

7. *Orbexilum pedunculatum* (Mill.) Rydberg.

Hedysarum pedunculatum Mill. Gard. Dict. ed. 8. Hedysarum no. 17. 1768.
Trifolium psoraloides Walt. Fl. Car. 184. 1788.
Psoralea melilotoides Michx. Fl. Bor. Am. 2: 58. 1803.
Psoralea Melilotus Pers. Syn. Pl. 2: 347. 1807.
Melilotus psoraloides Nutt. Gen. 2: 104. 1818.
Psoralea eglandulosa Ell. Bot. S. C. & Ga. 2: 198. 1822.
Lotodes psoralodes Kuntze, Rev. Gen. 194. 1891.
Psoralea pedunculata Vail, Bull. Torrey Club 21: 114. 1894. Not *P. pedunculata* Poir. 1816.

A perennial, often branched at the base, with a fusiform root, which sometimes is 2 cm. thick; stems 3–8 dm. high, glabrous or sparingly strigose; leaves 3-foliolate; stipules 4–5 mm. long, subulate; petioles 1–6 cm. long, or the upper much shorter; leaflets 4–7 cm. long, 1–2 cm. wide, linear-lanceolate or those of the lower leaves elliptic, glabrous or sparingly pubescent, reticulate, sparingly dotted with minute glands or sometimes almost glandless; peduncles 8–15 cm. long; racemes elongate, 4–10 cm. long; bracts 1 cm. long, broadly ovate, acuminate, longer than the flowers, deciduous; pedicels about 1 mm. long; calyx strigose, about 3 mm. long; lobes lanceolate, slightly longer than the tube, the lowest one slightly longer than the rest; corolla 5–6 mm. long, pale-purple, otherwise as in the two preceding; pod obliquely orbicular, flat, 4 mm. long, transversely wrinkled, with a short incurved beak; seed dark-brown, 3 mm. long.

TYPE LOCALITY: South Carolina.
DISTRIBUTION: Virginia to Illinois, Kansas, Texas, and Florida.
ILLUSTRATIONS: W. Bart. Fl. N. Am. pl. 57; Vent. Jard. Malin. pl. 94; Bot. Mag. pl. 2063; Bot. Reg. 6: pl. 454; Britt. & Brown, Ill. Fl. f. 2099; ed. 2. f. 2502.

8. *Orbexilum gracile* (Chapm.) Rydberg.

Psoralea melilotoides gracilis T. & G. Fl. N. Am. 1: 303. 1838.
Psoralea gracilis Chapm.; (T. & G. Fl. N. Am. 1: 303, as synonym. 1838) Small, Fl. SE. U. S. 623. 1903.

A perennial, often branched at the base, with a fusiform root; stems glabrate or minutely strigose, often purple-tinged, ascending, 2–7 dm. high, slender; leaves 3-foliolate; stipules linear-lanceolate, 5–8 mm. long; petioles of the lower leaves 3–4 cm. long, those of the upper very short; leaflets elliptic-oblong, or linear-lanceolate, 1–4 cm. long, minutely punctate, glabrous or nearly so, those of the lower leaves obtuse or retuse, those of the upper acute; peduncles 6–10 cm. long; racemes 2–4 cm. long, lax; bracts broadly obovate, conspicuously punctate, cuspidate-acuminate, 7–8 mm. long, deciduous; calyx sparingly strigose, 2–2.5 mm. long; upper 4 lobes triangular, shorter than the tube, the lowest lanceolate and a little longer than the tube; corolla 4–5 mm. long; banner suborbicular; blades of the wings obliquely elliptic-oblancheolate, with an acute basal lobe, those of the keel-petals broadly lunate, obtuse, with a minute rounded lobe, two thirds as long as those of the wings; pod similar to that of the preceding.

TYPE LOCALITY: Middle Florida.
DISTRIBUTION: Georgia and Florida.

5. *HOITA** Rydberg, gen. nov.

Perennial herbs, with rootstocks, rarely shrubby below. Leaves pinnately 3-foliolate, with entire short-petioluled leaflets, usually conspicuously glandular-punctate. Flowers in long-peduncled, axillary spikes or racemes. Calyx campanulate, not gibbous at the base, glandular-dotted, 5-lobed, the lowest lobe slightly longer than the rest. Corolla purple or ochro-

* Indian name for the type species, the fiber of which has been used as threads.

leucous, the keel with a dark-purple tip; banner broadly obovate, with more or less distinct basal lobes and a short somewhat curved claw; wings and keel-petals as in *Orbexilum*, but the claws of the former varying from equaling to half as long as the blades. The staminal tube as in that genus. Style usually more abruptly bent above. Stigma globose, bearded. Pod obliquely oval or ovate, with a short and slender beak, pubescent, included in the calyx; pericarp thin, free from the seed. Seed dark-brown or black, oval-reniform, smooth and shining.

Type species, *Psoralea macrostachya* DC.

Stem erect.

Bracts lanceolate to ovate, not surpassing the flowers.

Corolla ochroleucous, whitish, or pale, with a purple-tipped keel; plant glabrous or nearly so.

Plant shrubby below; flowers 8 mm. long, in elongate lax racemes; leaflets narrowly lanceolate.

1. *H. glandulosa*.

Plant herbaceous; flowers more than 10 mm. long, in short dense racemes; leaflets broader.

Calyx inflated in fruit; leaflets broadly rhombic-ovate to sub-orbicular.

2. *H. physodes*. ✓

Calyx not inflated in fruit; leaflets ovate-lanceolate or rhombic-lanceolate.

3. *H. rigida*.

Corolla purple or bluish; at least the leaves distinctly pubescent, except in the first species.

Lowest calyx-lobe not twice as long as the rest, about equaling the corolla.

Leaves glabrous; racemes short, less than 5 cm. long.

4. *H. rhomboidea*.

Leaves more or less pubescent; racemes elongate, 5–12 cm. long.

5. *H. macrostachya*. ✓

Lowest calyx-lobe more than twice as long as the rest and longer than the corolla.

Stem glabrous or nearly so; calyx and bracts pilose.

6. *H. longiloba*.

Stem grayish-puberulent, almost velutinous; calyx and bracts long-villosus.

7. *H. villosa*.

Bracts broadly ovate, abruptly acuminate, exceeding the flowers.

Inflorescence much exceeding the leaves; corolla 8–9 mm. long.

Corolla yellowish with purple-tipped keel; bracts conspicuously glandular, sparingly short-pubescent.

8. *H. Hallii*.

Corolla purplish; bracts decidedly long.

9. *H. Douglasii*.

Inflorescence usually shorter than the leaves; corolla about 15 mm. long.

10. *H. strobilina*.

Stem prostrate; leaves long-petioled, with orbicular leaflets; corolla 15 mm. long.

11. *H. orbicularis*. ✓

1. *Hoita glandulosa* (L.) Rydberg.

Psoralea glandulosa L. Sp. Pl. ed. 2. 1075. 1763.

? *Psoralea lutea* Molina, Sagg. Chili 163. 1782. Not. *P. lutea* Cav. 1797.

? *Psoralea Cullen* Poir. in Lam. Encyc. 5: 685. 1804.

Lotodes glandulosum Kuntze, Rev. Gen. 194. 1891.

A low shrub, 1 m. high or more; branches ascending, glabrous or slightly puberulent, with elevated black glands; leaves 3-foliolate; stipules subulate, 3–4 mm. long; petioles 2–5 cm. long; leaflets lanceolate, 3–5 cm. long, 1–1.5 cm. wide; peduncles 3–5 cm. long; racemes lax, 5–10 cm. long; bracts oval, cuspidate, 3 mm. long; pedicels very short; calyx strigose, conspicuously punctate, nearly equally cleft; tube 3 mm. long, slightly gibbous at the base above; lobes lanceolate, acute or acuminate, 3-ribbed, the lowest 4 mm. long, the rest 3 mm. long; corolla pale, with a purplish keel, 8 mm. long; banner broadly obovate, with a short claw; blades of the wings obliquely lunate, with an ovate acute basal lobe, 7 mm. long, those of the keel-petals broader, 5 mm. long, the claws of both 3 mm. long; tenth filament free or nearly so; pod ovoid, 6 mm. long, strigose.

TYPE LOCALITY: Peru.

DISTRIBUTION: Escaped from cultivation near Berkeley, California; native of Chile to Peru.

ILLUSTRATIONS: Bot. Mag. pl. 990; Sweet, Brit. Fl. Gard. pl. 296; Feuillée, Jour. Obs. 3: pl. 3 (right figure).

2. *Hoita physodes* (Dougl.) Rydberg.

Psoralea physodes Dougl.; Hook. Fl. Bor. Am. 1: 136. 1831.

Lotodes physodes Kuntze, Rev. Gen. 194. 1891.

A perennial, with a rootstock; stem erect, 3–8 dm. high, angled and grooved, glabrous or sparingly black-hairy; leaves pinnately 3-foliolate, rarely 5-foliolate; stipules 4–6 mm. long, lanceolate, acute, reflexed; petioles 3–5 cm. long; leaflets with short hairy petiolules, 2–6 cm.

long, 2-4 cm. wide, broadly rhombic-ovate to suborbicular, acute, mucronate, strongly reticulate, rather sparingly hirsutulous on the veins; peduncles 3-6 cm. long, sparingly hairy; racemes dense and short, 2-3 cm. long; rachis and pedicels strongly black-hairy; pedicels 1-3 mm. long; calyx rather conspicuously glandular-dotted, more or less black- and white-hairy, in fruit enlarged and inflated; tube 4 mm. long in anthesis, 6-7 mm. in fruit; lobes triangular, acuminate, shorter than the tube; corolla about 12 mm. long, ochroleucous, with a purple-tipped keel; banner oblanceolate, obtuse, with rounded basal lobes, tapering into a broad claw; blades of the wings obliquely lunate, with an ovate basal lobe, equaling the claws, those of the keel-petals broader and slightly shorter, with a rounded basal lobe; pod 6 mm. long, oval, compressed, black- and white-hairy, copiously glandular-dotted.

TYPE LOCALITY: Great Falls of the Columbia.

DISTRIBUTION: Vancouver Island to southern California.

ILLUSTRATION: Armstrong, Field Book W. Wild Fl. 263.

3. *Hoita rigida* (Parish) Rydberg.

Psoralea rigida Parish, Bull. Torrey Club 19: 91. 1892.

A perennial; stem erect, 3-6 dm. high, strigose-puberulent and sparingly glandular, angled and striate, branched above; leaves pinnately 3-foliolate; stipules lanceolate or subulate, 1 cm. long or less; petioles 2-4 cm. long; leaflets short-petiioled, ovate, lanceolate and acute, or those of the lower leaves ovate or oval and obtuse, rounded or retuse, glandular-punctate, glabrous above, sparingly pubescent beneath, 3-10 cm. long, 1-5 cm. broad, reticulate, firm; peduncles axillary, 3-7 cm. long; racemes short and dense, 2-3 cm. long; bracts lanceolate, acuminate, 4-5 mm. long, white-pubescent; calyx short-pubescent, with mixed white and black hairs, conspicuously glandular; tube campanulate, 4-5 mm. long; lobes lanceolate, the upper 3-4 mm. long, the lowest one 4-5 mm. long; corolla whitish or ochroleucous with purple-tipped keel; banner oblanceolate in outline, with indistinct rounded basal lobes, tapering into a long broad claw; blades of the wings obliquely lunate, with an ovate basal lobe, those of the keel broader, two thirds as long, with a rounded basal lobe; pod 8-10 mm. long, ovoid, minutely punctate, firm, somewhat roughened, strigose with mixed white and black hairs.

TYPE LOCALITY: Oak Grove, San Diego County, California.

DISTRIBUTION: Southern California.

4. *Hoita rhomboidea* Rydberg, sp. nov.

Psoralea macrostachya rhombifolia Torr. U. S. Expl. Exp. Bot. 269. 1874. Not *P. rhombifolia* T. & G. 1838.

A perennial; stem 1-2 m., rarely 3 m., high, glabrous or nearly so, light-green, striate, branched; leaves 3-foliolate; stipules lanceolate or subulate, about 1 cm. long; petioles 3-6 cm. long, glabrous; leaflets broadly lanceolate to rhombic-ovate, 2-7 cm. long, 1.5-4 cm. wide, glabrous on both sides or sparingly puberulent beneath, acute, with glabrous petiioles; peduncles 4-15 cm. long, glabrous; racemes short and dense, 3-5 cm. long; bracts villous, lanceolate, acuminate, not exceeding the flowers; calyx more or less villous; tube 4 mm. long; lobes lanceolate, the upper two broadly so, 4 mm. long, united one third their length, the lateral ones narrower and slightly shorter, the lowest one broad and 6 mm. long; corolla fully 1 cm. long, purple, the keel with a dark tip; banner broadly obovate, retuse, abruptly contracted into a short claw; blades of the wings obliquely obovate, with a rounded basal lobe, longer than the claw, those of the keel-petals obliquely oval, one third shorter, without a basal lobe; pod ovoid, short-hairy, 7 mm. long.

TYPE LOCALITY: On the upper Sacramento, California.

DISTRIBUTION: Upper Sacramento Valley, California.

5. *Hoita macrostachya* (DC.) Rydberg.

Psoralea macrostachya DC. Prodr. 2: 220. 1825.

Lotodes macrostachyum Kuntze, Rev. Gen. 194. 1891.

A perennial; stem 5-20 dm. high, glabrous or nearly so or in one form finely grayish-puberulent, almost velutinous; stipules 3-5 mm. long, subulate; leaves 3-foliolate; petioles 3-8 cm.

long; leaflets 2-8 cm. long, 1-6 cm. wide, ovate, ovate-lanceolate, or subrhombic, acute or rarely obtuse, from glabrate to cinereous-pubescent, almost velutinous; peduncles 4-10 cm. long, glabrous to cinereous; racemes 5-12 cm. long; rachis densely pubescent with white or black hairs, or both; bracts ovate or subrhombic, cuspidate, soon deciduous, 5-8 mm. long, shorter than the flowers; calyx densely hairy with white or gray hairs, unequally cleft, the cleft between the upper lobes least deep and those on each side of the lowest lobe deepest; lowest lobe lanceolate, 6-7 mm. long, the lateral ones 3-4 mm. long, usually narrower and often shorter than the upper two; corolla 8-10 mm. long, purplish; banner suborbicular, with a short claw; blades of the wings obliquely oblong, round-lobed at the base, 6.5-8 mm. long, the claw about 3 mm. long; blades of the keel-petals broadly lunate, rounded at the apex, round-lobed at the base, 5-7 mm. long; tenth filament free to near the base; pod obliquely ovate, 8 mm. long, densely pubescent.

TYPE LOCALITY: Nootka [probably erroneous; more likely Monterey or San Diego, California].
DISTRIBUTION: California and Lower California.

6. *Hoita longiloba* Rydberg, sp. nov.

A perennial; stem about 1 m. high, glabrous, slightly striate; leaves 3-foliolate; stipules subulate, 5 mm. long or less; petioles 3-6 cm. long; leaflets rhombic-lanceolate, acute, 2-6 cm. long, cinereous-pubescent on both sides; peduncles 5-10 cm. long; racemes elongate, 4-15 cm. long; rachis densely pubescent; bracts lanceolate, acuminate, 5-8 mm. long; calyx long-hairy, unequally cleft, the upper cleft about half as deep as the lateral ones, and these less deep than the lower ones; lowest lobe about 8 mm. long, the rest 3.5-4 mm. long; corolla nearly 1 cm. long, purplish; banner suborbicular, with a short claw; blades of the wings obliquely broadly oblong, with a rounded basal lobe, 7 mm. long, those of the keel-petals obliquely lunate, rounded at the apex, 5.5-6 mm. long; tenth filament free to near the base; pod obliquely ovate, 7 mm. long, densely hairy.

Type collected in southern California in 1875, *Parry & Lemmon 84* (herb. Columbia Univ.).
DISTRIBUTION: Southern California.

7. *Hoita villosa* Rydberg, sp. nov.

A stout perennial; stem erect, grooved, cinereous-puberulent, stout; leaves 3-foliolate; stipules lance-subulate, about 8 mm. long; petioles 3-8 cm. long, puberulent; leaflets broadly ovate, 3-8 cm. long, 2-5 cm. wide, cinereous-puberulent; peduncles about 1 cm. long, puberulent; racemes dense, 4-6 cm. long; rachis long-hairy; bracts rhombic-ovate, acuminate, about 8 mm. long, villous; calyx long-villous, unequally cleft, the upper cleft only one third as deep as the lateral ones and these less deep than the lower ones; lowest lobe 1 cm. long and the tube below it 3 mm. long; lateral lobes 4 mm. long, about equaling the upper ones; corolla nearly 1 cm. long; banner orbicular, with a short claw; blades of the wings broadly oblong, with a rounded basal lobe, 7 mm. long, those of the keel-petals broadly lunate, 5.5-6 mm. long, the claws of both 3 mm. long; tenth filament free to near the base; pod obliquely ovate, 7 mm. long, white-hairy, with black-reticulate veins.

Type collected near Burke's Sanitarium, Sonoma County, California, June 24, 1902, *Heller 5761* (herb. N. Y. Bot. Gard.).
DISTRIBUTION: Sonoma and Solano counties, California.

8. *Hoita Hallii* Rydberg, sp. nov.

A perennial; stem less than 1 m. high, angled, sparingly short-pubescent, somewhat branched; stipules lanceolate, acuminate, about 1 cm. long; petioles 3-5 cm. long, glabrous or sparingly short-pubescent; leaflets rhombic-lanceolate, acuminate, 6-10 cm. long, 3-5 cm. wide, glabrous, except the finely pubescent margins, or sparingly pubescent beneath, conspicuously glandular-dotted; peduncles 5-10 cm. long; racemes short, 3-5 cm. long; bracts broadly ovate, conspicuously glandular-dotted and sparingly short-pubescent, 8-10 mm. long; calyx more or less villous; tube 5 mm. long; lobes lanceolate, the upper four 4-5 mm. long, the lowest 6-7 mm. long, acuminate; corolla about 1 cm. long, yellowish except the dark-purple tip of the keel; banner broadly obovate, with a short claw; blades of the wings obliquely oblong-obo-

vate, with a large rounded basal lobe, those of the keel-petals broadly obovate, without a basal lobe; pod ovoid, darkly short-hairy.

Type collected on Humboldt Road, Butte County, California, July 31, 1914, *H. M. Hall 9325* (herb. Univ. Calif. no. 177574).

9. *Hoita Douglasii* (Greene) Rydberg.

Psoralea macrostachya Lindl. Bot. Reg. 21: pl. 1769. 1835. Not *P. macrostachya* DC. 1825.

Psoralea strobilina β T. & G. Fl. N. Am. 1: 689. 1840.

Psoralea Douglasii Greene, Erythraea 3: 99. 1895.

A perennial; stem 1–2 m. high, glabrous, glandular-scabrous or in a variety (*Bridges 74*) canescent-puberulent; leaves pinnately 3-foliolate; stipules subulate, about 5 mm. long; petioles 3–5 cm. long; leaflets rhombic-lanceolate or rhombic-ovate, acute, 2–6 cm. long, more or less puberulent, rarely cinereous; peduncles 5–13 cm. long; racemes 5–8 cm. long; rachis long-hairy; bracts broadly ovate, short-acuminate, 1 cm. long or more, conspicuously glandular and somewhat hairy; calyx long-hairy, the upper 3 clefts about equal, the lower 2 much deeper; lowest lobe lanceolate, 7 mm. long, the upper 4 scarcely more than 2 mm. long; corolla 8–9 mm. long, purplish; banner orbicular, with a short claw; blades of the wings oblong, with a rounded basal lobe, 7 mm. long, those of the keel-petals broadly lunate, 5 mm. long, the claws of both 3 mm. long; pod as in the preceding.

TYPE LOCALITY: California.

DISTRIBUTION: Central and southern California.

ILLUSTRATION: Bot. Reg. 21: pl. 1769.

10. *Hoita strobilina* (H. & A.) Rydberg.

Psoralea strobilina H. & A. Bot. Beech. Voy. 332. 1838.

Psoralea macrostachya β T. & G. Fl. N. Am. 1: 304. 1838.

Lotodes strobilinum Kuntze, Rev. Gen. 194. 1891.

A perennial; stem 6–10 dm. high, angled and grooved, branched, velutinous-puberulent and conspicuously glandular and viscidly long-hairy, especially above; leaves 3-foliolate; stipules ovate, cuspidate, 10–15 mm. long, conspicuously glandular-dotted and long-hairy, membranous; petioles 3–10 cm. long; leaflets 3–8 cm. long, ovate or oval, or those of the lower leaves suborbicular, acute or obtuse, finely pubescent and copiously minutely glandular-dotted above, velutinous beneath; peduncles 4–6 cm. long, densely pubescent and glandular; racemes dense, 3–5 cm. long; rachis densely black-hairy; bracts broadly ovate, acuminate, conspicuously glandular and hirsute; pedicels very short; calyx glandular and long-hirsute with brown, white, or black hairs; tube 5 mm. long; lobes linear-lanceolate, acuminate, the upper four 8–10 mm. long, the lowest one often 12 mm. long; corolla about 15 mm. long; banner obovate, with rounded basal lobes and a short claw; blades of the wings obliquely oblanceolate, obtuse, twice as long as the claws and with a rounded basal lobe, those of the keel-petals broadly lunate, somewhat shorter, without basal lobes; filaments with free tips 1–2 mm. long, the tenth filament more or less adnate; pod ovoid, black-reticulate, short-hairy, 9 mm. long.

TYPE LOCALITY: California.

DISTRIBUTION: San Francisco Bay region of California.

ILLUSTRATIONS: H. & A. Bot. Beech. Voy. pl. 80.

11. *Hoita orbicularis* (Lindl.) Rydberg.

Psoralea orbicularis Lindl. Bot. Reg. 23: pl. 1971. 1837.

Lotodes orbiculare Kuntze, Rev. Gen. 194. 1891.

A perennial; stem prostrate and creeping, glabrous or strigose; leaves 3-foliolate; stipules ovate, about 1 cm. long; petioles 1–5 dm. long, conspicuously punctate, glabrous or somewhat short-pubescent; leaflets orbicular or rounded-obovate, 3–8 cm. long, 3–7 cm. wide, glabrous to cinereous-puberulent; peduncles erect, 2–6 dm. long; racemes 5–30 cm. long, dense; bracts oblong-lanceolate, scarios, 1–2 cm. long, conspicuously glandular and ciliate; calyx densely villous and glandular, unequally cleft; tube 4–5 mm. long; lobes linear-lanceolate, acuminate, the lowest one about 15 mm. long, the rest about 10 mm. long; corolla reddish-purple, 15 mm. long; banner broadly obovate, with a short claw; blades of the wings oblong-oblanceolate, 12

mm. long, with a rounded basal lobe, those of the keel-petals 10 mm. long, obliquely lunate, obtuse, the claws of both 4 mm. long; tenth filament free to near the base; pod about 8 mm. long, hirsute, with a very small straight beak; seed elliptic, light-brown.

TYPE LOCALITY: California.

DISTRIBUTION: California.

ILLUSTRATION: Bot. Reg. 23: pl. 1971; Lounsberry, Guide Wild Fl. pl. 61.

6. RHYTIDOMENE* Rydberg, gen. nov.

Perennials, with creeping rootstocks. Leaves alternate, scattered, digitately 5-7-foliolate, with glandular-dotted linear-filiform leaflets. Flowers in long-peduncled axillary lax racemes. Calyx campanulate, with a short tube, not gibbous at the base, 5-lobed, the lowest lobe the longest. Corolla blue, not strongly veined; banner with a conduplicate orbicular blade and a short doubly bent claw; blades of the wings narrowly obliquely obovate, rounded at the apex, with a small basal lobe and twice as long as the free claws; blades of the keel-petals similar, but one third shorter, barely lobed at the base, united at the rounded apex, each adnate to the adjacent wing at the base. Staminal tube as in *Orbexilum*. Style merely curved upwards. Pod crescent-shaped, somewhat twisted, exerted from the calyx, with a short beak; pericarp coriaceous, obliquely cross-wrinkled.

Type species, *Psoralea Lupinellus* Michx.

1. *Rhytidomene Lupinellus* (Michx.) Rydberg.

Psoralea Lupinellus Michx. Fl. Bor. Am. 2: 58. 1803.

Psoralea lupinella DC. Prodr. 2: 220. 1825.

Psoralea floridana Shuttl.; A. Gray, Pl. Wright. 1: 45; hyponym. 1852.

Lotodes Lupinellus Kuntze, Rev. Gen. 194. 1891.

A perennial, with a creeping rootstock; stem erect or adsurgent, 3-6 dm. high, branching, glabrous, slightly glandular-dotted; leaves digitately 5-7-foliolate; stipules 2-5 mm. long; petioles 2-3 cm. long; leaflets 5-8 cm. long, linear to filiform, with a few scattered glands; peduncles 5-7 cm. long; racemes lax, 2-5 cm. long, few-flowered; bracts minute, ovate, cuspidate; calyx sparingly strigose, enlarging in fruit; tube 1.5 mm. long, sparingly glandular-punctate beneath; two uppermost lobes broadly ovate, acute, 1 mm. long, the lateral ones ovate-lanceolate, slightly longer, the lowest one subulate, fully 2 mm. long; corolla blue; pod 1 cm. long, glandular; seed kidney-shaped, brown.

TYPE LOCALITY: Arid places of Carolina.

DISTRIBUTION: North Carolina to Florida.

7. PSORALIDIUM† Rydberg, gen. nov.

Perennial herbs, with rootstocks. Leaves alternate, glandular-dotted, digitately 3-5-foliolate. Flowers in long-peduncled interrupted spikes or racemes, bearing 1-4 flowers at each node. Calyx campanulate, with a short tube, 5-lobed, the lowest lobe usually somewhat longer than the rest. Corolla blue or purple, sometimes whitish, with purple-tipped keel; banner rounded-obovate to nearly orbicular, usually with narrow lobes at the base of the blade and a short narrow straight claw; blades of the wings and keel-petals united below, obliquely oblanceolate, oblong, or obovate, rounded at the apex, each with a small basal lobe, those of the wings twice as long as their claws and as long as the blades of the keel-petals. Staminal tube as in *Orbexilum*. Tenth stamen usually free to near the base. Style bent above; stigma capitate. Pod from orbicular to oblong-ovate, somewhat compressed, glandular-dotted but not wrinkled, with a short straight beak; pericarp coriaceous, not attached to the seed.

Type species, *Psoralea tenuiflora* Pursh.

Pod suborbicular, abruptly contracted into the beak; corolla mostly whitish or pale, only the keel with a dark-purple tip; blades of the wings obliquely oblong. I. LANCEOLATA.
Racemes short, dense, 1-3 cm. long; calyx-lobes obtuse or rounded at the apex.

* From *βυτίς*, wrinkle, and *μηνή*, crescent, referring to the shape of the wrinkled pod.

† Diminutive of *Psoralea*.

- Pod sparingly strigose.
 Leaflets from linear to broadly oblanceolate
 Leaflets narrowly linear.
- Pod densely long-villous; leaflets oblanceolate to obovate.
 Racemes lax and elongate, 3-7 cm. long; calyx-lobes acute.
 Leaflets oblanceolate; pod densely villous.
 Leaflets narrowly linear; pod merely strigose.
- Pod ovate, more gradually tapering into the beak; corolla mostly blue, rarely purplish.
- Stem-leaves developed normally, 3-5-foliolate.
 Flowers distinctly pedicelled; blades of the wings mostly obliquely obovate. II. TENUIFLORA.
- Calyx-lobes acute.
 Leaflets narrowly linear; corolla 7-8 mm. long; pod gradually beaked. ✓ 1. *P. lanceolatum*.
 Leaflets broader; corolla 5-6 mm. long; pod abruptly short-beaked. ✓ 2. *P. micranthum*.
 Stem-leaves with oblanceolate, oblong, or linear leaflets. ✓ 3. *P. Purshii*.
 Racemes short, few-flowered; flowers about 5 mm. long, mostly 1 or 2 at each node; leaves rarely 5-foliolate. ✓ 4. *P. stenostachys*.
 Racemes elongate, many-flowered; flowers about 6 mm. long, usually 2-4 at each node; stem-leaves often 5-foliolate. ✓ 5. *P. stenophyllum*.
- Stem-leaves with obovate or broadly oblanceolate leaflets; flowers 6 mm. long, usually 2-4 at each node. ✓ 6. *P. linearifolium*.
 Calyx-lobes rounded or obtuse at the apex; corolla about 4 mm. long. ✓ 7. *P. tenuiflorum*.
 Flowers sessile or nearly so; blades of the wings obliquely oblanceolate. ✓ 8. *P. floribundum*.
 ✓ 9. *P. Bigelovii*.
 ✓ 10. *P. obtusilobum*.
- III. DIGITATA.
 Calyx accrescent in fruit; leaflets linear or linear-oblanceolate. ✓ 11. *P. digitatum*.
 Calyx not accrescent in fruit; leaflets oblanceolate to obovate. ✓ 12. *P. collinum*.
 Plant green; lowest calyx-lobe not much longer than the rest. ✓ 13. *P. argophyllum*.
 Plant silvery-white; lowest calyx-lobe much exceeding the rest, about equaling the corolla. ✓ 14. *P. junceum*.
 Stem-leaves reduced to small subulate scales; blades of the wings obliquely oblanceolate. IV. JUNCEA.

1. *Psoralidium lanceolatum* (Pursh) Rydberg.

- Psoralea lanceolata* Pursh, Fl. Am. Sept. 475. 1814.
Psoralea elliptica Pursh, Fl. Am. Sept. 741. 1814.
Psoralea arenaria Nutt. Gen. 2: 103. 1818.
Psoralea laxiflora Nutt.; T. & G. Fl. N. Am. 1: 299. 1838.
 ? *Psoralea scabra* Nutt.; T. & G. Fl. N. Am. 1: 300. 1838.
Lotodes ellipticum Kuntze, Rev. Gen. 193. 1891.
Lotodes ellipticum angustissimum Kuntze, Rev. Gen. 193. 1891.

A perennial, with a creeping branched rootstock; stem 1.5-4 dm. high, aromatic, glandular-punctate throughout, sparingly strigose; leaves palmately 3-foliolate; stipules linear-lanceolate to subulate, 3-10 mm. long; petioles 1-2 cm. long; leaflets 1-4 cm. long, oblanceolate to linear or those of the earlier leaves obovate-oblanceolate, acute to rounded and mucronate at the apex, sparingly strigose, especially along the veins beneath, and conspicuously punctate; peduncles 2-5 cm. long; racemes short, 1-2.5 cm. long; bracts minute, and conspicuously punctate; peduncles strigose, 2 mm. long; lobes nearly equal, obtuse, glandular-punctate; corolla white or slightly purple-tinged, 5-6 mm. long; banner almost orbicular; blades of the wings obliquely oblong-oblanceolate; keel-petals scarcely lobed at the base and usually purple-tipped; stigma capitate; pod globose, 5 mm. long, conspicuously glandular-warty, sparingly strigose or glabrate, the beak short, erect.

TYPE LOCALITY: Banks of the Missouri [probably Montana].

DISTRIBUTION: Missouri to Saskatchewan, Alberta, and Arizona.

ILLUSTRATIONS: Hook. Fl. Bor. Am. pl. 51; Britt. & Brown, Ill. Fl. f. 2086; ed. 2. f. 2491.

2. *Psoralidium micranthum* (A. Gray) Rydberg.

- Psoralea micrantha* A. Gray, in Torr. Pacif. R. R. Rep. 4: 77. 1857.
Lotodes micranthum Kuntze, Rev. Gen. 194. 1891.

A perennial, with a creeping branched rootstock; stem glabrous or sparingly strigose, glandular-punctate; leaves digitately 3-foliolate; stipules subulate, early deciduous; petioles 1.5-3 cm. long; leaflets narrowly linear, 1-5 cm. long, 1-3 mm. wide, sparingly strigose or glabrous, acute at both ends; peduncles 2-4 cm. long; racemes more lax than in the preceding, 2-5 cm. long;

calyx campanulate, sparingly strigose, 1.5 mm. long; lobes rounded-oval, half as long as the tube, rounded at the apex; corolla 5 mm. long, white except the tip of the keel; banner rounded-ovobate; keel purple-tinged at the tip; pod globose, fully 5 mm. long, with a short erect beak, glandular-warty. (Perhaps not distinct from the preceding species.)

TYPE LOCALITY: On the Canadian.

DISTRIBUTION: Oklahoma to southern Utah, Arizona, and Texas.

ILLUSTRATION: Britt. & Brown, Ill. Fl. f. 2087.

3. *Psoralidium Purshii* (Vail) Rydberg.

Lotodes ellipticum latifolium Kuntze, Rev. Gen. 193. 1891.

Psoralea Purshii Vail, Bull. Torrey Club 21: 94. 1894.

Psoralea lanceolata Purshii Piper; Piper & Beattie, Fl. Palouse Reg. 106. 1901.

Psoralea lanceolata scabra Piper, Contr. U. S. Nat. Herb. 11: 364. 1906.

A perennial, with a creeping rootstock; stem adsurgent or erect, glandular-punctate and strigose, 1-6 dm. high; leaves digitately 3-foliolate; stipules lanceolate or subulate, 4-7 mm. long; leaflets 1.5-4 cm. long, obovate or broadly oblanceolate or those of the upper leaves narrower, retuse or mucronate at the apex, sparingly strigose and conspicuously punctate; peduncles 2-4 cm. long; racemes rather dense, 1-2 cm. long; bracts minute; calyx 2 mm. long, strigose and ciliate on the margin, scarcely one third as long as the tube; corolla about 5 mm. long, white; banner rounded-ovobate; pod globose, fully 5 mm. long, densely long-villous, glandular-warty; seed globose, light-brown.

TYPE LOCALITY: Empire City, Nevada.

DISTRIBUTION: Idaho and Washington to Wyoming and Arizona.

4. *Psoralidium stenostachys* Rydberg.

Psoralea stenostachys Rydb. Bull. Torrey Club 40: 46. 1913.

A perennial, with a horizontal rootstock; stem adsurgent or erect, branched, sparingly strigose and glandular-dotted, 3-5 dm. high; leaves digitately 3-foliolate; stipules subulate, 4-6 mm. long, early deciduous; petioles 1-3 cm. long; leaflets oblanceolate, 2-4 cm. long, from rounded and mucronate to acute at the apex, sparingly strigose and conspicuously glandular-punctate; peduncles 5-15 cm. long; racemes elongate, many-flowered, lax, 3-7 cm. long; calyx densely white-strigose and ciliate; tube 1.5 mm. long; teeth 0.5 mm. long, triangular, acute; corolla white, fully 4 mm. long; banner orbicular; keel purplish-tipped; pod globose, densely white-villous.

TYPE LOCALITY: Government Well, Toole County, Utah.

DISTRIBUTION: Northern Utah.

5. *Psoralidium stenophyllum* Rydberg.

Psoralea stenophylla Rydb. Bull. Torrey Club 40: 46. 1913.

A perennial, with a horizontal branched rootstock; stem simple, about 3 dm. high, slender, sparingly strigose and glandular-punctate; leaves digitately 3-foliolate or the lower 5-foliolate; stipules linear to subulate, 3-8 mm. long; petioles 3-4 cm. long; leaflets narrowly linear, 2.5-5 cm. long, about 2 mm. wide, glandular-punctate and sparingly strigose; peduncles 8-10 cm. long; racemes elongate, 5 cm. long or longer, lax; pedicels usually longer than the calyx; calyx sparingly strigose, conspicuously punctate, nearly 2 mm. long; lobes triangular, ciliate on the margins, acute, half as long as the tube; corolla about 4 mm. long, white; ovary sparingly hairy.

TYPE LOCALITY: Near Wilson Mesa, Grand County, Utah.

DISTRIBUTION: Known only from the type locality.

6. *Psoralidium linearifolium* (T. & G.) Rydberg.

Psoralea linearifolia T. & G. Fl. N. Am. 1: 300. 1838.

Psoralea linearifolia robusta Coult. Contr. U. S. Nat. Herb. 1: 34. 1890.

Lotodes linearifolium Kuntze, Rev. Gen. 194. 1891.

A perennial, with a creeping rootstock; stem 3-8 dm. high, sparingly glandular-dotted, sparingly strigose or glabrate, striate, with long slender branches; leaves digitately 3-foliolate or

those of the branches 1-foliolate; stipules lanceolate or subulate, 3-7 mm. long; petioles 1-5 mm. long; leaflets linear, 2-6 cm. long, 1-3 mm. wide, with numerous small glands, glabrous above, sparingly strigose beneath, acute at both ends; peduncles 4-8 cm. long; racemes lax, few-flowered, 3-6 cm. long; flowers 1-4 at each node; bracts lanceolate, acuminate; pedicels 4-8 mm. long; calyx 3-4 mm. long, conspicuously punctate, sparingly strigose; lobes lanceolate, acute, as long as the tube; corolla blue, 7-8 mm. long; banner rounded-obovate; pod 8 mm. long, ovoid, flattened, gradually tapering into a straight beak; seed dark-brown, broadly obliquely reniform.

TYPE LOCALITY: Arkansas.

DISTRIBUTION: Western Nebraska and eastern Wyoming to Arkansas and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2091; ed. 2. f. 2494.

7. *Psoralidium tenuiflorum* (Pursh) Rydberg.

Psoralea tenuiflora Pursh, Fl. Am. Sept. 475. 1814.

Lotodes tenuiflorum Kuntze, Rev. Gen. 194. 1891.

A perennial, with a long rootstock; stem 2-6 dm. high, more or less strigose, glandular-dotted, much branched; leaves digitately 3-foliolate or the lower rarely 5-foliolate; stipules lanceolate, 2-3 mm. long, deciduous; petioles 3-12 mm. long; leaflets 1-4 cm. long, 5-8 mm. wide, oblong-ob lanceolate, obtuse, mucronate, glandular-dotted on both sides, glabrate above, strigose beneath; peduncles 2-4 cm. long; racemes 1.5-4 cm. long; bracts minute, ovate or lanceolate, acuminate; flowers solitary or two at each node; pedicels 2-4 mm. long; calyx 2-2.5 mm. long, sparingly strigose, densely glandular-dotted; lobes nearly equal, lanceolate, acute, nearly equaling the calyx-tube; corolla blue, about 5 mm. long; banner rounded-obovate, nearly orbicular; pod ovoid, 7-8 mm. long, glabrous, densely glandular-dotted, with a short straight beak; seed brown, kidney-shaped, shining.

TYPE LOCALITY: Banks of the Missouri [Montana].

DISTRIBUTION: North Dakota and Montana to Texas and Arizona.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2088; ed. 2. f. 2492; Clements, Rocky Mt. Fl. pl. 28, f. 4.

8. *Psoralidium floribundum* (Nutt.) Rydberg.

Psoralea floribunda Nutt.; T. & G. Fl. N. Am. 1: 300. 1838.

Lotodes floribundum Kuntze, Rev. Gen. 194. 1891.

Psoralea tenuiflora floribunda Rydb. Fl. Neb. 21: 55. 1895.

A perennial, with a horizontal rootstock; stem simple below, branched above, 5-12 dm. high, canescent, strigose, not glandular-dotted; leaves digitately 5-foliolate or those of the branches 3-foliolate; stipules 3-7 mm. long, subulate, deciduous; petioles 0.5-3 cm. long; leaflets 1-5 cm. long, 3-10 mm. broad, elliptic to oblanceolate or linear, mucronate, glandular-dotted on both sides, glabrous above, strigose beneath; peduncles 5-10 cm. long; racemes 4-10 cm. long, many-flowered; flowers 2-4 at each node; bracts lanceolate, acuminate; calyx 3 mm. long, strigose-canescens; lobes subequal, lanceolate, acute, as long as the corolla; corolla 6-7 mm. long, blue or rarely white; banner suborbicular; pod ovoid, glabrous, densely glandular-dotted, with a short erect beak, 8 mm. long; seed kidney-shaped, brown.

TYPE LOCALITY: Plains of the Arkansas.

DISTRIBUTION: Illinois to Nebraska, Texas, and Arkansas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2090; ed. 2. f. 2493.

9. *Psoralidium Bigelovii* Rydberg, sp. nov.

Psoralea floribunda Torr. Bot. Mex. Bound. Surv. 51 (erroneously so referred). 1859.

Psoralea obtusiloba Vail, Bull. Torrey Club 21: 97, mainly. 1894. Not *P. obtusiloba* T. & G. 1838.

A perennial, with a creeping rootstock; stem 3-6 dm. high, canescent, strigose, with more or less spreading branches; leaves digitately 3-foliolate or the lower 5-foliolate; stipules subulate, about 5 mm. long; petioles very short, 2-8 mm. long; leaflets of the stem-leaves usually obovate, 1-3 cm. long, 5-12 mm. wide, with numerous small glands, glabrate above, strigose beneath, retuse or obtuse and mucronate at the apex, those of the branches oblong or oblanceolate, smaller; peduncles 4-7 cm. long; racemes 3-5 cm. long, interrupted, many-flowered; flowers 2 or 3 at each node; pedicels 1-2 mm. long; calyx about 3 mm. long, sparingly long-strigose; upper four lobes lanceolate, fully as long as the tube, the lower one subulate, slightly longer;

corolla about 6 mm. long; banner orbicular; pod ovoid, flattened, copiously glandular-punctate, 6-7 mm. long, with a short erect beak; seed brown, kidney-shaped.

Type collected at the Copper mines [Santa Rita del Cobre], New Mexico, 1850, Bigelow [Mex. Bound. Surv.] 218 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Western Texas and southern Colorado to Arizona and Sonora.

ILLUSTRATION: Britt. & Brown, Ill. Fl. f. 2089 (as *Psoralea obtusiloba*).

10. *Psoralidium obtusilobum* (T. & G.) Rydberg.

Psoralea obtusiloba T. & G. Fl. N. Am. 1: 300. 1838.

Psoralea tenuiflora obtusiloba S. Wats. Bibl. Ind. 255. 1878.

A perennial, with horizontal rootstock; stem 5-10 dm. high, sparingly strigose, with many spreading branches; leaves digitately 3-5-foliolate; stipules subulate, very small; petioles 5-10 mm. long; leaflets obovate to oblanceolate, 1-4 cm. long, 5-10 mm. broad, with many small glands, glabrate above, sparingly strigose beneath, rounded or obtuse, mucronate at the apex; peduncles 2-4 cm. long; racemes 1-3 mm. long; flowers 1-3 at each node; pedicels about 2 mm. long; calyx 1.5 mm. long, sparingly strigose; lobes oblong, obtuse, shorter than the tube; corolla about 4 mm. long, blue; banner orbicular; pod ovoid, flattened, with a short erect beak.

TYPE LOCALITY: Texas.

DISTRIBUTION: Louisiana, Texas, and New Mexico.

11. *Psoralidium digitatum* (Nutt.) Rydberg.

Psoralea digitata Nutt.; T. & G. Fl. N. Am. 1: 300. 1838.

Psoralea campestris Nutt.; T. & G. Fl. N. Am. 1: 301. 1838.

Lotodes campestre Kuntze, Rev. Gen. 194. 1891.

Lotodes digitatum Kuntze, Rev. Gen. 194. 1891.

A perennial, with a rootstock; stem erect, simple below, with ascending-spreading branches, 3-8 dm. high, appressed-canescens throughout; leaves mostly digitately 5-foliolate or those of the branches 3-foliolate; stipules lanceolate, 5-10 mm. long; petioles 2-5 cm. long; leaflets linear or linear-oblanceolate, 2-5 cm. long, 3-5 mm. broad, glabrous above except the midvein, densely silky beneath; peduncles 10-15 cm. long; spikes interrupted, 3-6 cm. long; bracts broadly obovate, 5 mm. long, nearly as broad, sparingly glandular, abruptly short-acuminate; flowers 2-4 at each node, subsessile; calyx 6-7 mm. long, accrescent in fruit, densely silky; lobes ovate-lanceolate, abruptly short-acuminate, the lowest somewhat longer; banner obovate; pod ovoid, 7-8 mm. long, with a flat straight beak; seed ellipsoid, brown, 4-5 mm. long.

TYPE LOCALITY: Sandhills of Red River, Arkansas.

DISTRIBUTION: South Dakota to Colorado, Texas, and Arkansas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. 2093; ed. 2. f. 2496.

12. *Psoralidium collinum* Rydberg.

Psoralea collina Rydb. Fl. Neb. 21: 54. 1895.

A perennial, with a rootstock; stem ascending, diffusely branched, sparingly strigose and glandular-punctate; leaves digitately 3-foliolate or the lower 5-foliolate; stipules lanceolate or subulate, 2-8 mm. long; petioles 5-20 mm. long; leaflets obovate or oblanceolate, mucronate, 2-4 cm. long, glandular-punctate, glabrous or nearly so above, strigose beneath; peduncles 3-5 cm. long; spikes interrupted, lax, 3-5 cm. long; bracts lanceolate, pointed, 3-4 mm. long; flowers 2-4 at each node, sessile; calyx 4 mm. long, strigose; lobes linear-lanceolate, longer than the tube, the lowest only slightly longer; corolla blue, about 6 mm. long; banner broadly obovate; pod ovoid, 6-8 mm. long, tapering into a flat straight beak.

TYPE LOCALITY: Pleasant Valley, Scott's Bluffs County, Nebraska.

DISTRIBUTION: Western Nebraska.

ILLUSTRATIONS: Fl. Neb. 21: pl. 4, f. 6, 7; Britt. & Brown, Ill. Fl. f. 2092; ed. 2. f. 2495.

13. *Psoralidium argophyllum* (Pursh) Rydberg.

Psoralea argophylla Pursh, Fl. Am. Sept. 475. 1814.

Psoralea incana Nutt. (Fraser, Cat.; hyponym. 1813) Gen. 2: 102. 1818.

Psoralea argophylla decumbens A. Gray. Pacif. R. R. Rep. 12²: 41. 1860.

Lotodes argophyllum Kuntze, Rev. Gen. 194. 1891.

Psoralea argophylla robustior Bates, Am. Bot. 20: 16. 1914.

A perennial, with a rootstock; stem erect, 3-5 dm. high, silvery-canescens, divaricately branched; leaves digitately 3-5-foliolate; stipules 5-10 mm. long, lanceolate; petioles 2-5 cm. long; leaflets 1.5-4 cm. long, 5-20 mm. broad, elliptic to broadly obovate, obtuse, often mucronate, more or less silky on both sides, usually silvery-white beneath; peduncles 3-8 cm. long; spikes interrupted, 2-4 cm. long; bracts ovate-lanceolate, 5-10 mm. long, long-acuminate; flowers 2-4 at each node; calyx densely white-silky; tube about 2 mm. long, campanulate; upper four lobes lanceolate, acute, about 3 mm. long, the lowest lobe lanceolate, long-acuminate, 6-7 mm. or in fruit more than 1 cm. long; corolla dark-blue or purple, 8-9 mm. long; banner broadly obovate; pod ovoid, densely silky, 7-8 mm. long, with a flat straight beak; seed brown, oval, compressed, 4 mm. long.

TYPE LOCALITY: Banks of the Missouri [Dakota].

DISTRIBUTION: Wisconsin to Saskatchewan, Wyoming, New Mexico, and Missouri.

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl.* 52; Britt. & Brown, Ill. Fl. *f.* 2094; ed. 2. *f.* 2497.

14. *Psoralidium juncea* (Eastw.) Rydberg.

Psoralea juncea Eastw. Proc. Calif. Acad. II. 6: 286. 1897.

A perennial, with a rootstock, tufted; stem 6-10 dm. high, with numerous nearly erect virgate branches, sparingly strigose or nearly glabrous, sparingly glandular-dotted, striate; lower leaves digitately 3-5-foliolate; petioles 5-7 cm. long; leaflets oblanceolate, acute at both ends or acuminate at the apex, 3-4 cm. long, those of the stem and branches reduced to small subulate scales, 3-4 mm. long, glandular-dotted and strigose; peduncles 1-1.5 dm. long; racemes 1-3 cm. long, few-flowered; flowers 1 or 2 at each node; bracts minute, ovate, acuminate; pedicels about 1 mm. long; calyx canescent-strigose, 2 mm. long; teeth nearly equal, rounded at the apex; corolla dark-blue, 5 mm. long; banner suborbicular, emarginate; pod ovoid, with a short erect beak, densely silky.

TYPE LOCALITY: Epsom Creek, Southeastern Utah.

DISTRIBUTION: Southern Utah.

ILLUSTRATION: Proc. Calif. Acad. II. 6: *pl.* 44.

8. *PEDIOMELUM** Rydberg, gen. nov.

Perennials, with deep-seated round or fusiform, tuberous, farinaceous and edible roots. Leaves alternate, usually digitately 3-7-foliolate, but in one group with the terminal leaflet borne on a prolonged rachis more or less glandular-punctate. Flowers borne in axillary peduncled dense spikes or racemes. Calyx gibbous at the base on the upper side, 5-lobed, its tube usually deeply campanulate, and the lowest lobe usually longest. Corolla blue or purple, its petals not strongly veined; banner broadly oblanceolate or obovate, tapering into the claw, which is broad above, attenuate towards the base, decidedly curved and boat-shaped; blades of the wings obliquely usually oblong-oblanceolate, each with a distinct basal lobe and usually twice as long as the claw; blades of the keel-petals similar, broader and shorter, united at the rounded apex and each adnate to that of the adjacent wing at the base. Staminal tube nearly as in *Orbexilum* but usually longer. Style abruptly bent above. Stigma capitate. Pod with an oval compressed body and a long flat sword-shaped beak, as long as or longer than the body; pericarp of the body thin, free from the seed, irregularly or regularly bursting around the middle, the upper part together with the beak falling off, thus setting the seed free or carrying it along in falling.

Type species, *Psoralea esculenta* Pursh.

Rachis not produced beyond the lowest leaflets; leaves therefore truly digitate; calyx and claw of the banner long. Subgenus EUPEDIOMELUM.

Stem usually comparatively tall, 2-10 dm. high, leafy.

Plant with comparatively short, mostly appressed pubescence.

Leaflets broadly obovate, distinctly petioluled, canescent beneath; bracts 4-6 mm. long, not exceeding the pedicels in length. *1. P. canescens.*

Leaflets narrower, sessile or nearly so, green; bracts 6-25 mm. long, usually longer than the pedicels.

Leaflets linear; bracts shorter than the calyx. *2. P. cyphocalyx.*

* From *πειδιον*, plain, and *μηλον*, apple, equivalent to the French name of the type, "Pomme de Prairie."

- Leaflets oblong, oblanceolate, or obovate; bracts as long as the calyx or longer.
- Bracts broadly ovate, enclosing the calyx. 3. *P. Reverchoni*. (—)
- Bracts lanceolate or linear-lanceolate, not enclosing the calyx. Bracts ovate-lanceolate, acuminate, 10–15 mm. long, scarcely exceeding the calyx. 4. *P. cuspidatum*. (—)
- Bracts linear-lanceolate, caudate-attenuate, 15–20 mm. long, much exceeding the calyx. 5. *P. caudatum*.
7. *P. esculentum*.
- Plant with long spreading pubescence.
- Stem very low (plant often subacaulescent), usually less than 1 dm. high, sometimes with the lower branches elongate, 1–2 dm. long and prostrate.
- Plant green, sparingly hirsute or strigose; leaflets oblong, oblanceolate, or rarely obovate.
- Upper 4 calyx-lobes very short, triangular, the lowest one obovate or spatulate; leaflets glabrous except the ciliate margins. 6. *P. subacaule*.
- Upper 4 calyx-lobes subulate or lanceolate, 5 mm. long or more; leaflets pubescent at least beneath.
- Plant hirsute; lowest calyx-lobe slightly broader, but scarcely longer than the rest; seeds smooth.
- Plant usually with a distinct leafy stem; upper two calyx-lobes united about half their length. 7. *P. esculentum*.
- Plant subacaulescent; stem above ground almost none; upper calyx-lobes distinct. 8. *P. subulatum*.
- Plant appressed-strigose; lowest calyx-lobe much broader and longer than the rest; seeds reticulate.
- Peduncles much shorter than the petioles, scarcely longer than the spikes; root oblong-fusiform; lowest calyx-lobe ovate-lanceolate. 9. *P. hypogaeum*.
- Peduncles often equaling the petioles, three to four times as long as the spikes; root globose; lowest calyx-lobe narrowly lanceolate. 10. *P. scaposum*.
- Plant decidedly canescent; leaflets broadly obovate.
- Lowest calyx-lobe not much larger than the rest; seeds smooth.
- Flowers distinctly pedicelled; pedicels 4–6 mm. long. 11. *P. californicum*.
- Flowers subsessile; pedicels 3 mm. long or less.
- Petioles with appressed pubescence; corolla nearly 2 cm. long. 12. *P. megalanthum*.
- Petioles with spreading or retrorse hairs.
- Corolla about 12 mm. long; leaflets cuneate-obovate. 13. *P. mephiticum*.
- Corolla about 17 mm. long; leaflets rounded-obovate, almost orbicular. 14. *P. retrorsum*.
- Lowest calyx-lobe much larger than the rest; seeds reticulate.
- Lowest calyx-lobe rounded or obtuse at the apex, about 10 mm. long. 15. *P. castoreum*.
- Lowest calyx-lobe acute at the apex, 12–15 mm. long. 16. *P. trinervatum*.
- Rachis produced beyond the lowest leaflets, bearing the terminal one at its end; calyx and claw of the banner short. Subgenus GEOMELUM. 17. *P. pentaphyllum*.
- Leaflets 5; 4 sessile together and 1 on the produced rachis.
- Leaflets 3; 2 sessile and 1 on the produced rachis.
- Plant caulescent; spikes few-flowered; corolla less than 1 cm. long.
- Petioles usually longer than the leaflets.
- Beak of the pod much longer than the body. 18. *P. rhombifolium*.
- Beak of the pod scarcely longer than the body.
- Leaves and calyx densely canescent; lowest calyx-lobe not much longer than the rest. 19. *P. Sonorae*.
- Leaves and calyx glabrous or nearly so; lowest calyx-lobe much exceeding the rest. 20. *P. oliganthum*.
- Petioles shorter than the leaflets. 21. *P. brachypus*.
- Plant acaulescent; spikes many-flowered; corolla 15 mm. long or more. 22. *P. humile*.

1. *Pediomelum canescens* (Michx.) Rydberg.

Psoralea canescens Michx. Fl. Bor. Am. 2: 57. 1803.
Lotodes canescens Kuntze, Rev. Gen. 194. 1891.

A perennial, with a subglobose or fusiform tuberous root sometimes 4 mm. thick; stem 3–10 dm. high, coarsely canescent, much branched; leaves digitately 1–3-foliolate, subsessile or short-petioled; petioles 8 mm. long or less; stipules lanceolate or subulate, 1 cm. long or less; leaflets rounded-obovate, narrowed into distinct petiolules, 2–5 cm. long, rounded at the apex, minutely glandular-punctate and glabrate above, villous-canescens beneath; peduncles 2–5 cm. long; spikes loose, short, 2–4 cm. long; bracts 4–6 mm. long, ovate-acuminate; flowers short-pedicelled; calyx sparingly pubescent, 7 mm. long; lobes broadly lanceolate, acuminate, the upper four nearly 4 mm. long, the lowest about 7 mm. long; corolla dark-blue, 10–12 mm. long;

banner obovate, the basal lobes small, half-round; wings with an oblong basal lobe; pod 1 cm. long, ovate with a broad straight beak; seed nearly orbicular, dark-brown.

TYPE LOCALITY: Carolina.

DISTRIBUTION: North Carolina to Florida and Alabama.

2. *Pediomelum cyphocalyx* (A. Gray) Rydberg.

Psoralea cyphocalyx A. Gray, Bost. Jour. Nat. Hist. 6: 172. 1850.

? *Psoralea palmata* Buckl. Proc. Acad. Phila. 1861: 451. 1862.

Lotodes cyphocalyx Kuntze, Rev. Gen. 194. 1891.

A perennial, with a tuberous globular or ellipsoid root sometimes 2 cm. thick; stem 5-10 dm. high, simple below, branched above, strigose; leaves digitately 3-5-foliolate; stipules subulate or linear, 8-10 mm. long; petioles 1-6 cm. long; leaflets linear, 4-10 cm. long, 5-8 mm. wide, with numerous small glands, glabrous above, strigose beneath; peduncles 2-5 cm. long; spikes short and dense, 2-4 cm. long; bracts lanceolate or ovate-cuspidate, 6-8 mm. long, conspicuously glandular-punctate; calyx about 8 mm. long; lobes lanceolate, acuminate, nearly equal; corolla about 1.5 cm. long, similar to that of the preceding; pod rounded-ovoid, with a broad straight beak, 8 mm. long, densely punctate, sparingly strigose; seed dark-brown, nearly orbicular, compressed.

TYPE LOCALITY: Rocky prairies on the Cibola [Texas].

DISTRIBUTION: Texas.

3. *Pediomelum Reverchoni* (S. Wats.) Rydberg.

Psoralea Reverchoni S. Wats. Proc. Am. Acad. 21: 447. 1886.

A perennial, with a tuberous root; stem 5-8 dm. high, strigose-canescens, branched; leaves digitately 3-5-foliolate; stipules subulate, 3 mm. long; petioles 3-6 mm. long; leaflets 1.5-4 cm. long, 5-8 mm. broad, elliptic to linear-oblong, acute at each end, copiously and minutely glandular-dotted, glabrate above, sparingly strigose beneath; peduncles 1-2 cm. long; spikes short, dense; bracts 1-1.5 cm. long, broadly ovate, caudate-cuspidate, strigose, glandular-punctate; flowers subsessile; calyx 1-1.5 cm. long, hirsute and ciliate; lobes lance-linear, acuminate, the upper four about 8 mm. long, the lowest one 1 cm. long or more; corolla about 1.5 cm. long; banner oblanceolate, slightly retuse at the apex; wings with an ovate basal lobe.

TYPE LOCALITY: Hood County, Texas.

DISTRIBUTION: Texas and Oklahoma.

4. *Pediomelum cuspidatum* (Pursh) Rydberg.

Psoralea cuspidata Pursh, Fl. Am. Sept. 741. 1814.

Psoralea macrorrhiza Nutt.; (Fraser, Cat.; hyponym. 1813) Pursh, Fl. Am. Sept. 741, as synonym. 1814.

Psoralea cryptocarpa T. & G. Fl. N. Am. 1: 301. 1838.

? *Psoralea Roemeriana* Scheele, Linnaea 21: 463. 1848.

Lotodes cuspidatum Kuntze, Rev. Gen. 194. 1891.

Psoralea aromatica Payson, Bot. Gaz. 60: 379. 1915.

A perennial, with a fusiform or ellipsoid root; stem 1-6 dm. high, stout, branching, sparingly strigose or glabrate below; leaves digitately 5-foliolate; stipules lanceolate, 1-2 cm. long; petioles 2-3 cm. long; leaflets 2-4 cm. long, elliptic to obovate, finely glandular-punctate, glabrous above, strigose beneath, mucronate; peduncles 3-7 cm. long; spikes dense and short; bracts 1-1.5 cm. long, lanceolate, cuspidate-acuminate; calyx strigose and punctate, about 1 cm. long; lobes lanceolate, acuminate, the upper four 3-4 mm. long, the lowest 5-6 mm. long; corolla about 1.5 cm. long, similar to that of the preceding; pod ovoid, without the beak 6 mm. long; seed oval, 5 mm. long.

TYPE LOCALITY: Upper Louisiana [now South or North Dakota].

DISTRIBUTION: Minnesota to Montana, Arkansas, and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2095; ed. 2. f. 2498.

5. *Pediomelum caudatum* Rydberg, sp. nov.

A perennial, with a tuberous root; stem 3-5 dm. high, sparingly strigose, or glabrate below, terete, with spreading branches; leaves digitately 5-foliolate; stipules subulate, 12-15 mm. long,

submembranous; petioles 2–3.5 cm. long; leaflets 2–4 cm. long, broadly oblanceolate, rounded and cuspidate at the apex, glabrous above, strigose beneath, with numerous minute glands; peduncles 5–8 cm. long, grayish-strigose; spikes dense, 4–6 cm. long; bracts linear-lanceolate, caudate-attenuate, 15–25 mm. long, longer than the calyx; calyx glandular-punctate and sparingly hirsute; tube 5–6 mm. long; upper four lobes lanceolate, attenuate, 6 mm. long, the lowest narrowly lanceolate, caudate-attenuate, 8–10 mm. long; corolla 15–16 mm. long, similar to that of the preceding; pod ovoid, thin-walled, glandular-punctate, the beak flattened, as long as the body.

Type collected in sandy soil, Dallas County, Texas, May, *Reverchon* [Curtiss's distribution no. 563** (herb. Columbia Univ.).

DISTRIBUTION: Middle Texas.

6. *Pediomelum subacaule* (T. & G.) Rydberg.

Psoralea subacaulis T. & G. Fl. N. Am. 1: 302. 1838.

Lotodes subacaule Kuntze, Rev. Gen. 194. 1891.

A subacaulescent perennial, with a fusiform tuberous root 5–10 cm. long, 1–3 cm. thick; stem above ground very short; leaves digitately 5–7-foliolate, clustered at the base; stipules ovate, scarious, 1–2 cm. long; petioles 4–8 cm. long, hirsute-villous; leaflets 1.5–4 cm. long, 6–10 mm. wide, oblanceolate or oblong-oblanceolate, obtuse or acute, glabrous except the ciliate margins and midveins beneath; peduncles 4–10 cm. long, villous-hirsute; spikes dense, 2–6 cm. long; bracts ovate-lanceolate, 1–1.5 cm. long, ciliate; calyx hirsute; tube 3 mm. long; upper four lobes triangular, very short, acute, the lowest one obovate or spatulate, rounded or obtuse at the apex, 3 mm. long; corolla purple, 12–15 mm. long, similar to that of *P. cuspidatum*; pod hirsute, ovoid, the flat beak shorter than the body.

TYPE LOCALITY: Nashville, Tennessee.

DISTRIBUTION: Tennessee.

7. *Pediomelum esculentum* (Pursh) Rydberg.

Psoralea esculenta Pursh, Fl. Am. Sept. 475. 1814.

Psoralea brachiata Dougl.; Hook. Fl. Bor. Am. 1: 137. 1831.

Lotodes esculentum Kuntze, Rev. Gen. 194. 1891.

A perennial, with a fusiform to subglobose tuberous root 5–10 cm. long, 2–4 cm. thick; stem erect, 1–3 dm. high (rarely subacaulescent), simple or with a few ascending-spreading branches, hirsute with long spreading or reflexed hairs; leaves digitately 5-foliolate; stipules herbaceous, 1–2 cm. long, lanceolate or ovate-lanceolate; petioles 5–10 cm. long, hirsute; leaflets 2–6 cm. long, 1–2.5 cm. wide, oblong to obovate, obtuse, or rounded, rarely acutish at the apex, sometimes mucronate, glabrous above, hirsute beneath; peduncles 5–10 cm. long; spikes dense, 3–8 cm. long; bracts 1–1.5 cm. long, ovate-lanceolate, acuminate, hirsute; calyx hirsute; tube 4–5 mm. long; lobes lanceolate, acute or acuminate, 7–8 mm. long, subequal, the lowest slightly broader, the upper two more united; corolla 15–17 mm. long; banner broadly oblanceolate, slightly retuse at the apex; pod hirsute, ovoid, the flat beak three times as long as the body; seed 6 mm. long, black.

TYPE LOCALITY: Banks of the Missouri [Montana].

DISTRIBUTION: Manitoba to Alberta, Wyoming, Oklahoma, Missouri, and Wisconsin.

ILLUSTRATIONS: Pursh, Fl. Am. Sept. *pl.* 22; Hook. Fl. Bor. Am. 1: *pl.* 53; Britt. & Brown, Ill. Fl. f. 2096; ed. 2. f. 2499.

8. *Pediomelum subulatum* (Bush) Rydberg.

Psoralea esculenta β T. & G. Fl. N. Am. 1: 302, in part. 1838.

Psoralea subulata Bush, Rep. Mo. Bot. Gard. 17: 120. 1906.

A subacaulescent perennial, with an oval tuberous root 2–2.5 cm. thick; stem above ground almost none, hirsute; leaves clustered at the base, digitately 5-foliolate; stipules ovate to lanceolate, membranous; petioles 1–2 dm. long, hirsute; leaflets obovate, obtuse or rounded at the apex, mucronate or cuspidate, long-hirsute beneath, sparingly so or glabrate above, 3–6 cm. long, 2–2.5 cm. wide; peduncles 5–10 cm. long, reclining or curving upwards; spikes oblong, dense, 5–8 cm. long; bracts lanceolate, 6–8 mm. long; calyx hirsute; tube 5 mm. long; upper

four lobes subulate, 8 mm. long, the lowest lanceolate, acute, slightly if at all longer; corolla about 1.5 cm. long, similar to that of *P. esculentum*; pod hirsute, the body 4-5 mm. long, tipped with a flat subulate beak, 12-15 mm. long; seed black.

TYPE LOCALITY: Dallas County, Texas.

DISTRIBUTION: Texas to Louisiana.

9. *Pediomelum hypogaeum* (Nutt.) Rydberg.

Psoralea hypogaea Nutt.; T. & G. Fl. N. Am. 1: 302. 1838.

Lotodes hypogaeum Kuntze, Rev. Gen. 194. 1891.

A subcaulescent perennial, with an oblong-fusiform tuberous root 1-1.5 cm. thick, 2-5 cm. long; stem above ground nearly none; leaves digitately 5-foliolate, clustered at the base; stipules membranous, ovate or lanceolate; petioles 3-10 cm. long, strigose with long appressed hairs; leaflets 2-5 cm. long, 5-7 mm. wide, linear, linear-ob lanceolate, or linear-oblong, acute, glabrous or nearly so above, strigose beneath; peduncles usually short, from almost none to 3 cm. long; spikes very dense, 1-3 cm. long; bracts scarious, ovate, acute, hirsute, 5-8 mm. long; calyx hirsute-strigose; tube 4 mm. long; upper four lobes subulate or lance-subulate, 6 mm. long, the lowest one ovate-lanceolate, 8-10 mm. long; corolla about 12 mm. long, similar to that of *P. esculentum*; pod hirsute, the body ovoid, 5 mm. long, the beak flat, about 8 mm. long; seed light-brown, wrinkled.

TYPE LOCALITY: Plains of the Platte [Nebraska].

DISTRIBUTION: Nebraska to Montana, Utah, New Mexico, and Oklahoma.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2097; ed. 2. f. 2500.

10. *Pediomelum scaposum* (A. Gray) Rydberg, sp. nov.

Psoralea hypogaea scaposa A. Gray, Bost. Jour. Nat. Hist. 4: 173. 1850.

A subcaulescent perennial, with a globose tuberous root 1-2 cm. in diameter; stem above ground nearly none; leaves digitately 5-foliolate, clustered at the base; stipules membranous, lanceolate, 1 cm. long or less; petioles 5-8 cm. long, strigose; leaflets 1.5-3 cm. long, 4-6 mm. wide, linear-ob lanceolate to oblong-ob lanceolate, long-strigose on both sides or glabrate above; peduncles 3-6 cm. long, strigose; spikes dense, 1-2 cm. long; bracts scarious, ovate-lanceolate, acuminate, hirsute, about 5 mm. long; calyx hirsute-strigose; tube 3 mm. long; upper four calyx-lobes lance-subulate, 5 mm. long, the lowest one narrowly lanceolate, 7-8 mm. long; corolla about 1 cm. long, similar to that of *P. esculentum*; pod hirsute, similar to that of the preceding.

TYPE LOCALITY: Hills on the Pinedales, near Fredericksburg, western Texas.

DISTRIBUTION: Texas.

11. *Pediomelum californicum* (S. Wats.) Rydberg.

Psoralea californica S. Wats. Proc. Am. Acad. 12: 251. 1877.

Lotodes californicum Kuntze, Rev. Gen. 194. 1891.

Psoralea monticola Greene, Erythea 3: 98. 1895.

A perennial, with an enlarged fusiform or branched, farinaceous root; stem short, but with the lower branches prostrate, elongate, 1-3 dm. long, strigose-canescens with scattered spreading hairs; leaves digitately 5-foliolate; stipules lanceolate, 5-10 mm. long, acuminate; petioles 3-10 cm. long, strigose-hirsute with scattered spreading hairs; leaflets cuneate-obovate, 1-3 cm. long, rounded or retuse at the apex, strigose-canescens on both sides; peduncles of the main stem 3-4 cm. long, those of the branches much shorter, with spreading or reflexed pubescence; racemes dense, 2-4 cm. long; bracts narrowly lanceolate, 5-10 mm. long; pedicels 4-6 mm. long, silky-hirsute; calyx long-silky; tube campanulate, 4 mm. long; lobes 5-6 mm. long, the upper four linear-subulate, the lowest one linear-lanceolate; corolla about 12 mm. long; banner almost white, obovate, obtuse, with triangular basal lobes; wings and keel purple; pod ovoid, the body 6 mm. long, the beak somewhat longer; seed dark-brown, smooth, somewhat mottled.

TYPE LOCALITY: McGinnis Range, near the headwaters of Salinas River, California.

DISTRIBUTION: California and northern Lower California.

12. *Pediomelum megalanthum* (Wooton & Standley) Rydberg.

Psoralea mephitica Rydb. Fl. Colo. 214. 1906. Not *P. mephitica* S. Wats. 1879.
Psoralea megalantha Wooton & Standley, Contr. U. S. Nat. Herb. 16: 140. 1913.

A low perennial, with a tuberous root; stem above ground very short; leaves digitately 5-6-foliolate, clustered at the base; stipules scarious, ovate, about 1 cm. long; petioles 4-8 cm. long, densely white-strigose; leaflets obovate, 1-3 cm. long, densely white-strigose beneath, less densely so above; peduncles stout, 1-4 cm. long, white-strigose and with a few spreading hairs; spikes about 2 cm. long, dense; bracts lanceolate or ovate-lanceolate, about 1 cm. long, acute; pedicels 1-3 mm. long; calyx campanulate; tube 5-6 mm. long; lobes about 1 cm. long, all subulate; corolla 2 cm. long or nearly so; banner oblong.

TYPE LOCALITY: Aztec, New Mexico.

DISTRIBUTION: Western Colorado, eastern Utah, and northern New Mexico.

13. *Pediomelum mephiticum* (S. Wats.) Rydberg.

Psoralea mephitica S. Wats. (E. Palmer, Am. Nat. 12: 601; hyponym. 1878) Proc. Am. Acad. 14: 291. 1879.

A perennial, with a fusiform root about 1 dm. long and 1 cm. thick; stem above ground scarcely any; leaves clustered at the base, digitately 5-foliolate; stipules scarious, ovate, acuminate, 1 cm. long or less; petioles 4-6 cm. long, with spreading or retrorse pubescence; leaflets cuneate or obovate, rounded or retuse at the apex, 1-2 cm. long, canescently strigose beneath, less densely so or glabrate above; peduncles 2-5 cm. long, with spreading or reflexed white hairs; spikes about 2 cm. long, dense; bracts ovate, scarious, acuminate or acute; calyx long-hairy; tube 4 mm. long; lobes subequal in length, 7-8 mm. long, the upper four subulate, the lowest one lanceolate; corolla blue, about 12 mm. long; banner oblong.

TYPE LOCALITY: Near Beaver City, Utah [as given by Watson; Palmer, *loc. cit.*, gives the locality southeast of St. George, Utah].

DISTRIBUTION: Southern Utah and Arizona.

14. *Pediomelum retrorsum* Rydberg, sp. nov.

A perennial, with a fusiform root about 2 cm. thick; stem very short, usually with a few decumbent stout branches, 1-2 dm. long, densely canescent with long retrorse hairs; leaves digitately 5-foliolate; stipules ovate, 1-1.5 cm. long, densely hairy; petioles 3-12 cm. long, retrorsely hairy; leaflets rounded-obovate, 2-4 cm. long, densely silky-canescens with appressed hairs, the veins prominent on the upper side; peduncles of the main stem 5-7 cm. long, those of the branches often very short, only 1-2 cm. long, densely retrorse-hairy; spikes 3-7 cm. long; bracts lanceolate, acuminate; pedicels 1-2 mm. long or less; calyx silky-hirsute; tube 5 mm. long; lobes about 7 mm. long, the upper 4 subulate, the lowest one linear-lanceolate; corolla about 17 mm. long; banner obovate, with rounded basal lobes.

Type collected at Peach Spring near Big Bend of the Colorado, Arizona, June, 1884, *J. G. Lemmon & wife* (herb. Columbia Univ.).

DISTRIBUTION: Type locality and vicinity.

15. *Pediomelum castoreum* (S. Wats.) Rydberg.

Psoralea castorea S. Wats. (E. Palmer, Am. Nat. 12: 601; hyponym. 1878) Proc. Am. Acad. 14: 291. 1879.
Lotodes castoreum Kuntze, Rev. Gen. 194. 1891.

A perennial, with a fusiform, farinaceous, tuberous root 5-8 cm. long, 1-3 cm. thick; stem very short, less than 1 dm. high, strigose-canescens, sometimes with decumbent branches 1 dm. long or more; leaves digitately 3-5-foliolate; stipules membranous, ovate, acute, 1 cm. long; petioles 5-10 cm. long; leaflets cuneate-obovate, rounded, acute, or even retuse at the apex, strigose-canescens beneath, sparingly strigose above, 2-4 cm. long; peduncles 3-5 cm. long; spikes dense, 2-4 cm. long; bracts ovate, lanceolate, or oblong, acute or obtuse, 5 mm. long or less; calyx canescens-strigose; tube 2 mm. long; upper four lobes subulate, attenuate, 7-8 mm. long, the lowest one spatulate or obovate, rounded or obtuse at the apex, about 10 mm. long; corolla blue, fully 1 cm. long; banner oblong; body of the pod ovoid, 8 mm. long, the

flat attenuate beak 14–15 mm. long; seed 7 mm. long, flattened, transversely wrinkled, light-brown.

TYPE LOCALITY: Near Beaver City, Utah [according to Watson, but Palmer, *loc. cit.*, gives the locality as "between Beaver Dam, Arizona, and Saint Thomas, Nevada."].

DISTRIBUTION: Southern Utah and Nevada, Arizona, and southern California.

16. *Pediomelum trinervatum* Rydberg, sp. nov.

Psoralea esculenta Torr. Bot. Mex. Bound. Surv. 51. 1859. Not *P. esculenta* Pursh, 1814.

A perennial, with a fusiform, tuberous, farinaceous root, the tuberous portion about 5 cm. long, 2 cm. thick; stem above ground very short, less than 5 cm. long; leaves digitately 5-foliolate; stipules ovate or lanceolate, acuminate, 5–10 mm. long; petioles about 1 cm. long, strigose; leaflets obovate, cuspidate, 2–3 cm. long, often more or less undulate-crisp on the margins, strigose on both sides; peduncles 5–7 cm. long; spikes about 3 cm. long, dense; bracts lanceolate, acute, about 5 mm. long; calyx strigose-canescens; tube 4 mm. long; upper 4 calyx-lobes subulate, nearly 1 cm. long, attenuate, the lowest one oblanceolate, 12–15 mm. long, short-acuminate or acute, conspicuously 3-ribbed, at least in age; corolla blue, 15 mm. long; banner oblong; body of the fruit ovoid, 7 mm. long, the beak flat, attenuate, 12–14 mm. long; seeds dull-brown, 6 mm. long, strongly reticulate.

Type collected in the vicinity of Chihuahua, June 5–10, 1908, *Edward Palmer 356* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: New Mexico and Chihuahua.

17. *Pediomelum pentaphyllum* (L.) Rydberg.

Psoralea pentaphylla L. Sp. Pl. 764. 1753.

Lotodes pentaphyllum Kuntze, Rev. Gen. 194. 1891.

A perennial, with a subglobose tuber 1.5–2 cm. thick; stem branched at the base, decumbent, 1–3 dm. long, terete, slender, strigose; leaves pedately 3–5-foliolate; stipules subulate, small; petioles 3–5 cm. long, the 4 (rarely 2) lower leaflets inserted nearly at the same point, the terminal one borne on a prolongation of the rachis 5–10 mm. long; all linear-oblong to elliptic, 1–2.5 cm. long, sparingly strigose on both sides, acute at each end; peduncles axillary, 1–2 cm. long; spikes very short, 2–8-flowered; calyx strigose in anthesis, 3 mm. long, enlarging in fruit and becoming 6–7 mm. long; lobes lance-subulate, slightly longer than the tube; corolla about 6 mm. long, blue; banner obovate, with triangular basal lobes; body of the fruit ovoid, flattened, 5 mm. long, strigose, the beak 6 mm. long; seed smooth, slightly longer than broad, about 5 mm. long, grayish-brown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Chihuahua and Coahuila to Jalisco, San Luis Potosí, and Guanajuato.

ILLUSTRATION: Hist. Acad. Sci. Paris 1744: pl. 17.

18. *Pediomelum rhombifolium* (T. & G.) Rydberg.

Psoralea rhombifolia T. & G. Fl. N. Am. 1: 303. 1838.

Lotodes rhombifolium Kuntze, Rev. Gen. 194. 1891.

A perennial, with a deep-seated, fusiform, farinaceous root; stem branching at the base, 1–5 dm. long, decumbent or trailing, striate, strigose; leaves pinnately 3-foliolate; stipules subulate or lanceolate, 3–5 mm. long; petioles 2–5 cm. long, or those of the upper leaves shorter; leaflets 1–3 cm. long, ovate-rhombic and acute or those of the lower leaves suborbicular and obtuse or rounded at the apex; peduncles 3–10 cm. long; spikes subcapitate, few-flowered; bracts 3 mm. long, lanceolate; calyx strigose, slightly gibbous on the upper side; tube 2–2.5 mm. long; lowest lobe lanceolate, 4 mm. long, the rest 3 mm. long; corolla dark-blue or reddish, 7 mm. long; banner obovate, retuse, with distinct rounded basal lobes; pod strigose, the body ovoid, 4–5 mm. long, the beak straight, about 8 mm. long; seed brownish, obliquely oval, shining or slightly curved.

TYPE LOCALITY: Texas.

DISTRIBUTION: Louisiana to Texas, Tamaulipas, and Lower California.

19. *Pediomelum Sonorae* Rydberg, sp. nov.

A perennial, with a fusiform deep-seated root; stem branched at the base; branches prostrate, 1–4 dm. long, grayish, strigose; leaves pinnately 3-foliolate; stipules lanceolate, 3–5

mm. long; petioles 2-3 cm. long; leaflets broadly ovate to orbicular, mostly obtuse, sparingly strigose above, strigose-canescens beneath, 7-20 mm. long; peduncles 1-2 cm. long; spikes few-flowered, subcapitate; bracts elliptic or oval, 2-3 cm. long; calyx densely strigose; tube about 3 mm. long; lobes lanceolate, acute, the lowest about 3 mm. long, the rest slightly shorter; corolla pale, with purple-tipped keel, 7-8 mm. long; banner broadly obovate, with rounded basal lobes; pod strigose, the body 5 mm. long, ovoid, the beak scarcely longer, curved at the apex; seed obliquely oval, shining, brown.

Type collected in the vicinity of Alamos, Sonora, March 17, 1910, *Rose, Standley & Russell 13025* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sonora.

20. *Pediomelum oliganthum* (Brand.) Rydberg.

Psoralea oligantha Brand. Univ. Calif. Publ. Bot. 4: 179. 1911.

A perennial herb, with a fusiform root; stem about 1 dm. long, sparingly strigose; stipules lanceolate or subulate; leaves pinnately 3-foliolate; petioles 4-6 cm. long; leaflets glabrous or with a few appressed hairs, the terminal one broadly ovate, acute or acuminate, or on the lower leaves obtuse, 1.5-2.5 cm. long, the lateral ones oval or elliptic, somewhat smaller; leaflets of the lower leaves much smaller and suborbicular; peduncles 5-6 cm. long; flowers spicate; bracts ovate; calyx strigose on the veins; tube 2.5 mm. long; lowest lobe fully 5 mm. long, lanceolate, acute or obtuse, the rest 3.5 mm. long, narrowly lanceolate, acute or acuminate; corolla fully 8 mm. long; banner broadly obovate; pod obliquely ovate, strigose, the beak not longer than the body.

TYPE LOCALITY: Sierra de Parras, Coahuila.

DISTRIBUTION: Coahuila, and apparently also Jalisco.

21. *Pediomelum brachypus* Rydberg, sp. nov.

A perennial, with a fusiform root; stem branched at the base, decumbent, strigose, 1-3 dm. long; leaves pinnately 3-foliolate; stipules ovate, herbaceous, 3-5 mm. long; petioles less than 1 cm. long; leaflets rhombic-ovate or rhombic-lanceolate, glabrous above, sparingly strigose beneath, rarely 1.5 cm. long, acute; peduncles 2-4 cm. long; spikes few-flowered, subcapitate; calyx sparingly strigose; tube about 2 mm. long; lobes nearly equal, 2 mm. long, lanceolate, acute; corolla 6 mm. long, purplish, otherwise as in *P. rhombifolium*; pod strigose, the body ovate, 4 mm. long, the beak of about the same length, hooked at the apex.

Type collected at Los Naranjos, Oaxaca, August, 1908, *Purpus 3049* (herb. N. Y. Bot. Gard.).

22. *Pediomelum humile* Rydberg, sp. nov.

Psoralea esculenta A. Gray, Pl. Wright. 2: 37 (erroneously referred). 1853.

A subcaulescent perennial, with a fusiform deep-seated root 4-6 cm. long, 1-3 cm. thick; stem above ground almost none; leaves 3-foliolate with stalked terminal leaflet, clustered at the base; stipules membranous, lanceolate; petioles 3-6 cm. long, strigose; leaflets about 2 cm. long, conspicuously glandular-punctate, strigose beneath and on the veins above, the lateral ones broadly and obliquely ovate, sessile, the terminal one broadly rounded-rhombic or suborbicular, on a rachis about 1 cm. long; peduncles about 4 cm. long, strigose; spikes dense, many-flowered, 2-3 cm. long; calyx strigose; tube about 5 mm. long; lobes linear-subulate, 7-8 mm. long; corolla purplish, 15 mm. long or more; fruit unknown.

Type collected in the valley of Rio Grande near Piedras Nigras, Coahuila, April 19, 1910, *Pringle 9205* (U. S. Nat. Herb. no. 381823).

DISTRIBUTION: Type locality and San Felipe, Texas.

9. APOPLANESIA Presl, Symb. Bot. 1: 63. 1831.

Microlobium Liebm. Vidensk. Meddel. 1853: 104. 1854.

Large shrubs, with glandular-dotted foliage. Leaves alternate, odd-pinnate, but leaflets usually not exactly opposite. Stipules none. Flowers in axillary and terminal panicles. Calyx with a short tube; lobes slightly unequal, foliaceous, 3-ribbed, reticulate, obtuse, accrescent in fruit. Corolla sub-papilionaceous; petals short-clawed, of nearly equal length, all

free; banner obovate-oblong, reflexed; wings linear-oblong or oblong-oblancoelate; keel-petals oblong-spatulate. Stamens 10, monadelphous at the base; staminal tube split above; anthers equal. Ovary sessile, with a single ascending ovule; style filiform, persistent; stigma capitate, oblique. Pod half-included, coriaceous, indehiscent, flat, carinate, semiorbicular, conspicuously glandular-punctate.

Type species. *Apoplanesia paniculata* Presl.

1. *Apoplanesia paniculata* Presl, *Symb. Bot.* 1: 64. 1831.

Microlobium glandulosum Liebm. Vidensk. Meddel. 1853: 105. 1854.

? *Psoralea arborea* Sessé & Moc. Fl. Mex. ed. 2. 169. 1894.

Eysenhardtia Oliviana Safford, Jour. Wash. Acad. Sci. 6: 133. 1916.

A shrub, 1.5–2 m. high; branches terete, at first puberulent; leaves 10–17 cm. long; petiole and rachis puberulent and grooved; leaflets 11–17, oblong, 2–5 cm. long, 1–1.5 cm. wide, rounded at both ends or retuse at the apex, glabrous above, puberulent and somewhat paler beneath; petiolules 2–3 mm. long; panicles 1–1.5 dm. long, branched, puberulent; calyx in anthesis 3–5 mm. long, green, glandular-punctate, in fruit 8–10 mm. long; corolla white; petals about 6 mm. long, obtuse, veiny; banner with a yellowish spot at the base; pod 4–5 mm. long, puberulent, conspicuously punctate.

TYPE LOCALITY: Unknown; that of *Microlobium*: Oaxaca, near the Pacific Ocean.

DISTRIBUTION: Colima to Yucatán and Guatemala.

ILLUSTRATIONS: Presl, *Symb. Bot. pl. 41*; Jour. Wash. Acad. Sci. 6: 135. *f. 1*.

10. *PARRYELLA* T. & G.; A. Gray, *Proc. Am. Acad.* 7: 397.

1868.

Low shrubs, with glandular-punctate foliage. Leaves odd-pinnate, with many leaflets. Flowers in terminal racemes. Calyx turbinate, 10-striate, with 5 short equal teeth. Corolla wanting. Stamens 10; filaments free, inserted on the hypanthium; anthers uniform. Ovary 2-ovuled; style thick, bent near the apex; stigma gland-like, lateral. Pod indehiscent, obliquely obovoid, conspicuously glandular-punctate. Seed solitary, oval in outline, somewhat compressed.

Type species, *Parryella filifolia* T. & G.

Leaflets linear-filiform to narrowly elliptic; calyx not conspicuously glandular-punctate.

Leaflets broadly oblong to nearly orbicular; calyx conspicuously glandular-punctate

1. *P. filifolia*.

2. *P. rotundata*.

1. *Parryella filifolia* T. & G.; A. Gray, *Proc. Am. Acad.* 7: 397.

1868.

A low shrub, broom-like, much branched; branches glabrous or sparingly strigose, roughened with somewhat raised glands, becoming ash-colored; leaves 3–12 cm. long, ascending; stipules minute, subulate, deciduous; leaflets 11–45, linear-filiform to oblong, 5–15 mm. long, 0.5–2 mm. wide, strigose or glabrate, conspicuously glandular-punctate, often involute; racemes lax, 5–10 cm. long; bracts minute, deciduous; pedicels 1–1.5 mm. long; calyx 2.5 mm. long, glabrous except the ciliolate margins of the broad triangular teeth; filaments exerted, about twice as long as the calyx; style slightly pilose; pod 5–6 mm. long, 2.5–3 mm. wide, obliquely obovoid, with a short beak, conspicuously glandular-punctate.

TYPE LOCALITY: Along the Rio Grande, below Albuquerque, New Mexico.

DISTRIBUTION: New Mexico and Arizona.

2. *Parryella rotundata* Wooton, *Bull. Torrey Club* 25: 457.

1898.

A low shrub 5–8 dm. high, branching at the ground, spreading; branches canescent-strigose and with numerous glands; leaves 10–12 cm. long; leaflets about 51, broadly elliptic to rounded, obtuse or retuse, 1–6 mm. long, the upper ones very small; stipules 3–5 mm. long, narrowly lanceolate, deciduous; racemes short, crowded, 1–2 cm. long; bracts linear; calyx

cylindro-campanulate, angled, very glandular, about 3 mm. long; teeth triangular, acute, densely villous within; stamens exerted; style sparingly hirsute.

TYPE LOCALITY: Five miles north of Winslow, Arizona.

DISTRIBUTION: Known only from the type locality.

11. AMORPHA L. Sp. Pl. 713. 1753.

Shrubs, with glandular-dotted foliage. Leaves odd-pinnate, with setaceous stipules and petioluled entire leaflets. Flowers in spike-like racemes; bracts mostly subulate and deciduous. Calyx turbinate, slightly oblique, 5-lobed. Corolla consisting of the banner only, which is erect, incurved, obovate or cuneate in outline, with a more or less developed claw, folded around the stamens, blue, purple, or white. Stamens 10; filaments united at the base only, exerted. Ovary 2-ovuled; style slender, bearded; stigma terminal. Pod short, 1- or 2-seeded, indehiscent, oblique, somewhat compressed, rounded and broader at the apex, either with a straight back or upcurved. Seeds elongate, oblong or somewhat curved.

Type species, *Amorpha fruticosa* L.

Calyx-lobes lanceolate to subulate, at least half as long as the tube.

Petioles and rachis of the leaves and usually also the young branches with stalked glands; stipules membranous, lanceolate or oblong.

Plant decidedly pubescent; calyx-lobes about equaling the tube.

1. *A. californica*.

Plant glabrous or nearly so; calyx-lobes about half as long as the tube.

2. *A. hispidula*.

Petioles, leaf-rachis, and branches without stalked glands.

Inflorescence a long, peduncled panicle; leaflets strongly veined and tomentose beneath.

3. *A. paniculata*.

Inflorescence of solitary or clustered sessile racemes.

Plant more or less pubescent.

Calyx-lobes fully as long as the tube; racemes solitary; leaflets brown-villous beneath.

4. *A. Schreveri*.

Calyx-lobes about half as long as the tube; racemes clustered; leaflets canescent.

5. *A. canescens*.

Plant glabrous; racemes solitary; leaflets usually less than 1 cm. long.

6. *A. nana*.

Calyx-lobes very short, the upper broadly triangular or half-round.

Branches, petioles, leaf-rachis, peduncle, and upper surface of the leaflets glabrous or nearly so.

Calyx-lobes all very short, almost obsolete, very broad, separated by broad sinuses; leaflets rounded-oval, often emarginate; pod straight on the back, 7-8 mm. long.

7. *A. glabra*.

Calyx-lobes distinct, the upper two broad, the others lanceolate or subulate.

Pod curved, about 7 mm. long, narrow, scarcely punctate; leaflets broadest below the middle, pubescent beneath.

8. *A. nitens*.

Pod straight on the back, 4-7 mm. long, broad, conspicuously punctate; leaflets broadest at or above the middle, glabrous.

Leaflets broadly oval, usually retuse at the apex. (Glabrate form of)

15. *A. texana*.

Leaflets oblong to obovate or oval, not retuse at the apex.

Leaflets not conspicuously punctate beneath, cuneate at the base; banner usually broader than long.

9. *A. laevigata*.

Leaflets conspicuously punctate beneath, rounded at the base; banner not broader than long.

Calyx with numerous conspicuous glands; pod 4-5 mm. long.

Corolla mostly bluish; leaflets elliptic, mostly rounded at both ends, 1-2 cm. (rarely 2.5 cm.) long; racemes usually single; pods glandular-dotted throughout.

10. *A. caroliniana*.

Corolla mostly white; leaflets linear-oblong, acute at least at the base, 2-3.5 cm. long; racemes usually clustered; pod glandular-dotted above the middle.

11. *A. crenulata*.

Calyx with few and inconspicuous glands; pod 6-7 mm. long; leaflets 2-4 cm. long.

12. *A. Curtissii*.

Branches, petioles, leaf-rachis, and leaflets decidedly pubescent, at least when young.

Petioles very short, less than the width of the leaflets, the lowest pair of the latter therefore close to the stem; pod straight on the back, 4 mm. long.

Plant canescent; calyx-tube densely pubescent.

13. *A. herbacea*.

Plant sparingly hairy; calyx-tube glabrous.

14. *A. floridana*.

Petioles longer than the width of the leaflets, the lowest pair of the latter therefore some distance from the stem; pod 6-9 mm. long.

Pod straight on the back; leaflets subcoriaceous, except in *A. Bushii*.

Leaflets of a broadly oval type, not twice as long as broad; leaflets reticulate.

15. *A. texana*.

- Leaflets of an elliptic or oblong type, fully twice as long as broad.
 Leaflets coriaceous, glossy above, in age reticulate. 16. *A. virgata*.
 Leaflets thin, dull above, not reticulate. 17. *A. Bushii*.
- Pod more or less curved upward; leaflets not subcoriaceous.
 Pod narrow, only slightly curved, 6 mm. long, 2 mm. wide; leaflets small, oblong. 18. *A. tennesseensis*.
- Pod broader, strongly curved, about 8 mm. long and 3 mm. broad; leaflets usually larger.
 Pubescence spreading; leaflets mostly rounded at the base (except in *A. arizonica*).
 Pubescence rather sparse, grayish; leaflets oval to elliptic, thin, not reticulate. 19. *A. fruticosa*.
- Pubescence especially on the young parts dense.
 Pubescence orange or yellow; leaflets firmer, reticulate, elliptic to oblong, rounded at the base. 20. *A. croceolanata*.
- Pubescence grayish; leaves thin, not reticulate, obovate to oblong-oblancoate, acute at the base. 21. *A. arizonica*.
- Pubescence closely appressed; leaflets mostly cuneate at the base.
 Leaflets mostly of an obovate or oval type; upper calyx-lobes usually acutish; pod slightly curved; racemes mostly solitary. 22. *A. occidentalis*.
- Leaflets mostly of an oblanceolate or oblong type; upper calyx-lobes usually rounded; pod strongly curved; racemes usually clustered. 23. *A. fragrans*.

1. *Amorpha californica* Nutt.; T. & G. Fl. N. Am. 1: 306.

1838.

? *Amorpha hispidula* Greene, Fl. Franc. 14, in part. 1891.

Amorpha hispidula C. K. Schneid. Handb. Laubb. 2: 71. 1907.

A shrub, 1-3 m. high; branches more or less short-pilose and with some stalked glands; leaves 1-2 dm. long, ascending; stipules membranous, lanceolate or oblong; petioles about 1 cm. long, as well as the rachis pilose and with scattered stalked glands; leaflets 11-25, from broadly oval to elliptic, rounded at both ends or retuse and mucronate at the apex, softly pilose on both sides, 1-3 cm. long, 5-15 mm. wide; racemes mostly solitary, 5-20 cm. long, pilose; calyx 5-6 mm. long, densely pilose, 10-grooved; lobes lanceolate, about equaling the tube; banner reddish-purple, obovate-cuneate, 5 mm. long; pod curved on the back, 8 mm. long, 3 mm. wide, puberulent and conspicuously glandular-dotted.

TYPE LOCALITY: Santa Barbara, California.

DISTRIBUTION: Western Arizona and southern California; apparently also in Shasta County.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubb. 2: f. 42, g, r; f. 44, b, b'.

2. *Amorpha hispidula* Greene, Fl. Franc. 14. 1891.

Amorpha californica Brewer & Wats. Bot. Calif. 1: 140, in part. 1876. Not *A. californica* Nutt. 1838.

A shrub, 5-12 dm. high; branches sparingly hairy or glabrous; leaves ascending, 1-1.5 dm. long; stipules membranous, lanceolate; petioles about 1 cm. long, as well as the rachis with scattered stalked glands; leaflets 15-25, oval or elliptic, 1-3.5 cm. long, 5-15 mm. broad, glabrous or with a few scattered hairs, rounded at each end or retuse at the apex, conspicuously glandular-punctate beneath; racemes solitary, 5-10 cm. long; calyx 4 mm. long, sparingly pilose, 10-grooved; lobes lance-triangular, fully one half as long as the tube; banner reddish-purple, obovate, 4 mm. long; pod straight on the back, 5-6 mm. long, rather conspicuously glandular-punctate.

TYPE LOCALITY: Monterey County, California.

DISTRIBUTION: Central California.

3. *Amorpha paniculata* T. & G. Fl. N. Am. 1: 306. 1838.

? *Amorpha tomentosa* Raf. Fl. Ludov. 105. 1817.

Amorpha Roemeriana Scheele, Linnaea 21: 461. 1848.

A coarse shrub, 2-4 m. high; branches velutinous-canescens, angled; leaves 1-3 dm. long, ascending; petioles 2-5 cm. long, as well as the rachis tomentose; stipules setaceous, glabrous; leaflets 11-17, oval or elliptic, 2-7 cm. long, 1-3 cm. wide, strongly veined beneath,

rounded or retuse at each end, thick, densely velutinous beneath, sparingly tomentose, becoming glabrate and shining above; racemes in a peduncled panicle, 1-2 dm. long, tomentose; calyx about 4 mm. long; lobes subulate-lanceolate, about 2 mm. long; banner purple, obovate, 3-4 mm. long; pod incurved on the back, 7-8 mm. long, 2-3 mm. wide, glabrous, conspicuously glandular-dotted.

TYPE LOCALITY: Arkansas.

DISTRIBUTION: Arkansas, Louisiana, and Texas.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. f. 44, x; f. 45, x-y.

4. *Amorpha Schwerini* C. K. Schneid. Handb. Laubh. 2: 69, 71. 1907.

Amorpha densiflora F. Boynton; Small, Fl. SE. U. S. ed. 2. 1342. 1913.

A much-branched shrub, about 2 m. high; branches finely puberulent; leaves 7-15 cm. long, spreading; petioles 1 cm. long or less, as well as the rachis puberulent; leaflets 11-23, oblong, elliptic, or ovate-oblong, 1-4 cm. long, 6-18 mm. wide, rounded at each end, soft, villous and prominently veined beneath, puberulent above; racemes solitary or two together, 4-6 cm. long, dense, copiously pilose; calyx 4.5-5.5 mm. long, pilose; lobes subulate, longer than the tube; banner obovate, 4 mm. long, purple; pod 5-5.5 mm. long, straight on the upper edge, puberulent, minutely punctate.

TYPE LOCALITY: Dunns Mountain, North Carolina.

DISTRIBUTION: Piedmont region of North Carolina.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. 2: f. 42, l, m; f. 44, a.

5. *Amorpha canescens* (Nutt.; Fraser, Cat.; hyponym. 1813) Pursh, Fl. Am. Sept. 467. 1814.

Amorpha canescens leptostachya Engelm.; A. Gray, Mem. Am. Acad. II. 4: 31; hyponym. 1849.

Amorpha canescens glabrata A. Gray, Pl. Wright. 1: 49. 1852.

Amorpha canescens typica C. K. Schneid. Handb. Laubh. 2: 70. 1907.

An undershrub, 3-10 dm. high; branches angled, densely villous-canescens; leaves spreading, curved, 5-12 cm. long; petioles very short, shorter than the width of the leaflets; rachis densely villous; leaflets 15-35, crowded, oblong-lanceolate, elliptic, or oblong, nearly sessile, 7-20 mm. long, 4-10 mm. wide, villous-canescens on both sides, densely so beneath, rounded at the base, acute to rounded and mucronate at the apex; racemes dense, short-peduncled, clustered, 3-15 cm. long, the terminal one longest; rachis densely villous; flowers crowded, very short-pedicelled; calyx 5 mm. long, villous; lobes all subulate-lanceolate, nearly equal, 2-2.5 mm. long; banner obovate-cuneate, somewhat truncate and sinuate at the apex, blue, 5 mm. long; pod 4 mm. long, 2 mm. broad, densely villous-canescens, straight on the back, the beak ascending; seed solitary, 3 mm. long, oblong, brown, shining. [The last two synonyms represent a form, less hairy and with more elongate inflorescence.]

TYPE LOCALITY: Banks of the Missouri.

DISTRIBUTION: Michigan and Indiana to Arkansas, Texas, New Mexico, Saskatchewan, and Manitoba.

ILLUSTRATIONS: Britt. & Brown, III. Fl. f. 2103; ed. 2. f. 2506; C. K. Schneid. Handb. Laubh. 2: f. 42, c-g; f. 43, d-d'; Mathews, Field Book Am. Trees 275; Fl. Neb. 21: pl. 4; f. 15; Meehan's Monthly 5: pl. 6; Bot. Mag. pl. 6618.

6. *Amorpha nana* Nutt.; Fraser, Cat. 1813.

Amorpha microphylla Pursh, Fl. Am. Sept. 466. 1814.

Amorpha punctata Raf. New Fl. 3: 14. 1838.

A low shrub, rarely more than 1 m. high, glabrous or nearly so throughout; leaves numerous, crowded, 3-10 cm. long; petioles 7-10 mm. long; leaflets 13-19, oval or oblong, rounded or emarginate and mucronate at the apex, obtuse, rounded, or acute at the base, 5-12 mm. long, 3-5 mm. wide, glabrous, conspicuously punctate beneath; petiolules very short; racemes usually solitary, dense, 5-10 cm. long; calyx glabrous, 3 mm. long; lobes lanceolate, acuminate, more than half as long as the tube; banner purple, 4 mm. long, cuneate-obovate; pod 5 mm. long,

straight on the back, 2.5 mm. broad, conspicuously glandular-punctate; seed oblong, 3 mm. long, brown, shining.

TYPE LOCALITY: Near Mandan, North Dakota.

DISTRIBUTION: Manitoba and Saskatchewan to Iowa and New Mexico.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2102; ed. 2. f. 2505; C. K. Schneid. Handb. Laubh. 2: f. 42, h-k; f. 43, a; Clements, Rocky Mt. Fl. pl. 29, f. 4; Mathews, Field Book Am. Trees 275.

7. *Amorpha glabra* Desf. (Tabl. 192; hyponym. 1804); Pers.

Syn. Pl. 2: 295. 1807.

Amorpha montana F. Boynton, Biltmore Bot. Stud. 1: 138. 1902.

A glabrous shrub, 1-2 m. high; branches rarely with a few short hairs; leaves 7-16 cm. long, often spreading; petioles 2-3 cm. long; leaflets oval, elliptic, or elliptic-ovate, thin, glabrous on both sides, obtuse, rounded, or often emarginate at the apex, rounded or subcordate at the base, 2-5 cm. long, 1-4 cm. broad; petiolules 2-3 mm. long; racemes usually clustered, 6-15 cm. long, glabrous; calyx about 3 mm. long, glabrous except the ciliate margins, which are undulate-toothed, the lobes being very short and broad, obtuse, rounded, or acutish; banner orbicular-spatulate, with a short claw, 7 mm. long, rich-purple; pod 7-8 mm. long, nearly straight on the upper side, light-brown, with a few small glands; seeds elliptic, brown, 4 mm. long.

TYPE LOCALITY: North America.

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

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. 2: f. 44, d; f. 45, a-b.

8. *Amorpha nitens* F. Boynton, Biltmore Bot. Stud. 1: 139.

1902.

A branching shrub, 1-3 m. high; branches chestnut-brown, glabrous; leaves 12-25 cm. long, ascending; petioles 1-1.5 cm. long, as well as the rachis glabrous or nearly so; leaflets 7-19, thin, oblong-ovate or ovate, 2-6 cm. long, obtuse or rounded at both ends, reticulate, sparingly pubescent on both sides or glabrate, dull and pale beneath, dark and glossy above; petiolules about 1 mm. long; racemes usually solitary, 12-25 cm. long; pedicels 1-2 mm. long, erect; calyx obconic, about 3 mm. long; upper two lobes rounded, 0.5 mm. long, the lower three ovate, acute or obtuse, ciliate on the margins; pod 7 mm. long, narrow, curved, nearly glandless, glabrous.

TYPE LOCALITY: Waynesboro, Georgia.

DISTRIBUTION: Georgia.

9. *Amorpha laevigata* Nutt.; T. & G. Fl. N. Am. 1: 306. 1838.

Amorpha laevigata typica C. K. Schneid. Handb. Laubh. 2: 74. 1907.

A glabrous shrub, 1-2 m. high; leaves 9-18 cm. long, ascending; petioles 1-2 cm. long; leaflets 9-21, obovate to elliptic-oblong, 2-4 cm. long, 1.5-3 mm. wide, rounded or emarginate at the apex, acute at the base, glabrous or essentially so, glandular-punctate and reticulate; petiolules 2-3 mm. long; racemes 1-3 together, 1.5-3 dm. long; pedicels 1-3 mm. long; calyx glabrous or sparingly puberulent, 3 mm. long; lobes short, the upper two rounded, obtuse, the lateral ones broadly triangular and acute, the lowermost lanceolate and pointed; banner dark blue-purple, reniform, about 6 mm. long and fully as broad; pod about 5 mm. long, nearly straight on the back, conspicuously glandular-dotted.

TYPE LOCALITY: Banks of the Arkansas, near Salt River.

DISTRIBUTION: Arkansas, Oklahoma, and Texas.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. 2: f. 44, u; f. 45, u-w.

10. *Amorpha caroliniana* Croom, Am. Jour. Sci. 25: 74. 1833.

Amorpha cyanostachya M. A. Curt. Bost. Jour. Nat. Hist. 1: 140. 1835.

? *Amorpha pumila* Schlecht. Ind. Sem. Hort. Hal. 1848: 8.—Linnaea 24: 185. 1851.

Amorpha fruticosa caroliniana S. Wats. Bibl. Ind. 188. 1878.

Amorpha glabra F. Boynton; Small, Fl. SE. U. S. 626. 1903. Not *A. glabra* Desf. 1807.

A nearly glabrous shrub, 1-2 m. high; branches glabrous or sparingly pilose; leaves 7-16 cm. long, ascending; petioles about 1 cm. long, as well as the rachis glabrous or nearly so; leaf-

lets 11–25, oval or elliptic, 8–25 mm. long, 5–10 mm. wide, rounded at each end, rather firm and reticulate, dark-green and glossy above, pale and conspicuously glandular-dotted beneath; racemes usually solitary, 5–15 cm. long; calyx about 3 mm. long, glabrous except the margin of the lobes; tube turbinate; lobes short, ciliolate, the upper two broadly triangular and acutish or rounded (*A. cyanostachya*), the lower three lance-triangular, subulate-pointed; banner usually blue, broadly cuneate or cuneate-obovate, 4.5–5 mm. long; pod 4–5 mm. long, nearly straight on the back, conspicuously glandular-dotted throughout, 5 mm. long.

TYPE LOCALITY: Near Newbern, North Carolina.

DISTRIBUTION: North Carolina to Florida.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. 2: f. 42, s-u; f. 43, e-e'; f. 44, e.

11. *Amorpha crenulata* Rydberg, sp. nov.

A nearly glabrous shrub, 1–1.5 m. high; branches angled, glabrous, glandular-dotted; leaves 1–1.5 dm. long; petioles 1 cm. long or less, glabrous; leaflets 25–33, oblong or linear-oblong, 1.5–3.5 cm. long, less than 1 cm. wide, glabrous on both sides, paler and glandular-dotted beneath, acute at both ends, or obtuse or rounded at the apex, often decidedly crenulate on the margins, less firm than in the preceding; racemes usually more or less clustered, 1–2 dm. long, glabrous; calyx about 4 mm. long, glabrous except the margins of the lobes; tube elongate-turbinate; lobes short, ciliolate, the upper two triangular-ovate, acuminate, the lower three lanceolate, subulate-pointed; banner white, cuneate-spatulate, 6 mm. long; pod 6–7 mm. long, nearly straight on the back, conspicuously glandular-dotted above the middle.

Type collected in hammocks, between Coconut Grove and Cutler, Florida, May 9, 1904, Small & Wilson 1898 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Subtropical Florida.

12. *Amorpha Curtissii* Rydberg, sp. nov.

A glabrous shrub, 1–3 m. high; leaves 1–2 dm. long, ascending; petioles 1–2 cm. long; leaflets 11–21, oblong or elliptic, 2–4.5 cm. long, 8–15 mm. wide, rounded at both ends or acutish at the base, apiculate at the apex, minutely glandular-punctate beneath, reticulate; petiolules about 2 mm. long; racemes several, clustered, 5–15 cm. long, sparingly pubescent; pedicels 1–2 mm. long; calyx 3.5–4 mm. long, glabrous except the ciliate calyx-lobes, with only a few rather inconspicuous glands; lobes short, about 0.5 mm. long, the upper two rounded, the lower three triangular and acute; banner 5 mm. long, dark bluish-purple, broadly obovate; pod 7–8 mm. long, 4 mm. wide, nearly straight on the back, conspicuously glandular-punctate; seed brown, shining, oblong, 4 mm. long.

Type collected in low ground, near river, Jacksonville, Florida, May 6 and August 21, 1894, A. H. Curtiss 4703 (herb. Columbia Univ.).

DISTRIBUTION: Northern Florida to North Carolina (?).

13. *Amorpha herbacea* Walt. Fl. Car. 179. 1788.

Amorpha pubescens Willd. Berlin. Baumz. 17. 1796.

Amorpha pumila Michx. Fl. Bor. Am. 2: 64. 1803.

Amorpha herbacea typica C. K. Schneid. Handb. Laubh. 2: 69. 1907.

Amorpha herbacea Boyntoni C. K. Schneid. Handb. Laubh. 2: 69. 1907.

A low shrub, 5–15 dm. high; branches grooved, finely canescent; leaves divaricate, 4–16 cm. long; petioles not longer than the width of the leaflets, as well as the rachis finely canescent; stipules setaceous, glabrous; leaflets 11–37, elliptic, oblong, or ovate-oblong, 10–25 mm. long, 5–10 mm. broad, rounded at each end, sometimes mucronulate, finely canescent on both sides, conspicuously black-dotted and strongly veined beneath; petiolules about 2 mm. long; racemes clustered, 5–30 cm. long, villous-puberulent; pedicels about 1 mm. long; calyx about 4 mm. long, strongly grooved, villous; upper two lobes triangular, acute, about 1 mm. long, the lower three subulate, acuminate, 1.5 mm. long; banner broadly cuneate, retuse, 4–5 mm. long, white to pale-purple; pod 4–5 mm. long, 2–2.5 mm. wide, nearly straight on the back, puberulent, with conspicuous dark glands; seed solitary, oblong, brown, shining.

TYPE LOCALITY: Carolina.

DISTRIBUTION: North Carolina to Florida.

ILLUSTRATIONS: Bot. Cab. pl. 689; C. K. Schneid. Handb. Laubh. 2: f. 42, a, b; f. 43, b, c.

14. *Amorpha floridana* Rydberg, sp. nov.

A shrub, about 1 m. high; branches sparingly short-villous, brown and sharply angled; leaves 6-15 cm. long, mostly spreading; petioles 3-8 mm. long, as well as the rachis sparingly villous; leaflets 27-41, oblong or elliptic, rounded at each end, 1-2 cm. long, 3-7 mm. wide, strongly reticulate, glabrous above, sparingly pubescent, paler, and conspicuously glandular-dotted beneath; petiolules 1 mm. long; racemes numerous, clustered, 5-15 cm. long, villous; pedicels 1-2 mm. long; calyx 3 mm. long; tube grooved, slightly puberulent or glabrous, conspicuously glandular-dotted; lobes villous-ciliate, short, the upper two broadly triangular, acute, the lower three lance-triangular, the lowest one slightly longer; banner purple, broadly obovate-spatulate, 4 mm. long.

Type collected in Florida (no date nor locality given), *Chapman* (herb. Columbia Univ.).

15. *Amorpha texana* Buckl. Proc. Acad. Phila. 1861: 452. 1862.

Amorpha fruticosa var. [1] A. Gray, Bost. Jour. Nat. Hist. 6: 174. 1850.

? *Amorpha laevigata pubescens* A. Gray, Pl. Wright. 1: 49. 1852.

Amorpha subglabra A. Heller, Bot. Expl. Texas 48. 1895.

Amorpha texana mollis F. Boynton, Biltmore Bot. Stud. 1: 139. 1902.

A branching shrub, 1-3 m. high; branches sparingly pubescent or glabrous; leaves 8-18 cm. long, spreading; petioles about 2 cm. long; leaflets 7-13, subcoriaceous, broadly oval to elliptic, 1-3 cm. long, 8-25 mm. wide, rounded or emarginate at each end, reticulate, glabrous and shining above, sparingly pilose or glabrous (*A. subglabra*) and paler beneath; petiolules 3-4 mm. long; racemes 2-4 together, or solitary, 5-15 cm. long; pedicels about 1 mm. long; calyx 3-4 mm. long, pilose; upper two lobes rounded, 0.5 mm. long, the three lower ones triangular, acute, the lowest one the longest; banner blue, suborbicular-spatulate, about 7 mm. long; pod 7 mm. long and 3 mm. broad, nearly straight on the upper side, conspicuously glandular-dotted.

TYPE LOCALITY: On Pierdenalis River, Texas.

DISTRIBUTION: Central and eastern Texas.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. 2: f. 44, v-w; f. 45, u-w.

16. *Amorpha virgata* Small, Bull. Torrey Club 21: 17. 1894.

A shrub, 1-2 m. high, erect, branched at the summit; branches sparingly pilose or in age glabrate; leaves 8-16 cm. long; petioles about 2 cm. long, as well as the rachis sparingly hairy; leaflets 11-19, elliptic or oblong-ovate, 2-5 cm. long, 1-2 cm. broad, emarginate and often apiculate at the apex, obtuse to subcordate at the base, strongly veined, paler and pilose beneath, dark-green and somewhat glossy above, coriaceous; racemes mostly clustered, 8-15 cm. long; calyx 3 mm. long, sparingly pubescent; upper two lobes rounded or broadly triangular and acutish, the lower three triangular and acute; pod 7 mm. long, 3-4 mm. broad, straight on the back, sparingly but conspicuously glandular-dotted; seed oblong, 4 mm. long, slightly curved at one end, brown, glossy.

TYPE LOCALITY: Stone Mountain, De Kalb County, Georgia.

DISTRIBUTION: Tennessee, Georgia, and northern Florida.

ILLUSTRATIONS: Bull. Torrey Club 21: pl. 171; C. K. Schneid. Handb. Laubh. 2: f. 44, s-t; f. 45, q-4.

17. *Amorpha Bushii* Rydberg, sp. nov.

A shrub, 1 m. high or more; branches finely puberulent or in age glabrate; leaves strongly ascending, 2-3 dm. long; petioles about 3 cm. long, as well as the rachis finely pilose; leaflets oblong to oval, 3-6 cm. long, 1-2 cm. wide, thin, dull, puberulent or glabrate above, finely pilose beneath, rounded or retuse at the apex, rounded or acutish at the base; petiolules 1-2 mm. long; racemes slender, 2-3 dm. long, lax, sparingly pubescent; pedicels about 1 mm. long; calyx 3 mm. long, almost glabrous; lobes very short and broad, the upper two rounded, the lower three triangular and acute; pod about 7 mm. long and 3 mm. broad, straight on the back, inconspicuously punctate.

Type collected near Chattahoochee River, Florida, August 12, 1897, *Bush 13* (herb. N. Y. Bot. Gard.).

18. *Amorpha tennesseensis* Shuttl.; Kunze, Del. Sem. Hort.Lips. 1848: 1. 1848. — *Linnaea* 24: 191. 1851.

A branching shrub, 2-6 m. high; branches finely pubescent; leaves 6-20 cm. long, ascending; petioles about 1 cm. long, as well as the rachis finely pubescent; leaflets 13-55, elliptic or oblong, 1-2.5 cm. long, 3-7 mm. wide, obtuse or rounded at both ends, mucronate, sparingly and finely pubescent, paler beneath; petiolules about 1 mm. long; racemes mostly clustered, 7-15 cm. long; calyx 3 mm. long, finely pubescent; upper two lobes rounded, 0.5 mm. long, the lower three triangular, acute, the lowest one slightly longer than the rest; banner broadly obovate-spatulate, 4.5 mm. long, blue; pod 5-7 mm. long, 2 mm. broad, curved, with conspicuous glands; seed oblanceolate-oblong, brown and shining.

TYPE LOCALITY: Dandridge, Tennessee.

DISTRIBUTION: North Carolina to southern Missouri, Georgia, and Louisiana.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. 2: f. 43, f; f. 44, f-g; f. 45, c-d.

19. *Amorpha fruticosa* L. Sp. Pl. 713. 1753.*Amorpha perforata* Schkuhr, Handb. 2: 333. 1796.*Amorpha elata* Hayne, Dendr. Fl. 134. 1822.*Amorpha fruticosa ornata* Wender. Ind. Sem. Hort. Marburg. 1835.—*Linnaea* 11: Litt. 92. 1837.*Amorpha pubescens* Schlecht. *Linnaea* 24: 691. 1851. Not *A. pubescens* Willd. 1796.*Amorpha pendula* Carr. Rev. Hortie. 43: 378. 1871.*Amorpha fruticosa typica* C. K. Schneid. Handb. Laubh. 2: 72. 1907.

A shrub, 2-6 m. high; twigs sparingly pilose or in age glabrate; leaves 7-25 cm. long, ascending; petioles 1-2 cm. long, glabrous or finely pilose; leaflets 11-25, oval or elliptic, 1.5-4 cm. long, 7-20 mm. wide, rounded at each end, mucronate, finely pubescent or glabrate; petiolules about 2 mm. long; racemes clustered, 7-15 cm. long; pedicels 1-2 mm. long, erect; calyx angled, about 3 mm. long, sparingly pilose or in age glabrate, ciliate on the margins; upper two lobes rounded, 0.5 mm. long, the lower three triangular, acute, the lowest one slightly longer than the rest; banner rounded-obovate, emarginate, about 6 mm. long, blue; pod 7-9 mm. long, curved, conspicuously glandular-punctate; seed 4 mm. long, oblanceolate-oblong, curved at one end, brown, glossy.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Connecticut to Minnesota, Florida, and Louisiana.

ILLUSTRATIONS: L. Hort. Cliff. pl. 19; Lam. Tab. Encyc. pl. 621; Schkuhr, Handb. pl. 197; Bot. Reg. 5: pl. 427; Baillon, Hist. Pl. 2: f. 166, 167; Britt. & Brown, Ill. Fl. f. 2101; ed. 2. f. 2504; C. K. Schneid. Handb. Laubh. 2: f. 44, n-r; f. 45, i-p; E. & P. Nat. Pil. 3^e: f. 115, N-Q; Mathews, Field Book Am. Trees 275; Fl. Neb. 21: pl. 4, f. 16.20. *Amorpha croceolanata* Wats. Dendr. pl. 139. 1825.? *Amorpha coerulea* Lodd.; Loud. Hort. Brit. 283; hyponym. 1830.? *Amorpha fruticosa coerulea* Loud. Arb. 607. 1836.*Amorpha fruticosa croceolanata* C. K. Schneid. Handb. Laubh. 2: 73. 1907.

A bushy shrub, 1-1.5 m. high; branches densely villous-pubescent with orange-colored hairs, at least when young; leaves spreading or ascending, 1-2 dm. long; petioles about 2 mm. long, as well as the rachis more or less orange-hairy; leaflets 19-29, elliptic or lance-elliptic, 2-5 cm. long, 8-29 mm. broad, usually rounded at each end, minutely if at all mucronate, softly short-pubescent with yellowish or orange hairs, or in age glabrate; petiolules about 2 mm. long; racemes usually 2-4 together, 7-15 cm. long, the rachis densely short-villous; pedicels 1-2 mm. long; calyx 3.5-4 mm. long, distinctly sparingly villous, ciliate on the margins of the lobes; lobes nearly equal, 0.5 mm. long, the upper two rounded, the lower three triangular-acute; banner blue, broadly obovate-cuneate, retuse, 4-6 mm. long; pod 7-8 mm. long, 2.5-3 mm. broad, conspicuously glandular-dotted, more or less curved on the back; seed 4 mm. long, curved at one end, glossy, brown.

TYPE LOCALITY: North America.

DISTRIBUTION: Georgia to Florida and Louisiana.

ILLUSTRATIONS: Wats. Dendr. pl. 139; Loud. Arb. 2: f. 304.

21. *Amorpha arizonica* Rydberg, sp. nov.

A low shrub; branches softly villous, distinctly angled; leaves ascending, 1-1.5 dm. long; petioles 1.5-2.5 cm. long, as well as the rachis finely villous-pilose; leaflets 13-19, oblong-obovate or elliptic, 1-2 cm. long, 5-10 mm. wide, softly pubescent on both sides, rounded and mucronate at the apex, mostly acute at the base; petiolules 1-2 mm. long; racemes usually 2 or 3 together, short-villous, 5-12 cm. long; calyx about 3 mm. long, minutely puberulent; lobes very short, broader than long, the upper two rounded, the lower three acute; banner dark-blue, about 5 mm. long, broadly cuneate-obovate.

Type collected along streams, Ramsey Cañon, Huachuca Mountains, Arizona, June 10, 1909, Gooding 136 (herb. N. Y. Bot. Gard.).

22. *Amorpha occidentalis* Abrams, Bull. N. Y. Bot. Gard. 6:

394. 1910.

Amorpha fruticosa Torr. Bot. Mex. Bound. Surv. 53, in part. 1859.

Amorpha californica Greene, Fl. Franc. 14. 1891. Not *A. californica* Nutt. 1838.

A shrub, 2-3 m. high; branches minutely strigose, pubescent; leaves 1-2 dm. long, ascending; petioles 1.5-2.5 cm. long, as well as the rachis sparingly strigose; leaflets oval to oblong, sparsely strigose, firm, 2-4 cm. long, 1-2 cm. wide, usually rounded and mucronate at the apex, acute at the base; petiolules often 2 mm. long; racemes solitary or 2-4 together, 1-2 dm. long, the rachis more or less pubescent; pedicels scarcely 2 mm. long; calyx 3 mm. long; tube strigose to nearly glabrous; lobes densely villous, triangular, acute or the upper obtuse, the upper two broader and the lowest one slightly longer; banner dark-blue, about 5 mm. long; pod 6 mm. long, 2.5 mm. broad, somewhat curved on the back, with conspicuous glands on the upper half.

TYPE LOCALITY: San Diego River, near Old San Diego Mission, southern California.

DISTRIBUTION: New Mexico to southern California, Chihuahua, and Sonora.

ILLUSTRATIONS: C. K. Schneid. Handb. Laubh. 2: f. 42, n-p; f. 44, c-c' (all as *A. californica*).

23. *Amorpha fragrans* Sweet, Brit. Fl. Gard. pl. 241. 1828.

Amorpha fruticosa angustifolia Pursh, Fl. Am. Sept. 466. 1814.

Amorpha nana Sims, Bot. Mag. pl. 2112. 1819. Not *A. nana* Nutt. 1813.

? *Amorpha Lewisii* Lodd.; Loud. Hort. Brit. 283; hyponym. 1830.

Amorpha fruticosa Lewisii Loud. Arb. 2: 607. 1838.

Amorpha fruticosa var. [2] A. Gray, Bost. Jour. Nat. Hist. 6: 174. 1850.

Amorpha fruticosa Coult. Man. 59, mainly. 1885. Not *A. fruticosa* L. 1753.

Amorpha angustifolia F. Boynton, Biltmore Bot. Stud. 1: 139. 1902.

A branching shrub, 1-3 dm. high; branches finely strigose-canescens; leaves 7-20 cm. long; petioles 1-2 cm. long; leaflets 9-27, elliptic to linear-oblong, 2-4 cm. long, acute at the base, acute to rounded and mucronate at the apex, minutely strigose on both sides; racemes mostly clustered, 5-15 cm. long; pedicels 1-2 mm. long; calyx 3-3.5 mm. long, sparingly minutely puberulent, soon glabrate, except the ciliolate lobes; upper two lobes rounded, 0.5 mm. long, the lower three triangular, acute, the lowest one slightly longer; banner broadly obovate, 4.5-5 mm. long, 2.5 mm. broad, strongly curved, conspicuously glandular-dotted; seed oblong-lunate, 3.5 mm. long, brown, shining.

TYPE LOCALITY (of *A. nana* Sims, on which *A. fragrans* was based): Grassy hills of the Missouri [River].

DISTRIBUTION: Illinois to Montana, Chihuahua, and Texas.

ILLUSTRATIONS: Bot. Mag. pl. 2112; Sweet. Brit. Fl. Gard. 1^o: pl. 241; Loud. Arb. f. 303; C. K. Schneid. Handb. Laubh. 2: f. 44, h-m; f. 45, f-h; Clements, Rocky Mt. Fl. pl. 29, f. 5 (as *A. fruticosa*).

EXCLUDED AND DOUBTFUL SPECIES

AMORPHA LUTEA Raf. Fl. Ludov. 105. 1817. Indeterminable, but apparently does not belong to the genus.

AMORPHA RABIAE Lex.; Llave & Lex. Nov. Veg. Descr. 1: 22. 1824. This was described from specimens collected on the peak of Quinceo, near Valladolid [Morelia, Michoacan]. No species of *Amorpha* is known from Mexico except in the far northern part. From the description it seems probable that the plant belonged to that genus and would be distinguished from the known species by its ovate, acute, tomentose leaflets and its calyx-lobes, which are all obtuse.

AMORPHA HUMILIS Tausch, Flora 21: 750. 1838. ? *Amorpha nonperforata* Schkuhr, Handb. 2: 333. 1796. *Amorpha fruticosa* Hayne, Dendr. Fl. 134. 1822. *Amorpha fruticosa humilis* C. K. Schneid. Handb. Laubb. 2: 73. 1907. This is admitted as a variety of *A. fruticosa* by C. K. Schneider, but no native form agrees with the descriptions.

12. EYSENHARDTIA* H.B.K. Nov. Gen. & Sp. 6: 489. 1824.

Viborgia† Ortega, Dec. 66. 1798. Not *Viborgia* Moench, 1794.

Varennea DC. Prodr. 2: 522. 1825.

Wiborgia Kuntze, Rev. Gen. 213. 1891.

Much branched shrubs or trees. Leaves alternate, pinnate, with oblong to elliptic-oval, glandular-punctate leaflets. Flowers in loosely clustered terminal spike-like racemes. Calyx unequally lobed, the anterior lobe longest, the tube split more deeply between the posterior lobes. Corolla nearly regular; petals inserted on the hypanthium, mostly nearly equal, with oblanceolate to obovate blades and narrowed claw-like bases, white or rose-tinged, the standard slightly or decidedly larger, truncate to notched. Stamens 10, diadelphous; filaments glabrous, nine united for about half their length. Ovary sessile; style slender, more or less pubescent, upcurved and bearing a conspicuous gland near the apex, or straight and glandless; stigma large, capitate. Ovules 2-4. Pod indehiscent; seed solitary, pendulous, the hilum near the distal end.

Type species, *Eysenhardtia amorphoides* H.B.K.

Calyx slightly irregular, in fruit tubular-campanulate; slit between posterior lobes shallow; anterior lobes not much longer than the posterior.

Racemes elongate; style slightly pubescent, more or less upcurved at the apex, bearing at the curve a gland; pods 7-19 mm. long; seed not filling the entire pod; leaves 3-15 cm. long; leaflets 21-51, 3-24 mm. long, not thickened.

Pods reflexed-spreading, punctate with inconspicuous glands; standard decidedly notched.

Petals more than twice as long as the calyx, membranous; leaves membranous.

Leaflets minutely pubescent on both surfaces, obscurely reticulate above.

Calyx-lobes acute, 0.4-0.8 mm. long; leaflets 10-20 mm. long; stipels reddish, much shorter than the petiolules, soon deciduous.

Calyx-lobes obtuse to acutish, 0.2-0.5 mm. long; leaflets 3-10 mm. long; stipels brownish, frequently equaling the petiolules, more or less persistent.

Leaflets glabrate or glabrous on both surfaces, decidedly reticulate above.

Petals not more than twice as long as the calyx, firm; leaves firm.

Leaflets decidedly reticulate above; calyx with tube strongly ridged; gland on style small.

Leaflets obscurely reticulate above; calyx with tube slightly ridged; gland on style large.

Pods ascending-spreading, punctate with evident glands; standard emarginate to slightly notched.

Pods 12-19 mm. long, 3.5-4 mm. wide, straight or nearly so; seeds thin, filling less than half the length of the pod; calyx-lobes less than 0.3 mm. long; leaflets punctate beneath with reddish to brownish dots.

Leaflets 12-15 mm. long, pale beneath; pods 12-13 mm. long, 3.5-4 mm. wide, greenish-brown.

Leaflets 15-24 mm. long, glaucous beneath; pods 17-19 mm. long, 3.5 mm. wide, pale-brown.

Pods 7-10 mm. long, 1.7-2.5 mm. wide, more or less upcurved; seeds thickened, filling more than half the length of the pod; calyx-lobes 0.6-0.9 mm. long; leaflets punctate beneath with nearly black dots.

Leaves 8-9 cm. long; leaflets 37-47, narrowly oblong, 10-12 mm. long; gland on style large, pale-yellowish; pods slightly upcurved at least near apex.

Leaves 3-6 cm. long; leaflets 15-31, oblong, 5-11 mm. long; gland on style short and thick, reddish-brown; pods strongly upcurved throughout.

1. *E. orthocarpa*.
2. *E. polystachya*.
3. *E. reticulata*.
4. *E. subcoriacea*.
5. *E. cobriformis*.
6. *E. platycarpa*.
7. *E. adenostylis*.
8. *E. angustifolia*.
9. *E. texana*.

* Contributed by FRANCIS WHITTIER PENNELL.

† Named in honor of "D. Viborg" of Copenhagen, an evident misspelling of Viborg.

- Racemes short; style pubescent, straight, without a gland; pods 5-8 mm. long; seed filling the entire pod; leaves 0.9-1.2 cm. long; leaflets 9-13, 2-2.5 mm. long, much thickened.
- Calyx irregular, in fruit flaring from the base; slit between posterior lobes extending nearly to the base; anterior lobes much longer than posterior. Leaves 8-10 cm. long; leaflets 35-45, 8-12 mm. long; bracts deciduous before anthesis; pods 14-16 mm. long, 4.5-5 mm. wide, thin, glabrous, conspicuously punctate; seed flat, filling less than half the length of the pod.
- Leaves 1.5-4.5 cm. long; leaflets 9-25, 3-6 mm. long; bracts persisting until after anthesis; pods 5-7 mm. long, 2-3 mm. wide, thickened, pubescent, obscurely punctate; seed thick, filling the entire pod.
- Leaflets 21-25, pubescent above; racemes 6-9 cm. long; bracts persisting until after anthesis, but deciduous before fruit matures; gland on style short, thick; pods not ridge-veined, pale-brown; seed less turgid, smooth on each face, pale-brown.
- Leaflets 9-17, nearly glabrous above; racemes 1-5 cm. long; bracts more or less persistent until fruit matures; gland on style minute or none.
- Leaflets 9-11, 4-5 mm. long, firm; racemes 2-5 cm. long; style apparently with a small gland; mature pod not known.
- Leaflets 13-17, 3-4 mm. long, slightly thickened; racemes 1-3 cm. long; style without a gland; pods ridge-veined, dark-brown; seed turgid, ridged on each face, dark-brown.
10. *E. parvifolia*.
11. *E. punctata*.
12. *E. schizocalyx*.
13. *E. peninsularis*.
14. *E. spinosa*.

1. *Eysenhardtia orthocarpa* (A. Gray) S. Wats. Proc. Am. Acad. 17: 339. 1882.

Eysenhardtia amorphoides orthocarpa A. Gray, Pl. Wright. 2: 37. 1853.
Viborquia orthocarpa Cockerell, Bull. Am. Mus. Nat. Hist. 24: 97. 1908.

A much branched shrub or small tree, 3-5 m. high; stems grayish-brown, the young growth canescent with whitish ascending incurved hairs; leaves 5-15 cm. long, spreading; stipules 2-3 mm. long, subulate; stipels bristle-like, from a broad base, reddish, less than 1 mm. long, shorter than the petiolules, soon deciduous; leaflets 21-41, oblong, 10-20 mm. long, dull-green above, paler beneath, pubescent on both surfaces, especially beneath, punctate beneath with minute dark dots, faintly reticulate above, membranous; racemes 5-10 cm. long; bracts 1-2 mm. long, lanceolate, brown, pubescent, deciduous much before anthesis; calyx-tube 2-3 mm. long, glandular-dotted, finely pubescent, ridged, split slightly more deeply on the posterior side; lobes 0.4-0.8 mm. long, acute, nearly uniformly pubescent; petals 5-7 mm. long, membranous, more than twice as long as the calyx, the standard broad, notched; style 4-5 mm. long, slightly pubescent, slightly upcurved at the apex, the gland at the curve large, conspicuous; pods 10-13 mm. long, 2.5-3 mm. wide, thin, greenish-brown, glabrous, slightly upcurved at the apex, inconspicuously punctate distally with small glands, at maturity reflexed-spreading, on pedicels about 1 mm. long; seed filling two fifths to one half the length of the pod, 4.8-5.3 mm. long, oblanceolate, flat, smooth, olive-brown, with a narrow basal lobe.

TYPE LOCALITY: Mountains at Guadalupe Pass, near San Bernardino, Sonora.

DISTRIBUTION: Rocky cañons, in the mountains of southeastern Arizona, Sonora, and Chihuahua, at elevations of 1350-1750 meters.

ILLUSTRATION: Sarg. Silva *pl.* 110.

2. *Eysenhardtia polystachya* (Ortega) Sarg. Silva 3: 29. 1892.

Viborquia polystachya Ortega, Dec. 66. 1798.
Eysenhardtia amorphoides H.B.K. Nov. Gen. & Sp. 6: 491. 1824.
Varennea polystachya DC. Prodr. 2: 522. 1825.
Wiborgia amorphodes Kuntze, Rev. Gen. 213. 1891.
 ? *Psoralea stipularis* Sessé & Moc. Fl. Mex. ed. 2. 169. 1894.

A much branched shrub or tree, 3-8 m. high; stems grayish-brown, glabrous, the young growth canescent with whitish ascending appressed hairs; leaves 3-8 cm. long, spreading; stipules 2-3 mm. long, subulate; stipels subulate, brown, 0.7-1.2 mm. long, equaling the petiolules, more or less persistent; leaflets 31-51, oblong, 3-10 mm. long, dull-green above, paler beneath, pubescent on both surfaces, especially beneath, punctate beneath with minute brownish dots, faintly reticulate above, membranous; racemes 4-14 cm. long; bracts 2-4 mm. long, lanceolate, pale-brown, pubescent, deciduous before anthesis; calyx-tube 2-2.5 mm. long, strongly glandular-dotted, pubescent, faintly ridged, split slightly more deeply on the posterior side; lobes 0.2-0.5 mm. long, rounded to acutish, pubescent, ciliate; petals 5-7 mm. long, mem-

branous, more than twice as long as the calyx, the standard broad, notched; style 3-4 mm. long, slightly pubescent, strongly upcurved at the apex, the gland at the curve small, relatively inconspicuous; pods 10-15 mm. long, 3-3.5 (-4) mm. wide, thin, pale-brown, glabrous, not punctate or inconspicuously punctate distally with minute glands, straight or very slightly upcurved at the apex, at maturity reflexed-spreading, on pedicels 0.5-1 mm. long; seed filling two fifths to one half the length of the pod, 4.5-5 mm. long, obovoid-oblanceolate, light-brown, with a narrow basal lobe.

TYPE LOCALITY: Nova Hispania [Mexico].

DISTRIBUTION: Rocky cañons and hillsides, Durango and Tamaulipas to Oaxaca.

ILLUSTRATIONS: Ortega, Dec. *pl.* 9; H.B.K. Nov. Gen. & Sp. *pl.* 592; Jour. Wash. Acad. Sci. 5: 514. *f.* 2; Rep. Smithson. Inst. 1915: 284. *f.* 26.

3. *Eysenhardtia reticulata* Pennell, sp. nov.

A much branched shrub or small tree, 3-5 m. high; stems grayish-brown, the young growth slightly pubescent to glabrous; leaves 8-12 cm. long, spreading; stipules 2-3 mm. long, subulate; stipels bristle-like, from a broad base, reddish, less than 1 mm. long, shorter than the petioles, soon deciduous; leaflets 25-37, narrowly oblong to oblong, 10-17 mm. long, dull-green above, pale beneath, when young loosely pubescent, soon nearly or quite glabrous both above and beneath, punctate beneath with small dark dots, strongly reticulate or membranous racemes 4-9 cm. long; bracts 1-1.5 mm. long, lanceolate, brown, loosely pubescent to glabrate, deciduous before and during anthesis; calyx-tube 2-2.5 mm. long, glandular-dotted, becoming glabrate, ridged, split slightly more deeply on the posterior side; lobes 3-5 mm. long, acutish, somewhat pubescent, ciliate; petals 5 mm. long, membranous, more than twice as long as the calyx, the standard broad, notched; style 3-4 mm. long, slightly pubescent, slightly upcurved at the apex, the gland at the curve large, conspicuous; pods (possibly not of this species) 10-13 mm. long, 2-3 mm. wide, thin, pale-brown, glabrous, not punctate or inconspicuously punctate distally with minute glands, slightly upcurved at the apex, at maturity reflexed-spreading, on pedicels about 1 mm. long; seed filling two thirds the length of the pod, 6 mm. long, oblanceolate, flat, smooth, olive-brown, with a narrow basal lobe.

Type collected in flower, on slopes of the barranca of Guadalajara, altitude 1500 meters, July 30, 1902, C. G. Pringle 9752 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Dry slopes, Sonora to Zacatecas and Jalisco.

ILLUSTRATION: Rep. Smithson. Inst. 1915: *pl.* 2 (opp. 277).

4. *Eysenhardtia subcoriacea* Pennell, sp. nov.

A much branched shrub or small tree; stems grayish-brown, the young growth finely canescent with grayish incurved to appressed hairs; leaves 4-9 cm. long, spreading; stipules 1-3 mm. long, grayish, subulate; stipels subulate, grayish, 0.5-1 mm. long, equaling the petioles or shorter, more or less persistent; leaflets 19-37, oblong, 7-14 mm. long, dull-green above, slightly paler beneath, closely puberulent both above and beneath, punctate beneath with minute brown dots, decidedly reticulate above, firm; racemes 3-9 cm. long; bracts 1-2 mm. long, ovate-acuminate, brown, pubescent, deciduous before anthesis; calyx-tube 2.5-3 mm. long, glandular-dotted, canescent, strongly ridged, split slightly more deeply on the posterior side; lobes 0.3-0.7 mm. long, acutish to acute, pubescent, ciliate; petals 6 mm. long, firm, from less than to twice as long as the calyx, the standard broad, notched; style 3-4 mm. long, slightly pubescent, slightly upcurved at the apex, the gland at the curve small, not conspicuous; pods 10-12 mm. long, 3-3.5 mm. wide, thin, pale-brown, glabrous, punctate distally with small glands, straight or very slightly upcurved at the apex, at maturity reflexed-spreading, on pedicels 0.5-1 mm. long; seed filling one third to two fifths the length of the pod.

Type collected in flower, at Izmiquilpan, Hidalgo, August, 1905, C. A. Purpus 1366 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Hidalgo and Puebla.

5. *Eysenhardtia cobriformis* Pennell, sp. nov.

A much branched small tree, 3-8 m. high; stems grayish-brown, the young growth canescent with whitish incurved to appressed hairs; leaves 5-9 cm. long, spreading; stipules 2-3

mm. long, grayish, subulate; stipels subulate, 0.5–1 mm. long, shorter than the petioles, more or less persistent; leaflets 25–37, oblong, 7–16 mm. long, dull-green above, paler beneath, densely and finely pubescent above and beneath, punctate beneath with minute brown dots, obscurely reticulate above, firm; racemes 3–9 cm. long; bracts 1–2 mm. long, lanceolate, brown, pubescent, deciduous before anthesis; calyx-tube 2–2.7 mm. long, glandular-dotted, finely canescent, obscurely ridged, split slightly more deeply on the posterior side; lobes less than 0.4 mm. long, obtuse, pubescent, ciliate; petals 5–6 mm. long, firm, from less than twice to twice as long as the calyx, the standard broad, slightly notched; style 3–4 mm. long, slightly pubescent, slightly upcurved at the apex, the gland at the curve large, conspicuous (the apex of the style resembling a cobra's head, whence the specific name); pods about 14 mm. long and 3.5 mm. wide, thin, greenish-brown, glabrous, punctate distally with small glands, straight, at maturity reflexed-spreading, on pedicels less than 1 mm. long; seed 4.5 mm. long, obovoid, flat, smooth, olive-brown, with a narrow basal lobe, filling one third to two fifths the length of the pod.

Type collected in flower and fruit at Monte Alban, near Oaxaca city, Oaxaca, altitude between 1650 and 1800 meters, October, 1894, *C. L. Smith 337* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Cañon-sides, Oaxaca.

6. *Eysenhardtia platycarpa* Pennell & Safford, sp. nov.

A much branched shrub or small tree, 3–5 m. high; stems grayish-brown, the young growth cinereous-puberulent with appressed hairs; leaves 10–14 cm. long, spreading; stipules 2–3 mm. long, grayish, subulate; stipels subulate, 0.5–1 mm. long, shorter than the petioles, more or less persistent; leaflets 41–49, oblong, 12–15 mm. long, dull-green above, much paler beneath, minutely puberulent above and beneath, punctate beneath with reddish to brown, minute dots, obscurely reticulate above, firm; racemes 4–12 cm. long; bracts 1–2 mm. long, lanceolate, brown, pubescent, deciduous before anthesis; calyx-tube 2–2.5 mm. long, glandular-dotted, canescent-puberulent, obscurely ridged below, split slightly more deeply on the posterior side; lobes minute, less than 0.25 mm. long, obtuse (or acutish during anthesis), slightly pubescent, ciliate; petals 5 mm. long, firm, from less than twice to twice as long as the calyx, the standard broader, slightly emarginate-notched; style 3 mm. long, slightly pubescent, slightly upcurved at the apex, the gland at the curve large, conspicuous; pods (not mature) 12–13 mm. long, 3.5–4 mm. wide, thin, greenish-brown, glabrous, punctate distally with relatively large glands, straight, becoming ascending-spreading, on pedicels about 1 mm. long; seed with a small basal lobe, filling one third to two fifths the length of the pod.

Type collected in flower and immature fruit at Barranca de Guadalajara, Jalisco, altitude 1500 meters, October 25, 1903, *C. G. Pringle 8762* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Jalisco to Michoacan (or Guerrero).

ILLUSTRATION: Rep. Smithsonian. Inst. 1915: 285. f. 3.

7. *Eysenhardtia adenostylis* Baillon, *Adansonia* 9: 239. 1870.

Wiborgia adenostylis Kuntze, Rev. Gen. 213. 1891.

Viborquia adenostylis Cockerell, Bull. Am. Mus. Nat. Hist. 24: 97. 1908.

A much branched small tree, 3–5 m. high; stems grayish-brown, the young growth more or less cinereous-puberulent with appressed hairs; leaves 10–15 cm. long, spreading; stipules 2–3 mm. long, grayish, subulate; stipels subulate, 0.5–1 mm. long, shorter than the petioles, more or less persistent; leaflets 37–49, oblong, 15–24 mm. long, dull-green above, glaucous-whitened beneath, finely puberulent above and especially so beneath, punctate beneath with minute brownish dots, obscurely reticulate above, firm; racemes 4–12 cm. long; bracts 1–2 mm. long, lanceolate, grayish, pubescent, deciduous before anthesis; calyx-tube 2.5 mm. long, obscurely glandular-dotted, canescent-puberulent, obscurely ridged below, split more deeply (but not to the middle) on the posterior side; lobes 0.2–0.3 mm. long, acutish, the three anterior slightly longer, pubescent, ciliate; petals 5 mm. long, firm, from less than twice to twice as long as the calyx, the standard broader, slightly emarginate-notched; style 3–4 mm. long, slightly pubescent, slightly upcurved at the apex, the gland at the curve large, conspicuous; pods 17–19 mm. long, 3.5 mm. wide, thin, pale-brown, glabrous, punctate distally with small glands, slightly upcurved at the apex, at maturity ascending, on pedicels 1–1.8 mm. long;

seed 7 mm. long, oblanceolate, flat, smooth, olive-brown, with a narrow basal lobe, filling one third to two fifths the length of the pod.

TYPE LOCALITY: Guatemala.

DISTRIBUTION: Woodlands or thickets, Guatemala.

ILLUSTRATION: Rep. Smithson. Inst. 1915: 279. f. 1b.

8. *Eysenhardtia angustifolia* Pennell, sp. nov.

A much branched small tree, 3-4 m. high; stems grayish-brown, the young growth canescent with whitish incurved to appressed hairs; leaves 8-9 cm. long, spreading; stipules 3-4 mm. long, grayish, filiform; stipels subulate, less than 0.5 mm. long, shorter than the petioles, deciduous; leaflets 37-47, narrowly oblong, 10-12 mm. long, dull-green above, slightly paler beneath, puberulent above and beneath, punctate beneath with small nearly black dots, reticulate above, firm; racemes 4-7 cm. long; bracts 1-2 mm. long, ovate-acuminate, brown, pubescent, more or less persistent through anthesis; calyx-tube 2.3-3 mm. long, glandular-dotted, finely canescent, ridged, split slightly more deeply on the posterior side; lobes 0.6-0.8 mm. long, obtusish, pubescent; petals 4-4.5 mm. long, membranous, from less than twice to twice as long as the calyx, the standard broader, broadly emarginate; style 2.5-3 mm. long, pubescent, slightly upcurved at the apex, the gland at the curve large, conspicuous, pale-yellowish; pods 7-8 mm. long, 2-2.2 mm. wide, slightly thickened, greenish-brown, glabrous, punctate distally with relatively large glands, slightly upcurved at the apex, at maturity ascending, on pedicels 0.5-0.6 mm. long; seed 3.3 mm. long, lanceolate, thickened, very smooth, olive-brown, with a broad basal lobe, filling one half to three fifths the length of the pod.

Type collected in flower and fruit, at Sanderson [Terrill County], Texas, September 29, 1911, E. O. Wootton (U. S. Nat. Herb.).

DISTRIBUTION: Trans-Pecos region of Texas.

9. *Eysenhardtia texana* Scheele, *Linnaea* 21: 462. 1848.

A much branched shrub, 2.5-3.5 m. high; stems gray, the young growth more or less canescent with appressed white hairs; leaves 3-6 cm. long, spreading; stipules 2-3 mm. long, brownish, subulate; stipels subulate, less than 0.5 mm. long, shorter than the petioles, more or less persistent; leaflets 15-31, oblong, 5-11 mm. long, dull-green above, slightly paler beneath, more or less puberulent above and beneath, punctate beneath with minute dark dots, obscurely reticulate above, firm; racemes 3-11 cm. long; bracts 1-2 mm. long, ovate-lanceolate, brown, pubescent, more or less persistent until anthesis; calyx-tube 2-2.2 mm. long, glandular-dotted, more or less canescent-puberulent, slightly ridged, split much more deeply (but not to the middle) on the posterior side; lobes 0.6-0.9 mm. long, obtusish to acute, finely pubescent; petals 4-5 mm. long, membranous, more than twice as long as the calyx, the standard slightly broader, rounded to slightly emarginate; style 2.5-3 mm. long, pubescent, slightly upcurved at the apex, the gland at the curve short and thick, conspicuous, reddish-brown; pods 7-10 mm. long, 1.7-2.5 mm. wide, thickened, greenish-brown, glabrous, punctate distally with evident glands, more or less strongly upcurved throughout, at maturity ascending, on pedicels 0.5-1 mm. long; seed 3.2-3.7 mm. long, lanceolate to obovoid, thickened, very smooth, brown, with a broad basal lobe, filling three fifths to two thirds the length of the pod.

TYPE LOCALITY: New Braunfels, Texas.

DISTRIBUTION: Dry hillsides and cañons, southern Texas to Coahuila and Tamaulipas.

ILLUSTRATION: Rep. Smithson. Inst. 1915: 284. f. 2a.

10. *Eysenhardtia parvifolia* Brand. Univ. Calif. Publ. Bot. 4:

180. 1911.

An intricately branched shrub; stems gray, the young growth canescent with incurved to appressed white hairs; leaves 0.9-1.2 cm. long, spreading; stipules 1-2 mm. long, brown, filiform; stipels not seen, early deciduous and probably minute; leaflets 9-13, elliptic-oval, 2-2.5 mm. long, green above, scarcely paler beneath, glabrate above and beneath, punctate beneath with brownish dots, not reticulate above, fleshy; racemes 0.5-1 cm. long; bracts 1-2 mm. long, lanceolate, brown, pubescent, persisting till after anthesis; calyx-tube 2 mm. long, dotted with

large glands, canescent-puberulent, ridged, split slightly more deeply on the posterior side; lobes 0.3–0.5 mm. long, obtusish to acute, the three anterior longer, pubescent, ciliate; petals not seen, the standard described as slightly emarginate; style 3–4 mm. long, pubescent with relatively long hairs, straight (originally described as uncinata), without a gland; pods 5–8 mm. long, 1.7–2 mm. wide, slightly thickened, brown, glabrous, punctate with large glands, straight at maturity, ascending, sessile; seed filling the entire pod.

TYPE LOCALITY: Sierra de Parras, Coahuila.

DISTRIBUTION: Known only from the type locality.

11. *Eysenhardtia punctata* Pennell, sp. nov.

A much branched shrub or small tree, 3–5 m. high; stems grayish, the young growth finely puberulent with grayish hairs; leaves 8–10 cm. long, spreading; stipules 2–3 mm. long, grayish, subulate; stipels subulate, grayish, less than 1 mm. long, shorter than the petiolules, more or less persistent; leaflets 35–45, oblong-ovate, 8–12 mm. long, dull-green above, scarcely paler beneath, glabrate (minutely puberulent) above and beneath, punctate beneath with large brownish dots, finely reticulate above, firm; racemes 4–9 cm. long; bracts 1–2 mm. long, lanceolate, brown, puberulent, deciduous before anthesis; calyx-tube 2–2.5 mm. long, glandular-dotted, minutely puberulent, obscurely ridged below, split much more deeply (ultimately nearly to the base) on the posterior side; lobes minute, the two posterior less than 1 mm. long, rounded, the three anterior acute, reaching 0.7 mm. long, all pubescent, ciliate; petals not seen; style not seen; pods 14–16 mm. long, 4.5–5 mm. wide, thin, greenish-brown, glabrous, straight, at maturity spreading, on pedicels about 1 mm. long; seed at least 4 mm. long, broadly oblanceolate, thin, smooth, olive-brown, with broad basal lobe, filling one third to one half the length of the pod.

Type collected in fruit, on road between Bolaños and Guadalajara, Jalisco, September 19, 1897, J. N. Rose 3734 (U. S. Nat. Herb.).

DISTRIBUTION: Hillsides, Aguascalientes and Jalisco.

12. *Eysenhardtia schizocalyx* Pennell, sp. nov.

A virgately much branched shrub or small tree; stems gray, the young growth cinereous-pubescent, with incurved to appressed whitish hairs; leaves 4–4.5 cm. long, spreading; stipules 1–2 mm. long, brown, subulate; stipels subulate, brownish, about 0.5 mm. long, equaling the petiolules, more or less persistent; leaflets 21–25, oblong-oblanceolate, narrowed at the base, rounded-apiculate at the apex, 4–6 mm. long, pale-green above, paler beneath, appressed-pubescent above and beneath, punctate beneath with small dark-brown dots, not reticulate above, slightly thickened; racemes 6–9 cm. long; bracts 1–2 mm. long, lanceolate, grayish-brown, canescent, persisting until after anthesis; calyx-tube 1.5–1.7 mm. long, glandular-dotted, canescent-pubescent, slightly ridged, split nearly to the base on the posterior side; lobes unequal, the three anterior longer, 1–1.2 mm. long, pubescent; petals 4–4.5 mm. long, membranous, twice as long as the calyx, the standard slightly broader, emarginate at the apex; style 2 mm. long, pubescent with relatively long hairs, sharply upcurved at the apex, the gland at the curve short and thick, conspicuous, reddish; pods 6–7 mm. long, 2.5–3 mm. wide, thickened, not ridged-veined, pale-brown, puberulent, punctate distally with few minute glands, slightly upcurved, at maturity ascending, on pedicels about 0.5 mm. long; seed 4 mm. long, oblanceolate, thick, very smooth, pale-brown, with a narrow basal lobe, filling the entire legume.

Type collected at Mapimi, Durango, October 21–23, 1898, E. Palmer 528 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Known only from the type locality.

13. *Eysenhardtia peninsularis* Brand. Univ. Calif. Publ. Bot. 4:

180. 1911.

An intricately branched shrub; stems gray, the young growth cinereous-canescens with incurved to appressed whitish hairs; leaves 1–1.5 cm. long, spreading; stipules not seen; stipels subulate, brown, less than 0.5 mm. long, shorter than or equaling the petiolules, more or less persistent; leaflets 9–11, oblong, 4–5 mm. long, dull-green above, pale beneath, finely puberu-

lent to glabrate above and beneath, punctate beneath with small dark-brown dots, not reticulate above, firm; racemes 2-5 cm. long; bracts 1-2 mm. long, lanceolate-attenuate, brown, loosely pubescent, long-persistent; calyx-tube 2.5 mm. long, glandular-dotted, canescent, ridged, split nearly to the base on the posterior side; lobes nearly equal, 0.9-1 mm. long, pubescent, ciliate; petals 4-5 mm. long, thin, membranous, twice as long as the calyx, the standard slightly broader, slightly emarginate; style upcurved at the apex, with a rudimentary gland; pods small, thickened, more or less ridge-veined, dark-brown, not known mature.

TYPE LOCALITY: Lower California.

DISTRIBUTION: Known only from the type locality.

14. *Eysenhardtia spinosa* Engelm.; A. Gray, Bost. Jour. Nat. Hist. 6: 174. 1850.

Wiborgia spinosa Kuntze, Rev. Gen. 213. 1891.

Viborgia spinosa Cockerell, Bull. Am. Mus. Nat. Hist. 24: 97. 1908.

An intricately branched shrub; stems gray, the young growth cinereous-canescens with incurved to appressed whitish hairs; leaves 1-2.5 cm. long, spreading; stipules 1-1.5 mm. long, brown, subulate; stipels subulate, dark-brown, 0.3-0.5 mm. long, equaling the petiolules, persistent; leaflets 13-17, oblong-oblancoate, 3-4 mm. long, pale-green above, glaucous beneath, glabrous above, finely puberulent and punctate beneath with small dark dots, obscurely reticulate above, slightly thickened; racemes 1-3 cm. long; bracts 1-2 mm. long, ovate-acuminate, brown, loosely canescent, persistent until fruit matures; calyx-tube 2-3 mm. long, glandular-dotted, canescent, purple, ridged, split nearly to the base on the posterior side; lobes unequal, the three anterior longer, acuminate, 0.7-1 mm. long, pubescent, ciliate; petals 4-4.5 mm. long, firm, from less than twice to twice as long as the calyx, light-yellow, the standard slightly broader, notched; style 2-3 mm. long, relatively densely pubescent, sharply upcurved, without a gland; pods 5-6 mm. long, 2 mm. wide, much thickened, strongly ridge-veined, dark-brown, soon glabrate, punctate distally with minute glands, at maturity ascending, on pedicels scarcely 0.5 mm. long; seed 3.2-3.4 mm. long, obovoid, thick, ridged laterally, the surface very smooth, dark-brown, with a broad basal lobe, filling the entire pod.

TYPE LOCALITY: Lake Encinillas, Chihuahua.

DISTRIBUTION: Chihuahua.

13. *PSOROBATUS** Rydberg, gen. nov.

Low shrubs, with spinescent stipules and white-tomentose and glandular-pustulate branches. Leaves pinnate, with orbicular leaflets. Flowers spicate; bracts narrow, gland-tipped. Calyx deeply campanulate, with oblong lobes. Petals yellow, somewhat fleshy, distinct, inserted at the base of the staminal tube, neither oblique, nor distinctly clawed, the banner broader than the rest. Stamens 9, monadelphous, alternately longer and shorter. Stigma rather large, capitate. Pod ovoid or ellipsoid, turgid, without prominent sutures, exserted, 2-ovuled, 1- or 2-seeded, with a slender beak.

Type species, *Dalea Benthami* Brand.

Stipular spines 3-9 mm. long; terminal leaflet only retuse; banner about twice as broad as the other petals.

Stipular spines 1-2 mm. long; all leaflets retuse; banner 3-4 times as broad as the other petals.

1. *P. Benthami*.

2. *P. megacarpus*.

1. *Psorobatus Benthami* (Brand.) Rydberg.

Dalea ? sp. Benth. Bot. Voy. Sulph. 12. 1844.

Dalea megacarpa Greene, Pittonia 1: 202. 1888. Not *D. megacarpa* S. Wats. 1885.

Dalea Benthami Brand. Proc. Calif. Acad. II. 2: 148. 1889.

Dalea megacarpa biuncifera Greene; Vasey & Rose, Contr. U. S. Nat. Herb. 1: 15. 1890.

A low shrub, less than 1 m. high; branches white-tomentose, densely glandular-pustulate with orange or brown glands; leaves 2-4 cm. long; stipules spinescent, at first gland-tipped, 3-9 mm. long, often somewhat recurved at the base; rachis tomentose and glandular-

*From ψωρα, scab, and βραχος, bramble, on account of the glandular pustules and spinescent stipules.

dotted; leaflets 7-11, suborbicular, 4-8 mm. long, only the terminal one somewhat retuse, white-tomentose on both sides and glandular-dotted beneath; spikes 2-6 cm. long; bracts subulate, acuminate, gland-tipped, 4 mm. long; flowers ascending; calyx-tube white-tomentose, more or less glandular-dotted; calyx 10-ribbed, 4 mm. long, deeply campanulate; lobes oblong, 3 mm. long, obtuse; petals pale-yellow, 7-8 mm. long, retuse and revolute at the apex, the banner obovate, the other petals narrowly spatulate; pod ovoid, about 1 cm. long, tomentose and densely glandular, the beak slender, half as long; seeds large, dark-brown.

TYPE LOCALITY: Santa Margarita Island, Lower California.

DISTRIBUTION: Islands off west coast of Lower California.

2. *Psorobatus megacarpus* (S. Wats.) Rydberg.

Dalea megacarpa S. Wats. Proc. Am. Acad. 20: 359. 1885.

A shrub, less than 1 m. high; branches white-tomentose and conspicuously glandular-pustulate with light-brown glands; leaves 5-8 cm. long; stipules subulate, 1-2 mm. long, becoming spinescent; rachis white-tomentose and with scattered glands; leaflets 9-13, suborbicular or round-oval, or the terminal one obcordate, more or less retuse at the apex, 5-8 mm. long, white-tomentose on both sides or greener above, glandular-dotted beneath; spikes sessile or short-penduncled, 5-15 cm. long, nearly 1 cm. thick, dense; bracts filiform-subulate, 4-5 mm. long, tipped with a gland, deciduous; flowers ascending; calyx white-tomentose, with a few scattered glands; tube campanulate, 3-4 mm. long, scarcely ribbed; lobes 2 mm. long, oblong, obtuse; petals yellow, turning brown, all distinct, almost clawless, the banner broadly obovate, slightly retuse, 7 mm. long, the other petals narrowly oblanceolate, 6 mm. long; stamens 9, alternately longer and shorter; pod ellipsoid, about 1 cm. long, with a short beak, tomentose and with numerous glands.

TYPE LOCALITY: Northern Sonora.

DISTRIBUTION: Sonora and Lower California.

14. *PSORODENDRON** Rydberg, gen. nov.

Asagraea Baillon, *Adansonia* 9: 232. 1870. Not *Asagraea* Lindl. 1839.

Dalea § *Xyloalea* S. Wats. Proc. Am. Acad. 11: 132, in part. 1876.

Shrubs or trees, with pinnate or simple glandular-dotted leaves; stem glabrate and gray or straw-colored in age; branches often spinescent, mostly pubescent and somewhat glandular-dotted when young; glands, especially on the peduncles, often subulate or conic. Flowers racemose; rachis often more or less spinescent, subtended by two small subulate bractlets, and with a deciduous bract at the base of the short pedicels. Calyx-tube turbinate, the hypanthium slightly adnate to the base of the ovary. Corolla truly papilionaceous; petals subequal or the keel rarely longer, all inserted on the hypanthium, at the base of the staminal tube; banner usually deeply notched at the apex, usually with two small lobes at the base of the blade; blades of the wings and keel-petals similar to each other, the latter slightly united along the lower edge, obliquely obovate or oval, with a conspicuous rounded basal lobe. Stamens 9 or 10, monadelphous. Ovary mostly 2-ovuled, in *P. spinosum* 4-6-ovuled. Pod more or less compressed, longer than the calyx, long-beaked, oblique, usually with prominent sutures, conspicuously glandular-dotted.

Type species, *Dalea Johnsoni* S. Wats.

Leaves pinnate, rarely unifoliolate.

Racemes mostly 1-flowered; low undershrubs with creeping rootstocks.

Racemes several- or many-flowered; shrubs.

Plants densely villous-tomentose.

Plants strigose or puberulent, sometimes nearly glabrous.

Calyx-lobes shorter than the tube, very dissimilar, the upper two much broader, usually twice as broad as the lowest lobe.

Leaflets obovate or oval.

Leaflets oblong to lanceolate or linear.

Leaves, calyces, and branches densely strigose-canescens when young; body of the pod 10 mm. long or less.

Leaflets neither decurrent nor confluent; corolla deep-purple.

1. *P. Kingii*.

2. *P. arborescens*.

3. *P. Wheeleri*.

* From ψωρα, scab, and δένδρον, tree.

- Leaflets 1-7, oblong or elliptic.
 Leaflets 5-11, linear or linear-oblongate.
 Leaflets more or less decurrent and the upper ones confluent; corolla dark-blue.
 Leaves, calyces, and branches sparingly short-hirsute or glabrate; body of the pod 12 mm. long.
 Calyx-lobes nearly similar, all lance-subulate and equaling the tube; leaflets linear.
 Branches and leaves strigose when young; leaflets less than 1 cm. long; pod not conspicuously hoary.
 Branches and leaves sparingly short-hirsute when young, soon glabrate; leaflets more than 1 cm. long; pod conspicuously hoary.
- Leaves simple.
 Leaves narrowly linear; glands of the calyx scattered; ovules 2.
 Branches bright-green and glabrate; leaves sparingly pubescent; calyx 5 mm. long.
 Branches and leaves densely canescent-strigose when young, the former yellowish; calyx 4 mm. long.
 Leaves broader, the lower obovate, spatulate or oblanceolate, toothed, the upper spatulate or oblanceolate, entire; calyx with a solitary gland in each interval; ovules 4-6.
4. *P. Fremontii*.
 5. *P. Johnsonii*.
 6. *E. californicum*.
 7. *P. Saundersii*.
 8. *P. amoenum*.
 9. *P. pubescens*.
 10. *P. Schottii*.
 11. *P. puberulum*.
 12. *P. spinosum*.

1. *Psorodendron Kingii* (S. Wats.) Rydberg.

Dalea Kingii S. Wats. Bot. King's Expl. 64. 1871.

Parosela Kingii A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

A divaricately branched, spinescent, and flexuose undershrub, with a creeping rootstock; stems 1-3 dm. high; branches yellowish-green, sparingly strigose and conspicuously glandular-dotted; leaves divaricate, 2-4 cm. long, strigose or in age glabrate; leaflets 3-9, oval or elliptic, 6-12 mm. long, obtuse at each end; racemes mostly 1-flowered, the rachis produced and spinescent; bracts and bractlets subulate, about 1 mm. long; calyx sparingly strigose, conspicuously glandular-dotted; tube elongate-turbinate, 4 mm. long; lobes 2 mm. long, acute, the upper two broadly triangular, the others lanceolate; corolla bluish-purple; petals nearly equal, the blades about 4 mm. long, the claws 2 mm. long; blade of the banner broadly obcordate, those of the other petals obliquely obovate, with large rounded basal lobes; pod pubescent.

TYPE LOCALITY: Drifted sand, Hot Spring Mountains, Nevada.

DISTRIBUTION: Northern Nevada.

ILLUSTRATION: S. Wats. Bot. King's Expl. pl. 10, f. 1-3.

2. *Psorodendron arborescens* (Torr.) Rydberg.

Dalea arborescens Torr.; A. Gray, Mem. Am. Acad. II. 5: 316. 1854.

Parosela arborescens A. Heller, Cat. N. Am. Pl. ed. 2. 5. 1900.

Parosela neglecta Parish, Bot. Gaz. 55: 306. 1913.

A shrub, 1-1.5 m. high, or a small tree; branches villous-tomentose and with scattered subulate glands when young, in age gray, striate; leaves 2-4 cm. long, white-villous-tomentose; leaflets 3-7, oval or obovate, obscurely glandular-dotted, 6-10 mm. long; racemes 2-5 cm. long, 5-15-flowered; bracts subulate-filiform, 5 mm. long; pedicels 1-2 mm. long; bractlets subulate; calyx densely villous-tomentose; tube turbinate, 4 mm. long; lobes 3-4 mm. long, acuminate, the upper two lanceolate, the other three subulate; corolla ultramarine-blue; petals subequal, the blades 7 mm. long, the claws 2 mm. long; blade of the banner obcordate, with small rounded basal lobes, those of the other petals oval, with a large rounded basal lobe; pod obliquely ovate, villous and conspicuously glandular-dotted, the body 1 cm. long, the beak 6 mm. long.

TYPE LOCALITY: Mountains of San Fernando, southern California.

DISTRIBUTION: Mojave Desert, southern California.

ILLUSTRATION: Bot. Gaz. 55: 307, f. 3.

3. *Psorodendron Wheeleri* (Vail) Rydberg.

Parosela Wheeleri Vail, Bull. Torrey Club 24: 17. 1897.

A low shrub, with short branches, in age straw-colored, strigose when young, with raised glands; leaves 1-2.5 cm. long, strigose; rachis flattened; leaflets 5-7, obovate or oval, sparingly strigose and conspicuously glandular-dotted, 5-8 mm. long, 3-6 mm. wide; racemes 2-8 cm.

long; rachis with subulate glands, more or less spinescent; bracts subulate, 2-3 mm. long; pedicels about 0.5 mm. long; bractlets minute, subulate; calyx glabrate except the ciliate margins of the lobes; tube turbinate, 3 mm. long, sparingly and minutely glandular-dotted; lobes 2 mm. long, the upper two triangular-ovate, twice as broad as the rest, which are lance-subulate; corolla purple; petals subequal, the blades 4-5 mm. long, the claws 2 mm. long; blade of the banner suborbicular, notched, those of the other petals broadly obliquely obovate, with a large rounded basal lobe; pod obliquely ovate, nearly glabrous, conspicuously glandular-dotted, the body 8 mm. long or more, equaled by the beak.

TYPE LOCALITY: Nevada.

DISTRIBUTION: Nevada, and Owen's Valley, California.

4. *Psorodendron Fremontii* (Torr.) Rydberg.

Dalea Fremontii Torr.; A. Gray, Mem. Am. Acad. II. 5: 316. 1854.

Parosela Fremontii Vail, Bull. Torrey Club 24: 16. 1897.

A low shrub, intricately branched; branches straw-colored, strigose-canescenscent when young; leaves 2-4 cm. long, strigose-canescenscent; leaflets 1-7, oblong, elliptic, or rarely obovate, 5-10 mm. long, glandular-dotted, obtuse at the apex, acute at the base, scarcely decurrent; racemes 5-10 cm. long; bracts subulate, soon deciduous; pedicels 1-2 mm. long; bractlets subulate, 1 mm. long; calyx sparingly strigose-canescenscent; tube turbinate, 2.5 mm. long; lobes about 2 mm. long, acute or short-acuminate, the upper two triangular, about twice as broad as the lowest one; corolla purple; petals subequal, the blades 4.5-5 mm. long, the claws about 2 mm. long; blade of the banner broadly obovate, slightly round-lobed at the base, those of the other petals obliquely obovate, rounded at the apex, with a more prominent rounded lobe at the base; pod obliquely obovate, sparingly strigose, conspicuously glandular-dotted, the body about 1 cm. long, 5 mm. wide, the beak 8-10 mm. long.

TYPE LOCALITY: "Mountains of the Pah-Utah country" [near Muddy River, southern Nevada].

DISTRIBUTION: Southern Nevada, southwestern Utah, and southeastern California.

5. *Psorodendron Johnsoni* (S. Wats.) Rydberg.

Dalea Johnsoni S. Wats. Bot. King's Expl. 64. 1871.

Parosela Johnsoni Vail, Bull. Torrey Club 24: 17. 1897.

A diffusely branched shrub, 1-2 m. high; branches ash-colored, strigose-canescenscent when young; leaves 2-5 cm. long, somewhat strigose-canescenscent; leaflets 5-11, linear or linear-ob-lanceolate, 5-15 mm. long, acute at both ends or obtuse at the apex, not conspicuously glandular-dotted; racemes 3-7 cm. long, loosely flowered; bracts subulate, 1-1.5 mm. long, caducous; pedicels about 1 mm. long; bracts subulate, minute; calyx sparingly strigose; tube turbinate, 3-4 mm. long; lobes 2.5-3 mm. long, acuminate, the upper two ovate-lanceolate, nearly twice as broad as the lanceolate lowest one; corolla deep-purple; petals nearly equal, the blades about 7 mm. long and the claws 3 mm. long; blade of the banner broadly oval, emarginate, those of the other petals obliquely obovate, rounded at the apex and with a conspicuous rounded basal lobe; pod obliquely ovate, sparingly strigose and conspicuously glandular-dotted, the body 8 mm. long, 5 mm. wide, the beak 8 mm. long.

TYPE LOCALITY: St. George, on the Virgin River, Utah.

DISTRIBUTION: Southern Utah, northern Arizona, southern Nevada, and southeastern California.

6. *Psorodendron californicum* (S. Wats.) Rydberg.

Dalea californica S. Wats. Proc. Am. Acad. 11: 132. 1876.

Parosela californica Vail, Bull. Torrey Club 24: 17. 1897.

Parosela californica simplicifolia Parish, Bot. Gaz. 55: 309. 1913.

A shrub, 1-2 m. high, much branched; branches ashy or straw-colored, sparingly glandular-dotted, densely strigose-canescenscent when young; leaves 1-5 cm. long, densely strigose-canescenscent; leaflets 1-7, or on the shoots 7-11, oblong, or oblanceolate, 5-15 mm. long, more or less decurrent and the upper confluent; racemes 2-6 cm. long; rachis somewhat spinescent in age, strigose-canescenscent; bracts lance-subulate, 2 mm. long, deciduous; pedicels 1-2 mm. long; bractlets subulate, minute; calyx densely canescenscent; tube turbinate, 3 mm. long; lobes about 2 mm. long, the upper two ovate, the rest lanceolate, acute; corolla dark-blue; petals subequal,

8 mm. long; blade of the banner obovate, those of the other petals obliquely obovate, rounded at the apex, with a rounded basal lobe; fruit obliquely ovate, sparingly strigose, densely glandular-dotted, the body 8 mm. long, 5 mm. wide, the beak 8 mm. long.

TYPE LOCALITY: San Bernardino Mountains, California.

DISTRIBUTION: Southern California.

ILLUSTRATIONS: Bot. Gaz. 55: 310. f. 4; Armstrong, Field Book W. Wild Fl. 249.

7. *Psorodendron Saundersii* (Parish) Rydberg.

Dalea Saundersii Parish, Bull. So. Calif. Acad. 2: 83. 1903.

Parosela Wheeleri A. Heller, Muhlenbergia 2: 216. in part. 1906.

Parosela Saundersii Abrams, Bull. N. Y. Bot. Garden 6: 396. 1910.

Parosela Johnsonii Saundersii Parish, Bot. Gaz. 55: 308. 1913.

A shrub, 5–10 dm. high; branches sparingly short-hirsute when young, soon glabrous and straw-colored; glands few, and subulate in the inflorescence; leaves 4–6 cm. long, green, sparingly hirsute; leaflets 5–7, lanceolate or oblanceolate, acute, 5–15 mm. long, slightly revolute on the margins; racemes 5–10 cm. long; bracts subulate, 2–3 mm. long; pedicels 2–4 mm. long; bractlets subulate, 1 mm. long; calyx soon glabrate; tube turbinate, 3.5–4 mm. long; lobes 2 mm. long, ciliate on the margins, the upper two ovate, acute, the rest narrowly lanceolate; corolla dark purplish-blue; petals subequal, the blades 5 mm. long, the claws about 2 mm. long; blade of the banner rounded-reniform, retuse, those of the other petals obliquely obovate, with a large rounded basal lobe; pod obliquely ovate-lunate, glabrate, conspicuously glandular-dotted, the body 12 mm. long, 6 mm. wide, the beak 8 mm. long.

TYPE LOCALITY: Victorville, Mojave Desert, California.

DISTRIBUTION: Southern California.

ILLUSTRATION: Bull. So. Calif. Acad. 2: pl. 2.

8. *Psorodendron amoenum* (S. Wats.) Rydberg.

Dalea amoena S. Wats. Am. Nat. 7: 300. 1873.

Parosela amoena Vail, Bull. Torrey Club 24: 17. 1897.

? *Parosela Johnsonii minutifolia* Parish, Bot. Gaz. 55: 308. 1913.

A low subsperescent shrub; branches short, strigose when young, glabrous and straw-colored in age, sparingly glandular; glands in the inflorescence subulate; leaves 2–3 cm. long, strigose-hoary; leaflets 5–13, linear, 4–8 mm. long, often rounded or subtruncate at the apex, 1–2 mm. broad; racemes 2–3 cm. long, 6–12-flowered; bracts and bractlets subulate, the latter minute; pedicels about 1 mm. long; calyx hoary; tube narrowly turbinate, 4 mm. long, 10-ribbed; lobes all narrowly lanceolate, about equaling the tube; corolla dark bluish-purple; petals subequal, the blades 5–6 mm. long; blade of the banner broadly oval, retuse, those of the other petals obliquely oval, with a rounded basal lobe.

TYPE LOCALITY: Northern Arizona.

DISTRIBUTION: Southern Utah and Nevada and northwestern Arizona.

9. *Psorodendron pubescens* (Parish) Rydberg, sp. nov.

Parosela Johnsonii pubescens Parish, Bot. Gaz. 55: 308. 1913.

A shrub, 1 m. high or more; branches sparingly hairy when young, soon glabrous; leaves 3–5 cm. long, green, very sparingly hairy, conspicuously glandular-dotted; leaflets 7–9, linear, 10–15 mm. long, 1–2 mm. wide; racemes 4–5 cm. long; bracts and bractlets subulate; pedicels 1–2 mm. long; calyx sparingly hirsute; tube turbinate, 4 mm. long; lobes all lance-subulate, about equaling the tube; corolla purple; petals subequal, the blades about 5 mm. long, the claws 2 mm. long; blade of the banner suborbicular, deeply retuse, those of the other petals obliquely obovate, with a rounded basal lobe; pod obliquely ovate, rather densely hoary-pubescent and conspicuously glandular-dotted, the body nearly 1 cm. long, the beak somewhat shorter.

TYPE LOCALITY: Lee's Ferry, Arizona.

DISTRIBUTION: Known only from the type locality.

10. *Psorodendron Schottii* (Torr.) Rydberg.

Dalea Schottii Torr. Bot. Mex. Bound. Surv. 53. 1859.

Parosela Schottii A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

An intricately branched spinescent shrub, 1-3 m. high; branches slender, bright-green and glabrate or sparingly and minutely strigose, nearly glandless; leaves linear, 0.5-3 cm. long, 1-2 mm. wide, sparingly puberulent, glandular-dotted along the margins; racemes 4-8 cm. long, 6-20-flowered; bracts and bractlets subulate, the former about 2 mm., the latter 1 mm. long; pedicels 1-2 mm. long; calyx sparingly short-hirsute or soon glabrate, glandular-dotted; tube turbinate, 3 mm. long; lobes ovate, 1.5-2 mm. long, acutish; corolla blue, the keel-petals slightly longer than the rest; blade of the banner broadly obcordate, with small basal lobes, 6 mm. long, those of the other petals obliquely obovate, with a round basal lobe, those of the wings 6 mm., those of the keel-petals 7 mm. long the claws about 2 mm. long; pod obliquely ovate, conspicuously glandular-dotted, the body about 1 cm. long, 6 mm. wide, the beak 5 mm. long.

TYPE LOCALITY: Banks of the Colorado.

DISTRIBUTION: Southern California, western Arizona, and Lower California.

ILLUSTRATION: Bot. Gaz. 55: 311. f. 5.

11. *Psorodendron puberulum* (Parish) Rydberg, sp. nov.

Parosela Schottii puberula Parish, Bot. Gaz. 55: 312. 1913.

An intricately branched spinescent shrub; young branches densely canescent-puberulent, in age glabrate and gray; leaves linear, 1-2.5 cm. long, 1-2 mm. wide, grayish-canescens when young, glandular-dotted along the margins; racemes 3-5 cm. long; bracts and bractlets subulate, minute; pedicels less than 1 mm. long; calyx densely canescent, inconspicuously glandular-dotted; tube 3 mm. long, elongate-turbinate, strongly 10-ribbed; lobes triangular, 1 mm. long; corolla bluish-purple, about 10 mm. long; blade of the banner broadly obovate, emarginate, 6 mm. long, those of the wings and keel-petals oval, with a rounded basal lobe, 6 mm. long; pod obliquely obovoid, puberulent and conspicuously glandular-dotted, the body nearly 1 cm. long, 5 mm. wide, the beak of nearly the same length.

TYPE LOCALITY: Colorado Desert.

DISTRIBUTION: Colorado Desert, California, and northern Lower California.

12. *Psorodendron spinosum* (A. Gray) Rydberg.

Dalea spinosa A. Gray, Mem. Am. Acad. II. 5: 315. 1854.

Asagraea spinosa Bailon, Adansonia 9: 233. 1870.

Dalea spinescens Hemsl. Biol. Centr. Am. Bot. 1: 247. 1880.

Parosela spinosa A. Heller, Cat. N. Am. Pl. ed. 2. 7. 1900.

An intricately branched spinescent tree or shrub, 4-7 m. high; branches at first minutely canescent, later becoming glabrous, yellowish-green, conspicuously glandular-dotted, the glands at first conic; leaves simple, white-strigose, those of the young plant obovate, spatulate or oblanceolate, irregularly dentate, 2-5 cm. long, those of the branches linear-oblanceolate, 5-15 mm. long, early deciduous; racemes 3-5 cm. long, spinescent; bracts and bractlets minute, subulate; pedicels 1 mm. long or less; calyx densely white-strigose; tube turbinate, sharply 10-ribbed, with a solitary conspicuous gland in each interval, 3 mm. long; lobes ovate, acute, 1.5 mm. long; corolla dark-blue; blade of the banner broadly obcordate, 4 mm. long, those of the wings obliquely oval, with a conspicuous basal lobe, 4-5 mm. long, those of the keel-petals broader and with a more rounded basal lobe, about 6 mm. long, the claws of the wings and keel-petals about 2 mm. long; pod obliquely ovate, canescent and glandular-dotted.

TYPE LOCALITY: Arroyos of the Gila, Arizona.

DISTRIBUTION: Southern California, Arizona, Sonora, and Lower California.

ILLUSTRATIONS: Pacif. R. R. Rep. 7: pl. 3; Britton, N. Am. Trees f. 520; Sargent, Man. f. 471; Sargent, Silva pl. 111; Eastw. Handb. Trees Calif. pl. 39.

15. PSOROTHAMNUS* Rydberg, gen. nov.

Dalea § *Xylodalea* S. Wats. Proc. Am. Acad. 11: 132, in part. 1876.

Intricately branched shrubs, with pinnate or simple deciduous leaves, and conspicuously glandular-pustulate branches, the glands red or orange, turning brown. Flowers in dense, short, often subglobose spikes; bracts lanceolate, caducous; bractlets wanting or represented by glands. Calyx-tube turbinate, strongly 10-ribbed, with a row of glands in each interval.

* From ψωρα, scab, and θαμνος, shrub.

Corolla dark-blue or dark-purple, papilionaceous; petals inserted on the hypanthium, at the base of the staminal tube, nearly equal in length, often with a gland near the apex, except the keel-petals; blade of the banner suborbicular or round-cordate, slightly if at all retuse; blades of the other petals with a rounded basal lobe, those of the keel much broader than those of the wings. Stamens 9 or 10, monadelphous, united high up into a tube. Pod obliquely obovoid, turgid, pubescent above, glabrous at the base, slightly exceeding the calyx-tube, but not as long as the lobes, the sutures not prominent.

Type species *Dalea Emoryi* A. Gray.

Leaves mostly pinnate; branches spreading.

Calyx-tube glabrous; leaflets oblong-cuneate to obovate, retuse.

Calyx-tube distinctly pubescent.

Leaflets obcordate; corolla rose-purple.

Leaflets obovate to lance-linear or oblong; corolla dark-blue.

Calyx-lobes as long as the tube or longer.

Calyx-lobes shorter than the tube.

Calyx-lobes subequal in length; leaves at least somewhat canescent; branches stout.

Leaflets entire or merely sinuate, oval to oblong.

Leaflets distinctly dentate.

Leaflets obovate to oblanceolate; stem and leaves decidedly canescent.

Leaflets linear-lanceolate; stem and leaves somewhat pubescent but green.

Calyx-lobes unequal, the lowest one distinctly longer; stem and leaves glabrous; branches very slender.

Leaves simple; branches strongly ascending or erect.

1. *P. subnudus*.

2. *P. polyadenius*.

3. *P. Emoryi*.

4. *P. tinctorius*.

5. *P. dentatus*.

6. *P. arenarius*.

7. *P. junceus*.

8. *P. scoparius*.

1. *Psorothamnus subnudus* (S. Wats.) Rydberg, sp. nov.

Dalea polyadenia subnuda S. Wats. Bot. Calif. 2: 441. 1880.

Parosela polyadenia subnuda Parish, Bot. Gaz. 55: 305. 1913.

A shrub, with spreading branches covered with orange or red glandular pustules, finely canescent; leaves spreading, 1-1.5 cm. long; stipules represented by glands; rachis terete, strigose-canescens, with a few glands; leaflets 7-11, fleshy, canescent, with a few glands, oblong-cuneate to obovate, retuse, 2-3 mm. long; spikes short, terminating the branches; bracts deciduous; calyx-tube campanulate, 2.5 mm. long, glabrous, strongly 10-ribbed, with a row of conspicuous red glands in each interval; lobes subulate, ciliate, 2 mm. long; petals subequal, the banner and wings with a gland near the apex; blade of the banner rounded-cordate, 3.5 mm. long, the claw 2.5 mm. long; blades of the wings obliquely oblong, 4 mm. long, those of the keel-petals obliquely obovate, 4 mm. long, the claws of the wings and keel-petals 2 mm. long.

TYPE LOCALITY: Owens Valley, California.

DISTRIBUTION: Known only from the type locality.

2. *Psorothamnus polyadenius* (Torr.) Rydberg.

Dalea polyadenia Torr.; S. Wats. Bot. King's Expl. 64. 1871.

Parosela polyadenia A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

A somewhat spinescent shrub, 0.5-2 m. high, with numerous divaricate conspicuously glandular-pustulate branches, when young densely canescent with retrorse hairs; glands at first bright-orange, in age brown; leaves divaricate, 1-2.5 cm. long; rachis densely short-villous, with scattered glands; leaflets 7-13, orbicular-obcordate, 2-4 mm. long and about as wide, densely short-villous and usually with a single large gland; peduncles about 1 cm. long; spikes dense, 1-2 cm. long, 10-12 mm. thick; bracts lanceolate, about 3 mm. long, caducous; calyx-tube 2.5 mm. long, turbinate, strongly 10-ribbed, with a row of 1-3 glands in each interval, densely villous; lobes lance-subulate, acuminate, equaling the tube, gland-tipped; petals rose-purple, usually with a single gland near the apex; blade of the banner 4 mm. long, rounded-obovate, obtuse, the claw 3 mm. long; blades of the wings obliquely obovate, with a rounded basal lobe, 4-4.5 mm. long, the claws 2 mm. long; keel-petals similar but much broader, usually folded along the lower edge; pod obliquely obovate, villous and with a few large glands above, glabrous below, a little exceeding the calyx-tube.

TYPE LOCALITY: Border of Truckee Desert, Nevada.

DISTRIBUTION: Western Nevada to Mojave Desert, California.

ILLUSTRATION: S. Wats. Bot. King's Expl. pl. 9.

3. *Psorothamnus Emoryi* (A. Gray) Rydberg.

Dalea Emoryi A. Gray, Mem. Am. Acad. II. 5: 315. 1854.

Parosela Emoryi A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

A shrub, 1-2 m. high, intricately branched; branches white-velutinous when young, with minute red or orange, in age brown, glands; leaves 1-9 cm. long, white-velutinous and sparingly glandular-dotted; leaflets 1-13, from linear-oblong to elliptic or obovate, entire or sinuate, 5-20 mm. long, the terminal one usually much longer than the rest; peduncles 1-4 cm. long; spikes head-like, short and dense, 12-15 mm. broad, 10-20-flowered; bracts lanceolate, 3-3.5 mm. long, villous and with red glands; calyx-tube turbinate, 2.5 mm. long; lobes subulate, 2.5-3 mm. long, villous; corolla dark-blue or bluish-purple; blade of the banner rounded-cordate, slightly retuse, with a single gland, 4 mm. long, the claw 2 mm. long; blades of the wings obliquely obovate, with a large rounded basal lobe, 4-5 mm. long, usually with a gland, those of the keel-petals much broader, 5 mm. long; pod obliquely obovate, villous and with many small red glands above, glabrous below, slightly exceeding the calyx-tube.

TYPE LOCALITY: Tablelands of the Gila, Arizona.

DISTRIBUTION: Arizona, southern California, Sonora, and Lower California.

ILLUSTRATIONS: Pacif. R. R. Rep. 5: *pl. 11*; Armstrong, Field Book W. Wild Fl. 249.

4. *Psorothamnus tinctorius* (Brand.) Rydberg.

Dalea tinctoria Brand. Proc. Calif. Acad. II. 2: 147. 1889.

A shrub, 1-2 m. high; branches divergent, grayish-velutinous and copiously glandular-dotted when young; glands red turning dark-brown; leaves 1.5-3 cm. long, canescent and glandular-dotted, early deciduous; leaflets 3-5, oval or elliptic, 4-10 mm. long, or the terminal one oblong, 1-2 cm. long, mostly entire, rarely sinuate; peduncles 4-10 cm. long; spikes dense, subglobose, 1 cm. thick; bracts lanceolate, 3 mm. long, caducous; calyx-tube turbinate, strongly 10-ribbed, villous, with a row of 2 or 3 red glands in each interval, 2.5 mm. long; lobes lanceolate, 1.5 mm. long, gland-tipped; corolla dark-blue; blade of the banner suborbicular-cordate, slightly retuse, 3 mm. long, the claw 2 mm. long; blades of the wings elliptic, with a rounded basal lobe, those of the keel-petals broadly obliquely obovate, 4 mm. long, the claws of the wing and keel-petals 2.5 mm. long; pod like that of *P. Emoryi*.

TYPE LOCALITY: San Gregorio, Lower California.

DISTRIBUTION: Lower California.

5. *Psorothamnus dentatus* Rydberg, sp. nov.

A shrub, with spreading branches, velutinous-canescant, and with numerous at first red, in age almost black glands; leaves 3-7 cm. long, canescent and with numerous glands; leaflets 9-17, from obovate to oblanceolate, 1-2 cm. long, at least the larger coarsely dentate; peduncles 1-2 cm. long; spikes subglobose, about 1 cm. broad; bracts lanceolate, equaling the calyx; calyx-tube turbinate, 3 mm. long, strongly 10-ribbed, with a row of 2-4 red glands in each interval; calyx-lobes triangular-lanceolate, gland-tipped, 2 mm. long; corolla dark-blue; blade of the banner orbicular, 3 mm. long, the claw 2 mm. long; blades of the wings elliptic, with a rounded basal lobe, and a gland near the apex, those of the keel-petals obliquely rounded-obovate, 3.5 mm. long, glandless, the claws of the wings and keel-petals 2 mm. long; pod unknown.

Type collected at Santo Domingo, Lower California, September 26, 1905, *Nelson & Goldman 7170* (U. S. Nat. Herb. no. 565256).

6. *Psorothamnus arenarius* (Brand.) Rydberg, sp. nov.

Dalea tinctoria arenaria Brand. Proc. Calif. Acad. II. 2: 147. 1889.

A shrub, with spreading branches, glabrous or nearly so, with conspicuous red glands; leaves 3-7 cm. long, sparingly canescent and with scattered glands; leaflets 5-9, linear-lanceolate, sinuate-dentate, the terminal ones 1.5-3.5 cm. long, the rest 1-1.5 cm. long, 1-3 mm. wide; peduncles 5-10 cm. long; spikes subglobose or short-oblong, 1 cm. thick; bracts lanceolate; calyx-tube turbinate, nearly 3 mm. long, strongly 10-ribbed, with a row of 2-4 glands in each interval, silky-villous; lobes lanceolate, 1.5 mm. long, gland-tipped; corolla blue; blade of the

banner suborbicular-cordate, 3 mm. long, the claw 1.5 mm. long; blades of the wings obliquely elliptic, with a rounded basal lobe, 3.5 mm. long, and with a single gland at the apex, the claws 1 mm. long; blades of the keel-petals broadly obovate, 4 mm. long; pod slightly exceeding the tube of the calyx, obliquely obovate, pubescent and with many glands above, glabrous below.

TYPE LOCALITY: Boca de Soledad, Lower California.

DISTRIBUTION: Southern Lower California.

7. *Psorothamnus juncus* Rydberg, sp. nov.

A shrub, with slender spreading branches, which are glabrous, densely and minutely dotted with red glands, bright-green when young, yellowish in age; leaves 1-2 cm. long, early caducous, glabrous and with scattered red glands; leaflets 1-5, oblong or narrowly oblanceolate, 1-1.5 cm. long; peduncles 5-10 cm. long; spikes subglobose, about 1 cm. broad; calyx-tube turbinate, 10-ribbed, with a row of 3 or 4 red glands in each interval, villous, 3 mm. long; lobes lanceolate, the lowest fully 2 mm. long, the rest about 1.5 mm. long; corolla dark bluish-purple; blade of the banner rounded-cordate, obtuse, 4 mm. long, with a single gland at the apex, the claw 2 mm. long; blades of the wings obliquely obovate, with a large rounded basal lobe, 5 mm. long, with a single gland near the apex, those of the keel-petals similar but broader, glandless, 6 mm. long; pod similar to that of *P. Emoryi*.

Type collected in the Esperanza Cañon, San Pedro Martir Mountains, Lower California, June 27, 1905, *Goldman 1178* (U. S. Nat. Herb. no. 565085).

8. *Psorothamnus scoparius* (A. Gray) Rydberg.

Dalea scoparia A. Gray, Mem. Am. Acad. II. 4: 32. 1849.

Parosela scoparia A. Heller, Cat. N. Am. Pl. ed. 2. 7. 1900.

A shrub, 0.5 m. high or more, with ascending canescent and conspicuously glandular-pustulate branches; leaves simple, spatulate-linear or oblanceolate, 1 cm. long or less, canescent and glandular-dotted; peduncles 2-7 cm. long; spikes subglobose or oblong, 12-15 mm. broad, dense; bracts lanceolate, 2 mm. long; calyx-tube turbinate, strongly 10-ribbed, with a row of 2-4 glands in each interval, 2.5 mm. long, white-villous; lobes triangular, 1 mm. long; corolla dark-blue; blade of the banner broadly oval, subcordate at the base and retuse at the apex, usually with a single gland near the apex, the claw 2.5 mm. long; blades of the wings oblong, with a rounded basal lobe, 5 mm. long, those of the keel-petals broadly obliquely obovate, 5 mm. long, the claws of the wings and keel-petals 2 mm. long; pod obliquely obovate, pubescent and glandular-dotted, glabrous only at the very base; body about equaling the calyx.

TYPE LOCALITY: Jornada del Muerto, New Mexico.

DISTRIBUTION: New Mexico, Chihuahua, and Coahuila.

16. *PAROSELA** Cav. Descr. Pl. 185. 1802.

Dalea Vent. Tabl. Veg. 3: 396, in part. 1799. Not *Dalea* Mill. 1754.

Cylopegon Raf. Jour. Phys. 89: 97. 1819.

Jamesia Raf. Atl. Jour. 145. 1832.

Trichopodium Presl, Bot. Bemerk. 52. 1844. Not *Trichopodium* Lindl. 1832.

Marina Liebm. Vidensk. Meddel. 1853: 103. 1853.

Cerroa Presl, Symb. Bot. 2: 25. 1858.

Annual or perennial herbs, or shrubs, with more or less glandular-dotted branches, leaves, and calyces. Leaves pinnately compound, with stipules and stipels, both (especially the latter) often gland-like. Flowers racemose or spicate. Calyx campanulate, 10-ribbed and 5-lobed, the lower lobe sometimes longer. Corolla of various colors. Banner inserted on the hypanthium, long-clawed, most commonly with a cordate or reniform blade. Wings and keel-petals (the latter apparently lacking in 3 species) inserted on the staminal tube, usually below its middle, the keel-petals slightly higher up than the wings; blades (unless otherwise stated) obliquely obovate, with a rounded basal lobe on the upper side, those of the keel-petals usually united along the lower edge at least towards the tip, in a few species distinct, those of the wings usually distinct, very rarely adnate to the adjacent keel-petals. Stamens usually 10 or 9,

* Manuscript prepared with the help of copious notes by Joseph Nelson Rose and drawings made by the late Frederick Andrews Walpole.

rarely 7 or 8, monadelphous, the tube usually split on the upper side. Ovary 1- or 2-ovuled. Stigma capitate. Pod indehiscent, obliquely obovoid or semi-reniform, mostly included in the calyx.

Type species, *Psoralea mutabilis* Cav.

Flowers pedicelled, reflexed.
Flowers sessile, ascending.

Subgenus 1. TRICHOPODIUM.
Subgenus 2. EUPAROSELA.

Subgenus 1. TRICHOPODIUM. Flowers racemose, with distinct (although sometimes short) pedicels, reflexed, and with a distinct joint below the flowers. Bracts early deciduous. (*Trichopodium* Presl. *Marina* Liebm. *Carroa* Presl.)

Calyx-lobes lanceolate to ovate, shorter than or barely equaling the tube.

Leaflets several.

Calyx hairy without; glabrous or slightly pubescent herbs.

Calyx-lobes distinctly toothed.

Calyx-lobes entire.

Calyx glabrous without.

Calyx hairy within.

Calyx strongly angled, not conspicuously glandular.

Calyx not strongly angled, conspicuously glandular.

Calyx glabrous within.

Leaflets 1-3.

Calyx-lobes longer than the tube.

Calyx-lobes lance-subulate, not plumose (except in *P. filiciformis*); flowers not subtended by glands.

Corolla inconspicuous, shorter than the calyx; keel-petals not much exceeding the other petals in length; annuals.

Corolla conspicuous, longer than the calyx; keel-petals much exceeding the other petals; perennials.

Calyx-lobes filiform, plumose; flowers subtended by 1-3 prominent acute glands; petals with glands near the bases.

I. DELICATAE.

II. CHRYSORHIZAE.

III. DIVARICATAE.

IV. LASIOSTOMAE.

V. DIFFUSAE.

VI. UNIFOLIATAE.

VII. VETULAE.

VIII. CALYCOSAE.

IX. LACHNOSTACHYDES.

One species.

I. DELICATAE

1. *P. delicata*.

II. CHRYSORHIZAE

Leaves glabrous or nearly so.

Stem erect, glabrous or sparingly strigose.

Racemes dense and spike-like.

Calyx crisp-hairy.

Calyx sparingly hairy; lobes purple-tipped, ovate-lanceolate, obtuse except the lowest one.

Calyx more conspicuously hairy; lobes all acute.

Calyx densely silky; lobes triangular-lanceolate at the base, more or less subulate-acuminate.

Racemes lax, rather few-flowered.

Plant annual, herbaceous; stem sparingly strigose at least above.

Plant perennial, shrubby below; stem glabrous.

Leaflets not punctate above; calyx-lobes ovate or lanceolate, at least one half as long as the tube.

Leaflets about 2 mm. long, retuse; calyx 2.5 mm. long.

Leaflets 7-10 mm. long, obtuse; calyx 3-3.5 mm. long.

Leaflets punctate above; upper 4 calyx-lobes broadly triangular, less than one third as long as the tube.

Stem decumbent or spreading from the base, usually more or less pubescent.

Stem densely pilose, not filiform; racemes many-flowered; flowers 7 mm. long.

Stem sparingly puberulent or glabrous, filiform; racemes few-flowered; flowers about 5 mm. long.

Sepals obtuse; leaflets glandless.

Sepals acute or apiculate; leaflets conspicuously glandular-punctate.

Leaves decidedly hairy.

Pubescence of the stem, petioles, rachis, and peduncles spreading.

Plant erect, perennial.

Plant spreading, annual.

Pubescence of the stem, petioles, rachis, and peduncles strigose-canescent.

Calyx canescent all over.

Calyx glabrous below, canescent-hirsute above.

2. *P. spiciformis*.

3. *P. neglecta*.

74. *P. vernicia*.

4. *P. pueblensis*.

5. *P. Palmeri*.

3. *P. neglecta*.

86. *P. hospes*.

6. *P. procumbens*.

7. *P. Holwayi*.

8. *P. chrysorhiza*.

9. *P. Goldmani*.

10. *P. peninsularis*.

11. *P. Parryi*.

13. *P. maritima*.

III. DIVARICATAE

Leaves pubescent.

Leaves sparingly pilose; stem glabrous.

Leaves densely strigose; stem canescent.

12. *P. Anthonyi*.

13. *P. maritima*.

- Leaves glabrous.
 Leaflets oblong to oval.
 Branches strigose.
 Branches glabrous.
 Upper 4 calyx-lobes acute; branches ascending.
 Upper calyx-lobes lanceolate, as long as the tube.
 Upper calyx-lobes ovate, shorter than the tube.
 Upper 4 calyx-lobes obtuse, oblong, shorter than the tube;
 branches spreading.
 Leaflets linear.
30. *P. oculata*.
 14. *P. minor*.
 15. *P. variegata*.
 16. *P. divaricata*.
 17. *P. radicans*.
- IV. LASIOSTOMAE
- Leaflets pubescent above; racemes lax; petals purplish.
 Leaflets pubescent on both sides.
 Leaflets glabrous beneath.
 Leaflets glabrous on both sides; racemes dense, spike-like.
 Petals, except the banner, purplish.
 Petals all greenish-yellow.
18. *P. Thompsonae*.
 19. *P. Schaffneri*.
 20. *P. Hegewischiana*.
 21. *P. viridiflora*.
- V. DIFFUSAE
- Calyx-lobes much shorter than the tube; racemes terminating the branches.
 Leaf-rachis distinctly winged, constricted at the nodes.
 Plant annual, diffusely branched; racemes 2-4-flowered.
 Plant perennial, with ascending branches; racemes 5-10-flowered.
 Leaf-rachis not winged, merely slightly margined.
 Racemes head-like or subumbellate.
 Racemes more or less elongate, not head-like.
 Racemes 2-5-flowered, lax; plant diffusely branched above.
 Racemes many-flowered, dense; plant with ascending branches.
 Racemes short; plant decumbent or spreading.
 Racemes elongate; plant tall, erect.
22. *P. minutiflora*.
 23. *P. nutans*.
 24. *P. gracillima*.
 25. *P. diffusa*.
 26. *P. dispansa*.
 27. *P. submontana*.
- Calyx-lobes equaling the tube.
 Branches glabrous.
 Racemes short, at the ends of short leafy branches.
 Racemes very long, on naked peduncles opposite the leaves.
 Branches strigose.
28. *P. crenulata*.
 29. *P. elongata*.
 30. *P. oculata*.
- VI. UNIFOLIATAE
- Flowers 6-7 mm. long; calyx 3.5-4 mm. long, its lobes lanceolate.
 Flowers about 4 mm. long; calyx about 2.5 mm. long, its lobes ovate.
31. *P. unifoliata*.
 32. *P. Greenmaniana*.
- VII. VETULAE
- One species.
33. *P. vetula*.
- VIII. CALYCOSAE
- Leaves glabrous.
 Stem glabrous.
 Leaflets 17-37, less than 2 mm. long.
 Leaflets 5-7, usually 3-4 mm. long.
 Stem hirsute.
 Leaves and stem strigose-canescens.
 Calyx-lobes nearly equal.
 Flowers 8-10 mm. long; leaflets 15-29.
 Flowers about 6 mm. long; leaflets 9-17.
 Calyx-lobes unequal, the lowest one much longer.
34. *P. filiciformis*.
 35. *P. Berlandieri*.
 6. *P. procumbens*.
 36. *P. calycosa*.
 37. *P. Orcuttii*.
 38. *P. alamosana*.
- IX. LACHNOSTACHYDES
- Plant villous.
 Bracts ovate; stem erect, conspicuously glandular-pustulate.
 Bracts lanceolate to linear-lanceolate; stem glandular-punctate but not conspicuously pustulate.
 Plant shrubby, erect; calyx 1 cm. long or more.
 Plant decumbent or prostrate, rarely ascending; calyx 3-8 mm. long.
 Calyx 6-8 mm. long; corolla 5-8 mm. long.
 Stem long-pilose.
 Leaflets elliptic, rounded at the apex; banner acutish; wings broadest at the base.
 Leaflets cuneate-obovate, truncate or retuse at the apex; banner rounded at the apex; wings broadest at or above the middle.
 Stem sparingly pilose; bracts narrowly linear-lanceolate, long-attenuate; corolla not shorter than the calyx; wings usually retuse.
 Stem densely pilose; bracts lanceolate, acute; corolla shorter than the calyx; wings rounded at the apex.
 Stem densely short-pilose; banner and wings acutish, the latter broadest near the base.
 Calyx 3-4 mm. long; corolla about 4 mm. long.
39. *P. lachnostachys*.
 40. *P. sericocalyx*.
 41. *P. longipila*.
 42. *P. pilosa*.
 43. *P. mollissima*.
 44. *P. neomexicana*.
 45. *P. mollis*.
 46. *P. erythrorhiza*.
- Plant glabrous up to the inflorescence.

I. *Delicatae*. Slender annuals. Leaflets numerous, small, retuse. Racemes slender, lax. Flowers pedicelled, reflexed; bracts broadly obovate, short-acuminate, caducous. Calyx strongly 10-ribbed, pubescent on the ribs; lobes serrate. Banner very small. Wings and keel-petals inserted below the middle of the staminal tube.

1. *Parosela delicata* Rose, Contr. U. S. Nat. Herb. 8: 304.
1905.

Marina gracilis Liebm. Vidensk. Meddel. 1853: 103. 1854. Not *Parosela gracilis* (Kunth) Rose, 1906.
Dalea delicata Greenman, Field Mus. Publ. Bot. 2: 331. 1912.

A slender annual; stem branched, 2-4 dm. high, glabrous, glandular-punctate; leaves delicate, 2-3 cm. long, ascending; stipules minute, subulate; petioles 1-3 mm. long; rachis slightly margined, glabrous; stipels minute; leaflets 15-31, about 2 mm. long, oblong-cuneate, retuse, glabrous, punctate along the margins and on the lower surface; peduncles slender, 2-3 cm. long; racemes lax, 1-2 cm. long, 3-9-flowered; pedicels about 1 mm. long; calyx-tube turbinate, strongly 10-ribbed, sparingly silky on the ribs, 2.5 mm. long; lobes ovate, equaling the tube, short-acuminate, serrulate on the margins; corolla purplish; blade of the banner 1-1.5 mm. long, and a little broader, suborbicular, slightly shorter than the claw; blades of the wings and keel-petals 4.5-5 mm. long, the claws 1.5 mm. long; pod broadly obliquely obovate, shorter than the calyx, sparingly pubescent, with a short erect beak.

TYPE LOCALITY: Iguala, Guerrero.

DISTRIBUTION: Guerrero.

II. *Chrysohizae*. Annuals or perennials. Leaflets usually numerous. Racemes various. Calyx rather strongly ribbed, pubescent without; lobes mostly ovate, not longer than the tube. Corolla purple. Blade of the banner cordate or reniform. Wings and keel-petals inserted below the middle of the staminal tube, sometimes near its base; blades of the keel-petals only slightly larger than those of the wings.

2. *Parosela spiciformis* Rose, Contr. U. S. Nat. Herb. 8: 303.
1905.

A branched annual; stem 2-3 dm. high, glabrous up to the inflorescence, purplish; leaves many, glabrous, 3-5 cm. long; stipules subulate, about 5 mm. long; petioles 5-8 mm. long; leaflets 5-9, glabrous, elliptic or oval, or the terminal one obovate, 6-15 mm. long, sinuately crenulate, with a gland in each sinus, and minutely glandular-punctate beneath; peduncles terminating the branches, 1-4 cm. long, crisp-hairy and distinctly glandular-dotted; racemes dense, spike-like, 2-3 cm. long; bracts lanceolate, acuminate, 3-4 mm. long, with a few glands; pedicels very short; calyx-tube turbinate, strongly 10-ribbed, sparingly crisp-hairy; lobes ovate-lanceolate, green and purple-tipped, about as long as the tube, obtuse, except the lowest one, which is slightly longer and acute; corolla dark-purple; blade of the banner suborbicular, 2 mm. long, the claw about 1 mm. long; wings and keel-petals inserted slightly below the middle of the staminal tube, the blades about 3 mm. long; pod included in the calyx.

TYPE LOCALITY: Iguala, Guerrero.

DISTRIBUTION: Guerrero.

3. *Parosela neglecta* (B. L. Robinson) Rose, Contr. U. S. Nat.
Herb. 8: 304. 1905.

Dalea neglecta B. L. Robinson, Proc. Am. Acad. 29: 329. 1894.

A perennial, shrubby at the base, 3-5 dm. high; branches ascending, glabrous, glandular-punctate; leaves 3-5 cm. long, ascending; stipules minute, subulate; petioles about 1 cm. long, glandular-punctate and with gland-like pointed stipels; leaflets 11-15, elliptic or oblanceolate, 7-10 mm. long, obscurely crenate, rounded at the apex, acute at the base, glabrous above, glaucous and glandular-punctate beneath; petiolules 0.5 mm. long; peduncles 3-4 cm. long; racemes lax, 2-4 cm. long; rachis puberulent; bracts lanceolate, acuminate, caducous; calyx

crisp-hairy on the ribs and lobes; tube turbinate, strongly ribbed, nearly 2 mm. long, glandular-punctate between the ribs; lobes lanceolate, equaling the tube, acutish; corolla deep-purple; blade of the banner cordate, truncate, 2 mm. long, a little longer than the claw; wings and keel-petals inserted towards the base of the staminal tube, the blades 4.5-5 mm. long, the claws 1.5 mm. long.

TYPE LOCALITY: Guanajuato.

DISTRIBUTION: Known only from the type locality.

4. *Parosela pueblensis* (Brand.) Rydberg.

Dalea pueblensis Brand. Univ. Calif. Publ. Bot. 4: 86. 1910.

A slender annual; stem erect, 1-3 dm. high, glabrous, purple-tinged, sparingly glandular-dotted, branched; leaves 1.5-2 cm. long, glabrous; stipules minute, subulate; rachis sparingly puberulent or glabrate; stipels minute, subulate; leaflets 7-9, oblong or obovate, 3-4 mm. long, the terminal one larger, 6-8 mm. long, glabrous, glandular-dotted only along the margins beneath; peduncles opposite the leaves, very lax, 1-3 cm. long; racemes very lax, 4-10 cm. long, 10-15-flowered; bracts ovate, 2 mm. long, long-acuminate, dark, denticulate, persistent; pedicels 1 mm. long or less; calyx-tube turbinate, nearly 2 mm. long, strongly 10-ribbed, hispidulous on the ribs, minutely glandular-dotted between; lobes ovate, acuminate; corolla rose-purple; blade of the banner reniform, scarcely 1 mm. long, 2 mm. broad, the claw 1.5 mm. long; blades of the wings and keel-petals fully 2 mm. long, the claws 1 mm. long; pod pubescent.

TYPE LOCALITY: Coxcatlan, Puebla.

DISTRIBUTION: Puebla.

5. *Parosela Palmeri* Rose, Contr. U. S. Nat. Herb. 8: 304. 1905.

A low shrub, less than 1 m. high, with slender branches, glabrous or nearly so, glandular-punctate; leaves 2-4 cm. long; stipules minute, subulate; petioles 3-5 mm. long; rachis glandular-punctate; leaflets 11-21, elliptic or obovate, about 2 mm. long, retuse, glabrous, glandular-punctate beneath; peduncles 1-5 cm. long, slender; racemes lax, 4-6 cm. long; rachis glabrous; bracts lanceolate, acuminate, glabrous, slightly glandular-serrate, caducous; pedicels less than 1 mm. long; calyx crisp-hairy on the ribs and lobes; tube turbinate, strongly 10-ribbed, 1.5 mm. long, glandular-punctate between the ribs; lobes shorter than the tube, the upper 4 ovate, obtuse, the lowest one lanceolate and slightly longer; petals ochroleucous, tipped and margined with purple, somewhat glandular-punctate; blade of the banner reniform, 1 mm. long and 2 mm. broad, the claw 1 mm. long; blades of the wings and keel-petals 2.5-3.5 mm. long, the claws fully 1 mm. long; pod broadly obliquely obovate, glandular-punctate, nearly equaling the calyx.

TYPE LOCALITY: Alamos, Sonora.

DISTRIBUTION: Sonora and Sinaloa.

6. *Parosela procumbens* (Moc. & Sessé) Rose, Contr. U. S. Nat. Herb. 8: 304. 1905.

Dalea procumbens Moc. & Sessé; DC. Prodr. 2: 246. 1825.

A perennial, with a thick woody base; stems many, prostrate, much branched, 3-5 dm. long, reddish, pilose; leaves divergent, 2-3 cm. long; stipules lanceolate; petioles very short; rachis pilose, glandular-punctate; stipels small, subulate; leaflets 15-21, oval or obovate, glabrous, 2-3 mm. long, crenulate, minutely glandular-punctate beneath, conspicuously so on the margins; peduncles short, about 1 cm. long; racemes dense, 1-2 cm. long; bracts lanceolate, acuminate, glabrous; calyx-tube turbinate, strongly 10-ribbed, densely pilose on the ribs, 3 mm. long; lobes ovate, acute, about equaling the tube; corolla bright-purple; blade of the banner transversely oval, truncate, 2 mm. wide, 3.5 mm. broad, the claw nearly 2 mm. long; wings and keel-petals inserted towards the base of the staminal tube, the blades 3.5-4 mm. long, the claws 1.5 mm. long; pod shorter than the calyx, broadly obovate, with a short beak, puberulent and glandular-punctate.

TYPE LOCALITY: Chiapas.

DISTRIBUTION: Jalisco to Chiapas.

ILLUSTRATION: Moc. & Sessé, Calq. Dess. pl. 229.

7. *Parosela Holwayi* Rose, Contr. U. S. Nat. Herb. 8: 304. 1905.

A perennial; stem branched at the base, diffuse, decumbent, or prostrate, sparingly pubescent on the younger parts, purplish; leaves spreading, 2-3 cm. long; stipules lance-subulate, 2 mm. long; petioles short; rachis sparingly puberulent, glandless; leaflets 9-23, oblong or elliptic, glabrous or nearly so, glandless, 2-3 mm. long; peduncles 2-3 cm. long, slender; racemes short and dense, almost head-like; bracts small, ovate, glabrous; pedicels about 0.5 mm. long; calyx-tube strongly 10-angled, pubescent on the angles and with a row of glands between them, 3 mm. long; lobes oblong, obtuse, shorter than the tube, green; banner yellowish, the blade rounded-obovate in outline, sinuate, scarcely 2 mm. long, the claw 1 mm. long; wings purple, the keel-petals purple but yellowish along the lower edge; blades of the wings and keel-petals 3-3.5 mm. long, the claws scarcely 1 mm. long; pod shorter than the calyx, pubescent and glandular-punctate, broadly obliquely obovate, with an upcurved short beak.

TYPE LOCALITY: Iguala, Guerrero.

DISTRIBUTION: Guerrero and Morelos.

8. *Parosela chryisorhiza* (A. Gray) Rose, Contr. U. S. Nat. Herb. 8: 304. 1905.

Dalea chryisorhiza A. Gray, Proc. Am. Acad. 5: 156. 1861.

Apparently annual, with a deep orange root, branched at the base; stems many, diffusely procumbent, filiform, very sparingly pilose or glabrous; leaves spreading, 1-2 cm. long; stipules lanceolate, ciliate, 3 mm. long; rachis usually with a few scattered hairs; stipels minute, subulate; leaflets 15-21, oblong-cuneate, 2-3 mm. long, emarginate, glandular-punctate and with a few scattered hairs on the veins beneath, the terminal gland usually conspicuous; peduncles 1-3 cm. long, slender; racemes very short, few-flowered; bracts ovate, glabrous, slightly punctate, caducous; calyx caescent; tube turbinate, strongly 10-ribbed, scarcely 1.5 mm. long; lobes oblong-lanceolate, nearly equaling the tube, glandular-apiculate; corolla purple; blade of the banner reniform, 1.5 mm. long, nearly 2.5 mm. broad, the claw 1.5 mm. long; blades of the wings and keel-petals fully 3 mm. long, the claws 1.5 mm. long; pod broadly obliquely obovate, slightly concave on the back, hirsutulous and conspicuously glandular, with an incurved beak, shorter than the calyx.

TYPE LOCALITY: Cape San Lucas, Lower California.

DISTRIBUTION: Cape region of Lower California.

9. *Parosela Goldmani* Rose, Contr. U. S. Nat. Herb. 8: 305. 1905.

A perennial, suffruticose below; stem branched, 3-5 dm. high or more, short-hirsute, becoming glabrate in age, reddish, glandular-punctate; leaves ascending, 3-5 cm. long; stipules subulate, 3-4 mm. long; petioles 2-3 mm. long; rachis hirsutulous; stipels subulate, minute; leaflets 15-35, short-oblong or elliptic, obtuse, 3-4 mm. long, white-hirsute on both sides; peduncles 1.5-2 cm. long, hirsutulous; racemes rather dense, 2-4 cm. long; bracts lanceolate, acuminate, pubescent; calyx densely hirsute; tube turbinate, strongly 10-ribbed, 2 mm. long; lobes lanceolate, acute, the 4 upper nearly equaling the tube, the lowest one a little longer; corolla dark bluish-purple; blade of the banner subreniform, 2 mm. long, nearly 4 mm. broad, the claw 1.5 mm. long; wings and keel-petals inserted slightly below the middle of the staminal tube, the blades 5 mm. long, the claws 2 mm. long; pod shorter than the calyx, obliquely obovate, hirsutulous and glandular on its upper half, with an ascending beak.

TYPE LOCALITY: Sierra de Choix, Sinaloa.

DISTRIBUTION: Known only from the type locality.

10. *Parosela peninsularis* Rose, Contr. U. S. Nat. Herb. 8: 304. 1905.

Dalea canescens Benth. Bot. Voy. Sulph. 12. 1844. Not *D. canescens* Mart. & Gal. 1843.

A slender annual; stems many, diffusely branched, prostrate or reclining, 1-5 dm. long, white-hirsutulous; leaves spreading, 1-2 cm. long; stipules subulate, 2 mm. long; petioles 2-3

mm. long; rachis hirsutulous; stipels minute, subulate; leaflets 11-15, obovate, oblong, 2-4 mm. long, hirsutulous, obtuse or retuse, somewhat glandular beneath; peduncles subopposite the leaves, 1-1.5 cm. long, hirsutulous; racemes short and dense, 1-1.5 cm. long; bracts lanceolate or ovate, acuminate, hirsutulous; calyx hirsute; tube strongly 10-angled, turbinate, 1.5 mm. long; lobes ovate-lanceolate, acute, equaling the tube; corolla purple, with the keel yellowish-margined below; blade of the banner reniform, 2 mm. long, 3 mm. broad, the claw 1 mm. long; blades of the wings and keel-petals 3 mm. long, the claws 1 mm. long.

TYPE LOCALITY: Bay of Magdalena, Lower California.
DISTRIBUTION: Lower California and Sonora.

11. *Parosela Parryi* (T. & G.) A. Heller, Cat. N. Am. Pl. ed. 2.
6. 1900.

Dalea divaricata cinerea A. Gray, Proc. Am. Acad. 7: 336. 1868.
Dalea Parryi T. & G.; A. Gray, Proc. Am. Acad. 7: 397. 1868.

A suffruticose perennial; stem ashy-strigose, usually conspicuously glandular-punctate, 3-6 dm. high, branched; leaves 4-6 cm. long; stipules subulate, 2 mm. long; rachis grayish-strigose and glandular-punctate; stipels minute; leaflets 15-33, obovate or suborbicular, emarginate, strigose on both sides, 2-5 mm. long; peduncles terminal, 1-5 cm. long; racemes elongate, many-flowered, 3-8 cm. long; bracts lanceolate, acuminate, glandular-dentate, strigose; calyx strigose-canescens; tube turbinate, strongly 10-ribbed, nearly 2 mm. long; upper 4 calyx-lobes ovate-oblong, acutish or obtuse, slightly shorter than the tube, the lowest one lanceolate, acute and larger; corolla violet, pale below; blade of the banner reniform, 1.5 mm. long, 2.5 mm. broad, the claw 1 mm. long; wings and keel-petals inserted towards the base of the staminal tube; blades of the former 3 mm. long, those of the latter similar, 4 mm. long, the claws of both 1.5 mm. long; pod broadly obliquely obovate, minutely puberulent, conspicuously punctate, with a short beak.

TYPE LOCALITY: Fort Mohave, California.
DISTRIBUTION: Southern California and Arizona to Sonora and Lower California.

III. *Divaricatae*. Perennials, more or less shrubby at least below. Leaflets usually many and small. Racemes mostly lax. Flowers short-pedicelled, reflexed. Calyx glabrous without, pubescent at the mouth within, strongly 10-ribbed, not conspicuously glandular in the intervals; lobes shorter than the tube. Corolla purple or violet, often with white claws or more or less variegated. Banner small; blade reniform or rounded-cordate. Wings and keel-petals inserted below the middle of the staminal tube; blades of the keel-petals much larger than those of the wings.

12. *Parosela Anthonyi* (Brand.) Rose, Contr. U. S. Nat. Herb.
12: 272. 1909.

Dalea Anthonyi Brand. Erythra 7: 2. 1899.

A shrub, about 1 m. high; stem and branches glabrous, or the younger parts slightly pubescent; leaves 3-5 cm. long; stipules minute, subulate; petioles 3-5 mm. long; rachis sparingly pilose; stipels minute, subulate; leaflets 13-21, oblong, obtuse, 3-5 mm. long, sparingly pilose on both sides, glandular-punctate beneath and with larger glands along the margins; peduncles subopposite the leaves, 4-6 cm. long; racemes lax, 2-7 cm. long; bracts lanceolate, acuminate, slightly pubescent, ciliate-dentate; calyx-tube turbinate, strongly 10-ribbed, glabrous, nearly 2 mm. long; lobes ciliate on the margins, the upper 4 ovate, acute, shorter than the tube, the lowest one lanceolate and longer, all ciliate on the margins; corolla bluish-purple, variegated with yellowish; blade of the banner reniform, 1.5-2 mm. long, 3 mm. wide, the claw 1.5 mm. long; blades of the wings 3 mm. long, those of the keel-petals 4 mm. long, the claws of both 1.5 mm. long; pod obliquely obovate, glabrous, conspicuously glandular-punctate, with a straight beak.

TYPE LOCALITY: San José del Cabo, Lower California.
DISTRIBUTION: Cape region of Lower California.

13. *Parosela maritima* (Brand.) Rose, Contr. U. S. Nat. Herb.
8: 304. 1905.

Dalea maritima Brand. Proc. Calif. Acad. II. 3: 125. 1891.

A suffruticose perennial; stem branching, nearly prostrate, densely and closely white-pubescent; leaves 2-3 cm. long; stipules small, subulate; petioles very short; rachis white-canescens; stipels minute, subulate; leaflets 15-23, densely canescent on both sides, sparingly glandular-punctate beneath, 3-4 mm. long, oblong-obovate, rounded or retuse at the apex; peduncles subopposite the leaves, 1.5-3 cm. long; racemes dense, 1-3 cm. long; bracts lanceolate, caudate-acuminate, canescent; calyx-tube turbinate, 2 mm. long, glabrous, strongly ribbed; lobes hirsute, the upper 4 lance-ovate, acute, shorter than the tube, the lowest one lanceolate and longer; corolla purple; blade of the banner subreniform, 2 mm. long and fully 3 mm. broad, the claw nearly 2 mm. long; wings and keel-petals inserted towards the base of the staminal tube; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long, the claws of both 2 mm. long; pod broadly obliquely obovate, glabrous, conspicuously glandular-dotted.

TYPE LOCALITY: Todos Santos, Lower California.

DISTRIBUTION: Cape region of Lower California.

14. *Parosela minor* Rose, Contr. U. S. Nat. Herb. 8: 305. 1905.

Dalea minor Brand. Zoe 5: 201. 1915.

A decumbent perennial, branched at the base; stems slender, glabrous, reddish, inconspicuously punctate, 3-6 dm. long; leaves 3-6 cm. long; stipules setaceous, 2-3 mm. long; petioles 3-5 mm. long; rachis glabrous; stipels minute, subulate; leaflets 21-41, glabrous, oblong, 2-4 mm. long, rounded or retuse at the apex, thin, glandular-dotted beneath; peduncles 3-5 cm. long, glabrous or nearly so; racemes 3-6 cm. long, lax; bracts lanceolate, acuminate, tardily deciduous, ciliate; calyx-tube turbinate, strongly 10-ribbed, glabrous, 2 mm. long; lobes lanceolate, acute, the upper 4 about equaling the tube, the lowest one longer; corolla violet; blade of the banner reniform, 3 mm. long and 4 mm. broad, the claw 2 mm. long; wings and keel-petals inserted towards the base of the staminal tube, the blades of the former 4 mm. long, those of the latter 5-6 mm. long; pod obliquely obovate, glabrous, conspicuously glandular-punctate.

TYPE LOCALITY: Lodiego, Sinaloa.

DISTRIBUTION: Sinaloa.

15. *Parosela variegata* Rydberg, sp. nov.

A shrub, 5 dm. high or more, divaricately branched; branches reddish or purplish, more or less glaucous, glabrous, densely but minutely glandular-dotted; leaves 2-4 cm. long, spreading; stipules subulate, minute; rachis glabrous, glandular-dotted; stipels conic, gland-like; leaflets 19-25, elliptic, retuse at the apex, 3-4 mm. long, glabrous, conspicuously glandular-dotted beneath; peduncles opposite the leaves, 3-5 cm. long; racemes 3-6 cm. long; bracts glabrous, narrowly lanceolate, attenuate, deciduous; pedicels 1 mm. long or less; calyx-tube turbinate, 2 mm. long, strongly 10-ribbed, with small glands between the ribs; upper 4 lobes ovate, acute, 1 mm. long, the lowest one lanceolate, 1.5 mm. long; corolla variegated; blade of the banner reniform, with a yellowish glandular-dotted center, shading off into white towards the apex and blue on the sides, 1.5 mm. long, 3 mm. wide; wings and keel-petals mostly blue on the upper edge and shading into rose and white below; blades of the former 3 mm. long, those of the latter 5-6 mm. long; pod glabrous, conspicuously glandular-dotted.

Type collected at San José del Cabo, Lower California, October 24, 1902, T. S. Brandegee (U. S. Nat. Herb. no. 397953).

DISTRIBUTION: Type locality and vicinity.

16. *Parosela divaricata* (Benth.) Rose, Contr. U. S. Nat. Herb. 8:
305. 1905.

Dalea divaricata Benth. Bot. Voy. Sulph. 12. 1844.

An annual, according to the original description, but apparently perennial, and somewhat woody, diffusely branched from the base; stems glabrous, brownish, decidedly glandular-

dotted; leaves 1-4 cm. long; stipules subulate, 2 mm. long; petioles 2-3 mm. long; rachis glabrous or with a few scattered short hairs; stipels minute; leaflets 15-21, oblong to obovate, 2-4 mm. long, obtuse to emarginate at the apex, glabrous on both sides, sparingly glandular-punctate beneath; peduncles 1-2 cm. long; racemes 2-3 cm. long; rachis glabrous; bracts lanceolate, acuminate, ciliate-dentate; calyx-tube turbinate, strongly 10-ribbed, glabrous, about 1.5 mm. long; upper 4 lobes oblong-ovate, obtuse or rounded at the apex, shorter than the tube, the lowest one lanceolate, acute, about equaling the tube; corolla purplish; blade of the banner subreniform, 1.5 mm. long, nearly 3 mm. broad; wings and keel-petals inserted towards the base of the staminal tube; blades of the former 3.5 mm. long, those of the latter 4.5 mm. long; pod obliquely obovate, glabrous, conspicuously glandular-dotted.

TYPE LOCALITY: Bay of Magdalena, Lower California.

DISTRIBUTION: Type locality and vicinity.

17. *Parosela radicans* (S. Wats.) Rose, Contr. U. S. Nat. Herb.
8: 305. 1905.

Dalea radicans S. Wats. Proc. Am. Acad. 17: 341. 1882.

A suffruticose perennial, with a woody caudex; stem much branched, glabrous, sometimes erect and short, 1-2 dm. high, sometimes trailing and 3-4 dm. long; leaves 1-1.5 cm. long; stipules subulate; petioles very short; rachis glabrous; stipels small, subulate; leaflets 13-19, narrowly linear, 2-4 mm. long, glabrous; peduncles 1 cm. long or less; racemes 1-2 cm. long, lax; bracts lanceolate, acuminate, falcate, glabrous; calyx-tube turbinate, strongly 10-ribbed, glabrous, 2 mm. long; lobes triangular-lanceolate, acuminate, shorter than the tube; corolla magenta-colored; blade of the banner rounded-cordate, about 3 mm. long and broad, the claw 2 mm. long; blades of the wings 4 mm. long, those of the keel-petals nearly 5 mm. long, the claws of both 1-1.5 mm. long; pod obliquely obovate, glabrous, conspicuously glandular-dotted.

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

DISTRIBUTION: Coahuila.

IV. *Lasiostomae*. Perennials, more or less woody, at least at the base. Leaflets many or few, small. Racemes spike-like but not very dense; bracts caducous, conspicuously glandular. Flowers short-pedicelled. Calyx 10-ribbed, with conspicuous yellow glands in the broad intervals, glabrous without, more or less pubescent within; lobes very short. Blade of the banner suborbicular. Wings and keel-petals inserted below and near the middle of the staminal tube, or in the aberrant *P. Thompsonae* near the base; blades obliquely obovate, with small basal lobes; pod mostly glabrous and conspicuously glandular-dotted.

18. *Parosela Thompsonae* Vail, Bull. Torrey Club 24: 18. 1897.

A low shrub; branches short, retrorsely strigose and with scattered orange glands; leaves 1-2 cm. long; stipules subulate, minute; rachis strigose and glandular-dotted; leaflets 5-9, elliptic to oblong-obovate, 2-3 mm. long, strigose on both sides, sparingly glandular-dotted beneath; peduncles 1-2 cm. long; racemes 3-4 cm. long; bracts lanceolate, small, caducous; flowers short-pedicelled; calyx glabrous without, pubescent within; tube campanulate, comparatively strongly 10-ribbed, with 1-3 conspicuous orange glands in each interval, 2.5-3 mm. long; lobes broad, ovate, acutish, 1.5 mm. long; corolla rose-purple; blade of the banner rounded-reniform, 5 mm. long and fully as broad, the claw 2.5 mm. long; wings and keel-petals inserted near the base of the staminal tube, the blades 7-8 mm. long, the claws 2-3 mm. long.

TYPE LOCALITY: Northern Arizona.

DISTRIBUTION: Northern Arizona.

19. *Parosela Schaffneri* (Hemsl.) Rose, Contr. U. S. Nat. Herb. 12:
273. 1909.

Dalea Schaffneri Hemsl. Diag. Pl. Nov. 7. 1878.

A suffruticose perennial; branches glabrous, slender, glandular-dotted; leaves 1-2 mm. long; stipules subulate; petioles short; rachis glandular-dotted; stipels gland-like; leaflets 15-41,

oblong to elliptic, pilose above, conspicuously glandular-dotted beneath, about 4 mm. long, rounded or truncate at the apex; racemes lax; calyx-tube campanulate, membranous, 10-nerved, glabrous, with few conspicuous glands between the veins; lobes triangular-ovate, much shorter than the tube; blade of the banner suborbicular, 1.5 mm. long, yellowish (?); wings and keel-petals purple; blades of the former 2.5 mm. long, those of the latter fully 3 mm. long, the claws of both 2 mm. long.

TYPE LOCALITY: Chapultepec, Federal District, Mexico.

DISTRIBUTION: Known only from the type locality.

20. *Parosela Hegewischiana* (Steud.) Rydberg.

Dalea laxiflora Schlecht. *Linnaea* 12: 293. 1838. Not *D. laxiflora* Pursh, 1814.

Dalea Hegewischiana Steud. *Nom. Bot. ed. 2. 1: 480. 1840.*

? *Trichopodium glandulosum* Presl, *Bot. Bemerk.* 52. 1844.

Dalea rosea D. Dietr. *Syn. Pl.* 4: 1017. 1847.

Parosela lasiostoma Rose, *Contr. U. S. Nat. Herb.* 8: 305. 1905.

Parosela campylostachya Rose, *Contr. U. S. Nat. Herb.* 12: 272. 1909.

A perennial; stems decumbent or prostrate, glabrous, conspicuously glandular-dotted; leaves 6-7 cm. long; stipules subulate, about 2 mm. long; petioles 2-3 mm. long; rachis glabrous, glandular-dotted; stipels gland-like; leaflets 13-35, obovate or oval, sometimes involute, retuse or rounded at the apex, 2-5 mm. long, glabrous, conspicuously glandular-dotted beneath; peduncles terminating the branches, 1-2 cm. long; racemes dense and spike-like, 2-4 cm. long; bracts ovate, glabrous, or slightly ciliate, caducous; calyx-tube campanulate, 10-nerved, membranous, 2 mm. long; lobes ovate, gland-tipped, shorter than the tube; banner yellowish, the blade orbicular, retuse, 2.5 mm. long, the claw 2.5 mm. long; wings and keel-petals rose-purple; blades of the former 3 mm. long, those of the latter 5-5.5 mm. long, the claws of both 1 mm. long; pod semirhombic-obovate, glabrous, glandular-dotted. (*P. campylostachya* is a form with somewhat narrower and more numerous leaflets inclined to be revolute.)

TYPE LOCALITY: Mexico.

DISTRIBUTION: Hidalgo to Oaxaca.

21. *Parosela viridiflora* (S. Wats.) Rose, *Contr. U. S. Nat. Herb.*

8: 305. 1905.

Dalea viridiflora S. Wats. *Proc. Am. Acad.* 21: 448. 1886.

A perennial, with a woody base; stems decumbent, 2-3 dm. long, leafy, yellowish, glabrous throughout, conspicuously glandular-dotted; leaves 2-3 cm. long; stipules setaceous, 2-4 mm. long; petioles 2-3 mm. long; rachis glabrous, glandular-dotted; stipels represented by conspicuous glands; leaflets 9-17, oblong-obovate, obtuse or retuse, 3-7 mm. long, glabrous, conspicuously glandular-dotted beneath; peduncles at the ends of the branches, 0.5-2 cm. long; racemes dense, spike-like, ovate to cylindrical, 2-5 cm. long; bract's lanceolate, narrowed at the base, glabrous, conspicuously glandular-dotted, deciduous; calyx-tube campanulate, membranous, 2 mm. long; lobes triangular, with 3 gland-teeth at the apex; corolla greenish-yellow; blade of the banner suborbicular-cordate, 3 mm. long, with 3 orange glands, the claw 3 mm. long; blades of the wings and keel-petals 3-4 mm. long, with an orange gland near the apex, the claws 1.5 mm. long; pod rounded-obovate, glabrous.

TYPE LOCALITY: Santa Eulalia Mountains, Chihuahua.

DISTRIBUTION: Chihuahua to Hidalgo.

V. *Diffusae*. Perennial or annual herbs, usually with many slender branches. Leaflets small, numerous, with lanceolate gland-like stipels. Racemes various. Flowers short-pedicelled. Calyx wholly glabrous; tube short, strongly 10-ribbed, not conspicuously glandular-dotted; lobes short and broad, rarely equaling the tube. Corolla purple. Blade of the banner small, cordate or suborbicular. Wings and keel-petals inserted below the middle of the staminal tube, often near it; blades obovate, those of the keel-petals somewhat larger. Pod glabrous, conspicuously gland-dotted.

22. *Parosela minutiflora* Rose, Contr. U. S. Nat. Herb. 8: 306.
1905.

A delicate annual; stem diffusely branched, glabrous, purplish, minutely glandular-punctate, 2-4 dm. high; leaves 1-2 cm. long; stipules subulate, glandular-ciliate at the base; petioles 1-3 mm. long; rachis glabrous, conspicuously wing-margined; leaflets 13-29, oblong or linear-oblong, 3-7 mm. long, truncate or retuse at the apex, glabrous on both sides, somewhat crenulate, glandular along the margins and sparingly so on the lower surface; stipels gland-like; peduncles terminating the branches, 1 cm. long; racemes lax, 2-4-flowered; bracts glabrous, obovate, short-acuminate, caducous; calyx-tube broadly turbinate, strongly 10-ribbed, 1.5 mm. long; lobes ovate, acute, the lowest slightly longer, all shorter than the tube; corolla purple; peduncles of the banner suborbicular, sinuate, 1.5 mm. long, the claw 1 mm. long; wings and keel-petals inserted near the middle of the staminal tube, the blades broadly obovate, slightly lobed at the base, 2.5-3 mm. long; pod glabrous, glandular-dotted.

TYPE LOCALITY: Yautepec, Morelos.

DISTRIBUTION: Known only from the type locality.

23. *Parosela nutans* (Cav.) Rose, Contr. U. S. Nat. Herb. 8: 306.
1905.

Psoralea nutans Cav. Ic. 3: 1. 1794.

Dalea nutans Willd. Sp. Pl. 3: 1339. 1803.

Dalea mellilotoides Moc. & Sessé; DC. Prodr. 2: 246, as synonym. 1825.

A perennial; stem erect, branched above, glabrous, purplish, minutely glandular-dotted; leaves of the stem 4-6 cm. long; stipules subulate; petioles 3-5 mm. long; rachis more or less winged, glabrous, somewhat glandular-dotted; leaflets 11-41, oblong, 5-10 mm. long, glabrous, glandular-dotted along the margins and minutely so on the lower surface; leaves of the branches shorter and with fewer leaflets; peduncles terminating the branches, 1-2 cm. long; racemes lax, 5-10-flowered; bracts ovate, glandular-dentate, glabrous, caducous; calyx-tube broadly turbinate, strongly 10-ribbed, 2.5 mm. long; lobes acute, often slightly serrulate, shorter than the tube, the upper 4 ovate, the lowest one lanceolate, slightly longer; corolla purple; blade of the banner cordate, 2 mm. long, the claw 0.5 mm. long; blades of the wings 3 mm. long, those of the keel-petals 4 mm. long, the claws of both 0.5 mm. long; pod broadly obovate, glabrous, conspicuously glandular-dotted.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Sonora to Yucatán and Costa Rica.

ILLUSTRATION: Cav. Ic. pl. 201.

24. *Parosela gracillima* (S. Wats.) Rose, Contr. U. S. Nat. Herb.
8: 305. 1905.

Dalea gracillima S. Wats. Proc. Am. Acad. 22: 404. 1887.

A perennial, with a thick woody root, branched at the base; stems procumbent, glabrous throughout, reddish, minutely glandular-dotted, slender, 3-5 dm. long; leaves delicate, spreading, 1-2 cm. long; stipules minute, subulate; petioles 1-2 mm. long; rachis very slender, glabrous; stipels minute, subulate; leaflets 13-21, distinctly petioluled, oblanceolate, 1-4 mm. long, glabrous, minutely glandular-dotted beneath and conspicuously so along the margins; peduncles filiform, 1-4 cm. long; racemes 2-6-flowered, very short and head-like; calyx-tube turbinate, strongly 10-ribbed, 2 mm. long; upper 4 calyx-lobes ovate, acute, the lowest one lanceolate, slightly longer; blade of the banner cordate, yellowish, with brown spots, 2 mm. long; wings and keel-petals purple, with yellowish bases, inserted far below the middle of the staminal tube, the blades about 5 mm. long, the claws 2 mm. long; pod broadly and obliquely obovate, glabrous, with a few large glands.

TYPE LOCALITY: Guadalajara, Jalisco.

DISTRIBUTION: Jalisco.

25. *Parosela diffusa* (Moric.) Rose, Contr. U. S. Nat. Herb. 8:
305. 1905.

Dalea diffusa Moric. Mém. Soc. Genève 6: 536. 1833.

Dalea gracilis H. & A. Bot. Beech. Voy. 286. 1836. Not *D. gracilis* Kunth, 1824.

Dalea ramossissima Mart. & Gal. Bull. Acad. Brux. 10²: 41. 1843.

Trichopodium diffusum Presl, Bot. Bemerk. 53. 1844.

A slender perennial herb; stem 4–10 dm. high, glabrous, with spreading branches, minutely glandular-dotted; leaves 1–4 cm. long; stipules 1–2 mm. long, subulate; petioles 1–3 mm. long; rachis glabrous, not winged, scarcely margined; stipels minute, subulate; leaflets of the stem-leaves 13–23, of the branch-leaves 3–9, oblong to obovate, rounded or retuse at the apex, 2–5 mm. long, glabrous, obliquely striate above, glandular-punctate along the margins, and sparingly and minutely so beneath; peduncles terminating the branches, 1 cm. long; racemes lax, 2–5-flowered; bracts ovate, glabrous, caducous; calyx-tube broadly turbinate, about 1.5 mm. long, 10-ribbed, with few rather large glands; lobes broadly ovate, obtuse or acutish, shorter than the tube; banner usually yellowish, the blade reniform, 1 mm. long, 1.5 mm. broad, the claw 0.5 mm. long; wings and keel-petals purple, the blades 3.5–4 mm. long, the claws 0.5 mm. long; pod broadly obovate, glabrous, conspicuously glandular-dotted.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Sinaloa to San Luis Potosí and Guatemala.

ILLUSTRATIONS: Mém. Soc. Genève 5: pl. 6; Moric. Pl. Nouv. Am. pl. 6.

26. *Parosela dispansa* Rydberg, sp. nov.

A perennial, shrubby at the base; stem diffusely branched, chestnut-brown, glabrous; leaves 1.5–3 cm. long, spreading; stipules minute, subulate; rachis glabrous, sparingly and minutely glandular-dotted; stipels subulate-conic, fleshy, minute; leaflets 9–13, elliptic, 3–5 mm. long, retuse, glabrous and striate on both sides, minutely glandular-punctate beneath; racemes short-peduncled, 1–2 cm. long; bracts ovate, acute, glabrous, glandular-dotted, denticulate on the margins; calyx-tube turbinate, nearly 2 mm. long, strongly 10-angled, glabrous, minutely glandular in the intervals; upper 4 teeth ovate, 1 mm. long, denticulate-ciliate, the lowest one lanceolate, 1.5 mm. long; corolla violet or rose-purple; blade of the banner rounded-reniform, 2 mm. long, 2.5 mm. wide, the claw 1.5 mm. long; blades of the wings and keel-petals 4 mm. long, the claws 1–1.5 mm. long; pod glabrous, with a few gland-dots.

Type collected in the mountains near Talpa, Jalisco, March 7, 1897, *E. W. Nelson 4034* (U. S. Nat. Herb. no. 327061).

27. *Parosela submontana* Rose, Contr. U. S. Nat. Herb. 8: 306.
1905.

A perennial, woody below; stem 5–10 dm. high, with long slender glabrous branches, more or less purplish and minutely glandular-dotted; leaves many, 2–4 cm. long; stipules subulate, 3 mm. long; petioles 3–4 mm. long; rachis glabrous, wingless, sparingly glandular-punctate; stipels minute, subulate; leaflets 31–41, oblong or linear-oblong, 5–10 mm. long, glabrous, glandular-dotted along the margins; peduncles terminating the branches; racemes 3–8 cm. long, rather dense, many-flowered; calyx-tube broadly turbinate, strongly 10-ribbed, 2–2.5 mm. long; lobes ovate, acute, serrulate on the margins, shorter than the tube; corolla purple; blade of the banner cordate, retuse, 3–4 mm. long, the claw 1 mm. long; blades of the wings 5 mm. long, those of the keel-petals 6 mm. long, the claws of both 1 mm. long; pod glabrous, conspicuously glandular-dotted.

TYPE LOCALITY: Plateado, Zacatecas.

DISTRIBUTION: Chihuahua to Puebla and Oaxaca.

28. *Parosela crenulata* (H. & A.) Rose, Contr. U. S. Nat. Herb. 8:
306. 1905.

Dalea crenulata H. & A. Bot. Beech. Voy. 285. 1836.

A shrub, with virgate branches, glabrous; leaves 1–2 cm. long, spreading; stipules small, subulate; petioles 2–4 mm. long; rachis glabrous, scarcely margined; stipels minute; leaflets

7-13, elliptic, crenulate, 2-4 mm. long, glabrous, obliquely striate above, densely glandular-punctate beneath; peduncles 1 cm. long or less, at the ends of short branchlets; bracts lanceolate, glabrous, glandular-dotted; racemes dense, 1-3 cm. long; bracts ovate, ciliate-dentate, glabrous, glandular-punctate; calyx-tube broadly turbinate, strongly 10-ribbed; lobes lanceolate, acute, serrulate, equaling the tube; corolla purple; blade of the banner subreniform, 2 mm. long, 3 mm. broad, the claw 2 mm. long; blades of the wings and keel-petals 5 mm. long, the claws 1.5 mm. long; pod broadly obliquely obovate, glabrous, conspicuously glandular-punctate.

TYPE LOCALITY: Jalisco.

DISTRIBUTION: Sonora to Guerrero.

29. *Parosela elongata* Rose, Contr. U. S. Nat. Herb. 8: 306. 1905.

A perennial; stem 5-10 dm. high, glabrous, distinctly glandular-dotted; leaves 3-5 cm. long; stipules minute, subulate; petioles 4-5 mm. long; rachis glabrous, not winged, sparingly glandular-dotted; leaflets 7-15, oblong, obtuse, 7-12 mm. long, glabrous, conspicuously glandular-dotted along the margins, minutely so on the lower surface; peduncles subopposite the leaves, 5-6 cm. long; racemes elongate, 8-12 cm. long; bracts ovate-lanceolate, acuminate, glabrous, conspicuously glandular-dotted, ciliate-dentate; calyx-tube broadly turbinate, strongly 10-ribbed, glabrous, rather conspicuously glandular-dotted between the ribs, 1.5 mm. long; lobes lanceolate, acute, serrulate, as long as the tube; corolla purple; blade of the banner rounded-cordate, truncate, 2.5 mm. long, the claw 1.5 mm. long; wings and keel-petals inserted towards the base of the staminal tube, the blades broadly obliquely obovate, with a rounded basal lobe, about 4 mm. long, the claws 1 mm. long; pod rounded, obliquely obovate, glabrous, conspicuously glandular-punctate.

TYPE LOCALITY: Jojutla, Morelos.

DISTRIBUTION: Known only from the type locality.

30. *Parosela oculata* Rydberg, sp. nov.

A low shrub; branches terete, strigose; leaves 4-5 cm. long, spreading; stipules subulate, 2-3 mm. long; rachis sparingly strigose; stipules gland-like; leaflets 25-37, oblong, glabrous, about 5 mm. long, glandular-dotted beneath, the glands along the margins longer; racemes dense, 3-8 cm. long; bracts glabrous, glandular-dotted, lanceolate; calyx-tube turbinate, 2 mm. long, strongly 10-ribbed, with inconspicuous glands in the intervals; lobes lanceolate, acute, 1.5 mm. long; corolla purplish-blue, except a cream-colored, glandular-dotted eye on the banner; blade of the banner reniform, 2.5 mm. long, fully 3 mm. wide, the claw 1.5 mm. long; blades of the wings 3 mm. long, those of the keel-petals 6 mm. long, the claws of both 1 mm. long; pod unknown.

Type collected at Cerralvo, Lower California, April 19, 1911, *Rose 16884* (U. S. Nat. Herb. no. 638901).

VI. *Unifoliatae*. Slender annuals. Leaves 1-3-foliolate. Racemes slender and lax. Flowers pedicelled, reflexed. Calyx small, ciliate on the ribs and margin; lobes ovate, shorter than the tube. Banner shorter than the wings, with a suborbicular blade. Wings and keel-petals inserted about the middle of the staminal tube; blades obliquely obovate, with a rounded basal lobe.

31. *Parosela unifoliata* (Rob. & Greenm.) Rose, Contr. U. S. Nat. Herb. 8: 303. 1905.

Dalea unifoliata Rob. & Greenm. Proc. Am. Acad. 29: 383. 1894.

A slender annual; stem glabrous, diffusely branched from near the base, 2-4 dm. high, minutely glandular-punctate; leaves unifoliolate; stipules minute, subulate; petioles 6-10 mm. long, glabrous, with a pair of glands near the base of the leaflet; leaflet broadly ovate to orbicular, 0.5-2 cm. broad, truncate or subcordate at the base, rounded at the apex, glandular-crenate on the margins, minutely glandular-punctate, thin, glabrous; racemes terminating the branches, lax, 5-10 cm. long; bracts lanceolate, 2-3 mm. long, ciliate, acuminate, deciduous;

pedicels fully 1 mm. long, with a gland at the apex; calyx distinctly articulate to the pedicel, the tube turbinate, 3.5-4 mm. long, 10-costate; lobes lanceolate, acute, as long as the tube; banner usually white, sometimes purplish, the blade suborbicular, about 2 mm. long, the claw rather short; wings and keel-petals obliquely broadly obovate, 4 mm. long, short-clawed, violet; pod included.

TYPE LOCALITY: Barranca of Tequila, Jalisco.

DISTRIBUTION: Known only from the type locality.

32. *Parosela Greenmaniana* Rose, Contr. U. S. Nat. Herb. 8: 303.
1905.

Dalea unifoliata Rob. & Greenm. Proc. Am. Acad. 29: 383, in part. 1894.

A slender annual; stem glabrous, diffusely branched from the base, 2-4 dm. high, minutely glandular-punctate, usually reddish; leaves 1-3-foliolate; stipules minute, subulate; petioles about 5 mm. long; stipels minute; terminal leaflet suborbicular or rounded-oval, 5-15 mm. long, strongly veined beneath, glabrous, with conspicuous marginal glands, and sparingly and minutely glandular-punctate beneath; lateral leaflets, if present, scarcely half as long as the terminal one; petiolules about 0.5 mm. long; racemes terminating the branches, lax, including the peduncle 4-6 cm. long; bracts lanceolate, acuminate, 1.5-2 mm. long, slightly ciliate, deciduous; pedicels 0.5-1 mm. long; flowers reflexed; calyx distinctly articulate to the pedicel, the tube turbinate, strongly 10-costate, about 2.5 mm. long; lobes ovate, shorter than the tube, acute; petals purple; blade of the banner suborbicular, about 1.3 mm. long, and usually slightly broader, the claw less than 1 mm. long; wings and keel-petals similar, the blades obliquely obovate, fully 1.5 mm. long, the claw 0.5 mm. long; pod included, broadly and obliquely obovate, with a minute beak.

TYPE LOCALITY: Las Sedas, Oaxaca.

DISTRIBUTION: Oaxaca.

VII. *Vetulae*. Branched annuals, glabrous up to the inflorescence. Racemes elongate, dense; bracts lanceolate, sparingly hairy, equaling the calyx; pedicels very short. Calyx hirsute; lobes lanceolate, longer than the tube. Corolla shorter than the calyx. Blade of the banner rounded. Wings and keel-petals subequal, inserted near the upper end of the staminal tube, with small basal lobes; keel-petals free.

33. *Parosela vetula* (Brand.) Rose, Contr. U. S. Nat. Herb. 10:
105. 1906.

Dalea vetula Brand. Proc. Calif. Acad. II. 2: 146. 1890.

An erect annual; stem branched, about 3 dm. high, glabrous, sparingly glandular-dotted; leaves 4-5 cm. long; stipules subulate, 2 mm. long; rachis glabrous; stipels minute; leaflets 21-25, orbiculate, or the terminal ones orbicular or ovate, 2 mm. long; peduncles terminal, 1-2 cm. long; racemes rather dense, 2-5 cm. long, acute; flowers with very short pedicels; calyx-tube broadly campanulate, 1.5 mm. long, silky-pilose; lobes lanceolate, 3.5 mm. long, pilose, with 2 rows of small glands; corolla included in the calyx, purplish; blade of the banner rounded, somewhat cordate at the base, 1 mm. long, 1.5 mm. wide, the claw 1.5 mm. long; blades of wings and keel-petals broadly obliquely obovate, with a small basal lobe, 2 mm. long, the claws short; pod conspicuously glandular-dotted, pubescent.

TYPE LOCALITY: Comondu, San Gregorio, Lower California.

DISTRIBUTION: Known only from the type locality.

VIII. *Calycosae*. Perennials, usually branched and woody at the base, or *P. Berlandieri* shrubby. Leaflets small, usually many. Racemes dense; bracts narrow; pedicels short. Calyx pubescent; lobes lanceolate, longer than the tube. Corolla longer than the calyx. Blade of the banner cordate or reniform. Keel-petals much longer than the wings, inserted below the middle of the staminal tube.

34. *Parosela filiciformis* (Rob. & Greenm.) Rose, Contr. U. S. Nat. Herb. 8: 303. 1905.

Dalea filiciformis Rob. & Greenm. Proc. Am. Acad. 29: 382. 1894.

A suffruticose perennial, with a thick woody fusiform root; stems woody below, much branched, 2-5 dm. high, glabrous, glandular-dotted; leaves 1-3 cm. long; stipules minute, subulate; petioles 2-4 mm. long; rachis slender, glabrous, glandular-dotted; stipels wanting; leaflets 17-37, small, 1-2 mm. long, oval to suborbicular, rounded at both ends, glabrous, glandular-dotted beneath; peduncles terminal or opposite the leaves, often 1 dm. long; racemes lax, 5-10 cm. long; bracts ovate, acuminate, glabrous, caducous, purplish, glandular-dotted, 3 mm. long; calyx very villous; tube turbinate, strongly 10-ribbed, glandular-dotted between the ribs; lobes subulate, filiform-attenuate, 5-6 mm. long, plumose; corolla yellowish below, purplish upwards, purple-veined; blade of the banner cordate, 5 mm. long, the claw 2 mm. long; wings and keel-petals inserted near the base of the staminal tube; blades of the former 5 mm. long, with a large rounded basal lobe, those of the latter 8-9 mm. long, with a smaller basal lobe, the claws of both 2 mm. long; pod rounded-obovate, pilose and glandular-dotted.

TYPE LOCALITY: Villar, San Luis Potosí.

DISTRIBUTION: San Luis Potosí and Aguas Calientes to Oaxaca.

35. *Parosela Berlandieri* (A. Gray) Rose, Contr. U. S. Nat. Herb. 10: 106. 1906.

Dalea Berlandieri A. Gray, Proc. Am. Acad. 5: 177. 1861.

A shrub, 5-10 dm. high; branches glabrous, ashy, only sparingly glandular-punctate; leaves 1-2 cm. long; stipules minute, subulate; petioles 3-5 mm. long; rachis glabrous, glandular-dotted; stipels gland-like; leaflets 5-7, obovate-oblong or cuneate, 3-4 mm. long, glabrous, conspicuously glandular-dotted beneath; peduncles terminating the branches, 1-2 cm. long; racemes rather lax, 2-4 cm. long; bracts ovate-lanceolate, acuminate, ciliate, caducous; calyx densely pilose; tube 2 mm. long, strongly 10-ribbed; lobes subulate, filiform-attenuate, 5 mm. long; corolla apparently yellowish at first, rubescent; blade of the banner cordate, 3 mm. long, the claw 2 mm. long; wings and keel-petals inserted far below the middle of the staminal tube; blades of the former 4 mm. long, those of the latter 6 mm. long; pod pilose.

TYPE LOCALITY: San Carlos, Tamaulipas.

DISTRIBUTION: San Luis Potosí and Tamaulipas.

36. *Parosela calycosa* (A. Gray) A. Heller, Cat. N. Am. Pl. ed. 2. 5. 1900.

Dalea calycosa A. Gray, Pl. Wright. 2: 40. 1853.

A perennial, suffruticose at the base; stems many, 1-3 dm. high, more or less strigose-canescens; leaves 1-3 cm. long; stipules lanceolate, acuminate, strigose; petioles about 5 mm. long; rachis strigose-canescens; stipels minute, subulate; leaflets 15-29, oval or obovate, 3-5 mm. long, obtuse or retuse at the apex, glabrous above, strigose-canescens beneath; peduncles opposite the leaves or terminal, 2-4 cm. long; racemes dense, 2-4 cm. long; bracts lanceolate, pubescent, caducous; calyx densely pilose; tube turbinate, strongly 10-ribbed, 2.5 mm. long; lobes lanceolate, 4-5 mm. long; corolla white and purple; blade of the banner subreniform, 3 mm. long and 4 mm. broad; wings and keel-petals inserted near the base of the staminal tube; blades of the wings obliquely ovate, 5 mm. long, the claws 2 mm. long; blades of the keel-petals obliquely ovate, with a small basal lobe, 6 mm. long, the claws 1 mm. long; pod semirhombic-obovate, pilose, sparingly glandular-dotted.

TYPE LOCALITY: Deserted Rancho on the San Pedro, Sonora.

DISTRIBUTION: New Mexico to Arizona, Sonora, and Nuevo León.

37. *Parosela Orcuttii* (S. Wats.) Parish, Bot. Gaz. 55: 305. 1913.

Dalea Orcuttii S. Wats. Proc. Am. Acad. 20: 359. 1885.

A perennial, branched from the base, slightly suffruticose below; stems ascending or decumbent, 1-2 dm. high, strigose-canescens; leaves 1-2 cm. long; stipules minute, subulate;

petioles 3-5 mm. long; rachis strigose-canescens; stipels apparently wanting; leaflets 9-17, oblong-obovate, 2-4 mm. long, often folded, glabrous above, strigose beneath; peduncles 1-1.5 cm. long, strigose; racemes dense, 1-2 cm. long; bracts lanceolate, hirsute; calyx hirsute-pilose; tube turbinate, 1.5 mm. long, strongly 10-ribbed; lobes lanceolate, acuminate, longer than the tube; banner purple; wings and keel-petals whitish with purple margin; blade of the banner suborbicular-reniform, 1 mm. long, 1.5 mm. broad, the claw 2 mm. long; wings and keel-petals inserted near the middle of the staminal tube, the blades with a small basal lobe, those of the former 3 mm. long, those of the latter 4 mm. long, the claws 1.5 mm. long.

TYPE LOCALITY: Topo and in Cañon Cantillas, Lower California.

DISTRIBUTION: Extreme southern California and northern Lower California.

38. *Parosela alamosana* Rose, sp. nov.

A perennial herb, branched at the base; stems several, decumbent or prostrate, 1-3 dm. long, slender, strigose; leaves 2-3 cm. long, spreading; stipules minute, subulate; petioles 2-3 mm. long; rachis strigose-canescens; stipels obsolete; leaflets 15-21, oblong, 2 mm. long, striate and glabrous above, strigose beneath, rounded at the apex; peduncles 1-2 cm. long, terminal or opposite the leaves; bracts lanceolate, strigose, caducous; calyx-tube turbinate, 1.5 mm. long, strongly 10-ribbed, canescens; lobes lanceolate, acute, the upper four 2 mm. long, the lowest 3 mm. long; corolla apparently white; blade of the banner subreniform, 1.5 mm. long, 2.5 mm. broad, the claw 2 mm. long; wings and keel-petals inserted far below the middle of the staminal tube; blades of the wings 3 mm. long, those of the keel-petals 4 mm. long, the claws 1.5 mm. long.

Type collected at Alamos, Sonora, September 1890, *Edward Palmer 711* (U. S. Nat. Herb. no. 24314).

DISTRIBUTION: Type locality and vicinity.

IX. *Lachnostachydes*. Perennials, often more or less woody at the base. Leaflets many, with rather prominent glands. Racemes dense, often curved in fruit; bracts silky-pubescent. Flowers short-pedicelled or sessile, reflexed in fruit, subtended by 1-3 prominent acute glands. Calyx silky, with minute glands; lobes filiform from a triangular base, plumose. Blade of the banner cordate, shorter than the wings, often with a few glands towards the base. Wings and keel-petals inserted near the base of the staminal tube; keel-petals somewhat larger than the wings.

39. *Parosela lachnostachys* (A. Gray) A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

Dalea lachnostachys A. Gray, Pl. Wright. 1: 46. 1852.

A herbaceous perennial, with a deep root; stem erect, branched, 1-3 dm. high, straw-colored, conspicuously glandular-pustulate and finely villous; leaves spreading, 4-8 cm. long; stipules subulate, 3-5 mm. long; petioles 1-3 cm. long; rachis glandular-pustulate and villous; stipules gland-like; leaflets 9-11, oval or obovate, silky-villous on both sides, conspicuously glandular-dotted along the margins beneath, 8-15 mm. long; peduncles opposite the leaves and terminal, 3-6 cm. long; racemes dense, cylindric, 4-8 cm. long, fully 1.5 cm. thick; bracts ovate, concave, scarious-margined, often tinged with lilac, pubescent, long-acuminate, longer than the buds, deciduous; calyx-tube turbinate, 3 mm. long, silky-pilose, strongly 10-ribbed; lobes twice as long as the tube; corolla purple; blade of the banner broadly oval, cordate at the base, 4 mm. long, the claw 3 mm. long; blades of the wings and keel-petals obliquely oval, with a rounded basal lobe, about 4 mm. long, the claws 3 mm. long; pod very villous.

TYPE LOCALITY: Hills about 80 miles west of Pecos, Texas.

DISTRIBUTION: Western Texas to southern Arizona and Chihuahua.

40. *Parosela sericocalyx* Rydberg, sp. nov.

Dalea lachnostachys Seem. Bot. Voy. Herald 279, in part; hyponym. 1857.

A shrubby perennial; stem erect, 5 dm. high or more, straw-colored, not conspicuously glandular-dotted, silky-villous when young; leaves spreading, 3-7 cm. long; stipules setaceous; rachis silky-villous; leaflets 9-21, oval, silky on both sides, acutish at each end, 10-15 mm. long;

peduncles 1-3 cm. long; racemes 2-4 cm. long; bracts linear-lanceolate, caudate-acuminate, about 1 cm. long, long-silky, obscurely glandular-dotted; flowers subsessile, reflexed after anthesis; calyx long-silky; tube campanulate, 3 mm. long; lobes 8 mm. long; corolla reddish-purple; blade of the banner cordate, 3.5 mm. long, 4 mm. wide, the claw 3 mm. long; blades of the wings and keel-petals obliquely elliptic, with a rounded basal lobe; those of the wings 5 mm. long, those of the keel-petals 8 mm. long, the claws 2.5 and 3 mm. long respectively; fruit silky.

Type collected in Sierra Madre [Sinaloa or Durango] by *Berthold Seemann* (Gray Herb.).

41. *Parosela longipila* (B. L. Robinson) Rydberg, sp. nov.

Dalea mollis var. ? A. Gray, Pl. Wright. 1: 47. 1852.

Dalea mollis longipila B. L. Robinson, MS. in herb.

A perennial, with rather slender root; stem branched at the base, decumbent or spreading, 1-2 dm. long, long-villous; leaves 3-5 cm. long, spreading; stipules small, subulate; leaflets 9-13, elliptic, rounded at the apex, rather sparingly silky-villous with long hairs, conspicuously glandular-punctate, 6-12 mm. long; peduncles opposite the leaves, 3-7 cm. long; racemes rather dense, 2-3 cm. long; bracts narrowly lanceolate, gradually attenuate, not exceeding the calyces; calyx long-silky; tube about 3 mm. long; lobes 4 mm. long; blade of the banner acutish-cordate, 3.5 mm. long, yellowish-white, glandular-dotted near the base; wings yellowish-white, the blades obliquely obtuse-ovate, slightly retuse at the apex, with a rounded basal lobe, 4 mm. long, the claws 2 mm. long; keel-petals with a purple tip, the blades obliquely obovate, with a rather large rounded basal lobe, with small glands at the base, 5 mm. long, the claw 3 mm. long; pod glabrous.

Type collected in western Texas, October 1849, *Wright 126* (Gray Herb.).

DISTRIBUTION: Western Texas, Coahuila, and Tamaulipas.

42. *Parosela pilosa* Rydberg, sp. nov.

A perennial, with a slender deep root; stem branched from the base, decumbent or spreading, long-villous, rather conspicuously glandular-dotted (somewhat pustulate), 1-3 dm. long; leaves spreading, 2-3 cm. long; stipules subulate, 2-3 mm. long; petioles 3-5 mm. long; rachis sparingly villous, glandular-dotted; leaflets 7-15, broadly obovate-cuneate or subobcordate, 4-8 mm. long, usually truncate or retuse at the apex, villous, conspicuously glandular-dotted on the lower surface; peduncles opposite the leaves, 2-5 cm. long; racemes dense, 1.5-4 cm. long; bracts linear-lanceolate, sparingly silky-villous, long-attenuate, glandular-dotted, exceeding the calyx, caducous; flowers short-pedicelled, reflexed in fruit; calyx-tube turbinate, 2-2.5 mm. long, strongly 10-ribbed, silky-pilose; lobes 3-4 mm. long; corolla rose-colored to white and usually blotched with rose; blade of the banner broadly cordate, 3 mm. long, the claw 1.5-2 mm. long; wings and keel-petals inserted below the middle of the staminal tube; blades of the wings broadly oblong, usually retuse at the apex, 3 mm. long, those of the keel-petals obliquely obovate, with a rounded basal lobe, 4 mm. long, the claws of both 1.5-2 mm. long; pod villous.

Type collected at Los Angeles Bay, Lower California, 1887, *Palmer 550* (herb. Columbia Univ.).

DISTRIBUTION: Southern California to Sonora and Lower California.

43. *Parosela mollissima* Rydberg, sp. nov.

Dalea mollis Brewer & Wats. Bot. Calif. 1: 141, mainly. 1876. Not *D. mollis* Benth. 1848.

A perennial, with a deep root; stem branched at the base, spreading or ascending, 1-3 dm. long, densely silky-pilose and glandular-dotted; leaves spreading, 2-4 cm. long; stipules subulate, minute; rachis silky-pilose and glandular-dotted; leaflets 11-15, cuneate, truncate or retuse at the apex, 5-8 mm. long, sparingly pilose or glabrate above, densely so beneath, conspicuously glandular-dotted; peduncles short, usually less than 1 cm. long; racemes dense, 2-3 cm. or in fruit up to 5 cm. long; bracts and bractlets small but conspicuous, in age black; bracts lanceolate, shorter than the calyx, densely pilose; calyx densely silky-villous; tube 3 mm. long, the lobes 4.5 mm. long; corolla pinkish or white, shorter than the calyx; blade of the banner rounded-cordate, 2 mm. long, the claw 2 mm. long; blades of the wings and keel-petals

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- 25¹: 1-88. Geraniales: Geraniaceae, Oxalidaceae, Erythroxylaceae, Linaceae. 25²: 89-171. Tropaeolaceae, Balsaminaceae, Limnanthaceae, Koerberliniaceae, Zygophyllaceae, Malpighiaceae. 25³: 173-261. Rutaceae, Surianaceae, Simaroubaceae, Burseraceae.
- 29¹: 1-102. Ericales: Clethraceae, Monotropaceae, Lennoaceae, Pyrolaceae, Ericaceae.
- 32¹: 1-86. Rubiales: Rubiaceae (pars).
- 34¹: 1-80. (Carduales:) Carduaceae (pars). 34²: 81-180. Carduaceae (pars). 34³: 181-288. Carduaceae (pars).

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(ROSALES)

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PSORALEAE

✓
PER AXEL RYDBERG



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ANNOUNCEMENT

NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

- Volume 1. Myxomycetes, Schizophyta.
- Volumes 2 to 10. Fungi.
- Volumes 11 to 13. Algae.
- Volumes 14 and 15. Bryophyta.
- Volume 16. Pteridophyta and Gymnospermae.
- Volumes 17 to 19. Monocotyledones.
- Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. W. A. Merrill, and Dr. J. H. Barnhart.

Professor John M. Coulter, of the University of Chicago; Mr. Frederick V. Coville, of the United States Department of Agriculture; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

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oblong, rounded at the apex, with a rounded basal lobe, 2 mm. and 3 mm. long respectively, the claws respectively 1.5 mm. and 2 mm. long.

Type collected at Las Vegas Wash, Nevada, April 22, 1905, *Goodding 2237* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Southern Nevada and southern California.

44. *Parosela neomexicana* (A. Gray) A. Heller, Cat. N. Am. Pl.
ed. 2. 6. 1900.

Dalea mollis ? *neo-mexicana* A. Gray, Pl. Wright. 1: 47. 1852.

A perennial, with a slender root; stem branched from the base, decumbent or prostrate, 1-2 cm. long, densely short-villous, almost velutinous; leaves 1.5-3 cm. long; stipules subulate, minute; petioles 3-6 mm. long; rachis densely short-villous; leaflets 7-11, obovate, retuse, densely villous, glandular-dotted, 3-8 mm. long; peduncles opposite the leaves, 2-3 mm. long; racemes dense, 1-2 cm. long; bracts narrowly lanceolate, acuminate, scarcely longer than the calyx, long-villous; calyx-tube turbinate, strongly 10-ribbed, densely silky-villous, 3 mm. long; lobes about 5 mm. long; corolla mostly yellowish with purple- or rose-tinged keel, rarely rose-colored; blade of the banner broadly cordate, 3.5 mm. long, acute, conspicuously glandular-dotted towards the base, equaling the claw; blades of the wings obliquely obcuneate-ovate, acutish, with a rounded basal lobe, 3.5-4 mm. long, those of the keel-petals broadly obovate, with a rounded basal lobe, 4 mm. long, the claws of both 2-3 mm. long; pod villous.

TYPE LOCALITY: Hills west of the Pecos, Texas.

DISTRIBUTION: Western Texas, Chihuahua, Coahuila, and Tamaulipas.

45. *Parosela mollis* (Benth.) A. Heller, Cat. N. Am. Pl. ed. 2. 6.
1900.

Dalea mollis Benth. Pl. Hartw. 306. 1848.

A perennial, with a rather slender root; stem branched at the base, 1-2 dm. long, densely pilose, spreading; leaves spreading, 1-3 cm. long; stipules subulate, minute; rachis sparingly pilose and glandular-dotted; leaflets obovate, truncate or emarginate, 3-6 mm. long, densely silky-pilose, almost canescent; peduncles 1-3 cm. long; racemes dense, 1-2 cm. long; bracts narrowly lanceolate, rather shorter than the calyx, silky-pilose, somewhat glandular-dotted; calyx-tube 1.5 mm. long, equaling the filiform lobes; corolla white, tinged or tipped with rose-purple; blade of the banner cordate, rounded at the apex, 1.5 mm. long, equaling the claw; blades of the wings 2 mm. long, retuse at the apex, those of the keel-petals 2.5 mm. long, rounded at the apex, the claws respectively 1 mm. and 1.5 mm. long.

TYPE LOCALITY: "Monterey, California" [but more probably on the road from Mexico to Monterey, in Sonora or southern California].

DISTRIBUTION: Southern California, southwestern Arizona, Sonora, and Lower California.

46. *Parosela erythrorhiza* (Greenman) Rose, Contr. U. S. Nat.
Herb. 10: 105. 1906.

Dalea erythrorhiza Greenman, Zoe 5: 185. 1904.

A herbaceous perennial, with a red woody root; stems several from the base, decumbent or prostrate, branched, glabrous, reddish, glandular-tuberculate; leaves spreading, 1.5-6 cm. long; stipules minute, subulate; petioles 1-2 cm. long; rachis sparingly pubescent, conspicuously glandular-tuberculate; leaflets 7-15, obovate, 3-10 mm. long, retuse, glabrous, light-green above and paler and glandular-dotted beneath; peduncles opposite the leaves, 1-4 cm. long; racemes dense, 1-4 cm. long; bracts ovate, acuminate, 7-8 mm. long, glabrous, glandular-dotted, often purplish, scarious-margined, caducous; calyx-tube turbinate, 3 mm. long, strongly 10-ribbed; lobes equaling the tube; corolla dark-blue; blade of the banner broadly ovate, subcordate, 3.5 mm. long, the claw 2 mm. long; blades of the wings and keel-petals 3 mm. long, with a rather indistinct rounded basal lobe, the claws 2 mm. long; pod silky-villous.

TYPE LOCALITY: Near the city of Durango.

DISTRIBUTION: Durango, Zacatecas, and Aguascalientes.

Subgenus 2. **EUPAROSELA**. Flowers spicate or subcapitate, ascending, sessile in the axils of the bracts, which are usually more persistent than in the preceding subgenus. (*Dalea* Vent. *Cylopogon* Raf. *Jamesia* Raf.).

Annuals.

Calyx-lobes subulate-tipped, at least half as long as the tube.

Plant not sericeous.

Staminal tube long-exserted, about twice as long as the calyx-tube.

Staminal tube not long-exserted.

Calyx-tube slit deeper on the back.

Keel-petals wanting; calyx-tube slit to near the base; stamens usually only 7 or 8.

Keel-petals present; calyx-tube slit about half its length; stamens 9 or 10.

Calyx-tube not slit deeper on the back.

Corolla purple to white.

Corolla ochroleucous.

Plant sericeous-tomentose.

Calyx-lobes triangular or broadly deltoid, less than half as long as the tube.

Bracts not keeled, short-acuminate or acute; calyx-tube short-campanulate or turbinate.

Bracts keeled, boat-shaped, abruptly long acuminate; calyx-tube deeply campanulate or urceolate.

Perennials.

Calyx-lobes short, ovate or lanceolate, usually much shorter than the tube, rarely subulate-tipped.

Corolla yellow.

Low shrubs with subcapitate inflorescence and broad firm bracts; corolla fading yellow; leaflets small.

Tall shrubs with elongate inflorescence; bracts thin, caducous; corolla fading purple; leaflets large.

Corolla (except sometimes the banner) not yellow.

Bracts enclosing the flowers, abruptly contracted into a filiform acumination; calyx membranous, glabrous or slightly pubescent.

Bracts at most concave, neither enclosing the flowers nor abruptly caudate-acuminate (except in *TRIODORAE*).

Corolla wholly or partly purple, pink, or blue (in *P. psoraleoides* and *P. longifolia* fading cream-colored).

Calyx glabrous or slightly silky-strigose without, ciliolate on the margins; lobes broader than long.

Calyx pubescent without, at least the lobes, which are longer than broad.

Leaflets large, 1-2 cm. long, acute at each end; corolla yellow at first.

Leaflets small, rarely 1.5 cm. long, obtuse; wings and keel always purple, pink, or blue.

Corolla blue.

Plant glabrous.

Plant pilose.

Corolla (except sometimes the banner) purple or pink.

Banner yellow or white.

Branches conspicuously glandular-tuberculate; spikes single.

Branches not conspicuously glandular-tuberculate.

Spikes more or less paniculate; leaflets canescent, few.

Spikes single; leaflets glabrous, very numerous. (*P. longifolia* in)

Banner as well as the other petals purple.

Leaflets very numerous, linear.

Leaflets not very numerous, oblong to oval or obovate.

Decumbent or prostrate herbs with elongate lax spikes; bracts conspicuously glandular-punctate; keel-petals apparently distinct.

X. LAGOPODES.

XI. URCEOLATAE.

XII. POLYGONOIDES.

XIII. ALOPECUROIDES.

XIV. FLAVAE.

XV. SIMILES.

XVI. CITRIODORAE.

XVII. UNCIFERAE.

XVIII. CAPITATAE.

XX. ACUTIFOLIAE.

XVII. UNCIFERAE.

XIX. FRUTESCENTES.

XX. ACUTIFOLIAE.

XXI. CYANEAE.

XXIV. PILOSISSIMAE.

XXII. TUBERCULATAE.

XXIII. PSORALEOIDES.

XXXIV. CRASSIFOLIAE.

XXV. PECTINATAE.

XXXVI. ARENARIAE.

- Erect or ascending herbs or shrubs with short spikes; bracts not conspicuously glandular-dotted; keel-petals united.
- Flowers small; bracts broadly ovate, purplish and scarious-margined.
- Flowers rather large; bracts lanceolate or subulate. (*P. oaxacana* in)
- Corolla white.
- Calyx-tube glabrous; leaves cuspidate; stipels conspicuous, subulate.
- Calyx-tube pubescent, or at least puberulent; leaves obtuse or minutely mucronate.
- Leaflets more than 1 cm. long, oval or oblong; bracts shorter than the calyx, caducous.
- Leaflets 3-5 mm. long, linear; bracts covering the calyx, persistent.
- Calyx-lobes subulate-tipped, usually longer than the tube, rarely shorter than the same.
- Plant herbaceous with a tap-root, woody, if at all, only at the base.
- Flowers reflexed, subtended by a pair of prominent gland-like bractlets. (See page 50.)
- Flowers neither reflexed nor subtended by gland-like bractlets.
- Glands in the intervals of the calyx confluent.
- Glands in the intervals of the calyx not confluent.
- Plant glabrous, slender; bracts broadly obovate, conspicuously glandular on the back and scarious-margined.
- Plant sericeous or villous, stout; bracts subulate to ovate, neither conspicuously glandular nor conspicuously scarious-margined.
- Corolla yellow, fading pink or purplish; heads rarely long-peduncled.
- Corolla blue or purple, ochroleucous only on the banner; heads long-peduncled.
- Plant more or less shrubby.
- Spikes terminating the stem or branches.
- Corolla purple or bluish to white, only the banner often ochroleucous.
- Leaves decidedly pubescent.
- Heads on very long peduncles; leaflets large and acute.
- Heads short-peduncled or subsessile; leaflets small, obtuse or rounded at the apex.
- Leaves glabrous.
- Leaflets very numerous, 41-71; plants with elongate slender branches.
- Leaflets fewer, 7-31; densely branched shrubs with comparatively short branches.
- Spike more or less elongate, distinctly peduncled.
- Spike short and dense, subcapitate, subsessile.
- Corolla yellow, fading rose or purplish.
- Calyx not conspicuously glandular-dotted between the ribs; leaves glabrous; spikes short.
- Calyx with a row of conspicuous yellow or brown glands between the ribs; leaves more or less pubescent.
- Spikes subsessile at the end of short axillary branches, as well as at the ends of the main branches.
- XVI. CITRIDORAE.
- XXXIII. VERSICOLOREZS.
- XXVII. MUCRONATAE.
- XXVIII. EYSENHARDTIODES.
- XXIX. LUMHOLTZIANAE.
- IX. LACHNOSTACHYDES.
- XIV. FLAVAE.
- XXX. POGONATHERAE.
- XXXI. AUREAE.
- XXXII. SERICEAE.
- XXXII. SERICEAE.
- XXXIII. VERSICOLORES.
- XXXIV. CRASSIFOLIAE.
- XXXV. LASIOSTACHYAE.
- XXXVI. FORMOSAE.
- XXXVII. MICROPHYLLOE.
- XXXVIII. LEUCOSTOMAE.
- XXXIX. THYRSIFLORAE.

X. LAGOPODES

- Calyx-tube densely hairy, not conspicuously glandular-dotted. 47. *P. lagopina*.
- Calyx-tube glabrate or nearly so, with two rows of conspicuous yellowish glands. 48. *P. Lagopus*.
- Rachis of the spike pubescent; plant 3-10 dm. high. 49. *P. exserta*.
- Rachis of the spike glabrous; plant low, less than 3 dm. high.

XI. URCEOLATAE

- Calyx-lobes half as long as the tube; bracts scarious-margined; petals 3.
 Stem branched from the base, 1-1.5 dm. high; bracts not longer than the calyx.
 Stem simple below, branched above, about 3 dm. high; bracts longer than the calyx.
 Calyx-lobes one fourth as long as the tube; bracts not scarious-margined; petal apparently single.

50. *P. urceolata*.
 51. *P. Barberi*.
 52. *P. lucida*.

XII. POLYGONOIDES

- Leaflets reflexed; flowers 1 cm. long; spikes dense, thick, 1 cm. thick or more.
 Leaflets not reflexed; flowers less than 1 cm. long; spikes 5-7 mm. thick.
 Leaflets 3-7, linear or narrowly oblong.
 Leaflets 7-21, broadly oblong-ob lanceolate.

53. *P. fissa*.
 54. *P. polygonoides*.
 55. *P. Bigelovii*.

XIII. ALOPECUROIDES

- Stem and leaves pubescent.
 Peduncles terminal; bracts nearly black, their hairs with pustulate bases; leaflets obtuse or mucronate.
 Bracts narrowly linear-lanceolate, inconspicuously or at least narrowly scarious-margined.
 Bracts broadly lanceolate, broadly scarious-margined.
 Peduncles mostly opposite the leaves; bracts dark-green, their hairs not with pustulate bases; leaflets mostly acute.
 Bracts narrowly lanceolate, long-attenuate, longer than the calyx; lobes of the latter half longer than the tube.
 Bracts broadly ovate-lanceolate, abruptly acuminate, equaling the calyx; lobes of the latter about equaling the tube.
 Stem and leaves glabrous.
 Spikes short, head-like, globose or nearly so.
 Leaflets filiform; bracts pubescent on the back.
 Leaflets linear to oblong or cuneate; bracts glabrous on the back.
 Bracts ovate, more persistent, perfectly glabrous.
 Bracts lanceolate, early deciduous, ciliate on the margins.
 Spikes elongate, cylindric.
 Bracts with light somewhat scarious margins; leaflets distinctly glandular-dotted beneath.
 Stem conspicuously glandular-warty.
 Stem not conspicuously glandular-warty.
 Corolla mostly blue, with a white base; upper part of the staminal tube strongly colored; upper portion of the bracts with dark and glabrous back.
 Corolla white or tinged with rose or lilac; staminal tube wholly straw-colored; bracts pubescent throughout, mostly pale.
 Bracts almost black.

56. *P. pilifera*.
 57. *P. Townsendii*.
 58. *P. inconspicua*.
 59. *P. ervoides*.
 60. *P. filiformis*.
 61. *P. brachystachys*.
 62. *P. Lemmoni*.
 63. *P. costaricana*.
 64. *P. leporina*.
 65. *P. alopecuroides*.
 66. *P. Thouini*.

XIV. FLAVAE

- Plant pilose.
 Plant glabrous or nearly so.

67. *P. flava*.
 68. *P. elata*.

XV. SIMILES

- One species.

69. *P. similis*.

XVI. CITRIODORAE

- Calyx-lobes ovate or triangular, much shorter than the tube.
 Gland-dots on the lower surface of the leaves very inconspicuous, the terminal gland not larger.
 Gland-dots on the lower surface of the leaves especially along the margins rather conspicuous, the terminal gland much larger, often forming a kind of mucro.
 Corolla purple; leaflets 3-5 mm. long.
 Corolla dark-rose; leaflets 1.5-3 mm. long.
 Calyx-lobes lanceolate, acuminate, about equaling the tube.
 Bracts with a short acumination which is not more than one fourth as long as the body; leaflets rounded at the apex; flowers sessile.
 Bracts with a longer acumination which is half as long as the body; leaflets acutish; flowers often slightly pedicelled.

70. *P. citriodora*.
 71. *P. polyphylla*.
 72. *P. roseola*.
 73. *P. citrina*.
 74. *P. vernicia*.

XVII. UNCFERAE

- Stipules broad, semi-ovate or semi-sagittate, membranaceous-foliaceous, venose.
 Stipules subulate to setaceous, not foliaceous.
 Tail of the bracts about equaling the body.
 Slender annual.
 Stout perennial herb.

75. *P. insignis*.
 76. *P. caudata*.

Bracts lanceolate in side-view, comparatively gradually acuminate; calyx pilose, nearly 4 mm. long.

Bracts ovate or oval in side-view, truncate and abruptly contracted into the tail; calyx glabrous, less than 3 mm. long.

Tail of the bracts about half as long as the body.

Plant more or less pilose throughout.

Plant glabrous except the spike.

77. *P. attenuata*.

78. *P. uncifera*.

79. *P. bicolor*.

80. *P. mulabilis*.

Stem pubescent.

Stem glabrous.

Bracts brown, not conspicuously glandular; pubescence of the calyx appressed.

Bracts yellow with a green tip, conspicuously glandular; pubescence of the calyx loose.

XVIII. CAPITATAE

81. *P. capitata*.

82. *P. quinqueflora*.

83. *P. Lloydii*.

XIX. FRUTESCENTES

Calyx glabrous; flowers sessile.

Spikes very short, about 1 cm. long.

Spikes lax, 2-4 cm. long.

Calyx silky-strigose; flowers short-pedicelled.

84. *P. frutescens*.

85. *P. laxa*.

86. *P. hospes*.

XX. ACUTIFOLIAE

One species.

87. *P. acutifolia*.

XXI. CYANEA

One species.

88. *P. cyanea*.

XXII. TUBERCULATAE

Stem and leaves glabrous; spikes head-like; bracts obovate or oval, short-acuminate; wings and keel inserted below the middle of the staminal tube.

Spikes long-peduncled; bracts much shorter than the calyx; leaflets 2-3 mm. long.

Spikes short-peduncled; bracts equaling the calyx.

Bracts broadly obovate; leaflets 3-5 mm. long.

Bracts lanceolate; leaflets 1-2 mm. long.

Stem and leaves more or less pubescent.

Calyx merely puberulent, brown, conspicuously glandular; leaflets 11-21, small, 2-3 mm. long; spikes oblong, dense.

Calyx canescent; leaflets in most species 3-7, if more than 9, more than 3 mm. long.

Spikes elongate and lax in fruit; bracts rather early deciduous; leaves usually rather green.

Leaves short-pubescent above.

Calyx villous-canescant; lobes equaling the tube; bracts ovate, acuminate, longer than the buds.

Calyx appressed silky-canescant; lobes shorter than the tube.

Bracts ovate or ovate-lanceolate, abruptly or shortly acuminate, shorter than the buds; pubescence of the leaflets equally short on both sides.

Bracts lance-subulate, longer than the buds; pubescence of the leaflets longer above.

Leaves long-silky on both sides.

Spikes dense and short even in fruit.

Spikes (without the corollas) more than 1 cm. thick, acute at first; corolla more than 1 cm. long.

Leaflets 7-13, appressed-silky.

Leaflets 13-31, short-pubescent with spreading hairs.

Spikes (without the corollas) 7-8 mm. thick, obtuse; corolla less than 1 cm. long; leaflets 5-9.

Leaves glabrous above, minutely puberulent beneath, green.

Leaves canescent on both sides.

Spikes oblong, 2-3 cm. long, distinctly peduncled.

Spikes globose or short-oblong, 1-1.5 cm. long, subsessile or very short-peduncled.

Pubescence spreading; leaflets less than 3 mm. long.

Leaves greenish, minutely canescent; calyx silky-villous with brown hairs.

Leaves and calyx villous-canescant with long whitish hairs.

Pubescence appressed, silvery-silky; leaflets 3-8 mm. long.

89. *P. Hemsleyana*.

90. *P. trochilina*.

91. *P. minutifolia*.

92. *P. naviculifolia*.

93. *P. Seemanni*.

94. *P. tuberculata*.

95. *P. canescens*.

96. *P. argyrea*.

96. *P. argyyrea*.

97. *P. Conzattii*.

98. *P. tuberculina*.

99. *P. fulvosericca*.

100. *P. polycephala*.

101. *P. decora*.

102. *P. dorycnoides*.

XXIII. PSORALEOIDES

Petals purple.

Petals pink, turning yellowish in fruit.

103. *P. tomentosa*.

104. *P. psoraleoides*.

- One species. XXIV. PILOSISSIMAE 105. *P. pilosissima*.
- Leaves glabrous. XXV. PECTINATAE 106. *P. pectinata*.
Leaves canescent. 107. *P. abicliifolia*.
- Plant more or less pubescent. XXVI. ARENARIAE
Calyx-tube villous; lobes lanceolate, more than half as long as the tube. 108. *P. lanata*.
Calyx-tube glabrous or merely puberulent when young; lobes triangular, scarcely half as long as the tube.
Plant densely short-villous; pod villous. 109. *P. terminalis*.
Plant sparingly long-villous; pod glabrous. 110. *P. subvillosa*.
- Plant glabrous. 111. *P. glaberrima*.
Bracts rather thick, not scarious-margined; calyx-lobes not ciliate. 112. *P. scariosa*.
Bracts thin, with scarious lacerate margins; calyx-lobes ciliate.
- One species. XXVII. MUCRONATAE 113. *P. mucronata*.
- XXVIII. EYSENHARDTIOIDES
Calyx-lobes deltoid-acuminate, fully half as long as the tube; spikes paniculate, nodding. 114. *P. eysenhardtoides*.
Calyx-lobes triangular, acute, one third as long as the tube; spikes mostly axillary, erect. 115. *P. leucostachys*.
- One species. XXIX. LUMHOLTZIANAE 116. *P. Lumholtzii*.
- XXX. POGONATHERAE
Spikes not very lax; corolla purple; plant with many stems. 117. *P. lasianthera*.
Calyx-lobes much shorter than the tube. 118. *P. pogonathera*.
Spikes very lax; corolla white; stem mostly single. 119. *P. enneandra*.
- XXXI. AUREAE
Leaves 3-foliolate.
Leaflets linear or linear-oblancoolate, appressed silky-canescant.
Leaves pinnately trifoliolate; corolla scarcely exceeding the calyx and the bracts. 120. *P. luisana*.
Leaves digitately trifoliolate; corolla about twice as long as the calyx and bracts. 121. *P. Hallii*.
Leaflets obovate or oblanceolate.
Heads sessile or subsessile.
Stems short, less than 2 dm. long, ascending; leaflets broadly obovate. 122. *P. Jamesii*.
Stems elongate, 2-4 dm. long, prostrate; leaflets oblanceolate. 123. *P. trifoliolata*.
Heads with peduncles 2-5 cm. long; stems erect, about 3 dm. high, few-leaved. 124. *P. rubescens*.
- Leaves 5-foliolate.
Stems low, 1-2 dm. high, decumbent at the base; spikes sessile or short-peduncled.
Leaflets sericeous on both sides, obscurely glandular-dotted.
Bracts short-acuminate; spikes about 1 cm. thick. 125. *P. nana*.
Bracts long-attenuate; spikes nearly 2 cm. thick. 126. *P. Wrightii*.
Leaflets pea-green and sparingly hairy or glabrate above, sericeous but distinctly glandular-dotted beneath. 127. *P. carnescens*.
Stems tall, 3-5 dm. high, with the upper leaves reduced and spikes rather long-peduncled. 128. *P. aurea*.
- XXXII. SERICEAE
Stem mostly erect, 5-10 dm. high, usually leafy more than half its height. 129. *P. sericea*.
Stem decumbent at the base, usually less than 3 dm. high, densely leafy below.
Stems mostly herbaceous, simple; bracts not conspicuously scarious-margined; corolla mostly blue. 130. *P. gracilis*.
Stems suffruticose and branched below; bracts conspicuously scarious-margined; corolla rose-purple or the banner cream-colored. 131. *P. reclinata*.
- XXXIII. VERSICOLORES
Plant not densely sericeous.
Corolla (except sometimes the banner) dark-purple. 132. *P. oaxacana*.
Calyx-lobes shorter than the tube.
Calyx-lobes equaling or longer than the tube.
Leaflets broadly oblong, 4-7 mm. long, glabrous above, not conspicuously involute.
Corolla rose-purple; calyx not conspicuously glandular between the ribs. 133. *P. versicolor*.
Corolla dark bluish-purple, almost black; calyx with a row of conspicuous glands between the ribs. 162. *P. atrocyanea*.

- Leaflets narrowly oblong, 2-3 mm. long, strongly involute, pubescent on both sides.
 Corolla rose-colored to white.
 Spikes elongate, oblong-cylindric, usually peduncled at the ends of elongate branches.
 Leaves villous-sericeous; branches villous-canescens.
 Stems conspicuously glandular-tubercled; petals usually without glands.
 Stems not conspicuously glandular; petals with a large gland near the apex.
 Leaves at least below and stem finely short-pubescent.
 Leaflets sparingly pilose or glabrate above, obtuse; corolla rose-colored.
 Leaflets finely short-pubescent above, acute; corolla nearly white.
 Spikes short, often subglobose, sessile at the ends of short leafy branches.
 Plant densely silky-sericeous.
 Leaves pinnate, 5-11-foliolate; stems 2 dm. long or more.
 Stem and branches erect or ascending, stout; leaflets 9-11.
 Stem and branches decumbent, slender; leaflets 5-7.
 Leaves 3-foliolate; a dwarf shrub 1-2 dm. high.
131. *P. tsugoides*.
 135. *P. megalostachys*.
 136. *P. Wislizeni*.
 137. *P. Sanctae-Crucis*.
 138. *P. leucantha*.
 139. *P. sessilis*.
 140. *P. leucosericea*.
 141. *P. Greggii*.
 142. *P. eriophylla*.
- XXXIV. CRASSIFOLIAE
- Leaflets oval, flat.
 Bracts not exceeding the calyx; calyx-lobes shorter than the tube.
 Bracts much longer than the calyx; calyx-lobes equaling the tube.
 Leaflets oblong, thick, channeled; calyx-lobes longer than the tube.
143. *P. longifolia*.
 144. *P. roseiflora*.
 145. *P. crassifolia*.
- XXXV. LASIOSTACHYAE
- Calyx-tube densely pubescent.
 Bracts not conspicuously glandular-dotted.
 Leaflets broadly oblong; calyx-lobes shorter than the tube.
 Leaflets narrowly oblong to linear; calyx-lobes equaling or exceeding the tube.
 Calyx appressed-silky; leaves slightly pubescent when young; corolla pale.
 Calyx loosely pilose; leaves glabrous from beginning.
 Leaflets linear-oblong, slightly involute; corolla rose-purple.
 Leaflets linear, strongly involute; corolla pale-rose, pink, or whitish.
 Branches conspicuously glandular-dotted.
 Calyx-tube glabrous or nearly so.
146. *P. Smithii*.
 147. *P. glabrescens*.
 148. *P. lasiostachya*.
 149. *P. involuta*.
 150. *P. Brandegei*.
 159. *P. Bolterii*.
- XXXVI. FORMOSAE
- Spikes many-flowered; calyx-lobes about equaling the tube.
 Spikes few-flowered; calyx-lobes much longer than the tube.
 Bracts glabrous; calyx-lobes about 6 mm. long.
 Bracts silky-pilose; calyx-lobes 3.5-4 mm. long.
151. *P. Saffordii*.
 152. *P. formosa*.
 153. *P. Purpusi*.
- XXXVII. MICROPHYLLAE
- Calyx-tube more or less pubescent.
 Leaflets 7-11, often emarginate, blackening in drying; corolla in age almost black with lighter edges.
 Spikes very short, head-like; glands of the calyx inconspicuous.
 Spikes oblong, 2-5 cm. long; glands of the calyx very conspicuous.
 Leaflets 11-35, not emarginate, not blackening; corolla in age purplish-brown or rose-brown.
 Leaflets 11-19, usually less than 5 mm. long; corolla less than 1 cm. long.
 Leaflets 13-35, usually more than 5 cm. long; corolla more than 1 cm. long.
 Calyx-tube glabrous, conspicuously glandular-dotted.
154. *P. melantha*.
 155. *P. fuscescens*.
 156. *P. zimapanica*.
 157. *P. diversicolor*.
 158. *P. argyrostachya*.
- XXXVIII. LEUCOSTOMAE
- Calyx-tube wholly glabrous, except the margins.
 Leaves glabrous.
 Stem glabrous; corolla yellow, at least when young.
 Stem puberulent; corolla rose-purple.
 Leaves more or less pubescent.
 Bracts abruptly caudate-acuminate, glabrous.
 Corolla yellow.
 Stem and leaflets on both sides long-hairy.
 Stem and lower surface of the leaflets short-hairy, the upper surface of the leaves glabrate.
 Corolla dark-blue.
158. *P. argyrostachya*.
 159. *P. Bolterii*.
 160. *P. gigantea*.
 161. *P. macrostachya*.
 162. *P. atrocyanea*.

- Bracts acute or gradually short-acuminate; stem and leaflets short-hairy.
 Leaflets elliptic-obovate, pubescent on both sides. 163. *P. plumosa*.
 Leaflets oblong, glabrous above. 164. *P. Painteri*.
- Calyx glabrous only at the base, more or less long-pilose between the ribs as well as on the margin.
 Bracts acute or short-acuminate, shorter than the calyx.
 Corolla about 10 mm. long; bracts more or less pubescent. 165. *P. lutea*.
 Corolla about 7 mm. long; bracts glabrous on the back. 166. *P. Wardii*.
 Bracts caudate-acuminate, longer than the calyx. 167. *P. caudata*.

XXXIX. THYRSIFLORAE

- Leaves and branches glabrous or nearly so, except when very young.
 Spikes capitate, sessile in the axils of the leaves and at the end of the branches.
 Leaflets 11-13, conspicuously glandular-punctate beneath, 3-4 mm. long. 168. *P. capitulata*.
 Leaflets 5-9, less conspicuously glandular-punctate, 4-11 mm. long. 169. *P. tehuacana*.
- Spikes short, but not capitate, mostly short-peduncled or at the end of short leafy branches.
 Bracts ovate, pubescent, conspicuously glandular-dotted; leaflets 9-13, obovate, usually truncate to emarginate at the apex. 170. *P. emphyosodes*.
 Bracts lanceolate, puberulent, not conspicuously glandular-dotted; leaflets 7-9, elliptic, mostly rounded at the apex. 171. *P. scandens*.
- Leaves and branches decidedly villous.
 Calyx conspicuously glandular-dotted between the ribs.
 Bracts ovate, acute, scarcely longer than the calyx-tube.
 Inflorescence at least in fruit lax; calyx-lobes decidedly hooked at the apex; leaf-rachis decidedly winged. 172. *P. domingensis*.
 Inflorescence short and dense; leaf-rachis slightly winged.
 Leaflets 9-17; calyx-lobes scarcely hooked. 173. *P. floridana*.
 Leaflets 3-9; calyx-lobes slightly hooked. 174. *P. humilis*.
- Bracts lance-ovate, long-acuminate, much exceeding the calyx-tube.
 Calyx-tube almost glabrous, its glands large, confluent. 175. *P. vulnecaria*.
 Calyx-tube densely pubescent, its glands small, distinct.
 Leaflets 9-15. 176. *P. occidentalis*.
 Leaflets 5-9. 177. *P. platyphylla*.
- Calyx not conspicuously glandular-dotted between the ribs; bracts lance-ovate, acuminate, pubescent.
 Leaflets 7-11. 178. *P. barbata*.
 Leaflets 13-21. 139. *P. sessilis*.

X. *Lagopodes*. Annuals, simple below, branched above. Leaflets rather numerous, small, glabrous. Spikes dense, cylindrical, peduncled at the ends of the branches; bracts narrow, acuminate: Flowers sessile. Calyx-tube deeply cleft on the back. Calyx-lobes filiform-subulate, plumose, about equaling the calyx. Corolla blue, violet, or purple. Blade of the banner sub-cordate. Wings and keel-petals inserted just below the middle of the staminal tube, the blades obliquely oval or oblong, subequal, with a rounded basal lobe. Staminal tube long-exserted.

47. *Parosela lagopina* Rydberg, sp. nov.

A stout herb, probably annual; stem 7 dm. high or more, glabrous, striate, often purple-tinged, branched above; leaves 5-10 cm. long; stipules subulate, caducous; petiole and rachis glabrous, sparingly glandular-dotted; stipels gland-like; leaflets elliptic, 4-5 mm. long, glabrous, glandular-dotted beneath, rounded at each end; peduncles terminating the branches, 5-15 cm. long; spikes dense, cylindrical, 3-5 cm. long; rachis finely and densely pilose; calyx-tube deeply campanulate, 4 mm. long, strongly 10-ribbed, densely pilose, with many small inconspicuous glands rather irregularly scattered; lobes deltoid, with subulate tips, 3 mm. long; corolla bluish-purple; blade of the banner reniform-cordate, 3.5 mm. long, 4 mm. broad, the claw 3 mm. long; blades of the wings and keel-petals 5 mm. long, the claws 1-1.5 mm. long; pod broadly obliquely obovate, finely pubescent and minutely glandular-dotted above the middle.

Type collected at Chacala, Durango, March 7, 1899, *Goldman 357* (U. S. Nat. Herb. no. 360278).

48. *Parosela Lagopus* Cav. Descr. Pl. 187. 1802.

Psoralea Lagopus Cav. Ic. 1: 59. 1791.

Dalea Lagopus Willd. Sp. Pl. 3: 1340. 1803.

Dalea elata Mart. & Gal. Bull. Acad. Brux. 10^e: 41. 1843. Not *D. elata* H. & A. 1840.

Dalea lagopoda St.-Lag. Ann. Soc. Bot. Lyon 7: 124. 1880.

A stout annual; stem 5–10 dm. high, glabrous, somewhat glandular-warty, branched above; leaves 4–10 cm. long; stipules subulate, 4–6 mm. long; petiole about 1 cm. long; rachis margined, glabrous, sparingly and minutely glandular-dotted; stipels gland-like; leaflets 21–51, oblong, retuse or obtuse, 4–8 mm. long, glabrous on both sides, glandular-dotted beneath; peduncles terminating the branches, 5–15 cm. long; spikes dense, 2–10 cm. long, 12–14 mm. thick; bracts lanceolate, acuminate, glabrous, membranous, deciduous, equaling the calyx; calyx-tube campanulate, 10-ribbed, glabrous, with conspicuous yellow glands between the ribs; lobes with a triangular base and long filiform silky-pilose tips equaling the tube; corolla blue; blade of the banner broadly oval, subcordate or truncate at the base, 4 mm. long, the claw 2 mm. long; blades of the wings and keel-petals 3–4 mm. long, with obscure basal lobes, the claws 1 mm. long; keel-petals soon distinct; pod minutely glandular-dotted above, ciliate along the back, otherwise glabrous.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Veracruz to Costa Rica.

ILLUSTRATION: Cav. Ic. *pl. 86*; C. Don, Gen. Hist. 2: *f. 36*.

49. *Parosela exserta* Rydberg, sp. nov.

A low annual; stem about 2 dm. high, glabrous, striate, sparingly glandular-dotted; leaves 3–4 c m. long; stipules subulate, minute; rachis glabrous; stipels conic, gland-like; leaflets 13–17, oblong, 5–8 mm. long, glabrous, minutely glandular beneath; peduncles 5–8 cm. long; spikes dense, 3–6 cm. long, 12 mm. thick; bracts lanceolate, acuminate, deciduous, glabrous, glandular-dotted on the upper half; calyx-tube 4 mm. long, campanulate, membranous, glabrous, with a row of conspicuous oblong glands between the 10 veins; lobes filiform from a lanceolate base, plumose-pilose, 3 mm. long; corolla purplish-blue; blade of the banner cordate, 3.5 mm. long, the claw 2.5 mm. long; blades of the wings and keel-petals with the basal lobe rather poorly developed, 2 mm. long, the claws about 0.5 mm. long; pod membranous, slightly pilose and glandular at the summit.

Type collected at Colima, February 27 and 28, 1891, *Edward Palmer 1312* (U. S. Nat. Herb. no. 208865).

XI. *Urceolatae*. Glabrous annuals of the habit of section XIII. Leaflets many, small, oblong or oval. Spikes dense and short. Flowers sessile; bracts lanceolate or ovate-lanceolate, not exceeding the calyx. Calyx-tube campanulate to urceolate, with 10 blackish ribs, split on the back to near the base; lobes ovate with subulate tips. Banner blue or violet, the blade orbicular to cordate. Wings (if present) inserted near the middle of the staminal tube, the blades elliptic or oblong, very short-clawed. Keel-petals wanting. Stamens 7 or 8. (Approaching the annual species of *Petalostemon* in habit and in the small number of stamens.)

50. *Parosela urceolata* (Greene) Standley, Contr. U. S. Nat. Herb.

13: 194. 1910.

Dalea urceolata Greene, Leaflets 1: 199. 1905.

A slender glabrous annual; stem branched from the base, 1–1.5 dm. high; leaves 2–4 cm. long; stipules setaceous, 2 mm. long; petiole about 3 mm. long; rachis slightly margined, glabrous; stipels minute, gland-like; leaflets 11–21, oblong to cuneate-oblong, emarginate, 3–5 mm. long, glabrous, sparingly and minutely glandular-dotted beneath; peduncles at the ends of the branches, 1–3 cm. long; spikes dense, 1–2 cm. long, 1 cm. thick; bracts lance-ovate, slightly membranous-margined, acuminate; calyx-tube ellipsoid-campanulate, 3–3.5 mm. long; lobes triangular, acuminate, ciliate, half as long as the tube; corolla light-blue; blade of the banner rounded-cordate, 2 mm. long, nearly equaling the claw; blades of the wings oblong, 1.5 mm. long, the claws very short; pod obovate, glabrous and with a few glands, ciliate above.

TYPE LOCALITY: Mogollon Mountains, New Mexico.

DISTRIBUTION: Known only from the type locality.

51. *Parosela Barberi* Rose, sp. nov.

A slender annual; stem about 3 dm. high, glabrous, striate, sparingly glandular-dotted; leaves 3-5 cm. long; stipules minute, subulate; petiole 5-6 mm. long; rachis glabrous, glandless; stipels wanting; leaflets 9-17, elliptic, 8-10 mm. long, rounded or retuse at the apex, glabrous on both sides, yellowish-green above, glaucous and minutely glandular-dotted beneath; peduncles terminating the branches, 1.5-5 cm. long; spikes dense, 1-2 cm. long, 1 cm. in diameter; bracts ovate-lanceolate, acuminate, scarious-margined, fuscous and glandular-dotted on the back, caducous; calyx-tube ellipsoid-campanulate, 3 mm. long, straw-colored; lobes deltoid-lanceolate, acuminate, shorter than the tube; corolla blue; blade of the banner cordate, retuse at the apex, 4.5 mm. long, the claw 2 mm. long; blades of the wings 2-2.5 mm. long, rounded at the apex, the claws 1 mm. long; stamens 7 or 8, unequal; pod slightly pubescent.

Type collected in the Sierra Madre near Colonia Garcia, August 22, 1899, *Townsend & Barber 275* (U. S. Nat. Herb.).

52. *Parosela lucida* Rose, sp. nov.

An annual; stem stout, glabrous, branched above, striate, glandular-dotted; leaves about 4 cm. long; stipules minute, subulate; petiole about 5 mm. long; rachis glabrous, slightly margined; stipels represented by sessile glands; leaflets 21-27, oblong or linear-oblong, obtuse or acutish, glabrous on both sides, glandular-dotted and glaucous beneath; peduncles terminating the branches, about 1 cm. long; spikes dense, 1.5-3 cm. long, 1.5 cm. thick; bracts lanceolate, acuminate, glandular-dotted, caducous; calyx-tube ellipsoid, membranous, 5 mm. long; lobes very short, 1 mm. long, subulate, with a broad base; blade of the banner cordate, 1.5 mm. long, the claw 3 mm. long; wings apparently lacking; pod membranous, obliquely obovate, glabrous, slightly glandular.

Type collected at Cajetes, Durango, 1896, *Edward Palmer 955* (U. S. Nat. Herb. no. 304753).

XII. Polygonoides. Low glabrous annuals of the habit of the next section. Leaflets several pairs, mostly oblong. Spikes dense and short; bracts lanceolate to ovate-acuminate, dark-colored, equaling or slightly exceeding the calyx. Calyx-tube urceolate or in fruit campanulate, split on the back half-way down; lobes subulate from a broad base, with 10 dark ribs. Corolla violet or blue to white. Blade of the banner oval or ovate. Wings and keel-petals inserted at or below the middle of the staminal tube, the blades obliquely oblong or elliptic, short-clawed. [Approaching the annual species of *Petalostemon* in habit and shape of the petals.]

53. *Parosela fissa* Rydberg, sp. nov.

An annual; stem about 5 dm. high, glabrous, more or less tinged with red; leaves 3-5 cm. long; stipules subulate, 5-7 mm. long, reddish; rachis glabrous or with a few scattered hairs; stipels conic, gland-like; leaflets oblong-oblancoate, acute, 8-10 mm. long, glabrous above, sparingly ciliate on the margins and veins beneath, and the lower surface glandular-dotted; peduncles terminating the branches, 5-10 cm. long; spikes dense, 1-2 cm. long, 12 mm. thick; bracts ovate or lanceolate, caudate-acuminate, pilose and glandular-dotted on the back; calyx-tube campanulate, 3 mm. long, pilose, indistinctly glandular; lobes subulate-filiform from a broad base, 3 mm. long; corolla violet or the banner pale-blue; blade of the banner broadly oblong-oval, 5 mm. long, 4 mm. broad, the claw 2 mm. long; wings and keel-petals inserted towards the base of the staminal tube; blades of the wings oblong, with a rounded basal lobe, 5.5 mm. long, those of the keel-petals as long, broadly obliquely obovate, the claws of both 2 mm. long; pod villous.

Type collected near Santa Teresa, Tepic, August 11, 1897, *Rose 2181* (U. S. Nat. Herb. no. 301091).

DISTRIBUTION: Type locality and vicinity.

54. *Parosela polygonoides* (A. Gray) A. Heller, Cat. N. Am. Pl.
ed. 2. 6. 1900.

Dalea polygonoides A. Gray, Pl. Wright. 2: 39. 1853.

A slender annual; stem 1-2 dm. high, erect, branched, glabrous; leaves 2-3 cm. long; stipules subulate, 2 mm. long; petiole 5-10 mm. long; rachis glabrous, slightly glandular-dotted; leaflets 3-9, broadly linear or linear-oblong, 6-15 mm. long, glabrous on both sides, sparingly glandular-dotted beneath; peduncles terminating the branches, 3-8 cm. long; spikes dense, 1-2 cm. long; bracts ovate or obovate, acuminate, equaling the calyx, persistent, dark-colored, with a few large glands, ciliate; calyx-tube narrowly turbinate, somewhat extended by the fruit, silky-villous, 1.5 mm. long, 10-ribbed; lobes subulate, acuminate, about equaling the tube; corolla bluish, pinkish, or white; blade of the banner about 1 mm. long, rounded-ovate, truncate or subcordate at base, slightly longer than the claw; wings and keel-petals inserted at the middle of the staminal tube, the blades obliquely oval, with a rounded basal lobe, about 1 mm. long, those of the keel-petals united along the lower edge, the claws 1 mm. long; pod villous, obliquely obovate, equaling the calyx.

TYPE LOCALITY: Copper Mines [Santa Rita del Cobre], New Mexico.
DISTRIBUTION: New Mexico, Arizona, and Chihuahua.

55. *Parosela Bigelovii* Rydberg, sp. nov.

A low annual; stem 1-3 dm. high, glabrous, branched; leaves 2-5 cm. long; stipules subulate, 1 mm. long; rachis glabrous; stipules conic, gland-like; leaflets 7-21, broadly oblong-ob lanceolate, often retuse, 3-6 mm. long, glabrous on both sides, minutely glandular-dotted beneath; peduncles 2-8 cm. long; spikes dense, 2-4 mm. long, 8-9 mm. thick; bracts lanceolate, acuminate, pilose and glandular-dotted, deciduous, equaling the calyx; calyx-tube campanulate, 2.5 mm. long, pilose, glandular-dotted between the 10 dark ribs, the lobes filiform from a broad base, nearly equaling the tube; corolla white; blade of the banner 2 mm. long, oval, the claw 2 mm. long; wings and keel-petals inserted near the middle of the staminal tube, the blades obliquely oblong, with the basal lobes rather poorly developed, 1.5 mm. long; pod membranous, slightly pilose above.

Type collected near the Copper Mines [Santa Rita del Cobre], New Mexico, *Bigelow, Mexican Boundary Survey 226*, in part (U. S. Nat. Herb. no. 125432, in part).
DISTRIBUTION: New Mexico and Chihuahua.

XIII. *Alopecuroides*. Slender annuals. Leaflets several to many, linear to elliptic. Spikes dense, from subglobose to cylindrical; bracts lanceolate to ovate, often dark, more or less scarious-margined. Calyx-tube usually dark-ribbed, not split on the back; lobes subulate, or filiform from a broad base, silky-plumose. Corolla blue to rose-purple and white, small. Blade of the banner rounded-cordate to ovate. Wings and keel-petals inserted at or a little below the middle of the staminal tube, the blades obliquely oval or oblong, with small basal lobes and short claws. Pod pilose above, glabrous or less hairy below.

56. *Parosela pilifera* Rydberg, sp. nov.

An annual; stem about 3 dm. high, sparingly long-pilose, terete, often purple-tinged, with ascending branches; leaves ascending, 2-5 cm. long; stipules subulate-setaceous, 5-7 mm. long; rachis sparingly long-pilose; stipules minute, obsolete; leaflets 5-11, narrowly elliptic, mucronate, 6-10 mm. long, glabrous above, sparingly pilose and minutely or obsoletely glandular-dotted beneath; peduncles terminal, 4-10 cm. long; spikes dense, 2-5 cm. long, 8 mm. thick; bracts narrowly lanceolate, acuminate, pilose, almost black, with narrow whitish margins, equaling the calyx; calyx-tube campanulate, 2 mm. long, silky-pilose, not glandular; lobes filiform with a triangular base, about equaling the tube; corolla purplish-blue; blade of the banner orbicular-cordate, nearly 2 mm. long, equaling the claw; blades of the wings with a large rounded basal lobe, 2 mm. long, those of the keel-petals much broader, with an acute basal lobe, nearly 3 mm. long, the claws of both 1-1.5 mm. long; pod pilose above, glabrous below.

Type collected at Pachuca, Hidalgo, September 1905, *Purpus 1741*, in part* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Hidalgo, Morelos, and Mexico.

* This number is also partly represented by *P. leporina*.

57. *Parosela Townsendii* Rydberg, sp. nov.

A slender annual; stem 2-3 dm. high, sparingly pilose or glabrate; leaves ascending, 2-3 cm. long; stipules subulate-setaceous, 3-5 cm. long; rachis sparingly pilose; stipels obsolete; leaflets 7-9, reflexed, oblong, acute, 5-10 mm. long, glabrous above, sparingly silky-pilose, obsolete glandular-dotted beneath; peduncles terminal, 4-9 cm. long; spikes dense, 1-3 cm. long, about 8 mm. thick; bracts ovate-lanceolate, pilose, acuminate, nearly black, with broad white scarious margins, equaling the calyx; calyx-tube broadly campanulate, densely pilose, obscurely glandular, 2 mm. long; lobes filiform from a broad triangular base, pilose-plumose; corolla rose, with the claws and sometimes the whole banner yellowish; blade of the banner orbicular-oval, about 2 mm. long, equaling the claw; blades of the wings obovate, with a large rounded basal lobe, 2 mm. long, those of the keel-petals broader, with a small acute basal lobe, 2.5 mm. long, the claws of both 1.5 mm. long; pod densely pilose above, becoming glabrate near the base.

TYPE COLLECTED IN THE SIERRA MADRE NEAR COLONIA GARCIA, SEPTEMBER 4, 1899, *Townsend & Barber 301* (U. S. Nat. Herb. no. 347124).

58. *Parosela inconspicua* (S. Schauer) Rose, Contr. U. S. Nat. Herb. 10: 105. 1906.

?*Dalea humilis* G. Don, Gen. Hist. 2: 224. 1832. Not *Psoralea humilis* Mill. 1768.

?*Dalea herbacea* Moc. & Sessé; G. Don, Gen. Hist. 2: 224, as synonym. 1832.

Dalea inconspicua S. Schauer, Linnaea 20: 744. 1847.

A slender annual; stem 1-3 dm. high, branched, more or less silky; leaves spreading, 3-5 cm. long; stipules setaceous, 5-8 mm. long, somewhat silky; petiole about 1 cm. long; rachis silky-pubescent, not glandular; leaflets 3-7 (rarely 9), from narrowly lance-linear to oblanceolate, 5-15 mm. long, acute at both ends, sparingly silky on both sides; peduncles opposite the leaves, 2-5 cm. long; spikes dense, 1-5 cm. long; bracts linear-lanceolate, attenuate, 6-10 mm. long, longer than the calyx, green, slightly scarious-margined below; calyx-tube turbinate, 2 mm. long, 10-ribbed, silky; lobes with a lanceolate base, filiform-attenuate, 4-5 mm. long, silky-plumose; corolla pinkish or white; blade of the banner rounded-cordate, 3 mm. long, the claw 3 mm. long; blades of the wings obliquely elliptic, with a rounded basal lobe, 3.5-4 mm. long, those of the keel-petals broadly obliquely obovate, with a smaller basal lobe, 3-3.5 mm. long, the claws of both 1 mm. long; pod silky-pubescent.

TYPE LOCALITY: Oaxaca.

DISTRIBUTION: Jalisco to Puebla and Oaxaca.

59. *Parosela ervoides* (Benth.) Rydberg.

Dalea ervoides Benth.; Hemsl. Diag. Pl. Nov. 6. 1878.

A slender annual; stems 1-3 dm. high, sparingly appressed-silky, 1-3 dm. high, branched; leaves 2-4 cm. long; stipules subulate-setaceous, about 2 mm. long; petiole 5-10 mm. long; rachis sparingly silky, glandless; stipels obsolete; leaflets 3-5 (rarely 7), linear-lanceolate to elliptic, acute at both ends, 6-15 mm. long, sparingly silky; peduncles opposite the leaves, 2-5 cm. long; spikes dense, 1-3 cm. long; bracts ovate-lanceolate, acuminate, silky-pubescent, scarious-margined below; calyx-tube turbinate, 2 mm. long, silky, 10-ribbed; lobes with lanceolate bases, filiform-acuminate, 2-2.5 mm. long; corolla pinkish or white; blade of the banner cordate, rounded at the apex, 2 mm. long, shorter than the claw; blades of the wings elliptic, with a rounded basal lobe, 2.5 mm. long, those of the keel-petals broadly obliquely obovate, with a smaller basal lobe, 2.5 mm. long, the claws of both 1 mm. long; pod sparingly silky above.

TYPE LOCALITY: Real del Monte, Hidalgo.

DISTRIBUTION: Zacatecas and Jalisco to Puebla.

60. *Parosela filiformis* (A. Gray) A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

Dalea filiformis A. Gray, Pl. Wright. 2: 39. 1853.

A slender glabrous annual; stem 1-2 dm. high, with ascending branches, filiform, sparingly glandular-punctate; leaves 1.5-3 cm. long, ascending; stipules minute, subulate; petiole 5-

10 mm. long; rachis glabrous, margined, sparingly glandular-dotted; stipels represented by small glands; leaflets 3, rarely 5, linear-filiform, 3-5 cm. long; spikes dense, short, 1 cm. long or less, 7 mm. thick; bracts deciduous, ovate, acute, ciliate, scarcely equaling the calyces; calyx-tube turbinate, silky, nearly 2 mm. long; lobes subulate, about equaling the tube; corolla purple or rose; blade of the banner broadly deltoid-ovate, nearly 2 mm. long, equaling the claw; blades of the wings and keel-petals 2 mm. long, the claws 1 mm. long; pod silky-pilose, densely so above.

TYPE LOCALITY: Copper Mines [Santa Rita del Cobre], New Mexico.
DISTRIBUTION: New Mexico, Arizona, and Chihuahua.

61. *Parosela brachystachys* (A. Gray) A. Heller; Rose, Contr.
U. S. Nat. Herb. 10: 105. 1906.

Dalea brachystachys A. Gray, Pl. Wright. 2: 39. 1853.

A slender annual; stem 1-3 dm. high, glabrous, much branched, sparingly glandular-dotted; leaves 1-3 cm. long; stipules minute, subulate; petiole 4-8 mm. long; rachis glabrous, margined, sparingly glandular-dotted; stipels represented by glands; leaflets 5-11, cuneate-oblong to linear, glabrous, glandular-dotted and glaucous beneath, 5-15 mm. long; peduncles terminating the branches or opposite the leaves, 1-6 cm. long; spikes subglobose; bracts ovate, acute or acuminate, green to dark-brown, conspicuously glandular-dotted, glabrous, tardily deciduous; calyx-tube turbinate, 10-ribbed, silky-hirsute, 2 mm. long; lobes with a deltoid base, subulate-filiform, longer than the tube; corolla yellowish, tinged with rose; blade of the banner subcordate, 2 mm. long and fully as broad; wings and keel-petals inserted far below the middle of the staminal tube; blades of the wings 2-2.5 mm. long, those of the keel-petals broader and with a smaller basal lobe, 3 mm. long, the claws of both nearly 2 mm. long; pod silky-villous.

TYPE LOCALITY: Between San Pedro and Sonorita, Sonora.
DISTRIBUTION: New Mexico and Arizona to Sonora and San Luis Potosí.

62. *Parosela Lemmoni* (Parry) A. Heller, Cat. N. Am. Pl.
ed. 2. 6. 1900.

Dalea Lemmoni Parry; A. Gray, Proc. Am. Acad. 17: 200. 1882.

A slender annual or perennial, branched at the base; stem 1-3 dm. high, branched, glabrous; leaves 1-3 cm. long; stipules minute, subulate; petiole 1-3 mm. long; rachis glabrous, conspicuously glandular-dotted, margined; leaflets 5-11, linear to oblong-cuneate, 4-10 mm. long, acutish to retuse, glabrous on both sides, conspicuously glandular-dotted beneath; peduncles terminal or opposite the leaves, 2-6 cm. long; spikes globose or ovoid, about 1 cm. long; bracts lanceolate, acuminate, conspicuously glandular-dotted and glabrous on the back, ciliate on the margins; calyx-tube turbinate, 10-ribbed, silky-hirsute, 2 mm. long; lobes subulate-attenuate, longer than the tube; corolla rose-colored; blade of the banner deltoid-cordate, 2 mm. long, the claw 3 mm. long; blades of the wings obliquely elliptic or obovate, with a rounded basal lobe, 3-3.5 mm. long, those of the keel-petals broadly obovate, with a smaller basal lobe, 3.5-4 mm. long, the claws of both 2 mm. long; pod silky-villous.

TYPE LOCALITY: Near Fort Bowie, Apache Pass, Arizona.
DISTRIBUTION: Arizona and Chihuahua to Puebla.

63. *Parosela costaricana* Rydberg, sp. nov.

Dalea annua alopecuroides Kuntze, Rev. Gen. 178, in part. 1891.

A stout annual; stem 3-5 dm. high, much branched, grooved, conspicuously glandular-dotted; leaves spreading, 3-8 cm. long; stipules subulate; rachis glabrous, glandular-dotted; stipels conic, gland-like; leaflets 15-49, oblong, obtuse, 4-8 mm. long, glabrous on both sides, conspicuously glandular-dotted beneath; peduncles terminating the branches, 2-10 cm. long; spikes dense, cylindrical, 2-6 cm. long, 8-9 mm. thick; bracts ovate, acuminate, scarious on the margins below, ciliate, the back and tip green; corolla white; blade of the banner rounded obovate, with a pair of acutish basal lobes, 2 mm. long, the claw 1.5 mm. long; blades of the

wings obliquely oblong, with a rounded basal lobe, the claws very short; blades of the keel-petals obliquely obovate, with an obsolete basal lobe, 2 mm. long, the claws 1 mm. long; pod pilose above, glabrate below.

Type collected at Haciendas de Zent et de Guacimo, Costa Rica, *United Fruit Company 21* (U. S. Nat. Herb. no. 861459).

DISTRIBUTION: Costa Rica.

64. *Parosela leporina* (Ait.) Rydberg.

Psoralea leporina Ait. Hort. Kew. 3: 81. 1789.

Dalea alopecuroides Hemsl. Biol. Centr. Am. Bot. 1: 237. 1880. Not *D. alopecuroides* Willd. 1803.

Dalea annua alopecuroides Kuntze, Rev. Gen. 178, in part. 1891.

Dalea annua ebracteata Kuntze, Rev. Gen. 178. 1891.

A tall, branched annual; stem striate, glabrous, sparingly glandular-dotted, 5-10 dm. high; branches ascending; leaflets ascending, 5-10 cm. long; stipules subulate, 2-3 mm. long; petiole 5-10 mm. long; rachis margined, glabrous, sparingly dotted; stipels gland-like; leaflets 21-35, oblong, 5-10 mm. long, rounded or retuse at the apex, glabrous on both sides, paler and glandular-dotted beneath; peduncles terminal at the ends of the branches and opposite the leaves, 5-15 cm. long; spikes dense, cylindric, 2-5 cm. long, 8-10 mm. thick; bracts ovate or lanceolate, acuminate, membranous, early deciduous, longer than the buds, silky-pilose or puberulent below and ciliate on the margin, the upper part glabrous and dark on the back; calyx-tube turbinate, silky-pilose, 2-2.5 mm. long; lobes subulate-setaceous, with a broader base, about equaling the tube; corolla blue with whitish base or rarely white; blade of the banner rounded-subcordate, truncate at the base, 2-2.5 mm. long, the claw 2 mm. long; blades of the wings and keel-petals with rather indistinct basal lobes, 2 mm. long, the claws 1 mm. long; pod silky-pilose.

TYPE LOCALITY: Cultivated plant of unknown origin [probably Mexico].

DISTRIBUTION: New Mexico and Arizona to Guatemala; perhaps further south.

65. *Parosela alopecuroides* (Willd.) Rydberg.

? *Dalea alba* Michx.; Roem. Cat. Hort. Turic. 1802.

Dalea alopecuroides Willd. Sp. Pl. 3: 1336. 1803.

Dalea Linnaei Michx. Fl. Bor. Am. 2: 57, in part. 1803.

Psoralea alopecuroides Poir. in Lam. Encyc. 5: 695. 1804.

Petalostemon alopecuroides Pers. Syn. Pl. 2: 268. 1807.

Petalostemon alopecuroides Pursh, Fl. Am. Sept. 461. 1814.

Dalea Cliffortiana Pursh, Fl. Am. Sept. 474, in part. 1814. Not *D. Cliffortiana* Willd. 1803.

Dalea pedunculata Pursh, Fl. Am. Sept. 474. 1814.

Psoralea pedunculata Poir. in Lam. Encyc. Suppl. 4: 590. 1816.

Dalea Dalea McMill. Metasp. Minn. Valley 330, in part. 1892. Not *Psoralea Dalea* L. 1753.

Parosela Dalea Britton, Mem. Torrey Club 5: 196, in part. 1894.

An annual; stem striate, glabrous, glandular-dotted, somewhat tubercled, with ascending branches, 3-10 dm. high; leaves ascending, 4-8 cm. long; stipules subulate, 2-3 mm. long; petiole 5-8 mm. long; rachis glabrous, margined, sparingly glandular-dotted; stipels gland-like; peduncles at the ends of the branches and opposite the leaves, 3-10 cm. long; spikes dense, 2-8 cm. long, about 8 mm. thick; bracts lanceolate or lance-ovate, acuminate, caducous, membranous, mostly pale, ciliate on the margins and slightly pilose on the back; calyx-tube turbinate, silky-pilose, 3 mm. long; lobes lanceolate, subulate-acuminate, about equaling the tube; corolla white or tinged with rose or lilac; blade of the banner hastately obovate, with a truncate base and acute basal lobes, 2.5-3 mm. long; blades of the wings obliquely oblong, 2 mm. long, with a rounded basal lobe, those of the keel-petals more obovate, with a less distinct basal lobe, soon distinct; pod pilose at the apex.

TYPE LOCALITY: North America.

DISTRIBUTION: Illinois to South Dakota, Alabama, and New Mexico.

ILLUSTRATIONS: Michx. Fl. Bor. Am. pl. 33; Britt. & Brown, Ill. Fl. f. 2106; ed. 2. f. 2509.

66. *Parosela Thouini* (Schränk) Rydberg.

Dalea Thouini Schrank, Pl. Rar. Hort. Monac. 1: 9. 1819.

Dalea annua Thouin; Schrank, Pl. Rar. Hort. Monac. 1: 9, as synonym. 1819.

Petalostemon sessilis Moc. & Sessé; DC. Prodr. 2: 246, as synonym. 1825.

A low annual; stem 1-2 dm. high, glabrous, branched near the base, with spreading or assurgent branches; leaves 1-3 cm. long; stipules subulate, 2-3 mm. long; rachis glabrous and

glandless; stipels minute, gland-like; leaflets 3-9, oblong or oblong-cuneate, 4-10 mm. long, glabrous on both sides, dark-green above, paler beneath, apparently glandless; peduncles terminal, 1-3 cm. long; spikes dense, 2-3 cm. long, 8 mm. thick; bracts ovate, ciliate, almost black, short-acuminate; calyx-tube campanulate, 2 mm. long, densely pilose, with 10 dark veins; lobes filiform, with a triangular base, pilose-plumose; corolla blue; blade of the banner round-oval, 2.5 mm. long, the claw 2 mm. long; wings and keel-petals inserted towards the base of the staminal tube; blades of the wings 2 mm. long, those of the keel-petals more oblong and with less distinct basal lobes.

TYPE LOCALITY: Cultivated specimen from American seeds.

DISTRIBUTION: State of Mexico.

XIV. Flavae. Tall annuals, sometimes woody at the base, branched above. Leaflets many, oblong or elliptic, minutely glandular-dotted beneath. Spikes dense, cylindric, peduncled, opposite the leaves; bracts lanceolate, tardily deciduous, pubescent. Calyx-tube very strongly ribbed, with conspicuous glands in the intervals; lobes subulate, equaling the tube. Corolla ochroleucous, inconspicuous. Blade of the banner small, suborbicular. Blades of the other petals obliquely oblong, short-clawed. Pod villous above.

67. *Parosela flava* (Mart. & Gal.) Rydberg.

Dalea flava Mart. & Gal. Bull. Acad. Brux. 10: 40. 1843.

Parosela pauciflora Rose, Contr. U. S. Nat. Herb. 10: 106. 1906.

An annual or perennial; stem more or less short-villous, 3-12 dm. high, sometimes woody below, with ascending branches, striate or angled; leaves 2-4 cm. long; stipules subulate, 2-3 mm. long; petiole 2-5 mm. long; rachis short-villous; stipels obsolete; leaflets 15-25, oblong, elliptic, or obovate, 4-8 mm. long, villous on both sides, conspicuously glandular-dotted beneath; peduncles terminating the branches, 1-2 cm. long; spikes short, cylindric, dense, 2-4 cm. long; bracts lanceolate, tardily deciduous, villous, acuminate, longer than the calyx; calyx-tube turbinate, 2.5 mm. long, sparingly silky, strongly 10-ribbed, with conspicuous yellow glands between the ribs; lobes subulate, silky-plumose, equaling the tube; corolla ochroleucous; blade of the banner orbicular, nearly 1.5 mm. long, 2 mm. wide, the claw 2.5 mm. long; blades of the wings and keel-petals broadly oblong, oblique, with a rounded basal lobe, 2 mm. long, the claws less than 0.5 mm. long; pod villous above.

TYPE LOCALITY: Zacuapán, Veracruz.

DISTRIBUTION: Sonora and Jalisco to Veracruz and Puebla.

68. *Parosela elata* (H. & A.) Rydberg.

Dalea elata H. & A. Bot. Beech. Voy. 416. 1840.

A tall annual herb; stem 5-10 dm. high, branched above, glabrous, striate, angled; leaves 4-7 cm. long; stipules subulate, small; leaflets 13-21, elliptic, 8-12 mm. long, glabrous, paler and minutely glandular-dotted beneath; peduncles opposite the leaves, 2-4 cm. long; spikes dense, cylindric, 2-5 cm. long; bracts lanceolate, acuminate, villous, longer than the calyx; calyx-tube turbinate, 2.5 mm. long, glossy and glabrous or with a few scattered hairs, very strongly 10-ribbed, with a row of very conspicuous dark-brown oblong glands in each interval; lobes subulate, silky-plumose, equaling the tube; corolla ochroleucous; blade of the banner suborbicular, about 1-5 mm. long, shorter than the claw; blades of the other petals obliquely oblong, 2 mm. long, short-clawed; pod villous above.

TYPE LOCALITY: Acapulco.

DISTRIBUTION: Type locality and vicinity.

XV. Similes. Tall annuals, silky-canescens throughout. Leaflets numerous, small. Spikes on terminal peduncles, short and dense; bracts densely villous, longer than the calyx. Calyx-tube silky-villous, 10-ribbed, not conspicuously glandular; lobes longer than the tube. Corolla white. Blade of the banner orbicular. Wings and keel-petals inserted above the middle of the staminal tube, the blades elliptic-oblong, short-clawed. Pod villous above.

69. *Parosela similis* (Hemsl.) Rose, Contr. U. S. Nat. Herb. 12:
273. 1909.

Dalea similis Hemsl. Diag. Pl. Nov. 7. 1878.

An erect robust annual; stem densely yellowish-canescens, not angled; leaves spreading, 3-5 cm. long; stipules minute, subulate; petiole very short; rachis densely tomentose; leaflets 21-41, subsessile, oblong-elliptic, 3-5 mm. long, acute, densely villous, the glands obscured by the tomentum; peduncles terminal, 1-2 cm. long; spikes short and dense; bracts ovate-lanceolate or lanceolate, densely villous, acuminate, longer than the calyx; calyx-tube turbinate, silky-villous, 10-ribbed, 2.5 mm. long; lobes subulate, longer than the tube; corolla white; blade of the banner orbicular, 3 mm. long, shorter than the claw; blades of the other petals oblong-elliptic, with a rounded basal lobe and short claw; pod villous above.

TYPE LOCALITY: Cerro de Pinal, Durango.

DISTRIBUTION: Durango.

XVI. *Citriodora*. Slender, glabrous annuals, often branched from the base. Leaflets many, small, oblong to oval. Spikes dense and short; bracts more persistent, glabrous, obovate or ovate or orbicular, abruptly short-acuminate, glandular-dotted, more or less colored, scarious-margined, concave. Calyx-tube campanulate, moderately strongly 10-ribbed; lobes short, from half to fully as long as the tube. Corolla purple. Blade of the banner rhombic-ovate to rhombic-cordate. Wings and keel-petals inserted at or near the middle of the staminal tube, the blades obliquely obovate, the claws short. Pod pubescent, at least above.

70. *Parosela citriodora* (Cav.) Rose, Contr. U. S. Nat. Herb.
10: 104. 1906.

Psoralea citriodora Cav. Ic. 3: 36. 1794.

Dalea citriodora Willd., Sp. Pl. 3: 1339. 1803.

Dalea lateripes Moc. & Sessé; DC. Prodr. 2: 245, as synonym. 1825.

An annual; stem often branched from the base, 1-4 dm. high, glabrous; leaves 1.5-3 cm. long; stipules setaceous, 3 mm. long; petiole very short; rachis slender, glabrous, with gland-like stipels; leaflets 13-23, oblong, obtuse or glandular-apiculate, 3-5 mm. long, glabrous, glandless or with a few minute glands along the margin towards the apex; peduncles terminal, 1-5 cm. long; spikes dense, 1-2 cm. long, 6-8 mm. thick; bracts rounded-obovate, abruptly short acuminate, slightly purple-tinged, with 2 inconspicuous glands; calyx-tube turbinate, more or less silky, 2-2.5 mm. long, 10-ribbed; lobes slightly unequal, triangular, less than half as long as the tube, acute; corolla bluish-purple; blade of banner rhombic-ovate, nearly 2 mm. long, equaling the claw; blades of the wings a little more than 2 mm. long, those of the keel-petals broader, with a smaller basal lobe, the claws of both 1 mm. long; pod broadly obliquely obovate, almost 3-angular in outline, minutely puberulent above.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Durango and San Luis Potosi to Oaxaca and Guatemala.

ILLUSTRATION: Cav. Ic. pl. 271.

71. *Parosela polyphylla* (Mart. & Gal.) Rose, Contr. U. S. Nat.
Herb. 10: 104. 1906.

Dalea polyphylla Mart. & Gal. Bull. Acad. Brux. 10: 44. 1843.

Dalea citriodora H. & A.; Hemsl. Biol. Centr. Am. Bot. 1: 245. 1880. Not *D. citriodora* Willd. 1803.

? *Dalea platystegia* S. Schauer, Linnaea 20: 741. 1847.

An annual or perennial, more or less suffruticose below, branched above; stem glabrous, purplish, sparingly and inconspicuously glandular-dotted; leaves ascending, 3-5 cm. long; stipules subulate, 4-5 mm. long; petiole 2-5 mm. long; rachis glabrous; stipels conspicuous, gland-like; leaflets 11-41, oblong, 3-6 mm. long, glabrous, glandular-dotted beneath; peduncles terminating the branches or some of them sub-opposite the leaves, 3-10 cm. long; spikes oblong, dense, 1-3 cm. long; bracts suborbicular, abruptly acuminate, glabrous, conspicuously glandular-dotted, caducous; calyx silky-villous; tube campanulate, 10-ribbed, 2-2.5 mm. long;

lobes ovate, the upper about half as long as the tube, the lowest a little longer than the rest; corolla purple; blade of the banner rhombic-ovate, 2.5 mm. long, the claw 3 mm.; blades of the other petals obliquely 2.5 mm. long, the claws 1 mm. long; pod pubescent above.

TYPE LOCALITY: Juquila, Oaxaca.

DISTRIBUTION: Veracruz and Mexico to Oaxaca and Guatemala.

72. *Parosela roseola* Rydberg, sp. nov.

An annual, somewhat woody at the base; stem gray or purplish, 2-5 dm. high, glabrous, terete; leaves 2-3 cm. long, spreading; stipules subulate, 1 mm. long; rachis distinctly winged, glabrous; stipels gland-like, conspicuous; leaflets 21-27, oblong, 1.5-3 mm. long, glabrous on both sides, glandular-dotted along the margins beneath; peduncles opposite the leaves, 2-4 cm. long; spikes dense, short, 1-2 cm. long; bracts rounded, obovate or subreniform, abruptly short-acuminate, almost mucronate, glabrous and with a few glands on the back, shorter than the calyx; calyx-tube 10-ribbed, 2 mm. long, densely sericeous; lobes triangular, 1 mm. long; corolla dark-rose; blade of the banner rhombic-cordate, 1.5 mm. long, the claw 1 mm. long; blades of the other petals 2.5-3 mm. long; pod pubescent.

Type collected on Volcan Jumaytepeque, Santa Rosa, Guatemala, November 1892, *Heyde & Lux* (Donnell Smith dist. no.) 4166 (herb. Columbia Univ.).

73. *Parosela citrina* Rydberg, sp. nov.

A tall annual; stems 3-8 dm. high, often tinged with purple, glabrous sparingly glandular-dotted; leaves 3-8 cm. long; stipules subulate, 2 mm. long; rachis glabrous; leaflets 21-33, oblong, 3-10 mm. long, glabrous on both sides, rounded at the apex, slightly crenulate, glandular-dotted beneath; peduncles opposite the leaves, 3-5 cm. long; spikes dense, 1-2 cm. long; bracts broadly obovate, short-acuminate, glabrous, with several scattered large glands; corolla bluish-purple; petals often with a gland at the apex; blade of the banner rhombic-cordate, 2 mm. long, the claw 2 mm. long; blades of the other petals 5 mm. long, those of the keel much broader, with a smaller lobe, the claws 1.5 mm. long; pod densely pubescent above, glabrous below.

Type collected in fields about Tuxpan, Jalisco, October 27, 1904, *Pringle 8860* (herb. N. Y. Bot. Gard.).

74. *Parosela vernicia* Rose, Contr. U. S. Nat. Herb. 8: 303. 1905.

Dalea vernicia Greenman, Field Mus. Publ. Bot. 2: 331. 1912.

A slender annual; stem 3-9 dm. high, glabrous; leaves 3-6 cm. long, glabrous; stipules setaceous, 2-3 mm. long; petiole very short; rachis with conspicuous glands at the base of the leaflets and smaller ones between; leaflets 17-41, oblong, obtuse or acutish at the apex, 5-7 mm. long, glabrous on both sides, glandular-dotted beneath, conspicuously so along the margins; peduncles 5-8 cm. long; spikes dense, 1-3 cm. long; rachis short-pubescent; bracts ovate, acuminate, membranous, with purple-tinged tips, caducous; pedicels very short, divaricate; calyx-tube turbinate, 10-ribbed, silky, 2.5 mm. long; lobes silky, equaling the tube, triangular-lanceolate at the base, with slender subulate tips; corolla dark bluish-purple; blade of the banner cordate, 3 mm. long, the claw about 2.5 mm. long; blades of the wings nearly 4 mm. long, obliquely elliptic, the claws 1 mm. long; blades of the keel-petals obliquely obovate, 4 mm. long; pod obliquely obovate, shorter than the calyx, sparingly pubescent, with a straight beak.

TYPE LOCALITY: Yautepec, Morelos.

DISTRIBUTION: Jalisco to Puebla and Guerrero.

XVII. *Unciferae*. Annual or perennial herbs, glabrous or slightly pubescent. Leaflets several, oblong to oval or obovate. Spikes elongate, acute, rather dense; bracts membranous, scarious-margined, veiny, enclosing the flowers, abruptly cordate-acuminate. Calyx-tube campanulate, with 10 dark veins; lobes broader than long. Corolla mostly bluish-purple, with an ochroleucous banner, the blade of the latter cordate. Wings and keel-petals inserted slightly above the middle of the staminal tube, the blades obliquely obovate, with a large rounded basal lobe. Pod glabrous or somewhat pubescent at the apex.

75. *Parosela insignis* (Hemsl.) Rose, Contr. U. S. Nat. Herb.
10: 103. 1906.

Dalea insignis Hemsl. Diag. Pl. Nov. 7. 1878.

An herb, apparently annual; stem about 5 dm. high, stout, glabrous, leafy, branched at the summit; leaves 5–10 cm. long, spreading; stipules foliaceous, but thin, strongly veiny, glandular-dotted, semi-ovate or semi-sagittate, 8–10 mm. long, 5–7 mm. broad; petiole 1–2 cm. long; rachis glabrous or slightly pilose, not glandular; stipels obsolete; leaflets 9–13, oval, mucronate or cuspidate, 1–2 cm. long, glabrous, glandular-dotted beneath only; peduncles terminating the branches, 1–3 cm. long; spikes dense, 3–10 cm. long, about 1.5 cm. thick; bracts membranous, veiny, inflated, enclosing the flowers, truncate or retuse at the apex, abruptly produced into a filiform recurved acumination nearly as long as the body; calyx-tube broadly campanulate, membranous, with 10 dark veins, 2 mm. long; lobes broadly triangular, broader than long; flowers purple (?); blade of the banner rounded-cordate, 3 mm. long, the claw 5 mm. long; blades of the wings 4 mm. long, those of the keel-petals broader, more obovate, 5 mm. long, united along the lower edge, the claws of both 3 mm. long; pod glabrous.

TYPE LOCALITY: Veracruz.

DISTRIBUTION: Veracruz and Puebla.

ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. pl. 15.

76. *Parosela caudata* Rydberg, sp. nov.

A slender annual; stem sparingly pilose, simple, about 3 dm. high; leaves 2–4 cm. long, ascending; stipules filiform, about 4 mm. long; rachis sparingly pilose; leaflets 7–11, oblong 5–10 mm. long, glabrous above, paler and minutely punctate on the lower surface, ciliate on the margins and veins beneath, minutely mucronate; peduncles terminal, 1–2.5 cm. long; spikes dense, cylindric, 3–2 cm. long; bracts persistent, obovate, boat-shaped, membranous-margined, glandular and minutely glandular-punctate on the back, abruptly acuminate into a, subulate-filiform tip; calyx-tube campanulate, membranous, with 10 dark veins, 2 mm. long, sparingly appressed-pubescent; lobes triangular, less than 1 mm. long, acute; pod glabrous, membranous, with minute glands.

Type collected in Mexico, in 1853, *Fred. Müller 844* (herb. Columbia Univ.).

77. *Parosela attenuata* Rydberg, sp. nov.

A herbaceous perennial, with a woody caudex; stem about 5 dm. high, sparingly pilose, branched; leaves 5–7 cm. long; stipules lance-subulate, 10–15 mm. long; rachis slightly margined and sparingly pilose; stipels gland-like; leaflets 11–15, elliptic or oval, 1–2 cm. long, mucronate, glabrous above, sparingly ciliate on the veins beneath and on the margins, minutely glandular-punctate; peduncles terminal, 5–8 cm. long; spikes dense, 3–5 cm. long; bracts lanceolate, glandular and green on the back, white on the margins, long-attenuate, with a filiform tip; calyx-tube turbinate, 2.5 mm. long, with 10 black veins, pilose; lobes triangular, 1 mm. long; corolla bluish-purple, except the ochroleucous banner; blade of the banner cordate, 4–5 mm. long, the claw 4 mm. long; blades of the wings 4 mm. long, those of the keel-petals similar with a smaller basal lobe, 5 mm. long, the claws of both 2 mm. long; pod glabrous.

Type collected in Sierra de San Felipe, Oaxaca, October 26, 1894, *Charles E. Smith 547* (herb. N. Y. Bot. Gard.).

78. *Parosela uncifera* (Schlecht. & Cham.) Rose, Bot. Gaz. 40:
144. 1905.

Dalea uncifera Schlecht. & Cham. Linnaea 5: 580. 1830.

A herbaceous perennial, with a woody caudex; stems several, more or less pilose, 3–6 dm. high, branched, erect or ascending; leaves 4–8 cm. long; stipules lance-subulate to setaceous, 8–10 mm. long; petiole 1–2 cm. long; rachis sparingly pilose; stipels gland-like; leaflets 7–11, usually glabrous, except the ciliate margins, glandular-dotted and paler beneath, obovate, obtuse, mucronate, 8–25 mm. long; peduncles terminating the branches, 3–12 cm. long; spikes dense, 2–6 cm. long, about 1 cm. thick; bracts persistent, membranous, inflated, somewhat

boat-shaped and enclosing the flowers, veiny, truncate, abruptly contracted into a filiform acumination about equaling the body; calyx-tube broadly campanulate, membranous, with 10 dark veins, 2 mm. long, glabrous; lobes triangular, less than half as long as the tube; banner ochroleucous, tinged with violet, the blade cordate, 5 mm. long, the claw 4 mm. long; blades of the wings 4 mm. long, those of the keel-petals with a smaller basal lobe, 5 mm. long, the claws of both 2 mm. long; pod glabrous.

TYPE LOCALITY: Mexico, probably in Veracruz.

DISTRIBUTION: Central Mexico.

79. *Parosela bicolor* (Willd.) Rydberg.

Dalea bicolor Willd. Hort. Berol. *pl.* 89. 1809.

? *Dalea Coronilla* G. Don, Gen. Hist. 2: 226. 1832.

A perennial, woody at the base; stems several, decumbent or ascending, terete, more or less pilose; leaves 3-4 cm. long; stipules setaceous-subulate, about 4 mm. long; rachis sparingly pilose and slightly glandular-dotted; stipels obsolete; leaflets 7-9, obovate, or cuneate, emarginate or truncate at the apex, usually 4-7 mm. long, sometimes 7-15 mm., glabrous above, glandular-dotted and usually sparingly pilose beneath; peduncles terminating the branches, 2-5 cm. long, pilose; spikes dense, 3-6 cm. long, about 1 cm. thick; bracts persistent, membranous, somewhat boat-shaped, broad, glandular-punctate, enclosing the flowers, truncate at the apex, abruptly contracted into a filiform, ciliate acumination, which is about half as long as the body; calyx-tube campanulate, glabrous or slightly pilose, minutely glandular-dotted, with 10 dark veins, 3 mm. long; lobes triangular, one-fourth to one-third as long as the tube; banner ochroleucous, the blade round-ovate, 3 mm. long, equaling the claw; wings and keel ochroleucous below, with violet tips; blades of the wings elliptic, with a large basal lobe, 4 mm. long, those of the keel-petals broadly obliquely obovate, with a smaller basal lobe, 4.5 mm. long, the claws of both about 1 mm. long; pod pilose towards the summit.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: States of Mexico and Puebla.

ILLUSTRATIONS: Willd. Hort. Berol. *pl.* 89; Hook. Exot. Fl. *pl.* 43.

80. *Parosela mutabilis* Cav. Descr. Pl. 186. 1802.

Psoralea mutabilis Cav. Ic. 4: 65. 1797.

Dalea obovatifolia Ortega, Dec. 32. 1797.

Dalea mutabilis Willd. Sp. Pl. 3: 1339. 1803.

Dalea unguicularis Moc. & Sessé; DC. Prodr. 2: 245, as a synonym. 1825.

A herbaceous perennial, with a thick root and short caudex, rarely suffrutescent; stems decumbent, 2-5 dm. long, glabrous or sparingly pubescent above; leaves spreading, 2-3 cm. long; stipules subulate, 2-3 mm. long; petiole about 1 cm. long; rachis glabrous or nearly so; stipels gland-like; leaflets 7-17, obovate, truncate or slightly emarginate, 5-8 mm. long, glabrous on both sides, glaucous and glandular-punctate beneath; peduncles terminating the branches, sparingly villous, 1-3 cm. long; spikes elongate but rather dense, 3-10 cm. long; bracts obovate, boat-shaped, truncate or emarginate at the apex, abruptly contracted into a filiform tip, rather persistent; calyx-tube sparingly silky-villous, campanulate, terete, with strong dark veins, 4 mm. long; lobes broadly deltoid, ciliate on the margins, one-fourth as long as the tube; banner yellow, the blade rounded-obovate, 4 mm. long, equaling the claw; wings and keel yellowish with purple spots; blades of the former 6 mm. long, those of the keel-petals broader with a smaller basal lobe, the claws of both 1 mm. long; pod obliquely ovoid, silky-villous on the top.

TYPE LOCALITY: Cultivated in the Royal Garden at Madrid; said to come from Cuba and Mexico, probably the latter.

DISTRIBUTION: San Luis Potosí to Puebla.

ILLUSTRATIONS: Cav. Ic. *pl.* 394; Bot. Mag. *pl.* 2486; Bonpl. Jard. Malm. *pl.* 57.

XVIII. *Capitatae*. Low shrubs with divaricate branches. Leaflets rather few, small and crowded. Spikes short and head-like, few-flowered. Bracts broadly ovate, subsistent, copiously glandular-dotted. Calyx-tube campanulate, pubescent, not strongly ribbed, glandular-dotted; lobes triangular, shorter than the tube. Corolla yellow. Blade of the

banner small, rounded-ovate. Wings and keel-petals inserted below the middle of the staminal tube, the blades large, obovate, with large basal lobes, the claws comparatively long. Pod finely pubescent.

81. *Parosela capitata* (S. Wats.) Rose, Contr. U. S. Nat. Herb. 12: 272. 1909.

Dalea capitata S. Wats. Proc. Am. Acad. 25: 146. 1890.

A shrub, 3-5 dm. high, much branched; stem straw-colored; branches finely puberulent, leaves about 1 cm. long; stipules subulate, 1-2 mm. long; petiole 1-2 mm. long; rachis glabrous; sparingly glandular-punctate; stipels gland-like; leaflets 5-9, obovate, emarginate, 2-3 mm. long, conspicuously punctate on both sides; peduncles short, seldom more than 1 cm. long, terminating the branches; spikes short and dense, 1-3 cm. long; bracts broadly ovate, acute or short-acuminate, subsistent, brown, conspicuously glandular-punctate; calyx-tube campanulate, 2.5 mm. long, silky, glandular-dotted, not strongly ribbed; corolla yellow; blade of the banner rounded ovate, 3.5 mm. long, the claw 2.5 mm. long; wings and keel-petals inserted far below the middle of the staminal tube, the blades obliquely obovate, with a large basal lobe, 4.5-5 mm. long, those of the keel united along the lower edge, the claws 2 mm. long; pod finely pubescent.

TYPE LOCALITY: Carneros Pass, Coahuila.

DISTRIBUTION: Chihuahua and Coahuila to San Luis Potosí.

82. *Parosela quinqueflora* (Brand.) Rydberg.

Dalea quinqueflora Brand. Univ. Calif. Publ. Bot. 4: 180. 1911.

A low shrub; stem much branched; branches flexuose, glabrous; leaves 1 cm. long or less; stipules minute, subulate; petiole about 2 mm. long; rachis conspicuously glandular-dotted; stipels gland-like; leaflets 5-7, cuneate-oblong, about 3 mm. long, usually folded, conspicuously glandular-dotted; peduncles 1 cm. long or less, terminating the branches; spikes short and head-like, 3-7-flowered; bracts ovate, brown, involute, persistent; calyx-tube campanulate, 3 mm. long, silky; lobes triangular, acute, much shorter than the tube; corolla yellow; blade of the banner cordate, 4 mm. long, the claw 3 mm. long; wings and keel-petals inserted near the middle of the staminal tube, the blades obliquely obovate, with a rather large basal lobe, those of the wings 4 mm. long, those of the keel 5 mm. long, broader, and united along the lower edge, the claws 1.5 mm. long.

TYPE LOCALITY: Buena Vista, San Luis Potosí.

DISTRIBUTION: San Luis Potosí.

83. *Parosela Lloydii* Rydberg, sp. nov.

A low diffusely branched shrub; branches flexuose, glabrous; leaves less than 1 cm. long; stipules lance-subulate, minute; rachis glabrous, sparingly glandular-dotted; stipels conic, gland-like; leaflets 7-9, about 3 mm. long, cuneate-oblong, infolded, glabrous, glandular-dotted beneath; spikes subsessile, 2-7-flowered; bracts ovate, 2 mm. long, yellow with green tips; calyx-tube campanulate, 2 mm. long, silky; lobes triangular, acute, less than 1 mm. long; corolla yellow; blade of the banner cordate, 2 mm. long; wings and keel-petals inserted near the middle of the staminal tube, the blades obliquely round-obovate, with a large basal lobe, those of the former 2 mm., those of the latter 3 mm. long, the claws 1 mm. long.

Type collected at Cedros, Zacatecas, April 29, 1908, *Lloyd 60* (U. S. Nat. Herb. no. 574025).

XIX. *Frutescentes*. Glabrous shrubs. Leaflets several pairs, obovate or oval. Spikes on peduncles terminating the branches; bracts ovate, glandular-punctate. Flowers sessile or short-pedicelled. Calyx-tube very short, glabrous, strongly 10-ribbed, with usually conspicuous orange glands in the intervals, ciliolate on the margins; lobes triangular, with short subulate tips, much shorter than the tube. Corolla rose-purple. Wings and keel-petals inserted at or near the middle of the staminal tube, much exceeding the banner, the blades broadly obliquely obovate, with a rounded basal lobe, the keel the longer. Pod glabrous, conspicuously glandular-dotted.

84. *Parosela frutescens* (A. Gray) Vail; Rose, Contr. U. S.
Nat. Herb. 8: 303. 1905.

Dalea frutescens A. Gray, Bost. Jour. Nat. Hist. 6: 175. 1850.

A shrub, 3-10 dm. high; branches striate, glabrous, very sparingly glandular-punctate; leaves spreading, 1-2.5 cm. long; stipules setaceous-subulate, 2 mm. long; petiole 5 mm. long; rachis glabrous, slightly margined; leaflets 13-17, glaucous-verdigris, glabrous, minutely glandular-punctate beneath, obovate, retuse, 3-8 mm. long; peduncles terminating the branches, 1-5 cm. long, glabrous; spikes at first subcapitate, dense, about 1 cm. long; bracts ovate, acute, conspicuously glandular-punctate; calyx-tube turbinate, 3 mm. long, with conspicuous orange glands between the 10 strong ribs; lobes triangular, with short subulate tips, villous-ciliate on the margins; corolla purple; blade of the banner cordate, nearly 5 mm. long, the claw 3 mm. long; blades of the other petals 6 mm. long, the claws 1.5 mm. long; pod broadly obliquely obovate, glabrous, conspicuously glandular-punctate.

TYPE LOCALITY: On the Guadalupe, Texas.

DISTRIBUTION: Texas and New Mexico to Chihuahua and Nuevo León.

85. *Parosela laxa* Rydberg, sp. nov.

A shrub, perhaps 1 m. high; branches glabrous, straw-colored, terete, ascending; leaves 1.5-2 cm. long, spreading; stipules minute, subulate; rachis slightly margined, on the upper side glandular-punctate; stipules gland-like, acute; leaflets more or less cuneate, 4-5 mm. long, slightly retuse, glabrous, glandular-dotted beneath; peduncles terminating the branches, 1 cm. long; spikes slender and lax, 2-4 cm. long; bracts ovate, glabrous, conspicuously glandular-dotted, early deciduous; calyx glabrous, except the ciliate margin; tube 3 mm. long, strongly 10-ribbed, with a row of oblong, yellow glands in each interval; teeth broadly triangular, with a short subulate tip, 0.5 mm. long and very broad, the sinuses between them rounded; corolla rose-purple or with a yellowish banner; blade of the banner cordate, 4 mm. long, the claw 3 mm. long; wings and keel-petals inserted near the middle of the staminal tube, the blades of the wings 5 mm. long, those of the keel 5 mm. long.

Type collected in the vicinity of Devils River, Texas, October 16, 1913. *Rose & Fitch 17957* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Texas.

86. *Parosela hospes* Rose, Contr. U. S. Nat. Herb. 12: 272. 1909.

A slender shrub, 2-3 m. high; stem divaricately branched, glabrous throughout, sparingly minutely glandular-punctate, more or less purplish; leaves glabrous, 1-3 cm. long; stipules 5-7, oblong to cuneate, retuse or rounded at the apex, 6-10 mm. long, glabrous, minutely but densely glandular-punctate on both sides; petiolules 0.5 mm. long, somewhat thickened; spikes lax, 2-4 cm. long, terminating the branches or sub-opposite the leaves, 5-12-flowered, glabrous; bracts ovate, 2 mm. long, caducous; pedicels very short; calyx-tube turbinate, 3.5-4 mm. long, 10-costate, glabrous or slightly puberulent when young; upper 4 lobes very short, broadly triangular, densely ciliate, the lowest one lanceolate, larger, half as long as the tube; petals creamy-white to pale-purple; blade of the banner rounded-cordate, 3 mm. long, the claw about 2 mm. long; wings and keel-petals similar, their blades 4-5 mm. long, the claws about 1 mm. long; pod included, obliquely ovate, silky-pubescent.

TYPE LOCALITY: Sierra Madre, above Monterey, Nuevo León.

DISTRIBUTION: Coahuila and Nuevo León.

XX. *Acutifoliae*. Glabrous shrubs. Leaflets comparatively large, acute at each end. Spikes lax; bracts ovate, minutely ciliate, caducous. Flowers sessile. Calyx pubescent; tube strongly 10-ribbed, obsolete glandular in the intervals; lobes triangular-lanceolate, acuminate, equaling the tube. Corolla at first yellowish, turning purple. Blade of the banner rounded-ovate. Wings and keel-petals inserted near the base of the staminal tube, the blades broadly obovate, with a large basal lobe, those of the keel-petals larger. Pod silky-villous.

87. *Parosela acutifolia* (DC.) Rose, Bot. Gaz. 40: 144. 1905.

Dalea acutifolia DC. Prodr. 2: 245. 1825.

A shrub, 1-3 m. high; branches glabrous and terete; leaves 5-12 cm. long; stipules lanceolate, 3 mm. long; petiole about 8 mm. long; rachis glabrous, slightly margined, sparingly punctate; stipels gland-like; leaflets 7-11, elliptic or oval, acute at the base, cuspidate at the apex, 1-2.5 cm. long, glabrous and bright-green on both sides, glandular-punctate beneath; peduncles glabrous, axillary, 5-12 cm. long, glabrous; spikes elongate, rather lax, 5-15 cm. long; bracts ovate, acute, brown, minutely ciliate, caducous; calyx-tube broadly campanulate, 2.5 mm. long, silky-villous, strongly 10-ribbed; calyx-lobes triangular-lanceolate, abruptly long-acuminate, about equaling the tube; corolla at first greenish-yellow, turning dark reddish-purple; blade of banner rounded-ovate, nearly 3 mm. long, the claw 2 mm. long; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long, the claws of both 2 mm. long; pod broadly obliquely obovate, silky villous.

TYPE LOCALITY: Chilapa Mountains, Guerrero.

DISTRIBUTION: Morelos and Guerrero.

ILLUSTRATION: Moc. & Sessé, Calq. Dess. pl. 228.

XXI. *Cyaneae*. Perennial herbs. Leaflets several pairs, small, elliptic, glabrous. Spikes head-like; bracts ovate, glandular-dotted, sparingly hairy on the back. Calyx densely pubescent; lobes lanceolate-subulate, equaling the tube. Corolla blue with a white banner, the blade of the latter orbicular. Wings and keel-petals inserted towards the base of the staminal tube, the blades obliquely obovate.

88. *Parosela cyanea* (Greene) Rose, Contr. U. S. Nat. Herb. 10: 105. 1906.

Dalea cyanea Greene, Pittonia 1: 153. 1888.

A perennial, with tufted stems; stem glabrous, angled, decumbent at the base, sparingly glandular-dotted, branched above, about 3 dm. high; leaves 2-3 cm. long; stipules lanceolate or subulate, 3-4 mm. long; rachis glabrous; stipels conic, gland-like; leaflets 9-13, elliptic, 7-10 mm. long, obtuse, glabrous on both sides, minutely glandular-dotted beneath; peduncles terminal, 1-4 cm. long; spikes head-like; bracts ovate, acuminate, glandular-dotted and sparingly pubescent on the back, densely pubescent on the margins; calyx-tube campanulate, 3 mm. long, densely pubescent; lobes lance-subulate, about equaling the tube; banner nearly white, the blade orbicular, 5 mm. long, the claw 4 mm. long; the other petals sky-blue, the blades obliquely obovate, 6-7 mm. long, those of the keel-petals with a smaller basal lobe, the claws 3-4 mm. long.

TYPE LOCALITY: Sierra Madre, back of Durango, Mexico.

DISTRIBUTION: Known only from the type locality.

XXII. *Tuberculatae*. Low shrubs or undershrubs, with conspicuously glandular-tuberculate branches. Spikes at the ends of the branches, dense, from globose to cylindrical; bracts lanceolate to obovate, not much exceeding the calyx. Calyx-tube pubescent, not very strongly ribbed, nor very conspicuously glandular; lobes deltoid to lance-subulate, shorter than or equaling the tube in length. Corolla purple with a white or ochroleucous banner. Blade of the banner mostly rounded-cordate. Wings and keel-petals inserted below the middle of the staminal tube, the blades broadly obliquely obovate, with a rounded basal lobe, the keel-petals somewhat larger than the wings and much longer than the banner. Pod pubescent.

89. *Parosela Hemsleyana* Rose, Contr. U. S. Nat. Herb. 10: 104. 1906.

Dalea ramosissima Hemsl. Biol. Centr. Am. Bot. 1: 245. 1880. Not *D. ramosissima* Mart. & Gal. 1843.

A shrub, probably a meter or more high, with numerous ascending, glabrous, and densely glandular-tuberculate branches, often reddish; leaves small, spreading, 1-1.5 cm. long; stipules minute, subulate; petiole very short; rachis glabrous, glandular-dotted; leaflets 9-15, oblong,

obtuse, 2-3 mm. long, glabrous on both sides, very glandular-dotted beneath; peduncles terminating the branches, 3-6 dm. long; spikes sub-capitate; bracts obovate or oval, short-acuminate or apiculate, shorter than the calyx, persistent; calyx-tube turbinate-campanulate, 2.5 mm. long, brown-silky, not strongly ribbed; lobes deltoid, acute, two-thirds as long as the tube; banner ochroleucous, the blade rounded-cordate, 3 mm. long, longer than the claw; wings and keel-petals purple, with the base ochroleucous, inserted far below the middle of the staminal tube, the blades of the wings obliquely elliptic, 4 mm. long, those of the keel-petals broader, obovate, with a smaller rounded basal lobe, 4.5 mm. long, the claws of both 1.5 mm. long; pod densely brown-pubescent.

TYPE LOCALITY: San Luis Potosí.

DISTRIBUTION: San Luis Potosí.

90. *Parosela trochilina* (Brand.) Rose, Contr. U. S. Nat.

Herb. 10: 104. 1906.

Dalea trochilina Brand. Proc. Calif. Acad. II: 3: 200. 1892.

A shrub, 1-1.5 m. high, branched above, glabrous, copiously glandular-tuberculate; leaves numerous, 1-2 cm. long; stipules minute, subulate; petiole 3-5 mm. long; rachis glabrous, glandular-dotted; stipels gland-like; leaflets 7-15, obovate, 3-5 mm. long, rounded at the apex, glabrous on both sides, glandular-dotted beneath; peduncles terminating the branches, 1-3 cm. long; spikes dense and short, head-like, 1-2 cm. long; bracts firm, broadly obovate, abruptly acuminate, almost black, persistent, equaling the calyx; calyx-tube turbinate-campanulate, 2.5 mm. long, brown-silky, not strongly ribbed; lobes deltoid, acute, fully half as long as the tube; banner ochroleucous or whitish, the blade rounded-cordate, 3 mm. long, fully equaling the claw; wings and keel-petals purple with the base ochroleucous, inserted far below the middle of the staminal tube, the blades of the wings obliquely elliptic, 4 mm. long, those of the keel-petals broader, with a smaller basal lobe, 5 mm. long, the claws 1.5 mm. long; pod pubescent.

TYPE LOCALITY: La Chuparosa, Lower California.

DISTRIBUTION: Cape region of Lower California.

91. *Parosela minutifolia* Rydberg, sp. nov.

Dalea polycephala Benth.; Hemsl. Biol. Centr. Am. Bot. 1: 244, in part; hyponym. 1880.

A shrub, about 5 dm. high; branches glabrous, densely glandular-tubercled; leaves rarely more than 0.5 cm. long; stipules subulate, 1 mm. long or less; rachis glabrous; stipels conic, gland-like; leaflets 7-9, fleshy, clavate, somewhat involute, glabrous, conspicuously glandular-dotted beneath, 1-2 mm. long, crowded; spikes subsessile, terminal, 1-1.5 cm. long; bracts lanceolate, densely silky-pilose, acute, equaling the calyx; calyx-tube campanulate, densely silky-pilose, 2 mm. long; lobes lance-subulate, 1 mm. long, densely silky; blade of the banner rounded-cordate, with a conspicuous gland near the apex and several small ones near the base, 2.5 mm. long, the claw 1.5 mm. long; the other petals rose-purple, the blades 4-5 mm. long, the claws 1 mm. long; pod densely silky-villous.

Type collected at Pachuca, Hidalgo, May, 1905, *Purpus 1145* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Veracruz to Zacatecas and Oaxaca.

92. *Parosela naviculifolia* (Hemsl.) Rose, Contr. U. S. Nat.

Herb. 10: 104. 1906.

Dalea naviculifolia Hemsl. Diag. Pl. Nov. 7. 1878.

A diffusely branched shrub, prostrate or spreading, 3-5 dm. high; branches finely puberulent, conspicuously glandular-tubercled; leaves numerous, 1-2 cm. long; stipules subulate, 1-2 mm. long; rachis puberulent; stipels gland-like; leaflets 11-21, oblong, 2-3 mm. long, concave, puberulent above, glandular-dotted beneath, obtuse; peduncles terminating the branches, about 1 cm. long; spikes dense, 1-3 cm. long, about 8 mm. thick; bracts lance-ovate, acuminate, pubescent, deciduous; calyx brown, puberulent; tube campanulate, not strongly ribbed, puberulent and conspicuously glandular, 2 mm. long; lobes lance-ovate, acute, half as long as the tube, the lowest the longest; banner white or ochroleucous, the blade round-cordate, emarginate, 3 mm. long and broad; wings and keel-petals purple, inserted just below the middle

of the staminal tube, the blades fully 3.5 mm. long, the claws 1 mm. long; pod slightly puberulent above.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Oaxaca.

93. *Parosela Seemanni* (S. Wats.) Rose, Contr. U. S. Nat. Herb.
10: 106. 1906.

? *Dalea Ehrenbergii* Schlecht. Linnaea 12: 290. 1838.
Dalea Seemanni S. Wats. Proc. Am. Acad. 22: 470. 1887.

A shrub, 5 dm. high or more; branches finely and densely short-pubescent and strongly glandular-tuberculate; leaves 1-2 cm. long, spreading; stipules minute, subulate; petiole 2-5 cm. long; rachis densely short-hairy; stipels gland-like; leaflets 7-11, cuneate-oblong or obovate, obtuse, short-silky on both sides, conspicuously glandular-dotted beneath; peduncles terminating the branches, 1-3 cm. long; spikes rather dense, 2-5 cm. long; bracts ovate or ovate-lanceolate, acuminate, longer than the buds, caducous, pubescent and glandular; calyx-tube campanulate, long-villous, 3 mm. long; lobes deltoid-lanceolate, acuminate, about equaling the tube; banner yellowish, the blade rounded-cordate, 3 mm. long, the claw 2 mm. long; wings and keel purple, the blades of the wings 4 mm., those of the keel-petals 5 mm. long.

TYPE LOCALITY: Sierra Madre, "probably Durango."
DISTRIBUTION: Northern Lower California to Hidalgo.

94. *Parosela tuberculata* (Lag.) Rose, Contr. U. S. Nat.
Herb. 10: 104. 1906.

Dalea tuberculata Lag. Gen. & Sp. Nov. 23. 1816.
Parosela tuberculata Lag. Gen. & Sp. Nov. 23, as synonym. 1816.
Dalea pendulina Moc. & Sessé; DC. Prodr. 2: 245, as synonym. 1825.
Dalea thymoides Schlecht. Linnaea 5: 580. 1830.
Dalea verrucosa G. Don, Gen. Hist. 2: 225. 1832.
? *Dalea comosa* Schlecht. Linnaea 12: 289. 1838.
Dalea Seemannii villosa S. Wats. in herb.

A shrub, 5 dm. high or more, copiously branched; branches densely short-pubescent and conspicuously glandular-warty; leaves spreading, 1-2 cm. long; stipules subulate, 2-3 mm. long; petiole 2-5 mm. long; rachis densely short-pubescent; leaflets usually 5-9, rarely 9-11, oblong to obovate or cuneate, 4-8 mm. long, short-pubescent on both sides, or glabrate above, conspicuously glandular-dotted beneath, rounded, or rarely retuse, and mucronate at the apex; peduncles terminating the branches, 1-5 cm. long; spikes at first short and conic, in age becoming elongate and lax, 2-15 cm. long; bracts ovate, abruptly acuminate, glandular-punctate and short-pubescent; calyx-tube broadly campanulate, brown, short pubescent, 3 mm. long; lobes deltoid, acute, nearly half as long as the tube, the lower somewhat longer; banner yellowish, the blade rounded-cordate, 4 mm. long, the claw 3 mm. long; wings and keel purple, the blades of the wings 5 mm. long, those of the keel-petals 6 mm. long; pod short-pubescent.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Coahuila and Chihuahua to Mexico.

95. *Parosela canescens* (Mart. & Gal.) Rose, Contr. U. S. Nat.
Herb. 10: 105. 1906.

Dalea canescens Mart. & Gal. Bull. Acad. Brux. 10: 43. 1843.

A branched shrub, 1-2 m. high; branches more or less finely canescent and copiously glandular-tubercled; leaves 1-2 cm. long; stipules subulate, 2-3 mm. long; petiole 4-6 mm. long; rachis finely canescent and glandular-dotted; stipels gland-like; leaflets 3-7, obovate, 4-10 mm. long, rounded or retuse at the apex, more or less finely short-canescent and strongly glandular-dotted beneath, appressed-silky or in age sometimes glabrate above; peduncles terminating the branches, 1-4 cm. long; spike at first rather dense, in age more lax, 2-10 cm. long; bracts lance-subulate, equaling or surpassing the calyx, acuminate, canescent; calyx-tube broadly campanulate, 3 mm. long, densely short-pubescent with brown hairs; lobes deltoid, acuminate, shorter than the tube; banner ochroleucous, the blade rounded-ovate, 3-4 mm.

long, about equaling the claw; wings and keel purple, with the bases yellowish, the blades of the former 5-6 mm. long, those of the latter 6-7 mm. long; pod densely pubescent towards the apex.

TYPE LOCALITY: Tehuacan de las Granadas, Puebla.
DISTRIBUTION: Puebla and Oaxaca.

96. *Parosela argyrea* (A. Gray) A. Heller, Cat. N. Am. Pl.
ed. 2. 5. 1900.

Dalea argyrea A. Gray, Pl. Wright. 1: 47. 1852.

A shrub, 3-10 dm. high, corymbosely branched above; branches canescent-tomentose and glandular-tuberculate, leafy; leaves spreading, 1-2 cm. long; stipules subulate, about 2 mm. long; petiole 3-5 mm. long; rachis canescent-tomentose; stipels gland-like; leaflets 7-13, obovate or obovate-oblong, closely sericeous on both sides, glandular-dotted beneath, 5-8 mm. long; peduncles terminating the branches, 1-2 cm. long; spikes dense, short, 1-2.5 cm. long; bracts lance-ovate, acuminate, about equaling the calyx, canescent; calyx-tube broadly campanulate, silky-villous, 2.5 mm. long; lobes deltoid, acute, shorter than the tube; banner yellowish, fading purplish, the blade orbicular, 3-4 mm. long, equaling the claw; wings and keel-petals purple, the blades of the keel-petals united along the lower edge; pod silky-villous.

TYPE LOCALITY: Hills near the San Pedro River, Texas.
DISTRIBUTION: Texas and New Mexico to Nuevo León and Chihuahua.

97. *Parosela Conzattii* Rydberg, sp. nov.

A low shrub; branches more or less warty, puberulent, spreading; leaves 2-3 cm. long; stipules subulate-filiform; rachis puberulent; stipels conic, gland-like; leaflets 17-31, linear-oblong, 4-5 mm. long, glabrous above, puberulent and glandular-dotted beneath; spikes dense, short-peduncled at the ends of the branches, conic, about 2 cm. long; bracts ovate, acuminate, sparingly pubescent, except the tip, glandular-dotted, equaling the calyx; calyx-tube pubescent, campanulate, 2 mm. long; lobes elongate-deltoid, 1 mm. long; corolla rose-purple; blade of the banner rounded-cordate, 3 mm. long, the claw 2 mm. long; blades of the wings 3 mm. long, those of the keel-petals 4.5 mm. long, their claws respectively 2 mm. and 3 mm. long.

Type collected at Cerro San Antonio, Oaxaca, December 15, 1901, *Conzatti* (U. S. Nat. Herb. no. 865321).

98. *Parosela tuberculina* Rydberg, sp. nov.

A low shrub; branches short, puberulent, densely glandular-tubercled; leaves 1-3 cm. long, spreading; stipules subulate, 2 mm. long; rachis puberulent, sparingly glandular-dotted; stipels conic, gland-like; leaflets 7-11, obovate, retuse, 4-5 mm. long, glabrous above, puberulent and glandular-dotted beneath; peduncles terminal, 1-2 cm. long; spikes dense, oblong, 1.5-3 cm. long; bracts lanceolate, acute, short-pilose; calyx-tube broadly campanulate, 2 mm. long, densely short-pilose; lobes lanceolate, subulate-tipped, 1.5 mm. long; banner yellowish, the blade 3 mm. long, broadly cordate; wing- and keel-petals rose-purple, the blades of the wings 4 mm., those of the keel-petals 5 mm. long; pod densely pubescent.

Type collected in the vicinity of San Luis Tultitlanapa, Puebla, July 1908, *Purpus 3215* (herb. N. Y. Bot. Gard.).

99. *Parosela fulvosericca* Rydberg, sp. nov.

A shrub, about 5 dm. high; branches brown, villous; leaves 1.5-3 cm. long, spreading; stipules subulate, 2 mm. long; rachis densely villous; leaflets 7-9, obovate, retuse, yellowish-sericeous on both sides, indistinctly glandular-dotted beneath, 4-10 mm. long; spikes oblong, 2-3 cm. long, dense, on peduncles 2-6 cm. long; bracts ovate-lanceolate, acute, about equaling the calyx, sericeous, glandular-dotted; calyx-tube broadly campanulate, 2 mm. long, sericeous, inconspicuously glandular-dotted; lobes lanceolate, acute, sericeous, 1.5 mm. long; petals with a gland near the tip; banner yellowish, the blade broadly cordate, 2.5 mm. long, equaling the claw; the other petals rose-purple, the blades about 4 mm. long, the claws 1.5 mm. long; pod densely pubescent.

Type collected in the region of San Luis Potosí, 1878, *Parry & Palmer 148*, in part (U. S. Nat. Herb. no. 24432, in part).

100. *Parosela polycephala* (Benth.) Rydberg, sp. nov.

Dalea polycephala Benth.; Hems. Biol. Centr. Am. Bot. 1: 244; hyponym. 1880.

A low shrub; branches numerous, gray, puberulent, sparingly glandular-dotted; leaves less than 1 cm. long; stipules minute, subulate; rachis puberulent; stipels conic, gland-like; leaflets 5-9, obovate or oblanceolate, often folded, canescent-puberulent, glandular-dotted beneath, 2 mm. long or less; spikes sessile, sub-globose; bracts ovate, acute, shorter than the calyx; calyx-tube broadly campanulate, densely villous, inconspicuously glandular-dotted, 2 mm. long; lobes 1.5 mm. long, ovate, acute, the lowest more lanceolate and a little longer; blade of the banner yellowish, glandular-dotted towards the base, rounded-reniform, 3 mm. long and slightly broader, the claw 2 mm. long; the other petals rose-purple, inserted near the middle of the staminal tube, the blades of the wings 4 mm. long, those of the keel-petals broader and with a smaller lobe, the claws of both 1-1.5 mm. long; pod pubescent.

Type collected in San Luis Potosí, 1878, *Parry & Palmer 160* (U. S. Nat. Herb. no. 24425).
DISTRIBUTION: San Luis Potosí.

101. *Parosela decora* (S. Schauer) Rydberg.

Dalea decora S. Schauer, *Linnaea* 20: 743. 1847.

A shrub, 3-10 dm. high, virgately paniculately branched; branches finely tomentose-canescenscent and glandular-tubercled; leaves numerous, spreading, about 1 cm. long; stipules subulate, small; petiole very short, tomentose; stipels subulate; leaflets 3-7, obovate-cuneate to oblong, obtuse or retuse, 2-5 mm. long, villous-tomentose, glandular-dotted on both sides, but less so above; peduncles terminating the branches, very short; spikes short and dense, head-like, 1-1.5 cm. long; bracts persistent, broadly obovate, abruptly acuminate, shorter than the calyx, tomentose; calyx-tube broadly campanulate, 2.5 mm. long, densely white-villous; lobes deltoid, shorter than the tube, acute; banner white or ochroleucous, the blade rounded-reniform, 4 mm. long and 5 mm. broad; wings and keel-petals inserted far below the middle of the staminal tube, purple, the blades 5 mm. long, the claws 2 mm. long; pod pubescent.

TYPE LOCALITY: State of Oaxaca.
DISTRIBUTION: Oaxaca.

102. *Parosela dorycnoides* (DC.) Rydberg.

Dalea dorycnoides DC. *Prodr.* 2: 245. 1825.

Dalea pulchella Moric. *Mém. Soc. Genève* 7: 249. 1836. Not *D. pulchella* G. Don, 1832.

? *Dalea argentea* Mart. *Del. Sem. Hort. Monac.* 1846.—Walp. *Ann.* 1: 228. 1848. Not *D. argentea* G. Don, 1832.

Parosela pulchella A. Heller, *Cat. N. Am. Pl.* ed. 2. 6. 1900.

A shrub, 5 dm. high or more; branches finely grayish-tomentose and more or less prominently glandular-tuberculate; leaves 1-1.5 cm. long, spreading; stipules subulate, 2-3 mm. long; petiole 3-4 mm. long; rachis finely tomentose; stipels gland-like; leaflets 5-7, obovate, retuse at the apex, 3-8 mm. long, densely and appressed silky-canescenscent; peduncles terminating the branches, 1-3 cm. long; spikes dense, head-like, 1-1.5 cm., rarely 2 cm., long; bracts broadly obovate, abruptly short-acuminate, tomentose, shorter than the calyx, persistent; calyx-tube broadly campanulate, oblique, 2 mm. long, white-villous; lobes deltoid, more than half as long as the tube, the lowest one narrower and almost equaling the tube; banner ochroleucous, the blade rounded, 3 mm. long, the claw 2 mm. long; wings and keel-petals purple, the blades obliquely obovate, with a small basal lobe, 5 mm. long, those of the keel-petals united along the lower edge*, the claws 2 mm. long; pod pubescent.

TYPE LOCALITY: Tropical America.
DISTRIBUTION: San Luis Potosí to Hidalgo.
ILLUSTRATIONS: *Mém. Soc. Genève* 7: *pl. 7*; Moric. *Pl. Nouv. Am.* *pl. 7*.

XXIII. *Psoraleoides*. Pubescent shrubs, branched above. Leaflets rather few, more or less canescent. Spikes many, each at the end of a leafy branch. Calyx-tube campanulate, pubescent; lobes lance-subulate, four of them half as long as the tube, the lowest somewhat longer and nearly equaling it. Corolla rose-purple, rose, or white, with an ochroleucous banner,

* Hemsley (*Biol. Centr. Am. Bot.* 1: 245) erroneously described the petals as all free and all except the banner oblong-elliptic.

the blade of the latter ovate. Wings and keel-petals inserted above the middle of the staminal tube. Pod hairy at the summit.

103. *Parosela tomentosa* (Cav.) Rose, Contr. U. S. Nat.

Herb. 12: 273. 1909.

Psoralea tomentosa Cav. Ic. 3: 21. 1794.

Dalea tomentosa Willd. Sp. Pl. 3: 1341. 1803.

Dalea onobrychioides Moc. & Sessé, DC. Prodr. 2: 246, as synonym. 1825.

Dalea verbenacea Schlecht. & Cham. Linnaea 5: 579. 1830.

Dalea argentea G. Don, Gen. Hist. 2: 225. 1832.

Parosela compactiflora Rose, MS. in herb.

A shrub, about 1 m. high; stems densely villous, branched above; leaves ascending, 2-4 cm. long; stipules setaceous, 2 mm. long; petiole 4-5 mm. long; rachis densely villous; stipels gland-like; leaflets 3-7, obovate or oblanceolate, acute or mucronate, densely silky-villous on both sides, glandular-dotted beneath, 8-12 mm. long; peduncles terminating the branches; spikes dense, acute, 1-3 cm. long; bracts lanceolate, acuminate, longer than the buds, densely silky; calyx-tube broadly campanulate, not strongly ribbed, densely villous, nearly 2.5 mm. long; corolla purple or pink; blade of the banner orbicular, fully 2 mm. long, the claw 2.5 mm. long; blades of the other petals 3.5 mm. long, the claws 1.5 mm. long; pod pubescent above.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Veracruz to Jalisco.

ILLUSTRATION: Cav. Ic. *pl.* 240.

104. *Parosela psoraleoides* (Moric.) Rose, Contr. U. S. Nat. Herb.

10: 104. 1906.

Dalea verbenacea sericea Schlecht. Linnaea 5: 579. 1830.

Dalea psoraleoides Moric. Mém. Soc. Genève 6: 533. 1833.

Dalea vulcanicola Donn. Smith, Bot. Gaz. 56: 52. 1913.

A shrub, 5-12 dm. high; stem erect, branched above, very leafy; branches densely villous, not glandular-tubercled; leaves 1-2 cm. long; stipules subulate, about 5 mm. long; petiole 3-5 mm. long; rachis white-villous; leaflets 5-9, oblong-obovate or elliptic, mucronate-cuspidate, 5-10 mm. long, densely white-silky on both sides; spikes sessile or short-peduncled, dense, cylindrical, 1-4 cm. long, 8 mm. thick; bracts lanceolate, acuminate, sericeous, longer than the buds, persistent; calyx-tube campanulate, fully 2 mm. long more or less villous, 10-ribbed; lobes lance-subulate, the lower somewhat shorter than the calyx, the rest half as long; banner yellowish, the blade ovate, 2 mm. long, a little shorter than the claw; wings and keel light-pink at first, turning yellowish, the blades 2-2.5 mm. long, the claws 1.5 mm. long; pod hairy at the summit.

TYPE LOCALITY: Near Cuernavaca, Morelos.

DISTRIBUTION: Veracruz to Jalisco and Guatemala.

ILLUSTRATIONS: Mém. Soc. Genève 6: *pl.* 4; Moric. Pl. Nov. *pl.* 4.

XXIV. *Pilosissimae*. Low intricately branched shrubs. Leaflets small and rather crowded, long-pilose. Spikes oblong, numerous, dense, at the ends of leafy branches; bracts ovate, as long as the calyx. Calyx-tube campanulate, pubescent not conspicuously punctate; lobes lance-deltoid, less than half as long as the tube. Corolla sky-blue. Blade of the banner oval, with a cordate base. Wings and keel-petals distinct, inserted near the base of the staminal tube, the blades oblong, with obliquely cordate base. Pod slightly pilose.

105. *Parosela pilosissima* Rydberg, sp. nov.

A low shrub, 2-4 dm. high; branches purplish, puberulent when young, glabrate in age; leaves 1.5-3 cm. long, spreading; stipules subulate, 3-5 mm. long; rachis sparingly pilose; stipels minute, subulate; leaflets 9-15, elliptic or oval, 2-4 mm. long, glabrous above, long-pilose beneath; spikes peduncled at the ends of the branches, dense, cylindrical-oblong, 1-3 cm. long; bracts acuminate, glandular-dotted; calyx-tube campanulate, 3 mm. long, pubescent; lobes lance-deltoid, 1 mm. long, acute; corolla blue; blade of the banner rounded at the apex,

4 mm. long, 3 mm. wide; blades of the other petals nearly alike, obliquely oblong, 4 mm. long, with a basal lobe on each side, that on the upper side somewhat larger; pod slightly pubescent.

Type collected at the city of Durango and vicinity, 1896, *Palmer 808* (Gray Herbarium).

XXV. *Pectinatae*. Perennials, woody at the base. Leaflets numerous, linear, involute. Spikes at the ends of the branches, short, dense; bracts lanceolate or ovate, caducous, more or less pubescent. Calyx-tube campanulate, densely villous; lobes lanceolate or subulate, about equaling the tube. Corolla purple. Wings and keel-petals inserted far below the middle of the staminal tube. Pod villous.

106. *Parosela pectinata* (Kunth) Rose, Contr. U. S. Nat. Herb. 10: 104. 1906.

Dalea pectinata Kunth, *Mimoses* 169. 1819.

A herbaceous perennial, with a woody thick base; stems several, 5–10 dm. high, branched above, glabrous, striate; leaves spreading, 3–5 cm. long; stipules subulate-setaceous, about 2 mm. long; petiole 1–3 mm. long; rachis slightly-winged, glabrous, glandular-dotted on the wings; stipels gland-like; leaflets 41–65, linear, involute, 2–4 mm. long, glabrous, glandular-dotted; peduncles axillary or terminating axillary branches, 2–8 cm. long, glabrous except in and just below the spike; spikes dense, 2–3 cm. long, about 1 cm. thick; bracts lanceolate, acuminate, caducous, silky-villous; calyx-tube turbinate, 2 mm. long, rather prominently 10-ribbed, silky-villous; lobes lanceolate, acuminate, nearly equaling the tube; corolla blue or bluish-purple; blade of the banner cordate, 3 mm. long, about equaling the claw; blades of the wings 4.5 mm. long, those of the keel-petals with a less distinct basal lobe, the claws about 3 mm. long; pod broadly obliquely obovate, with a minute beak, short-villous.

TYPE LOCALITY: Villapando, Mexico.

DISTRIBUTION: Durango to Jalisco and San Luis Potosí.

ILLUSTRATION: Kunth, *Mimoses* pl. 49.

107. *Parosela abietifolia* Rose, sp. nov.

An undershrub; stems simple below, branched above, villous-tomentose, very leafy, 3–4 dm. high; leaves 2–3 cm. long; stipules filiform, 2 mm. long; rachis villous-canescens; stipels obsolete; leaflets 31–35, linear-filiform, involute, 5–8 mm. long, less than 1 mm. wide, densely grayish short-villous; spikes short-peduncled in corymbiform-cymose leafy panicles, 1–3 cm. long; bracts ovate, acuminate, densely silky-villous, obscurely glandular-dotted, about equaling the calyx; calyx-tube broadly campanulate, somewhat more deeply cleft on the back, 2 mm. long, densely silky-villous, obscurely glandular-dotted; lobes subulate, about equaling the tube, densely silky; corolla rose-purple; blade of the banner cordate, 2 mm. long, about equaling the claw; blades of the wings 3.5 mm. long, those of the keel-petals 4 mm. long, the claws 1.5 and 2 mm. long respectively; pod densely villous with a few rather large glands.

Type collected on dry chalky summits of mountains above Etzatlán, Jalisco, October 27, 1903, *Pringle 8774* (U. S. Nat. Herb. 460816).

XXVI. *Arenariae*. Decumbent or spreading perennial herbs. Leaflets several, mostly obovate or cuneate. Spikes elongate, lax and slender, on peduncles arising opposite the leaves; bracts obovate, acuminate, persistent, with a few conspicuous glands. Calyx-tube turbinate, not conspicuously ribbed. Corolla purple, red or rarely white, each petal with a gland at the apex. Blade of the banner rounded-cordate, more or less cucullate. Wings and keel-petals inserted at or below the middle of the staminal tube, the blades very broad, with rather obsolete basal lobes, short-clawed. Pods half-reniform.

108. *Parosela lanata* (Spreng.) Britton, Mem. Torrey Club
5: 196. 1894.

Dalea lanata Spreng. Syst. Veg. 3: 327. 1826.

Dalea lanuginosa Nutt.; T. & G. Fl. N. Am. 1: 307. 1838.

A perennial, with a woody long root; stems several, decumbent, 3-5 dm. long, densely and shortly villous-tomentose; leaves spreading, 2-3 cm. long; stipules subulate, 3-5 mm. long; rachis villous-tomentose; stipels represented by glands; leaflets 9-13, obovate, cuneate, or rarely oblong, usually emarginate, 4-12 mm. long, densely short-villous; peduncles opposite leaves, 1-3 cm. long; spikes elongate, in fruit lax, 3-8 cm. long; bracts broadly obovate, abruptly acuminate, equaling the calyx, persistent, villous and with a few conspicuous glands on the back; calyx densely villous; tube turbinate, membranous, 2.5 mm. long; lobes lanceolate, acuminate, shorter than the tube; corolla blood-red to purple, rarely white; blade of the banner rounded-cordate, with a deep sinus, more or less cucullate, 3 mm. long, the claw 2 mm. long; blades of the wings oval with a rounded basal lobe, 3 mm. long, those of the keel-petals broadly obliquely obovate, with a smaller basal lobe, 3 mm. long, the claws of both 1 mm. long; pod half-reniform, finely villous.

TYPE LOCALITY: On Arkansas River, North America.

DISTRIBUTION: Kansas and Colorado to Arkansas; Chihuahua.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2015; ed. 2, f. 2508.

109. *Parosela terminalis* (M. E. Jones) A. Heller, Muhlenbergia
6: 96. 1910.

Dalea terminalis M. E. Jones, Contr. W. Bot. 12: 8. 1908.

A perennial, with a deep woody root; stems several, divaricately branched, prostrate, 3-6 dm. long, densely and softly short-villous; leaves 2-3 cm. long; stipules minute, caducous; rachis densely short-villous; stipels gland-like; leaflets 7-13, cuneate-obovate, retuse, thick, 5-8 mm. long, densely short-villous on both sides, conspicuously glandular-dotted beneath; peduncles opposite the leaves and terminal, 1-3 cm. long; spikes elongate and lax in fruit, 4-8 cm. long; bracts rhombic-obovate, very villous, caudate-acuminate, with a few conspicuous glands; calyx-tube turbinate, slightly ribbed, membranous, finely puberulent when young, soon glabrous and shining; lobes triangular, villous, scarcely half as long as the tube; corolla deep red-purple; blade of the banner rounded-cordate, 2.5-3 mm. long, the claw 1-2 mm. long; blades of the other petals 2.5-3 mm. long, those of the keel-petals slightly broader, the claws less than 1 mm. long, pod semi-reniform, short-villous.

TYPE LOCALITY: El Paso, Texas.

DISTRIBUTION: Texas to southern Utah, Arizona, and Chihuahua.

110. *Parosela subvillosa* Rydberg, sp. nov.

A perennial, with a slender deep yellow root; stems divaricately branched, spreading, 3-5 dm. long, sparingly villous and sparingly glandular-dotted; leaves about 2 cm. long; stipules subulate, 2 mm. long; rachis villous, with scattered yellow glands; stipels gland-like; leaflets 9-11, cuneate-obovate, retuse, 4-7 mm. long, sparingly villous on both sides, conspicuously glandular-dotted beneath; peduncles opposite the leaves, 1-3 cm. long; spikes elongate, lax, in fruit 5-10 cm. long; bracts rhombic-obovate, abruptly acuminate, sparingly villous, conspicuously glandular-dotted; calyx-tube turbinate, membranous, 2 mm. long, minutely glandular, glabrous, except at the apex; lobes triangular, acute, densely villous, about 1 mm. long; corolla rose-purple, resembling that of the preceding; pod glabrous, sparingly glandular-dotted.

Type collected on sand near Paso del Norte, Chihuahua, September 23, 1886, Pringle 720, in part (herb. Cloumbia Univ.).

111. *Parosela glaberrima* (S. Wats.) Rose, Contr. U. S.
Nat. Herb. 10: 103. 1906.

Dalea glaberrima S. Wats. Proc. Am. Acad. 22: 470. 1887.

Dalea arenaria M. E. Jones, Contr. W. Bot. 12: 8. 1908.

An annual or perennial, with a long slender deep root; stems erect to prostrate, diffusely branched, 3-6 dm. long, glabrous, sparingly glandular-dotted; leaves spreading, 2-3 cm. long;

stipules subulate, 2 mm. long; rachis glabrous, glandular-dotted; stipels represented by glands; leaflets 9-17, cuneate-obovate to oblong, rounded or retuse at the apex, 5-12 mm. long, glabrous, bright-green above, somewhat glaucous and glandular-dotted beneath; peduncles mostly opposite the leaves, 1-3 cm. long; spikes elongate, lax, 5-10 cm. long; bracts persistent, broadly obovate, abruptly acuminate, glabrous, with 4-6 conspicuous glands on the back and 2 smaller ones near the tip; calyx-tube broadly turbinate, about 2 mm. long, glabrous, 10-nerved, membranous; lobes triangular, short-acuminate, shorter than the tube; corolla deep-purple; blade of the banner deeply cordate, notched at the apex, 2.5 mm. long, the claw 1.5 mm. long; wings and keel-petals inserted near the middle of the staminal tube, the blades with a gland near the apex, 2.5 mm. long, the claws very short; pod glabrous, glandular-dotted, extending the calyx in fruit.

TYPE LOCALITY: Sandhills 30 or 40 miles south of Paso del Norte, Chihuahua.
DISTRIBUTION: Southern New Mexico and Chihuahua.

112. *Parosela scariosa* (S. Wats.) Rydberg.

Dalea scariosa S. Wats. Proc. Am. Acad. 17: 369. 1882.

A perennial herb; stems slender, branching, glabrous, 2-3 dm. long; leaves 2-3 cm. long, ascending; stipules subulate; rachis glabrous, glandular-dotted; petiole about 1 cm. long; stipels represented by glands; leaflets 7-9, cuneate-obovate, obtuse or retuse, 5-8 mm. long, glabrous and glaucous, minutely glandular-punctate beneath; spikes comparatively dense, becoming lax and 5 cm. long in fruit; bracts thin, greenish, ovate, acuminate, the white margin somewhat lacerate; calyx slightly pubescent; tube turbinate, not conspicuously ribbed, 2.5 mm. long; lobes deltoid, acuminate, about half as long as the tube, ciliate on the margins; corolla pink; blade of the banner broadly cordate, 3 mm. long; pod glabrous.

TYPE LOCALITY: Albuquerque, New Mexico.
DISTRIBUTION: Known only from the type locality.

XXVII. **Mucronatae.** Tall glabrous perennial. Leaflets many, comparatively large, cuspidate. Spikes dense, cylindric-oblong, fully 1 cm. thick; bracts ovate, acuminate, persistent, glandular-dotted on the back. Calyx-tube prominently 10-ribbed, more deeply cleft on the back; lobes lanceolate, ciliate within. Corolla white. Blade of the banner rounded-oval, cordate at the base. Wings and keel-petals inserted slightly below the middle of the staminal tube. Pod glabrous, with an incurved pubescent beak.

113. *Parosela mucronata* (DC.) Rose, Contr. U. S. Nat.

Herb. 10: 104. 1906.

Dalea mucronata DC. Prodr. 2: 246. 1825.

A perennial; stem 5-10 dm. high, glabrous, angled, very sparingly glandular-dotted, virgately branched; leaves 4-7 cm. long; stipules herbaceous, narrowly lanceolate, acuminate, 10-12 mm. long; petiole about 1 cm. long; rachis glabrous, not glandular-dotted; stipels ovate, gland-like; leaflets 19-27, or in the inflorescence 7-17, elliptic, cuspidate, 6-10 mm. long, glabrous on both sides, densely glandular-punctate beneath; peduncles ending axillary leafy branches or the upper axillary and naked, 3-8 cm. long; spikes dense, 1-2.5 cm. long, fully 1 cm. thick; bracts ovate, acuminate, ciliate, glandular-dotted on the back; calyx-tube campanulate, 2-2.5 mm. long, glabrous, glandular-dotted, not prominently 10-ribbed, more deeply cleft on the back; calyx-lobes lanceolate, acute, ciliate within; corolla white; blade of the banner rounded-oval, with a cordate base, 3 mm. long, the claw 2 mm. long; wings and keel-petals inserted slightly below the middle of the staminal tube, their blades 3 mm. long, the claws 1 mm. long; pod glabrous, obliquely ovate, with a pubescent incurved beak.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Central Mexico.

XXVIII. **Eysenhardtoides.** Glabrous shrubs with straw-colored bark. Leaflets rather few, oblanceolate or obovate, comparatively large. Spikes paniculate, dense, elongate, 6-7 mm thick; bracts lanceolate or ovate, shorter than the calyx, deciduous. Calyx-tube

puberulent, 10-ribbed; lobes deltoid, half as long as the tube. Corolla white. Wings and keel-petals inserted far below the middle of the staminal tube, the blades oblong or oblanceolate, with a rounded basal lobe. Pod puberulent.

114. *Parosela eysenhardtoides* (Hemsl.) Rose, Contr. U. S.
Nat. Herb. 10: 104. 1906.

Dalea eysenhardtoides Hemsl. Diag. Pl. Nov. 6. 1878.

A shrub, 2-4 m. high, with ascending branches; branches finely puberulent, sparingly glandular-dotted; leaves ascending, 3-6 cm. long; stipules subulate, 4-5 mm. long; petiole 1-1.5 cm. long; rachis finely puberulent; leaflets 7-13, oblong-oblanceolate or oblong-obovate, mucronate, 1-2 cm. long, glandular-dotted on both sides; spikes paniculate, sessile or short-peduncled, dense, 1-3 cm. long, 6-7 mm. thick; bracts ovate or lanceolate, acuminate, puberulent, shorter than the calyx; calyx-tube turbinate, 10-ribbed, puberulent, 2 mm. long; lobes deltoid, acuminate, about half as long as the tube; corolla white; blade of the banner ovate-subcordate, 2.5 mm. long, the claw 2 mm. long; blades of the wings 3 mm. long, those of the keel-petals obliquely oblanceolate, with a rather indistinct basal lobe, the claws of both 1 mm. long; pod somewhat broadly lunate, puberulent.

TYPE LOCALITY: Oaxaca, near the Pacific Ocean.

DISTRIBUTION: Guerro, Oaxaca, and Michoacan.

115. *Parosela leucostachys* (A. Gray) Rose, Contr. U. S.
Nat. Herb. 10: 104. 1906.

Dalea leucostachys A. Gray, Mem. Am. Acad. II. 4: 32. 1849.

A shrub, 5-10 dm. high; branches ascending, leafy, finely puberulent to short-villous, almost velutinous, somewhat glandular-dotted; leaves 3-5 cm. long; stipules setaceous, caducous, 2-3 mm. long; petiole 1 cm. long or less; rachis minutely puberulent, glandular-dotted; stipels gland-like; leaflets 5-9, oblanceolate or cuneate-oblong to obovate, obtuse or retuse, sometimes mucronate; spikes short-peduncled or subsessile in the upper axils and a few panicle at the end of the branches, 1-3 cm. long; bracts lanceolate, acute, puberulent, shorter than the calyx; calyx-tube turbinate, 10-ribbed, densely puberulent, fully 2 mm. long; lobes triangular, acute, one-third as long as the tube; corolla white; blade of the banner rounded-cordate, 3.5 mm. long, the claw nearly 2 mm. long; blades of the other petals obliquely oblanceolate, with a rather large basal lobe, 3.5 mm. long, the claws 1 mm. long; pod pubescent.

TYPE LOCALITY: Cosiquirachi [Cosihuirachi], Sierra Nevada, Chihuahua.

DISTRIBUTION: Chihuahua to Durango and Jalisco.

XXIX. *Lumholtzianae*. Perennials, suffruticose at the base. Leaflets many, linear, more or less involute. Spikes dense, short, capitate; bracts closely imbricate, persistent, ovate or obovate, short-acuminate, conspicuously glandular-dotted. Calyx-tube short, sparingly silky; lobes lanceolate, half as long as the tube. Corolla white. Blade of the banner obovate, subcordate at the base. Wings and keel-petals inserted near the middle of the staminal tube, all free. [Approaching *Thorbera* and *Petalostemon* in habit and the distinct keel-petals.]

116. *Parosela Lumholtzii* (Rob. & Fern.) Vail, Bull. Torrey
Club 26: 117. 1899.

Dalea Lumholtzii Rob. & Fern. Proc. Am. Acad. 30: 115. 1894.

Parosela arizonica Vail, Bull. Torrey Club 24: 14. 1897.

Dalea arizonica K. Schumann, Bot. Jahresb. 27: 493. 1901.

A perennial, with a suffruticose branched caudex; stems 1.5-3 dm. high, puberulent, sparingly glandular-dotted; leaves ascending, 2-4 cm. long; stipules subulate, minute; rachis sparingly pubescent or glabrate, sparingly gland-dotted; stipels gland-like; leaflets 17-27, linear, 4-6 mm. long, obtuse, glabrous or sparingly minutely silky when young; peduncles terminating the branches, 3-7 cm. long; spikes dense, subglobose or short-oblong, 1 cm. long or less; bracts silky on the margins and near the base, glabrate on the back; calyx-tube sparingly

silky, 10-ribbed, 2 mm. long; lobes lanceolate, about 1 mm. long, acute; blade of the banner obovate, subcordate at the base, 2.5 mm. long, the claw 2 mm. long; blades of the wings 2.5-3 mm. long, those of the keel-petals broader, apparently distinct, the claws of both 2 mm. long; pod densely pubescent at the summit.

TYPE LOCALITY: Los Pinitos, Sonora.
DISTRIBUTION: Sonora and Arizona.

XXX. *Pogonatherae*. Glabrous herbaceous perennials, with a woody root and often also a short caudex. Leaflets comparatively few. Spikes elongate; bracts broadly obovate, conspicuously glandular-punctate, scarious-margined, rather persistent. Calyx silky-villous and glandular-dotted; lobes with triangular bases and subulate or filiform plumose tips. Corolla purple or white. Blade of the banner round-reniform. Wings and keel-petals inserted near the middle of the staminal tube. Pod densely villous above.

117. *Parosela lasianthera* (A. Gray) A. Heller, Cat. N. Am.
Pl. ed. 2. 6. 1900.

Dalea pogonathera A. Gray, Bost. Jour. Nat. Hist. 6: 175. 1850. Not *D. pogonathera* A. Gray, 1849.

Dalea lasianthera A. Gray, Pl. Wright. 1: 47. 1852.

A perennial, with a woody root and short caudex; stems 1-3 dm. high, slender, glabrous, almost glandless; leaves 2-3.5 cm. long; stipules subulate, 1-2 mm. long; rachis margined, glabrous, slightly glandular-dotted; leaflets 7-13, linear-oblong or oblanceolate, rounded or retuse at the apex, 5-15 mm. long, glabrous, minutely glandular-dotted beneath; peduncles 3-5 cm. long; spikes comparatively dense, 3-6 cm. long; bracts broadly ovate, short-acuminate, bluish-green and conspicuously glandular-punctate on the back, somewhat scarious-margined; calyx-tube broadly turbinate, 3 mm. long, silky-villous and glandular-dotted; lobes plumose, with a triangular base and a short subulate tip, 2 mm. long; corolla purple; blade of the banner round-reniform, 4 mm. long, 5 mm. broad; wings and keel-petals inserted a little below the middle of the staminal tube, the blades strongly curved, those of the former 5 mm. long, those of the latter 6 mm. long; pod densely villous above.

TYPE LOCALITY: San Antonio, Texas.
DISTRIBUTION: Texas to Chihuahua and Tamaulipas.

118. *Parosela pogonathera* (A. Gray) Vail, Trans. N. Y.
Acad. Sci. 14: 34. 1894.

Dalea pogonathera A. Gray, Mem. Am. Acad. II. 4: 31. 1849.

A perennial, with a woody root and short caudex; stems many, ascending or erect, 1-2 dm., seldom 3 dm. high, glabrous, slender; leaves spreading, 1-2 cm. long; stipules subulate-setaceous, 2-3 mm. long; rachis slightly margined, glabrous, glandular-dotted; stipels gland-like; leaflets 5-7, linear-oblong or linear-cuneate, truncate or retuse at the apex, glabrous, glandular-dotted beneath, bluish-green; peduncles opposite the leaves, 1-2.5 cm. long; spikes 2-6 cm. long, rather dense; bracts broadly ovate, abruptly short-acuminate, glabrous, scarious-margined, bluish-green and glandular-dotted on the back, persistent; calyx-tube broadly turbinate, 3 mm. long, 10-ribbed, silky, not conspicuously glandular-dotted; lobes filiform from a triangular base, silky-plumose, 4 mm. long; corolla purple; blade of the banner rounded reniform, 2 mm. long, 3 mm. broad, the claw 3 mm. long; wings inserted near the middle of the staminal tube, the keel-petals higher up, the blades of the former 2.5-3 mm. long, the claws 1 mm. long; blades of the keel-petals similar but with a comparatively smaller basal lobe, 4-4.5 mm. long; pod densely villous above.

TYPE LOCALITY: Monterey, Mexico.
DISTRIBUTION: Texas to Arizona, Zacatecas, San Luis Potosí, and Tamaulipas.

119. *Parosela enneandra* (Nutt.) Britton, Mem. Torrey

Club 5: 196. 1894.

Dalea enneandra Nutt.; Fraser, Cat. 1813.*Dalea laxiflora* Pursh. Fl. Am. Sept. 741. 1814.*Psoralea laxiflora* Poir. in Lam. Encyc. Suppl. 4: 590. 1816.*Cylipogon virgatum* Raf. Jour. Phys. 89: 97. 1819.*Dalea penicillata* Moric. Pl. Nouv. Am. 66. 1839.*Petalostemon laxiflorus* Steud. Nom. Bot. ed. 2. 2: 303. 1841.

A perennial, with a woody root; stems mostly single, 3–10 dm. high, glabrous, branched above; leaves 2–3 cm. long; stipules subulate; rachis margined, glandular-dotted; leaflets 5–9, linear or narrowly oblong, conspicuously glandular-dotted beneath, 5–12 mm. long, glabrous and bluish-green; peduncles slender, 2–4 cm. long; spikes very lax, 5–12 cm. long; bracts broadly ovate, short acuminate, densely glandular-dotted on the back, conspicuously scarious-margined; calyx-tube turbinate, 3 mm. long, densely silky; lobes filiform with a triangular base, 4 mm. long, beautifully plumose; corolla white; blade of the banner rounded-cordate, glandular-dotted below, 3 mm. long, the claw 3 mm. long; wings inserted near the middle of the staminate tube, the keel-petals higher up, the blades of the former 4 mm., those of the latter 5 mm. long, the claws of both 1.5–2 mm. long; pod densely villous above, glabrous below.

TYPE LOCALITY: On the Missouri River.

DISTRIBUTION: Iowa to North Dakota, New Mexico, Texas, and Mississippi.

ILLUSTRATIONS: Moric. Pl. Nouv. Am. pl. 45; Britt. & Brown, Ill. Fl. f. 2104; ed. 2. f. 2507.

XXXI. *Aureae*. Sericeous perennial herbs, with a woody root and often with a short woody caudex. Leaflets few, silky-canescens. Spikes dense, usually short, at the ends of the stem and branches. Calyx-tube silky-pubescent, not strongly ribbed nor conspicuously glandular. Corolla yellow, sometimes turning purple or red in age. Blade of the banner suborbicular to cordate or reniform. Wings and keel-petals inserted near the middle of the staminate tube, sometimes above, sometimes below it, the keel-petals longer than the wings, and these than the banner. Pod pubescent, mostly silky.

120. *Parosela luisana* (S. Wats.) Vail, Bull. Torrey Club

24: 16. 1896.

Dalea luisana S. Wats. Proc. Am. Acad. 17: 341. 1882.*Dalea ternata* Brand. Univ. Calif. Publ. Bot. 3: 380. 1909.

A herbaceous perennial, with a woody caudex; stems several, ascending or decumbent, 5–15 cm. high, strigose-canescens; leaves 2–4 cm. long; stipules setaceous, 3 mm. long; petiole about 1 cm. long; rachis and petiole strigose-canescens; leaflets 3, linear or linear-oblongate, 1–2 cm. long, acute, glabrate above, silky-strigose beneath, the terminal one longer than the other two and on a short rachis; peduncles terminal, very short; spikes dense, 1–2 cm. long, about 1 cm. thick; bracts greenish, ovate to lanceolate, silky, acuminate, equaling the calyx; calyx-tube turbinate, nearly 3 mm. long, densely silky-villous; lobes filiform from a triangular base, plumose, longer than the tube; corolla yellow; blade of the banner suborbicular, 1.5 mm. long, 2 mm. broad, the claw 2 mm. long; blades of the wings 2 mm. long, those of the keel-petals 3 mm. long, the claws of both 1 mm. long; pod silky-villous.

TYPE LOCALITY: San Miguelito Mountains, San Luis Potosí.

DISTRIBUTION: San Luis Potosí to Puebla.

121. *Parosela Hallii* (A. Gray) A. Heller, Bot. Expl.

Texas 49. 1895.

Dalea Hallii A. Gray, Proc. Am. Acad. 8: 625. 1873.

A herbaceous perennial, with a woody caudex; stems slender, decumbent, 1–2 dm. high, strigose-canescens; leaves digitately ternate, 2–4 cm. long; stipules subulate, minute; petiole 1–1.5 cm. long, strigose; leaflets linear, acute or even minutely cuspidate, 1–2.5 cm. long, glabrous above, strigose-canescens beneath, absolutely glandular-dotted; peduncles terminal, 1–2 cm. long; spikes at first dense, in age laxer, 1–4 cm. long; bracts ovate-lanceolate, acuminate, villous-canescens, equaling the calyx; calyx-tube turbinate, 2 mm. long, silky-canescens; lobes

filiform from a broad base, silky-plumose, nearly twice as long as the tube; corolla yellow, fading rose-colored; blade of the banner flabelliform-reniform, 2 mm. long, shorter than the claw; wings and keel-petals inserted below the middle of the staminal tube, the blades of the wings 3.5-4 mm. long, those of the keel-petals 5 mm. long; pods villous.

TYPE LOCALITY: Dallas, Texas.

DISTRIBUTION: Texas.

122. *Parosela Jamesii* (Torr.) Vail, Bull. Torrey Club

24: 16. 1897.

Psoralea Jamesii Torr. Ann. Lyc. N. Y. 2: 175. 1827.

Jamesia obovata Raf. Atl. Journ. 145. 1832.

Dalea Jamesii T. & G. Fl. N. Am. 1: 308. 1838.

Parosela Porteri A. Nelson, Bot. Gaz. 31: 395. 1901.

A perennial, with a thick woody caudex; stems numerous, ascending, usually about 1 dm. high, densely silky; leaves digitately 3-foliolate, 1-2.5 cm. long; stipules subulate-setaceous; petiole about 1 cm. long, densely silky; leaflets obovate or cuneate, rounded or acutish at the apex, 8-15 mm. long, densely silky-canescens on both sides; peduncles terminal, very short, sometimes obsolete; spikes dense, 1.5-6 cm. long, 15-18 mm. thick; bracts deciduous, membranous, ovate or broadly lanceolate, acuminate, equaling the calyx, often purple-tinged; calyx-tube turbinate, 2.5-3 mm. long, densely silky; lobes filiform from a broad base, plumose, longer than the tube; corolla yellow, fading purplish; blade of the banner cordate, 3 mm. long, equaling the claw; wings and keel-petals inserted below the middle of the staminal tube, the blades of the wings 4-4.5 mm. long, those of the keel-petals 7-8 mm. long; pod villous.

TYPE LOCALITY: Sandy plains of the Canadian.

DISTRIBUTION: Kansas and Colorado to Chihuahua and Coahuila.

ILLUSTRATION: Clements, Rocky Mt. Fl. pl. 29, f. 6.

123. *Parosela trifoliolata* (Moric.) Rydberg.

(?) *Dalea prostrata* Ortega, Dec. 69. 1798.

(?) *Dalea triphylla* Sessé & Moc.; G. Don, Gen. Hist. 2: 224. 1832.

Dalea trifoliolata Moric. Mém. Soc. Genève 6: 531. 1833.

Dalea triphylla Pavon; Schlecht. Linnaea 12: 289. 1838.

Parosela triphylla Rose, Bot. Gaz. 40: 144. 1905.

A perennial, with a thick woody root and caudex; stems several, 2-4 dm. long, branched, striate, canescens with both appressed and spreading hairs; leaves pinnately 3-foliolate, 1.5-3 cm. long, spreading; stipules setaceous, 3-4 mm. long; petiole 5-10 mm. long; rachis more or less hairy; leaflets oblanceolate or elliptic, or rarely obovate, acute to rounded at the apex, glabrous or sparingly hairy above, silky and sparingly and minutely glandular-dotted beneath, 8-15 mm. long; spikes terminal, sessile, dense, 2-9 cm. long, 18 mm. thick; bracts lanceolate, acuminate, sparingly hirsute, longer than the calyx, deciduous, yellowish below and purplish on the back, or sometimes wholly green; calyx-tube turbinate, 4 mm. long, hirsute, 10-ribbed; lobes filiform from a broad base, plumose, longer than the tube; corolla yellow, fading rose-colored; blade of the banner broadly sub-cordate, 3 mm. long, the claw 4 mm. long; wings and keel-petals inserted far below the middle of the staminal tube, the blades of the wings 5.5-6 mm. long, those of the keel-petals fully 7 mm. long; pod villous.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Chihuahua to Jalisco and Federal District of Mexico.

ILLUSTRATIONS: Mém. Soc. Genève 6: pl. 3; Moric. Pl. Nouv. Am. pl. 3.

124. *Parosela rubescens* (S. Wats.) Vail, Trans. N. Y.

Acad. Sci. 14: 34. 1894.

Dalea nana var. A. Gray, Pl. Wright. 1: 46. 1852.

Dalea nana elatior Torr.; Port. & Coult. Syn. Fl. Colo. 22, in part, as to synonym. 1872.

Dalea rubescens S. Wats. Proc. Am. Acad. 17: 369. 1882.

Parosela elatior Vail, Bull. Torrey Club 24: 15. 1897.

A perennial, with a woody caudex; stems several, herbaceous, erect, about 3 dm. high, strigose-sericeous; leaves 3-foliolate, rarely the lower 5-foliolate, 1.5-3 cm. long; stipules subulate, 2 mm. long; petiole 5-10 mm. long; rachis margined, sericeous; leaflets linear-oblong to

oblanceolate, acutish at both ends, 8–15 mm. long, sericeous on both sides, less densely so above; peduncles at the ends of the stem and branches, 2–6 cm. long; spikes oblong, 1.5–2 cm. long, about 1 cm. thick; bracts ovate, with a short subulate acumination, silky, shorter than the calyx, sooner or later deciduous; calyx-tube turbinate, about 2 mm. long, densely sericeous; lobes filiform from a broad base, longer than the tube, plumose; corolla yellow, fading rose-colored; blade of the banner reniform-flabelliform, 2 mm. long and fully as broad, the claw 3 mm. long; blades of the wings about 3 mm. long, those of the keel-petals 4 mm. long, the claws 1.5 mm. long; pod pubescent.

TYPE LOCALITY: Pass of the Limpia.

DISTRIBUTION: Western Texas.

125. *Parosela nana* (Torr.) A. Heller, Bot. Expl.
Texas 49. 1895.

Dalea nana Torr.; A. Gray, Mem. Am. Acad. II. 4: 31. 1849.

A perennial herb, branched at the base; stems 1–2 dm. high, decumbent at the base or ascending, silky-canescens; leaves many, spreading, 2–3 cm. long; stipules subulate-setaceous, 3–4 mm. long; petiole 4–8 mm. long; rachis silky-canescens; leaflets obovate, 5–15 mm. long, sericeous on both sides; peduncles opposite the leaves and at the ends of the branches, 0.5–2 cm. long; spikes oblong, dense, 1–3 cm. long, about 1 cm. thick; bracts ovate, short-acuminate, pubescent, about equaling the calyx; calyx-tube turbinate, 10-angled, 3 mm. long, sericeous; lobes filiform from a broad base, longer than the tube; corolla yellow, fading rose-colored; blade of the banner reniform, 2 mm. long, 3.5 mm. wide, the claw 3 mm. long; blades of the other petals 3–3.5 mm. long, those of the keel-petals slightly larger than those of the wings, the claws 1 mm. long; pod villous.

TYPE LOCALITY: Willow Bar, on the Cimarron.

DISTRIBUTION: Kansas to Arizona and San Luis Potosí.

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2, f. 2511.

126. *Parosela Wrightii* (A. Gray) Vail, Bull. Torrey Club
24: 16. 1897.

Dalea Wrightii A. Gray, Pl. Wright. 1: 49. 1852.

Dalea subulicola Brand, Univ. Calif. Publ. Bot. 4: 179. 1911.

Dalea parrasana Brand, Univ. Calif. Publ. Bot. 4: 179. 1911.

A low perennial, with a woody root and a short caudex; stems several, rarely more than 1 dm. long, densely silky-canescens, leafy; leaves pinnately 5–7-foliolate, 2–4 cm. long; stipules subulate, 4–5 mm. long; petiole about 1 cm. long; rachis sericeous, not glandular; leaves oblanceolate, obovate, or elliptic, 5–20 mm. long, silky-canescens on both sides; spikes subsessile at the ends of the stems, 2–6 cm. long, nearly 2 cm. thick; bracts lanceolate, acuminate, longer than the calyx; calyx-tube turbinate, 3 mm. long, densely silky, 10-ribbed; lobes filiform, from a broad base, plumose, almost twice as long as the tube; corolla yellow, fading rose-colored or purplish; blade of the banner cordate-flabelliform, nearly 3 mm. long and broad, the claw 6 mm. long; wings and keel-petals inserted a little above the middle of the staminal tube, the blades of the wings 3.5 mm. long, those of the keel-petals 4 mm. long; pod villous-pubescent.

TYPE LOCALITY: Dry hills, 80 miles west of the Pecos, Texas.

DISTRIBUTION: Western Texas to Arizona, Zacatecas, and Coahuila.

127. *Parosela carnescens* Rydb. Fl. Rocky Mts. 483. 1917.

Dalea nana elatior Torr.; Port. & Coult. Syn. Fl. Colo. 22, mainly as to description. 1872.

Dalea rubescens S. Wats. Proc. Am. Acad. 20: 360. 1885. Not *D. rubescens* S. Wats. 1882.

Parosela rubescens A. Nelson; Coult. & Nels. Man. 298. 1909. Not *P. rubescens* Vail, 1894.

A herbaceous perennial, branched at the base; stems several, decumbent below, 1.5–3 dm. high, silky-canescens; leaves spreading, 2–3 cm. long; stipules subulate, 2 mm. long; petiole about 1 cm. long; rachis slightly margined, sparingly silky; leaflets mostly 5, oblanceolate or oblong-oblanceolate, 8–15 mm. long, rounded or mucronulate at the apex, pea-green and glabrate or slightly pubescent above, sericeous and somewhat glandular-dotted beneath; peduncles terminating the stem and branches, 1–2 cm. long; spikes dense, 2–5 cm. long, about

12 mm. thick; bracts lanceolate or ovate-lanceolate, acuminate, equaling the calyx; calyx-tube 3 mm. long, turbinate, silky-pubescent; lobes filiform from a broad base, silky plumose; corolla yellow, fading pinkish; blade of the banner reniform, about 1.5 mm. long, 2 mm. broad, the claw 3 mm. long; wings and keel-petals inserted a little above the middle of the staminal tube, the blades of the wings 2.5 mm. long, those of the keel-petals 3 mm. long, the claws of both 1-1.5 mm. long; pod silky-villous.

Type collected on rocky hills near Chihuahua [city], April 2, 1885, C. G. Pringle 196 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Southern Colorado to Arizona, Chihuahua, and Coahuila.

128. *Parosela aurea* (Nutt.) Britton, Mem. Torrey Club
5: 196. 1894.

Dalea aurea Nutt.; (Fraser Cat., hyponym. 1813) Pursh Fl. Am. Sept. 740. 1814.

Psoralea aurea Poir. in Lam. Encyc. Suppl. 4: 590. 1816.

Cylipogon capitatum Raf. Jour. Phys. 89: 97. 1819.

Petalostemon (?) *capitatum* DC. Prodr. 2: 244. 1825.

A perennial, woody at the base; stems several, erect, 3-5 dm. high, silky-canescens, leafy but the upper leaves reduced and scattered; leaves pinnately 5-, rarely 7-foliolate, ascending, 2-5 cm. long; stipules subulate, 2-3 mm. long; petiole about 1 cm. long; rachis sericeous, obscurely if at all dotted; leaflets oblong-oblancoate to narrowly obovate, sparingly silky above, densely so and minutely glandular-dotted beneath, 1-2 cm. long; peduncles terminating the stems, 1-10 cm. long; spikes dense, 2-5 cm. long, nearly 1.5 cm. thick; bracts ovate, short-acuminate, densely silky, equaling the calyx; corolla yellow; blade of the banner flabelliform-cordate, about 4 mm. long and broad, the claw 4-5 mm. long; wings and keel-petals inserted slightly above the middle of the staminal tube, the blades obliquely oval, with a large rounded basal lobe, those of the wings about 5 mm. long, those of the keel-petals 6-7 mm. long, the claws of both 1 mm. long; pods silky-villous.

TYPE LOCALITY: "Upper Louisiana" [according to Nuttall (Gen.): near White River, now South Dakota].

DISTRIBUTION: South Dakota and Wyoming to Texas, Coahuila, and New Mexico.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2107; ed. 2. f. 2510.

XXXII. *Sericeae*. Sericeous perennials, suffruticose, at least at the base. Leaflets few, large, silky-canescens. Spikes dense, oblong, on long peduncles at the end of the stem, bracts lanceolate, silky. Calyx-tube silky; lobes filiform, plumose, with a broad base, longer than the tube. Corolla from bluish-purple to rose or nearly white. Blade of the banner suborbicular. Wings and keel-petals inserted far below the middle of the staminal tube. Pod silky.

129. *Parosela sericea* (Lag.) Rose, Contr. U. S. Nat. Herb.
10: 105. 1906.

Dalea sericea Lag. Gen. & Sp. Nov. 23. 1816.

Dalea longipes Moc. & Sessé; DC. Prodr. 2: 245, as synonym. 1825.

? *Dalea Alopecurus* Sessé & Moc.; G. Don, Gen. Hist. 2: 223. 1832.*

Dalea Alopecurus Moric. Mém. Soc. Genève 7: 250. 1836.

Psoralea Alopecurus Sessé & Moc. Pl. Nov. Hisp. 120. 1889.*

A perennial, somewhat suffruticose at the base; stems 5-10 dm. high, silky-pubescent with appressed or spreading hairs, leafy more than half its length, mostly erect; leaves ascending, 3-6 cm. long; stipules subulate-filiform, 1 cm. long or more, sericeous; petiole about 1 cm. long; rachis sericeous, apparently not glandular-dotted; leaflets 7-11, elliptic, acute at both ends, more or less cuspidate-acuminate at the apex, 1-2 cm. long, silky on both sides, obscurely glandular-dotted; peduncles terminal, 1.5-4 dm. long; spikes oblong-cylindric, dense, 2-7 cm. long, 1.5-2 cm. thick; bracts lanceolate, attenuate, silky, usually slightly, sometimes broadly scarious-margined at the base, or the lowest subulate and not at all scarious; calyx-tube turbi-

* Both G. Don's description and that of Sessé & Moc. agree well with this plant, except that the plant is said to be an annual.

mate, 3 mm. long, silky; lobes filiform, with a broad base, plumose, much exceeding the tube; corolla bluish-purple or partly white; blade of the banner suborbicular, 3-4 mm. long, slightly cordate at the base, the claw 4 mm. long; blades of the wings 5 mm. long, those of the keel-petals 6-7 mm. long, the claws of both about 3 mm. long; pods silky.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Durango to Guatemala.

ILLUSTRATIONS: Mém. Soc. Genève 7: pl. 8; Moric. Pl. Am. pl. 8.

130. *Parosela gracilis* (Kunth) Rose, Contr. U. S. Nat.

Herb. 10: 105. 1906.

Dalea sericea G. Don. Gen. Hist. 2: 223. 1832. Not *D. sericea* Lag. 1816.

Dalea gracilis Kunth, Mimosas 166. 1824.

Psoralea sericea Sessé & Moc. Pl. Nov. Hisp. 121. 1889.

A perennial, with a woody caudex; stems decumbent at the base, densely leafy, less than half their length, 2-3 dm. high, silky-strigose; leaves spreading, 1.5-4 cm. long; stipules subulate, 4-5 mm. long; petiole 5-10 mm. long; rachis sericeous, not glandular; leaflets 5-19, elliptic or oblanceolate, acute at each end, 5-15 mm. long, silky on both sides; peduncles terminal, 1-2 dm. high; spikes dense, oblong, 2-5 cm. long, 12-15 mm. thick; bracts lanceolate, attenuate, silky, scarcely scarious-margined; calyx-tube turbinate, 2.5 mm. long, silky, 10-ribbed; lobes filiform from a broad base, longer than the tube; blade of the banner rounded, subcordate, wavy, 4 mm. long, the claw 2 mm. long; blades of the wings 5-6 mm. long, those of the keel-petals broader, 6-7 mm. long, the claws of both 2 mm. long; pod villous.

TYPE LOCALITY: Near Guanajuato.

DISTRIBUTION: Guanajuato to Veracruz and Puebla.

ILLUSTRATION: Kunth, Mimosas pl. 48.

131. *Parosela reclinata* (Cav.) Rydberg.

Psoralea reclinata Cav. Ic. 1: 60. 1791.

Dalea reclinata Willd. Sp. Pl. 3: 1340. 1803.

Petalostemon reclinatus Steud. Nom. Bot. ed. 2: 2: 408. 1841.

A suffruticose perennial; stems 2-4 dm. long, decumbent, prostrate, except the tips and peduncles, much branched; branches puberulent or slightly silky, usually reddish; leaves 1-3 cm. long; stipules subulate, 3-5 mm. long; rachis sericeous; stipels subulate-setaceous; leaflets 5-7, oblanceolate, 5-10 mm. long, acute or short-acuminate, silky on both sides; peduncles 5-10 cm. long; spikes dense, 1.5-5 cm. long, about 1 cm. thick; bracts ovate, caudate-acuminate, purplish, silky on the back, glabrous and more or less scarious on the margins; calyx-tube campanulate, 3 mm. long, densely sericeous; lobes 2 mm. long, filiform from a broad base, sericeous-plumose; banner often cream-colored or purplish on the sides, the blade broadly cordate, with inflexed acute basal lobes, 3.5 mm. long, the claw 2 mm. long; wings and keel-petals rose-purple, the blades 4 mm. long, the claws 1.5 mm. long; pod densely silky-pilose.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Oaxaca.

ILLUSTRATION: Cav. Ic. pl. 87.

XXXIII. *Versicolores*. Pubescent shrubs. Leaflets few to more numerous, more or less pubescent. Spikes dense, at the ends of the branches. Calyx-tube 10-ribbed with a row of rather large glands in each interval; lobes subulate, filiform from a broader base, usually longer than or equaling the tube (except in the first species). Corolla purple or rose, with an ochroleucous or white banner, which usually bears a semicircle of glands near the base of the blade. Wings and keel-petals inserted far down on the staminal tube. Pod pubescent and conspicuously glandular-punctate above.

132. *Parosela oaxacana* Rose, Contr. U. S. Nat. Herb.

10: 104. 1906.

A shrub, 1-2 m. high, with many ascending branches, finely and softly pubescent, often reddish; leaves spreading, 3-5 cm. long; stipules minute, subulate; petiole about 5 mm. long;

rachis finely puberulent; stipels minute, subulate; leaflets 13-31, narrowly oblong, 6-9 mm. long, finely pubescent on both sides when young, glabrate especially above, rounded at each end, apiculate, paler and minutely glandular-dotted beneath; peduncles ending the branches, 1-5 cm. long; spikes dense, short, 1-3 cm. long, fully 1 cm. thick; bracts lanceolate, acuminate, puberulent, caducous; calyx-tube silky pubescent, not strongly ribbed, campanulate, oblique, 3 mm. long; lobes lanceolate, acuminate, darker-colored, not half as long as the tube, the lowest the longest; corolla rose-purple; blade of the banner round-reniform, 5 mm. long and fully as broad, the claw 3.5 mm. long; blades of the wings oblique, oblong, truncate at the base, 5 mm. long, those of the keel-petals 6 mm. long, the claws of both 5 mm. long; pod sparingly pubescent above.

TYPE LOCALITY: Sierra de San Felipe, Oaxaca.
DISTRIBUTION: Oaxaca.

133. *Parosela versicolor* (Zucc.) Rydberg.

Dalea versicolor Zucc. Flora 15²: Beibl. 1: 69. 1832.

A shrub, about 1 m. high; branches ascending, villous; leaves 2-3 cm. long; stipules subulate, 3 mm. long; rachis sparingly villous; stipels gland-like; leaflets 15-21, oblong, 4-7 mm. long, glabrous above, finely pubescent beneath and glandular-dotted; spikes terminal, short-peduncled, 3-5 cm. long, 15 mm. thick; bracts narrowly lanceolate, attenuate, glandular-dotted and pilose; calyx-tube broadly turbinate, 3 mm. long, pilose, 10-ribbed, with a row of glands between the ribs; corolla, except the banner, dark rose-purple, at least the keel-petals with a gland near the apex; blade of the banner ochroleucous or white, or tinged with purple, rhombic-cordate or rhombic-ovate, 4 mm. long, with a semicircle or two of small yellow glands below, the claw 3 mm. long; blades of the wings 5 mm. long, those of the keel-petals 6 mm. long, the claws of both 3 mm. long; pod densely pubescent and conspicuously glandular-punctate above, glabrate below.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Chiapas and Oaxaca.

134. *Parosela tsugoides* Rydberg, sp. nov.

A shrub, probably about 1 m. high; stem finely villous, reddish; leaves spreading, 1-2 cm. long; stipules lanceolate-subulate, 2 mm. long; rachis villous; stipels gland-like; leaflets 13-23, approximate, oblong, 2-3 mm. long, strongly involute, pubescent on both sides, obtuse; spikes terminal, short-peduncled, 2-3 cm. long, 1 cm. thick; bracts lanceolate, long-attenuate, pilose and minutely glandular-dotted, longer than the calyx; calyx-tube turbinate, 2 mm. long, densely pilose and obscurely glandular between the 10 ribs; lobes subulate-filiform from a lance-triangular base, 3 mm. long, plumose, often with a pair of subulate glandular bristle-like lobes; corolla dark-purple; petals with a large gland near the apex; blade of the banner round-reniform, 3 mm. long, nearly 4 mm. broad, with one or two arches of small glands below, the claw 2 mm. long; blades of the wings 4.5 mm. long, those of the keel-petals 5-5.5 mm. long; pod pubescent and with few glands above, glabrate at the base.

Type collected in the valley of Oaxaca, October 3, 1894, *E. W. Nelson 1540* (U. S. Nat. Herb. no. 865318).
DISTRIBUTION: Oaxaca to Guatemala.

135. *Parosela megalostachys* Rose, sp. nov.

A shrub, 1 m. high or more; branches densely villous and conspicuously glandular-tuberculate; leaves 3-5 cm. long; stipules subulate, 2-3 mm. long; rachis densely villous; leaflets 7-13, obovate, 8-10 mm. long, densely sericeous, rounded at the apex; spikes very dense, 3-5 cm. long, fully 12-15 mm. thick; bracts narrowly lanceolate, attenuate, pilose and glandular-punctate, longer than the calyx; calyx-tube broadly turbinate, 3 mm. long, densely silky-pilose, 10-ribbed, glandular-dotted between the ribs; lobes filiform from a triangular base, fully equaling the tube, plumose; corolla rose-colored; petals usually glandless; blade of the banner rounded-cordate, 4 mm. long, the claw 4 mm. long; blades of the wings 5 mm. long,

those of the keel-petals 6 mm. long, the claws of both 2-2.5 mm. long; pod densely villous, glabrate at the very base.

Type collected at San Esteban, Lower California, 1889, *T. S. Brandegee* (U. S. Nat. Herb. no. 24443).

DISTRIBUTION: Lower California.

136. *Parosela Wislizeni* (A. Gray) Vail, Trans. N. Y. Acad.
Sci. 14: 34. 1894.

Dalea Wislizeni A. Gray, Mem. Am. Acad. II. 4: 32. 1849.

A shrub, 5-10 dm. high; branches erect, densely villous-canescens; leaves ascending, 2-4 cm. long; stipules setaceous, 3 mm. long; rachis densely short-villous; stipels gland-like; leaflets 15-23, oblong, obtuse, densely villous-sericeous, 3-6 mm. long, glandular-dotted beneath; spikes cylindric, dense, 2-5 cm. long; rachis densely short-villous; bracts narrowly lanceolate, attenuate, exceeding the calyx; calyx-tube broadly turbinate, densely silky-villous, 10-ribbed, with a row of small glands between the ribs, 2.5 mm. long; lobes plumose, filiform from a lance-triangular base, often with a pair of subulate glandular bristle-like lobes; corolla light rose-colored or nearly white; petals each usually with a linear gland near the apex; blade of the banner rhombic-cordate, 3.5-4 mm. long, with a semicircle of glands below, the claw 3 mm. long; blades of the wings 5 mm. long, those of the keel-petals 6 mm. long, the claws 3 mm. long; pod densely villous and with a few large glands above, glabrate at the base.

TYPE LOCALITY: Sierra Madre, west of Chihuahua.

DISTRIBUTION: Chihuahua and Durango; Guanajuato(?).

137. *Parosela Sanctae-Crucis* Rydberg, sp. nov.

Dalea Wislizeni var. A. Gray, Pl. Wright. 2: 38. 1853.

A shrub, 5-10 dm. high; branches sparingly short pubescent, erect; leaves ascending, 2-3 cm. long; stipules setaceous, 2 mm. long; rachis short-pubescent; stipels gland-like; leaflets 13-15, oblong, 3-5 mm. long, sparingly pilose above, soon glabrate, more densely short-pubescent beneath; spikes terminal, peduncled, dense, 1-2 cm. long; peduncles 1-2.5 cm. long; bracts narrowly lanceolate, long-acuminate, equaling the calyx, glandular-dotted and sparingly pubescent; calyx-tube broadly turbinate, 2.5 mm. long, densely pilose, 10-ribbed, with a row of glands in the intervals; lobes plumose, filiform from a lance-triangular base, often with a pair of subulate gland-like lobes; corolla rose-colored; petals usually with a gland near the tip; blade of the banner 2.5 mm. long, rhombic-cordate, with a semicircle of small glands below; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long; pod pilose and with a few large glands above, glabrous below.

TYPE LOCALITY: Santa Cruz, Sonora.

DISTRIBUTION: Sonora, Arizona, and western Chihuahua.

138. *Parosela leucantha* Rydberg, sp. nov.

A shrub, about 1 m. high; branches finely short-pubescent, about 2 cm. long; stipules subulate-setaceous, 2-3 mm. long; rachis minutely pubescent; stipels gland-like; leaflets lance-oblong, finely short-pubescent on both sides, minutely glandular-dotted beneath, acute, 2-4 mm. long; spikes dense, terminal, short-peduncled, 2-7 cm. long; bracts lanceolate, attenuate, shorter than the calyx, pubescent and glandular-dotted, caducous; calyx-tube 2 mm. long, broadly turbinate, pilose, 10-ribbed, with a row of glands in each interval; lobes filiform from a triangular base, plumose, often with a pair of subulate gland-like lobes, 3 mm. long; corolla white, the petals usually with a conspicuous gland near the apex and smaller glands below or the wings glandless; blade of the banner cordate, 2.5-3 mm. long, equaling the claw; blades of the wings 4-5 mm. long, those of the keel-petals 5-6 mm. long, the claws of both 3 mm. long; pod densely pubescent and minutely glandular above, glabrate near the base.

Type collected in Tepic, 1892, *Edward Palmer P.*, in part (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Tepic and northern Jalisco.

139. *Parosela sessilis* (A. Gray) Rydberg.

Dalea Wislizeni sessilis A. Gray, Proc. Am. Acad. 16: 105. 1880.
Parosela Wislizeni sessilis Vail, Bull. Torrey Club 24: 15. 1897.

A shrub, 5-10 dm. high; branches finely puberulent and minutely glandular-dotted; leaves 1-3 cm. long; stipules subulate; rachis short-pubescent; stipels gland-like; leaflets 13-21, oblong, sparingly pilose or glabrate above, densely and finely pubescent beneath, 2-3 mm. long; spikes sessile at the end of short leafy branches, dense, 1-2.5 cm. long; bracts narrowly lanceolate, attenuate, nearly equaling the calyx; calyx-tube broadly turbinate, 3 mm. long, densely pilose, 10-ribbed, with a row of glands in the intervals; lobes filiform from a triangular base, plumose, often with a pair of subulate gland-like lobes; corolla rose-colored with the banner white or yellowish, the petals with a gland near the apex; blade of the banner rounded-cordate, nearly 4 mm. long; blades of the wings 5 mm. long, those of the keel-petals 6 mm. long, the claws of both 3 mm. long; pod densely pubescent and with a few glands above, glabrate below.

TYPE LOCALITY: New Mexico.

DISTRIBUTION: New Mexico and Arizona to Durango and Sonora.

140. *Parosela leucosericea* Rydberg, sp. nov.

A shrub, 5 dm. high or more; branches erect, densely villous; leaves 1.5-3 cm. long, densely sericeous-villous; leaflets 9-11, broadly oval, 5-10 mm. long, mucronate; stipules subulate; spikes oblong, 2-3 cm. long, subsessile, 1 cm. thick; bracts lanceolate, silky-villous, equaling the calyx; calyx-tube turbinate, 3 mm. long, densely long-villous; lobes subulate-filiform, equaling the tube, long-villous; corolla rose-colored, or the banner yellow; blade of the banner 3 mm. long, rhombic-cordate; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long; pod villous above, glabrate towards the base.

Type collected on hills near Tula, Oaxaca, May 20, 1906, Pringle 13866 (U. S. Nat. Herb. no. 462420).

141. *Parosela Greggii* (A. Gray) A. Heller, Cat. N. Am. Pl.

ed. 2. 6. 1900.

Dalea Greggii A. Gray, Mem. Am. Acad. II. 5: 314. 1854.

An undershrub, with a thick caudex; branches slender, 5-30 cm. long, often decumbent, tomentose-sericeous and glandular-dotted; leaves short, 0.5-2 cm. long, densely sericeous-tomentose; stipules subulate, 1-2 mm. long; leaflets 5-7, often crowded, obovate, 3-6 mm. long; spikes short and dense, globose or oblong, 1-2 cm. long, sessile or short-peduncled; bracts ovate-lanceolate, densely silky-villous, shorter than the calyx; calyx-tube broadly turbinate, 10-ribbed, densely silky-villous, inconspicuously glandular between the ribs, 2 mm. long; lobes subulate, pilose, about equaling the tube; corolla rose-purple or the banner and claws yellowish; petals often with a gland near the tip; blade of the banner broadly rhombic-ovate, 3.5 mm. long, 4 mm. wide, the claw 2 mm. long; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long, the claws of both 1.5 mm. long; pod densely villous and minutely glandular-dotted above, glabrate below.

TYPE LOCALITY: Near Buena Vista, Coahuila.

DISTRIBUTION: Arizona and Sonora to Durango, San Luis Potosí, and Nuevo León; apparently also Puebla.

142. *Parosela eriophylla* (S. Wats.) Rose, Contr. U. S.

Nat. Herb. 10: 106. 1906.

Dalea eriophylla S. Wats. Prod. Am. Acad. 17: 340. 1882.

A dwarf shrub, 1-2 dm. high or less, much branched, very leafy; branches tomentose; leaves less than 1 cm. long; stipules subulate, 1 mm. long; leaflets 3, oblong or obovate-oblong, about 3 mm. long, thick, densely white-villous; spikes sessile, head-like; bracts ovate to spatulate, acute, densely villous; calyx-tube broadly turbinate, 2 mm. long, densely villous, 10-ribbed; lobes subulate-filiform, 2.5 mm. long; corolla rose-colored; petals often with a gland near the apex; blade of the banner round-cordate, 3 mm. long, 4 mm. broad, with many small

glands in 2 irregular semicircles, the claw 2.5 mm. long; blades of the wings 4-4.5 mm. long, those of the keel-petals 5 mm. long, the claws of both 1.5 mm. long.

TYPE LOCALITY: Sierra Madre, 40 miles south of Saltillo.

DISTRIBUTION: Coahuila.

XXXIV. *Crassifoliae*. Glabrous herbs. Leaflets numerous, 15 pairs or more, elliptic or oval. Spikes dense; bracts ovate to lanceolate, pubescent, not conspicuously glandular. Calyx-tube densely silky, glandular-dotted between the ribs; lobes triangular with a subulate tip, shorter or longer than the tube. Corolla rose or rose-purple to nearly white. Blade of the banner rounded-cordate, with a semicircle of glands at the base. Wings and keel-petals inserted far below the middle of the staminal tube. Pod long-silky above, glabrous at the base.

143. *Parosela longifolia* Rose, sp. nov.

A glabrous herb, probably woody at the base, 1 m. high or more; branches slender, striate, glabrous, strongly ascending; leaves 5-10 cm. long; stipules short, subulate; rachis glabrous; stipels gland-like; leaflets 31-37, oval, 3-4 mm. long, flat, glabrous on both sides, conspicuously glandular-dotted beneath; peduncles terminating the branches, 2-10 cm. long; spikes dense, 2-3 cm. long, about 1 cm. thick; bracts ovate, pilose and glandular-dotted, acuminate; calyx-tube campanulate, silky-pilose, inconspicuously glandular-dotted between the ribs, 3 mm. long; lobes filiform from a triangular base, 2 mm. long; banner yellowish, the blade rounded-cordate, 3 mm. long, with a semicircle of glands near the base, the claw 3 mm. long; wings and keel-petals light rose-colored, the blades of the former 4 mm. long, those of the latter 5 mm. long, the claws of both 2 mm. long; pod long silky above, glabrate towards the base.

Type collected on the road from Altenguilla to Jacala, Jalisco, March 5, 1897, *E. W. Nelson* 4016 (U. S. Nat. Herb. no. 327050).

144. *Parosela roseiflora* Rydberg, sp. nov.

A glabrous herb, perhaps woody at the base; stem 4 dm. high or more, striate, glabrous; leaves 6-10 cm. long; stipules small, subulate; rachis glabrous, slightly margined; stipels gland-like; leaflets 25-41, elliptic, about 5 mm. long, glabrous, minutely glandular-dotted, obtuse at each end; spikes very dense, about 2 cm. long; bracts ovate, silky, abruptly cordate-acuminate, much exceeding the calyx; calyx-tube campanulate, 3 mm. long, silky, with rather small glands in the intervals; lobes lance-deltoid with linear-subulate tips, plumose, 3 mm. long; corolla rose-colored; blade of the banner ovate-cordate, 3.5 mm. long, the claw 2 mm. long; blades of the wings and keel-petals 4 mm. long, the claws about 2 mm. long; pod silky-villous; above.

Type collected in Sierra Madre [Sinaloa or Durango], *Seemann** (Gray Herbarium).

145. *Parosela crassifolia* (Hemsl.) Rose, Contr. U. S. Nat.

Herb. 12: 272. 1909.

Dalea crassifolia Hemsl. Biol. Centr. Am. Bot. 1: 238. 1880.

A shrub, 5 dm. high or more, with elongate branches, striate, glabrous, sparingly glandular-dotted; leaves 4-5 cm. long, ascending; stipules subulate, small; rachis slightly margined, fleshy, glabrous, glandular-punctate; stipels gland-like; leaflets 47-71, oblong, 3-4 mm. long, fleshy, glabrous and glaucous, channeled above, conspicuously glandular-dotted beneath; peduncles terminating the branches, 1-4 cm. long; spikes dense, 2-3 cm. long; rachis velutinous; bracts narrowly lanceolate, subulate-acuminate, silky-pilose and with a few glands, equaling the calyx; calyx-tube broadly campanulate, 2 mm. long, densely silky-pilose, and glandular-dotted between the ribs; lobes filiform-subulate from a lance-triangular base, silky-plumose; corolla light-rose or nearly white; blade of the banner ovate-cordate, 2.5 cm. long, equaling the claw; blades of the wings 3 mm. long, those of the keel-petals with a smaller more reflexed basal lobe, 3.5-4 mm. long, the claws of both 2-3 mm. long; pod densely pilose above, glabrate at the base.

TYPE LOCALITY: Sierra Madre [Sinaloa or Durango].

DISTRIBUTION: Jalisco to Sinaloa.

* Hemsley (Biol. Centr. Am. Bot. 1: 239. 1880) refers this erroneously to *Dalea elata* Mart. & Gal.

XXXV. *Lasiostachyae*. Glabrous or glabrate much branched shrubs. Leaflets of several pairs, small. Spikes rather dense, mostly oblong; bracts deciduous. Calyx-tube densely silky; lobes filiform from a broader base, plumose, longer than the tube (except in the first species). Corolla rose-purple to nearly white. Wings and keel-petals inserted far below the middle of the staminal tube, the keel longer than the wings. Pod more or less pubescent.

146. *Parosela Smithii* Rydberg, sp. nov.

A shrub, about 1 m. high or more; stem glabrous, somewhat glandular-tubercled, often chestnut-brown; branches numerous, ascending; leaves 3-7 cm. long, spreading; stipules subulate-setaceous, 2-3 mm. long; rachis glabrous; stipels conic, gland-like; leaflets 13-21, oblong, obtuse, 5-8 mm. long, glabrous on both sides, conspicuously glandular-dotted beneath; spikes terminating the branches, short, dense, 1.5-4 cm. long, fully 1 cm. thick; rachis densely velutinous; bracts deciduous, lanceolate, silky and sparingly glandular-dotted; calyx-tube campanulate, 2.5 mm. long, densely silky and with a row of glands between the ribs; lobes subulate, from a broad base, 2 mm. long; corolla rose-purple; blade of the banner round-reniform, 3 mm. long, 4 mm. broad, the claw 2.5 mm. long; blades of the wings 4-4.5 mm. long, those of the keel-petals broader, 5 mm. long, the claws of both about 2 mm. long; pod densely silky above.

Type collected in Sierra de San Felipe, Oaxaca, November 19, 1894, *Charles L. Smith 343* (U. S. Nat. Herb. no. 312832).

DISTRIBUTION: Oaxaca to Hidalgo(?).

147. *Parosela glabrescens* Rydberg, sp. nov.

A shrub, at least 5 dm. high; stem glabrous or slightly pubescent when young; leaves ascending, 2-3 cm. long; stipules subulate, about 2 mm. long; rachis sparingly pubescent when young, soon glabrate; stipels gland-like; leaflets 15-21, elliptic, acute at both ends, sparingly pilose when young, conspicuously glandular-dotted beneath, channeled above; peduncles terminating the branches, 2-4 cm. long; spikes dense, 1.5-3 cm. long, fully 1 cm. thick; bracts narrowly lanceolate, acuminate, densely silky-pilose, longer than the calyx; calyx-tube campanulate, 2.5 mm. long, densely silky-pilose, obscurely glandular-dotted between the 10 ribs; lobes subulate-filiform from a lance-triangular base, fully equaling the tube; corolla light-rose or almost white, the petals usually with a conspicuous gland near the apex; blade of the banner cordate, 3 mm. long, the claw about the same length; blades of the wings nearly 5 mm. long, those of the keel-petals broader and 6 mm. long.

Type collected in the region of San Luis Potosí, 1878, *Parry & Palmer 150* (U. S. Nat. Herb. no. 24371).

DISTRIBUTION: San Luis Potosí.

148. *Parosela lasiostachya* (Benth.) Rose, Contr. U. S. Nat.

Herb. 10: 107. 1906.

Dalea lasiostachya Benth. Pl. Hartw. 11. 1839.

A shrub, 1 m. high or more; branches glabrous, reddish, sparingly glandular-dotted, in age brown; leaves 1.5-3 cm. long; stipules subulate-setaceous, 3 mm. long; rachis glabrous and glandular-dotted, margined; stipels gland-like; leaflets 13-17, oblong or linear-oblong, with involute margins, glabrous on both sides, minutely glandular-dotted beneath, acute, 3-6 mm. long; spikes terminal, cylindric, 2-4 cm. long, 1.5 cm. thick; peduncles 3-5 cm. long; rachis densely villous; bracts narrowly lanceolate, silky-villous, nearly equaling the calyx, caducous; calyx-tube turbinate, silky-villous, 10-ribbed, with a row of small glands between the rows, 3 mm. long; lobes filiform from a lance-triangular base, 4-5 mm. long; corolla rose or purple; blade of the banner rhombic-cordate, 4 mm. long, retuse, the claw 3 mm. long; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long; pod densely villous.

TYPE LOCALITY: Not given [but Graham collected near City of Mexico, Tlalpuexahua, and Real del Monte, probably the first named locality].

DISTRIBUTION: State of Mexico, Federal District, and Puebla.

149. *Parosela involuta* Rydberg, sp. nov.

A shrub, 1 m. high or more; branches glabrous, sparingly and minutely glandular-dotted; leaves 1.5–3 cm. long; stipules subulate, 2 mm. long; rachis glabrous, glandular-dotted, margined; stipels gland-like; leaflets 11–15, linear, strongly involute, 3–5 mm. long, glabrous, glandular-dotted beneath; spikes terminal, dense, cylindrical, 2–4 cm. long, 1 cm. thick; rachis densely short-villous; bracts narrowly lanceolate, long-silky, attenuate, equaling the calyx, caducous; calyx-tube turbinate, 3 mm. long, densely silky-pilose, 10-ribbed, minutely glandular-dotted between the ribs; lobes filiform from a lance-triangular base, plumose, 5 mm. long; corolla light-rose or pink, or at first whitish; blade of the banner rhombic-cordate, 2.5 mm. long, the claw 3 mm. long; blades of the wings 3.5 mm. long, those of the keel-petals 5 mm. long, the claws of both 2 mm. long; pod densely pubescent.

Type collected at Rio Blanco, Jalisco, 1886, *Palmer 26* (herb. Columbia Univ.).

DISTRIBUTION: Jalisco.

150. *Parosela Brandegei* Rose, Contr. U. S. Nat. Herb.

10: 106. 1906.

Dalea ramosissima Benth. Bot. Voy. Sulph. 11. 1844. Not *S. ramosissima* Mart. & Gal. 1843.
Parosela ramosissima (Benth.) A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

A shrub, with spreading branches; twigs glabrous, densely glandular-tubercled, reddish, in age becoming grayish; leaves 1.5–3.5 cm. long; stipules subulate-setaceous, 2 mm. long; rachis glabrous, glandular-dotted; stipels gland-like; leaflets 11–13, obovate, obtuse or retuse, glabrous, densely glandular-dotted beneath, 2–5 mm. long; spikes terminal, dense, cylindrical, 3–5 cm. long, about 1 cm. thick; bracts lanceolate, sparingly pilose, conspicuously glandular-dotted, dark, deciduous; calyx-tube broadly turbinate, 3 mm. long, 10-ribbed, with a row of glands in each interval, densely pilose; lobes subulate-filiform from a lance-triangular base, plumose, 3–4 mm. long, the lowest longest; corolla rose-colored; blade of the banner round-reniform, 3 mm. long, 4 mm. broad, the claw 2 mm. long; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long; pod sparingly pilose and conspicuously glandular-dotted.

TYPE LOCALITY: Bay of Magdalena, Lower California.

DISTRIBUTION: Lower California.

ILLUSTRATION: Benth. Bot. Voy. Sulph. *pl. 10*.

XXXVI. *Formosae*. Glabrous shrubs, with glandular-dotted branches. Leaves short, with few, rather crowded leaflets. Spikes short, few-flowered, at the ends of the branches; bracts broad, conspicuously glandular-dotted. Calyx-tube pubescent, rather conspicuously glandular in the intervals; lobes filiform from a triangular base, plumose, longer than the tube. Corolla rose-colored with a yellowish banner. Wings and keel-petals inserted far below the middle of the staminal tube, the keel much longer than the wings. Pod pilose and glandular above, often glabrate below.

151. *Parosela Saffordii* Rose, Contr. U. S. Nat. Herb.

12: 273. 1909.

A low shrub; branches short, glabrous, sparingly glandular-dotted; leaves 1–1.5 cm. long; stipules broadly subulate, 2 mm. long, persistent; rachis glabrous, sparingly glandular-dotted; stipels conic; leaflets 9–13, oblanceolate, spatulate or obovate, 2–3 mm. long, glabrous, glandular-dotted beneath, thickish, somewhat involute; spikes dense, subsessile or short-peduncled at the ends of the branches, head-like; bracts lanceolate, acuminate, dark, glandular-dotted, ciliate; calyx-tube turbinate, 3 mm. long, pilose, 10-ribbed, with a row of glands in each interval; lobes filiform from a triangular base, 3 mm. long; corolla rose-colored; blade of the banner rhombic-cordate, 3 mm. long, equaling the claw; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long, the claws of both 2–3 mm. long; pod pubescent.

TYPE LOCALITY: Not given [probably in Coahuila].

DISTRIBUTION: Coahuila to Durango.

152. *Parosela formosa* (Torr.) Vail, Trans. N. Y. Acad. Sci.
14: 34. 1894.

Dalea formosa Torr. Ann. Lyc. N. Y. 2: 177. 1827.

A shrub, 3–10 dm. high, divaricately branched; branches glabrous and sparingly glandular-dotted; leaves usually less than 1 cm. long; stipules subulate, persistent; rachis glabrous; stipels conic, thick; leaflets 7–9, oblong-spatulate, 1.5–2 mm. long, involute, glabrous, glandular-dotted beneath; spikes head-like, few-flowered, short-peduncled, at the ends of the branches; bracts broadly ovate, glabrous, conspicuously glandular-dotted, short-acuminate, deciduous; calyx-tube deeply campanulate, pilose, 10-ribbed, with a row of glands in each interval; lobes filiform from a triangular base, plumose, 6 mm. long; corolla rose-colored with the banner usually yellowish; blade of the banner cordate, 4 mm. long, the claw nearly as long; blades of the wings 5 mm. long, those of the keel-petals 6–7 mm. long, the claws of both 4 mm. long; pod pilose and glandular-dotted above, glabrate below.

TYPE LOCALITY: On the Platte, Colorado.

DISTRIBUTION: Oklahoma and Colorado to Arizona, Sonora, and Chihuahua.

ILLUSTRATION: Emory, Notes Mil. Rec. Bot. pl. 1.

153. *Parosela Purpusi* (Brand.) Rose, Contr. U. S. Nat.
Herb. 10: 106. 1906.

Dalea formosa Brand. Proc. Calif. Acad. II. 2: 147. 1890.

Dalea Purpusi Brand. Erythra 7: 2. 1899.

An intricately branched shrub, 3–4 dm. high; stem and branches slightly glandular-dotted and glabrous, or slightly strigulose when young, straw-colored in age; leaves 1–2 cm. long; stipules subulate, 1–2 mm. long; rachis strigose; stipels gland-like; leaflets 3–5, obovate, obtuse or retuse, 4–6 mm. long, strigose on both sides, conspicuously glandular-dotted beneath; spikes terminal, ovoid, about 1.5 cm. long; bracts ovate, deciduous, 5–6 mm. long, silky and sparingly glandular-dotted; calyx-tube campanulate, silky-pubescent, 2.5 mm. long, with yellow glands between the 10 prominent ribs; lobes filiform from a lanceolate base, 3.5–4 mm. long, plumose; corolla rose-colored or pink; blade of the banner broadly cordate, 3 mm. long; blades of the other petals obliquely obovate, 4–5 mm. long; pod silky pubescent, glandular-dotted.

TYPE LOCALITY: Calmoli, Lower California.

DISTRIBUTION: Lower California.

XXXVII. *Microphyllae*. Branched glabrous shrubs. Leaflets of several pairs. Spikes mostly short, dense; bracts glabrous or pubescent, mostly conspicuously glandular, dark, tardily deciduous. Calyx-tube silky, more or less conspicuously glandular in the intervals; lobes filiform from a broader base, longer than the tube. Corolla yellow, often turning rose-purple, brownish, or almost black in drying. Wings and keel-petals inserted far below the middle of the staminal tube, the latter the larger. Pod villous above, less so or glabrate at the base.

154. *Parosela melantha* (S. Schauer) Rydberg.

Dalea melantha S. Schauer, Linnæa 20: 746. 1847.

A shrub; stem erect, glabrous, sparingly glandular-dotted, blackening in drying; leaves 1–2 cm. long, spreading; stipules subulate, 2 mm long; rachis sulcate, glabrous; stipels conic, fleshy; leaflets 7–13, cuneate, usually emarginate or retuse, 2–4 mm. long, glabrous on both sides, conspicuously glandular-dotted beneath, blackening in drying; peduncles 2–5 cm. long; spikes oblong, 1–4 cm. long; bracts ovate-lanceolate, acuminate, ciliate at the base and along the margins, black, glabrous on the back, at least at the tip; calyx-tube campanulate-turbinate 2–3 mm. long, strongly 10-ribbed, pilose, with a row of glands between the ribs; lobes filiform from a triangular base, plumose, longer than the tube; corolla yellow, turning almost black in drying; blade of the banner 3 mm. long; cordate, usually with a gland at the tip, the claw 2–3 mm. long; blades of the wings 4 mm., those of the keel-petals 5 mm. long, the claws of both 1.5 mm. long; pod villous-pilose above, glabrous towards the base.

TYPE LOCALITY: State of Oaxaca.

DISTRIBUTION: Veracruz and Hidalgo to Oaxaca.

155. *Parosela fuscescens* Rydberg, sp. nov.

A shrub, probably 1 m. high or more; branches glabrous, leafy; leaves 1-2 cm. long; stipules subulate, persistent, 1-2 mm. long; rachis glabrous; stipels conic, gland-like; leaflets 5-11, oblong-obovate, often retuse, 4-6 mm. long, glabrous on both sides, glandular-dotted beneath; spikes terminal, dense, 1.5-2.5 cm. long, 1 cm. thick, short-peduncled; bracts lanceolate, pilose and glandular, acute; calyx-tube campanulate, 3 mm. long, 10-ribbed, pilose, conspicuously glandular-dotted in the intervals; lobes filiform from a broad base, 4 mm. long, plumose; corolla yellow, the petals usually with a large gland near the tip; blade of the banner broadly rhombic-ovate, 4 mm. long, the claw 3 mm. long; blades of the wings 5 mm. long, those of the keel-petals broader, 6 mm. long, with a smaller reflexed basal lobe; pod densely and finely pilose above, glabrous below.

Type collected in Coahuila, in 1880, *Edward Palmer 209* (U. S. Nat. Herb. no. 24309).

156. *Parosela zimapanica* (S. Schauer) Rydberg.

Dalea microphylla Schlecht. *Linnaea* 12: 296. 1838. Not *D. microphylla* H.B.K. 1823.*

Dalea zimapanica S. Schauer, *Linnaea* 20: 746. 1857.

Parosela microphylla Rose, *Contr. U. S. Herb.* 10: 106, in part. 1906.

Dalea adenophylla Moric. MS., in herb.

A shrub, 1-3 m. high, often much branched; branches glabrous, terete; leaves 2-5 cm. long, spreading; stipules subulate, 2 mm. long; petiole 2-5 mm. long; rachis rather thick, glabrous, slightly glandular-dotted; stipels gland-like; leaflets 11-19, somewhat fleshy, 2-6 mm. long, elliptic or oblong, rounded to acutish at the apex, glabrous on both sides, glandular-dotted beneath; peduncles terminal, 1-3 cm. long; spikes short, subglobose or oblong, 1.5-3 cm. long, 12-15 mm. thick; bracts lanceolate or ovate-lanceolate, acute or somewhat acuminate, glabrous and conspicuously glandular-dotted on the back, ciliate at the base and on and near the margins, about equaling the calyx; calyx-tube turbinate, 2.5 mm. long, silky-villous, with yellow glands between the 10 ribs; lobes subulate-filiform from a broad base, slightly longer than the tube; corolla yellow, fading purplish-brown or brownish-rose-colored; blade of the banner 3 mm. long, rounded-cordate; wings and keel-petals each with a gland near the apex, the blades of the wings obliquely elliptic, with a large basal lobe, 5 mm. long, those of the keel-petals obliquely obovate, 6 mm. long, the claws of both 3 mm. long; pod villous.

TYPE LOCALITY: In the neighborhood of Zimapan [Hidalgo].

DISTRIBUTION: Southern Mexico.

157. *Parosela diversicolor* Rydberg, sp. nov.

A shrub, 1 m. high or more; branches glabrous, very sparingly glandular-dotted; leaves ascending, 3-7 cm. long, ascending; stipules subulate; rachis glabrous, glandless except the gland-like stipels; leaflets 13-35, oblong, glabrous, 7-9 mm. long, glandular-dotted beneath; peduncles terminal, 2-5 cm. long; spikes dense, short, 1-2 cm. long; bracts lanceolate, acuminate, conspicuously glandular-dotted, glabrous except the ciliate margins; calyx-tube turbinate, 3 mm. long, silky-villous, 10-ribbed, with yellow glands between the ribs; lobes filiform from a triangular base, plumose, 5 mm. long; corolla yellow, turning rose and purple; blade of the banner round-cordate, 4 mm. long, the claw 4 mm. long; blades of the wings 6-7 mm. long, those of the keel-petals 7-8 mm. long, the claws of both 4 mm. long; pod silky villous.

Type collected in Sierra de Clevellinas, State of Oaxaca, October 1894, *Charles L. Smith 549* (U. S. Nat. Herb. no. 312833).

XXXVIII. *Leucostomae*. Glabrous or pubescent shrubs. Leaflets of several pairs. Spikes rather dense, usually elongate and often acute; bracts glabrous or sparingly pubescent, usually dark, almost black, and conspicuously glandular-dotted. Calyx-tube glabrous or sparingly pubescent below the strongly pubescent throat, strongly ribbed and conspicuously glandular between the ribs. Corolla yellow, turning purplish, brown, or blackish in drying, in two species purple apparently from the beginning; some of the petals often with a gland near the apex, and the banner with a semicircle of glands near the base. Wings and keel-petals inserted far below the middle of the staminal tube, the latter the larger. Pod densely pubescent and conspicuously glandular above, less so or glabrous at the base.

* The Mexican plant is apparently different from the South American and true *P. microphylla*, the description of which does not agree with our plant. Good South American material wanting.

158. *Parosela argyrostachya* (H. & A.) Rydberg.

Dalea argyrostachya H. & A. Bot. Beech. Voy. 285. 1836.

A shrub, 5 dm. high or more; branches glabrous, sparingly glandular-dotted; leaves 3-5 cm. long; stipules subulate, 2 mm. long; rachis glabrous; stipels conic, minute; leaflets 15-21, oblong or oblong-obovate, rounded or retuse at the apex, glabrous on both sides, glandular-dotted beneath; peduncles terminal, 1-5 cm long; spikes dense, acute, 3-6 cm. long; bracts black, glabrous, ovate, rather abruptly long-acuminate, exceeding the calyx; calyx-tube broadly campanulate, 2.5 mm. long, glabrous, 10-ribbed, with a row of conspicuous, often confluent glands in each interval; lobes filiform from a broad base, plumose, 3-3.5 mm. long; corolla yellow, turning brownish; blade of the banner rounded-ovate or cordate, 3.5-4 mm. long, the claw 2.5 mm. long; blades of the wings 5 mm. long, those of the keel-petals 6 mm. long and with a smaller basal lobe, the claws of both 2-3 mm. long; pod densely pubescent above, glabrous below.

TYPE LOCALITY: Jalisco.

DISTRIBUTION: Chihuahua, Zacatecas, Chiapas, and Guerrero.

159. *Parosela Botterii* Rydberg, sp. nov.

A shrubby perennial; branches with scattered glands, glabrous or the younger part somewhat brownish-villous; leaves about 2 cm. long; stipules subulate, 2 mm. long; rachis glabrous; stipels conic, gland-like; leaflets 17-21, elliptic, 2-4 mm. long, glabrous, glandular-dotted beneath; peduncles at the ends of the branches, 2-3 cm. long; spikes dense, 3-5 cm. long, pyramidal, acute; bracts ovate-cordate, acuminate, glabrous, with a few glands, about equaling the calyx; calyx-tube campanulate, sparingly hirsute, more densely so at the mouth, glandular in the intervals, 3 mm. long; lobes linear-subulate from a deltoid base, 2.5 mm. long, plumose; corolla dark rose-purple; blade of the banner cordate, 4 mm. long, with an elongate gland at the apex and a semicircle of small glands near the base; blades of the wings and keel-petals with an acute basal lobe, the latter in the wings somewhat salient, in the keel-petals reflexed; blades of the wings 5 mm., those of the keel-petals 7 mm. long, the claws of both 3-4 mm. long. (Though the petals are rose-purple, the structure of the calyx and the more or less gland-bearing petals associate this with the yellow-flowered species of the *LEUCOSTOMAE*.)

Type collected at Orizaba, Mexico, *Botteri* 973 (Gray Herbarium).

160. *Parosela gigantea* Rose, sp. nov.

A shrub, 2-5 m. high; branches long-villous and glandular-dotted, in age gray and striate; leaves 3-5 cm. long; stipules subulate-setaceous, 3-5 mm. long; leaflets 11-17, oval or obovate, 6-10 mm. long, long-pilose on both sides, dotted with black glands beneath; stipels gland-like; peduncles terminal, 2-4 cm. long; spikes 3-6 cm. long, dense, acute, fully 1 cm. thick; bracts broadly ovate, almost black, glabrous, and conspicuously glandular-dotted, abruptly acuminate into a subulate tip, longer than the calyx, deciduous; calyx-tube broadly turbinate, 3 mm. long, glabrous, 10-ribbed, with 3-4 black glands in each interval; lobes long-pilose, subulate-filiform from a triangular base, 2 mm. long; corolla yellow, turning blackish; blade of the banner suborbicular, 3 mm. long, equaling the claw; blades of the wings 4 mm. long, those of the keel-petals 6 mm. long; pod sparingly pilose and with a few glands.

Type collected at Tarascon, Michoacan, October 11, 1904, *Pringle* 8848 (U. S. Nat. Herb. no. 461346).

DISTRIBUTION: Michoacan to Puebla.

161. *Parosela macrostachya* (Moric.) Rose, Contr. U. S. Nat.

Herb. 12: 273. 1909.

Dalea macrostachya Moric. Mém. Soc. Genève 6: 534. 1833.

Dalea leucostoma Schlecht. Linnaea 12: 294. 1838.

Parosela leucostoma Rose, Contr. U. S. Nat. Herb. 10: 106. 1906.

A shrub, 3-10 dm. high; branches short-pubescent when young, in age glabrate and pale-gray, sparingly glandular-dotted; leaves 2-3 cm. long; stipules subulate; rachis sparingly short-pubescent and slightly glandular-dotted; stipels gland-like, conic; leaflets 17-25, oblong or

elliptic, 5-7 mm. long, glabrous above, except the margins, long-pilose and glandular-punctate beneath, slightly retuse; spikes terminal, dense, 2-4 cm. long; bracts glabrous, ovate and concave, abruptly caudate-acuminate, longer than the calyx; calyx-tube turbinate, 10-ribbed, with a row of oblong conspicuous glands in each interval, 2.5 mm. long; lobes long-pilose, with a broad triangular base, abruptly contracted into a subulate-filiform tip, the lowest 3 mm. long, the rest 2 mm. long; corolla yellow; blade of the banner reniform-cordate, 2 mm. long; blades of the wings 3 mm., those of the keel-petals 5 mm. long, the claws of both 2 mm. long; fruit sericeous.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Hidalgo.

ILLUSTRATIONS: Mém. Soc. Genève 6: *pl. 5*; Moric. Pl. Nouv. Am. *pl. 5*.

162. *Parosela atrocyanea* Rydberg, sp. nov.

A low shrub; branches dark-gray, in age blackening, strigose; leaves 1-3 cm. long; stipules subulate, persistent, 1-2 mm. long; rachis sparingly strigose; stipels gland-like; leaflets 9-17, oblong to obovate, sometimes retuse, 4-7 mm. long, glabrous above, strigose and glandular-dotted beneath; peduncles terminal, 1-5 cm. long; spikes dense, 1.5-3.5 cm. long, fully 1 cm. thick; bracts ovate, black, acuminate, fully equaling the calyx, glabrous except the ciliate margins and tip; calyx-tube broadly campanulate, 2.5 mm. long, nearly glabrous, with a few scattered hairs, conspicuously glandular-dotted between the strong ribs; lobes filiform from a triangular base, strongly ciliate, slightly shorter than the tube; corolla probably at first yellow, soon dark ultra-marine blue with the banner wholly or partly yellow; blade of the banner cordate, 3 mm. long, equaling the claw; blades of the wings 4 mm. long, those of the keel-petals broader, 5.5 mm. long, the claws of both 2-3 mm. long; pod densely pubescent above, glabrous below.

Type collected in the vicinity of San Luis Tuxtlanapa, Puebla, July, 1908, *Purpus 2651* (herb. N. Y. Bot. Gard.).

163. *Parosela plumosa* (S. Wats.) Rose, Contr. U. S. Nat.

Herb. 10: 106. 1906.

Dalea plumosa S. Wats. Proc. Am. Acad. 21: 448. 1886.

A low shrub, 3-5 dm. high; branches finely short-pubescent and minutely glandular-dotted when young, glabrate and straw-colored in age; leaves 2-3 cm. long; stipules lance-subulate; leaflets 11-17, elliptic-obovate, obtuse or retuse, 4-6 mm. long, sparingly and minutely pilose on both sides; stipels gland-like; peduncles terminal, 1-3 cm. long; spikes dense, 2-4 cm. long, about 1 cm. thick; bracts ovate-lanceolate, acute or short-acuminate, glabrous, conspicuously glandular-dotted, longer than the calyx-tube, deciduous; calyx-tube glabrous except the margins, turbinate, 10-ribbed, with 3 or 4 black glands in each interval, 2.5 mm. long; lobes long-pilose, with a broad triangular base abruptly contracted into a filiform tip, 2 mm. long or the lowest a little longer; corolla yellow, turning brownish; blade of the banner round-reniform, nearly 3 mm. long, the claw 3 mm. long; blades of the wings 4 mm. long, those of the keel-petals 5-5.5 mm. long; pod pubescent and glandular-dotted.

TYPE LOCALITY: Near Chihuahua [city].

DISTRIBUTION: Chihuahua.

164. *Parosela Painteri* Rose, Contr. U. S. Nat. Herb. 10: 105.

1906.

A low shrub, 3-5 dm. high; branches minutely and sparingly puberulent and minutely glandular-dotted, in age dark-gray and striate; leaves 1.5-3 cm. long; stipules lance-subulate; leaflets 11-15, oblong, 5 mm. long, retuse, glabrous above, glandular-dotted and sparingly and minutely pubescent beneath; stipels gland-like; spikes terminal, short, dense, 2-3 cm. long; peduncles 3-5 cm. long; bracts ovate, acute, slightly pubescent, deciduous; calyx-tube broadly turbinate, glabrous, except on the margin, 2.5 mm. long, with 3-4 oblong black glands in each interval; lobes long-pilose, the lowest equaling the tube, the upper shorter; corolla yellow, turning brownish-purple; blade of the banner round-reniform, 3 mm. long, the claw 3 mm.

long; blades of the wings 4 mm. long, those of the keel-petals 6-7 mm. long, the claws of both 3 mm. long; fruit densely pubescent.

TYPE LOCALITY: San Juan del Rio, Querétaro.

DISTRIBUTION: Querétaro.

165. *Parosela lutea* Cav. Descr. Pl. 186. 1802.

Psoralea lutea Cav. Ic. 4: 12. 1797.

Dalea ovalifolia Ortega, Dec. 30. 1797.

Dalea lutea Willd. Sp. Pl. 3: 1341. 1803.

Dalea flava Moc. & Sessé; DC. Prodr. 2: 245, as synonym. 1825.

Dalea cinerea Moric.; Donn. Smith, Bot. Gaz. 20: 283, in part. 1895.

A low shrub, 3-5 dm. high; branches rather densely short-pubescent, in age grayish; leaves 2-4 cm. long; stipules subulate; rachis softly pubescent; leaflets 15-21, elliptic or oval, often slightly retuse, pilose on both sides, sparingly so above and sometimes glabrate, 4-6 mm. long; stipules gland-like; peduncles terminal, 1-3 cm. long; spikes dense, 5-8 cm. long, about 1 cm. thick; bracts ovate, acuminate, more or less pubescent or in age glabrate, nearly black; calyx-tube broadly turbinate, 2.5 mm. long, more or less pilose, except at the base, glandular-dotted between the 10 ribs; lobes pilose-ciliate, subulate-filiform, from a triangular base, the lowest 4-5 mm. long, the rest 3 mm. long; corolla yellow; blade of the banner round-reniform, 3 mm. long, 5 mm. broad, the claw 3 mm. long; blades of the wings 5 mm. long, those of the keel-petals 7-8 mm. long; pod densely villous.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Nuevo León and Puebla to Guatemala.

ILLUSTRATIONS: Cav. Ic. *pl.* 325; Ortega, Dec. *pl.* 3.

166. *Parosela Wardii* Rydberg, sp. nov.

Dalea leucostoma var. A. Gray, Proc. Am. Acad. 5: 177. 1861.

Dalea cinerea Moric.; (Hemsl. Biol. Centr. Am. Bot. 1: 238; hyponym. 1880) Donn. Smith, Bot. Gaz. 20: 283, in part. 1895.

A shrub, 3-6 dm. high; branches rather densely pubescent; leaves 1-4 cm. long; stipules subulate, persistent, 2 mm. long; rachis densely pubescent; leaflets 9-15, oblong, 3-8 mm. long, villous-canescens on both sides, obtuse; peduncles terminal, about 1-5 cm. long; spikes dense, 2-3 cm. long; bracts ovate, acuminate, black, glandular-dotted, glabrous or the margins slightly ciliate; calyx-tube broadly campanulate, 2.5 mm. long, silky-pilose, with a row of glands between the ribs; lobes subulate-filiform, with a broad base, 2 mm. long, plumose; corolla yellow, fading brownish; blade of the banner rounded-reniform, 3 mm. long, 4 mm. wide; blades of the wings 4 mm., those of the keel-petals 5 mm. long, the claws of both 1.5-2 mm. long; pod densely pubescent.

Type collected at San Luis Potosí, September, 1891, *Lester F. Ward* (U. S. Nat. Herb. no. 134594).

DISTRIBUTION: Tamaulipas and San Luis Potosí.

167. *Parosela caudata* Rydberg, sp. nov.

A shrub, 1 m. high or more; branches densely villous; leaves 3-4 cm. long; stipules subulate, 2-3 mm. long; rachis densely villous; leaflets 13-17, oblong or elliptic, 5-6 mm. long, villous on both sides, less densely so above; peduncles terminating the branches, 2-5 cm. long; spikes dense, 2-6 cm. long, fully 1 cm. thick; bracts lanceolate, contracted into a long filiform tip, longer than the calyx-lobes; calyx-tube broadly turbinate, 2.5 mm. long, sparingly silky-pilose, more densely so along the margins, 10-ribbed, with a row of glands in each interval; lobes filiform from a triangular base, plumose, the lowest 4 mm. long, the rest 2.5-3 mm. long; corolla yellow, turning brownish; blade of the banner round-reniform, 2.5 mm. long, 4 mm. broad, the claw 4 mm. long; blades of the wings 4 mm. long, those of the keel-petals 6 mm. long, the claws of both 3 mm. long; pod densely villous.

Type collected at Alvarez, San Luis Potosí, September 5-10, 1902, *Edward Palmer* 110 (U. S. Nat. Herb. no. 397658).

XXXIX. *Thyrsiflorae*. Glabrous or pubescent branched shrubs. Leaflets of several pairs. Spikes mostly short, numerous, sometime compound, borne in the axils of the leaves,

or on short leafy axillary branches as well at the ends of the branches; bracts pubescent or puberulent, glandular-punctate. Calyx-tube more or less densely pubescent and usually conspicuously glandular in the intervals; lobes filiform from a broad base, plumose, longer than the tube. Corolla pink, white, or ochroleucous, turning purple or brownish in drying. Wings and keel-petals inserted far below the middle of the staminal tube, the keel-petals the larger. Pod villous and glandular-dotted above.

168. *Parosela capitulata* Rydberg, sp. nov.

A glabrous shrub; branches ascending, strict, purplish-brown, glandular-punctate; leaves about 2 cm. long, divaricate; stipules small, subulate; rachis glabrous, densely glandular-dotted; stipels gland-like; leaflets 11-13, glabrous on both sides, densely glandular-dotted beneath, oblong, 3-4 mm. long; spikes capitate, sessile in the axils of the leaves; bracts ovate, acute, 2-3 mm. long, shorter than the calyx, sparingly pubescent and conspicuously glandular-punctate; calyx-tube sparingly hairy, 2 mm. long; lobes subulate, filiform, plumose, the lowest 4 mm. long, the rest about 3 mm. long; corolla when dry darkly brownish-purple; blade of the banner cordate, 3 mm. long, the claw 2 mm. long; blades of the wings obliquely elliptic, 3 mm. long, those of the keel-petals broadly obovate, with an acute reflexed basal lobe, 4 mm. long, the claws of both 2 mm. long.

Type collected in Oaxaca, December 8, 1901, *Conzatti & Gonzalez 1262* (Gray Herbarium).

169. *Parosela tehuacana* Rydberg, sp. nov.

A low shrub; branches glabrous, brown, glandular-dotted, the glands becoming almost white, conspicuous and lenticel-like in age; leaves spreading, 1-2 cm. long; stipules subulate; rachis glabrous or sparingly pubescent when young; leaflets obovate, 3-7 mm. long, slightly retuse or rounded, sparingly short-villous when young, soon glabrous, glandular-dotted beneath; stipels gland-like; spikes mostly axillary, subsessile, or the terminal ones short-peduncled, globose; bracts ovate, white-pilose and conspicuously glandular-dotted, short-acuminate; calyx-tube broadly campanulate, 10-ribbed, with a row of glands in most of the intervals, pilose, 2.5 mm. long; lobes plumose, filiform from a triangular base, the lowest one 4 mm. long, the rest 3 mm. long; corolla yellow, turning dark-purple, the petals usually with a large gland at the apex; blade of the banner cordate, 2 mm. long, the claw 1.5 mm. long; blades of the wings and keel-petals 3-4 mm. long, the claws 1 mm. long; pod villous and glandular above, naked below.

Type collected at Tehuacan, Puebla, November 7, 1903, *Holway 53* (U. S. Nat. Herb. no. 472560).

170. *Parosela emphysodes* (Jacq.) Rydberg.

Psoralea emphysodes Jacq. Coll. 4: 144. 1790.

Psoralea phymatodes Jacq. Ic. Pl. Rar. 3: 13. 1793.

Dalea phymatodes Willd. Sp. Pl. 3: 1338. 1803.

Dalea domingensis Urban, Symb. Ant. 4: 283. 1905. Not *D. domingensis* DC. 1825.

A shrub, 0.5-2 m. high or a small tree (?); branches glabrous or slightly pubescent when young, with small glands; leaves 2-4 cm. long; stipules short, subulate; rachis glabrous or rarely slightly pubescent when young, glandular-dotted, slightly margined; stipels gland-like; leaflets 9-13, oval or obovate, rounded or retuse at the apex, 6-10 mm. long, glabrous or nearly so, minutely glandular-dotted beneath; spikes dense, oblong, 1-2 cm. long, both terminal and subsessile at the ends of very short axillary branches; bracts lance-ovate, short-acuminate, 5 mm. long, pubescent and glandular-dotted; calyx-tube campanulate, 10-ribbed, with a row of yellow glands in each interval, pilose on the ribs; lobes filiform, plumose, 3 mm. long or the lowest one 4 mm. long; corolla purple, rose, or white; blade of the banner cordate, 2.5 mm. long, the claw 2 mm. long; blades of the wings 3 mm. long, those of the keel-petals 4 mm. long, the claws of both 1.5 mm. long; pod villous and glandular-dotted above, naked below.

TYPE LOCALITY: [Not given, but supplied by Willdenow as] Caracas.

DISTRIBUTION: Porto Rico; Venezuela to Costa Rica.

ILLUSTRATION: Jacq. Ic. Pl. Rar. pl. 563.

171. *Parosela scandens* (Mill.) Rydberg.

Psoralea scandens Mill. Gard. Dict. ed. 8. *Psoralea* no. 4. 1768.

A glabrous shrub, with slender, brown branches; leaves 2-4 cm. long, spreading; stipules minute, subulate; rachis glabrous, sparingly glandular-dotted; stipules glandlike; leaflets 7-9, elliptic or elliptic-oblongate, 8-15 mm. long, glabrous on both sides, conspicuously glandular-dotted on the lower side; spikes short, globose or oblong, usually peduncled in the axils of the leaves; bracts ovate, glabrous or puberulent, somewhat glandular-punctate, shorter than the calyx; calyx-tube nearly glabrous, 2.5 mm. long; lobes filiform, plumose, about 5 mm. long; corolla yellow, in age brownish; blade of the banner cordate, 3.5 mm. long; blades of the wings 4 mm. long, those of the keel-petals 5 mm. long, and with a gland near the apex, the claws of both 2-2.5 mm. long.

TYPE LOCALITY: Veracruz.

DISTRIBUTION: State of Veracruz.

172. *Parosela domingensis* (DC.) Millsp. Field. Mus. Publ. Bot. 1: 21. 1895.

Dalea domingensis DC. Prodr. 2: 246. 1825.

Dalea enneaphylla Balbis; DC. Prodr. 2: 246, as synonym. 1825.

A shrub, 1-4 m. high; branches ascending, villous-puberulent, more or less glandular-tuberclad; leaves 2-6 cm. long; stipules subulate, 2 mm. long; petiole 5-10 cm. long; rachis winged, villous-puberulent, glandular-dotted; leaflets 5-9, oval or obovate, rounded or retuse at the apex, 6-15 mm. long, villous on both sides, conspicuously dotted beneath; spikes axillary and terminal, short-peduncled, at first short, in age elongate, becoming 2-4 cm. long and lax; bracts ovate, shorter than the calyx, acute, more or less pubescent, conspicuously glandular-dotted; calyx-tube turbinate, 2 mm. long, pubescent, strongly 10-ribbed, with conspicuously yellow glands between the ribs; lobes subulate-filiform from a broad base, plumose, the upper 4 fully equaling the tube, the lowest one much longer, hooked at the apex; corolla ochroleucous, turning pink or purple; blades of the banner round-reniform, 2 mm. long and slightly broader, usually with 3-4 glands, the claw 2 mm. long; blades with a gland near the apex, those of the wings 2.5 mm. long, those of the keel-petals 3.5 mm. long, the claws of both 2 mm. long; pod villous and conspicuously glandular-dotted above.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Cuba, Hispaniola, and Yucatan(?).

173. *Parosela floridana* Rydberg, sp. nov.

Parosela domingensis Small. Fl. SE. U. S. 628, mainly. 1903. Not *P. domingensis* Millsp. 1895.

A pubescent shrub; branches puberulent, brown, rather densely glandular-dotted; leaves 3-6 cm. long; stipules small, subulate; rachis puberulent, slightly winged; stipules gland-like; leaflets 9-17, oval or obovate, often retuse, 5-10 mm. long, puberulent; spikes short-peduncled in the axils of the leaves; bracts ovate-lanceolate, acute, shorter than the calyx, finely pubescent, with a few glands; calyx-tube villous, campanulate, 2.5 mm. long; lobes filiform, with a broader base, the lowest 4 mm., the rest 3 mm. long; corolla white or ochroleucous, or pink, turning dark brownish rose-purple; blade of the banner rounded cordate, with a single gland at the apex and a few near the base, 2.5 mm. long; blades of the wings 3 mm. long those of the keel 4 mm. long and with a gland near the apex.

Type collected at Miami, Florida, November, 1878, A. P. Garber (herb. Columbia University).

DISTRIBUTION: Subtropical Florida.

174. *Parosela humilis* (Mill.) Rydberg.

Psoralea humilis Mill. Gard. Dict. ed. 8. *Psoralea* no. 7. 1768.

? *Dalea vulneraria brevipes* Oerst. Vidensk. Meddel. 1853: 4. 1853.

Dalea thyrsoiflora A. Gray, Proc. Am. Acad. 5: 177. 1861.

Dalea domingensis pauciflora Coult. Contr. U. S. Nat. Herb. 2: 78. 1891.

Parosela thyrsoiflora Vail, Bull. Torrey Club 24: 14. 1897.

A pubescent shrub, with rather thick, short, grayish-brown, villous branches; leaves 2-5 cm. long; stipules subulate, 3-5 mm. long; rachis short-villous; stipules gland-like; leaflets 3-9,

obovate or oval, often retuse, 6-18 mm. long, short-villous on both sides, glandular-dotted beneath; spikes short, dense, usually oblong and subsessile in the axils of the leaves; bracts ovate, about equaling the calyx-tube; calyx-tube pubescent, strongly 10-ribbed, conspicuously glandular-dotted in the intervals, 2.5-3 mm. long; lobes filiform, plumose, the lowest 5 mm. long and hooked at the apex, the rest 4 mm. long; corolla yellowish turning brownish-purple; petals nearly as in *P. domingensis*.

TYPE LOCALITY: Veracruz.

DISTRIBUTION: Texas and Chihuahua to Guatemala.

175. *Parosela vulneraria* (Oerst.) Rydberg.

Dalea vulneraria typica Oerst. Vidensk. Meddel. 1853: 4. 1853.

A shrub, 1 m. high or more; branches sparingly short-hairy, in age glabrate and light brown, sparingly glandular-dotted; leaves 2-5 cm. long; stipules filiform-subulate, 4-5 mm. long; rachis more or less villous, scarcely margined; stipels gland-like; leaflets 9-15, oval, rounded or retuse at the apex, 8-12 mm. long, villous on both sides, paler and glandular-dotted beneath; spikes short, 1-2 cm. long, mostly axillary and subsessile, terminal and often peduncled; bracts lance-ovate, acuminate, equaling or exceeding the calyx, deciduous, pubescent and with a few glands; calyx-tube broadly turbinate, nearly glabrous, 10-ribbed, 2 mm. long, the glands in the intervals long and usually confluent; lobes filiform from a triangular base, plumose, the lowest 3 mm. long, the rest 2 mm. long; corolla yellowish, turning purple; blade of the banner cordate-reniform, 2.5 mm. long, 3-3.5 mm. broad, the claw 2 mm. long; blades of the wings 3.5 mm. long, those of the keel-petals 4.5-5 mm. long; pod densely pilose above.

TYPE LOCALITY: Between Matagalpa and Chinotega, Segovia, Nicaragua.

DISTRIBUTION: Guatemala to Nicaragua.

176. *Parosela occidentalis* Rydberg, sp. nov.

Dalea domingensis Rose, Contr. U. S. Nat. Herb. 1: 96, in part. 1891. Not *D. domingensis* DC. 1825.

A shrub, about 1 m. high; branches short-villous and dotted with small glands, in age brown; leaves 3-5 cm. long; stipules subulate; rachis short villous and minutely glandular-dotted; leaflets 9-15, oblong to oval or obovate, 6-10 mm. long, villous on both sides, glandular-dotted beneath; spikes dense, both axillary on short branches, and terminal, often short-peduncled, 1-2 cm. long, dense; bracts lanceolate, long-acuminate, about equaling the calyx, short-hairy and glandular-dotted; calyx-tube campanulate, 10-ribbed, with a row of glands in each interval, rather densely pubescent; lobes filiform, from a triangular base, plumose, the lowest one 4 mm. long, the rest 3 mm. long; corolla yellow, turning brown or purplish; blade of the banner cordate, 2 mm. long, the claw 2 mm. long; blades of the wings 2.5 mm. long, those of the keel-petals 3.5 mm. long, the claws 2.5 mm. long; pod villous and glandular-dotted above, naked below.

Type collected at Culiacan, Sinaloa, October 25 to November 18, 1891, Edward Palmer 1783 (herb. N. Y. Bot. Gard.).*

DISTRIBUTION: Sinaloa and Sonora.

177. *Parosela platyphylla* Rydberg, sp. nov.

Dalea domingensis Rose, Contr. U. S. Nat. Herb. 1: 96, in part. 1891. Not *D. domingensis* DC. 1825.

A shrub, 1-1.5 m. high; branches villous and sparingly glandular-dotted, in age gray or brownish; leaves 2-3 cm. long; stipules short, subulate; rachis villous and sparingly dotted; stipels gland-like; leaflets 5-7, rarely 9, broadly oval or obovate, the terminal one larger and retuse, 5-15 mm. long, villous on both sides, glandular-dotted beneath; spikes dense, 1-3 cm. long, 12 mm. thick, both axillary and terminal, usually short-peduncled; bract lance-ovate, acuminate, about equaling the calyx, villous, obscurely glandular-dotted; calyx-tube turbinate, 3 mm. long, 10-ribbed, villous, and with a row of glands in each interval; lobes filiform from

* The duplicate, with the same number, in the U. S. Nat. Herb. bears the date October 9-15, and the locality Lodiago.

a triangular base, plumose, the lowest one 4 mm. long, the rest 3-3.5 mm. long; pod villous and glandular-dotted above, naked below.

Type collected on dry hills in the vicinity of Fuerte, Sinaloa, March 26, 1910, *Rose, Standley, & Russell 13527* (U. S. Nat. Herb. no. 636351).

DISTRIBUTION: Sinaloa.

178. *Parosela barbata* (Oerst.) Rydberg, sp. nov.

Dalea vulneraria barbata Oerst. Vidensk. Meddel. 1853: 4. 1853.

A shrub, about 1 m. high; branches slender, finely villous, slightly glandular-dotted; leaves 2-4 cm. long; stipules short, subulate; rachis margined, short-villous; leaflets 7-11, obovate, short-petioluled, 6-10 mm. long, short-villous on both sides, minutely glandular-dotted beneath; spikes dense, head-like, mostly axillary and short-peduncled; bracts ovate, short-acuminate, villous, obscurely glandular-dotted, shorter than the calyx; calyx-tube campanulate, 3 mm. long, 10-ribbed, densely silky-villous; lobes filiform, 4 mm. long, plumose; corolla yellow, fading brown; blade of the banner cordate, 2 mm. long, the claw 2 mm. long; blades of the wings nearly 3 mm. long, those of the keel-petals 4 mm. long.

TYPE LOCALITY: Between Matagalpa and Chinotega, Segovia, Nicaragua.

DISTRIBUTION: Nicaragua to Panama and Colombia.

UNKNOWN OR EXCLUDED SPECIES

DALEA PARVIFLORA Pursh, Fl. Am. Sept. 2: 474. 1814. This is a species of *Microphacos* (*Astragalus*).

DALEA VIRGATA Lag. Gen. & Sp. Nov. 23. 1816. Unknown.

DALEA HYPOGLOTTIDEA DC. Prodr. 2: 245. 1825. *Dalea astragalina* Moc. & Sessé; DC. *loc. cit.*, as synonym. 1825. Unknown.

DALEA FLAVOROSEA Moc. & Sessé; DC. Prodr. 2: 246. 1825. Unknown.

DALEA ANGUSTIFOLIA G. Don, Gen. Hist. 2: 223. 1832. Unknown.

DALEA PULCHELLA G. Don, Gen. Hist. 2: 224. 1832. Unknown.

DALEA LAEVIGATA Moc. & Sessé; G. Don, Gen. Hist. 2: 224. 1832. *Psoralea laevigata* Sessé & Moc. Pl. Nov. Hisp. 120. 1889. Unknown.

DALEA PULCHERRIMA G. Don, Gen. Hist. 2: 225. 1832. *Dalea violacea* Cerv.; G. Don, *loc. cit.*, as synonym. 1832. Unknown.

DALEA CORONILLA G. Don, Gen. Hist. 2: 226. 1832. Unknown.

DALEA OVALIFOLIA G. Don, Gen. Hist. 2: 226. 1832. Unknown.

DALEA FRUTICOSA G. Don, Gen. Hist. 2: 226. 1832. *Psoralea fruticosa* Sessé & Moc. Pl. Nov. Hisp. 121. 1889. Unknown; from the description probably not a *Parosela*.

DALEA TRIFOLIATA Zucc. Flora 15^o: Beibl. 69. 1832. *Dalea Zuccarini* Walp. Rep. 1: 654. 1842. Unknown; perhaps not a *Parosela*. Compare *Psoralea melanocarpa* Benth.

DALEA COMOSA Schlecht. Linnaea 12: 289. 1838. Unknown.

DALEA EHRENBERGII Schlecht. Linnaea 12: 290. 1838. Unknown.

DALEA PYRAMIDALIS Schlecht. Linnaea 12: 292. 1838. Unknown.

DALEA PLATYSTEGIA S. Schauer, Linnaea 20: 741. 1847. Unknown.

DALEA MACROTROPIS S. Schauer, Linnaea 20: 742. 1847. Unknown.

DALEA LACHNANTHA S. Schauer, Linnaea 20: 743. 1847. Unknown.

DALEA TEPHROSIODES Griseb. Cat. Pl. Cub. 69. 1866. This is *Indigofera sabulicola* Benth.

DALEA GUATEMALENSIS Benth.; Hemsl. Biol. Centr. Am. Bot. 1: 241; hyponym. 1880. Hemsley cited a specimen of Wendland.

DALEA LEPTOCLADOS Benth.; Hemsl. Biol. Centr. Am. 1: 242; hyponym. 1880. Hemsley cited *Coulter 534*.

DALEA VELUTIFES Benth.; Hemsl. Biol. Centr. Am. 1: 248; hyponym. 1880. Hemsley cited as specimens *Coulter, Andrieux 477*.

DALEA INFLATA M. E. Jones, Contr. W. Am. Bot. 12: 7. 1908. Unknown.

17. *THORNBERA* Rydb. Jour. N. Y. Bot. Gard.

20: 66. 1919.

Dalea Juss. Gen. 355. 1789. Not *Dalea* Mill. 1754.

Annual or perennial herbs, with glandular-dotted branches and leaves. Leaves pinnately compound, with stipules and stipels, the latter often gland-like. Flowers in usually dense spikes. Calyx campanulate, 10-ribbed, 5-lobed. Corolla white, rose, purple, yellow, or blue; banner inserted in the bottom of the calyx, with a more or less cordate or ovate blade and a long claw; other petals distinct, similar, oblong or oblanceolate to oval or obovate, subsessile, somewhat oblique at the base, inserted at the mouth of the staminal tube. Stamens 9 or 10, monadelphous, the upper portion of the filaments free. Ovary sessile, 2-ovuled; style filiform; stigma minute. Pod membranous, enclosed in the calyx, mostly 1-seeded, obliquely obovate, somewhat compressed.

Type species, *Dalea albiflora* A. Gray.

- Calyx-lobes rounded; corolla yellow. 1. *T. lutea*.
 Calyx-lobes triangular to subulate-filiform; corolla not yellow.
 Corolla white.
 Leaves and stem pubescent.
 Stem and leaves long-villous.
 Leaflets 15-23; blades of the petals about 2 mm. long. 2. *T. Watsoni*.
 Leaflets 13-15; blades of the petals 3 mm. long. 3. *T. villosa*.
 Stem and leaves short-pubescent or puberulent; blades of the petals 3 mm. long.
 Bracts longer than the calyx; leaflets broadly oblong or elliptic. 4. *T. albiflora*.
 Bracts shorter than the calyx; leaflets linear or nearly so.
 Calyx-lobes equaling the tube; leaflets usually 7-10 mm. long. 5. *T. leucantha*.
 Calyx-lobes shorter than the tube; leaflets 3-4 mm. long. 6. *T. Ordiae*.
 Leaves and stem glabrous.
 Leaflets oblong to oval; bracts villous-pilose throughout. 7. *T. Grayi*.
 Leaflets linear; bracts puberulent, long-hairy only at the base. 8. *T. revoluta*.
 Corolla (except sometimes the banner) blue or purple.
 Perennials; bracts pubescent throughout.
 Bracts ovate; corolla rose-purple. 9. *T. Pringlei*.
 Bracts narrowly lance-subulate; corolla blue. 10. *T. Nelsonii*.
 Annuals; bracts strongly ciliate on the margins; banner white, the other petals blue or rarely rose-purple.
 Bracts broadly obovate; plant low. 11. *T. pumila*.
 Bracts ovate; plant taller.
 Spikes 7-8 mm. thick. 12. *T. Dalea*.
 Spikes more than 1 cm. thick. 13. *T. robusta*.

1. *Thornbera lutea* Rydberg, sp. nov.*Parosela rubricaulis* Rose, Ms. Not *P. rubricaulis* Rusby, 1910.

A perennial herb; stem about 5 dm. high, reddish, puberulent and glandular-dotted, branched; leaves 2-3 cm. long; stipules subulate, 1 mm. long; rachis red, puberulent; stipels gland-like; leaflets oblong, 4-5 mm. long, glabrate above, minutely puberulent and glandular-dotted beneath, rounded or slightly retuse at the apex; peduncles about 1 mm. long; spikes dense, 2-3 mm. long, 8-9 mm. thick; bracts cuneate, truncate and apiculate at the apex, minutely puberulent, glandular-dotted, shorter than the calyx; calyx-tube deeply campanulate or somewhat urceolate, 4 mm. long, with 10 low black ribs, and a row of conspicuous yellow glands in the intervals, nearly glabrous; lobes rounded, glandular, 3-dentate at the apex; corolla yellow; blade of the banner broadly obovate, with a pair of small basal lobes, 2 mm. long, with 3 glands, one near the apex and two towards the base, the claw 2.5 mm. long; blades of the other petals elliptic, slightly oblique at the base, with a gland near the apex, 2.5 mm. long, the claws about 1 mm. long; pod glabrous.

Type collected on the west side of the Valley of Cuicatlan, Oaxaca, November 10, 1894, E. W. Nelson 1896 (U. S. Nat. Herb. no. 865305).

2. *Thornbera Watsoni* (Rose) Rydberg.*Parosela Watsoni* Rose, Contr. U. S. Nat. Herb. 10: 106. 1906.

A perennial, shrubby below; stems branched, rather long-villous; leaves spreading, 1.5-3 cm. long; stipules filiform, 3-4 mm. long; rachis villous; stipels gland-like, conspicuous; leaf-

lets 15-23, oblong, villous, somewhat involute, 3-4 mm. long; peduncles 2-4 cm. long; spikes dense, 2-8 cm. long, 7 mm. thick; bracts linear-lanceolate, attenuate, longer than the calyx; calyx-tube campanulate, villous, 2 mm. long, 10-ribbed, with a row of glands in the intervals; lobes subulate, pilose, equaling or exceeding the tube; corolla white; blade of the banner suborbicular; blades of the other petals oblong-oblancheolate, 2 mm. long, the claws about 1 mm. long; pod densely long-villous and somewhat gland-dotted above, glabrate below.

TYPE LOCALITY: Frayles, Chihuahua.

DISTRIBUTION: Known only from the type locality.

3. *Thornbera villosa* Rydberg, sp. nov.

A perennial, shrubby at the base; stem 3-5 dm. high, densely long villous, terete; leaves 2-3 cm. long; stipules subulate-setaceous, about 2 mm. long; rachis densely villous; glands and stipels concealed; leaflets 13-15, oval, or obovate, densely silky-villous, 3-5 mm. long; peduncles terminal, 2-4 cm. long; spikes 2-4 cm. long, about 1 cm. thick; bracts lanceolate, acuminate, densely silky and glandular-dotted, about equaling the calyx; calyx-tube campanulate, silky-villous, with a row of brownish glands between the ribs, 2 mm. long; lobes filiform, with a lanceolate base, plumose; corolla white; blade of the banner rounded-reniform, 2 mm. long and broad, the claw 3 mm. long; blades of the other petals oblong, 3 mm. long, slightly if at all oblique at the base, the claws about 0.5 mm. long.

Type collected in the Santa Rita Mountains, Arizona, 1902, *Griffiths & Thornber 130* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Santa Rita and Santa Catalina Mountains, Arizona.

4. *Thornbera albiflora* (A. Gray) Rydb. Jour. N. Y. Bot.

Gard. 20: 66. 1919.

Dalea albiflora A. Gray, Pl. Wright. 2: 38. 1853.

Parosela albiflora Vail, Trans. N. Y. Acad. Sci. 14: 34. 1894.

A perennial, somewhat shrubby at the base; stems several, 3-6 dm. high, densely short-villous, terete, branched; leaves 3-5 cm. long, spreading; stipules filiform, 3 mm. long; rachis villous and sparingly and minutely glandular-dotted, black; stipels represented by yellow glands; leaflets 21-31, crowded, oblong, obtuse, 5-8 mm. long, sparingly villous on both sides, glandular-dotted beneath; peduncles 2-8 cm. long; spikes dense, 1.5-6 cm. long, 8 mm. thick; bracts lanceolate, long-attenuate, usually longer than the calyx, pilose and glandular-dotted below; calyx-tube campanulate, sharply 10-ribbed, 2.5 mm. long, densely pilose, with a row of glands in the intervals; lobes lance-subulate, nearly 2 mm. long, plumose; corolla white; blade of the banner suborbicular, with a cordate base, 3 mm. long, glandular near the base, the claw 3 mm. long; blades of the other petals broadly obliquely obovate, rounded at the apex, rounded on the upper and tapering on the lower edge of the base, 2.5 mm. long, the claws 1 mm. long; pod finely and densely pubescent and glandular-dotted above, glabrous at the base.

TYPE LOCALITY: Hillsides on the San Pedro, Sonora.

DISTRIBUTION: New Mexico, Arizona, Sonora, and Chihuahua.

5. *Thornbera leucantha* Rydberg, sp. nov.

A perennial, somewhat shrubby at the base; stems 3-5 dm. high, finely puberulent, often reddish; leaves 2-4 cm. long; stipules subulate, 2 mm. long; rachis finely puberulent; stipels gland-like; leaflets 21-27, linear-oblancheolate or linear, puberulent, 7-10 mm. long; peduncles 2-4 cm. long; spikes dense, 2-4 cm. long, 7-8 mm. thick; bracts lanceolate, pilose and glandular-dotted, shorter than the calyx; calyx-tube campanulate, 2 mm. long, short-pilose, 10-ribbed, glandular-dotted in the intervals; lobes subulate-filiform, plumose, about equaling the tube; corolla white; blade of the banner round-oval, truncate at the base, about 3 mm. long, the claw 3 mm. long; other petals obliquely oblancheolate, or oblong-oblancheolate, 3 mm. long, the claws 1.5 mm. long; pod pilose and glandular-dotted above, glabrate at the base.

Type collected near Providencia, Durango, September 11-12, 1898, *E. W. Nelson 4996* (U. S. Nat. Herb. no. 333023).

6. *Thornbera Ordiae* (A. Gray) Rydberg.

Dalea albiflora var. A. Gray, Pl. Wright. 2: 38. 1853.
Dalea Ordiae A. Gray, Proc. Am. Acad. 17: 200. 1882.
Parosela Ordiae A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

A perennial, somewhat woody at the base; stems 3-5 dm. high, finely pubescent; leaves 2-4 cm. long, ascending; stipules filiform, 2-3 mm. long; rachis finely pubescent, sparingly glandular-punctate; stipels gland-like; leaflets 21-33, linear, more or less involute, 3-4 mm. long, sparingly pubescent, glandular-punctate beneath; peduncles 1-4 cm. long; spikes dense, 2-7 cm. long, 7-8 mm. thick; bracts lanceolate, acuminate, shorter than the calyx; calyx-tube campanulate, sharply 10-ribbed, densely pilose, with a row of glands between the ribs, 2.5 mm. long; lobes subulate, 1-1.5 mm. long; corolla white; petals like those of *D. albiflora*; pod densely villous and glandular-dotted above, glabrate below.

TYPE LOCALITY: Plains near Bowie and Rucker Valley, southern Arizona.
 DISTRIBUTION: New Mexico, Arizona, Chihuahua, and Sonora.

7. *Thornbera Grayi* (Vail) Rydberg.

Dalea laevigata A. Gray, Pl. Wright. 2: 38. 1853. Not *D. laevigata* Moc. & Sessé, 1832.
Parosela Grayi Vail, Bull. Torrey Club 24: 14. 1897.

A perennial herb, with a woody caudex; stems several, erect, striate, glabrous; leaves 2-4 cm. long, ascending; stipules subulate, 1-2 mm. long; petioles 3-5 mm. long; rachis glabrous, slightly glandular-dotted; stipels wanting; leaflets 35-41, oblong to oval, mucronate, 2-4 mm. long, glabrous, glandular-dotted beneath only; peduncles terminating the stems and branches, 1-5 cm. long; spikes dense, 1-3 cm. long, 8 mm. thick; bracts ovate, acuminate, sparingly glandular-dotted, villous-pilose, subsistent; calyx-tube 2 mm. long, villous, 10-ribbed, inconspicuously glandular-punctate; lobes deltoid-ovate, acuminate, nearly equaling the tube; corolla white or cream-colored; blade of the banner rounded-ovate, 2 mm. long, the claw 3 mm. long; blades of the other petals distinct, oblong, 2.5 mm. long, the claws very short; pod pubescent and minutely glandular-dotted above, glabrate below.

TYPE LOCALITY: Chiricahui Mountains, Sonora.
 DISTRIBUTION: New Mexico and Arizona to Sonora and Durango.

8. *Thornbera revoluta* (S. Wats.) Rydberg.

Dalea revoluta S. Wats. Proc. Am. Acad. 22: 404. 1887.
Parosela revoluta Rose, Contr. U. S. Nat. Herb. 10: 105. 1906.

A perennial, with a woody root and a short caespitose caudex; stems 3-6 dm. high, glabrous, angled, glandular-dotted; leaves 1-3 cm. long, spreading; stipules filiform, 3 mm. long; rachis glabrous, copiously glandular-dotted; leaflets about 21, linear, revolute, glabrous, densely glandular-dotted, 4-10 mm. long; peduncles 3-8 cm. long; spikes dense, 1.5-4 cm. long, 6-7 mm. thick; bracts ovate, acuminate, puberulent, densely punctate, persistent, ciliate at the base; calyx-tube campanulate, 10-ribbed, densely short-pilose, with a row of glands in the intervals, 2 mm. long; lobes lanceolate, 1 mm. long, pilose; corolla white or the banner tinged with rose; blade of the banner round-ovate, truncate at the base, 2 mm. long, the claw 2.5 mm. long; blades of the other petals obliquely oblong, cuneate at the base on the lower and rounded on the upper edge, 2 mm. long, the claws 0.5 mm. long; pod densely pubescent.

TYPE LOCALITY: Guadalajara, Jalisco.
 DISTRIBUTION: Sonora to Jalisco.

9. *Thornbera Pringlei* (A. Gray) Rydberg.

Dalea Pringlei A. Gray, Proc. Am. Acad. 17: 201. 1882.
Parosela Pringlei A. Heller, Cat. N. Am. Pl. ed. 2. 6. 1900.

A perennial, suffrutescent at the base, 3-6 dm. high, glabrous and glaucous, almost glandless; leaves 4-6 cm. long, ascending; stipules subulate, 1-2 mm. long; rachis glabrous and glandless, except the minute gland-like stipels; leaflets 19-47, oblong, 2-5 mm. long, obtuse or acutish, glabrous on both sides, finely glandular-dotted beneath; peduncles 3-10 cm. long; spikes 3-10 long, 7-8 mm. thick; bracts ovate, acuminate, rather persistent, dark, pilose and glandular-dotted, slightly exceeding the calyx; calyx-tube campanulate, 2 mm. long, pilose,

10-ribbed, with a row of small glands in the intervals; lobes lance-subulate, pilose, about equaling the tube; corolla rose-purple; blade of the banner rhombic-ovate, 1.5 mm. long, the claw 2.5 mm. long; blades of the other petals obliquely oval or elliptic, 2 mm. long, with a short claw, scarcely 0.5 mm. long; pod densely pilose, glandular-dotted.

TYPE LOCALITY: Santa Catalina Mountains, southern Arizona.

DISTRIBUTION: Arizona, Sonora, and Chihuahua.

10. *Thornbera Nelsonii* (Rose) Rydberg, sp. nov.

Dalea Nelsonii Rose, MS., in herb.

A herbaceous perennial; stem about 5 dm. high, purplish, glabrous; leaves ascending, 3-4 cm. long; stipules filiform, 3 mm. long; rachis glabrous; stipules gland-like; leaflets 17-33, oblong, about 5 mm. long, glabrous on both sides, glandular-dotted beneath; peduncles 5-12 cm. long; spikes 4-10 cm. long, 7 mm. thick; bracts lance-subulate, long-attenuate, pilose and glandular-dotted, longer than the calyx; calyx-tube campanulate, 2 mm. long, more deeply cleft above, obscurely 10-ribbed, with numerous scattered glands; lobes triangular, acute, 1 mm. long, ciliate; corolla bluish-purple; blade of the banner rounded-ovate, with acutish basal lobes, 3.5 mm. long, the claw 2 mm. long; blades of the other petals elliptic, somewhat oblique at the base, 3 mm. long, the claws very short; pod glabrous, minutely glandular.

Type collected sixty miles south of Guadalupe y Calvo, Chihuahua, August, 1898, E. W. Nelson 4790 (U. S. Nat. Herb. no. 332840).

11. *Thornbera pumila* Rydberg, sp. nov.

A low annual; stem branched from near the base, 1-3 dm. high, angled, glabrous and slightly glandular-dotted; leaves about 2 cm. long; stipules subulate, 1-2 mm. long; rachis glabrous, slightly margined; leaflets 7-9, linear-oblong or oblanceolate, 5-10 mm. long, glabrous on both sides, finely glandular-dotted beneath; peduncles terminating the branches, about 1 cm. long; spikes very dense, short, 1-2.5 cm. long, 6-8 mm. thick; bracts broadly obovate, abruptly short-acuminate, dark, with conspicuous straw-colored margins, densely glandular-dotted on the backs, ciliate on the margins; calyx-tube campanulate, 2 mm. long, densely silky; lobes subulate, equaling the tube, silky-plumose; banner white, the blade broadly oval, 2 mm. long, the claw 3 mm. long; other petals blue, oblong, 3 mm. long, with very short claws; pod densely pubescent above, glabrous at the base.

Type collected at Culiacan, Sinaloa, October 5, 1904, T. S. Brandegee (U. S. Nat. Herb. no. 571945).

DISTRIBUTION: Sinaloa.

12. *Thornbera Dalea* (L.) Rydberg.

Psoralea Dalea L. Sp. Pl. 764. 1753.

Psoralea annua Mill. Gard. Dict. ed. 8. Psoralea no. 6. 1768.

Dalea Cliffortiana Willd. Sp. Pl. 3: 1336. 1803.

Dalea Linnaei Michx. Fl. Bor. Am. 2: 57, in part. 1803.

Amorpha glandulosa Blanco, Fl. Filip. 555. 1837.*

Dalea nigra Mart. & Gal. Bull. Acad. Brux. 10²: 43. 1843.

Dalea alopecuroides Blanco, Fl. Filip. ed. 2. 389. 1845. Not *D. alopecuroides* Willd. 1803.

Dalea annua Kuntze, Rev. Gen. 178. 1891.

Dalea annua Cliffortiana Kuntze, Rev. Gen. 178. 1891.

Dalea Dalea MacM. Metasp. Minn. Valley 330. 1892.

Dalea glandulosa Merrill, Philip. Gov. Lab. Bur. Bull. 27: 37. 1905.

Parosela nigra Rose, Contr. U. S. Nat. Herb. 10: 105. 1906.

Parosela Cliffortiana Rose, Contr. U. S. Nat. Herb. 10: 105. 1906.

An annual; stem much branched, 2-8 dm. high, angled, glabrous, rather copiously glandular-dotted; leaves 2-4 cm. long; stipules subulate, 3 mm. long; rachis glabrous, wing-margined, copiously glandular-dotted; leaflets 7-15, oblong-oblanceolate, 5-10 mm. long, glabrous on both sides, conspicuously glandular-dotted beneath; peduncles about 1 cm. long, terminating the branches; spikes very dense, 1-3 cm. long, 8 mm. thick; bracts rhombic-lanceolate, acuminate, blackish, conspicuously glandular-dotted, puberulent or glabrate on the back, ciliate on the margins; calyx-tube nearly 2 mm. long, campanulate, with 10 dark ribs, with a row of glands in the intervals, silky; lobes lance-subulate, fully as long as the tube, silky-plumose;

* The Philippine plant is usually somewhat more slender than the Mexican.

banner white, the blade oval, 1.5-2 mm. long, the claw 2.5 mm. long; other petals blue or rarely rose-purple, the blades broadly oval, oblique at the base, 2 mm. long, the claws less than 0.5 mm. long; pod short-pubescent at the apex, otherwise glabrous.

TYPE LOCALITY: "America" [according to several references: Veracruz].

DISTRIBUTION: Mexico, from Veracruz and Tepic, south; also Philippine Islands (native?).

ILLUSTRATION: L. Hort. Cliff. *pl.* 22.

13. *Thornbera robusta* Rydberg.

Dalea virgata M. Micheli, Bull. Herb. Boiss. 2: 442. 1894. Not *D. virgata* Lag. 1816.

A stout annual; stem branched, erect, glabrous, glandular-dotted; leaves 2-3 cm. long, ascending; stipules subulate-setaceous, 2-3 mm. long; rachis glabrous, margined, glandular-dotted; leaflets 9-11, linear, 4-10 mm. long, glabrous on both sides, copiously glandular-dotted beneath; peduncles terminating the branches, 1-3 cm. long; spikes dense, 2-5 cm. long, fully 1 cm. thick; bracts ovate, caudate-acuminate, dark, densely glandular-dotted, puberulent on the back, ciliate on the margins, 6-7 mm. long; calyx-tube campanulate, 10-ribbed, silky, not conspicuously glandular-dotted between the ribs; lobes subulate, 3 mm. long, plumose; banner white, the blade oval, 2 mm. long, the claw 3.5 mm. long; other petals blue or purple, the blades oval, nearly 2.5 mm. long, oblique at the base, the claws less than 0.5 mm. long; pod densely pubescent at the apex, glabrous below.

TYPE LOCALITY: Near San José and Buenos Ayres, Costa Rica.

DISTRIBUTION: Guatemala to Panama.

ILLUSTRATION: Bull. Herb. Boiss. 2: *pl.* 9.

18. *Petalostemon** Michx. Fl. Bor. Am. 2: 48. 1803.

Perennial or rarely annual herbs, often branched at the base, more or less glandular-dotted. Leaves odd-pinnate with entire sessile or short-petioled leaflets. Flowers in terminal, usually dense spikes; bracts usually sooner or later deciduous. Calyx campanulate or turbinate, 10-nerved, with triangular to lanceolate lobes, rarely much exceeding the tube, usually shorter. Corolla indistinctly papilionaceous, white, pink, purple, or yellowish; banner free, long-clawed, the blade broader than those of the other petals, usually cordate or truncate at the base; other petals oblong to oval, short-clawed, usually acute at the base, inserted at the mouth of the staminal tube and alternating with the free portion of the filaments. Stamens 5, monadelphous below, but the filaments one fifth to one third free. Ovary sessile, 2-ovuled; style filiform; stigma minute. Pod membranous, enclosed in the calyx, 1- or 2-seeded, usually somewhat compressed, obliquely obovate, semi-orbicular, or somewhat lunate.

Type species, *Petalostemon candidus* Michx.

Calyx glabrous throughout or villous-ciliate on the margins of the lobes only (in *P. microphyllum* sparingly pilose all over).

Stem-leaves with 3-11 leaflets.

Banner oblong to orbicular; calyx not strongly 10-ribbed.

I. CARNEL.

Banner cordate or reniform; calyx strongly 10-ribbed.

II. CANDIDI.

Calyx nearly regular; petals white.

III. PROSTRATI.

Calyx decidedly oblique, with all the lobes towards the lower side; petals rose-colored.

Stem-leaves with 11-37 leaflets.

Calyx nearly regular; petals rose-purple.

IV. FOLIOSI.

Calyx very oblique, all the lobes on the lower half of the calyx-rim; petals white.

V. PHLEOIDES.

Calyx densely pubescent at least on the angles and lobes.

Corolla white or yellowish.

Spikes slender, less than 1 cm. thick; leaflets 11-37.

VI. PILULOSI.

Spikes stout, dense, 1-2 cm. thick; leaflets 3-7.

VII. COMPACTI.

Corolla rose or purple, or bluish.

VIII. EXILES.

Plants annual.

Plants perennial, with a woody base.

Leaflets 9-17, more or less silky-villous, oblong or oblanceolate.

IX. VILLOSI.

Leaflets 3-9, usually glabrous at least above, or pubescent in nos. 27 and 33 only.

Pubescence on the calyx dense and short.

X. PURPUREI.

Pubescence on the calyx long, silky-pilose.

XI. ORNATI.

* Originally published as *Petalostemonum*, but incorrect as *σθημων* is masculine and has a long *o* in the final syllable.

I. CARNEI

Banner a little broader than the other petals, cuneate or abruptly contracted at the base; spikes oblong.

Petals white.

Stem and long branches decumbent; leaves distant, not clustered, shorter than the nodes.

Stem and branches erect or ascending; leaves more numerous, usually equaling the nodes, with clustered secondary ones in the axils.

Petals rose- or flesh-colored.

Banner suborbicular or rounded-ovate, much broader than the other petals, truncate at the base; petals rose-colored or deep-pink; spikes globose.

1. *P. gracilis*.2. *P. albidus*.3. *P. carneus*.4. *P. Feayi*.

II. CANDIDI

Spikes globose or nearly so, rather numerous, corymbosely or racemously arranged, each ending a short almost naked branch; petals elliptic.

Spikes oblong or cylindrical (rarely some on the branches globose), solitary at the ends of the stem and of long leafy branches; petals oblong.

Bracts short-acuminate, rarely exceeding the calyces or flower-buds.

Petals truncate at the base; spikes dense in fruit.

Petals acute at the base; spikes loose in fruit.

Bracts long-acuminate, much exceeding the calyces or the flower-buds.

Calyx-lobes less than half as long as the tube.

Calyx-lobes about half as long as the tube.

5. *P. multiflorus*.6. *P. truncatus*.7. *P. oligophyllus*.8. *P. Sonorae*.9. *P. candidus*.

III. PROSTRATI

One species.

10. *P. prostratus*.

IV. FOLIOSI

Leaflets oblong.

11. *P. foliosus*.

Leaflets linear.

12. *P. sabinatis*.

V. PHLEOIDES

Calyx-tube glabrous; leaflets 11-17.

Stem, leaves, and bracts glabrous or the latter slightly puberulent.

Stem, leaves, and bracts more or less long-pilose.

Calyx-tube pilose; leaflets 13-37.

13. *P. glandulosus*.14. *P. phleoides*.15. *P. microphyllus*.

VI. PILULOSI

Calyx very oblique; leaflets 13-37, very small.

Calyx not oblique; lobes subulate; leaflets 11-15.

15. *P. microphyllus*.16. *P. pilulosus*.

VII. COMPACTI

Leaflets glabrous or sparingly pubescent, linear-oblong.

Petals white or yellowish-white; leaflets 5-7, glabrous.

Petals yellow; leaflets 3-5, sparingly silky.

Leaflets obovate to elliptic, densely silky; corolla yellowish-white.

17. *P. compactus*.18. *P. flavescens*.19. *P. obovatus*.

VIII. EXILES

Bracts ovate or lanceolate to cuneate, long-acuminate.

Leaflets 15-17, oblong-cuneate; spikes short and thick.

Leaflets 3-9; spikes slender.

Leaflets linear to elliptic, acute or mucronate; plant glabrous or nearly so, 2-4 dm. high.

Leaflets 3-5, linear.

Leaflets 5-9, elliptic or oblong.

Leaflets cuneate-obovate, retuse; plant strigose, 1-2 dm. high.

Bracts inverted-reniform, apiculate.

20. *P. emarginatus*.21. *P. exilis*.22. *P. confusus*.23. *P. evanescens*.24. *P. obreniformis*.

IX. VILLOSI

Stem and leaves sparingly villous; leaves ascending.

Stem and leaves densely villous; leaves spreading.

25. *P. griseus*.26. *P. villosus*.

X. PURPUREI

Calyx villous-pubescent with spreading hairs.

Leaflets linear, conspicuously glandular-punctate; bracts longer than the calyces and the buds.

Stem and leaves villous throughout.

Stem and leaves glabrous or slightly pubescent.

Bracts with glabrous or merely puberulent tips.

Spikes dense; calyx not ribbed.

Spikes slender; calyx ribbed.

Bracts with pubescent tips.

Spikes less than 1 cm. thick; leaflets obtuse; tips of the bracts not longer than the bodies.

Spikes usually more than 1 cm. thick.

Leaflets acute; tips of the bracts much longer than the bodies.

Leaflets obtuse; tips of at least the upper bracts much shorter than the bodies.

27. *P. mollis*.28. *P. purpureus*.30. *P. Porterianus*.31. *P. tenuifolius*.32. *P. Gattingeri*.29. *P. Standleyanus*.

- Leaflets spatulate-linear, pubescent, but not glandular-dotted; bracts shorter than the calyces and the buds. 33. *P. pubescens*.
- Calyx silky with an appressed pubescence.
- Bracts lanceolate to broadly obovate, not much if at all exceeding the calyces or the flower-buds.
- Spikes globose; leaflets mostly 3. 34. *P. tenuis*.
- Spikes oblong to cylindrical; leaflets usually more than 3.
- Spikes cylindrical, in fruit 7-10 mm. thick.
- Leaflets 5-11, linear or linear-oblongate; bracts pubescent throughout. 35. *P. Reverchoni*.
- Leaflets mostly 5, narrowly linear or linear-filiform; bracts with glabrous tips.
- Spikes oblong, in fruit 12-15 mm. thick. 36. *P. Stanfieldii*.
- Bracts narrowly lanceolate, much exceeding the calyces and the buds. 37. *P. pulcherrimus*.
38. *P. decumbens*.

XI. ORNATI

- Spikes oblong, 1.5 cm. thick or more in fruit; leaflets obovate or broadly elliptic.
- Bracts lanceolate, long-attenuate, much exceeding the buds or calyces. 39. *P. ornatus*.
- Bracts broadly obovate, abruptly acuminate, scarcely exceeding the buds or calyces. 40. *P. lagopus*.
- Spikes cylindrical, 1 cm. thick or less in fruit; leaflets oblong; bracts about equaling the calyces.
- Bracts broadly obovate, short-acuminate; banner broadly oblong, truncate or subcordate at the base. 41. *P. Rothrockii*.
- Bracts lanceolate to rhombic-lanceolate; banner cordate. 42. *P. Searlsiae*.

1. *Petalostemon gracilis* Nutt. Jour. Acad. Phila. 7: 92. 1834.

Petalostemon bicolor Bertol. Mem. Accad. Bologna 2: 273. 1850.
Kuhnistera gracilis Kuntze, Rev. Gen. 192. 1891.

A perennial, with a creeping rootstock; stems decumbent, 3-6 dm. long, slender, terete, glabrous; leaves few, shorter than the nodes, 2-4 cm. long, spreading; stipules subulate; leaflets 5-7, linear-oblong, or the lower oblong-oblongate, 8-20 mm. long, acute, glabrous, not conspicuously punctate; spikes solitary at the ends of the long branches, oblong, or at first subglobose, 1-2 cm. long, in fruit 8 mm. thick; bracts elliptic, with subulate tips, scarcely exceeding the calyces; calyx glabrous, 3 mm. long; tube obtusely 5-ribbed, 10-nerved; lobes triangular-lanceolate, acute, ciliate, 1 mm. long; corolla white; blade of the banner elliptic-obovate, retuse, abruptly contracted at the base, 2.5 mm. long, equaling the claws; blades of the other petals elliptic, 2.5 mm. long, the claws 1.5 mm. long; pod obliquely-obovoid.

TYPE LOCALITY: Lower part of Alabama.

DISTRIBUTION: Mississippi, Alabama, and Florida.

ILLUSTRATIONS: Mem. Accad. Bologna 2: pl. 13, f. 1; Bertol. Misc. Bot. 9: pl. 3, f. 1.

2. *Petalostemon albidus* (T. & G.) Small, Fl. SE. U. S.
630. 1903.

Petalostemon carneus Ell. Bot. S. C. & Ga. 2: 176. 1824. Not *P. carneus* Michx. 1803.
Petalostemon carneus albidus T. & G. Fl. N. Am. 1: 311. 1838.

A perennial, somewhat woody and branched at the base; stems erect or ascending, 5-10 dm. high, slender, glabrous, terete, more or less branched, leaves numerous, 2-5 cm. long, glabrous, usually with short branches of clustered smaller leaves in their axils; stipules subulate; leaflets 5-7, linear-oblong to linear-oblongate, 4-12 mm. long, acute, often involute, glabrous; spikes terminating slender branches, cylindrical or oblong, in fruit 8-10 mm. thick, 1-2.5 cm. long, bracts narrowly lanceolate, caudate-acuminate, glabrous, slightly exceeding the bud and about equaling the mature calyces, persistent or tardily deciduous, glabrous; bristles 1.5 mm. long; calyx glabrous, about 3 mm. long; tube obtusely angled, 10-nerved; lobes triangular-lanceolate, nearly 1 mm. long; corolla white; blade of the banner oval or elliptic-obovate, retuse at the apex, cuneate or abruptly contracted at the base, 2-2.5 mm. long, about 1.75 mm. wide, equaling the claw; blades of the other petals elliptic, 2.5-3 mm. long, 1.25 mm. wide, the claws 1.5 mm. long; pod obliquely-obovoid, 2.5 mm. long, sparingly pilose above, the beak at right angles to the axis.

TYPE LOCALITY: Near Milledgeville, Georgia.

DISTRIBUTION: Georgia and Florida.

3. *Petalostemon carneus* Michx. Fl. Bor. Am. 2: 49. 1803.

Psoralea carnea Poir. in Lam. Encyc. 5: 694. 1804.

Dalea carnea Poir. Dict. Sci. Nat. 12: 462. 1818.

Petalostemon roseus Nutt. Am. Jour. Sci. 5: 298. 1822.

Kuhnistera carnea Kuntze, Rev. Gen. 192. 1891.

A perennial, with a woody base, often branched below; stems erect, 5–10 dm. high, glabrous, minutely striate, branched; leaves 2–4 cm. long, divaricate, often bearing short branches with smaller clustered leaves in their axils; stipules subulate-setaceous; leaflets 5–7, linear, linear-elliptic, or linear-oblancoolate, acute, often involute; 5–10 mm. long, glabrous; spikes dense at the ends of elongate branches, oblong or cylindrical, or rarely subglobose in fruit, 8–9 mm. thick, 1–3 cm. long; bracts lanceolate, acuminate, 3–4 mm. long, somewhat longer than the calyces or buds; calyx glabrous, 2.5–3 mm. long; tube slightly angled, 10-nerved; lobes triangular-lanceolate, acute, less than 1 mm. long; corolla pink, rose-colored, lilac, or sometimes flesh-colored; blade of the banner 2.5 mm. long, oval, truncate or retuse at the apex, abruptly contracted at the base, about equaling the claw; blades of the other petals elliptic-oblong, 2.5–3 mm. long, the claws about 1.5 mm. long; pod obliquely obovoid, about 3 mm. long, pilose above, the beak at right angles to the axis.

TYPE LOCALITY: Georgia.

DISTRIBUTION: Georgia and Florida.

4. *Petalostemon Feayi* Chapm. Fl. S. U. S. ed. 2. 615. 1883.

Kuhnistera Feayi Nash, Bull. Torrey Club 22: 149. 1895.

A perennial, woody and often suffrutescent at the base; stems many, 2–6 dm. high, erect, or decumbent below, glabrous, striate; leaves numerous, 2–4 cm. long; stipules subulate-setaceous; leaflets 3–7, linear, 8–18 mm. long, involute-filiform, obtuse or truncate, glabrous; spikes at the ends of the branches, subglobose, about 8 mm. thick; bracts narrowly lanceolate, acute or short-acuminate, shorter than the calyces; calyx glabrous, 3 mm. long; tube obtusely 10-angled; lobes lanceolate, acute, 1 mm. long; corolla rose-lilac or deep pink, or rarely white; blade of the banner suborbicular or rounded-ovate, truncate at the base, retuse at the apex, 2.5 mm. long, 2–2.5 mm. broad, equaling the claw; blades of the other petals elliptic, 2.5 mm. long, the claws 1–1.5 mm. long; pod obliquely obovoid, 3 mm. long, in age glabrate, the beak at right angles to the axis.

TYPE LOCALITY: Bartow, southern Florida.

DISTRIBUTION: Florida and Georgia.

5. *Petalostemon multiflorus* Nutt. Jour. Acad. Phila.

7: 92. 1834.

Kuhnistera multiflora A. Heller, Mem. Torrey Club 5: 197. 1894.

Kuhnistera candida multiflora Rydb. Contr. U. S. Nat. Herb. 3: 154. 1895.

A perennial, with a woody caudex; stems several, 3–6 dm. high, glabrous, grooved, much branched, the upper branches short and with few reduced leaves; leaves numerous, 2–4 cm. long, spreading; stipules lance-subulate; leaflets 3–9, linear, linear-oblong or linear-oblancoolate, obtuse or mucronate, often involute, conspicuously glandular-dotted beneath, glabrous, 6–12 mm. long; spikes usually numerous, subglobose, in fruit 8 mm. in diameter, 1 cm. long; bracts rhombic-lanceolate, with subulate tip, shorter than the calyces, deciduous; calyx 3 mm. long; tube glabrous, strongly 10-ribbed; lobes triangular-lanceolate, 1 mm. long, ciliolate on the margins; corolla white; blade of the banner reniform, 2–2.5 mm. long, 3 mm. broad, the claw 3 mm. long; blades of the other petals elliptic, 3 mm. long, the claws 1.5 mm. long; pod obliquely obovoid, 3.5 mm. long, the beak at right angles to the axis.

TYPE LOCALITY: Plains of Red River [Arkansas?].

DISTRIBUTION: Missouri and Kansas to Arkansas and Texas.

ILLUSTRATIONS: Britt. & Brown Ill. Fl. f. 2111; ed. 2. f. 2515.

6. *Petalostemon truncatus* Rydberg, sp. nov.

A perennial, branched at the woody thick base; stems several, decumbent, glabrous, angled, conspicuously punctate, 2–4 dm. high, glabrous; leaves numerous, 2–3 cm. long;

stipules subulate; leaflets 5-7, linear or linear-oblancoate, 6-10 mm. long, rarely more than 1 mm. wide, involute, glandular-dotted beneath; spikes solitary at the ends of the stems or branches, oblong or those of the branches sometimes subglobose, in fruit dense, 8-10 mm. thick, 1-2 cm. long; bracts lanceolate, acuminate, shorter than the calyces, deciduous; calyx 3 mm. long; tube 10-ribbed; lobes triangular-ovate, less than 1 mm. long; corolla white; blade of the banner reniform, 2 mm. long, 3 mm. wide, the claw 3 mm. long; blades of the other petals rectangular-oblong, rounded at the apex, truncate at the base, 3-3.5 mm. long, nearly 2 mm. wide, the claws 1 mm. long; pod obliquely obovoid, 3 mm. long, nearly straight on the back.

Type collected at Tepehuanes, Durango, June, 1906, *Edw. Palmer 284* (herb. N. Y. Bot. Gard.).
DISTRIBUTION: Durango, Chihuahua, and Texas.

7. *Petalostemon oligophyllus* (Torr.) Rydb. Mem. N. Y.

Bot. Gard. 1: 237. 1900.

Petalostemon gracilis oligophyllus Torr. in Emory, Notes Mil. Rec. 139. 1848.

Petalostemon gracilis A. Gray, Mem. Am. Acad. II. 4: 33. 1849. Not *P. gracilis* Nutt. 1834.

Kuhnistera occidentalis A. Heller, Trans. N. Y. Acad. Sci. 14: 33. 1895.

Petalostemon candidus occidentalis A. Gray; A. Heller, Trans. N. Y. Acad. Sci. 14: 33, as synonym. 1895.

Kuhnistera candida occidentalis Rydb. Contr. U. S. Nat. Herb. 3: 154. 1895.

Kuhnistera oligophylla A. Heller, Bull. Torrey Club 23: 122. 1896.

A perennial, with a thick woody base; stems several, branched, ascending or decumbent below, glabrous, striate-angled; leaves numerous, 2-5 cm. long, spreading; stipules subulate; leaflets 5-9, firm, linear to elliptic or oblanceolate, 5-20 mm. long, acute or mucronate, conspicuously glandular-dotted beneath; spikes oblong or rarely globose, becoming looser and cylindric, in fruit about 8 mm. thick and 1-7 cm. long; bracts lanceolate or ovate, with subulate tip, little if at all exceeding the calyces; calyx 3 mm. long; tube 10-ribbed, glabrous; lobes triangular-lanceolate, 1 mm. long, villous-ciliolate, acute; corolla white; blade of the banner about 2 mm. long and 3 mm. broad, the claw 3 mm. long; blades of the other petals oblong, 3 mm. long, the claws 1.5 mm. long; pod obliquely obovoid, somewhat lunate, 3 mm. long.

TYPE LOCALITY: Valley of Del Norte [near Albuquerque, according to label], New Mexico.

DISTRIBUTION: Saskatchewan and Montana to western Iowa and Texas; Chihuahua and Durango.

ILLUSTRATIONS: Britt. & Brown. III. Fl. f. 2110; ed. 2. f. 2514.

8. *Petalostemon Sonorae* Rydberg, sp. nov.

A perennial, woody at the base; stems erect, strict, 3-5 dm. high, striate, branched above; leaves scattered, ascending, 3-5 cm. long; stipules subulate; leaflets 5-7, linear-oblong, 8-15 mm. long, 1-3 mm. wide, glabrous, minutely punctate beneath, obtuse; spikes oblong, dense, in fruit 8-10 mm. thick, 1-3 cm. long; bracts lanceolate, caudate-attenuate, with a subulate tip, longer than the calyces and buds, glabrous; calyx about 3 mm. long; tube 10-ribbed, glabrous; lobes less than 1 mm. long, triangular-ovate, acute, minutely ciliolate; corolla white; blade of the banner reniform-cordate, 2 mm. long, 3 mm. broad, the claw 3 mm. long; blades of the other petals oblong, 3 mm. long, the claws 1.5 mm. long; pod obliquely obovoid.

Type collected at Rio de Santa Cruz, Sonora, June 25, 1855, *Schott* (Mex. Bound. Surv. no. 241, in part; herb. N. Y. Bot. Gard.).

9. *Petalostemon candidus* (Willd.) Michx. Fl. Bor. Am. 2: 49.

1803.

Dalea candida Willd. Sp. Pl. 3: 1337. 1803.

Psoralea candida Poir. in Lam. Encyc. 5: 694. 1804.

? *Petalostemon virgatus* Nees & Schw.; Max. Reise N. Am. 2: 432. 1841.

Kuhnistera candida Kuntze, Rev. Gen. 192. 1891.

A perennial, with a woody base; stems 3-10 dm. high, glabrous, striate, with ascending branches; leaves scattered, ascending, 3-5 cm. long; stipules subulate; leaflets 5-9, oblong, linear-oblancoate, or linear-oblong, 1-3 cm. long, acute, or mucronate, minutely glandular-dotted beneath, acute at the base; spikes dense, oblong to cylindric, in fruit about 8 mm. thick, 1.5-10 cm. long; bracts lanceolate, with a long subulate tip, longer than the

calyces or the buds; calyx 3 mm. long; tube glabrous, 10-angled; lobes triangular-lanceolate, villous-ciliolate, acute, 1 mm. long; corolla white; blade of the banner reniform-cordate, 2 mm. long, 3 mm. broad, the claw 2.5 mm. long; blades of the other petals oval to oblanceolate, cuneate at the base, 2.5 mm. long, about equaling the claws; pod obliquely obovoid, 3 mm. long.

TYPE LOCALITY: North America.

DISTRIBUTION: Indiana to Mississippi, Texas, and Saskatchewan.

ILLUSTRATIONS: Michx. Fl. Bor. Am. 2: pl. 37; f. 1; Britt. & Brown, III. Fl. f. 2109; ed. 2. f. 2513.

10. *Petalostemon prostratus* Wooton & Standley, Contr.

U. S. Nat. Herb. 16: 138. 1913.

A perennial; stem prostrate, 5-8 dm. long, much branched, glabrous, glandular-punctate; leaves 2-4 cm. long, spreading; petioles as long as the rachis; stipules subulate; leaflets 7-8, crowded, cuneate-oblanceolate, 5-8 mm. long, rounded or retuse at the apex, glabrous, glaucous, conspicuously glandular-dotted; spikes short-peduncled, rather lax, cylindrical, in fruit 5-10 cm. long, 8 mm. thick; bracts broadly lanceolate, acuminate, glabrous, fully as long as the calyces or buds, early deciduous; calyx oblique, 4 mm. long, glabrous, conspicuously glandular-punctate; tube 10-ribbed, especially below; lobes acute or retuse at the tube, ciliolate on the margins, the upper two triangular-ovate, the lower three lanceolate; corolla rose-colored; blade of the banner reniform, 3 mm. long, 4-5 mm. broad, the claw 4 mm. long; blades of the other petals elliptic or elliptic-obovate, 3 mm. long, the claws 0.5 mm. long; pod glabrous, 3.5 mm. long, obliquely obovate, almost semiorbicular.

TYPE LOCALITY: Albuquerque, New Mexico.

DISTRIBUTION: New Mexico.

11. *Petalostemon foliosus* A. Gray, Proc. Am. Acad.

7: 336. 1868.

Kuhnistera foliosa Kuntze, Rev. Gen. 192. 1891.

A perennial, with a woody base; stem stout, 3-10 dm. high, glabrous, striate, branched above; leaves numerous, ascending, 3-5 cm. long; stipules subulate-setaceous; leaflets 13-31, oblong or oblong-oblanceolate, bright-green above, paler beneath, glabrous, mucronate, 6-10 mm. long; spikes many, short-peduncled, cylindrical, dense, in fruit 1 cm. thick, 2-5 cm. long; bracts lanceolate, glabrous, with subulate tips, much surpassing the calyces and the buds, persistent or tardily deciduous; calyx 4 mm. long; tube glabrous, 10-ribbed, slightly oblique; lobes 1.5 mm. long, acute, ciliolate on the margins, the lower three triangular-lanceolate, the upper two triangular-ovate; corolla white; blade of the banner suborbicular, retuse at the apex, subcordate at the base, 2-2.5 mm. long, the claw 2.5-3 mm. long; blades of the other petals oblong, 2.5-3 mm. long, cuneate at the base, the claws short, scarcely 0.5 mm. long; pod obliquely obovoid, 3 mm. long, glabrous, the beak ascending.

TYPE LOCALITY: Banks of Fox River, Kane county, Illinois.

DISTRIBUTION: Illinois to Tennessee.

ILLUSTRATIONS: Britt. & Brown, III. Fl. f. 2114; ed. 2. f. 2518.

12. *Petalostemon sabinalis* S. Wats. Proc. Am. Acad. 21: 448.

1886.

Petalostemon luteolus S. Wats.; A. Heller, Bull. Torrey Club 23: 122, as synonym. 1896.

Kuhnistera sabinalis A. Heller, Bull. Torrey Club 23: 124. 1896.

A perennial, woody only at the base; stems ascending, 2-4 dm. high, glabrous, somewhat striate; leaves yellowish-green, about 3 cm. long; leaflets 11-15, linear or linear-oblanceolate, 10-15 mm. long, flat, glandular-dotted beneath, blunt, glabrous; spikes cylindrical, in age 4-6 cm. long, 1 cm. thick; bracts lanceolate, acuminate, glabrous, deciduous, about equaling the calyces; calyx 3 mm. long; tube glabrous, 10-ribbed, with conspicuous yellow glands; lobes short, triangular, ciliolate, acute; corolla rose-colored; blade of the banner broadly cordate, notched at the apex, 2 mm. long, 3 mm. wide, the claw 2 mm. long; blades of the other

petals oblong-oblancoate, obtuse at the apex, 2.5 mm. long; pod glabrous, obliquely obovoid, mm. long.

TYPE LOCALITY: Brander County, Texas, at the entrance of Sabinal Cañon.
DISTRIBUTION: Known only from the type locality.

13. *Petalostemon glandulosus* Coult. & Fisher, Bot. Gaz.

18: 299. 1893.

Petalostemon candidus multifoliolatus A. Gray, in E. Hall, Pl. Tex. 7; hyponym. 1873.

A perennial, with a woody base; stems striate, leafy, glabrous, 2-6 dm. high, branched; leaves 2-4 cm. long, ascending; stipules subulate-seataceous; leaflets 13-25, oblong or oblong-obovate, 5-8 mm. long, obtuse or retuse, conspicuously black-dotted beneath, dark-green above, paler beneath, glabrous or sparingly pilose above; spikes dense, cylindric, in fruit 8 mm. thick, 2-9 cm. long; bracts linear-lanceolate, caudate-attenuate, longer than the calyces and buds, glabrous; calyx rose-tinged, 3-4 mm. long; tube oblique, gibbous on the upper side, glabrous, conspicuously glandular-dotted, not ribbed; lobes small, all near the lower side, ciliate on the margins, the lower three lance-subulate, the upper two broadly triangular, with a subulate tip; corolla white; blade of the banner cordate, 3-4 mm. long, 4 mm. wide, the claw fully 3 mm. long; blades of the other petals linear, 3 mm. long, the claws 1.5 mm. long; pod obliquely obovoid, 3 mm. long, pubescent.

TYPE LOCALITY: Hockley, eastern Texas.
DISTRIBUTION: Texas.

14. *Petalostemon phleoides* T. & G. Fl. N. Am. 1: 310. 1838.

Petalostemon aphleoides Young, Fl. Tex. 221. 1873.
Kuhnistera phleoides Kuntze, Rev. Gen. 192. 1891.

A perennial, branched at the base; stems 3-7 dm. high, simple or branched, striate, glabrous or nearly so; leaves 3-5 cm. long, ascending; stipules subulate-setaceous; leaflets 13-17, oblong or cuneate-oblong, 5-10 mm. long, usually rounded at the apex, conspicuously glandular beneath, sparingly pilose on both sides; spikes cylindric, dense, in fruit 1.5-6 cm. long, about 8 mm. thick; bracts lanceolate, with long, subulate-filiform, long-ciliate tips, much exceeding the calyces or the buds; calyx 3 mm. long; tube turbinate, oblique, glabrous, 10-nerved; lobes near the lower side, similar to those of the preceding species, ciliate on the margins; corolla white; blade of the banner cordate, 3 mm. long, 3-4 mm. broad, the claw 3 mm. long; blades of the other petals linear or linear-oblancoate, 3 mm. long, the claws 2 mm. long; pod obliquely obovoid.

TYPE LOCALITY: Arkansas.
DISTRIBUTION: Arkansas and Texas.

15. *Petalostemon microphyllus* (T. & G.) A. Heller, Bull.

Torrey Club 26: 593. 1899.

Petalostemon phleoides microphyllus T. & G. Fl. N. Am. 1: 310. 1838.
Kuhnistera microphylla A. Heller, Bull. Torrey Club 23: 122. 1896.

A perennial, branched at the woody base; stems erect or ascending, 2-6 dm. high, grooved or striate, more or less pilose, often branched; leaves very numerous, 3-5 cm. long, spreading or ascending; stipules subulate; leaflets 25-37, oblong or oblong-cuneate, 4-6 mm. long, emarginate, conspicuously glandular-dotted beneath, more or less pilose or in age glabrate; spikes dense, cylindric, in fruit 8 mm. thick, 2-5 cm. long; bracts linear-lanceolate, densely pubescent, with long subulate tips, persistent, longer than the calyces; calyx 2.5-3 mm. long; tube oblique, gibbous above, densely pubescent; lobes very short, the lower three triangular-ovate; corolla white; blade of the banner cordate, 2 mm. long, 3 mm. wide, the claw 3 mm. long; blades of the other petals linear-oblancoate, 3 mm. long, the claws 2 mm. long; pod 2-2.5 mm. long, obliquely and very broadly obovoid, pubescent, the beak at right angles to the axis.

TYPE LOCALITY: Texas.
DISTRIBUTION: Texas.

16. *Petalostemon pilulosus* Rydberg, sp. nov.

A perennial; stem 4-5 dm. high, terete, finely short-pilose, tinged with red or brown, branched; leaves 2-4 cm. long, spreading; stipules subulate, 1 mm. long; rachis not margined, finely pilose; leaflets 15-19, elliptic, sparingly and finely pilose on both sides, bright-green above, glandular-dotted beneath; peduncles 2-5 cm. long; spikes dense, 2-3 cm. long, about 6 mm. thick; bracts lanceolate, attenuate into a subulate tip, longer than the calyces, pubescent; calyx densely silky, 4 mm. long; lobes lance-subulate, attenuate, equaling the tube; corolla white; blade of the banner elliptic, about 2 mm. long, the claw nearly as long; blades of the other petals oblanceolate, 2 mm. long, the claws about 0.5 mm. long; pod silky-pubescent above.

Type collected in Arizona, 1891, *Nealley 237* (herb. N. Y. Bot. Gard.).

17. *Petalostemon compactus* (Spreng.) Swezey, Neb.

Fl. Pl. 6. 1891.

Dalea compacta Spreng. Syst. 3: 327. 1826.

Petalostemon macrostachyus Torr. Ann. Lyc. N. Y. 2: 176. 1827.

Kuhnistera compacta Kuntze, Rev. Gen. 192. 1891.

A perennial, with a woody tap-root; stems several, 4-8 dm. high, glabrous, striate, leafy; leaves numerous, ascending, 5-8 cm. long; stipules subulate; leaflets 5-7, oblong, oblong-lanceolate, or linear-oblong, acute or obtuse, short-petiolulate, glabrous, glandular-dotted beneath, light-green above, pale beneath, 1.5-2.5 cm. long; spikes cylindric, dense, in fruit 10-12 mm. thick, 2-15 cm. long; bracts linear-lanceolate, attenuate, densely pubescent with long silky hairs; calyx 4.5 mm. long, densely silky-villous with brown hairs; lobes narrowly lanceolate, equaling the tube; corolla white or yellowish-white; blade of the banner cordate, 2 mm. long, the claw 4 mm. long; blades of the other petals lanceolate or oblanceolate, 2 mm. long, the claws about 1 mm. long; pod broadly obliquely obovate, almost half-round, 3 mm. long, sparingly pubescent.

TYPE LOCALITY: "Rio Roxo, Arkansas?" [? Canadian River, Oklahoma].

DISTRIBUTION: Nebraska, Colorado, and Wyoming; (Oklahoma?).

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2108; ed. 2. f. 2512.

18. *Petalostemon flavescens* S. Wats. Am. Nat. 7: 299. 1873.

Kuhnistera flavescens Kuntze, Rev. Gen. 192. 1891.

A perennial; stem simple, glabrous, conspicuously glandular-dotted, fully 3 dm. high; stipules subulate, silky; leaflets 3-5, narrowly oblong, obtuse, 6-12 mm. long, sparingly silky; spikes dense, long-peduncled, in fruit 12-13 mm. thick, 2.5-4.5 cm. long; bracts subulate, very villous, 4 mm. long; calyx very villous, 5 mm. long, the upper two lobes subulate, 2 mm. long, the lower three lobes lance-ovate, 1.5 mm. long; corolla said to be yellow; blade of the banner rectangular, emarginate, 3 mm. long, equaling the claw; blades of the other petals narrowly oblong, 2.5 mm. long, the claws 1 mm. long; pod densely villous. (Perhaps not distinct from *P. Searlsiae*.)

TYPE LOCALITY: Kanab, southern Utah.

DISTRIBUTION: Known only from the type locality.

19. *Petalostemon obovatus* T. & G. Fl. N. Am. 1: 310. 1838.

Dalea agastachya Moric. Pl. Nouv. Am. 65. 1839.

Kuhnistera agastachya Kuntze, Rev. Gen. 192. 1891.

Kuhnistera obovata A. Heller, Bull. Torrey Club 23: 122. 1896.

A perennial; stem erect, 3-5 dm. high, densely silky-villous; leaves numerous, 3-5 cm. long; stipules subulate; leaflets obovate or oval, 8-10 mm. long, truncate, rounded, or acutish at the apex, densely silky-villous on both sides; spikes cylindric, in fruit 15-18 mm. thick, 5-11 cm. long; bracts oval or ovate, acuminate, silky-villous, longer than the calyces; calyx 6 mm. long, silky-villous; lobes lanceolate, caudate-attenuate, twice as long as the tube; corolla yellowish-white; blade of the banner cordate, 2 mm. long, the claw 2 mm. long; blades of the

other petals oblong, 3 mm. long, the claws less than 1 mm. long; pod broadly obliquely obovate, nearly orbicular, villous.

TYPE LOCALITY: Texas.

DISTRIBUTION: Texas.

ILLUSTRATIONS: Moric. Pl. Nouv. Am. pl. 44.

20. *Petalostemon emarginatus* T. & G. Fl. N. Am.

1: 311. . 1838.

Kuhnistera emarginata Kuntze, Rev. Gen. 192. 1891.

An annual, branched at the base; stems decumbent at the base, 2-5 dm. long, usually simple, glabrous, terete; leaves 2-5 cm. long, spreading; stipules subulate; leaflets 13-17, cuneate or oblong-cuneate, 2-7 mm. long, emarginate at the apex, glabrous, verdigris-green above, minutely glandular-dotted beneath; spikes oblong or cylindric, long-peduncled, in fruit 1-3 cm. long, about 1 cm. thick; bracts obovate, abruptly acuminate, villous with glabrate tips; calyx villous, 3 mm. long, oblique; lobes lanceolate, acuminate, fully equaling the tube; corolla deep-pink; blade of the banner broadly rectangular-oblong, retuse or truncate at the apex, truncate at the base, 2.5 mm. long, shorter than the claw; blades of the other petals oblong, rounded at the apex, 2.5 mm. long, the claws short; pod obliquely obovate, somewhat lunate, villous above.

TYPE LOCALITY: Texas.

DISTRIBUTION: Texas.

21. *Petalostemon exilis* A. Gray, Pl. Wright. 2: 41. 1853.

Kuhnistera exilis Kuntze, Rev. Gen. 192. 1891.

A slender annual; stem simple or somewhat branched, glabrous; leaves scattered, 3-5 cm. long, ascending; stipules subulate; leaflets linear, acute, 1-3 cm. long, 1-2.5 mm. broad; spike long-peduncled, cylindric, in fruit 6 mm. thick, 1-4 cm. long; bracts ovate, acuminate, sparingly pubescent, longer than the calyces; calyx 4 mm. long, long-silky; lobes lanceolate, acuminate, equaling the tube; corolla rose or lilac; blade of the banner suborbicular, rounded or retuse at the apex, subcordate at the base, 1.5 mm. long, the claw 2-2.5 mm. long; blades of the petals oblong, 2 mm. long, the claws about 0.5 mm. long; pod obliquely obovate, villous at the top.

TYPE LOCALITY: Hillsides near Santa Cruz, Sonora.

DISTRIBUTION: New Mexico, Arizona, Sonora, and Chihuahua.

22. *Petalostemon confusus* Rydberg, sp. nov.

A slender annual; stem about 4 dm. high, branched above, glabrous and slightly angled; leaves 1-4 cm. long, ascending; stipules subulate; leaflets 5-9, elliptic or oblong, 6-15 mm. long, glabrous or sparingly pilose, dotted with scattered glands; rachis slightly margined; peduncles 2-5 cm. long; spikes oblong to cylindric, 1-2.5 cm. long, about 7 mm. thick; bracts lanceolate to cuneate, acuminate, dark, slightly pubescent, scarious, shorter than the calyces; calyx 3-3.5 mm. long, densely pubescent; lobes triangular-ovate, short-acuminate, 1-1.5 mm. long; corolla bluish-purple; blade of the banner oval, nearly 2 mm. long, the claw 1.5 mm. long; blades of the other petals oblong, cuneate at the base, nearly 2 mm. long, the claws less than 1 mm. long; pod pubescent.

Type collected on pine plains, base of Sierra Madre, September 20, 1887, Pringle 1215 (U. S. Nat. Herb. no. 24427, labeled *Dalea polygonoides* var.).

23. *Petalostemon evanescens* (Brand.) Rose.

Dalea evanescens Brand. Proc. Calif. Acad. II. 2: 146. 1889.

A low annual; stem spreading, nearly prostrate, strigose, 6-20 cm. long; leaves 1-2 cm. long, spreading; stipules subulate, 1 mm. long; rachis strigose; leaflets 7-9, cuneate-obovate, retuse, 2 mm. long, strigose, minutely glandular-dotted beneath; peduncles supra-axillary, 1 cm. long or less; racemes 1-1.5 cm. long, lax; bracts minute, ovate-lanceolate, purplish;

pedicels 1 mm. long or less; calyx strigose, about 2 mm. long; lobes purplish, acute, slightly shorter than the tube; corolla light rose-color or whitish; blade of the banner reniform, 1 mm. long, 1.5 mm. wide, the claw 1 mm. long; blades of the other petals obliquely rounded-obovate, 1.5 mm. long, with a very short claw; pod with conspicuous glands, sparingly pubescent.

TYPE LOCALITY: San Ignacio, Lower California.

DISTRIBUTION: Known only from the type locality.

24. *Petalostemon obreniformis* Rydberg, sp. nov.

An annual, branched at the base; stems about 3 dm. high, glabrous, terete, branched; leaves ascending, 2-4 cm. long; stipules subulate-setaceous, 3-4 mm. long; rachis scarcely margined; leaflets 9-13, elliptic, 6-10 mm. long, glabrous, paler beneath; peduncles 1-7 cm. long; spikes slender, 1-4 cm. long, about 5 mm. thick; bracts inverted-reniform, apiculate, dark, with white or light margins, glabrous, conspicuously glandular-dotted; calyx about 2.5 mm. long, silky-pubescent; lobes ovate, acute, 0.75 mm. long; corolla dark-blue; blade of the banner suborbicular, truncate at the base, 1 mm. long, fully 1.5 mm. wide, the claw 2 mm. long; pod hairy above.

TYPE LOCALITY: The base of Mt. Mohinora, Chihuahua, 8 miles from Guadalupe y Calvo, August, 1898, E. W. Nelson (U. S. Nat. Herb. no. 332883).

25. *Petalostemon griseus* T. & G. Fl. N. Am. 1: 310. 1838.

Kuhnistera grisea Kuntze, Rev. Gen. 192. 1891.

A perennial; stem 2-7 dm. high, usually erect, often reddish, striate, sparingly pilose, branched above; leaves numerous, 3-4 cm. long, spreading; stipules subulate; leaflets 9-17, oblong, oblanceolate, or linear-oblong, 6-12 mm. long, mucronate, finely long-pilose, conspicuously glandular-dotted beneath; spikes many, very short-peduncled, cylindric, in fruit 2.5-6 cm. long, 6-7 mm. thick; bracts deciduous, linear-lanceolate, caudate-attenuate, longer than the calyces, pubescent; calyx 10-ribbed, densely pubescent, 3 mm. long; lobes lanceolate or triangular-lanceolate, acute, a little shorter than the tube; corolla pink or pink-purple; blade of the banner cordate, 2 mm. long and as broad, equaling the claw; blades of the other petals oblong, 2 mm. long, the claws scarcely 0.5 mm. long; pod 2 mm. long, obliquely obovoid, pubescent.

TYPE LOCALITY: Pine woods near the Sabine River, Texas.

DISTRIBUTION: Texas.

26. *Petalostemon villosus* Nutt. Gen. 2: 85. 1818.

Dalea villosa Spreng. Syst. 3: 326. 1826.

Kuhnistera villosa Kuntze, Rev. Gen. 192. 1891.

A perennial, with a woody tap-root and caudex, branched at the base, bushy; stems ascending or decumbent, 3-6 dm. high, densely villous; leaves very numerous and crowded, 3-5 cm. long, often with fasciculate ones in their axils; stipules subulate; leaflets 9-17, approximate, oblong or oblanceolate, acute or obtuse, 5-10 mm. long, 2-4 mm. wide, densely villous; spikes terminating the branches, usually subsessile, sometimes clustered, cylindric, in fruit 8 mm. thick, 2-10 cm. long, dense; bracts lanceolate, caudate-attenuate, longer than the calyces, deciduous, villous; calyx about 3 mm. long, densely villous, 10-ribbed; lobes lanceolate, acute, shorter than the tube; corollas rose-purple, rarely white; blade of the banner cordate, 2 mm. long and as broad, the claw 2.5 mm. long; blades of the other petals elliptic, 2.5 mm. long, the claws 0.5 mm. long; pod obliquely obovate, somewhat lunate, 3 mm. long, villous.

TYPE LOCALITY: Banks of Knife River, near Fort Mandan, North Dakota.

DISTRIBUTION: Michigan to Missouri, Texas, Montana, and Saskatchewan.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2115; ed. 2. f. 2519.

27. *Petalostemon mollis* Rydb. Mem. N. Y. Bot. Gard. 1: 238.

1900.

Petalostemon purpureus mollis A. Nelson; Coult. & Nels. Man. 299. 1909.

A perennial, with a woody tap-root, branched at the woody base; stems 2-5 dm. high, villous, striate, simple or branched above; leaves spreading, 2-4 cm. long, often with fasciculate

ones in the axils; stipules subulate; leaflets mostly 5, linear, involute, 1–1.5 cm. long, 1–2 mm. wide, villous, obtuse; spikes short-peduncled, oblong, dense, in fruit 2–4 cm. long, 10–12 mm. thick; bracts lanceolate, abruptly acuminate, glabrate at the base, pubescent at the middle, with a filiform less pubescent tip; calyx villous, 3–4 mm. long; lobes lanceolate, acute, shorter than the tube; corolla rose-purple; blade of the banner cordate, 2 cm. long, equaling the claw; blades of the other petals oblong, 3 mm. long; claws 0.5 mm. long; pod obliquely obovate, 3 mm. long, pubescent.

TYPE LOCALITY: SNOWY MOUNTAINS, MONTANA.

DISTRIBUTION: MONTANA TO TEXAS AND NEW MEXICO.

28. *Petalostemon purpureus* (Vent.) Rydb. Mem. N. Y.

Bot. Gard. 1: 238. 1900.

Dalea purpurea Vent. Descr. Pl. Cels *pl.* 40. 1801.

Petalostemon violaceus Michx. Fl. Bor. Am. 2: 50. 1803.

Dalea violacea Willd. Sp. Pl. 3: 1337. 1803.

Psoralea purpurea Poir. in Lam. Encyc. 5: 694. 1804.

Kuhnistera violacea Ait.; Steud. Nom. ed. 2. 1: 851. 1840.

Kuhnistera purpurea MacM. Metasp. Minn. Valley 329. 1892.

Petalostemon purpureus f. *arenarius* F. C. Gates, Torreya 11: 127. 1911.

A perennial, branched at the woody base; stems 2–9 dm. high, striate, glabrous or sparingly pubescent, more or less branched; leaves numerous, 3–5 cm. long, often with fasciculate ones in their axils; stipules subulate; leaflets linear, glabrous or sparingly pubescent, 8–20 mm. long, 1–3 mm. wide, involute; spikes short-peduncled, oblong or cylindrical, dense, in fruit 1.5–5 cm. long, about 1 cm. thick; bracts oblanceolate, abruptly acuminate, densely pubescent, with a dark almost glabrous subulate tip; calyx silky-villous, 3–4 mm. long; lobes lanceolate, acute, shorter than the tube; corolla rose-purple; blade of the banner cordate, obtuse, 2 mm. long, the claw about 3 mm. long; blades of the other petals oblong, rounded at the apex, 3 mm. long, the claws 1 mm. long; pod obliquely obovate, 3 mm. long, pubescent.

TYPE LOCALITY: Described from cultivated specimens introduced from Illinois.

DISTRIBUTION: Indiana to Saskatchewan, New Mexico, and Texas.

ILLUSTRATIONS: Vent. Descr. Pl. Cels *pl.* 40; Michx. Fl. Bor. Am. *pl.* 37, f. 2; Bot. Mag. *pl.* 1707; Lam. Tab. Encyc. *pl.* 980; Britt. & Brown, Ill. Fl. f. 2112; ed. 2. f. 2516; Clements, Rocky Mt. Fl. *pl.* 27, f. 3.

29. *Petalostemon Standleyanus* Rydberg, sp. nov.

Petalostemon tenuifolius Wootton & Standley, Contr. U. S. Nat. Herb. 19: 356, in part. 1915.

A perennial, branched at the base; stems 3–5 dm. high, usually sparingly pubescent; leaves numerous, ascending, 3–5 cm. long; stipules subulate-setaceous; leaflets mostly 5, linear, obtuse, usually involute, 10–15 mm. long, glabrous or sparingly pubescent and conspicuously glandular-dotted beneath; peduncles 2–7 cm. long; spikes oblong, 1–3.5 cm. long, 10–12 mm. thick; bracts oblanceolate or obovate, or the lower lanceolate, abruptly acuminate into a subulate tip, more or less pubescent throughout; calyx silky-villous, 3–4 mm. long; lobes lanceolate, acute, shorter than the tube; corolla rose-purple; blade of the banner rounded-cordate, 2 mm. long, the claw slightly longer; blades of the other petals oblong, rounded at the apex, more than 2 mm. long; pod densely pubescent.

Type collected in the Raton Mountains, New Mexico, August 18–19, 1903, *David Griffiths* 5464 (U. S. Nat. Herb. no. 496689).

DISTRIBUTION: Northern New Mexico.

30. *Petalostemon Porterianus* Small, Fl. SE. U. S. 631, 1332.

1903.

A perennial, with a woody base; stems 2–4 dm. high, more or less branched, sparingly pubescent, striate; leaves ascending, 3–5 cm. long; stipules subulate-setaceous; leaflets 3–5, linear, 8–15 mm. long, strongly involute, sparingly pubescent or glabrous, conspicuously punctate; spikes oblong-cylindric, in fruit 1.5–4 cm. long, 8 mm. thick; bracts obovate, acuminate, pubescent with a dark glabrate tip, longer than the calyces and buds; calyx villous, distinctly 10-ribbed, 4 mm. long; lobes lanceolate or triangular-lanceolate, shorter than the tube;

corolla rose-purple or violet; blade of the banner subcordate, rounded or truncate at the apex, 2 mm. long, the claw 3 mm. long; blades of the other petals broadly oblong, 3 mm. long, rounded at the apex, truncate at the base, the claws 1 mm. long; pod pubescent.

TYPE LOCALITY: "Leavenworth, Arkansas, to El Paso, Texas."

DISTRIBUTION: Texas.

31. *Petalostemon tenuifolius* A. Gray, Proc. Am. Acad. 11: 73.
1876.

Kuhnistera tenuifolia Kuntze, Rev. Gen. 192. 1891.

A perennial, with a woody base; stem ascending or erect, slender, 1.5-3 dm. high, pale, glabrous, striate, branched; leaves ascending, 3-4 cm. long; stipules subulate-setaceous; leaflets 3-5, linear or narrowly linear-oblancoolate, 8-18 mm. long, involute, blunt, glabrous or nearly so, sparingly glandular; spikes cylindric, in fruit 2-5 cm. long, 8 mm. thick; bracts silky-villous throughout, ovate, abruptly contracted into a subulate tip, slightly exceeding the buds; calyx silky-villous, 4 mm. long; lobes triangular-lanceolate, about as long as the tube; corolla rose-purple; blade of the banner cordate, 3 mm. long and as broad, nearly equaling the claw; blades of the other petals oblancoolate, 3 mm. long; pod pubescent.

TYPE LOCALITY: Arkansas at the crossing of Red River.

DISTRIBUTION: Kansas to Arkansas and Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2113; ed. 2. f. 2517; Rothr. Bot. Wheeler's Surv. pl. 2, f. B.

32. *Petalostemon Gattingeri* A. Heller, Bull. Torrey Club
26: 593. 1899.

Kuhnistera Gattingeri A. Heller, Bull. Torrey Club 23: 121. 1896.

A perennial, woody at the base; stem 3-5 dm. high, branched and bushy, decumbent or erect, sparingly pubescent and glandular-punctate; leaves numerous, 3-4 cm. long; stipules subulate; leaflets 5-7, narrowly linear to narrowly oblong, 1-2 cm. long, 1-3 mm. wide, dull and glandular below, light-green above, glabrous or nearly so; spikes short-peduncled, cylindric, in fruit 2-6 cm. long; bracts longer than the calyces, oval-lanceolate, long-attenuate, pubescent; calyx pubescent, 4 mm. long; lobes triangular-lanceolate, slightly shorter than the tube; corolla rose-purple; blade of the banner reniform-cordate, 2 mm. long, 3 mm. broad, the claw 3 mm. long; blades of the other petals oblong, 3 mm. long, the claws 1 mm. long; pod obliquely obovate, 3 mm. long, pubescent.

TYPE LOCALITY: Nashville, Tennessee.

DISTRIBUTION: Tennessee and Alabama.

33. *Petalostemon pubescens* A. Nelson, Bot. Gaz. 31: 395. 1901.

A perennial, with a woody root, branched at the base; stems numerous, prostrate-assurgent, or the central one suberect, 1-2 dm. high, white-sublanate; stipules filiform; rachis pubescent like the stem; leaflets 5, nearly glabrous above, sublanate beneath, spatulate-linear, sessile, 10-14 mm. long, not glandular-dotted; peduncles 1-5 cm. long; spikes oblong, 2-5 cm. long, less than 1 cm. thick; bracts scarcely equaling the calyces, obovate, abruptly acuminate, the tip purplish but hidden by the long pubescence; calyx 4-5 mm. long; lobes shorter than the tube; corolla light-purple; blade of the banner broadly cordate, 3 mm. long and broad, the claw somewhat longer; pod softly pubescent.

TYPE LOCALITY: Berwind, Colorado.

DISTRIBUTION: Known only from the type locality.

34. *Petalostemon tenuis* (Coul.) A. Heller, Bull. Torrey
Club 26: 593. 1899.

Petalostemon violaceus tenuis Coul. Contr. U. S. Nat. Herb. 1: 34. 1890.

A perennial, with a woody base; stem much branched, glabrous, slender, terete, about 3 dm. high; leaves numerous, spreading, 2-3 cm. long; stipules subulate-setaceous; leaflets mostly 3, linear, strongly revolute, 5-12 mm. long, acute, glabrous or nearly so, strongly

punctate; spikes usually long-peduncled, subglobose or short-oblong, 1-1.5 cm. long, about 1 cm. thick in fruit; bracts ovate-lanceolate, pubescent, much shorter than the calyces; calyx 4 mm. long, appressed-silky; lobes triangular-ovate, shorter than the tube; corolla pink-purple; blade of the banner broadly cordate, 2 mm. long, shorter than the claw; blades of the other petals elliptic, 3 mm. long; pod obliquely obovate, finely pubescent.

TYPE LOCALITY: Santa Anna, Coleman County, Texas.

DISTRIBUTION: Arkansas and Texas.

35. *Petalostemon Reverchoni* S. Wats. Proc. Am. Acad.

21: 449. 1886.

Kuhnistera Reverchoni A. Heller, Bull. Torrey Club 23: 124. 1896.

A perennial, branched at the base; stems diffuse, 1-2 dm. long, finely pubescent; leaves 2-3 cm. long; stipules subulate; leaflets 5-11, linear or linear-oblongate, glabrous, 5-10 mm. long, acutish, somewhat involute; spikes sessile, subglobose or oblong, in fruit 1-7 cm. long, about 1 cm. thick; bracts shorter than the calyces, deciduous, silky throughout, lanceolate, acuminate; calyx about 4 mm. long, appressed, silky; lobes deltoid, acute or acuminate, about equaling the tube; corolla deep-pink; pods silky, obliquely obovate, 3 mm. long.

TYPE LOCALITY: Rocky top of Comanche Peak, Texas.

DISTRIBUTION: Texas.

36. *Petalostemon Stanfieldii* Small, Fl. SE. U. S. 631, 1332. 1903.

A perennial, branched at the suffrutescent base; stems 1-3 dm. high, often branched, glabrous, terete, straw-colored; leaves numerous, 2-4 cm. long, ascending; stipules subulate-filiform; leaflets 3-5, linear or linear-filiform, 5-12 mm. long, acute, strongly involute, glabrous, conspicuously punctate; spikes long-peduncled, cylindrical, in fruit about 7 mm. thick, 1-4 cm. long; bracts broadly obovate, abruptly acuminate, silky below, with dark glabrous tips; calyx silky-puberulent, with mostly appressed hairs, 3 mm. long; lobes triangular, about half as long as the tube; corolla rose-purple; blade of the banner cordate, 2 mm. long, fully as broad, the claw 3 mm. long; blades of the other petals oblong, rounded at the apex, truncate at the base, 3 mm. long, the claws less than 1 mm. long; pod 2 mm. long, pubescent, at least above, obliquely obovate.

TYPE LOCALITY: San Marcos, Texas.

DISTRIBUTION: Kansas to Texas.

37. *Petalostemon pulcherrimus* A. Heller, Bull. Torrey Club

26: 593. 1899.

Petalostemon virgatus Scheele, Linnaea 21: 461. 1848. Not *P. virgatus* Nees & Schw. 1841.

Petalostemon violaceus pubescens A. Gray, Pl. Wright. 1: 46, in part. 1852.

Kuhnistera pulcherrima A. Heller, Bot. Expl. Texas 50. 1895.

Petalostemon pubescens A. Heller, Muhlenbergia 1: 28. Au 1901. Not *P. pubescens* A. Nelson, Je 1901.

A perennial, with a woody tap-root, branched at the base; stems simple, erect, striate, glabrous or sparingly pubescent, 3-7 dm. high; leaves 4-6 cm. long, numerous; stipules subulate-filiform; leaflets 3-7, linear, 2-4 cm. long, 1-3 mm. wide, acute at each end, often somewhat involute, yellowish-green above, somewhat glaucous, sparingly pubescent or glabrous, glandular-punctate beneath; spikes long-peduncled, oblong, in fruit 2-4 cm. long, 12-15 mm. thick; bracts broadly ovate, short-acuminate, pubescent, with a dark almost glabrous subulate tip; calyx 4 mm. long; tube glaucous, silvery-pubescent on the ribs; lobes acute, silvery-pubescent, much shorter than the tube, the three lower triangular-lanceolate, the upper two triangular-ovate; corolla deep-rose-purple; blade of the banner 2.5 mm. long, cordate, rounded or retuse at the apex, the claw 3 mm. long; blades of the other petals oblong or elliptic, rounded at the apex, 3 mm. long, the claws 1 mm. long; pod broadly obliquely obovoid, slightly pubescent, 3 mm. long.

TYPE LOCALITY: New Braunfels, Texas.

DISTRIBUTION: Missouri and Arkansas to Texas and New Mexico.

ILLUSTRATION: A. Heller, Bot. Expl. Texas *pl.* 2.

38. *Petalostemon decumbens* Nutt. Jour. Acad. Phila.
7: 93. 1834.

Kuhnistera decumbens Kuntze, Rev. Gen. 192. 1891.

A perennial; stems solitary or several, decumbent or ascending, glabrous or sparingly pubescent, striate; leaves numerous, 3–5 cm. long, ascending; stipules subulate; leaflets 5–7, linear or linear-oblong, 8–20 mm. long, acute or mucronate, slightly involute on the margins, sparingly pilose, glandular-dotted beneath; spikes ovoid or short-oblong, 1–2 cm. long, fully 1 cm. thick in fruit; bracts lanceolate, attenuate, much longer than the calyces and buds; calyx with short silky appressed pubescence, 4 mm. long; lobes lanceolate or ovate-lanceolate, shorter than the tube, acute; corolla pink or rose-purple; blade of the banner oblong-ovate, cordate at the base, 3 mm. long, equaling the claw; blades of the other petals linear-oblong, fully 3 mm. long, the claws less than 1 mm. long; pod broadly and obliquely obovate, strigillose.

TYPE LOCALITY: Plains of Red River [Arkansas?].

DISTRIBUTION: Arkansas and Texas.

39. *Petalostemon ornatus* Dougl.; Hook. Fl. Bor. Am.
1: 138. 1830.

Petalostemon ovatus S. Wats. Am. Nat. 7: 300. (err.) 1873.

Petalostemon macrostachyus T. & G. Fl. N. Am. 1: 309, in part. 1838. Not *P. macrostachyus* Torr., 1827.

Dalea ornata Eaton & Wright, N. Am. Bot. 219. 1840.

Kuhnistera ornata Kuntze, Rev. Gen. 192. 1891.

A perennial, branched at the woody base; stems 3–5 dm. high, glabrous, striate, conspicuously punctate; leaves ascending, 4–5 cm. long; stipules subulate; leaflets 5–7, obovate or elliptic-oblancoate, 10–15 mm. long, yellowish-green above, paler and densely glandular-punctate beneath, rounded at the apex; spikes oblong, long-peduncled, in fruit 2–4 cm. long, about 15 mm. thick; bracts narrowly lanceolate, long-acuminate, long-pilose, almost plumose above, much exceeding the calyces; calyx 4.5 mm. long, silky-pilose; lobes lanceolate, about equaling the tube; blade of the banner 3.5 mm. long, rounded at the apex, truncate or subcordate at the base, the claw 4 mm. long; blades of the other petals 3.5–4 mm. long, rounded at the apex, acute at the base, the claws fully 1.5 mm. long.

TYPE LOCALITY: Prairies near the Blue Mountains of Lewis River [Snake River], Oregon or Washington.

DISTRIBUTION: Oregon and Washington.

40. *Petalostemon lagopus* Rydberg, sp. nov.

A perennial, branched at the woody base; stems 3–6 dm. high, glabrous, straw-colored, punctate; leaves ascending, 3–5 cm. long; stipules subulate; leaflets mostly 5, obovate or broadly elliptic, 1–2 cm. long, rounded or obtuse at the apex, glabrous, punctate beneath; heads oblong, in fruit 2–4 cm. long, about 1.5 cm. thick; bracts broadly obovate, abruptly acuminate, long-pilose, about equaling the calyces; calyx 5 mm. long, long-pilose; lobes lanceolate, somewhat shorter than the tube; corolla rose-colored; blades of the banner broadly oblong or oval, rounded or truncate at the apex, truncate at the base, 4 mm. long, the claw 5 mm. long; blades of the other petals oblong, acute at the base, the claws 1.5 mm. long; pod 4 mm. long, broadly obliquely obovate, pubescent.

Type collected at Truckee Pass, Washoe County, Nevada, June 14, 1906, *Kennedy 1316* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Idaho, Nevada, and western Utah.

41. *Petalostemon Rothrockii* Rydberg, sp. nov.

Petalostemon tenuifolius Rothr. Bot. Wheeler's Surv. 99, in part. 1878.

A perennial, with a thick woody base; stems several, 3–5 dm. high, glabrous, striate, conspicuously punctate; leaves ascending, 3–5 cm. long; stipules subulate-filiform; leaflets oblong or linear-oblong, obtuse or retuse, thick, about 1 cm. long, light-green above, glaucous and strongly punctate beneath; spikes long-peduncled, cylindrical or oblong, in fruit 8–9 mm. thick, 1–5 cm. long; bracts broadly obovate, short-acuminate, dark, short-pilose or glabrous, about

equaling the calyces; calyx 3.5 mm. long, long-pilose; lobes acute, about equaling the tube, the lower three triangular-lanceolate, the upper two ovate; blade of banner broadly oblong, rounded or retuse at the apex, truncate or subcordate at the base, 3.5 mm. long, the claw 5 mm. long; blades of the other petals 3.5 mm. long, oblong, acute at the base, the claws 2 mm. long; pod obliquely obovate, pubescent.

TYPE COLLECTED IN ARIZONA, 1874, *Rothrock* (Wheeler Exp., in herb. Columbia Univ.).
DISTRIBUTION: Southern Utah and Arizona.

42. *Petalostemon Searlesiae* A. Gray, Proc. Am. Acad. 8: 380. 1873.

Kuhnistera Searlesiae Kuntze, Rev. Gen. 192. 1891.

A perennial, branched at the woody base; stem 3-5 dm. high, decumbent at the base, glabrous, striate, conspicuously glandular-punctate; leaves ascending, 3-5 cm. long; stipules subulate; leaflets 3-7, oblong or oblanceolate, 10-15 mm. long, involute on the margins, yellowish-green above, paler and conspicuously punctate beneath, acute at each end; spikes long-peduncled, cylindrical, in fruit 1-4 cm. long, about 1 cm. thick; bracts rhombic-oblanceolate, acute or short-acuminate, glabrous, equaling the calyces; calyx 4 mm. long, long-pilose; lobes lanceolate, acute or acuminate, slightly shorter than the tube; corolla rose-purple; blade of the banner broadly cordate, emarginate at the apex, 3 mm. long and about as broad, the claw 4 mm. long; blades of the other petals oblong or obovate, 3-4 mm. long, the claws about 1 mm. long; pod pubescent.

TYPE LOCALITY: Pahrnanagot Mountains, southern Nevada.
DISTRIBUTION: Southern Nevada and Utah, and northern Arizona.

19. *KUHNISTERA* Lam. Encyc. 3: 370. 1789.

Gatesia Bertol. Novi Comm. Bonon. 9: 212. 1849.

Perennials, with long tough tap-roots. Leaves alternate, pinnate, with linear-filiform to obovate, glandular-punctate leaflets. Flowers in corymbosely arranged terminal head-like spikes, subtended by 3-4 series of broadly ovate, persistent, empty bracts. Calyx deeply cleft; tube turbinate; lobes subulate-filiform, about 3 times as long as the tube, silky-plumose. Corolla nearly regular; petals nearly equal, with oblong blades, but the banner long-clawed and inserted in the bottom of the calyx and the other petals short-clawed, inserted at the mouth of the staminal tube, and alternate with the free portions of the 5 stamens. Stamens monadelphous; filaments united about half their length. Ovary sessile; style filiform; stigma minute; ovules 1 or 2. Pod indehiscent; seed solitary.

Type species, *Kuhnistera carolinensis* Lam.

Leaflets linear-filiform; gland-dots minute.

Leaflets oblong to obovate; gland-dots very conspicuous.

1. *K. pinnata*.

2. *K. adenopoda*.

1. *Kuhnistera pinnata* (Walt.) Kuntze, Rev. Gen. 192. 1891.

Anonymus pinnatus Walt. Fl. Car. 103. 1788.

Kuhnistera carolinensis Lam. Encyc. 3: 370. 1789.

Petalostemon corymbosus Michx. Fl. Bor. Am. 2: 50. 1803.

Dalea Kuhnistera Willd. Sp. Pl. 3: 1337. 1803.

Psoralea corymbosa Poir. in Lam. Encyc. 5: 694. 1804.

Dalea corymbosa Poir. Dict. Sci. Nat. 12: 462. 1818.

Gatesia alabamensis Bertol. Novi Comm. Bonon. 9: 213. 1849.

Petalostemon corymbosus trifoliatius Chapm. Fl. S. U. S. ed. 3. 101. 1897.

A perennial, with a long slender tap-root; stems solitary or a few 3-11 dm. high, corymbosely branched above, glabrous; leaves 1-2 cm. long, spreading, glabrous, usually with smaller ones fascicled in their axils; stipules minute, subulate; leaflets 3-7, linear-filiform, 5-10 mm. long, less than 0.5 mm. thick; outer empty bracts purplish-brown, broadly ovate, nearly orbicular, ciliolate, the inner subtending the flowers much smaller, oblong; calyx-tube scarcely 2 mm. long, silky; lobes 5-6 mm. long; petals white, the blades oblong, acute at each end, about 4 mm. long; pod 2 mm. long, densely pubescent.

TYPE LOCALITY: Carolina.

DISTRIBUTION: North Carolina to Florida and Mississippi.

ILLUSTRATIONS: Novi Comm. Bonon. 9: pl. 10; Bertol. Bot. Misc. 7: pl. 1.

2. *Kuhnistera adenopoda* (B. L. Robinson) Rydberg, sp. nov.

Petalostemon corymbosum adenopodum B. L. Robinson, MS. in herb.

A perennial; stem corymbosely branched above, glabrous, reddish-brown, angled and striate, conspicuously glandular; leaves 1-2 cm. long, spreading; stipules minute, subulate; rachis conspicuously glandular-dotted; leaflets mostly 5, oblong to obovate, 5-10 mm. long, with more or less involute margins, glabrous, conspicuously glandular dotted beneath; bracts and flowers as in preceding species.

Type collected at Tampa, Florida, October, 1877, A. P. Garber (Gray Herbarium).
DISTRIBUTION: Tampa Bay region of Florida.

COMPLETED VOLUME

9: i-iv, 1-542. (Agaricales:) Polyporaceae (pars), Boletaceae, Agaricaceae (pars). Complete in 7 parts.

PARTS OF VOLUMES PREVIOUSLY PUBLISHED

- 3¹: 1-88. Hypocreales: Nectriaceae, Hypocreaceae. Fimetariales: Chaetomiaceae, Fimetariaceae.
- 7¹: 1-82. Ustilaginales: Ustilaginaceae, Tilletiaceae. 7²: 83-160. Uredinales: Coleosporiaceae, Uredinaceae, Aecidiaceae (pars). 7³: 161-268. Aecidiaceae (pars).
- 10¹: 1-76. (Agaricales:) Agaricaceae (pars). 10²: 77-144. Agaricaceae (pars). 10³: 145-226. Agaricaceae (pars).
- 15¹: 1-75. Sphagnales: Sphagnaceae. Andreaeales: Andreaeaceae. Bryales: Archidiaceae, Bruchiaceae, Ditrichaceae, Bryoxyphiaceae, Seligeriaceae. 15²: 77-166. Dicranaceae, Leucobryaceae.
- 16¹: 1-88. Ophioglossales: Ophioglossaceae. Marattiales: Marattiaceae. Filicales: Osmundaceae, Ceratopteridaceae, Schizaeaceae, Gleicheniaceae, Cyatheaceae (pars).
- 17¹: 1-98. Pandanales: Typhaceae, Sparganiaceae. Naiadales: Zannichelliaceae, Zosteraceae, Cymodoceaceae, Naiadaceae, Liliaceae. Alismales: Scheuchzeriaceae, Alismaceae, Butomaceae. Hydrocharitales: Elodeaceae, Hydrocharitaceae. Poales: Poaceae (pars). 17²: 99-196. Poaceae (pars). 17³: 197-288. Poaceae (pars).
- 21¹: 1-93. Chenopodiales: Chenopodiaceae. 21²: 95-169. Amaranthaceae 21³: 171-254. Allioniaceae.
- 22¹: 1-80. Rosales: Podostemonaceae, Crassulaceae, Penthoraceae, Parnassiaceae. 22²: 81-192. Saxifragaceae, Hydrangeaceae, Cunoniaceae, Iteaceae, Pterostemonaceae, Hamamelidaceae, Altingiaceae, Phyllonomaceae. 22³: 193-292. Grossulariaceae, Platanaceae, Crossosomataceae, Connaraceae, Calycanthaceae, Rosaceae (pars). 22⁴: 293-388. Rosaceae (pars). 22⁵: 389-480. Rosaceae (pars). 22⁶: 481-560. Rosaceae (pars).
- 24¹: 1-64. (Rosales:) Fabaceae (pars).
- 25¹: 1-88. Geraniales: Geraniaceae, Oxalidaceae, Erythroxylaceae, Linaceae. 25²: 89-171. Tropaeolaceae, Balsaminaceae, Limnanthaceae, Koerberliniaceae, Zygophyllaceae, Malpighiaceae. 25³: 173-261. Rutaceae, Surianaceae, Simaroubaceae, Bursereaceae.
- 29¹: 1-102. Ericales: Clethraceae, Monotropaceae, Lennoaceae, Pyrolaceae, Ericaceae.
- 32¹: 1-86. Rubiales: Rubiaceae (pars).
- 34¹: 1-80. (Carduales:) Carduaceae (pars). 34²: 81-180. Carduaceae (pars). 34³: 181-288. Carduaceae (pars).

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VOLUME 24

PART 3

NORTH AMERICAN FLORA

(ROSALES)

FABACEAE

INDIGOFEREAE, GALEGEAE (pars)

PER AXEL RYDBERG



PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

JULY 16, 1923

ANNOUNCEMENT

NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

Volume 1. Myxomycetes, Schizophyta.

Volumes 2 to 10. Fungi.

Volumes 11 to 13. Algae.

Volumes 14 and 15. Bryophyta.

Volume 16. Pteridophyta and Gymnospermae.

Volumes 17 to 19. Monocotyledones.

Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. W. A. Murrill, and Dr. J. H. Barnhart.

Professor John M. Coulter, of the University of Chicago; Mr. Frederick V. Coville, of the United States Department of Agriculture; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or five parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

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Tribe 7. INDIGOFEREAE

By PER AXEL RYDBERG

Herbs or shrubs, more or less covered with malpighiaceous hairs, *i. e.*, appressed 2-branched hairs, apparently attached at their middle, sometimes with other kinds of pubescence intermixed. Leaves usually odd-pinnate, rarely digitate or unifoliolate. Stipules usually and stipels often present, the latter minute. Flowers usually in axillary racemes or spikes. Calyx 5-toothed. Corolla papilionaceous; keel-petals united above, the claws distinct, the blades furnished with a lateral spur or pouch on the outside. Stamens diadelphous or monadelphous; anthers with the connective produced into a subulate mucro or gland, in some exotic species also variously appendaged. Pod 1 many-seeded, dehiscent, with false transverse partitions between the seeds. Seeds without strophiole.

1. INDIGOFERA L. Sp. Pl. 751. 1753.

Anil [Ludw.] Mill. Gard. Dict. abr. ed. 4. 1754.
Hemisipodon Endl. Flora 15: 385. 1832.
Eilemanthus Hochst. Flora 29: 593. 1846.
Amecarpus Benth.; Lindl. Veg. Kingd. 554. 1847.
Indigastrium Jaub. & Spach, Illust. Pl. Orient. pl. 492. 1857.
Anila Kuntze, Rev. Gen. 160. 1891.

Herbs or shrubs. Stipules usually subulate-setaceous, slightly adnate to the petioles. Flowers bracteate, the bracts usually caducous. Calyx small, obliquely 5-toothed, the teeth equal or the lower slightly longer. Corolla pink or red or purple, externally, especially the banner, strigose with malpighiaceous hairs. Banner usually broad, orbicular or obovate, sessile or short-clawed, rounded or obtuse at the apex. Wings oblanceolate or oblong or linear, short-clawed, slightly adherent to the keel, the blade rounded or truncate on the upper side forming a rounded or broadly acute basal auricle which is often thickened. Keel-petals obliquely oblanceolate, gradually tapering into a long broad claw, rounded, obtuse, or acute at the apex, rarely produced into a beak, the lateral spur directed backward or rarely reduced to a small shallow pouch. Stamens diadelphous, the uppermost filament free, the other 9 united for about three fourths of their length into a staminal sheath, which is ovate or triangular at the apex, the lowest filaments being united further up than the lateral ones. Ovary sessile, one- to many-ovuled, usually strigose; style bent upward and glabrous; stigma capitate. Pod from globose to oblong or linear, terete or somewhat 4-angled or compressed, rarely strongly flattened. Seed from globose to cylindric or prismatic, with truncate ends, attached at their middle.

Type species, *Indigofera tinctoria* L.

Stem, petioles, and pods hirsute or glandular, not canescent; introduced species?

Plant tall and stout, villous-hirsute; racemes elongate.

Plant slender, glandular-hirsute; racemes short.

Stem, petioles, and pods more or less strigose, or rarely canescent with short spreading hairs.

Plants annual; introduced species.

Keel produced into a beak; lateral spurs represented by shallow pouches; racemes short, few-flowered, almost sessile, shorter than the flowers.

Keel not beaked; lateral spurs well developed; racemes longer than the leaves, many-flowered.

I. HIRSUTAE.
II. VISCOSAE.

III. PARVIFLORAE.

IV. HENDECAPHYLLAE.

- Plants perennial; mostly native species.
 Calyx more than half as long as the corolla, its teeth subulate or subulate-tipped, twice as long as the tube or more.
 Pods loosely pubescent with spreading kinked hairs; decumbent suffruticose plants; leaves conspicuously punctate beneath.
- V. MICROCARPAE.
- Pods closely strigose.
 Leaflets acute at the base, subsessile.
 Leaves strongly ascending, at least the lower ones unifoliolate; lateral leaflets opposite on the rachis; racemes erect.
 Leaves spreading, the lower not unifoliolate; leaflets often alternate on the rachis; racemes ascending.
- VI. LESPEDEZOIDES.
- VII. LEPTOSEPALAE.
- Leaflets rounded at the base, distinctly petioluled, usually 5.
 Calyx less than half as long as the corolla, its teeth lanceolate or deltoid, not at all or not much exceeding the tube in length.
- VIII. MUCRONATAE.
- Pods not strongly flattened, rounded, subrhombic or oval in cross-section; seeds turgid or prismatic.
 Pods gradually tapering into a long beak, straight, linear, many-seeded.
 Pods abruptly contracted into a slender short beak.
 Pods linear, 3-12-seeded, often more or less curved.
 Pods oblong, ovoid, or spheric, 1-3-seeded, rarely 4-seeded.
 Pods strongly flattened, linear in cross-section, 4 mm. broad; seeds flat.
- IX. TRIBAUDIANAE
- X. TINCTORIAE.
- XI. DISPERMAE.
- XII. PLATYCARPAE.
- I. HIRSUTAE
 One species. 1. *I. hirsuta*.
- II. VISCOSAE
 One species. 2. *I. viscosa*.
- III. PARVIFLORAE
 One species. 3. *I. parviflora*.
- IV. HENDECAPHYLLAE
 One species. 4. *I. hendecaphylla*.
- V. MICROCARPAE
 Plant somewhat canescent, with strictly appressed hairs; pods 4-6-seeded.
 Plant almost white, with loose kinked hairs; pods 3- or 4-seeded.
5. *I. sabulicola*.
 6. *I. domingensis*.
- VI. LESPEDEZOIDES
 One species. 7. *I. lespedezoides*.
- VII. LEPTOSEPALAE
 Leaflets strigose on both sides.
 Leaflets all cuneate, truncate or retuse at the apex.
 Leaflets oblanceolate to linear, acute to rounded at the apex, only those of the lower leaves sometimes cuneate in no. 9.
 Corolla 8-11 mm. long; pods 3 mm. thick, 2-3 cm. long.
 Stem 5-10 dm. high; racemes much longer than the leaves; corolla 10-11 mm. long.
 Stem about 1 dm. high, from a stout caudex; corolla 8-9 mm. long.
8. *I. sphenoides*.
9. *I. leptosepala*.
10. *I. nana*.
- Corolla 5-8 mm. long; pods less than 3 mm. thick, 1-2.5 cm. long.
 Plant rather stout, erect or nearly so, silvery-white pods 2.5 mm. thick or more.
 Plant slender, decumbent to ascending, not white; pods about 2 mm. thick.
 Racemes short and dense, shorter than the leaves; leaflets of the lower leaves rounded at the apex, those of the upper obtuse or acutish.
 Racemes lax, longer than the leaves except in depauperate specimens; leaflets acute or those of the lower leaves obtuse.
11. *I. argentata*.
12. *I. brevipes*.
13. *I. miniata*.
- Leaflets glabrous or nearly so above.
 Leaflets narrowly oblanceolate, acute; racemes lax; corolla 8-9 mm. long.
 Leaflets oblanceolate or cuneate, rounded or obtuse at the apex; racemes short and dense; corolla 6-7 mm. long.
14. *I. acutifolia*.
15. *I. Hartwegii*.
- VIII. MUCRONATAE
 Pods not strongly torulose.
 Leaflets glabrous above.
16. *I. laevis*.

- Leaflets strigose on both sides.
 Pods gradually tapering into the long stout beak; calyx-teeth subulate-filiform.
 Pods abruptly contracted into the short slender beak; calyx-teeth lance-subulate.
 Plant decumbent; banner orbicular.
 Plant erect; banner obovate.
 Pods strongly torulose.
- IX. THIBAUDIANAE
- Leaflets glabrous above.
 Leaflets rounded at the base.
 Leaflets 11-15, rarely 9; pods reflexed.
 Leaflets 1-9; pods spreading.
 Leaflets cuneate at the base.
 Leaflets strigose on both sides.
 Leaflets 13-27.
 Pods 4-6 cm. long; leaflets 1-2 cm. long.
 Pods 2-3 cm. long; leaflets 2-4 cm. long.
 Leaflets 5-11, rarely 13.
 Racemes much longer than the leaves.
 Racemes scarcely exceeding the leaves.
 Leaflets not paler beneath.
 Leaflets paler and more densely pubescent beneath.
 Pods 6-8-seeded, not strongly torulose; beak stout.
 Leaflets of a lanceolate type, 2-4 cm. long, mostly acute.
 Leaflets oval or elliptic, rounded or obtuse, 1-2 cm. long.
 Pods 3-4-seeded.
 Pods not strongly torulose; beak stout.
 Pods strongly torulose; beak slender.
- X. TINCTORIAE
- Pods 2.5-6 cm. long, 6-12-seeded.
 Leaflets green above; racemes shorter than the leaves.
 Pods slightly curved, about 2 mm. wide; leaflets usually glabrous above.
 Pods more curved, forming one fourth or one third of a circle, about 3 mm. wide; leaflets somewhat strigose above.
 Leaflets canescent on both sides.
 Pods 2.5-3 mm. broad, elliptic in cross-section; racemes longer than the leaves.
 Pods 4-5 mm. broad, sub-rhombic in cross-section; racemes shorter than the leaves.
 Pods usually less than 2.5 cm. long, 3-7-seeded.
 Leaflets oblong to oval.
 Pods distinctly curved.
 Leaflets narrowly linear-oblanccolate.
 Leaflets oblanceolate or obovate to oblong or elliptic.
 Pods usually 2 cm. long or more; racemes in fruit equaling the leaves; leaflets silvery-white on both sides.
 Pods 1.5-2 cm. long; racemes shorter than the leaves; leaflets usually green at least above.
 Leaflets of the upper leaves usually 11-17, sparingly strigose or glabrate above.
 Leaflets of the upper leaves 7-9, rarely 11, almost equally strigose on both sides.
 Pods straight or nearly so; leaves densely white-strigose beneath, greener above.
 Pubescence of the pods, pedicels, petioles, and leaf-rachises short and spreading.
 Pubescence of the whole plant strictly appressed.
 Pods abruptly acute at the apex.
 Leaflets rounded at the base; pods 2 cm. long, about 6-seeded.
 Leaflets acute at the base; pods less than 1 cm. long, 2-4 seeded.
 Pods gradually tapering at the apex.
 Leaflets obovate, silvery-silky.

XI. DISPERMAE

- Pods usually 2-seeded.
 Leaflets 9-21.
 Leaflets 15-21, oblong or rarely oblanceolate; pods nearly terete, 2-2.5 mm. thick.
 Racemes much shorter than the leaves; pods straight.
 Leaves strigose on both sides; pods 2 mm. thick.
 Leaves glabrous or glabrate above; pods 2.5 mm. thick.
 Racemes about equaling the leaves; pods slightly curved.

17. *I. mucronata*.
 18. *I. keyensis*.
 19. *I. Rosei*.
 20. *I. constricta*.
 21. *I. costaricensis*.
 22. *I. salmoniflora*.
 30. *I. tinctoria*.
 23. *I. Purpusi*.
 24. *I. Thibaudiana*.
 25. *I. Langlassei*.
 26. *I. cuernavacana*.
 27. *I. lancifolia*.
 28. *I. discolor*.
 40. *I. Conzattii*.
 29. *I. panamensis*.
 30. *I. tinctoria*.
 31. *I. sumatrana*.
 36. *I. fruticosa*.
 37. *I. Nelsonii*.
 32. *I. Kurtzii*.
 33. *I. Lindheimeriana*.
 34. *I. suffruticosa*.
 35. *I. truxillensis*.
 38. *I. Palmeri*.
 39. *I. pueblensis*.
 42. *I. guatemalensis*.
 40. *I. Conzattii*.
 41. *I. argentea*.
 43. *I. densiflora*.
 44. *I. montana*.

- Leaflets 9-13, obovate or oblanceolate; pods flattened, fully 3 mm. broad, somewhat reticulate. 45. *I. caroliniana*.
 Leaflets 3-9. 46. *I. tumidula*.
 Pods usually 1-seeded.
 Pods globose or rounded-ovoid; lateral leaflets oblong or oblong-ob-lanceolate.
 Leaflets equally grayish-strigose on both sides. 47. *I. jalisicensis*.
 Leaflets green and glabrous above. 48. *I. sphaerocarpa*.
 Pods oblong, truncate at both ends; leaflets obovate. 49. *I. sphinctosperma*.
- XII. PLATYCARPAE
- Leaflets green, not silvery-canescens; valves of the pod not at all keeled. 50. *I. platycarpa*.
 Leaflets silvery-canescens; valves of the pod slightly keeled. 37. *I. Nelsonii*.

I. **Hirsutae**. Annual or biennial herbs, villous-hirsute with brown hairs. Leaflets 5-11, loosely pubescent on both sides. Calyx-lobes subulate, several times as long as the tube, the lowest one the longest, long-villous. Banner orbicular-obovate; wings narrowly oblanceolate; keel-petals obliquely oblanceolate, rounded at the apex; lateral spurs acute. Pod linear, straight, densely villous with dark-brown hairs. Seeds bluntly prismatic.

1. *Indigofera hirsuta* L. Sp. Pl. 751. 1753.

Indigofera ferruginea Schum. & Thonn. Guin. Pl. 370. 1827.

Indigofera fusca G. Don, Gen. Hist. 2: 211. 1832.

Anita hirsuta Kuntze, Rev. Gen. 160. 1891.

An annual or biennial; stem 5-12 dm. high, brown, villous-hirsute with brown hairs; stipules subulate-setaceous, 5-10 mm. long, villous; leaves 1-1.5 dm. long, the rachis and petiole villous; leaflets 5-11, membranous, loosely pubescent on both sides, gray-green beneath, obovate, 2-3.5 cm. long; spikes longer than the leaves, rather densely many-flowered; bracts subulate-setaceous; pod with rather strong sutures, about 2 cm. long, 2 mm. wide, 6-8-seeded; seeds 1.5 mm. long, 1 mm. wide, slightly pitted.

TYPE LOCALITY: India.

DISTRIBUTION: St. Vincent; also in Guiana and Brazil; naturalized from the tropics of the Old World.

ILLUSTRATIONS: Jacq. Ic. Pl. Rar. pl. 509; Hook. Comp. Bot. Mag. pl. 24; Rheede, Hort. Mal. 9: pl. 30; Beauv. Fl. Oware pl. 119; Lam. Tab. Encyc. pl. 626, f. 3.

II. **Viscosae**. Herbs, somewhat woody at the base, glandular-hirsute. Leaflets 7-13, strigose, glaucescent beneath. Calyx-teeth subulate, twice as long as the tube. Banner broadly obovate; wings obliquely oblanceolate, with a small basal auricle; keel-petals obliquely cuneate; lateral spurs sac-like, obtuse. Pod linear, straight, glandular-hirsute. Seeds rounded-prismatic.

2. *Indigofera viscosa* Lam. Encyc. 3: 247. 1789.

Indigofera inquinans Willd. Sp. Pl. 3: 1236. 1803.

Stem 3-10 dm. high, erect or spreading, in age somewhat woody at the base, densely glandular-hirsute as well as strigose; stipules subulate-setaceous, 2-3 mm. long; leaves 2-5 cm. long, the petiole and rachis glandular-hirsute and strigose; leaflets 7-13, membranous, elliptic or the terminal one obovate, 5-8 mm. long, pale-green above, with somewhat curved hairs less than 0.5 mm. long, glaucescent beneath, strigose with straight hairs nearly 1 mm. long; spikes about equaling the leaves, 3-12-flowered; calyx about 2 mm. long, strigose; corolla about 4 mm. long, bright-red; pod terete, 1.5-2.5 cm. long, 1.5 mm. thick, 8-12-seeded, faintly tomentose; seeds about 1 mm. long, truncate at the ends.

TYPE LOCALITY: Described from cultivated specimens.

DISTRIBUTION: Hispaniola; also in the East Indies, Malay islands, northern Australia, and tropical Africa.

ILLUSTRATIONS: Pluk. Phyt. pl. 166, f. 3 (?); Wight, Ic. Pl. Ind. pl. 404.

III. **Parviflorae**. Annuals, with strigose stems. Leaflets linear or narrowly oblanceolate, strigose. Banner obovate, sessile; wings broadly obliquely oblanceolate, rounded at the apex, with a rather large acute basal auricle; keel-petals with a lanceolate blade ending in a long beak; lateral spurs represented by a shallow pouch. Pod linear, subterete, strigose. Seeds subcubic, with rounded angles.

3. *Indigofera parviflora* Heyne; Wight & Arn. Prodr.

Fl. Ind. 201. 1834.

Indigofera deflexa Hochst.; A. Rich. Tent. Fl. Abyss. 1: 178. 1847.*Indigostrum deflexum* Jaub. & Spach, Illust. Pl. Orient. pl. 492. 1857.

An annual; stem 3-10 dm. high, branched, strigose; stipules subulate, 2 mm. long; leaves ascending, 3-4 cm. long; leaflets 7-9, linear or narrowly oblanceolate, opposite, 1-2 cm. long, strigose, acute at both ends; racemes very short and dense, rather few-flowered; calyx 3 mm. long, its teeth subulate, slightly longer than the tube; corolla lilac, 6 mm. long; pod 2.5-4 cm. long, 2 mm. thick, strigose, slightly upcurved at the abruptly acute apex, 15-20-seeded; seeds 1.5 mm. long.

TYPE LOCALITY: Mysore, India.

DISTRIBUTION: On ballast, Mobile, Alabama; native of the East Indies, northern Australia, Arabia, and Africa.

ILLUSTRATION: Jaub. & Spach, Illust. Pl. Orient. pl. 492.

IV. *Hendecaphyllae*. Annuals or biennials. Leaflets 7-11, green and glabrous above, strigose beneath, often alternate, petiolulate. Calyx-teeth about 3 times as long as the tube. Banner suborbicular; wings with a broad acute basal auricle; keel-petals obliquely oblanceolate, obtuse; lateral spurs acute. Pod linear, strigose, slightly 4-angled, gradually tapering at the apex.

4. *Indigofera hendecaphylla* Jacq. Coll. 2: 358. 1788.*Indigofera endecaphylla* Beauv. Fl. Oware 2: 44. 1807.

An annual or biennial; stem erect to procumbent, 3-10 dm. high, sparingly strigose or subglabrous; stipules lanceolate, acuminate, membranous, 6-8 mm. long, persistent; leaves 2.5-6 cm. long, short-petioled, the rachis strigose; leaflets 7-11, oblanceolate or oblong-oblanceolate, 1-2.5 cm. long, obtuse or rounded and mucronate at the apex; racemes dense, 3-10 cm. long, many-flowered; corolla 5-6 mm. long, salmon-pink to light-scarlet; pod reflexed, linear, 1.5-2.5 cm. long, 2 mm. thick, 6-8-seeded; seeds 1.5 mm. long, 1 mm. thick.

TYPE LOCALITY: Guinea.

DISTRIBUTION: Guadeloupe, naturalized; native of tropical Africa, East Indies, and China.

ILLUSTRATIONS: Jacq. Ic. Pl. Rar. pl. 570; Bot. Reg. 10: pl. 789; Beauv. Fl. Oware pl. 84.

V. *Microcarpae*. Low decumbent suffruticose plants. Leaflets 5-9, conspicuously punctate beneath. Calyx-teeth subulate, twice as long as the tube. Banner obovate, with a short claw; wings linear-oblanceolate, with a small basal auricle; keel-petals oblanceolate, obtuse; lateral spur small, pouch-like. Pod linear, torulose, 2-7-seeded, pubescent with curved, in age spreading hairs. Seeds nearly cubic, with rounded edges.

5. *Indigofera sabulicola* Benth. in Mart. Fl. Bras. 15¹: 40. 1859.*Indigofera domingensis* Griseb. Cat. Fl. Cub. 69. 1866. Not *I. domingensis* Spreng. 1825.*Dalea-lephrosioides* Griseb. Cat. Fl. Cub. 69. 1866.

A perennial, more or less shrubby herb; stem 3-5 dm. long, procumbent, canescent-strigose, in age glabrate; stipules subulate, 5 mm. long; leaves 2-3 cm. long, the rachis and petioles strigose; leaflets 7-9, cuneate or obovate, rounded or retuse at the apex, 8-12 cm. long, canescent-strigose on both sides; peduncles 1-2 cm. long; spikes short and dense; bracts subulate, shorter than the calyx; calyx 4 mm. long, canescent; corolla purplish or blue, 7 mm. long; pod nearly straight, 8-12 mm. long, nearly 2 mm. thick, somewhat tomentose, 4-7-seeded; seeds about 1 mm. long.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Veracruz and Guerrero; Cuba; also from northern South America to Brazil and Paraguay.

6. *Indigofera domingensis* Spreng.; DC. Prodr. 2: 227. 1825.

A perennial herb, suffruticose at the base; stems decumbent, densely caespitose, with short, more or less spreading hairs, 3-5 dm. long; stipules subulate, 3-4 mm. long; leaves 1-2 cm. long; rachis and petiole canescent as the stem; leaflets 7-9, obovate, 3-5 mm. long, canescent,

almost white on both sides, conspicuously punctate beneath; peduncles 1-2 cm. long; spikes dense, 1-2 cm. long, 6-10-flowered, often exceeding the leaves; calyx 3 mm. long, canescent; corolla apparently very similar to that of the preceding; pod straight, linear-cylindric, acute at both ends, 6-8 mm. long, 2 mm. thick, 3- or 4-seeded; seeds 1 mm. long.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Santo Domingo.

VI. *Lespedezoides*. Shrubs or undershrubs. Leaves strongly ascending, with rather conspicuous stipels, the lower and sometimes all unifoliolate, the upper usually 3-7-foliolate, with silky-strigose, narrow, subsessile leaflets. Calyx-lobes lance-subulate, much exceeding the tube in length. Banner obovate, short-clawed; wings and keel-petals obliquely oblanceolate; lateral spurs of the latter short, acute. Pod linear, cylindric, abruptly acute. Seeds subprismatic.

7. *Indigofera lespedezoides* H.B.K. Nov. Gen. & Sp. 6:
457. 1823.

Indigofera grisea Desv. Ann. Sci. Nat. 9: 410. 1826.

Indigofera Humboldtiana Spreng. Syst. 3: 276. 1826.

Indigofera mucronata Willd.; Spreng. Syst. 3: 276, as synonym. 1826.

? *Indigofera pascuorum* Benth. Ann. Nat. Hist. 3: 431. 1839.

Indigofera Pohliana Benth. Ann. Nat. Hist. 3: 431. 1839.

Anila lespedezoides Kuntze, Rev. Gen. 160. 1891.

Indigofera Acazoniticae Brand Univ. Calif. Publ. Bot. 7: 326. 1920.

A shrub or at least shrubby at the base, with a thick root; stem 1-20 dm. high, branched, erect, somewhat angled at first, strigose; stipules lanceolate, acuminate, 3-5 mm. long; leaves ascending, 4-10 cm. long, short-petioled; rachis grooved above; stipel present, subulate, minute; leaflets 3-7 (or the lower leaves and rarely all 1-foliolate), oblong to cuneate or obovate, 1-4 cm. long, 5-15 mm. wide, strigose on both sides, varying from acute to rounded or slightly emarginate, often mucronate at apex, cuneate at the base; racemes at first densely flowered and shorter, in fruit somewhat longer than the leaves; calyx 3 mm. long, canescent; corolla rose-colored, 6-7 mm. long; banner obovate, short-clawed; pod 2-3 cm. long, 2 mm. wide, 8-10-seeded; seeds 1.5-2 mm. long, 1 mm. thick.

TYPE LOCALITY: Mountain of Jorullo, Michoacan.

DISTRIBUTION: Jamaica; Cuba; Hispaniola; southern Mexico to Bolivia and Brazil.

ILLUSTRATION: Mart. Fl. Bras. 15: pl. 5.

VII. *Leptosepalae*. Perennials, suffruticose at the base, with a thick woody root and short caudex. Leaves spreading; leaflets 3-11, often alternate, sometimes even in number, acute at the base. Calyx-teeth subulate, 2-3 times as long as the tube. Banner rounded-oval or orbicular, short-clawed; wings obliquely oblanceolate or somewhat lunate, rounded at the apex, with a small acute basal auricle; keel-petals oblanceolate; lateral spur acute. Pod linear, cylindric or slightly 4-angled, tapering into a short beak. Seeds sub-prismatic, round-angled.

8. *Indigofera sphenoides* Rydberg, sp. nov.

A perennial; stems branching, decumbent, 3-4 dm. long, sparingly strigose; stipules subulate, 2 mm. long; leaves spreading, 2-3 cm. long; rachis and petiole strigose; leaflets 4-8 (the lower pair usually represented by a single leaflet), cuneate, 5-9 mm. long, truncate or retuse at the apex, sparingly strigose on both sides; racemes lax, 7-10 cm. long, bearing the flowers near the end; bracts subulate, shorter than the calyx; calyx strigose, 4-5 mm. long; corolla rose-purple, 7-8 mm. long; pod 2.5-3 cm. long, 2.5 mm. broad, straight, strigose, 6-9-seeded; seeds 2 mm. long, 1.5 mm. thick, grayish-brown, mottled.

Type collected at San Dieguito, San Luis Potosí, June 13-16, 1904, *Edward Palmer 95* (Gray Herbarium).

9. *Indigofera leptosepala* Nutt.; T. & G Fl. N. Am.

1: 298. 1838.

Indigofera cinerea Buckl. Proc. Acad. Phila. 1861: 451. 1861. Not *I. cinerea* Willd. 1803.*Indigofera texana* Buckl. Proc. Acad. Phila. 1861: 451. 1861.

A perennial, with a thick woody root and short caudex; stems several, decumbent or pro-cumbent, woody at the base, 3-10 dm. long, sparingly strigose; stipules subulate, about 5 mm. long; leaves spreading, 2-5 cm. long; rachis and petiole strigose; leaflets 5-9, oblanceolate and obtuse, or those of the earlier leaves sometimes 3, cuneate and rounded, truncate, or even slightly retuse, often mucronate at the apex, cuneate and subsessile at the base, equally strigose on both sides, 1-3 cm. long, 3-10 mm. wide; racemes lax, 5-15 cm., or in fruit even 20 cm. long, 6-15-flowered, bracts shorter than the calyx, subulate, caducous; calyx strigose, 8 mm. long; corolla pink, 10-11 mm. long; pod 2-3 cm. long, about 3 mm. broad, strigose, 6-9-seeded; seeds 2-2.5 mm. long, 1.5 mm. thick, light-brown.

TYPE LOCALITY: Plains of Arkansas.

DISTRIBUTION: Georgia and northern Florida to Kansas, Coahuila, and Tamaulipas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2116; ed 2, f. 2520.

10. *Indigofera nana* Rydberg, sp. nov.

A dwarf perennial, with a thick root; stems numerous, 1 dm. high or less, canescent; stipules subulate-setaceous, 4-5 mm. long; leaves spreading, 1-2 cm. long; rachis and petiole strigose; leaflets 7-11, cuneate or oblanceolate, rounded or obtuse at the apex, tapering at the base, 5-10 mm. long, canescent; racemes 3-4 cm. long, rather dense; bracts lance-subulate; calyx strigose; corolla pink, 8-9 mm. long; pod 2.5-3 cm. long, 3 mm. thick, rather abruptly acute, 10-12-seeded; seeds 2-2.5 mm. long, 1.5 mm. thick.

Type collected at Sanguato, near Morelia, Michoacán, June 24, 1910, *Fr. Arsdne* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Michoacán and Puebla.

11. *Indigofera argentata* Rydberg.*Indigofera leptosepala* var. A. Gray, Pl. Wright. 1: 45. 1852.

A perennial, with a woody root and short caudex; stem rect or nearly so, about 3 dm. high, branched, more or less white-strigose; stipules subulate, 5 mm. long; leaves spreading, 2-4 cm. long; rachis and the short petiole densely and loosely strigose; leaflets 5-9, linear-oblong to oblanceolate, 1-2 cm. long, 3-4 mm. wide, obtuse or rounded and mucronate at the apex, densely white-strigose on both sides; racemes 1-2 dm. long; bracts lance-subulate, acuminate, 2-3 mm. long, caducous; calyx strigose, 3.5-4 mm. long; corolla 6-7 mm. long; pod 15-23 mm. long, 2.5-3 mm. thick, densely white-strigose, 5-6-seeded.

Type collected at Sabinas, Coahuila, May 21, 1902, *E. W. Nelson 6833* (U. S. Nat. Herb. no. 37459).

DISTRIBUTION: Coahuila and western Texas.

12. *Indigofera brevipes* (S. Wats.) Rydberg, sp. nov.*Indigofera leptosepala brevipes* S. Wats, Proc. Am. Acad. 17: 342. 1882.

A perennial, with a thick root; stems several, branched, 1-3 dm. long, ascending or pro-cumbent, strigose; stipules subulate, 2-3 mm. long; leaves spreading, 2-4 cm. long; rachis and petiole strigose; leaflets 4-7, grayish-strigose on both sides, those of the lower leaves obovate or cuneate, obtuse or rounded at the apex, 0.5-1 cm. long, those of the later leaves oblanceolate and obtuse or acutish, 1-1.5 cm., rarely 2 cm. long; peduncles 1-2 cm. long, not exceeding the leaves; racemes few-flowered, dense and short; bracts subulate; corolla pinkish, 7-8 mm. long; pod 2-2.5 cm. long, 2 mm. thick, often somewhat curved, abruptly acute at the apex, 6-8-seeded; seeds 1.5 mm. long, 1 mm. thick. Perhaps grading into *I. miniata*.

TYPE LOCALITY: San Rafael Mountains, San Luis Potosí.

DISTRIBUTION: Southern Texas to Chihuahua, Durango, San Luis Potosí, and Tamaulipas.

13. *Indigofera miniata* Ortega, Dec. 98. 1798.

Indigofera ornithopodioides Schlecht. & Cham. *Linnaea* 5: 577. 1830. Not *I. ornithopodioides* Schum. 1827.

A perennial, with a thick woody root; stems several, branched, strigose, spreading or procumbent, 2-5 dm. long, slender, terete; stipules subulate, 2 mm. long; leaves spreading, 1-3 cm. long; rachis and petiole strigose; leaflets 5-9, linear-oblong or oblanceolate, 0.5-1.5 cm. long, acute, tapering at the base, subsessile, strigose-canescens on both sides; racemes lax, 3-8 cm. long; calyx canescent, 4-5 mm. long; corolla 5-7 mm. long, light-scarlet; pod 1-2 cm. long, 2 mm. thick, tapering into a stout beak, 4-8-seeded; seeds 1.5 mm. long, 1 mm. thick.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Subtropical Florida; Cuba; southern Texas to Veracruz and Morelos.

14. *Indigofera acutifolia* Schlecht. *Linnaea* 12: 282. 1838.

Indigofera leptosepala angustata S. Wats. *Proc. Am. Acad.* 17: 342. 1882. Not *I. angustata* E. Meyer, 1835.

A perennial, with a thick woody root; stems several, decumbent or ascending, 2-5 dm. long, terete, strigose; stipules subulate-setaceous, 4-5 mm. long; leaves spreading, 3-4 cm. long; leaflets 5-16, linear or narrowly oblanceolate, acute at both ends or obtusish at the apex, 8-20 mm. long, 2-4 mm. wide, glabrous above, strigose beneath; racemes 4-8 cm. long, lax; calyx 5-6 mm. long; corolla rose-colored, 8-9 mm. long; pod about 1.5 cm. long, nearly 2 mm. thick, straight, gradually tapering at the apex, 5-6-seeded.

TYPE LOCALITY: Grande [Hidalgo].

DISTRIBUTION: Coahuila to San Luis Potosí, Hidalgo, and Durango.

15. *Indigofera Hartwegii* Rydberg.

Indigofera mexicana Benth. *Pl. Hartw.* 286. 1848. Not *I. mexicana* L. f. 1781.

A perennial, with a thick root and short woody caudex; stem woody at the base, ascending, 1-3 dm. long, somewhat angled, striate, branched; stipules fuscous, subulate or lanceolate, 2-3 mm. long; leaves spreading, 1-2 cm. long; rachis and petiole strigose; leaflets 5-9, oblanceolate or cuneate, 5-10 mm. long, 2-4 mm. wide, cuneate at the base, sessile, rounded or obtuse, and mucronate at the apex, glabrous or very sparingly strigose above, grayish-strigose beneath; peduncle 1-2 cm. long; racemes short and dense; bracts lanceolate-subulate, fuscous, deciduous, shorter than the calyx; calyx strigose, 4 mm. long; corolla 6-7 mm. long; pod straight, 1.5-2 cm. long, 2.5 mm. thick, strigose, tapering at the apex, 6-12-seeded; seeds 2 mm. long, fully 1 mm. thick.

TYPE LOCALITY: León [Guanajuato].

DISTRIBUTION: Jalisco and Guanajuato to Oaxaca and Chiapas.

VIII. *Mucronatae*. Plants suffrutescent below. Leaflets mostly 5, distinctly petiolulate, rounded at both ends, thin. Calyx-teeth narrowly subulate, fully twice as long as the tube. Banner broadly obovate, sessile; wings oblanceolate with a small basal auricle, short-clawed; keel-petals obliquely oblanceolate; lateral spurs acute or obtuse. Pod slender, sub-tetragonous, gradually tapering into a stout beak. Seeds prismatic.

16. *Indigofera laevis* Rydberg, sp. nov.

A perennial, shrubby below; stem branched, probably 1 m. high; branches straw-colored, sparingly strigose; stipules subulate-setaceous, 3 mm. long; leaves 4-6 cm. long, spreading; rachis and petiole sparingly strigose; leaflets mostly 5, short-petioluled, elliptic or oval, mucronate, rounded at each end, 1.5-3 cm. long, light-green, glabrous above, sparingly strigose beneath; racemes 1-1.5 dm. long, lax; bracts lance-subulate, deciduous, 1-2 mm. long; calyx about 3 mm. long, strigose, the lobes subulate, twice as long as the tube; corolla 4-6 mm. long; pod reflexed, slightly curved, 3-4 cm. long, 2 mm. wide, gradually acuminate at the apex, bluntly 4-angled, sparingly strigose, 8-10-seeded.

Type collected among rocks and bushes in the mountains near Guaymas, Sonora, in 1887, Edward Palmer 296 (Gray Herbarium).

17. *Indigofera mucronata* Spreng.; DC. Prodr. 2: 227. 1825.

Galega frutescens Mill. Gard. Dict. ed 8. Galea no. 5. 1768. Not *Indigofera frutescens* L.f. 1789.

Tephrosia frutescens DC. Prodr. 2: 256. 1825.

Indigofera jamaicensis Spreng. Syst. 3: 277. 1826.

Indigofera subulata Griseb. Fl. Brit. W. Ind. 181. 1859. Not (?) *I. subulata* Vahl, 1813.*

? *Indigofera heterophylla* Presl, Abh. Böhm. Ges. Wiss. V. 3: 55. 1844. Not *I. heterophylla* Thunb. 1794.

Indigofera flaccida Koenig; Roxb. Fl. Ind. 3: 375. 1832.

Indigofera tephrosioides M. Micheli, Bull. Soc. Bot. Belg. 30: 286. 1891.

Suffrutescent below; stem procumbent or spreading over bushes, often 1-2 m. long, more or less angled, sparingly strigose; stipules subulate-setaceous; leaves 6-10 cm. long, the rachis and petiole sparingly strigose; leaflets usually 5, sometimes 7, thin, green, sparingly strigose on both sides, elliptic or oval, petioluled, rounded at both ends, mucronate, 1-4 cm. long; racemes lax, elongate, in flower often 1 dm. long, in fruit often 2 dm. long; calyx 3 mm. long, strigose; corolla pink, about 6 mm. long; banner suborbicular; pod reflexed, straight or somewhat curved, 2.5-4 cm. long, sparingly strigose, many-seeded; seeds 1.5-1.75 mm. long, less than 1 mm. thick.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Cuba; Jamaica; southern Mexico to Colombia and Venezuela; apparently also in the East Indies.

ILLUSTRATION: Wight, Ic. Pl. Ind. Or. pl. 387.

18. *Indigofera keyensis* Small, Fl. Fla. Keys 63, 155. 1913.

Stem decumbent, branched, 3-5 dm. long, slender, sparingly strigose; leaves 2-3 cm. long; stipules subulate, 3-4 mm. long; rachis and petiole strigose; leaflets mostly 5, oval to elliptic, mostly rounded at each end, sparingly strigose on both sides, 8-20 mm. long, mucronate; racemes 5-8 or in fruit sometimes up to 12 cm. long, lax; calyx 2.5-3 mm. long; teeth subulate, slightly longer than the tube; corolla about 4 mm. long; banner orbicular, with a very short claw; lateral spur of the keel-petals ovate, obtuse; pod 3-4 cm. long, about 1.5 mm. wide, strigose, somewhat arcuate, abruptly acute, with a slender beak; seeds brown, sub-prismatic, bluntly 4-angled, 2 mm. long, 1 mm. thick.

TYPE LOCALITY: Lower Metacumbe Key, Florida.

DISTRIBUTION: Keys of Florida.

19. *Indigofera Rosei* Rydberg, sp. nov.

Stem erect, shrubby at the base, terete, sparingly strigose, 3-5 dm. high; leaves 3-4 cm. long; stipules subulate, 2-3 mm. long; rachis and petiole sparingly strigose; leaflets 3-5, oval or elliptic, rounded at each end, mucronate, 1-2.5 cm. long, sparingly strigose; racemes 5-10 cm. long, lax; calyx about 3 mm. long, strigose; teeth subulate, a little longer than the tube; corolla purplish, 4 mm. long; pod linear, somewhat arched, 3-3.5 cm. long, 1.5 mm. wide, abruptly acute, 8-10-seeded.

Type collected near San Juan Capistrano, Zacatecas, August 22, 1897, *J. N. Rose 2480* (herb. N. Y. Bot. Garden).

DISTRIBUTION: Zacatecas to Puebla.

20. *Indigofera constricta* Rydberg.

Indigofera torulosa H. & A. Bot. Beechey Voy. 286. 1836. Not *I. torulosa* E. Meyer, F 1836.

Suffruticose below; stem terete, erect, sparingly strigose; stipules subulate-setaceous; leaves 5-8 cm. long; rachis sparingly strigose; leaflets 7-13, oval or elliptic, 15-25 mm. long, strigose on both sides, paler beneath, mucronate; racemes equaling or longer than the leaves; calyx-lobes subulate, longer than the tube; pod straight, ascending or spreading, 6-10-seeded, 2.5-4.5 cm. long, 2 mm. thick, strongly constricted between the seeds, abruptly contracted into a slender beak 2 mm. long; seeds prismatic, 2.5 mm. long.

TYPE LOCALITY: Tepic.

DISTRIBUTION: Tepic and Guerrero.

* In the original description, Vahl's species (see Poir. in Lam. Encyc. Suppl. 3: 150. 1813) was described as having simple or trifoliate leaves and a raceme nearly as long as the leaves, and came from Guinea.

IX. *Thibaudiana*. Shrubs. Leaflets distinctly petiolulate. Calyx more or less ferruginous-strigose; teeth lanceolate or deltoid, not exceeding the tube in length. Banner rounded-obovate, sessile, usually densely ferruginous-strigose on the back when young; wings obliquely oblanceolate, with a rounded thick basal auricle; keel-petals obliquely oblanceolate; lateral spurs acute. Pod linear, sub-cylindrical, usually slightly flattened, gradually acuminate into a stout, rather long median beak. Seeds terete or round-angled, truncate at both ends.

21. *Indigofera costaricensis* Benth. Vidensk. Meddel.

1853: 5. 1853.

A shrub; branches angled, glabrous or nearly so; stipules setaceous, about 5 mm. long; leaves ascending, 7-15 cm. long; petiole and rachis sparingly strigose; leaflets 11-15, rarely 9, with subulate stipels, distinctly petiolulate, elliptic, mucronate, 1.5-3 cm. long, glabrous above, strigose beneath; racemes densely many-flowered, shorter than the leaves; bracts setaceous, caducous; calyx 2 mm. long, ferruginous-sericeous, the teeth lanceolate, shorter than the tube; corolla brownish-white, tinged with pink, 5-6 mm. long; pod about 3 cm. long, 10-12-seeded.

TYPE LOCALITY: San José, Costa Rica.

DISTRIBUTION: Costa Rica.

22. *Indigofera salmoniflora* Rose, Contr. U. S. Nat.

Herb. 5: 140. 1897.

A shrub, about 1 m. high; stem somewhat angled, strigose; stipules setaceous, 5 mm. long; leaves spreading, 7-15 cm. long; rachis and petiole strigose, grooved above; leaflets 7-9, elliptic or oval, 2-5 cm. long, mucronate, glabrous above, grayish-strigose beneath; racemes many-flowered, about equaling the leaves; calyx 2 mm. long; corolla 6 mm. long, salmon-pink; wings almost linear, with a rather large broadly deltoid basal auricle; pod spreading, 3.5-4 cm. long, 2 mm. wide, nearly straight, strigose, 10-12-seeded; seeds 2 mm. long.

TYPE LOCALITY: Ymalá, Sinaloa.

DISTRIBUTION: Sinaloa.

23. *Indigofera Purpusi* Brand. Univ. Calif. Publ.

Bot. 6: 499. 1919.

Indigofera cacuapana Rydberg, in herb.

A shrub, 5 dm. high or more; branches terete, strigose; stipules subulate, 2-3 mm. long; leaves 5-10 cm. long; rachis and petiole strigose, channeled above; leaflets 21-31, distinctly petioluled, elliptic, rounded at both ends, cuspidate, 1-2 cm. long, grayish-strigose on both sides; racemes short, in fruit 4-10 cm. long; calyx 2 mm. long; corolla unknown; pod nearly straight, 4-6 cm. long, 2 mm. thick, sparingly strigose, about 10-seeded; seeds round-angled, 2.5 mm. long, fully 1 mm. thick.

TYPE LOCALITY: Barranca de Tenampa, Veracruz.

DISTRIBUTION: Veracruz and Federal District to Oaxaca.

24. *Indigofera Thibaudiana* DC. Prodr. 2: 225. 1825.

Indigofera sp. Schlecht. & Cham. Linnæa 5: 577. 1830.

Indigofera excelsa Mart. & Gal. Bull. Acad. Brux. 10: 45. 1843.

Indigofera Chamissoniana D. Dietr. Syn. Pl. 4: 1041. 1847.

A shrub, 4-6 m. high; branches angled, strigose; stipules setaceous, 5 mm. long; leaves 1-2 dm. long, spreading; rachis and petiole strigose; leaflets 21-27, oblong, 2-4 cm. long, strigose on both sides, paler beneath, mucronate; racemes densely many-flowered, 1 dm. long or in fruit sometimes 2 dm. long; calyx 2 mm. long, ferruginous-strigose; corolla 8-9 mm. long; pod linear-cylindric, 2-3 cm. long, 2 mm. thick, 6-8-seeded; seeds almost terete, 2 mm. long, 1.5 mm. thick, light-brown.

TYPE LOCALITY: Unknown (that of *I. excelsa*: Juquila, Oaxaca).

DISTRIBUTION: San Luis Potosí to Tepic, Oaxaca, and Guatemala.

25. *Indigofera Langlassei* Rydberg, sp. nov.

A shrub, 1.5 m. high; branches terete, brownish, nearly glabrous; stipules subulate-setaceous; leaves 5-12 cm. long, spreading; rachis and petioles slightly strigose; leaflets 5-9, broadly oval, 2-3.5 cm. long, 1-2 cm. wide, rounded at each end, mucronate, thin, green on both sides but slightly paler beneath, sparingly strigose on both sides; racemes lax, 1-2 dm. long; bracts subulate, about equaling the pedicels; calyx 2 mm. long; corolla 7 mm. long; pod 2.5-3 cm. long, 2 mm. thick, 7-8-seeded; seeds fully 2 mm. long and 1 mm. thick, round-angled.

Type collected in Sierra Madre, Guerrero or Michoacan, November 11, 1898, *Langlasse 609* (U. S. Nat. Herb. no. 385535).

DISTRIBUTION: Sinaloa to Guerrero.

26. *Indigofera cuernavacana* Rose, Contr. U. S.

Nat. Herb. 5: 140. 1897.

A shrub, 5-12 dm. high; branches strigose, somewhat angled; stipules subulate-setaceous, 4-5 mm. long; leaves spreading, 8-12 cm. long; rachis and petiole sparingly strigose, grooved above; leaflets elliptic or oval, acutish to rounded, mucronate, 2-3 cm. long, 1.5-2 cm. wide, rather thin, green and sparingly strigose on both sides; racemes many-flowered, shorter than the leaves; calyx 2 mm. long; corolla 6 mm. long; pod about 2.5 cm. long and 2 mm. thick, strigose, 6-7-seeded; seeds 2 mm. long, 1 mm. thick, round-angled.

TYPE LOCALITY: Cuernavaca, Morelos.

DISTRIBUTION: Morelos and Guerrero.

27. *Indigofera lancifolia* Rydberg, sp. nov.

A shrub; branches terete, grayish or ferruginous-strigose; stipules subulate-setaceous, 3-4 mm. long; leaves spreading, 8-12 cm. long; rachis and petiole strigose, grooved above; leaflets 5-7, lanceolate or oblong-lanceolate, acute and mucronate, 2-4 cm. long, 1-2 cm. wide, dark-green and sparingly strigose above, pale and densely strigose beneath; racemes 4-5 cm. long; calyx about 2 mm. long, its teeth deltoid, equaling the tube; corolla 7 mm. long; pod 4.5-5.5 cm. long, less than 2 mm. thick, about 10-seeded; seeds 3 mm. long, 1 mm. wide, somewhat 4-angled, rounded-rhombic in cross-section.

Type collected in the vicinity of Acapulco, Guerrero, October 1894 to March 1895, *Edward Palmer 251* (U. S. Nat. Herb. no. 266504).

28. *Indigofera discolor* Rydberg, sp. nov.

A shrub; branches terete, brown, strigose becoming glabrate; stipules small, subulate; leaves spreading, 4-5 cm. long; rachis and petiole strigose, grooved above; leaflets 5-7, oval, elliptic, or obovate, rounded and mucronate at the apex, 1-2 cm. long, 5-10 mm. wide, green and sparingly strigose above, pale and densely strigose beneath; racemes about 5 cm. long; calyx 2 mm. long; corolla unknown; pod 4 cm. long, less than 1.5 mm. thick, 7-8-seeded; seeds 2.5 mm. long, 1 mm. thick, round-angled.

Type collected at Lodiago, Sinaloa, October 9-25, 1891, *Edward Palmer 1634* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Type locality and vicinity; apparently also near Cordoba, Veracruz.

29. *Indigofera panamensis* Rydberg, sp. nov.

A shrub, about 2 m. high; branches terete, grayish-strigose; stipules subulate, 1-2 mm. long; leaves spreading, 3-5 cm. long; rachis and petiole grayish-strigose; leaflets 7-11, distinctly petioluled, oblanceolate, 1-2 cm. long, 5-8 mm. wide, obtuse and mucronate at the apex, cuneate at the base, green and sparingly strigose above, pale and densely strigose beneath; racemes 3-4 cm. long; calyx less than 2 mm. long; corolla unknown; pod slightly curved, about 2 cm. long, 1.5 mm. thick, tapering into a long slender beak, strongly torulose, 3-4-seeded; seeds 2.5 mm. long, fully 1 mm. thick, round-angled.

Type collected in the vicinity of Penonome, Panama 1918, *R. S. Williams 123* (herb. N. Y. Bot. Gard.).

X. *Tinctoriae*. Shrubs. Leaflets distinctly petiolulate, usually thin. Racemes densely flowered. Calyx 1-1.5 mm. long, usually densely ferruginous-strigose; teeth deltoid or lanceolate, not much exceeding the tube in length. Banner obovate, sessile, densely ferruginous-strigose on the back when young; wings spatulate or oblanceolate, with a rounded or acute basal auricle, short-clawed; keel-petals obliquely oblanceolate; lateral spurs acute. Pod linear, often somewhat arcuate, abruptly contracted at the apex into a short slender beak nearer the upper edge, somewhat flattened, 4-12-seeded. Seeds subprismatic, round-angled, truncate at both ends.

30. *Indigofera tinctoria* L. Sp. Pl. 751. 1753.

Indigofera tinctoria macrocarpa DC. Prodr. 2: 224, in part. 1825.

Anil tinctoria normalis Kuntze, Rev. Gen. 160. 1891.

A shrub, 1-2 m. high; branches terete or slightly angled, more or less strigose; stipules subulate-setaceous, 2-3 mm. long; leaves 5-10 cm. long, spreading; leaflets 9-15, distinctly petioluled, obovate or oval, rounded and mucronate at the apex, obtuse or acute at the base, 1-2.5 cm. long, 6-15 mm. wide, usually glabrous above, strigose beneath; racemes 3-7 cm. long, usually shorter than the leaves; calyx 1.5 mm. long; corolla reddish-yellow, 5-6 mm. long; wings spatulate; pod linear-cylindric, usually 3-3.5 cm. long, 2 mm. broad, slightly curved towards the apex, 8-12-seeded; seeds 2 mm. long, 1.5 mm. thick.

TYPE LOCALITY: India.

DISTRIBUTION: Subtropical Florida; West Indies; escaped from cultivation and naturalized; native of southern India.

ILLUSTRATIONS: Rheede, Hort. Mal. 1: pl. 54; E. & P. Nat. Ph. 3: f. 115, A-D; Baillon, Hist. Pl. 2: f. 160.

31. *Indigofera sumatrana* Gaertn. Fruct. 2: 317. 1791.

Indigofera indica Lam. Encyc. 3: 245. 1789. Not *I. indica* Mill. 1768.

Indigofera tinctoria Lunan, Hort. Jam. 1: 419. 1814.

Indigofera tinctoria macrocarpa DC. Prodr. 2: 224, in part. 1825.

A shrub, 1-2 m. high; branches somewhat angled, strigose; stipules subulate, 2 mm. long; leaves 5-8 cm. long, spreading; leaflets 7-11, distinctly petioluled, obovate, rounded and mucronate at the apex, cuneate or acute at the base, 1-2.5 cm. long, strigose on both sides; racemes 3-8 cm. long; calyx 1.5 mm. long, strigose; corolla reddish-orange, 5 mm. long; pod 3-4 cm. long, 3 mm. wide, sickle-shaped, abruptly acute, 8-12-seeded; seeds 2 mm. long, 1.5 mm. thick.

TYPE LOCALITY: (Not given, but by inference) Sumatra.

DISTRIBUTION: Jamaica to Virgin Islands and St. Kitts; also in Venezuela; cultivated and naturalized; native from northern India to Formosa and the Dutch East Indies.

ILLUSTRATIONS: Gaertn. Fruct. pl. 148; Lam. Tab. Encyc. pl. 626, f. 1; Sloane, Hist. Jam. pl. 179, f. 2; Wight, Ic. Pl. Ind. Or. pl. 365; Rumph. Amb. 5: pl. 80; Ehret, Trew & Vogel, Pl. Sel. pl. 53.

32. *Indigofera Kurtzii* (Kuntze) Harms(; Kuntze, Rev.

Gen. 3³: 51, as a synonym. 1898).

Indigofera Anil angustifolia Griseb. Symb. Fl. Arg. 99. 1879.

Anil Kurtzii Kuntze, Rev. Gen. 3³: 51. 1898.

A shrub, perhaps 1 m. high; branches angled, white-strigose; stipules subulate, 2 mm. long; leaves 5-10 cm. long, spreading; rachis and petiole slender, white-strigose, grooved above; leaflets 11-15, narrowly linear-oblanceolate, 2-3 cm. long, 2-3 mm. wide, acute at each end, strigose beneath, less densely so or glabrate above; racemes 8-12 cm. long, in fruit longer than the leaves; calyx a little more than 1 mm. long; corolla orange, 4 mm. long; pod arcuate, linear, slightly flattened, 2 cm. long, 5- or 6-seeded.

TYPE LOCALITY: Sierra Achala, Argentina.

DISTRIBUTION: Argentina; apparently also collected on St. Vincent by H. H. Smith.

33. *Indigofera Lindheimeriana* Scheele, *Linnæa* 21: 464.

1848.

A shrub, 5-10 dm. high or more; branches somewhat angled, densely strigose; stipules subulate-setaceous, 2 mm. long; leaves 7-12 cm. long; rachis and petiole densely strigose; leaflets 7-15, petioluled, obovate to elliptic, rounded and mucronate at the apex, acute at the base, 1-2 cm. long, 7-12 mm. wide, densely white-strigose on both sides; stipels present, minute, subulate; racemes in flower somewhat shorter than the leaves but in fruit longer; calyx densely strigose, 1.5 mm. long; corolla 6 mm. long; wings linear, oblique at the apex; pod terete, 2-2.5 cm. long, fully 2 mm. thick, somewhat arcuate, 5-7-seeded; seeds 2.5 mm. long, 1.5 mm. thick.

TYPE LOCALITY: Shores of Guadalupe River, at Indian Point, Texas.

DISTRIBUTION: Texas, Coahuila, and Nuevo León.

34. *Indigofera suffruticosa* Mill. *Gard. Dict.* ed. 8.*Indigofera* no. 2. 1768.

Indigofera tinctoria Mill. *Gard. Dict.* ed. 8. *Indigofera* no. 1. 1768. Not *I. tinctoria* L. 1753.

Indigofera Anil L. *Mant.* 272. 1771.

Indigofera divaricata Jacq. *Hort. Schoenbr. pl.* 365. 1798.

Indigofera Guatemala Lunan, *Hort. Jam.* 420. 1814.

Indigofera tinctoria brachycarpa DC. *Prodr.* 2: 224, in part. 1825.

Indigofera Anil polyphylla DC. *Prodr.* 2: 225. 1825.

Indigofera Comenzelo Moc. & Sesse; D.C. *Prodr.* 2: 225, as synonym. 1825.

Indigofera Anil drepanocarpa Berg, in Berg & Schmidt, *Darst. Offiz. Gew.* 4: 30d, in part. 1863.

Anila tinctoria vera Kuntze, *Rev. Gen.* 160. 1891.

A shrub, 0.5-2 m. high; branches strict, angled, strigose; stipules subulate-setaceous, 3 mm. long; leaves 8-15 cm. long; rachis and petiole densely strigose; leaflets 9-15, elliptic to obovate or oblanceolate, acute or obtuse and mucronate at the apex, acute at the base, 1.5-3.5 cm. long, decidedly strigose beneath, sparingly so, but usually glabrate in age above; racemes dense, 2-5 cm. long, much shorter than the leaves; calyx densely strigose, 1.5 mm. long; corolla orange, 5-6 mm. long; pod 1.5-2 cm. long, about 2 mm. broad, slightly flattened, strongly curved, 3-7-seeded; seeds 2 mm. long, 1 mm. thick. The cultivated plant is usually less pubescent than the wild one.

TYPE LOCALITY: (By inference) Jamaica.

DISTRIBUTION: Bermuda; South Carolina to Florida and Texas, south to Bolivia and Argentina; naturalized in tropical Africa, Asia, and Australia.

ILLUSTRATIONS: Jacq. *Hort. Schoenbr. pl.* 365; Berg & Schmidt, *Darst. Offiz. Gew.* 4: *pl.* 30d (as *I. tinctoria*); *Dict. Sci. Nat.* *pl.* 252; Descourt. *Fl. Ant.* 1: *pl.* 17; *Bot. Mag.* *pl.* 6506; *Cycl. Am. Hort.* *f.* 1133.

35. *Indigofera truxillensis* H. B. K. *Nov. Gen. & Sp.* 6:

456. 1823.

Indigofera tinctoria brachycarpa DC. *Prodr.* 2: 224, in part. 1825.

Indigofera Anil oligophylla DC. *Prodr.* 2: 225. 1825.

Anila tinctoria media Kuntze, *Rev. Gen.* 160. 1891.

A shrub, 5 dm. high or more, branched; branches angled, densely strigose; stipules subulate-setaceous, 3 mm. long; leaves 5-10 cm. long; leaflets 7-11, oblong to obovate, rounded at the apex, acute at the base, strigose on both sides, 1-2 cm. long; racemes dense, about 5 cm. long; calyx 1.5 mm. long; flowers like those of *I. suffruticosa*; pod 1.5-2 cm. long, 2-2.5 mm. broad, slightly arcuate, but less so than in the preceding, more gradually tapering at the apex, 3-6-seeded, mostly 4-seeded. Perhaps not distinct from *I. suffruticosa*, but so regarded by Prain & Baker (*Jour. Bot.* 40: 137. 1902).

TYPE LOCALITY: Truxillo, Peru.

DISTRIBUTION: Veracruz, Sonora, and Sinaloa; Panama; Jamaica; Porto Rico; St. Vincent; also from Colombia and Venezuela to Bolivia.

ILLUSTRATIONS: Sloane, *Hist. Jam.* *pl.* 176, *f.* 3; Ehret, Trew & Vogel, *Pl. Sel.* *pl.* 54.

36. *Indigofera fruticosa* Rose, *Contr. U. S. Nat. Herb.* 5:

140. 1897.

A shrub, 1-1.5 m. high; branches terete, densely strigose and slightly glandular-hispidulous; stipules subulate-setaceous, 2 mm. long; leaves spreading, 4-7 cm. long; rachis and petiole

densely strigose and somewhat glandular-hispid, especially at the bases of the leaflets; leaflets 7-11, elliptic, rounded or obtuse and mucronate at the apex, acutish at the base, 8-15 mm. long, densely silvery-strigose on both sides; racemes 8-12 cm. long, strict, longer than the leaves; calyx 2 mm. long; corolla unknown; pod 3-4 cm. long, 2.5-3 mm. wide, slightly arcuate, 8-10-seeded; seeds 2 mm. long, 1.5 mm. thick.

TYPE LOCALITY: San José del Cabo, Lower California.

DISTRIBUTION: Lower California; apparently also at Guaymas, Sonora.

37. *Indigofera Nelsonii* Rydberg, sp. nov.

A low shrub; branches terete, grayish-strigose and slightly glandular; stipules subulate, 3 mm. long; leaves 3-5 cm. long; rachis and petiole strigose-canescens; leaflets 9-11, oval or elliptic, 1-1.5 cm. long, rounded at both ends, mucronate at the apex, strigose-canescens on both sides; racemes about 3 cm. long, strigose and glandular-hispidulous; pod about 3 cm. long, 4-5 mm. wide, densely strigose, abruptly acute at each end, the sutures prominent, the valves somewhat carinate but the ridge rounded; seeds not seen but probably not flat as in *I. platycarpa*.

Type collected between La Laguna and El Taraiso, Lower California, January 29, 1906, *Nelson & Goldman 7472* (U. S. Nat. Herb. no. 565541).

38. *Indigofera Palmeri* S. Wats. Proc. Am. Acad. 22: 404.

1887.

A shrub, 1-2 m. high; branches terete, subtomentose with short loose pubescence; stipules subulate, minute; leaves spreading, 4-6 cm. long; leaflets 7-11, elliptic, acute or obtuse and mucronate at the apex, acute at the base, 1-2 cm. long, rather firm, green and finely strigose above, pale and more coarsely and somewhat loosely hairy beneath, with curved hairs; racemes 2-4 cm. long, few-flowered; calyx about 2 mm. long; corolla orange, 7 mm. long; pod straight, abruptly acute, with short loose pubescence, 1.5-2 cm. long, 2.5 mm. thick, 4-6-seeded; seeds 2 mm. long, 1.5 mm. thick, round-angled.

TYPE LOCALITY: Tequila, Jalisco.

DISTRIBUTION: Jalisco to Durango.

39. *Indigofera pueblensis* Rydberg, sp. nov.

A shrub, perhaps 1 m. high; branches terete, strigose with white and brown hairs; stipules subulate-setaceous, 2 mm. long; leaves spreading, 4-5 cm. long; rachis and petiole strigose; leaflets 9-11, elliptic, rounded and mucronate at the apex, obtusish at the base, 1-1.5 cm. long, strigose on both sides, paler beneath; racemes 4-6 cm. long; calyx strigose, 1.5 mm. long; corolla 5 mm. long, orange; pod linear, 2 cm. long, 2.5 mm. wide, about 6-seeded, nearly straight, abruptly acute.

Type collected on Cerro de la Yerba, vicinity of San Luis Tultitlanapa, Puebla, July 1907, *C. A. Purpus 2672* (herb. N. Y. Bot. Gard.).

40. *Indigofera Konzattii* Rose, Contr. U. S. Nat. Herb.

8: 310. 1905.

A low shrub; branches terete, densely strigose with white and rusty hairs; stipules subulate-setaceous, 3 mm. long; leaves spreading, 3-5 cm. long; petiole and rachis densely strigose; leaflets 7-17, white-strigose on both sides, densely so beneath, somewhat greener above, 10-15 mm. long, obovate to oblong-oblanccolate, rounded and mucronate at the apex, cuneate or rounded at the base; racemes in flower 3-4 cm. long, usually shorter than the leaves, in fruit somewhat longer; calyx a little more than 1 mm. long; corolla pink or light-violet, 6 mm. long; pod 2-2.5 cm. long, 12 mm. thick, 4-5-seeded; seeds fully 2 mm. long, 1 mm. thick, round-angled.

TYPE LOCALITY: Monte Alban, near Oaxaca City.

DISTRIBUTION: Oaxaca and Puebla.

41. *Indigofera argentea* L. Mant. 273. 1771.

A shrub, 1-2 m. high or more; stems silvery-strigose; leaves 3-5 cm. long; stipules subulate, 1-2 mm. long; leaflets 5-7, obovate, 1-2.5 cm. long, silvery-white; racemes subsessile, 12-20-flowered, 1-3 cm. long in flower, shorter than the leaves; calyx-tube 1 mm. long, silvery; lobes deltoid, cuspidate, as long as the tube; corolla 4 mm. long, reddish-yellow; pod 1-1.5 cm. long, 4 mm. wide, 3-4-seeded, distinctly torulose.

TYPE LOCALITY: India.

DISTRIBUTION: Santo Domingo (according to Urban), adventive; native from Abyssinia and Egypt to India.

ILLUSTRATION: L'Hér. Stirp. Nov. pl. 79.

XI. *Dispermae*. Shrubs or at least suffruticose at the base. Leaflets 9-21, distinctly petiolulate, thin. Calyx 1-1.5 mm. long, densely strigose, its teeth deltoid or lanceolate, not much exceeding the tube in length. Banner usually broadly obovate, rarely oblanceolate, sessile, densely ferruginous-strigose on the back when young; wings obliquely oblanceolate or oblong, with a rounded basal auricle; keel-petals obliquely oblanceolate; lateral spurs acute. Pod short-oblong, ovoid, or spheric, 1- or 2-seeded, rarely 3- or 4-seeded, abruptly contracted into a short slender beak. Seed if solitary subglobose, if 2 truncate at the end toward the other seed, if more than 2, the middle seeds truncate at both ends, only in *I. sphinctosperma* subcylindric.

42. *Indigofera guatimalensis* Moc., Sessé & Cerv.; Prain & Baker, Jour. Bot. 40: 67. 1902.

Indigofera tinctoria brachycarpa DC. Prodr. 2: 224, in part. 1825.

Anila tinctoria brachycarpa Kuntze, Rev. Gen. 160. 1891.

Indigofera Micheliiana Rose, Contr. U. S. Nat. Herb. 8: 310. 1905.

Shrubby at the base, 1-2 m. high; branches slightly angled, strigose; stipules subulate-setaceous, 2-4 mm. long; leaves 5-10 cm. long; rachis and petiole strigose; leaflets oblong to oblanceolate, rounded to acutish and mucronate at the apex, acute at the base, 1-2.5 cm. long, strigose on both sides, petioluled; calyx 1.5 mm. long, strigose; corolla like that of *I. suffruticosa*; pod oblong, 2-4-seeded, straight, 5-15 mm. long, abruptly acute; seeds 2 mm. long, 1 mm. thick, slightly round-angled.

TYPE LOCALITY: Guatemala.

DISTRIBUTION: Cuba, Porto Rico, St. Thomas, Martinique; cultivated and escaped; Guatemala; also in Ecuador and Peru.

43. *Indigofera densiflora* Mart. & Gal. Bull. Acad. Brux. 10²: 44. 1843.

Shrubby below, 6-10 dm. high; branches erect, angled, strigose, with gray and ferruginous hairs mixed; stipules subulate, 2 mm. long; rachis and petiole ferruginous-strigose; leaflets 15-21, oblong or elliptic, rounded and mucronate at the apex, acutish at the base, 1-2.5 cm. long, glabrous above, strigose beneath; racemes short, dense, subsessile, about half as long as the leaves; calyx a little more than 1 mm. long, dark-ferruginous, almost black; corolla 5 mm. long, brown-violet, densely ferruginous-strigose without; banner broadly obovate; pod oblong, 6-8 mm. long, 3 mm. thick, straight, mostly 2-seeded; seeds 2 mm. thick.

TYPE LOCALITY: Cordillera Oriental, Oaxaca

DISTRIBUTION: Veracruz and the state of Mexico to Michoacán and Oaxaca; apparently also at Alamos, Sonora.

44. *Indigofera montana* Rose, Contr. U. S. Nat. Herb. 8: 311. 1905.

Shrubby at the base; stem 5-12 dm. high, angled, strigose; stipules subulate-setaceous, 2 mm. long; leaves spreading, 8-12 cm. long; rachis and petiole densely strigose; leaflets 15-31, oblong, obtuse or retuse and mucronate at the apex, acutish at the base, 1-2.5 cm. long, 5-10 mm. wide, strigose on both sides; racemes nearly equaling the leaves, at least in fruit,

rather densely many-flowered; calyx scarcely more than 1 mm. long, darkly ferruginous; corolla 5 mm. long, densely and darkly ferruginous-strigose without; pod oblong, slightly curved, abruptly acute, 6-9 mm. long, 2.5 mm. broad, 2- or 3-seeded, terete; seeds 2 mm. thick.

TYPE LOCALITY: Between Mesquitee and Monte Escobado, Jalisco.

DISTRIBUTION: Durango to Jalisco and Zacatecas.

45. *Indigofera caroliniana* Mill. Gard. Dict. ed. 8.

Indigofera no. 3. Mr 1768.

Indigofera disperma L. Syst. Nat. ed. 12. 3: 232. S 1768.

A shrub 0.5-2 m. high, widely branching; branches terete, often reddish, slender, minutely strigose; stipules subulate-setaceous, 2 mm. long; leaves spreading, 5-10 cm. long; rachis and petiole minutely strigose; leaflets 9-13, obovate or oblanceolate, rounded or obtuse and mucronate at the apex, acute at the base, 1-2.5 cm. long, 5-10 mm. wide, finely strigose on both sides, thin, slightly paler beneath, petioluled; racemes usually surpassing the leaves; calyx 1.5 mm. long; corolla 5-6 mm. long, yellowish-brown; banner broadly oblanceolate; pod somewhat flattened, with strong sutures, oval in outline, 7-10 mm. long, 3 mm. wide, 2-3-seeded; seeds rounded, somewhat compressed, about 2.5 mm. long, nearly 2 mm. broad.

TYPE LOCALITY: Carolina.

DISTRIBUTION: North Carolina to Florida and Louisiana.

ILLUSTRATION: Ehret, Trew & Vogel, Pl. Sel. *pl.* 55.

46. *Indigofera tumidula* Rose, Contr. U. S. Nat.

Herb. 12: 273. 1909.

A shrub, 6 mm. high or more; branches angled, minutely strigose; stipules subulate, 1-2 mm. long; leaves 10-15 cm. long; leaflets 3-9, oblong to oval, 3-4 cm. long, rounded at the base and apex, mucronate, sparingly strigose on both sides, paler beneath; racemes 7-12 cm. long; calyx 2 mm. long, strigose; corolla not seen; pod 4-5 mm. long, turgid, appressed-pubescent, 2-seeded.

TYPE LOCALITY: Iguala Cañon, Guerrero.

DISTRIBUTION: Known only from the type locality.

47. *Indigofera jaliscensis* Rose, Contr. U. S. Nat.

Herb. 8: 310. 1905.

Shrubby below, the branches angled, grooved, densely strigose; stipules setaceous, 4-6 mm. long; leaves spreading, 5-10 cm. long; rachis and petiole strigose, grooved above; leaflets 11-21, oblong, or the terminal ones obovate, rounded or obtuse at each end, strigose on both sides, 8-20 mm. long; racemes 1-2 dm. long, usually exceeding the leaves; calyx 1.5 mm. long, ferruginous-strigose; corolla not known; pod ovoid, acute, 3 mm. long, 2 mm. thick, 1-seeded; seed globose, 1.5 mm. thick.

TYPE LOCALITY: Río Blanco, Jalisco.

DISTRIBUTION: Jalisco and Morelos.

48. *Indigofera sphaerocarpa* A. Gray, Pl. Wright. 2:

37. 1853.

A shrub, 6-12 dm. high; branches angled, more or less ferruginous-dotted or streaked; stipules subulate, 1-2 mm. long; leaves 5-10 cm. long; rachis and petiole ferruginous-strigose; leaflets 13-17, oblong, rounded and mucronate at the apex, acute at the base, 1-2 cm. long, 3-7 mm. wide, glabrous above, strigose beneath; racemes equaling or longer than the leaves; calyx 1.5 mm. long, ferruginous-strigose; corolla 6-7 mm. long, ferruginous-strigose without; pod rounded-ovoid or subglobose, 3-3.5 mm. long, 2.5 mm. thick, 1-seeded; seed globose, 2 mm. thick.

TYPE LOCALITY: Santa Cruz, Sonora.

DISTRIBUTION: Arizona, Sonora, and Chihuahua.

49. *Indigofera sphinctosperma* Standley, Contr. U. S.

Nat. Herb. 20: 216. 1919.

A shrub, 1 m. high or more; branches slender, angled, densely white-strigose; stipules subulate, 2 mm. long; leaves 4-8 cm. long; rachis and petiole densely strigose; leaflets 11-15, oval, 6-15 mm. long, 4-8 mm. wide, rounded at each end, mucronate, strigose on both sides, pale beneath; racemes slender, 5-15 cm. long, longer than the leaves; calyx densely strigose, about 1 mm. long; corolla 4-5 mm. long, strigose without; pod 3-4 mm. long, oblong, truncate at each end, somewhat angled, 1-seeded; seed 2-2.5 mm. long, subcylindric, 1.5 mm. thick.

TYPE LOCALITY: Barranca de Santa Maria, Zacuapán, Veracruz.

DISTRIBUTION: Veracruz.

XII. *Platycarpae*. Shrubs. Leaflets 13-21, petiolulate, rounded at the base. Racemes few-flowered. Calyx-teeth deltoid, about equaling the tube. Banner densely ferruginous-strigose without, elliptic-oval; wings shorter than the banner and keel, oblong; keel-petals obliquely oblanceolate, acute; lateral spurs slender, acute. Pod broad. Seeds flat, orbicular.

50. *Indigofera platycarpa* Rose, Contr. U. S.

Nat. Herb. 8: 47. 1903.

A shrub, 1-2 m. high, much branched; branches rounded, white-strigose or somewhat ferruginous; stipules subulate, 2 mm. long; leaves 3-6 cm. long; leaflets 13-21, oblong to obovate, rounded at the base, rounded or retuse at the apex, mucronate, strigose on both sides, 4-10 mm. long; racemes few-flowered, shorter than the leaves; calyx 1 mm. long; corolla 7-10 mm. long; keel-petals obliquely oblanceolate, acute; pod 2-3 cm. long, 4 mm. broad, less than 1 mm. thick, somewhat constricted between the seeds, 3-5 seeded; seeds 2 mm. in diameter.

TYPE LOCALITY: Iguala, Guerrero.

DISTRIBUTION: Guerrero and Morelos.

ILLUSTRATION: Contr. U. S. Nat. Herb. 8: pl. 7.

DOUBTFUL AND EXCLUDED SPECIES

INDIGOFERA MEXICANA L. f. Suppl. 335. 1781. This is *Psoralea Mutisii*, a native of Colombia.

INDIGOFERA LAGASCANA DC. Prodr. 2: 229. 1825. The type locality is given as "Cheuchim," a place which I have been unable to locate, perhaps not in North America. G. Don suggests Peru.

INDIGOFERA HAITENSIS Desv. Ann. Sci. Nat. 9: 410. 1826. This is unknown; perhaps *I. lespedezooides*. It was described from Hispaniola.

INDIGOFERA BERTERIANA Spreng. Syst. 3: 277. 1826. This was described from the island of Guadeloupe. It is said to have 1-flowered peduncles, a character not found in any North American species.

INDIGOFERA LOTOIDES Schlecht. Linnaea 12: 282. 1838. Not *I. lotoides* Lam. 1789; *Indigofera Ehrenbergiana* Steud. Nom. Bot. ed. 2. 1: 806. 1840. This is evidently a species of *Anisolotus*.

INDIGOFERA HIPPOCREPOIDES Schlecht. Linnaea 12: 282. 1838. This is evidently a species of *Anisolotus*.

INDIGOFERA CORONILLOIDES Mart. & Gal. Bull. Acad. Brux. 10²: 45. 1843. This is unknown; the type came from Penoles in Misteca Alta, Oaxaca.

Tribe 8. GALEGEAE

BY PER AXEL RYDBERG

Herbs, shrubs, trees, or woody vines, only in *Glycyrrhiza* with glandular-dotted foliage. Leaves odd-pinnate or abruptly pinnate, with or without stipels, very rarely with malpighiaceus hairs. Calyx campanulate to tubular, 5-toothed or 5-lobed, or more or less 2-lipped. Corolla papilionaceous, with 5 petals, the keel-petals more or less adnate along the lower margin. Stamens 10, diadelphous or monadelphous, the connective of the anthers not produced nor appendaged. Ovary usually many-ovuled; style usually more or less curved or bent upwards; stigma small. Fruit usually several- or many-seeded (except in *Kentrophyta*), two-valved (but evidently indehiscent in *Glycyrrhiza*).

Seeds strophiolate; embryo with a straight radicle; flowers 1 or 2 in the axils of the leaves or in terminal racemes or panicles; calyx subtended by a pair of deciduous bractlets; pods flat; trees or shrubs.

Seeds not strophiolate (rarely slightly so in species of *Cracca*); embryo mostly with an incurved radicle; flowers mostly racemose.

Subtribe 3. BRONGNIARTIANAE.

Bractlets 2 under the calyx; pods internally with more or less distinct false cross-partitions.

Calyx tubular, with long lobes; petals long-clawed, their blades cuneate at the base, that of the banner oblong, not spreading; pods flat, many-seeded, dehiscent; shrubs with odd-pinnate leaves.

Subtribe 4. BARBIERIANAE.

Calyx campanulate, with short tooth-like lobes; petals short-clawed, at least the blades of the wings with basal auricles; blade of the banner sub-orbicular or broadly ovate; pods not flattened or if flat 2-seeded (*Glottidium*).

Exocarp of the pod not inflated; hypanthium obsolete, not differentiated from the calyx; shrubs or trees, with abruptly pinnate leaves.

Subtribe 5. SESBANIANAE.

Exocarp of the pod inflated, forming two elongate bladders, one on each side of the pod; hypanthium well developed and differentiated from the calyx, obconic; shrubs and trees, with odd-pinnate leaves.

Subtribe 6. DIPHYSANAE.

Bractlets under the calyx wanting; pods usually without cross-partitions, except in *Benthamantha*, *Sphinctospermum*, and *Hebestigma*.

Base of the pistil or of its stipe usually surrounded by a more or less developed saucer-shaped disk within the staminal sheath; racemes terminal, or terminal and in the upper axils, or opposite the leaves, or if axillary, the leaflets with parallel oblique lateral veins.

Leaflets with parallel or indistinct lateral veins; pods obliquely striate; leaves without stipels; herbs or low shrubs.

Subtribe 1. CRACCANAE.

Leaflets netted-veined; pods not obliquely striate; leaves mostly with stipels; trees or (ours) woody vines.

Subtribe 2. MILLETTIANAE.

Base of the pistil or its stipe without a disk; racemes always axillary; leaflets not with parallel oblique lateral veins.

Pods flat, or if terete with prominent sutures, neither inflated nor with even a vestige of a longitudinal partition.

Flowers in fascicles, on short branches arising in the axils of fallen leaves; leaves abruptly pinnate; banner usually enveloping the other petals.

Subtribe 7. CORYNELLANAE.

- Flowers in axillary racemes; leaves odd-pinnate, except in some species of *Coursletia* and occasionally in *Obeya*; banner mostly spreading. Subtribe 8. ROBINIANAE.
- Pods more or less inflated or completely or partially 2-celled, by the intrusion of one or both sutures. Style bearded along the upper margin; pods always 1-celled. Subtribe 9. COLUTEANAE.
- Style glabrous, or bearded only around the stigma. Anther-cells not confluent; pods not prickly; plant not glandular-dotted. Subtribe 10. ASTRAGALANAE.
- Anther-cells confluent at the apex; pods in ours prickly; plant glandular-dotted. Subtribe 11. GLYCYRRHIZANAE.

Subtribe 1. CRACCANAE. Herbs or shrubs, with alternate odd-pinnate leaves, persistent stipels, and no stipels, the leaflets usually with parallel oblique lateral veins. Flowers racemose, the racemes mostly terminal and in the upper axils, or opposite the leaves, or (in *Galega*) axillary. Calyx campanulate, 5-lobed, the upper lobes often more or less united higher up. Corolla papilionaceous, the petals more or less clawed. Banner broad, more or less spreading. Stamens monadelphous or diadelphous. Style glabrous, more or less hairy around the stigma. Pod elongate, flat, 2-valved, obliquely striate. Seeds usually reniform or transversely oblong, *i. e.*, their longer axis in the axis of the pod; strophiole if present very small.

Stipules not spinescent; lateral veins of the leaflets prominent.

- Upper filament wholly united with the staminal sheath, forming a closed tube; banner in ours glabrous. 1. GALEGA.
- Upper filament free, at least at the base; banner in ours silky-strigose on the back. 2. CRACCA.
- Stipules spinescent; upper filament wholly free; lateral veins of the leaflets obsolete. 3. PETERIA.

1. GALEGA L. Sp. Pl. 714. 1753.

Perennial herbs. Leaves odd-pinnate, with semi-sagittate stipules. Flowers in axillary and terminal racemes, with narrow bracts and no bracteoles. Calyx campanulate, with 5 subequal lobes. Corolla white or light-blue. Banner obovate-oblong, narrowed below into a short claw. Wings with oblong blades adherent to the keel at the middle and with a prominent basal auricle. Keel-petals obtuse, straight or nearly so to near the apex, where they are strongly arcuate, longer than the wings, united nearly their whole length. Stamens monadelphous, the upper filament united with the sheath for at least half its length; anthers uniform or the alternate ones slightly smaller. Ovary sessile, many-ovuled; style incurved, glabrous; stigma small, terminal. Pod linear, terete, 2-valved, the valves obliquely striate. Seeds transversely oblong, without strophiole.

Type species, *Galega officinalis* L.

1. *Galega officinalis* L. Sp. Pl. 714. 1753.

A perennial herb; stem 5–10 dm. high, glabrous, growing in tufts; leaves about 1 dm. long; rachis glabrous; leaflets 11–17, oblong or lanceolate, mucronate-cuspidate, 2–3 cm. long, glabrous; racemes 1–1.5 cm. long; bracts subulate, persistent; calyx-tube 2 mm. long, glabrous, the lobes subulate-sctaceous from a deltoid base, 3 mm. long; corolla light-blue or white, about 1 cm. long; wings with an oblong reflexed basal auricle; pod linear, glabrous, 4 cm. long, acuminate at both ends, somewhat torulose.

TYPE LOCALITY: Italy.

DISTRIBUTION: Kansas, Colorado, and Utah; escaped from cultivation or introduced incidentally in seeds; native of Europe and western Asia.

ILLUSTRATIONS: Coste, Fl. France 1: f. 980; Lam. Tabl. Encyc. pl. 625; Hayne, Arzn. Gew. 6: pl. 34; Schkuhr, Handb. pl. 208a; Sibth. Fl. Graeca pl. 726; Thomé, Fl. Deuts. pl. 106; ed. 2. pl. 365; Fl. Deuts. ed. 5. pl. 2421; E. & P. Nat. Pl. 3: f. 116 H; Baillon, Hist. Pl. 2: f. 158.

2. CRACCA L. Sp. Pl. 752. 1753.

- Brissonia* Neck. Elem. 3: 36. 1790.
Reinertia Moench, Meth. Suppl. 44. 1802.
Tephrosia Pers. Syn. Pl. 2: 328. 1807.
Kiesera Reinw. Syll. Pl. Nov. 2: 11. 1825.
Apodymome E. Meyer, Comm. Pl. Afr. Aust. 111. 1835.
Balboa Liebm. Vidensk. Meddel. 1853: 106. 1854.

Herbs, often woody below, or shrubs. Leaves odd-pinnate; leaflets striate, with the lateral veins oblique to the midrib and parallel; stipules setaceous, or broader and striate. Flowers racemose, the racemes either terminal, with or without smaller racemes also in the upper axils, or apparently opposite the leaves (in this case the racemes are really terminal, and an axillary branch is produced which in its turn bears a terminal raceme and an axillary branch, &c.; this is often repeated several times), or rarely only axillary, the individual flowers usually in clusters of 2-6 at each node of the peduncle; bractlets none. Calyx campanulate, furnished within with a more or less developed disk; lobes subequal, or the lowest one longer, the upper two usually more or less united. Petals clawed. Blade of the banner suborbicular, more or less sericeous without. Blade of the wings obliquely obovate or oblong, slightly coherent with the keel-petals, with a basal auricle on the upper side. Stamens usually partly monadelphous at first, the upper filament being free at the base, adnate at first to the staminal sheath in the middle, but usually separating later; anthers uniform. Ovary sessile, many-ovuled; style inflexed or incurved, sub-corneous at the base, most commonly glabrous; stigma terminal. Pod sessile, flat, 2-valved, many-seeded.

Type species, *Cracca villosa* L.

Stem monopodial; racemes terminal and axillary, not opposite the leaves.

Terminal raceme (or panicle) first and best developed, the axillary ones if present smaller and later.

Stipules broad, ovate, many-ribbed, conspicuous, colored and persistent; pod glabrous except on the sutures.

Stipules narrow, from lanceolate to setaceous, 1-3-ribbed, attenuate.

Pod glabrous.

Pod pubescent.

Leaflets 11-41.

Corolla 1 cm. long or more.

Plant tall, 3 dm. high or more; racemes many-flowered; leaflets linear-oblong to elliptic-lanceolate or oblanceolate (only the terminal one obovate in *C. latidens*).

Leaflets rounded or obtuse at the apex, mostly oblong or oblanceolate.

Leaflets oblanceolate, leathery, glabrate above; racemes very long and dense.

Leaflets linear-oblong to elliptic.

Leaves rather thin.

Racemes long and lax.

Racemes short and rather dense.

Leaves rather thick, subcoriaceous, strongly reticulate; racemes elongate but dense.

Leaflets lanceolate, acute.

Plant low, rarely more than 2 dm. high; leaflets obovate, green above, silky-canescens beneath.

Corolla 6-7 mm. long; plant slender; leaflets linear-oblanceolate.

Leaflets 1-11.

Leaflets more or less coriaceous, oblanceolate to obovate or elliptic.

Plant shrubby, erect; racemes dense, many-flowered; leaflets more than 2 cm. long.

Leaflets linear-oblanceolate, not conspicuously reticulate, shining above.

Leaflets broader, strongly reticulate, dull above. Plant herbaceous from a woody root, decumbent; racemes short, few-flowered; leaflets less than 2 cm. long.

Leaflets membranous, lanceolate, acute; racemes lax.

I. GRANDIFLORAE.

II. LEIOPARPAE.

IX. NITENTES.

III. FOLIOLOSAE.

IV. VIRGINIANAE.

V. TONICARIAE.

VI. CANDIDAE.

VII. PRINGLEANAE.

VIII. VICTOIDES.

IX. NITENTES.

X. CRASSIFOLIAE.

XII. RUGELIANAE.

XI. LANGLOSSANAE.

- Terminal racemes developing later than the lower axillary ones.
(The monopodial or sympodial nature of the inflorescence of these species is doubtful, as the axillary racemes are inserted obliquely, neither opposite to nor exactly in the axils of the leaves.)
Flowers more than 10 mm. long.
Flowers 6-7 mm. long.
- Stem sympodial; racemes theoretically terminal, but apparently opposite the leaves, by the early development of a branch in the uppermost axil which elongates and produces another terminal raceme, which in its turn bears an axillary branch, &c.
Calyx-lobes all lanceolate to filiform, equaling or longer than the tube.
Petioles 1-3 mm. long; leaflets obovate.
Petioles 5 mm. long or more, except sometimes in *C. littoralis* and *C. rhodantha*, where the leaflets are linear to oblong.
Corolla usually 12 mm. long or more; leaflets firm, often somewhat leathery.
Leaflets suborbicular or rounded-obovate.
Leaflets from linear to oval or rarely narrowly obovate.
Corolla 5-12 mm. rarely up to 15 mm. long; leaves not firm.
Calyx-lobes unlike, the lowest one subulate, much exceeding the tube, the upper 4 deltoid, scarcely equaling the tube.
- III. FOLIOLOSÆ.
VIII. VICIOIDES.
- XIII. CHRYSOPHYLLÆ.
- XIV. LINDHEIMERIANÆ.
XV. SPICATÆ.
XVI. PURPUREÆ.
- XVII. NOCTIFLORÆ.
- I. GRANDIFLORÆ
- One species. 1. *C. grandiflora*.
- II. LEIOCARPÆ
- Leaves glabrous above; racemes terminal and in the upper axil.
Bracts subulate; racemes elongate; pods wholly glabrous.
Calyx-lobes about equaling the tube; wing-petals oblong.
Calyx-lobes distinctly longer than the tube; wing-petals obliquely obovate.
Bracts lanceolate, acuminate; racemes short; pods hairy on the sutures.
Leaves pubescent above; racemes axillary.
2. *C. leiocarpa*.
3. *C. calva*.
4. *C. cuernavacana*.
5. *C. Conzattii*.
- III. FOLIOLOSÆ
- Pods glabrous, except on the upper suture.
Pods pubescent throughout.
Stem and leaves strigose.
Leaflets 13-19; corolla 10-12 mm. long.
Leaflets 17-31; corolla about 15 mm. long.
Stem and lower surface of the leaves pilose; leaflets 21-31.
5. *C. Conzattii*.
6. *C. rhodantha*.
7. *C. foliolosa*.
8. *C. multifolia*
- IV. VIRGINIANÆ
- Leaflets thin, green on both sides; corolla white or ochroleucous, only tinged with purple.
Calyx-lobes rather broad, not subulate.
Calyx-lobes ovate or ovate-lanceolate; pubescence strictly appressed, silky.
Leaflets mostly broadly oblong or elliptic; calyx-lobes not longer than the tube.
Leaflets narrowly oblong; calyx-lobes longer than the tube.
Pods and lower surface of the leaflets short-hairy; corolla about 10 mm. long.
Pods and lower surface of the leaflets long-hairy; corolla 15-18 mm. long.
Calyx-lobes lanceolate; pubescence of the stem, pedicels, and calyces more or less spreading.
Calyx-lobes very narrow, subulate to almost filiform.
Bracts lanceolate, acuminate.
Stem, pedicels, and calyces with silky appressed pubescence.
Stem, pedicels, and calyces with tawny spreading pubescence.
Bracts subulate or nearly filiform.
Leaflets thick, subcoriaceous, green above, white-silky beneath.
9. *C. latidens*.
10. *C. Mohrii*.
11. *C. leucosericea*.
12. *C. virginiana*.
13. *C. Rosvana*.
14. *C. leucantha*.
15. *C. Thurberi*.
16. *C. Seemanni*.
- V. TOXICARIÆ
- Corolla less than 2 cm. long.
Calyx-lobes ovate, abruptly acute or obtusish.
Calyx-lobes lanceolate or subulate, acuminate.
Corolla 15-18 mm. long; banner suborbicular; wings obliquely ob-lanceolate; leaflets strongly veined beneath.
Leaflets elliptic or broadly oblong; pod straight; raceme usually single.
Leaflets linear or linear-oblong; pod arcuate; racemes usually several.
17. *C. toxicaria*.
18. *C. Talpa*.
19. *C. arcuata*.

- Corolla 14-15 mm. long; banner oval or obovate; wings linear-ob-lanceolate or oblong.
 Leaflets 21-29, not strongly veined beneath.
 Leaflets 15-21, strongly veined beneath.
 Corolla more than 2 cm. long.
20. *C. Heydeana*.
 21. *C. nicaraguensis*.
 22. *C. macrantha*.
- VI. CANDIDAE
 Calyx-lobes rounded-oval; racemes short.
 Calyx-lobes deltoid-lanceolate; racemes elongate.
23. *C. candida*.
 24. *C. submontana*.
- VII. PRINGLEANAE
 One species.
25. *C. Pringlei*.
- VIII. VICIODES
 Stem pilose, with spreading hairs.
 Leaves glabrous above.
 Leaves pubescent on both sides.
 Stem strigose.
26. *C. vicioides*.
 27. *C. Brandegei*.
 63. *C. piscatoria*.
- IX. NITENTES
 One species.
28. *C. nitens*.
- X. CRASSIFOLIAE
 Leaflets 1-7.
 Leaves glabrous on both sides.
 Leaves densely white-pubescent beneath.
 Leaves silky beneath; pods flat.
 Leaves tomentose beneath; pods turgid.
 Pubescence of the branches and lower surface of the leaves short (tomentose); racemes elongate.
 Inflorescence lax; bracts lanceolate or linear; terminal leaflets (except of the upper leaves) 10-20 cm. long.
 Inflorescence dense; bracts broadly ovate; terminal leaflets 6-10 cm. long.
 Pubescence of the branches and lower surface of the leaves rather long (villous-tomentose); inflorescence short and dense.
29. *C. madrensis*.
 30. *C. Watsoniana*.
 31. *C. Micheliana*.
 32. *C. diversifolia*.
 33. *C. platyphylla*.
- Leaflets 7-13.
 Branches and lower surface of the leaflets villous-velutinous; leaflets oval or elliptic; racemes terminal and axillary, less than 1 dm. long.
 Branches and lower surface of the leaflets short-velutinous; leaflets oblong; racemes terminal, more than 1 dm. long.
34. *C. lanata*.
 35. *C. velutina*.
- XI. LANGLASSEANAE
 One species.
36. *C. Langlassei*.
- XII. RUGELIANAE
 One species.
37. *C. Rugelii*.
- XIII. CHRYSOPHYLLAE
 Pubescence of the stem spreading; leaflets 1-3 cm. long; corolla 1 cm. long or more; pods 3.5-4.5 cm. long.
 Racemes shorter than the leaves, either terminal or axillary.
 Racemes longer than and opposite to the leaves.
 Pubescence of the stem appressed or ascending; leaflets 0.5-1.5 cm. long.
 Corolla fully 1 cm. long; pods 4 cm. long; leaflets obovate.
 Corolla about 8 mm. long; pods 2 cm. long; leaflets elliptic.
37. *C. Rugelii*.
 38. *C. chrysophylla*.
 39. *C. Carpenteri*.
 40. *C. Chapmanii*.
- XIV. LINDHEIMERIANAE
 Leaves strigose above at least when young; calyx-lobes deltoid or deltoid-lanceolate.
 Leaves glabrous above; calyx-lobes lance-subulate.
41. *C. Lindheimeri*.
 42. *C. potosina*.
- XV. SPICATAE
 Leaves green, or canescent, or ferruginous, not silvery.
 Racemes few-flowered, the flowers 1 or 2 at each node, mostly near the end of the peduncle.
 Pubescence of the stem spreading.
 Leaflets oblong or obovate, spreading, the terminal nearly similar to the rest.
 Pubescence of the stem and leaflets dense, long, and loose.
 Pubescence of the stem short and sparse, that of the leaflets appressed.
 Leaflets linear, reflexed, the terminal one much longer than the rest.
 Pubescence of the stem appressed.
 Petioles not much longer than the lower leaflets; leaflets oblong or elliptic.
43. *C. spicata*.
 44. *C. intermedia*.
 45. *C. flexuosa*.
 46. *C. hispidula*.

- Petioles usually much longer than the lower leaflets.
 Leaflets oblanceolate, oblong, or somewhat cuneate.
 Leaflets narrowly linear.
- Racemes long, many-flowered, the flowers often 2-4 at each node.
 Pubescence of the stem spreading.
 Leaflets 5-11, broadly elliptic; upper part of the stem and the peduncles triangular.
- Leaflets 11-23, oblong or oblanceolate; stem and peduncles terete.
 Stem, leaf-rachis, and peduncle ferruginous-pubescent; plant stout.
- Stem, leaf-rachis, and peduncle white- or gray-pubescent; plant slender.
- Calyx and peduncle densely pilose.
 Calyx sparingly hirsute; peduncle strigose.
- Pubescence of the stem appressed.
- Stem simple, strict.
 Calyx densely pilose-canescens; corolla yellowish.
- Calyx sparingly hirsute-strigose; corolla rose-colored.
 Leaflets oblong, elliptic, oblanceolate, or oblong-obovate, decidedly strigose beneath.
- Leaflets linear or linear-oblanceolate, glabrous or nearly so.
 Stem much branched, flexuose.
- Leaves silvery, at least beneath.
- Leaves green above.
- Leaves silvery-canescens on both sides.
- Leaflets linear, acute, with a short straight mucro.
 Leaflets linear-oblanceolate, with a recurved mucro.

47. *C. ambigua*.
 48. *C. gracillima*.
 49. *C. tepicana*.
 50. *C. onobrychooides*.
 51. *C. californica*.
 6. *C. rhodantha*.
 52. *C. cana*.
 53. *C. texana*.
 54. *C. angustifolia*.
 69. *C. cinerea*.
 72. *C. bracteolata*.
 55. *C. Palmeri*.
 56. *C. hamata*.

XVI. PURPUREAE

- Pubescence of the stem spreading.
- Calyx-lobes not longer than the tube; leaflets linear or linear-oblong.
 Leaves villous or pilose on both sides.
- Racemes very long, many-flowered.
 Racemes short, few-flowered.
- Leaves glabrous above.
- Calyx-lobes longer than the tube.
 Leaflets linear-oblanceolate to oblong, usually more than 2 cm. long; corolla about 10 mm. long or more.
- Leaflets oblanceolate, oblong, or cuneate, 1-2 cm. long; corolla 8-10 mm. long.
- Pubescence of the stem appressed.
- Calyx-lobes about equalling the tube.
 Leaflets oblong or oblanceolate, rounded or retuse at the apex.
 Pods more or less arcuate upwards; leaves strigose beneath.
- Pods straight; leaves minutely strigulose or glabrous beneath.
- Leaflets linear, acute or merely obtusish at the apex.
 Leaves somewhat strigose but not silvery beneath; pods minutely strigose.
- Stem herbaceous, from a tap-root or a subterranean rootstock; plant light-green; leaflets mostly 7-11.
- Stem somewhat suffrutescent at the base; plant dark-green; leaflets mostly 11-15.
 Leaflets mostly linear-oblanceolate, distinctly strigose beneath.
- Leaflets narrowly linear, glabrous or nearly so beneath.
- Leaves silvery-strigose beneath; pods short-hirsute.
- Calyx-lobes decidedly longer than the tube.
 Leaflets obovate or cuneate to broadly oblanceolate, rounded or retuse at the apex.
- Leaflets glabrous above.
 Leaflets strigose above.
- Leaflets linear-oblanceolate to narrowly linear, obtuse or acute.
 Leaflets linear-oblanceolate.
- Calyx sparingly hairy, hirsute; leaflets sparingly strigose beneath, glabrous above.
- Calyx cinereous-strigose; leaflets cinereous, at least beneath.
 Leaflets narrowly linear, very acute or attenuate.

27. *C. Brandegei*.
 57. *C. corallicola*.
 26. *C. vicioides*.
 58. *C. littoralis*.
 59. *C. decumbens*.
 60. *C. purpurea*.
 61. *C. Curtissii*.
 62. *C. tenella*.
 63. *C. piscatoria*.
 64. *C. angustissima*.
 65. *C. hypoleuca*.
 66. *C. Wallichii*.
 67. *C. cathartica*.
 68. *C. domingensis*.
 69. *C. cinerea*.
 70. *C. Rusbyi*.

XVII. NOCTIFLORAE

- Plant shrubby; pods long-hairy, 6 mm. wide; sutures not prominent.
- Plant annual, herbaceous; pods short-hairy, 4 mm. wide; sutures prominent.

71. *C. noctiflora*.
 72. *C. bracteolata*.

I. *Grandiflorae*. Stem monopodial; racemes terminating the stem or leafy branches, corymbiform, few-flowered. Leaves 11-15-foliolate; stipules ovate, several-ribbed, persistent, often brownish. Corolla 15-20 mm. long, rose-red. Pod short-pubescent on the sutures.

1. *Cracca grandiflora* (L'Hér.) Kuntze, Rev. Gen. 175. 1891.

Galega grandiflora L'Hér.; Ait. Hort. Kew. 3: 70. 1789.

Tephrosia grandiflora Pers. Syn. Pl. 2: 329. 1807.

Apodymene grandiflora E. Meyer, Comm. Pl. Afr. Aust. 111. 1835.

A perennial shrub, 3-6 dm. high; branches more or less strigose; leaves 3-8 cm. long; stipules ovate, acuminate, 6-10 mm. long, several-ribbed, brownish or purplish, persistent; leaflets 11-15, usually oblanceolate or oblong, rarely cuneate, 1-2.5 cm. long, cuspidate, strongly veined, strigose on both sides or glabrate above, bracts resembling the stipules, 1-1.5 cm. long, deciduous; flowers mostly 2 at each node; calyx silky-strigose, the tube 4 mm. long, the lobes deltoid-lanceolate, acuminate, subulate-tipped; corolla 15-20 mm. long, rose-red, tinged with orange or yellow without; banner broadly obovate, silky-strigose without; wings obliquely obovate, with a small basal auricle; pod 5-6 cm. long, 8-9 mm. wide, straight, acute at each end, short-pubescent on the sutures, 10-14-seeded.

TYPE LOCALITY: Cape of Good Hope.

DISTRIBUTION: Naturalized in Jamaica; native of South Africa.

ILLUSTRATION: Bot. Reg. 9: pl. 769.

II. *Leiocarpae*. Stem monopodial; racemes terminal and also axillary in the upper axils, or in one species more decidedly axillary, rather elongate. Leaves 9-25-foliolate; stipules lance-subulate to setaceous, caducous; leaflets oblong, mostly obtuse. Corolla 15-20 mm. long, rose or white. Pod wholly glabrous or merely pubescent on the sutures.

2. *Cracca leiocarpa* (A. Gray) Kuntze, Rev. Gen. 175. 1891.

Tephrosia leiocarpa A. Gray, Pl. Wright. 2: 36. 1853.

Tephrosia affinis S. Wats. Proc. Am. Acad. 21: 424. 1886.

Tephrosia viridis M. E. Jones, Contr. W. Bot. 12: 7. 1906.

Cracca affinis Rose, Contr. U. S. Nat. Herb. 12: 269. 1909.

A perennial herb, from a thick woody root; stems several, 3-5 dm. high, angled, striate, strigose; leaves 10-15 cm. long; stipules 4-6 mm. long, setaceous; petiole 1-3 cm. long; rachis sericeous-strigulose; leaflets 9-19, oblong, 2-4.5 cm. long, 5-7 mm. wide, obtuse or acutish, apiculate, glabrous above, cinereous-strigose beneath; racemes terminal and axillary in the upper axils, short-peduncled; bracts caducous; pedicels 5-8 mm. long; calyx cinereous-strigose, the tube 3 mm. long, the lobes lanceolate, 3 mm. long, acuminate; corolla rose-colored or purplish, 15-18 mm. long; banner strigulose on the back, suborbicular, longer than the other petals; wings oblong with an acute basal lobe, short-clawed; keel-petals semi-orbicular, short-clawed; pod glabrous, 3-5 cm. long, 6 mm. wide, straight, about 10-seeded; seeds sub-orbicular, brownish.

TYPE LOCALITY: On the Sonoita, near Deserted Rancho, Sonora.

DISTRIBUTION: Southern Arizona to Sonora and southern Chihuahua.

3. *Cracca calva* Rydberg, sp. nov.

Tephrosia affinis S. Wats. Proc. Am. Acad. 22: 405. 1887. Not *T. affinis* S. Wats. 1886.

A perennial herb, 6-10 cm. high, woody at the base; stem and branches angled, slender, finely strigose; leaves 8-15 cm. long; stipules setaceous, 8-10 mm. long; petiole 1-2 cm. long, as well as the rachis strigose; leaflets 9-17, oblong or oblong-oblanceolate, obtuse to retuse at the apex, mucronate, 2.5-3 cm. long, 8-10 mm. wide, glabrous above, silky-strigose beneath; racemes terminal and in the upper axils, long and slender, 1.5-2 dm. long; flowers 1 or 2 at each node; bracts subulate, deciduous; calyx silky-strigose, the tube 2.5-3 cm. long, the lobes subulate, 4 mm. long; corolla rose-colored, about 20 mm. long; banner broadly obovate, silky-strigose without; wings obliquely obovate, with a large basal auricle; pod about 5 cm. long, straight, 6 mm. wide, glabrous, 7-8-seeded.

Type collected on the slopes of the barranca of Guadalajara, Jalisco, June 11, 1902, Pringle 9773 (Herb. N. Y. Bot. Gard.).

DISTRIBUTION: Jalisco.

4. *Cracca cuernavacana* Rose, Contr. U. S. Nat.

Herb. 12: 269. 1909.

A herbaceous perennial; stems 6-9 cm. high, rusty-pilose with short ascending hairs; leaves 6-10 cm. long; stipules lance-subulate, 7-10 mm. long; petiole about 1 cm. long; rachis rusty-pilose; leaflets 19-25, elliptic or oblong, obtuse, mucronate, 1.5-2.5 cm. long, glabrous above, silky-strigose beneath; racemes axillary, including the peduncles 6-8 cm. long, densely flowered, the flowers all near the end of the peduncle, 1 or 2 at each node; bracts lanceolate, acuminate, silky, about 1 cm. long; calyx rusty-sericeous, the tube scarcely 2 mm. long, the lobes subulate, 2.5 mm. long; corolla nearly white, 15 mm. long; banner obovate, strigose on the back; wings obliquely oblanceolate, obscurely auriculate at the base; pod straight, 4 cm. long, 4 mm. broad, acute, glabrous, except on the sutures, about 6-seeded.

TYPE LOCALITY: Above Cuernavaca, Morelos.

DISTRIBUTION: Known only from the type locality.

5. *Cracca Conzattii* Rydberg, sp. nov.

A shrubby perennial, apparently 1 m. or more high; stems with yellowish-gray bark; branches velutinous-pubescent with ferruginous hairs; leaves 5-15 cm. long; stipules subulate, 7-10 mm. long; petiole 1-2 cm. long, as well as the rachis velutinous; leaflets 15-25, linear or linear-oblong, 1.5-3 cm. long, 3-5 mm. wide, strigose on both sides, somewhat caescent beneath, cuspidate-mucronate; racemes terminal and axillary, but the latter usually first and best developed, 1.5 dm. long or more; bracts subulate, 7-10 mm. long; calyx silky-strigose, the tube 3 mm. long, the lobes lanceolate-acuminate, 3 mm. long; corolla rose-colored, 15 mm. long; banner obovate, silky-strigose and yellowish without; wings obliquely obovate with a large basal auricle; mature pod unknown, the young pod glabrous, except the hirsute upper suture.

Type collected at Las Sedas, Oaxaca, May 19, 1907, *C. Conzatti 1786* (U. S. Nat. Herb. no. 474980).

III. *Foliolosae*. Stem monopodial or sympodial; racemes terminal and also at the nodes, the latter usually neither axillary nor opposite the leaves, but more or less obliquely arranged, long and lax, many-flowered. Leaves 13-31-foliolate; stipules subulate, caducous. Corolla 15-18 mm. long, white or purple. Pod pubescent.

6. *Cracca rhodantha* (Brand.) Rose Contr. U. S. Nat.

Herb. 12: 270. 1909.

Tephrosis rhodantha Brand. Zoe 5: 201. 1905.

A perennial herb; stems several, 4-6 dm. high, hirsutulous, terete; leaves 1-1.5 dm. long; stipules subulate, about 7 mm. long; petiole 1-2 cm. long; rachis sparingly hirsutulous; leaflets 11-19, oblong, 2-4 cm. long, 6-10 mm. wide, rounded at both ends, mucronate, hirsutulous-strigose on both sides, paler beneath; racemes terminal and in the upper axils, 1.5-2 dm. long; bracts subulate, 5-7 mm. long; calyx strigose, the tube 1.5-2 mm. long, the lobes 2-2.5 mm. long, subulate; corolla brick-red or purplish, 10-12 mm. long; banner obovate, silky-strigose without; wings obliquely obovate; upper stamen distinct; pod 5.5-6.5 cm. long, 4 mm. wide, slightly arcuate, sparingly hirsutulous-strigose, 10-12-seeded.

TYPE LOCALITY: Cofradia, Sinaloa.

DISTRIBUTION: Sinaloa.

7. *Cracca foliolosa* Rydberg, sp. nov.

A shrub, 2 m. high; stem angled, strigose; leaves 1-2 dm. long; stipules subulate, 5 mm. long, deciduous; petiole 1.5-2 cm. long; rachis strigose; leaflets 17-31, oblong, 4-5 mm. long, obtuse at each end, mucronate, strigulose or glabrate above, strigose beneath; racemes terminal and in the upper axils, lax, 7-20 cm. long; bracts subulate-setaceous; flowers 1 or 2 at each node; calyx strigose, the tube 3 mm. long, the lobes triangular, contracted into a subulate tip; corolla nearly white, 15 mm. long; banner rounded-obovate; wings oblong-

oblanccolate, shorter than the keel; pod 4.5-5 cm. long, 3-4 mm. wide, slightly arcuate, densely strigose, about 10-seeded.

Type collected at Cerro Colorado, vicinity of Culiacan, Sinaloa, November 3, 1904, T. S. Brandegee (U. S. Nat. Herb. no. 572117).

DISTRIBUTION: Known only from the type locality.

8. *Cracca multifolia* Rose, Contr. U. S. Nat. Herb. 12: 270.

1909.

Tephrosia multifolia Rose, Contr. U. S. Nat. Herb. 1: 320. 1895.

A shrub, 1 m. high or more; stem angled, pilose with long spreading hairs; leaves 1.5 dm. long or more; stipules linear-subulate, caducous; petiole 2-3 cm. long; rachis sparingly pilose; leaflets 21-31, narrowly oblong, 3-5 cm. long, rounded at both ends or retuse at the apex, mucronate, green and strigose above, paler and loosely pilose beneath; racemes terminal and from the upper axils, 1-2 dm. long; bracts subulate; calyx pilose, the tube 2-2.5 mm. long, the lobes deltoid, acuminate, 4 mm. long; corolla purplish, 12-15 mm. long; banner orbicular; wings oblong-cblanceolate; stamens monadelphous above; pod silky-pilose, 5-6 cm. long, 5 mm. wide, about 10-seeded; seeds 4 mm. broad.

TYPE LOCALITY: Manzanillo, Tepic.

DISTRIBUTION: Tepic.

IV. *Virginiana*. Stem monopodial; racemes terminal and in the upper axils, short and rather dense. Leaves 11-29-foliolate; leaflets oblong, obtuse, thin; stipules subulate to setaceous, deciduous. Corolla 10-18 mm. long, yellowish or whitish. Pod pubescent.

9. *Cracca latidens* Small, Fl. SE. U. S. 609, 1331.

1903.

A perennial, with a woody branched rootstock; stems several, tufted, 2-5 dm. high, striate or sulcate, strigose-canescens; leaves 5-9 cm. long; stipules lance-linear, caducous; petiole about 5 mm. long; rachis silky-strigose; leaflets 19-37, broadly oblong or oblong-cuneate, 9-17 mm. long, mucronate, glabrate above, silky-strigose beneath; flowers few in terminal racemes; bracts subulate; calyx densely silky-strigose, the tube 3 mm. long, the lobes broadly ovate, abruptly acuminate, 3 mm. long; corolla 18 mm. long, similar to that of *C. virginiana*; banner sparingly pubescent without; pod unknown, but the young ovary silky-strigose.

TYPE LOCALITY: [Eustis], central peninsular Florida.

DISTRIBUTION: Known only from the type locality.

10. *Cracca Mohrii* Rydberg, sp. nov.

A perennial herb; stem 2-3 dm. high; leaves 5-7 cm. long; stipules minute, subulate, caducous; rachis short-strigose; leaflets 11-21, oblong, acute at each end, mucronate, 6-18 mm. long, 3-6 mm. wide, glabrous and green above, short-strigose and purplish-brown beneath, reticulate; flowers few, in a terminal raceme, or a few also in the upper axils; pedicels 4 mm. long; calyx short-strigose, the tube 2 mm. long, the lobes ovate-lanceolate, acuminate, 2.5 mm. long; corolla yellowish, or the wings rose-tinged, about 1 cm. long; pod about 5 cm. long, 5 mm. wide, arcuate, long-acuminate, short-hirsute, 7-9-seeded.

Type collected in Florida, June, 1880, Charles Mohr (U. S. Nat. Herb. no. 773335).

11. *Cracca leucosericea* Rydberg, sp. nov.

A perennial herb, with a branched caudex; stems several, 3-5 dm. high, appressed-silky, striate; leaves 5-10 cm. long; stipules subulate-setaceous, caducous, about 8 mm. long; rachis appressed-silky; leaflets 11-29, linear-oblong to lance-elliptic, those of the lower leaves often obtuse, the rest acute and acuminate, 1.5-2.5 cm. long, 5-6 mm. wide, glabrate above, silky beneath; flowers in terminal racemes; pedicels 1-1.5 cm. long, silky; calyx densely appressed-silky, almost silvery-white, the tube 3 mm. long, the lobes ovate-lanceolate, short-acuminate,

4 mm. long; corolla 15-18 mm. long, similar to that of *C. virginiana*; pod almost straight, 4-5 cm. long, 4-5 mm. wide, densely white-silky with rather appressed hairs, 6-7-seeded.

Type collected on the False Washita, between Fort Cobb and Fort Arbuckle, 1868, *E. Palmer* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sandy places, Kansas to Texas.

12. *Cracca virginiana* L. Sp. Pl. 752. 1753.

Galega virginiana L. Syst. ed. 10. 1172. 1759.

Galega virginica J. F. Gmel. Syst. Nat. 2: 1552 (index). 1791.

Tephrosia virginiana Pers. Syn. Pl. 2: 329. 1807.

Tephrosia holosericea Nutt. Jour. Acad. Phila. 7: 105. 1834.

Tephrosia virginiana holosericea T. & G. Fl. N. Am. 1: 296. 1838.

Tephrosia virginica Bigel. Fl. Bost. ed. 3. 296. 1840.

Cracca virginiana holosericea Vail, Bull. Torrey Club 22: 27. 1895.

Cracca holosericea Britten & Baker, Jour. Bot. 38: 15. 1900.

Perennial herb, with a woody branched caudex; stems several, 3-6 dm. high, erect, angled or striate, simple, more or less villous, copiously so above; leaves 6-12 cm. long; stipules lance-subulate, caducous, 5-7 mm. long; petiole very short; rachis more or less short-villous; leaflets 11-27, oblong or elliptic, or the terminal one elliptic-obovate, mostly obtuse, apiculate, green and glabrous, or nearly so above, soft silky-villous beneath, or in the var. *holosericea* equally silky-pilose on both sides, 2-3.5 cm. long, 5-10 mm. wide; racemes short, terminal, with 1-3 flowers at each node, and sometimes 1 or 2 in the upper axils; bracts subulate; pedicels 5-10 mm. long; calyx silky-villous with short hairs; tube 2.5-3 mm. long, the lobes 4-5 mm. long, lanceolate, gradually acuminate; corolla cream-colored, pale-yellow, or white, with a tinge of purple or pink; banner pubescent without, broadly obovate, 15-17 mm. long, tapering into the claw; wings about as long, their blades oblong-oblancoate, with a large rounded basal auricle on the upper side and a smaller one on the lower, which is adnate to the keel-petal, the claws 2.5 mm. long; keel-petals lunate, almost semicircular, with a large acute basal auricle on the upper side, united with each other for the upper third of their length; claws 3 mm. long; pod 3-5 cm. long, 4-5 mm. wide, straight or slightly falcate, short-villous; seeds 4-8, reniform-orbicular, 4 mm. long, 3 mm. high, mottled.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Open woods, from New Hampshire to Manitoba, Louisiana, and Florida.

ILLUSTRATIONS: Hill, Veg. Syst. pl. 55, f. 1; Britt. & Brown, Ill. Fl. f. 2117; ed. 2. f. 2521; Lousbery, Guide Wild Fl. pl. 124.

13. *Cracca Roseana* Rydberg, sp. nov.

A herbaceous perennial, slightly shrubby at the base; stem 3-6 dm. high, canescent-strigose; leaves 8-15 cm. long; stipules subulate, 8-10 mm. long; petiole about 2 cm. long, as well as the rachis canescent-strigose; leaflets 15-21, linear-lanceolate or lance-oblong, 1.5-3 cm. long, pale, silky-strigose on both sides, acute and mucronate; racemes 5-15 cm. long, terminal and in the upper axils; bracts lanceolate, short-acuminate, 7-8 mm. long; calyx silky-strigose, the tube 2.5 mm. long, the lobes subulate, 4 mm. long; corolla apparently ochroleucous, 12-14 mm. long; banner obovate, densely strigose without; pod 5-6 cm. long, 6 mm. wide, hirsute-strigose, about 8-seeded.

Type collected at Hacienda Cierro, Querétaro, August 20, 1905, *Rose, Painter & Rose 9642* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Durango and Querétaro.

14. *Cracca leucantha* (H.B.K.) Kuntze, Rev. Gen. 175. 1891.

Tephrosia leucantha H.B.K. Nov. Gen. & Sp. 6: 460. 1823.

A perennial herb, with a branched caudex; stem 3-5 dm. high, angled, sulcate, short-villous or sub-strigose; leaves about 1 dm. long; stipules subulate-filiform, acuminate, 8-12 mm. long; rachis short-villous; petioles 1-2 cm. long; leaflets 7-21, oblong, rounded and mucronate at the apex, obtuse at the base, appressed-pubescent on both sides, 2-3 cm. long, 5 mm. wide; racemes terminal, compact, single, or a second smaller in the uppermost axil, peduncled; bracts lanceolate, acuminate, about 1 cm. long, silky; pedicels 4-10 mm. long; calyx sericeous,

the tube 3 mm. long, the lobes 4 mm. long, subulate; corolla whitish, 12-15 mm. long; banner orbicular, clawed, strigose without; wings oblong, with a rounded auricle on the upper side obtuse, adnate to the keel-petals at the base, short-clawed; keel-petals falcate, nearly semi-orbicular with a rounded base and short claw; pod sericeous.

TYPE LOCALITY: Near Guanajuato.

DISTRIBUTION: Guanajuato to Zacatecas.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. pl. 577.

15. *Cracca Thurberi* (A. Gray) Rydberg, sp. nov.

Tephrosia leucantha A. Gray, Pl. Wright. 2: 36. 1853. Not *T. leucantha* H.B.K. 1823.

Cracca leucantha Vail, Bull. Torrey Club 22: 27, mainly, as to description. 1895. Not *C. leucantha* Kuntze, 1891.

Tephrosia leucantha acuta M. E. Jones, Contr. W. Bot. 12: 7. 1906.*

Tephrosia Thurberi A. Gray ms. in herb.

A perennial herb, with a branched woody caudex; stem 3-6 dm. high, angled and striate, short-villous with spreading or reflexed hairs; leaves 8-15 cm. long; stipules subulate-setaceous, 8-10 mm. long, caducous; petiole 5-20 mm. long; rachis short-villous, somewhat rusty; leaflets 19-25, oblong, obtuse or rounded and mucronate at the apex, 2-3 cm. long, 6-10 mm. wide, appressed-pubescent on both sides; racemes short and dense, terminal or also 1 or 2 in the upper axils; bracts subulate-filiform, 5-10 mm. long, short-villous; calyx short-villous, tawny or rusty, the tube 2.5 mm. long, the lobes subulate, attenuate, 3 mm. long; corolla 15 mm. long, white, usually tinged with rose or purple, the banner hairy without; pod 3-6 cm. long, 4-5 mm. wide, sub-velutinous, nearly straight, 6-9-seeded; seeds pale-green, reniform, 4 mm. long, 3 mm. broad.

Type collected at Mububi, Sonora, June 1851, *Thurber 410* (fl.) and Bubacamori, Sonora, Sept. 1851, *Thurber 1009* (fr.; both in herb. Columbia Univ.)

DISTRIBUTION: Arizona, Sonora, and Chihuahua.

16. *Cracca Seemanni* Britten & Baker, Jour. Bot. 38: 16. 1900.

Tephrosia virginiana Seem. Bot. Voy. Herald 280. 1856. Not *T. virginiana* Pers. 1807.

Tephrosia Seemanni K. Schum. Bot. Jahresb. 28: 442. 1902.

A suffruticose plant; stem villous-tomentose with spreading hairs, about 3 dm. high; leaves 2-4 cm. long; stipules lanceolate, acuminate; petiole short; leaflets 11-19, coriaceous, oblong or ovate-oblong, mucronate, sparingly pubescent or glabrous above, white-sericeous beneath, 0.8-1.5 cm. long, about 5 mm. wide, the midrib prominent on the lower surface; racemes terminal, few-flowered and with a few flowers in the upper axils; pedicels slender, 1-1.5 cm. long, with spreading pubescence; bracts linear-subulate; calyx-tube villous, the lobes narrowly lanceolate, acuminate; corolla purple; wings shorter than the keel-petals, the latter about 7 cm. long; pod white-sericeous.

TYPE LOCALITY: Sierra Madre, Sinaloa.

DISTRIBUTION: Known only from the type locality.

V. *Toxicariae*. Stem monopodial; racemes terminal and in the upper axils, elongate, many-flowered. Leaves 11-41-foliolate; leaflets oblong or elliptic, thick, subcoriaceous, strongly veined beneath, rounded or obtuse at each end; stipules subulate or setaceous. Corolla 14-25 mm. long, yellow to white or rose-colored. Pod pubescent, usually more or less ferruginous-villous.

17. *Cracca toxicaria* (Sw.) Kuntze, Rev. Gen. 175. 1891.

Galega toxicaria Sw. Prodr. 108. 1788.

Tephrosia toxicaria Pers. Syn. Pl. 2: 328. 1807.

Tephrosia Schiedeana Schlecht. Linnaea 12: 299. 1838.

A shrub, 5-15 dm. high, woody below; branches thick, sulcate, densely reddish- or yellowish-velutinous; leaves 2-3 dm. long; stipules setaceous, 1 cm. long, caducous, velutinous; petiole 1-3 cm. long, as well as the rachis densely velutinous, sulcate on the upper side;

* Type specimen not seen, but a specimen in fruit collected by M. E. Jones in Cayanopa Cañon is doubtfully referred to *C. Thurberi*, having shorter and more appressed pubescence and smaller leaflets.

leaflets 21-41, linear-oblong or linear, 4-7 cm. long, 8-18 mm. wide, obtuse or acutish, mucronate at the apex, short-silky above, densely long-silky beneath; racemes terminal and in the upper axils, 1-2 dm. long, dense, many-flowered; flowers 3-6 at each node; bracts subulate-setaceous, acuminate, caducous; calyx densely reddish-velutinous, the tube 2.5-3 mm. long, the lobes ovate, 3 mm. long, abruptly acute; corolla whitish or pale-yellow, 15-20 mm. long; banner orbicular, silky on the back, short-clawed; wings obliquely oblanceolate, with a rounded basal auricle; pod 5-7 cm. long, 5-6 mm. wide, densely ferruginous-villous, 10-15-seeded; seeds 4 mm. long, 2.5 mm. broad.

TYPE LOCALITY: West Indies.

DISTRIBUTION: Jamaica; southern Mexico to Bolivia, Northern Brazil, and Guiana.

ILLUSTRATIONS: Tuss. Fl. Ant. 1: pl. 20; Descourt. Fl. Ant. pl. 183; Mart. Fl. Bras. 25: pl. 8; Plum. Pl. Am. pl. 135.

18. *Cracca Talpa* (S. Wats.) Rose, Bot. Gaz. 40: 143. 1905.

Tephrosia emarginata Mart. & Gal. Bull. Acad. Brux. 10: 48. 1843. Not *T. emarginata* H.B.K. 1823.

Tephrosia Talpa S. Wats. Proc. Am. Acad. 22: 405. 1887.

A perennial, with a woody caespitose base; stems 3-6 dm. high, sulcate, densely villous, subvelutinous, with yellowish pubescence; leaves 1-2 dm. long; stipules 10-12 mm. long, linear-setaceous; petiole 2-5 cm. long, as well as the rachis densely villous, sulcate; leaflets 11-21, oblong, rounded at each end, coriaceous, silky on both sides, densely so and strongly veined beneath, 3-5 cm. long, 1-1.5 cm. wide; racemes terminal and rarely one or two in the upper axils, 1-2 dm. long, many-flowered; flowers 3-6 at each node; calyx silky-villous, the tube 2.5 mm. long, the lobes 3 mm. long, lanceolate, acuminate; corolla rose colored, 15-18 mm. long; banner suborbicular, silky without; wings obliquely oblanceolate, with a rounded basal auricle; pod 3-5 cm. long, 6 mm. wide, straight, densely villous, 4-6-seeded; seeds mottled, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Río Blanco, Jalisco.

DISTRIBUTION: Durango and Sonora to Oaxaca.

19. *Cracca arcuata* Rydberg, sp. nov.

Cracca toxicaria Standley, Contr. U.S. Nat. Herb. 23: 471, 473. 1922. Not *C. toxicaria* Kuntze, 1891.

A shrub, up to 7 m. high; branches angled, short-pubescent with spreading hairs; leaves 1.5-2 dm. long; stipules subulate, deciduous; the short petiole and rachis short-hirsute; leaflets 31-37, linear or lance-linear, acute, 3-4 cm. long, 7-8 mm. wide, silky or in age nearly glabrous above, densely villous beneath; racemes elongate, 1.5-2 dm. long; flowers 2 or 3 at each node; calyx villous with yellowish hairs, the tube 3 mm. long, the lobes lance-subulate, 3 mm. long; corolla about 1.5 cm. long; banner obovate; wings obliquely oblanceolate; pod about 5 cm. long, 4-5 mm. wide, decidedly arcuate, short-hirsute, 8-10-seeded.

Type collected on María Madre, Tres Marias Islands, Tepic, May 1897, E. W. Nelson 4193 (U. S. Nat. Herb. no. 345936).

DISTRIBUTION: Tepic to Oaxaca.

20. *Cracca Heydeana* Rydberg, sp. nov.

A perennial, suffruticose at the base; stems sulcate, finely villous; leaves 1-2 cm. long; stipules subulate, 3-5 cm. long; petiole 1-2 cm. long, as well as the rachis sulcate, densely villous; leaflets 21-29, oblong, subcoriaceous, rounded at both ends, 2-4 cm. long, 7-12 mm. wide, silky on both sides, rather densely so beneath; racemes several, terminal and from the upper axils, 1-2 dm. long, rather lax; flowers 2-4 at each node; bracts subulate, 8-10 mm. long; calyx silky, the tube 2.5 mm. long, the lobes subulate, acuminate, 3 mm. long; corolla apparently white or sulphur-yellow, 14-15 mm. long; banner oval, silky without; wings linear-oblanceolate, with a rounded basal auricle; pod slightly upcurved, 5-6 cm. long, 4 mm. wide, densely short-villous, 6-9-seeded; seeds brown, 3 mm. long, 2 mm. broad.

Type collected at Cerro Redondo, Santa Rosa, Guatemala, October, 1893, Heyde & Lux (Donnell Smith's dist. no.) 6111 (herb. Columbia Univ.).

DISTRIBUTION: Guatemala to Panama.

21. *Cracca nicaraguensis* (Oerst.) Kuntze, Rev.

Gen. 175. 1891.

Tephrosia nicaraguensis Oerst.; Benth. & Oerst. Vidensk. Meddel. 1853: 6. 1853.

A suffruticose perennial, 3-5 dm. high; branches angled, densely villous; leaves 10-15 cm. long; stipules subulate, 6-10 mm. long; leaflets 15-21, oblong, obtuse at each end, silky-villous on both sides, subsericeous beneath, 2-3 cm. long, thick, strongly veined beneath; racemes short, terminal; bracts setaceous, caducous; pedicels villous, 1 mm. long in flower, 4 mm. long in fruit; calyx villous, the tube 2-3 cm. long, the lobes lanceolate, acuminate, unequal, the lowest much the longest; corolla about 12 mm. long; banner sericeous-villous on the back; wings oblong, short-clawed; keel-petals broadly obliquely obovate, obtuse; pod straight, 4 cm. long, 4 mm. wide, ferruginous-villous.

TYPE LOCALITY: Savannas between Granada and Masaya, Nicaragua.

DISTRIBUTION: Nicaragua and Costa Rica.

22. *Cracca macrantha* (Pringle) Rose, Bot. Gaz. 40: 143. 1905.*Tephrosia macrantha* Pringle, Garden & Forest 7: 173. My 1894.*Tephrosia macrantha* Rob. & Greenm. Proc. Am. Acad. 29: 383. Je 1894.

A tall perennial, shrubby below, 2-4 m. high; branches angled and ribbed, fulvous-velutinous; leaves 7-13 cm. long; stipules subulate, 10-12 mm. long; petiole 2-3 cm. long, as well as the rachis sulcate, and subvelutinous; leaflets 17-23, oblong, elliptic, or lance-oblong, obtuse to cuneate at the base, obtuse or acutish at the apex, strigose on both sides, somewhat canescent beneath, tawny on the ribs, 2-4 cm. long, 6-18 mm. wide; racemes terminal and in the upper axils, the terminal one often branched, 1.5-2.5 dm. long; bracts filiform-subulate, 8-10 mm. long; calyx finely pubescent, the tube 3 mm. long, the lobes lanceolate, 3 mm. long, attenuate; corolla about 2.5 cm. long, lilac, tinged yellow; banner orbicular; wings oblong, oblique at the base; keel-petals lunate, semi-obovate, with a rounded basal auricle; pod 5-7 cm. long, 4 mm. wide, falcate.

TYPE LOCALITY: Tequila, Jalisco.

DISTRIBUTION: Jalisco and Guerrero.

ILLUSTRATION: Garden & Forest 7: fig. 32.

VI. *Candidae*. Stem monopodial, erect; racemes terminal and in the upper axils, dense. Leaves 13-25-foliolate; leaflets lanceolate or lance-oblong, rather firm, acute; stipules setaceous, persistent. Corolla white or yellowish, 2.5-3 cm. long. Pod pubescent, strigose or subvelutinous.

23. *Cracca candida* (Roxb.) Kuntze, Rev. Gen. 173. 1891.*Robinia candida* Roxb. (Cat. Hort. Beng. 56; hyponym. 1814; DC. Prodr. 2: 249, as synonym. 1825) Fl. Ind. 3: 327. 1832.*Tephrosia candida* DC. Prodr. 2: 249. 1825.*Xiphocarpus martinicensis* Presl, Symb. Bot. 1: 14. 1830.*Xiphocarpus candidus* Hassk. Pl. Jav. Rar. 336. 1848.*Kieseria candida* Reinw. Syll. Pl. Nov. 2: 11. 1828.*Robinia sericea* Sieber; Presl, Symb. Bot. 1: 14, as synonym. 1830.

A shrub, 1-3 m. high; branches angled, densely silky-strigose with brown or gray hairs; leaves 1-2 dm. long; stipules setaceous, about 1 cm. long, persistent; leaflets 19-25, lance-oblong, acute at each end, mucronate, 4-5 cm. long, 7-10 mm. wide, firm, glabrous above, silky-strigose beneath; racemes short, dense, terminal and in the upper axils; flowers 3-6 at each node; bracts subulate, caducous; calyx silky-strigose, more or less ferruginous, the tube 4 mm. long, the lobes rounded-ovate, 2-3 mm. long, mucronate; corolla white, 2.5-3 cm. long; banner broadly obovate, silky-strigose without; wings obliquely obovate, scarcely auricled at the base; stamens monadelphous, but the upper stamen free at the base and the tube split on one side of it above; pod 6-10 cm. long, 7 mm. wide, sparingly strigose, 9-14-seeded.

TYPE LOCALITY: Bengal, India.

DISTRIBUTION: Naturalized in Jamaica, St. Kitts, and Martinique; native of India.

ILLUSTRATION: Presl, Symb. Bot. pl. 7.

24. *Cracca submontana* Rose, Contr. U. S. Nat.
Herb. 8: 46. 1903.

A tall perennial, woody below; branches reddish or brownish, velutinous, sulcate; leaves 1-1.5 dm. long; stipules lanceolate, silky; petiole 1-2 cm. long, as well as the rachis densely velutinous; leaflets 13-17, lanceolate or lance-oblong, acute at the apex, 2-6 cm. long, glabrous and shining above, densely reddish- or silvery-silky beneath; racemes several, terminal and in the upper axils, 2-3 dm. long, many-flowered; bracts lanceolate, 1 cm. long or less; calyx densely silky, the tube 4 mm. long, the lobes deltoid, 4 mm. long, the lowest one narrower; corolla 2.5 cm. long; banner suborbicular, silky without; wings broadly oblanceolate; pod 9-11 cm. long, 6 mm. wide, finely velutinous.

TYPE LOCALITY: Between Pedro Paulo and San Blasito, Tepic.

DISTRIBUTION: Tepic.

VII. *Pringleanae*. Stem monopodial, short, decumbent; racemes terminal, short, few-flowered. Leaves 15-21-foliolate; leaflets obovate, green and glabrous above, silky-strigose beneath. Corolla 2.5-3 cm. long, white. Pod sparingly strigose.

25. *Cracca Pringlei* Rose, Bot. Gaz. 40: 143. 1905.

A low perennial, woody at the base, caespitose; stems several, 1-2 dm. high; branches densely strigose-canescent; leaves 4-6 cm. long; stipules subulate, 4-5 mm. long; leaflets 15-21, oblong or oblanceolate, green and sparingly pubescent, strongly reticulate above, densely white-silky beneath, rounded and mucronate at the apex, 8-15 mm. long; racemes terminal, dense and short; flowers mostly 2 at each node; calyx sericeous, the tube 3 mm. long, the lobes lance-subulate, 5 mm. long; corolla purplish, 15 mm. long; banner obovate, silky-strigose without; pod 4-4.5 cm. long, 6 mm. wide, acute, hirsute-pilose, about 8-seeded.

TYPE LOCALITY: Las Sedas, Oaxaca.

DISTRIBUTION: Oaxaca.

VIII. *Vicioides*. Stem monopodial or pseudo-sympodial, slender and branched; racemes terminal and axillary, often placed obliquely to the leaves. Leaves 9-21-foliolate; leaflets lanceolate, oblanceolate, or linear, acute. Corolla 6-8 mm. long, purple or rose-colored. Pod strigose or pilose.

26. *Cracca vicioides* (Schlecht.) Kuntze, Rev. Gen. 175. 1891.

Tephrosia vicioides Schlecht. Linnaea 12: 297. 1838.

A perennial herb, somewhat lignescent below; stems several, about 3 dm. high, angular above, striate, reddish-pilose, especially above; leaves about 1 dm. long; stipules setaceous, 5-8 mm. long, persistent; petiole 1 cm. long or less; rachis angled, channeled, pilose; leaflets 15-21, oblanceolate, 2-3 cm. long, 4-8 mm. wide, obtuse, mucronate, glabrous above, sparingly silky-strigose beneath; racemes slender, terminal and in the upper axils, 8-15 cm. long; flowers 1 or 2 at each node; bracts setaceous, persistent; calyx pilose, the tube 2 mm. long, the lobes subulate, 2.5 mm. long; corolla about 6 mm. long, purple; banner rounded, strigose without; upper stamen free at the base; pod about 4 cm. long, 4 mm. wide, strigose, 7-8-seeded.

TYPE LOCALITY: Hacienda de la Laguna, Veracruz.

DISTRIBUTION: Veracruz to Guerrero.

27. *Cracca Brandegei* Standley, Contr. U. S. Nat.
Herb. 20: 217. 1919.

A diffusely branched perennial, with woody base; stems 3-5 dm. high, angled, densely hirtellous with short white hairs; leaves 3-7 cm. long, spreading; stipules subulate, 3 mm. long; petiole 1-2 cm. long, as well as the rachis hirtellous; leaflets 9-19, linear or linear-oblanceolate, 1-4.5 cm. long, 1-6 mm. wide, acute at each end or obtuse at the apex, short-pilose on both sides; racemes terminal and axillary, or sub-opposite the leaves, including the peduncle 10-23 cm. long; calyx hirtellous, the tube about 1.5 mm. long, the lobes deltoid, attenuate, about

as long; corolla rose-purple, 7-8 mm. long; banner obovate, finely sericeous without; pod 3-4 cm. long, 2.5-3 mm. wide, minutely pilose, 7-8-seeded.

TYPE LOCALITY: Altata, Sinaloa.

DISTRIBUTION: Sinaloa and Durango.

IX. *Nitentes*. Stem monopodial, fruticose; racemes terminal, rarely also in the upper axils, dense. Leaves 9-13-foliolate; leaflets oblong or oblong-lanceolate, rounded at the apex, acute at the base, coriaceous, silvery-silky beneath; stipules lanceolate, acuminate. Corolla 2 cm. long, rose-colored. Pod velutinous.

28. *Cracca nitens* (Benth.) Kuntze, Rev. Gen. 175. 1891.

Tephrosia nitens Benth.; Seem. Bot. Voy. Herald 107. 1853.

Tephrosia nitens lanata M. Micheli, Bull. Soc. Bot. Belg. 30: 286. 1891.

A fruticose perennial, 6-10 dm. high; stems erect, silky-villous; leaves 1-1.5 dm. long; stipules lanceolate, acuminate, silky without; petiole 1 cm. long or less, as well as the sulcate rachis densely silky; leaflets 9-13, oblong or oblong-oblancoate, rounded or retuse and recurved-apiculate at the apex, acute at the base, coriaceous, yellowish-green and glabrous above, silvery-silky beneath; racemes terminal and sometimes one from the upper axil, 2-4 dm. long; bracts lanceolate, acuminate; calyx white-silky, the tube 3 mm. long, the lobes lance-subulate, 4-5 mm. long; corolla rose-colored, about 2 cm. long; banner broadly obovate, silky without; wings obliquely oblanceolate, with a rounded basal auricle; pod 5-6 cm. long, 5-6 mm. broad, velutinous, 8-10-seeded.

TYPE LOCALITY: Island of Taboga, Bay of Panama.

DISTRIBUTION: Oaxaca to British Honduras and Panama; also from Colombia and Venezuela to Brazil.

ILLUSTRATIONS: Seem. Bot. Voy. Herald *pl.* 19.

X. *Crassifoliae*. Stem monopodial; racemes terminal, dense, with very short pedicels. Leaves 1-11-foliolate; leaflets subcoriaceous, oblong to obovate, rounded at the apex, strongly ribbed beneath. Corolla rose or lilac, 12-20 mm. long. Pod velutinous.

29. *Cracca madrensis* (Seem.) Kuntze, Rev. Gen. 175. 1891.

Tephrosia madrensis Seem. Bot. Voy. Herald 280. 1856.

Galactia marginalis Seem. Bot. Voy. Herald 280, as synonym. 1856.

A suffruticose perennial; branches prostrate, angled, glabrous; leaves unifoliolate; stipules lanceolate or lance-subulate, about 1 cm. long; petiole 1-2 cm. long, glabrous; leaflets elliptic to ovate-oblong, 2-5 cm. long, coriaceous, venose, glabrous, mucronate; racemes terminating the branches, 10-12-flowered, the peduncle and pedicels appressed-pubescent; flowers mostly solitary at the nodes; calyx appressed-hairy, the tube 3 mm. long, the lobes deltoid-lanceolate, acute, of about the same length; corolla 15-18 mm. long; banner broadly obovate, pubescent without; wings obliquely oblanceolate, with a rounded basal auricle; pod 5-6-seeded.

TYPE LOCALITY: Sierra Madre (Durango or possibly Sinaloa).

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Seem. Bot. Voy. Herald *pl.* 61.

30. *Cracca Watsoniana* Standley, Contr. U. S. Nat. Herb.

23: 472. 1922.

Clitoria (?) *sericea* S. Wats. Proc. Am. Acad. 22: 407. 1887.

Cracca sericea Rose, Contr. U. S. Nat. Herb. 12: 271. 1909. Not *C. sericea* A. Gray, 1883; nor *C. sericea* Kuntze, 1891.

A perennial, somewhat suffruticose at the base; stems 1-3 dm. high, densely silky, with ascending or appressed hairs; leaves unifoliolate, or on vigorous plants 3-7-foliolate, with the terminal leaflet larger than the rest; stipules linear-subulate, 5-10 mm. long; petiole 0.5-3 cm. long; leaflets linear-oblong to oblanceolate or oval, 2-8 cm. long, 1-3 cm. wide, green and somewhat silky above, densely white-silky and with prominent veins beneath, obtuse or rounded and mucronate at the apex, obtuse or rounded at the base; racemes

terminal, 5-18 cm. long; flowers 1-3 at each node; bracts subulate; calyx white-silky, the tube 3 mm. long, the lobes deltoid, lanceolate, long-acuminate, 4-5 mm. long; banner broadly obovate, villous on the back; wings broadly oblanceolate; pod 4-5 cm. long, about 5 mm. wide, densely short-silky with at first appressed, later spreading hairs, 6-8-seeded;

TYPE LOCALITY: Rio Blanco, Jalisco.

DISTRIBUTION: Tepic and Jalisco to Guerrero.

31. *Cracca Micheliana* Standley, Contr. U. S. Nat.

Herb. 23: 472. 1922.

Tephrosia major M. Micheli, Mém. Soc. Genève 34: 251. 1903.

Cracca major Rose, Contr. U. S. Nat. Herb. 12: 270. 1909. Not *C. major* Alef. 1861.

A suffruticose perennial; stem erect, about 1 m. high, angled, velutinous, with dark hairs; leaves 1-5-foliolate; stipules deciduous; petiole 1-3 cm. long, as well as the rachis velutinous; leaflets coriaceous, oblong, elliptic, or oblong-oblanceolate, obtuse at each end, glabrate and shining above, densely white-tomentose and with strong veins beneath, the terminal one 7-20 cm. long, 2-6 cm. wide, the lateral ones 4-10 cm. long, 2-4 cm. wide; racemes terminal, simple or with a single branch in the uppermost axil, 1.5-3 dm. long, many-flowered; bracts short, 3-5 mm. long, linear or lanceolate, caducous; flowers 2-4 at each node; calyx grayish-tomentose, the tube 4 mm. long, the lobes lanceolate, 4 mm. long; corolla pale-lilac, 2 cm. long; banner orbicular, emarginate, densely villous without; wings obliquely oblanceolate, with a small, rounded basal auricle; pod about 4 cm. long, 7-8 mm. wide, turgid, tomentose, 6-8-seeded; seed suborbicular, with a short funicle.

TYPE LOCALITY: El Ocote, Guerrero or Michoacan.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Mém. Soc. Genève 34: pl. 4.

32. *Cracca diversifolia* Rose, Contr. U. S. Nat. Herb.

12: 270. 1909.

? *Balboa diversifolia* Liebm. Vidensk. Meddel. 1853: 107. 1854.

A suffruticose perennial, caespitose; stems less than 1 m. high, finely tomentose; leaves 1-5-foliolate; stipules lance-subulate, 8-10 mm. long; petiole 0.5 cm. long or less; leaflets oblong or oblanceolate, obtuse or rounded at the apex, obtuse or acutish at the base, coriaceous, glabrate and green above, white- or gray-tomentose and strongly veined beneath, the terminal one 6-10 cm. long, 2.5-5 cm. wide, the lateral ones 3-5 cm. long; inflorescence, a dense terminal raceme, 1-2 dm. long, often with a few short branches below; flowers usually several at each node; calyx densely short-villous, subvelutinous, the tube about 5 mm. long, the lobes ovate or broadly lanceolate, acuminate, 7 mm. long; corolla violet, 18-20 mm. long; banner orbicular, silky-villous on the back; wings obliquely oblanceolate; pod velutinous, 4-5 cm. long, 7 mm. broad, 5-6-seeded; seeds orbicular, with a short funicle.

TYPE LOCALITY: Near Uruapan, Michoacan.

DISTRIBUTION: Michoacan.

33. *Cracca platyphylla* Rose, Contr. U. S. Nat. Herb.

12: 270. 1909.

A suffruticose perennial; stem about 3 dm. high, densely villous; leaves unifoliolate; stipules lanceolate, densely villous, about 1 cm. long; petiole very short, villous; leaflets broadly oblong to obovate, 4-7 cm. long, 2-4 cm. wide, coriaceous, rounded or retuse at the apex, rather densely silky above when young, but soon glabrate, white villous-tomentose beneath; inflorescence short, compact, terminal or rarely with a branch in the uppermost axil; bracts lanceolate, very villous; calyx densely white-villous, the tube 5 mm. long, the lobes broadly lanceolate, acuminate, 7-8 mm. long; corolla rose-red, 15 mm. long; banner suborbicular, silky-villous without; wings broadly obliquely oblanceolate; pod not known.

TYPE LOCALITY: Pine woods between Mascota and San Sebastián, Jalisco.

DISTRIBUTION: Known only from the type locality.

34. *Cracca lanata* (Mart. & Gal.) Kuntze, Rev.

Gen. 175. 1891.

Tephrosia lanata Mart. & Gal. Bull. Acad. Brux. 10: 48. 1843.*Tephrosia crassifolia* Benth. Bot. Voy. Sulph. 80. 1844.*Cracca crassifolia* Kuntze, Rev. Gen. 174. 1891.

A shrubby perennial; stems tomentose-villous, flexuose, branched, with gray or on the younger parts yellowish pubescence; leaves 5-12 cm. long; stipules lanceolate, villous, 5-10 mm. long; petiole 1 cm. long or less, as well as the rachis densely villous; leaflets 5-9, oblong to oval, rounded at both ends, silky-villous or in age glabrate above, densely villous-canescens, when young often more or less fulvous beneath, strongly veined beneath, the lowest 2-3 cm. long, the odd one 4-8 cm. long, 1.5-4 cm. wide; racemes terminal and in the upper axils, 5-10 cm. long, dense, often branched; flowers 2-4 at each node; calyx villous, the tube 2 mm. long, the lobes lanceolate, 5 mm. long, acuminate; corolla rose-red, about 12 mm. long; pod densely fulvous-villous, 4 cm. long, 6 mm. wide.

TYPE LOCALITY: Savannas of Zacuapán, Veracruz.

DISTRIBUTION: Veracruz to Guerrero and Sinaloa.

35. *Cracca velutina* Rydberg, sp. nov.

A shrubby perennial; stem densely velutinous, somewhat yellowish, angled; leaves 1-1.5 cm. long; stipules lanceolate, velutinous; petiole 1 cm. long or less, as well as the rachis densely velutinous; leaflets oblong, often acutish, coriaceous, strongly reticulate, shining and glabrous or slightly pubescent on the midrib above, finely velutinous beneath, 2-3 cm. broad, the lowest pair about 4 cm. long, the odd leaflet 8-10 cm. long; racemes terminal, about 2 dm. long; bracts lanceolate; flowers 2-4 at each node; calyx yellowish-velutinous, the tube 3 mm. long, the lobes 4 mm. long, lance-subulate; corolla rose-colored, 18-20 mm. long; banner suborbicular, villous without; wings obliquely oblanceolate; pod 4-5 cm. long, 5-6 mm. wide, velutinous, 8 or 9-seeded.

Type collected at Zopelote, Tepic, February, 1895, F. H. Lamb 575 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Tepic.

XI. *Langlasseanae*. Stem monopodial; racemes terminal and in the upper axils, rather lax. Leaves 9-11-foliolate; leaflets broadly lanceolate, acute or acuminate, thin, green above, reddish and pilose beneath. Corolla about 2 cm. long. Pod pilose-villous.

36. *Cracca Langlassei* (M. Micheli) Rose, Contr. U. S.

Nat. Herb. 12: 270. 1909.

Tephrosia Langlassei M. Micheli, Mém. Soc. Genève 34: 250. 1903.

A perennial herb, about 5 dm. high; stem purplish or reddish, pilose; leaves 1-1.5 dm. long; stipules linear-subulate, pilose, 1 cm. long; petiole 1 cm. long; rachis pilose; leaflets 9-11, broadly lanceolate, obtuse at the base, acute or acuminate, 4-8 cm. long, 1.5-2 cm. wide, green and puberulent above, reddish and pilose beneath, reticulate-venose; racemes terminal and in the upper axils; flowers 1-3 at each node; bracts linear-subulate, pilose; calyx pilose, the tube 3 mm. long, the lobes lance-subulate, 5 mm. long; corolla lilac, about 2 cm. long; banner orbicular; wings obliquely obovate, with a rounded basal auricle; keel acutish; stamens monadelphous, but the uppermost one free at the base; pod 4-5 cm. long, 5-7 mm. wide, pilose-villous, 5-7-seeded.

TYPE LOCALITY: Sierra Madre, Guerrero or Michoacan.

DISTRIBUTION: Jalisco to Oaxaca.

XII. *Rugeliana*. Stems monopodial; racemes terminal and in the upper axils, short and few-flowered. Leaves 3-11-foliolate; leaflets subcoriaceous, obovate, retuse, strigulose above, strigulose beneath. Corolla 15-18 mm. long, purple. Pod tomentose.

37. *Cracca Rugelii* (Shuttl.) A. Heller, Cat. N. Am. Pl. ed. 2: 7.
1900.

Tephrosia Rugelii Shuttl.; B. L. Robinson, Bot. Gaz. 28: 197. 1899.

A perennial herb, with a woody rootstock; stems several, finely appressed-pubescent with bronze-colored hairs; stipules 4-6 mm. long, persistent; petiole 5-15 mm. long; leaflets 3-11, obovate, retuse, mucronate, finely strigulose above, cinereous-strigose beneath, 8-17 mm. long, 4-8 mm. wide; flowers in a short dense terminal raceme and in pairs in the upper axils; bracts lance-subulate; calyx tawny-villous, 5 mm. long; lobes subulate; corolla apparently purple, 15-18 mm. long; pod somewhat falcate, 3.5-4 cm. long, 5 mm. wide, tomentulose.

TYPE LOCALITY: Manatee River, southwestern Florida.
DISTRIBUTION: Southwestern Florida.

XIII. *Chrysophyllae*. Stem sympodial; racemes opposite the leaves, the lower ones best developed, long-peduncled, with few flowers near the end. Leaves 3-9-foliolate, short-petioled, the petioles much shorter than the lowest leaflets; leaflets obovate to elliptic. Corolla 8-12 mm. long, purple. Pod strigose or hirtous.

38. *Cracca chrysophylla* (Pursh) Kuntze, Rev. Gen. 174. 1891.

Tephrosia chrysophylla Pursh, Fl. Am. Sept. 489. 1814.

Galega florida F. G. Dietr. Vollst. Lex. Gaertn. Nachtr. 3: 422, as to description. 1817.

Tephrosia prostrata Nutt. Gen. 2: 120. 1818.

Perennial herb, with a woody root; stems prostrate, 3-10 dm. long, dichotomously branched, densely short-pilose, somewhat viscid and usually tawny; leaves 3-6 cm. long, nearly sessile; stipules lance-subulate, deciduous, 3-4 mm. long; petiole 1-3 mm. long; rachis pilose; leaflets 3-9, cuneate-obovate, obtuse or retuse, coriaceous, 1-3 cm. long, 7-20 mm. wide, glabrous and yellowish-green above, appressed-silky beneath; racemes opposite the leaves, lax, including the pilose peduncle 4-10 cm. long; bractlets 5 mm. long, lance-subulate, persistent; calyx silky-pilose, the tube 2 mm. long, the lobes subulate, 3 mm. long; corolla purple; banner broadly obovate, 1 cm. long, short-clawed, abruptly acutish, strigose on the back; wings oblanceolate-oblong, round at the apex, short-clawed, with a basal auricle on the upper side, slightly shorter than the banner; keel-petals broadly lunate, almost semicircular; pod 3.5-4.5 cm. long, 5-6 mm. wide, strigose, straight, abruptly acute at both ends, 8-10-seeded; seeds suborbicular, brownish, variegated with black.

TYPE LOCALITY: Georgia.
DISTRIBUTION: Pine barrens from Georgia to Mississippi and Florida.

39. *Cracca Carpenteri* Rydberg, sp. nov.

A perennial herb; stem decumbent, 2-4 dm. long, strigose; leaves 2-3.5 cm. long, very short-petioled; stipules 2-3 mm. long, lance-subulate; petiole 1-2 cm. long, as well as the rachis strigose; leaflets 5-7, obovate, retuse or truncate at the apex, 1-1.5 cm. long, cuneate at the base, glabrous above, strigose with long hairs beneath; racemes opposite the leaves, including the peduncle 5-8 cm. long, 1-4-flowered; calyx strigose, the tube 2 mm. long, the lobes ovate-deltoid, acute, 2 mm. long; corolla purple, 10-12 mm. long; banner broadly obovate; wings obliquely obovate, with a small acute basal auricle; keel-petals semi-orbicular, with an acute basal auricle; pod 4-4.5 cm. long, slightly downwardly arcuate, 4 mm. wide, hirtous.

Type collected in pine woods, Pensacola, Florida, June 1838, *Dr. Carpenter 41* (Torrey herb., flower); also in fruit, Chapman (herb. N. Y. Bot. Gard.).
DISTRIBUTION: Western Florida.

40. *Cracca Chapmanii* (Vail) Small, Fl. SE. U. S.
612, 1331. 1903.

Cracca chrysophylla Chapmanii Vail, Bull. Torrey Club 22: 34. 1895.

Tephrosia chrysophylla Chapmanii B. L. Robinson, Bot. Gaz. 28: 198. 1899.

A perennial herb, with woody root; stem slender, 1-3 dm. long, pilose with ascending or appressed hairs; leaves 1-3 cm. long, subsessile; stipules 2-3 mm. long, lance-subulate; rachis appressed-pilose; leaflets 3-7, obovate or elliptic, rounded to retuse at the apex, 5-15

cm. long, glabrous above, silky-strigose beneath; racemes opposite the leaves, including the peduncle 2-4 cm. long, 2-4-flowered; calyx strigose, the tube 2 mm. long, the lobes deltoid, 2 mm. long; corolla purple, about 8 mm. long; banner broadly obovate; pod about 2 cm. long, 3-4 mm. wide, straight, strigose, 6-8-seeded.

TYPE LOCALITY: St. Joseph's, Florida.

DISTRIBUTION: Type locality and vicinity.

XIV. *Lindheimerianae*. Stem sympodial; racemes opposite the leaves, elongate, lax. Leaves 3-13-foliolate; petioles usually longer than the lower leaflets; leaflets broadly obovate to suborbicular, coriaceous. Corolla 12-15 mm. long, purple. Pod villous-hirsute or pilose.

41. *Cracca Lindheimeri* (A. Gray) Kuntze, Rev.

Gen. 175. 1891.

Tephrosia Lindheimeri A. Gray, Bost. Jour. Nat. Hist. 6: 172. 1850.

A perennial herb, with a thick woody root; stem 0.5-1.5 m. long, decumbent or ascending, flexuose, branched, short-pilose; leaves 1-1.5 dm. long; stipules subulate, 6-7 mm. long; petiole 1-4 cm. long; leaflets 7-13, broadly obovate, from obtuse to retuse at the apex, silky-strigose on both sides, canescent beneath, 2-3 cm. long, often nearly as wide; racemes subopposite the leaves, elongate, including the peduncle 1-2.5 dm. long, usually 2 at each node; calyx short-villous, the tube 2 mm. long, the lobes deltoid or deltoid-lanceolate, 2-2.5 cm. long; corolla purple, 12-15 mm. long; banner obovate, silky-strigose without; pod about 5 cm. long, 8 mm. wide, straight, acute at each end, villous-hirsute, 6-8-seeded.

TYPE LOCALITY: Mesquit prairies on the Llano, Texas.

DISTRIBUTION: Texas.

42. *Cracca potosina* (Brand.) Rydberg

Tephrosia potosina Brand. Univ. Calif. Publ. Bot. 4: 272. 1912.

A perennial herb, with a woody root; stem decumbent, flexuose, densely hirsute-pilose; leaves 1-1.5 dm. long; stipules linear-lanceolate, hirsute, 8 mm. long; petiole 4-6 cm. long; rachis hirsute-pilose; leaflets 3-7, broadly obovate to orbicular, rounded or retuse at the apex, 2.5-3.5 cm. long, 2-3 cm. wide, glabrous above, hirsute-pilose beneath; racemes subopposite the leaves, 1.5-2 dm. long, about 12-flowered; flowers mostly 2 at each node; calyx densely hirsute, the tube 2 mm. long, the lobes lance-subulate, 3 mm. long; corolla purplish, about 12 mm. long; banner obovate, silky-strigose without; pod about 5 cm. long, 8 mm. wide, acute at each end, densely hirsute-pilose, about 6-seeded.

TYPE LOCALITY: Near Rascon, San Luis Potosí.

DISTRIBUTION: San Luis Potosí and Nuevo León.

XV. *Spicatae*. Stem sympodial; racemes opposite the leaves, lax. Leaves 3-23-foliolate; petioles usually equaling or longer than the lower leaflets; stipules lance-linear or subulate, persistent; leaflets linear to oval, rarely obovate, coriaceous, strongly veined. Corolla 12-15 mm. long, purple or white. Pod pubescent.

43. *Cracca spicata* (Walt.) Kuntze, Rev. Gen. 175. 1891.

Cracca virginiana L. Sp. Pl. 752, in part. 1753.

Galega virginiana L. Sp. Pl. ed. 2. 1062, in part. 1763.

Galega spicata Walt. Fl. Car. 188. 1788.

Galega villosa Michx. Fl. Bor. Am. 2: 67. 1803. Not *G. villosa* L., 1759.

Tephrosia villosa (Michx.) Pers. Syn. Pl. 2: 329. 1807. Not *T. villosa* (L.) Pers. Syn. Pl. 2: 329. 1807.

Tephrosia paucifolia Nutt. Gen. 2: 119. 1818.

Galega florida F. C. Dietr. Vollst. Lex. Gaertn. Nachtr. 3: 422, as to synonym. 1817.

Tephrosia hispida DC. Prodr. 2: 250. 1825.

Galega paucifolia Nutt.; M. A. Curt. Bost. Jour. Nat. Hist. 1: 122. 1837.

Tephrosia spicata T. & G. Fl. N. Am. 1: 296. 1838.

Tephrosia mollissima Bertol. Mem. Accad. Bologna 2: 274. 1850.

A perennial, with a strong and long woody root; stem decumbent or ascending, flexuose, somewhat angled, rusty hirsute-villous throughout, sometimes becoming glabrate below; leaves 5-15 cm. long; stipules 5-10 mm. long, often persistent, linear-lanceolate; petiole

3-20 mm. long; rachis villous-hirsute; leaflets 5-15, broadly oblong to oval or obovate, obtuse, mucronate, often reflexed, 1.5-3.5 cm. long, 7-15 mm. wide, sparingly silky or glabrate above, densely villous or pilose beneath; racemes elongate, lax, opposite the leaves, including the peduncle 1-3 dm. long; bracts 5-10 mm. long, subulate, persistent; flowers 1-3 at each node, mostly near the end of the peduncle; calyx silky-hirsute, the tube 2 mm. long, the lobes subulate, 3-4 mm. long; corolla white or purple, 12-15 mm. long; banner strigose without, suborbicular, short-clawed; wings oblanceolate, longer than the keel; pod 3-5 cm. long, 5-6 mm. wide, acute, straight, 8-12-seeded; seeds brown.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Sandy pine lands from Delaware and Virginia to Tennessee, Mississippi, and Florida.

ILLUSTRATION: Mem. Accad. Bologna 2: pl. 13, f. 2; Britt. & Brown, Ill. Fl. f. 2118; ed. 2. f. 2522.

44. *Cracca intermedia* Small, Bull. Torrey Club 21: 303. 1894.

Cracca Smallii Vail, Bull. Torrey Club 22: 33. 1895.

Cracca floridana Vail, Bull. Torrey Club 22: 35. 1895.

Tephrosia Smallii B. L. Robinson, Bot. Gaz. 28: 198. 1899.

A perennial, with a long woody root; stem prostrate to adscurgent, 2-6 dm. long, branched and flexuose, angled above, finely short-pilose, somewhat viscid; leaves 4-10 cm. long; stipules 3-5 mm. long, subulate, deciduous or persistent; petiole 1-2.5 cm. long; leaflets 5-13, elliptic or oblong-obovate, obtuse, rounded or truncate at the apex, apiculate, 1.5-3 cm. long, 5-14 mm. wide, glabrous and yellowish-green above, grayish-strigose beneath, the veins strong, turning reddish; racemes opposite the leaves, lax, including the peduncle 1-2 dm. long; bracts subulate, 5-7 mm. long; flowers 1 or 2 at each node; calyx strigose-pilose, the tube 2.5 mm. long, the lobes subulate, 3 mm. long; corolla white turning reddish-purple, about 15 mm. long; banner rounded-obovate, strigose on the back; wings obliquely broadly oblanceolate, with a rather large basal auricle; pod 3-4 cm. long, 4-5 mm. wide, erect, straight, strigose, 6-10-seeded; seeds ovoid, grayish or brownish variegated with black.

TYPE LOCALITY: Near Jacksonville, Florida.

DISTRIBUTION: Pinelands from Georgia to Florida and Louisiana.

45. *Cracca flexuosa* (Chapm.) A. Heller, Cat. N. Am. Pl. ed. 2. 7. 1900.

Tephrosia hispidula γ T. & G. Fl. N. Am. 1: 297. 1838.

Tephrosia flexuosa Chapm.; T. & G. Fl. N. Am. 1: 297, as synonym. 1838.

Tephrosia villosa flexuosa B. L. Robinson, Bot. Gaz. 28: 200. 1899.

A perennial, from a woody root; stem slender, 2-6 dm. high, flexuose, sparingly hirsute; leaves 6-12 dm. long; stipules subulate, 8-10 mm. long, hirsute, persistent; petiole 1-3 cm. long; rachis hirsute; leaflets 3-15, linear or lance-linear, long-acute, glabrous or puberulent above, hirsute and with strong reddish veins beneath, the lateral ones spreading or reflexed, 1-3 cm. long, 2-4 mm. wide, the terminal one larger, 1.5-4.5 cm. long; racemes lax, few-flowered, 8-18 cm. long; flowers 1 or 2 at each node; bracts subulate; calyx hirsute, the tube 2.5 mm. long, the lobes subulate, 3.5-4 mm. long; corolla 12 mm. long; banner suborbicular, short-clawed, strigose without; wings obliquely oblanceolate, round at the apex, with an acute basal auricle.

TYPE LOCALITY: Florida.

DISTRIBUTION: Florida and Alabama.

46. *Cracca hispidula* (Michx.) Kuntze, Rev. Gen. 175. 1891.

Galega hispidula Michx. Fl. Bor. Am. 2: 68. 1803.

Tephrosia hispidula Pers. Syn. Pl. 2: 329. 1807.

Tephrosia gracilis Nutt. Gen. 2: 119. 1818.

Tephrosia elegans Nutt. Jour. Acad. Phila. 7: 105. 1834.

A perennial, with a fusiform woody root; stem somewhat ligneous at the base, 1-4 dm. long, decumbent, flexuose, branching, angled, sparingly strigose or glabrate; leaves 3-6 cm. long; stipules 2-5 mm. long, subulate, sometimes persistent; petiole 5-15 cm. long; rachis

sparingly strigose; leaflets 7-17, elliptic-oblong or lance-oblong, 1-2 cm. long, 4-8 mm. wide, acutish at both ends, those of the lower leaves rounded or even retuse at the apex, apiculate, often reflexed, glabrous or sparingly strigose above, silky-strigose beneath, the veins often reddish; racemes opposite the leaves, lax, 5-10 cm. long; flowers few, 1 or 2 at each node near the end of the peduncle; bracts subulate, 2-5 cm. long; calyx sparingly hairy, the tube 2 mm. long, the lobes lance-subulate, 2 mm. long; corolla purple, 12-16 mm. long; banner rounded-obovate; wings broadly obliquely obovate; pod about 4 cm. long, 4-5 mm. wide, slightly falcate (curved downward), 8-12-seeded; seeds dark-brown, nearly orbicular, 3 mm. long.

TYPE LOCALITY: "Virginia, Carolina, and Georgia."

DISTRIBUTION: Virginia (?); North Carolina to Florida and Louisiana.

ILLUSTRATION: Britt. & Brown, Ill. Fl. f. 2119; ed. 2. f. 2523.

47. *Cracca ambigua* (M. A. Curt.) Kuntze, Rev. Gen. 174.
1891.

Galega ambigua M. A. Curt. Bost. Jour. Nat. Hist. 1: 121. 1834.

Tephrosia hispidula β T. & G. Fl. N. Am. 1: 296. 1838.

Tephrosia ambigua M. A. Curtis; (D. Dietr. Syn. Pl. 4: 1043, as synonym. 1847) Chapm. Fl. S. U. S. 96. 1860.

A perennial, with a woody caudex and strong woody root; stems prostrate or ascending, 3-5 dm. long, often purplish, dichotomously branched, angled, more or less strigose; leaves 7-15 cm. long; stipules 5-7 mm. long, lance-subulate, persistent; petiole 3-8 cm. long; rachis strigose; leaflets 7-13, linear-oblong to oblanceolate or cuneate-oblong, or obovate, 2-4 cm. long, 5-15 mm. broad, mostly obtuse or rounded and mucronate at the apex, coriaceous, sparingly strigose or glabrate above, more densely strigose beneath, red-veined; racemes opposite the leaves, including the peduncle 1-1.5 cm. long, lax; flowers 1 or 2 at each node; bracts subulate, 5 mm. long; calyx hirsute, the tube 2.5 mm. long, the lobes subulate, 3 mm. long; corolla purple, 12-15 mm. long; banner rounded-obovate; wings oblong-oblanceolate, with a rounded basal auricle; pod 3.5-4.5 cm. long, 5 mm. wide, strigose-hispidulous.

TYPE LOCALITY: Wilmington, North Carolina.

DISTRIBUTION: Pinelands from North Carolina to Florida and Louisiana.

48. *Cracca gracillima* (B. L. Robinson) A. Heller,
Cat. N. Am. Pl. ed. 2. 7. 1900.

Cracca angustissima Vail, Bull. Torrey Club 22: 32. 1895. Not *C. angustissima* Kuntze, 1891.

Tephrosia ambigua gracillima B. L. Robinson, Bot. Gaz. 28: 201. 1899.

A perennial, with a somewhat ligneous base; stem 3-6 dm. long, prostrate, diffuse, flexuose, sparingly strigose or glabrate; leaves 5-15 cm. long; stipules 3-7 mm. long, subulate-setaceous, persistent; petiole 2-8 cm. long; rachis sparingly strigose; leaflets 5-17, linear, acute at each end, 2-3 cm. long, 2-3 mm. wide, minutely strigose beneath; racemes lax, including the peduncle 5-10 cm. long; flowers 1 or 2 at each node; bracts subulate, setaceous; calyx sparingly strigose, the tube 2 mm. long, the lobes subulate, about 2 mm. long; corolla 10-12 mm. long, purple; banner suborbicular; wings broadly obliquely oblanceolate, with an acute basal auricle; pod 3-4 cm. long, 4-5 mm. wide, hirsutulous, 6-8-seeded; seeds dark-brown, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Near Eau Gallie, Indian River, Florida.

DISTRIBUTION: Known only from the type locality.

49. *Cracca tepicana* Standley, Contr. U. S. Nat.
Herb. 20: 217. 1919.

A perennial, somewhat woody below; stems flexuose, probably 5 dm. high, sparingly pilose with spreading hairs, the upper part triangular; leaves 7-12 cm. long; rachis pilose; stipules subulate-setaceous, 5-10 mm. long; leaflets 5-11, elliptic, 2-5 cm. long, 1-1.5 cm. wide, obtuse at each end, cuspidate, rather strongly veined and reticulate beneath, glabrous above, sparingly pubescent beneath; racemes including the peduncle 1-3 dm. long, the peduncle 3-angular; flowers 2 or 3 at each node; bracts subulate-setaceous, 8-10 mm. long; calyx silky-

strigose, the tube 3 mm. long, the lobes deltoid, abruptly acuminate, 2 mm. long; corolla 12-15 mm. long; banner rounded-obovate, silky on the back; wings with a small basal auricle; pod densely silky-pubescent.

TYPE LOCALITY: Tepic.

DISTRIBUTION: Known only from the type locality.

50. *Cracca onobrychoides* (Nutt.) Kuntze, Rev. Gen. 175.

1891.

Tephrosia onobrychoides Nutt. Jour. Acad. Phila. 7: 104. 1834.

Tephrosia multiflora Featherman, Rep. Bot. Surv. Louisiana 1870: 73. 1871.

A perennial herb, with a somewhat woody base; stem erect, rather stout, somewhat flexuose, striate, usually densely pilose with spreading or reflexed hairs; leaves 1-2 dm. long; stipules 8-15 mm. long, linear-lanceolate, often persistent; petiole 1-3 cm. long; rachis pilose; leaflets 11-25, elliptic, oblong, or oblanceolate, obtuse or rounded, or slightly retuse and mucronate at the apex, 2-5 cm. long, 9-18 mm. wide, silky-pilose on both sides or glabrate above; racemes mostly opposite the leaves, elongate, including the rusty-pilose peduncle 3-6 dm. long; bracts 5 mm. long, linear-subulate; flowers many, 1-4 at each node; calyx pilose, the tube 2 mm. long, the lobes 2-3 mm. long, lanceolate or lance-subulate, acuminate; corolla white, turning scarlet, 15 mm. long; banner strigose on the back, rounded-obovate; wings slightly shorter, oblanceolate, with a small basal auricle; pod 3-5 cm. long, 5-6 mm. wide, acute, somewhat falcate, puberulent or hispidulous, 6-8-seeded.

TYPE LOCALITY: Plains of the Arkansas.

DISTRIBUTION: Alabama to Oklahoma and Texas.

51. *Cracca californica* Rydberg, sp. nov.

A perennial, somewhat woody at the base; stems branched, somewhat angled, finely pilose with spreading short hairs, often purple-tinged; leaves 10-15 cm. long; stipules subulate, reflexed or spreading, 8-10 mm. long; petiole 1.5-3 cm. long; rachis pilose; leaflets 15-19, oblong, acute at each end, mucronate, strongly veined beneath, 2-3 cm. long, 6-8 mm. wide, glabrate above, short-pilose beneath; racemes lax, including the peduncle 1-2 dm. long; flowers 1-3 at each node; bracts subulate; calyx densely pilose, the tube 2 mm. long, the lobes lance-subulate, 3 mm. long, acuminate; corolla ochroleucous, or the banner tinged with purple, 12 mm. long; banner rounded-obovate, pilose on the back; wings obliquely oblanceolate, with a small basal auricle; pod about 5 cm. long or more, 4-5 mm. wide, about 12-seeded.

Type collected at Mesa Verde, Lower California, in 1899, *T. S. Brandegee* (herb. N. Y. Bot. Gard.).

52. *Cracca cana* (Brand.) Rydberg.

Tephrosia cana Brand. Proc. Calif. Acad. II, 3: 126. 1891.

A perennial, shrubby below; stem 6-9 dm. high, strigose-canescens; leaves 8-15 cm. long; stipules often deflexed, 3-5 cm. long, subulate; petiole 1-3 cm. long; rachis strigose; leaflets 11-21, oblong-elliptic, acute at each end, 3-4 cm. (according to the original description up to 8 cm.) long, green and sparingly silky above, grayish-silky beneath; racemes including the peduncle 1.5 dm. long or more, rather lax, many-flowered; flowers 1 or 2 at each node; bracts lance-subulate; calyx silky-pubescent, the tube 2.5-3 mm. long, the lobes lance-subulate, 3-4 mm. long; corolla ochroleucous, sometimes turning purplish, 12-15 mm. long; banner rounded-obovate; wings broadly obliquely oblanceolate; pod 6-8 cm. long, 4 mm. wide; seeds 5 mm. long, 3 mm. broad.

TYPE LOCALITY: Sierra de la Laguna, Lower California.

DISTRIBUTION: Lower California.

53. *Cracca texana* Rydberg, sp. nov.

A perennial herb; stem 5-10 dm. high, erect, strict, terete, strigose; leaves 1-1.5 dm. long; stipules lance-subulate, 10-15 mm. long; petiole 1-3 cm. long, as well as the rachis

grayish-strigose; leaflets 13-19, oblong, elliptic, oblanceolate, or oblong-obovate, 2-4 cm. long, 6-15 mm. wide, acutish to truncate and mucronate at the apex, acute or obtuse at the base, strongly veined, glabrous or nearly so above, grayish-strigose beneath; racemes opposite the leaves, including the peduncles 3-7 dm. long; bracts subulate, 5 mm. long; calyx sparingly pubescent with ascending hairs, the tube 3 mm. long, the lobes lanceolate, acuminate, 2.5-3 mm. long; corolla rose-purple, 15 mm. long; banner broadly obovate; wings obovate with an acute basal auricle; keel-petals semiorbicular, with a small basal auricle; pod 5-6 cm. long, 4 mm. wide, slightly downwardly arcuate, strigulose, 8-10-seeded.

TYPE COLLECTED on prairies at Hempstead, Texas, June 1, 1872, *Elihu Hall 119* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Western Louisiana and eastern Texas; apparently also near Mobile, Alabama.

54. *Cracca angustifolia* (Featherman) Pennell, Bull. Torrey

Club 44: 337. 1917.

Tephrosia hispidula δ T. & G. Fl. N. Am. 1: 297. 1838.

Tephrosia angustifolia Featherman, Rep. Bot. Surv. Louisiana 1870: 73. 1871.

A perennial herb, with a woody root; stem 5-10 dm. high, pubescent with more or less ascending hairs; leaves about 1 dm. long; stipules subulate, 5-7 mm. long; petiole 1-2.5 cm. long, sparingly pubescent; leaflets 7-15, linear or linear-ob lanceolate, obtuse to truncate at the apex, 2.5-4 cm. long, 5-8 mm. wide, glabrous or sparingly hairy above, silky-strigose beneath; racemes slender, lax, including the peduncle 2-5 dm. long; flowers 1 or 2 at each node; calyx hirsute, the tube 3.5 mm. long, the lobes subulate, 3-5 mm. long; corolla 15-20 mm. long; banner broadly obovate; wings obliquely oblanceolate, with an acute basal lobe; pod about 6 cm. long, 5 mm. wide, hirsutulous, 8-10-seeded.

TYPE LOCALITY: Pine barrens near Ponchatoula, Louisiana.

DISTRIBUTION: Alabama, Mississippi, and Louisiana.

55. *Cracca Palmeri* (S. Wats.) Rose, Contr. U. S.

Nat. Herb. 12: 270. 1909.

Tephrosia Palmeri S. Wats. Proc. Am. Acad. 24: 46. Ja 1889.

Tephrosia Purisimae Brand. Proc. Calif. Acad. II. 2: 149. N 1889.

A tall perennial; stem probably 1 m. high, silvery-strigose, angled; leaves 8-12 cm. long; stipules subulate, 4-7 mm. long, persistent; petiole 2.5-4 cm. long; rachis strigose; leaflets 7-13, linear or linear-oblong, 1.5-4 cm. long, 3-5 mm. wide, silvery-strigose on both sides, acute at each end, apiculate; racemes lax, many-flowered, including the peduncle 2-4 dm. long; flowers 1 or 2 at each node; bracts subulate, 2-5 mm. long; calyx silver-canescent, the tube 3.5 mm. long, the lobes lance-subulate, 4 mm. long; corolla light-yellow or purplish, about 18 mm. long; banner pubescent on the back, broadly obovate; wings slightly shorter, oblong-ob lanceolate, with a prominent basal auricle; pod nearly straight, 6 cm. long, 4 mm. wide, canescent, 8-10-seeded; seeds nearly 4 mm. long, 2 mm. broad.

TYPE LOCALITY: Mountains near Guaymas, Sonora.

DISTRIBUTION: Sonora and Lower California.

56. *Cracca hamata* (Brand.) Rydberg, sp. nov.

Tephrosia Palmeri Brand. Proc. Calif. Acad. II. 3: 126. 1891. Not *T. Palmeri*, S. Wats. 1889.

Tephrosia hamata Brand. MS.

A perennial, shrubby below; stem 5 dm. high or more, silvery-strigose, angled, flexuose; leaves 5-10 cm. long; stipules subulate, about 3 mm. long; petiole 1-2 cm. long; rachis silvery-strigose; leaflets linear-ob lanceolate, 1.5-3.5 cm. long, 2-6 mm. broad, retuse at the apex, with a recurved mucro, silvery-strigose on both sides; racemes lax, many-flowered, 1-2 dm. long; bracts subulate; flowers 1 or 2 at each node; calyx silvery-canescent, the tube 2.5 mm. long, the lobes 3 mm. long, subulate; corolla yellowish, 12-14 mm. long; banner orbicular; wings broadly oblanceolate, pod about 5 cm. long, 4 mm. wide, 8-9-seeded, strigose-canescent.

TYPE COLLECTED at San José del Cabo, Lower California, October 1, 1890, *T. S. Brandegee* (herb. Columbia Univ.).

DISTRIBUTION: Cape region of Lower California.

XVI. **Purpureae.** Stem sympodial; racemes opposite or subopposite the leaves, but sometimes placed obliquely or rarely axillary, lax and few-flowered. Leaves 5-21-foliolate; leaflets mostly narrow, not coriaceous; stipules lance-linear to filiform. Corolla 5-12 mm. long, in *C. cinerea* and *C. littoralis* rarely up to 15 mm. long. Pod strigose to villous or hirsutulous.

57. ***Cracca corallicola*** Small, Bull. Torrey Club 36: 160. 1909.

A perennial, ligneous at the base; stems erect or decumbent, flexuose, branched, densely hirsute-villous with short hairs, 3-10 dm. long; leaves numerous, 4-10 cm. long; stipules subulate, 2-4 mm. long; rachis hirsute-villous; leaflets 11-15, linear or linear-oblong, mucronate, 1-3 cm. long, 3-5 mm. wide, hirsute-villous on both sides; racemes including the peduncle 5-10 cm. long; flowers mostly solitary at the nodes; bracts subulate; calyx hirsute, the tube 4 mm. long, the lobes subulate, 3 mm. long; corolla pinkish or purplish, 7-10 mm. long; banner suborbicular, strigose without; wings broadly obliquely oblanceolate, with a rounded basal auricle; pod 3.5-4.5 cm. long, 3-4 mm. wide, hirsutulous, 5-8-seeded; seeds oblong-reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Between Coconut Grove and Cutler, Florida.
DISTRIBUTION: Subtropical Florida and Cuba.

58. ***Cracca littoralis*** (Jacq.) Rydberg.

Vicia littoralis Jacq. Enum. Pl. Carib. 27. 1760.
Galega littoralis L. Syst. Nat. ed. 12. 2: 497. 1767.
Tephrosia littoralis Pers. Syn. Pl. 2: 329. 1807.
Tephrosia gynothrix Miq. Linnaea 18: 29. 1844.
Tephrosia cinerea littoralis Pers.; Griseb. Fl. Brit. W. Ind. 182. 1859.
Tephrosia scopulorum Brand. Univ. Calif. Publ. Bot. 7: 181. 1915.

A perennial herb; stems prostrate to ascending, 3-10 dm. long, pilose with soft spreading hairs, angled and channeled; leaves 2-12 dm. long; stipules subulate, 5-10 mm. long, persistent; petiole 1-3 cm. long; leaflets 7-17, oblong to linear-oblanceolate, 1-5 cm. long, 4-12 mm. wide, obtuse or rounded, rarely acutish at the apex, mucronate, glabrous or sparingly pubescent above, silky-pubescent beneath; racemes slender, lax, including the peduncles 7-20 cm. long; bracts subulate; calyx hirsute, the tube 2-3.5 mm. long, the lobes 4-5 mm. long, subulate, attenuate; corolla purplish, about 1 cm. long; banner suborbicular, with a short claw; wings obliquely oblanceolate with an acute basal auricle, short-clawed; pod 4-5 cm. long, 4 mm. wide, straight, short-hirsute, 8-10-seeded; seeds rectangular-reniform, 3 mm. long, 2 mm. broad, somewhat truncate at the ends. *Tephrosia scopulorum* is a rather densely pubescent form, with larger flowers. Closely related to *C. cinerea*, and by some botanists not regarded as specifically distinct.

TYPE LOCALITY: Carthage.
DISTRIBUTION: Bahamas, Cuba, Porto Rica; Oaxaca, Veracruz, Yucatan; also in Colombia, Venezuela, and Brazil.
ILLUSTRATIONS: Jacq. Sel. Stirp. Pict. pl. 192; Jacq. Sel. Stirp. Am. pl. 124.

59. ***Cracca decumbens*** (Benth.) Kuntze, Rev. Gen. 174. 1891.

Tephrosia decumbens Benth.; Oerst. Vidensk. Meddel. 1853: 7. 1853.
Tephrosia cinerea villosior Benth. in Mart. Fl. Bras. 15: 48. 1859.

A perennial, with a woody root or caudex; stems several, diffuse or prostrate, 2-5 dm. long, densely villous, branched and somewhat flexuose; leaves 3-5 cm. long; stipules subulate-setaceous, 3-5 mm. long; petiole 5-10 mm. long; rachis villous; leaflets 5-11, oblanceolate or cuneate, spreading or reflexed, obtuse to retuse at the apex, 1-2 cm. long, 4-7 mm. wide, silky-canescens on both sides, densely so beneath, with rather loose hairs; racemes opposite the leaves, the lowest bract often foliaceous, pinnate, the rest lance-subulate; calyx pilose, the tube 1.5-2 mm. long, the lobes subulate-setaceous, 3 mm. long; corolla 8-10 mm. long, purplish; banner suborbicular; wings broadly obliquely oblanceolate, with a deltoid basal auricle; pod 3-4 cm. long, 4 mm. wide, straight, densely short-villous with spreading hairs, 7-9-seeded; seeds greenish, oblong, 3 mm. long, nearly 2 mm. broad, subtruncate at the ends. Perhaps a form of the preceding or *C. cinerea*.

TYPE LOCALITY: Granada, Nicaragua.
DISTRIBUTION: Yucatan to Guerrero, Colombia, Venezuela, and Brazil.

60. *Cracca purpurea* L. Sp. Pl. 752. 1753.

Galega purpurea L. Syst. Nat. ed. 10. 1172. 1759.
Tephrosia purpurea Pers. Syn. Pl. 2: 329. 1807.
Tephrosia ascendens Macfad. Fl. Jam. 257. 1837.
Cracca villosa purpurea Kuntze, Rev. Gen. 174. 1891.

A perennial herb; stems copiously branched and flexuose, 3-6 dm. high, sparingly and finely strigose or glabrate; leaves 2-10 cm. long; stipules linear-subulate, 3-5 mm. long; petiole 5-10 mm. long; leaflets 7-21, narrowly oblanceolate, obtuse or rounded at the apex, glabrous or sparingly strigose above, somewhat silky-strigose beneath; racemes mostly opposite the leaves, lax, including the peduncle 1-15 cm. long; bracts subulate, small; calyx silky-strigulose, the tube about 2 mm. long, the lobes 2 mm. long, subulate; corolla 6-9 mm. long, red; banner orbicular-ovate, short-clawed; wings broadly obliquely oblanceolate; pod 3-4 cm. long, 4 mm. wide, minutely strigose, 3-6-seeded, somewhat arcuate upward; seeds oblong-reniform, 3 mm. long.

TYPE LOCALITY: Ceylon.

DISTRIBUTION: Jamaica and Hispaniola; Sinaloa to Guerrero; Panama; also in Colombia; naturalized from India.

ILLUSTRATIONS: Rheede, Hort. Mal. 9: pl. 22; Burm. Fl. Zeyl. pl. 32.

61. *Cracca Curtissii* Small, sp. nov.

Tephrosia purpurea B. L. Robinson, Bot. Gaz. 28: 201, in part. 1899.

A perennial herb; stem slender, flexuose, branched, glabrous or sparingly strigose; leaves 4-10 cm. long; stipules subulate-setaceous; petiole 8-12 mm. long; rachis glabrous or nearly so; leaflets 7-17, oblong or oblanceolate, rounded or retuse at the apex, mucronate, 1-3 cm. long, 4-6 mm. wide, glabrous above, sparingly strigillose or glabrate beneath; racemes slender, lax, including the peduncles 8-12 cm. long; calyx strigose, the tube 2.5 mm. long, the lobes lanceolate, acuminate, 2.5 mm. long; corolla 10-12 mm. long, purplish; banner suborbicular, often retuse at the apex; wings broadly obliquely oblanceolate, with a deltoid basal auricle; pod straight, about 4 cm. long and 4 mm. wide, strigillose, 5-6-seeded

Type collected on sandy ridges near Cape Malabar, eastern Florida, *A. H. Curtiss 584* (herb. Columbia University).

DISTRIBUTION: Eastern Florida.

62. *Cracca tenella* (A. Gray) Rose, Contr. U. S. Nat
Herb. 12: 271. 1909.

Tephrosia tenella A. Gray, Pl. Wright. 2: 36. 1853.

A perennial, with a deep rootstock; stem slender, branched, sparingly strigose or glabrate, angled; leaves 6-10 cm. long; stipules subulate-filiform, 3-5 mm. long; petiole 1-3 cm. long; rachis sparingly strigose; leaflets 7-9, rarely 11, or on the lower leaves 3 or 5, linear, acute, 2-4 cm. long, 2-8 mm. wide, glabrous above, sparingly strigose beneath; racemes mostly opposite the leaves, lax, few-flowered, including the peduncle 1-2 dm. long; flowers solitary or two together at each node; bracts subulate; calyx sparingly strigose, the tube 2 mm. long, the lobes lance-subulate, 2 mm. long; corolla about 8 mm. long, similar to that of *C. purpurea*; pod nearly straight, 3-4.5 cm. long, 4 mm. wide, short-strigose, 6-8-seeded.

TYPE LOCALITY: San Pedro, Sonora.

DISTRIBUTION: Texas to Arizona, Lower California, and Chihuahua.

63. *Cracca piscatoria* (Ait.) Rydberg.

Galega piscatoria Ait. Hort. Kew. 3: 71. 1789.
Tephrosia piscatoria Pers. Syn. Pl. 2: 329. 1807.

A more or less fruticose perennial; stem 5-10 dm. high, angled, striate or sulcate, strigose, with ascending strict branches; leaves 8-10 cm. long; stipules subulate, 5-10 mm. long; petiole less than 1 cm. long, as well as the rachis strigose; leaflets 11-19, linear or linear-oblanceolate, 2-4 cm. long, 2-4 mm. wide, glabrous above, strigose beneath, obtuse or acutish at the apex, acute at the base; racemes arranged irregularly, terminal, obliquely axillary,

or sub-opposite the leaves, 1-2 dm. long, strict; bracts subulate, 5-8 mm. long; calyx strigose, the tube 2 mm. long, the lobes lance-subulate, acuminate, 2 mm. long; corolla pink or purplish, 7-8 mm. long; pod about 5 cm. long, 4 mm. wide, slightly arcuate upwards, strigulose.*

TYPE LOCALITY: India.

DISTRIBUTION: Morelos and Tepic to Colombia; also in India and the Pacific islands.

64. *Cracca angustissima* (Shuttl.) Kuntze, Rev. Gen. 174. 1891.

Tephrosia angustissima Shuttl.; Chapm. Fl. S. U. S. 96. 1860.

Tephrosia purpurea angustissima B. L. Robinson, Bot. Gaz. 28: 201. 1899.

A perennial, more or less shrubby below; stem 5-7 dm. high, glabrous or sparingly strigose, branched; leaves 6-10 cm. long; stipules subulate, setaceous, 2-3 mm. long; petiole about 1 cm. long; leaflets 11-15, narrowly linear, mucronate, 2-5 mm. long, 1-3 mm. wide, glabrous above, sparingly strigulose or glabrate beneath; racemes slender, lax, including the peduncle 1-2 dm. long; bractlets subulate; calyx sparingly strigose, the tube 2 mm. long, the lobes subulate, 2 mm. long; corolla purple, about 1 cm. long or less; banner suborbicular, strigose without; wings broadly obliquely oblanceolate, with a rounded basal auricle; pod 4-5 cm. long, 4 mm. wide, nearly straight, minutely strigose, 7-9-seeded.

TYPE LOCALITY: South Florida.

DISTRIBUTION: Subtropical Florida.

65. *Cracca hypoleuca* Rydberg.

Indigofera Perriniana Spreng. Neue Entd. 2: 161. 1821. Not *Cracca Perriniana* (Spreng.) Kuntze 1891.

A perennial herb; stem slender, brownish, branched, sparingly strigose; leaves 4-7 cm. long; stipules setaceous, about 3 mm. long; rachis more or less strigose; leaflets about 9-15, narrowly linear, 2-7 cm. long, 1-3 mm. wide, glabrous or nearly so above, densely silvery-strigose beneath, mucronate; racemes few-flowered, including the peduncle 4-20 cm. long, slender; bracts minute, subulate-setaceous; calyx strigose, the tube 1.5 mm. long, the lobes subulate, 1.5 mm. long; corolla pink, 6-10 mm. long; pod linear, slightly arcuate upwards, about 4 cm. long and 3 mm. wide, ferruginous-hirsutulous, 10-12-seeded.

TYPE LOCALITY: "America, probably South" (on the label, it is given as West Indies).

DISTRIBUTION: Known only from the type collection.

66. *Cracca Wallichii* (Graham) Rydberg.

Tephrosia Wallichii Graham (Wall. Cat. n. 5640, nomen nudum); Fawcett & Rendle, Jour. Bot. 55: 35. 1917.

A perennial, subliguous at the base; stem terete, 3-5 dm. high, sparingly strigose or glabrate; leaves 6-10 cm. long; stipules lance-subulate, 5-7 mm. long; petiole 5-10 mm. long; rachis sparingly strigose; leaflets 11-19, oblong, cuneate, or oblanceolate, glabrous above, cinereous-strigose beneath, 1.5-2.5 cm. long, 5-15 mm. wide; racemes lax, 8-10 cm. long, opposite the leaves; flowers 1-3 at each node; calyx strigose, the tube 2 mm. long, the lobes about 3 mm. long, subulate; corolla 8-10 mm. long, red-purple; banner suborbicular, strigose without; wings oblong-oblanceolate; pod 3-4 cm. long, strigillose, 5-7-seeded.

TYPE LOCALITY: India.

DISTRIBUTION: Jamaica, Haïti, St. Kitts, Dominica, Barbados, and Trinidad; naturalized from India.

67. *Cracca cathartica* (Sessé & Moc.) Rydberg.

Galega cathartica Sessé & Moc. Fl. Mex. ed. 2. 175. 1894.

Cracca Schottii Vail, Bull. Torrey Club 22: 25. 1895.

Tephrosia cathartica Urban, Symb. Ant. 4: 283. 1905.

A perennial, somewhat woody below; stem 3-5 dm. long, strigose, erect or decumbent, angled; leaves 4-10 cm. long; stipules 4-7 mm. long, subulate, persistent; petioles 1-2.5 cm. long; rachis strigose; leaflets 5, oblong-oblanceolate to obovate, 1-3 cm. long, rounded or

* This description does not fully agree with the original one but it has been drawn from Oersted's specimens, collected near Realajo, Nicaragua, and so named by Bentham, and from several similar Mexican and Central American specimens.

retuse at the apex, cuneate at the base, strigose on both sides, usually sericeous beneath; racemes opposite the leaves, lax, few-flowered, including the peduncle 5-15 cm. long; flowers 1 or 2 at each node; bracts subulate, 7-10 mm. long; calyx strigose, the tube 2 mm. long, the lobes lance-subulate, nearly 3 mm. long; corolla rose-purple, 7-10 mm. long; banner suborbicular, short-clawed, strigose on the back; wings broadly obliquely oblanceolate, with an acute basal auricle; pod 3-5 cm. long, 4-5 mm. wide, straight, strigose, 6-8-seeded; seed brownish, mottled, 3.5-4 mm. long, 2.5 mm. broad.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Bahamas, Cuba, Hispaniola, Lesser Antilles; Yucatan and Honduras; also in Colombia.

68. *Cracca domingensis* (Willd.) Rydberg.

Galega domingensis Willd. Sp. Pl. 3: 1249. 1803.
Tephrosia domingensis Pers. Syn. Pl. 2: 330. 1807.

A perennial, with woody caudex; stems ascending or decumbent, branched, glabrous or nearly so, 3-6 dm. high; leaves 5-10 cm. long; stipules subulate, 7-10 mm. long; petiole 1 cm. long or less, as well as the rachis glabrous; leaflets 11-19, linear-oblanceolate, obtuse or acutish and mucronate at the apex, acute at the base, 1-3 cm. long, 3-6 mm. wide, glabrous on both sides, or with scattered hairs beneath; racemes opposite the leaves, 10-15 cm. long; bracts subulate, 4-7 mm. long; calyx with a few rather loose hairs, the tube 2 mm. long, the lobes subulate, 4 mm. long; corolla nearly 1 cm. long, rose-purple; pod straight, 4-5 cm. long, 4 mm. wide, very sparingly strigose or nearly glabrous, 8-11-seeded. Closely related to the next species.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Cuba and Santo Domingo.

69. *Cracca cinerea* (L.) Morong, Ann. N. Y. Acad. Sci. 7: 79. 1892.

Galega cinerea L. Syst. Nat. ed. 10. 1172. 1759.
Tephrosia cinerea Pers. Syn. Pl. 2: 529. 1807.
Tephrosia procumbens Macfad. Fl. Jam. 1: 256. 1837. Not *T. procumbens* Buch.-Ham. 1822.
Cracca villosa cinerea Kuntze, Rev. Gen. 173. 1891.

A perennial, suffruticose below, with a woody root; stem prostrate, diffuse or ascending, 3-6 dm. high, strigose, cinereous especially when young, angled; leaves 4-10 cm. long; stipules 3-8 mm. long, acuminate, persistent; petiole 5-15 mm. long; rachis cinereous-strigose; leaflets 9-17, linear- or oblong-oblanceolate, 2-5 cm. long, 4-8 mm. wide, obtuse or acutish at the apex, acute at the base, sparingly strigose or glabrate above, cinereous-strigose beneath, or in one form almost equally cinereous on both sides; racemes opposite the leaves, lax, including the peduncle 5-10 cm. long; bractlets subulate or setaceous, persistent; calyx cinereous-strigose, the tube 2 mm. long, the lobes subulate, 3 mm. long or more; corolla purplish, 10-15 mm. long; banner suborbicular, strigose without; pod 4-5 cm. long, 4-5 mm. wide, strigose, nearly straight, 6-12-seeded; seeds brown, mottled, 4 mm. long, 2 mm. broad.

TYPE LOCALITY: [By inference] Jamaica.

DISTRIBUTION: West Indies; Yucatan, Chiapas, and Guatemala; also from Venezuela and Colombia to Paraguay; introduced at Mobile, Alabama.

70. *Cracca Rusbyi* Rydberg, sp. nov.

A perennial herb, suffruticose below; stem 5 dm. high or more, sparingly strigose, angled, slender; leaves 10-15 cm. long; stipules sulcate-setaceous, 8-10 mm. long; petiole 1-2 cm. long; rachis strigose; leaflets 9-11, narrowly linear, tapering at each end, 3-7 cm. long, 1.5-3 mm. wide, strigose below, glabrate above; racemes lax, including the peduncle 3-3.5 dm. long; flowers 1-3 at each node; bractlets subulate, 5-8 mm. long; calyx loosely strigose, the tube 2 mm. long, the lobes subulate, 3-4 mm. long; corolla red-purple, 8-9 mm. long; young pod strigose, 7-9-seeded; mature pod unknown.

Type collected at Santa Catarina, Oaxaca, July 14, 1910, *H. H. Rusby 69* (herb. N. Y. Bot. Gard.).

XVII. *Noctiflorae*. Stem sympodial, shrubby; racemes opposite the leaves. Leaves 13-17-foliolate; leaflets firm, silky-strigose beneath, oblanceolate; stipules linear-subulate. Corolla 10-12 mm. long, reddish. Calyx-lobes unequal, the upper four deltoid, the lowest one lanceolate, much longer. Pod silky-villous.

71. *Cracca noctiflora* (Bojer) Kuntze, Rev. Gen. 175.
1891.

Tephrosia noctiflora Bojer; Oliver, Fl. Trop. Africa 2: 112. 1871.

A shrub; stem diffusely branched, densely silky-pilose with short ascending brown hairs, at least on the younger parts; leaves 1-1.5 dm. long; stipules linear-subulate, 7-10 mm. long; petiole less than 1 cm. long, often very short; rachis brown-pilose; leaflets 13-17, narrowly oblanceolate, 2.5-4 cm. long, 6-10 mm. wide, glabrous above, silky-strigose beneath, rounded and mucronate at the apex; racemes terminal according to the original description, but from the specimens seen opposite the leaves, 2-3 dm. long, lax; bracts lanceolate, short; calyx densely ferruginous-silky, the tube 2 mm. long, the upper 4 teeth deltoid, 1.5 mm. long, the lowest one 2.5 mm. long, lanceolate; corolla 10-12 mm. long, reddish; banner broadly obovate, yellowish-silky on the back; pod 4-5 cm. long, 6 mm. wide, slightly curved upwards, densely silky-villous with brown hairs, 8-9-seeded.

TYPE LOCALITY: Island of Zanzibar.

DISTRIBUTION: Jamaica (naturalized); native of Zanzibar, Madagascar, and Mauritius.

72. *Cracca bracteolata* (Guill. & Perr.) Rydb.

Tephrosia bracteolata Guill. & Perr. Fl. Seneg. 194. 1830.

Perennial or annual; stem about 3 dm. high, strigose; leaves 1-1.5 dm. long; stipules lanceolate, acuminate, 6-8 mm. long; petiole 8-12 mm. long; rachis strigose; leaflets 11-15, linear, 2-5 cm. long or the terminal one up to 6 cm. long, 2-4 mm. wide, obtuse to retuse at the apex, glabrate above, densely strigose beneath; racemes 1-2 dm. long, inserted obliquely at the axils, lax; bracts lanceolate, about 4 mm. long; pedicels short; calyx densely ferruginous- or yellowish-silky; tube 3 mm. long; lowest calyx-lobe lanceolate, 2 mm. long, the rest triangular, acute, 1 mm. long or less; corolla 1 cm. long or more, densely ferruginous-silky on the back; pod about 5 cm. long and 4 mm. wide, hispidulous on the thick sutures, hirsutulous on the sides.*

TYPE LOCALITY: Lam Sar near St. Louis, Senegambia.

DISTRIBUTION: Santo Domingo; native of tropical Africa.

DOUBTFUL OR EXCLUDED SPECIES

TEPHROSIA FRUTESCENS (Mill.) DC. Prodr. 2: 256. 1825. *Galega frutescens* Mill. Gard. Diet. ed. 8. Galega no. 5. 1768. This is, according to Britten & Baker, *Indigofera mucronata*. See Jour. Bot. 35: 225. 1897.

TEPHROSIA LONGIFOLIA (Jacq.) Pers. Syn. Pl. 2: 328. 1807. *Galega longifolia* Jacq. Coll. 2: 349. 1788.—Ic. Rar. pl. 572. 1793. This is a species of *Galactia*.

CRACCA OROBOIDES (H. B. K.) Kuntze, Rev. Gen. 175. 1891. *Tephrosia oroboides* H. B. K. Nov. Gen. & Sp. 6: 462. pl. 579. 1823. This is evidently not a *Cracca*. The figure seems to represent a species of either *Anisolotus* or *Astragalus*.

CRACCA LEPTOSTACHYA (DC.) Rusby, Mem. Torrey Club 33: 18. 1893. *Tephrosia leptostachya* DC. Prodr. 2: 251. 1825. This has been reported from Central America and Mexico, but the specimens belong mostly to *C. piscatoria* and *C. tenella*. It is an African plant, apparently introduced in South America.

CRACCA BREVIPES (Benth.) Kuntze, Rev. Gen. 174. 1891. *Tephrosia brevipes* Benth. Ann. Nat. Hist. 3: 432. 1839. This is a South American species, extending north into Trinidad; it has been reported from Porto Rico, but according to Urban the specimens on which this record was based, probably came from Trinidad. See Symb. Ant. 4: 284. 1905.

* The description is drawn from R. T. Lowe's specimen, collected January 29, 1866, in Santo Domingo, now in the Gray Herbarium. It agrees very well with the description of *T. bracteolata*, but is evidently not *T. Kotschyana* Hochst., which is usually regarded as a synonym of that species.

CRACCA VENOSA (Mart. & Gal.) Kuntze, Rev. Gen. 175. 1891. *Tephrosia venosa* Mart. & Gal. Bull. Acad. Brux. 10²: 47. 1843. Perhaps the same as *C. Pringlei*, but the pod is described as glabrous. It came from Oaxaca.

TEPHROSIA CHRYSOPHYLLA Mart. & Gal. Bull. Acad. Brux. 10²: 49. 1843. Not *T. chrysophylla* Pursh, 1814. This perhaps should be referred to *Cracca Langlassei* M. Micheli.

TEPHROSIA (?) *ELLIOTTII* Benth.; S. Wats. Bibl. Ind. 220, as synonym. 1878. This is based on *Galactia Elliottii* Nutt. and probably belongs to that genus.

TEPHROSIA BARCLAYI Baillon, Bull. Soc. Linn. Paris 1: 388. 1883. This is a species of *Dalbergia*.

3. *PETERIA* A. Gray, Pl. Wright. 1: 50. 1852.

Perennial herbs, somewhat woody at the base. Leaves odd-pinnate, with stipular spines and no stipels. Flowers racemose, the racemes terminal or by the development of an axillary branch becoming opposite to the leaves. Calyx cylindrical-campanulate, gibbous at the base above, 5-lobed, the upper two lobes united high up. Corolla ochroleucous or nearly white. Banner long-clawed, the blade obovate-oblong, with the sides reflexed. Wings with obliquely oblong or obovate blades, slightly auricled at the base, and slender claws. Keel-petals slender-clawed, the blades obliquely obovate, obtuse, with a broad rounded basal auricle. Stamens diadelphous, the upper filament wholly free, straight; anthers uniform. Ovary short-stipitate or sessile, many-ovuled, the style horny at the base, inflexed, glabrous, except at the apex, where it has a ring of hairs under the stigma. Pod linear, straight, compressed, 2-valved, without cross-partitions, with thick sutures, many-seeded.

Type species, *Peteria scoparia* A. Gray

Stem branched; leaflets linear to oblong, acutish, 3-6 mm. long; corolla 15 mm. long or less.

Stem, peduncles, and pedicels glabrous; calyx strigose, only slightly glandular-puberulent.

Stem and peduncles strigose; pedicels and calyx hirsutulous and densely glandular-hirsutulous.

Stem simple; leaflets oval, rounded to obtuse at the apex, 6-15 mm. long; corolla 15-20 mm. long.

1. *P. scoparia*.

2. *P. glandulosa*.

3. *P. Thompsonae*.

1. *Peteria scoparia* A. Gray, Pl. Wright. 1: 50. 1852.

Stem 6-10 dm. high, terete, glabrous, much branched and bushy; stipular spines 2-5 mm. long; leaves 5-10 cm. long; rachis slender, glabrous, terete, in the upper leaves often without leaflets; leaflets when present 9-15, elliptic, lanceolate, or nearly linear, acutish, 2-6 mm. long, more or less strigose beneath when young; racemes terminating the branches or sometimes opposite the leaves; bracts subulate, 2-3 mm. long; pedicels 6-10 mm. long, glabrous; calyx strigose, the tube 5 mm. long, the lobes deltoid, acuminate, 3 mm. long, the upper two united to the middle; corolla 12-15 mm. long; blade of the banner obovate, retuse; blades of the wings and keel-petals obliquely obovate, truncate at the base; pod pendulous, 5-6 cm. long, 6 mm. broad, 3-4-seeded.

TYPE LOCALITY: Mountain Valleys beyond the pass of the Limpia, Texas.

DISTRIBUTION: Western Texas, New Mexico, and Chihuahua.

ILLUSTRATION: E. & P. Nat. Pl. 3²: f. 110 B.

2. *Peteria glandulosa* (A. Gray) Rydberg.

Peteria scoparia glandulosa A. Gray; S. Wats. Proc. Am. Acad. 17: 342. 1882.

A low perennial, with a thick tuberous root; stem woody at the base, 2-3 dm. high, much branched, strigose; stipular spines 4-8 mm. long; leaves 3-6 cm. long; rachis strigose; leaflets 9-13, oblong or elliptic, 4-6 or rarely 8 mm. long, acutish or mucronate, glabrous above, strigose on the veins beneath and on the margins; racemes terminal, 5-10 cm. long; peduncle strigose and glandular-pubescent; bracts lance-subulate, spinescent; pedicels 5-8 mm. long; calyx hirsutulous and glandular; tube 5-6 mm. long, the lobes lance-subulate, 3 mm. long; corolla

13-14 mm. long; blades of the wings and keel-petals with broad rounded basal auricles; pod 4-6 cm. long, 4 mm. wide, stipitate, glabrous; seeds oblong, 4 mm. long, 2.5 mm. broad, dark-brown with black dots.

TYPE LOCALITY: Near San Luis Potosí.

DISTRIBUTION: San Luis Potosí and Zacatecas to Puebla.

3. *Peteria Thompsonae* S. Wats. Am. Nat. 7: 300. 1873.

Stem herbaceous, except at the very base, 2-4 dm. high, glabrous or nearly so, straw-colored, strict; stipular spines 2-5 mm. long; leaves 6-13 cm. long; rachis strigose; leaflets 13-21, oval, 6-15 mm. long, rounded at the apex, glabrous above, strigose beneath; raceme solitary, terminal, 1-2 dm. long; bracts linear-subulate, deciduous; pedicels 5-8 mm. long; calyx-tube 7-8 mm. long, hirsute and glandular-pubescent, the lobes linear-subulate, attenuate, 7-8 mm. long, the upper two united half their length; corolla 15-20 mm. long, ochroleucous; blade of the banner suborbicular; those of the wings and keel-petals broadly obovate, with a rounded basal lobe; pod about 5 cm. long, 4 mm. wide, glabrous, about 6-seeded; seeds oval, compressed.

TYPE LOCALITY: Kanab, southern Utah.

DISTRIBUTION: Central and southern Utah.

Subtribe 2. **MILLETTIANAE.** Trees or (ours) woody vines, with alternate odd-pinnate leaves and persistent stipules, and usually with stipels; leaflets netted-veined. Flowers in terminal racemes or panicles. Calyx campanulate, 5-toothed, the lobes often minute, or the upper two and the lower three more or less united, forming an upper and a lower lip, the upper two sometimes wholly united. Corolla papilionaceous, the petals short-clawed, the banner broad, spreading or reflexed, often with two folds or callosities at the base; both the wings and the keel-petals adnate at the apex. Stamens monadelphous or diadelphous, the upper filament free, at least at the base; anthers uniform. Pod flat, 2-valved, elongate, several- or many-seeded. Seeds mostly reniform, sometimes round, without a strophiole.

4. *KRAUNHIA* Raf. Med. Repos. II. 5: 352. 1808.

Diplonyx Raf. Fl. Ludov. 101. 1817.

Thyrsanthus Ell. Jour. Acad. Phila. 1: 371. 1818.

*Wisteria** Nutt. Gen. 2: 115. 1818.

Bradleya Britton, Man. 548. 1901. Not *Bradlea* Adans. 1763.

High-climbing woody vines. Leaves odd-pinnate, with small stipules and stipels. Flowers in terminal racemes, with deciduous bracts. Calyx more or less 2-lipped, the upper lip with 2 broad teeth united to near the apex, the lower lip with 3 longer and narrower teeth. Corolla blue or purplish, rarely white, the petals subequal in length. Banner with a suborbicular blade and short claw, reflexed, the blade with 2 callosities or appendages. Wings free, clawed, the blades obliquely obovate, falcate, with a prominent basal auricle on the upper margin, sometimes also with a smaller tooth on the lower side. Keel-petals clawed, united at the apex, the blade lunate with a salient basal lobe. Stamens diadelphous, the upper filament free or slightly adherent at the middle to the staminodial sheath; anthers uniform. Ovary stipitate, many-ovuled, glabrous; style inflexed, terete, glabrous; stigma small, terminal. Pod elongate, 2-valved, the valves slightly convex. Seeds reniform, without strophiole.

Type species, *Glycine frutescens* L.

Leaflets 7-13; basal auricles of the wings reflexed; peduncle glandular as well as pubescent.

Racemes 1 dm. long or less; calyx-lobes all much shorter than the tube. 1. *K. frutescens*.
 Racemes 2-3 dm. long; lowest calyx-lobe fully as long as the tube. 2. *K. macrostachys*.
 Leaflets 15-19; basal auricles of the wings porrect; peduncle puberulent. 3. *K. floribunda*.

*Named by Nuttall for Dr. Caspar Wistar, and often spelled *Wistaria* by later authors.

1. *Kraunhia frutescens* (L.) Greene, Pittonia 2: 175. 1891.

- Glycine frutescens* L. Sp. Pl. 753. 1753.
Anonymos frutescens Walt. Fl. Car. 186. 1788.
Apios frutescens Pursh. Fl. Am. Sept. 474. 1814.
Diplomyx elegans Raf. Fl. Ludov. 101. 1817.
Thyrsanthus frutescens Ell. Jour. Acad. Phila. 1: 371. 1818.
Wisteria speciosa Nutt. Gen. 2: 116. 1818.
Wisteria frutescens Poir. in Lam. Tab. Encyc. 3: 674. 1823.
Thyrsanthus floridana Croom, Am. Jour. Sci. 25: 75. 1834.
Phaseolus frutescens Eaton & Wright, N. Am. Bot. 354. 1840.
Bradleya frutescens Britton, Man. 549. 1901.

A woody vine, 10-15 m. high; branches puberulent or villous when young; stipules lanceolate, caducous; leaves 1-3 dm. long; petiole and rachis more or less pubescent; leaflets 9-15, ovate or ovate-lanceolate, 2-6 cm. long, acuminate, from acute to rounded at the base, glabrous and green above, pale and sparingly pubescent beneath; racemes dense, 4-10 cm. long, the rachis lanuginous-villous; bracts lanceolate, caducous; pedicels 4-6 mm. long; calyx finely pilose and more or less glandular, the tube campanulate, 5-6 mm. long, the upper two teeth broadly triangular, sometimes nearly obsolete, the lower three deltoid, 1-2 mm. long; corolla lilac-purple, 15-19 mm. long; basal auricles of the wings lanceolate, reflexed, those of the keel-petals porrect; pod linear, 5-10 cm. long, about 12 mm. broad, somewhat torulose.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Low ground from Virginia to Arkansas, Texas, and Florida.

ILLUSTRATIONS: Audubon, Birds pl. 95; Sweet, Brit. Fl. Gard. II. pl. 104; Loud. Arb. 2: f. 359; Bot. Mag. pl. 2103; Rev. Hort. 1862: pl. opp. 11; Britt. & Brown, Ill. Fl. f. 2120; ed. 2. f. 2524; C. K. Schneid. Ill. Handb. Laubb. 2: f. 47 g-h; f. 48 t-u.

2. *Kraunhia macrostachys* (T. & G.) Small, Bull. Torrey

Club 25: 134. 1898.

- Wisteria frutescens macrostachys* T. & G. Fl. N. Am. 1: 283. 1838.
Wisteria macrostachys Nutt.; T. & G. Fl. N. Am. 1: 283, as synonym. 1838.
Wisteria frutescens magnifica Herincq, Rev. Hort. 1862: 50. 1862.
Bradleya macrostachys Small; Britton, Man. 549. 1901.

A woody vine, 6-8 m. high; branches sparingly pilose when young; leaves 1-3 dm. long; petiole and rachis more or less silky-pilose; leaflets mostly 9, ovate to elliptic-lanceolate, 3-7 cm. long, acuminate at the apex, rounded or cordate at the base, sparingly silky-pilose on both sides or in age glabrate above; racemes 2-3 dm. long, drooping; peduncle densely hirsute and glandular; bracts lanceolate, acuminate, caducous; pedicels 10-12 mm. long; calyx densely hirsute and glandular, the tube about 6 mm. long; upper teeth almost obsolete, the upper lip rounded or truncate; lateral teeth 4-5 mm. long, lanceolate, the lowest one subulate, 6-7 mm. long; corolla lilac-purple or light-blue; basal auricle of the wings lanceolate to linear-subulate, reflexed, often nearly equaling the claw; basal auricles of the keel-petals deltoid, porrect; pod 7-12 cm. long, somewhat torulose, reddish-brown; seeds nearly black, 14 mm. long, 8 mm. thick.

TYPE LOCALITY: Louisiana.

DISTRIBUTION: In swamps, from Illinois to Arkansas, Louisiana, and Tennessee.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 2525; C. K. Schneid. Ill. Handb. Laubb. 2: 47c; f. 48 w-y.

3. *Kraunhia floribunda* (Willd.) Taub. in E. & P. Nat.

Pfl. 3³: 271. 1894.

- Glycine floribunda* Willd. Sp. Pl. 3³: 1066. 1803.
Wisteria floribunda DC. Prodr. 2: 390. 1825.
Wisteria brachybotrys Sieb. & Zucc. Fl. Jap. 1: 92. 1826.
Kraunhia brachybotrys Greene, Pittonia 2: 175. 1891.
Wisteria multijuga Van Houtte, Fl. Serres 19: 125. 1872.

A woody vine, 10-15 m. high; branches glabrate; leaves 2-3 dm. long; rachis somewhat silky-strigose when young, soon glabrate; leaflets 15-19, elliptic-ovate to lanceolate, long-acuminate, 2-7 cm. long, silky-strigose when young, glabrate in age, acute to rounded at the base; racemes 1-3 dm. long; peduncle puberulent; pedicels 1.5-2 cm. long; calyx puberulent,

the tube 3-4 mm. long, 6-7 mm. broad, the upper two teeth obsolete, the lower three broadly deltoid, 1-2 mm. long; corolla bluish-purple, 15-20 mm. long; basal auricles of both the wings and the keel-petals deltoid and porrect; pod 1-2 dm. long, 2 cm. wide, velutinous; seeds 15 mm. long, 10-12 mm. broad, dark-brown. Sometimes confused with *Kraunhia sinensis* (Sims) Makino, the Chinese Wisteria.

TYPE LOCALITY: Japan.

DISTRIBUTION: Occasionally escaped from cultivation in the eastern states; native of Japan.

ILLUSTRATIONS: Fl. Serres *pl. 880, 2002*; Sieb. & Zucc. Fl. Jap. *pl. 45*; C. K. Schneid. Ill. Handb. Laubh. 2: f. 47, d-f; f. 48, q-s.

Subtribe 3. **BRONGNIARTIANAE.** Trees or shrubs, with alternate odd-pinnate leaves; stipules and sometimes stipels present, the former often caducous and the latter minute. Flowers axillary or in terminal racemes or panicles. Calyx with a short tube, more or less 2-lipped, the upper two calyx-lobes united high up or to the apex, the lower three also more or less united. Corolla papilionaceous, the banner broad and with somewhat reflexed or spreading sides. Stamens monadelphous or diadelphous; anthers various but not appendaged. Pod usually elongate, flat, 2-valved, several-seeded, sometimes filled between the seeds with spongy tissue. Seeds erect, *i.e.*, the longer axis at right angles to the pod, somewhat compressed, with a well developed strophiole.

Calyx 5-lobed, the upper 2 lobes united two-thirds to four-fifths their length, the lower 3 usually free to near the base, but sometimes united higher up; stamens diadelphous (9 and 1), the filament of the uppermost one free; leaves never glandular-granuliferous beneath.

Calyx completely 2-lipped, the upper 2 as well as the lower 3 lobes united to the apex; stamens monadelphous, the filament of the upper stamen united with the rest at least half its length; leaves dotted with yellow sessile oil-glands on the under side.

5. BRONGNIARTIA.

6. HARPALYCE.

5. BRONGNIARTIA H.B.K. Nov. Gen. & Sp. 6: 453. 1824.

Peraltea H.B.K. Nov. Gen. & Sp. 6: 469. 1824.

Megastegia G. Don, Gen. Hist. 2: 468. 1832.

Shrubs or trees, with odd-pinnate leaves; stipules present but often caducous. Leaflets entire-margined, usually distinctly petioluled and sometimes with minute subulate or setaceous stipels. Flowers normally axillary, solitary or in 2-7-flowered sessile umbels; in some species the upper floral leaves are reduced to the two stipules and the flowers become falsely racemose. Bractlets 2, close under the calyx, either foliaceous, resembling the stipules, persistent or deciduous, or else minute or represented by small hair-tufts. Calyx partly 2-lipped; the upper 2 lobes united two-thirds to four-fifths their length, the lower 3 free to near their base or occasionally united higher up, in one species above the middle. Corolla papilionaceous, and red, brown, or purple; banner broad, orbicular or broadly obovate, short-clawed; wings obliquely oblanceolate or obovate, more or less falcate, with a short fleshy claw and a rounded auricle at the base of the blade on the upper side; keel-petals obliquely obovate or broadly lunate, tapering to the fleshy base, their blades united above the middle to the tip. Uppermost filament free, the rest united into a sheath; anthers oblong, all alike, or the alternating ones shorter, the connective without appendage. Ovary short-stipitate; style filiform, incurved, with a small sometimes capitate stigma; ovary several-ovuled. Pod flat, elongate, often somewhat wing-margined on the upper suture.

Type species, *Brongniartia mollis* H.B.K.

Lower three calyx-lobes united to above the middle; flowers 3-7 together, at the end of the branches or in the upper axils.

Lower three calyx-lobes free to near the base or at least below the middle.

Flowers pseudo-racemose, the floral leaves all or the upper ones reduced to the mere stipules, which resemble bracts; flowers 1-4 at each node.

Leaflets 1-5, strongly reticulate; stipules very large.

Leaflets 7 or more; stipules smaller.

I. BILABIATA.

II. INCONSTANIES.
III. PODALYRIOIDES.

- Flowers strictly axillary.
 Pod glabrous or nearly so, usually many-seeded (few-seeded in *Minutifoliae* and *Trifoliatae*).
 Twigs and leaves glabrous or strigose.
 Leaflets oblong to broadly oval, obtuse, rounded or retuse at the apex.
 Branches and leaflets glabrous.
 Branches or leaflets or both more or less strigose.
 Leaflets narrowly linear-lanceolate or linear, revolute.
 Twigs densely pubescent with spreading hairs, either subvelutinous or hirsute.
 Branches and leaflets hirsute.
 Leaflets about 1 cm. long.
 Leaflets 2-3 cm. long.
 Branches subvelutinous, short-hairy.
 Leaflets ovate, acute, glabrous; branches often with cork-ridges.
 Leaflets oblong to oval, rounded or retuse at the apex; branches not corky.
 Leaflets 3, suborbicular or round-oval, glabrous.
 Leaflets several to many, more than 3.
 Leaflets green on both sides, merely strigose.
 Leaflets either canescent on both sides or green and more or less silky beneath.
 Leaflets many, not velutinous on both sides, mostly oblong and rarely more than 3 cm. long.
 Leaflets fewer, velutinous on both sides, oval, 3-5 cm. long, strongly reticulate.
- Pod hirsute, few-seeded.
- I. **BILABIATAE**
- Branches and leaves glabrous; stipules minute, deciduous.
 Branches and leaves short-pubescent; stipules conspicuous.
- II. **INCONSTANTES**
- One species.
- III. **PODALYRIOIDES**
- Stipules lanceolate, deciduous.
 Leaflets and calyx minutely strigillose; keel much longer than the banner.
 Leaflets and calyx glabrous; keel not longer than the banner.
 Stipules ovate, semicordate at the base, persistent.
 Branchlets, stipules, and leaflets glabrous or the latter sparingly appressed-silky when young.
 Branchlets, stipules, and leaflets more or less pilose or hirsute with spreading hairs.
 Leaflets and stipules thin, not strongly reticulate; flowers appearing with the leaves.
 Leaflets and stipules thick, strongly reticulate; flowers appearing before the leaves.
- IV. **FOLIOLOSAE**
- Leaflets numerous, 1 cm. long or less, firm, strongly reticulate.
 Leaflets usually more than 1 cm. long, thin, faintly veined.
 Leaflets rounded at each end, merely mucronate; bractlets conspicuous, oval.
 Leaflets cuspidate; bractlets subulate or obsolete.
- V. **REVOLUTAE**
- Leaflets subcoriaceous.
 Branches short-velutinous.
 Calyx brown-velutinous; stipules and bractlets inconspicuous and deciduous.
 Calyx glabrous; stipules large, persistent; bractlets rudimentary.
 Branches strigose.
 Leaflets oval, 3-5 cm. long, strongly reticulate; bractlets ovate-cordate, 15 mm. long.
 Leaflets oblong, 1-2 cm. long; bractlets lanceolate to oblanceolate or elliptic, 4-6 mm. long.
 Leaflets 17-25, strongly reticulate, not revolute; calyx glabrous.
 Leaflets 9-15, not strongly reticulate, with revolute margins; calyx silky-strigose.
- Leaflets thin.
 Leaflets 5-13, strigillose or glabrate.
 Leaflets oval or elliptic, acutish.
 Leaflets 3-5 cm. long; stipules foliaceous.
- IV. **FOLIOLOSAE.**
 V. **REVOLUTAE.**
 VI. **MINUTIFOLIAE.**
- VII. **PARVIFOLIAE.**
 VIII. **HIRSUTAE.**
- IX. **SUBEREAEE.**
- X. **TRIFOLIATAE.**
 V. **REVOLUTAE.**
- XI. **SERICEAEE.**
 XII. **PARRYANAE.**
 XIII. **OLIGOSPERMAE.**
1. *B. bilabiata.*
 12. *B. lunata.*
2. *B. inconstans.*
3. *B. glabrata.*
 4. *B. paniculata.*
5. *B. podalyrioides.*
6. *B. Palmeri.*
 7. *B. nudiflora.*
8. *B. foliolosa.*
9. *B. diffusa.*
 10. *B. pauciflora.*
11. *B. Goldmanii.*
 12. *B. lunata.*
13. *B. bracteolata.*
14. *B. discolor.*
 15. *B. revoluta.*
16. *B. alamosana.*

- Leaflets usually 1-3 cm. long.
 Calyx glabrous; leaflets strigillose on both sides; stipules foliaceous.
 Calyx strigillose; leaflets glabrous above; stipules small.
 Leaflets orbicular, rounded-oval, or obovate.
 Leaflets 17-21, silky-strigose.
17. *B. peninsularis*.
 18. *B. strigillosa*.
 19. *B. molliuscula*.
 20. *B. louisiana*.
- VI. MINUTIFOLIAE
 Leaves glabrous; stipules oblong or lanceolate.
 Leaves strigose-canescens; stipules linear-subulate.
21. *B. minutifolia*.
 22. *B. canescens*.
- VII. PARVIFOLIAE
 One species.
23. *B. parvifolia*.
- VIII. HIRSUTAE
 Leaflets narrowly lanceolate.
 Leaflets ovate to lance-elliptic.
24. *B. angustata*.
 25. *B. hirsuta*.
- IX. SUBEREAЕ
 One species.
26. *B. suberea*.
- X. TRIFOLIATAE
 One species.
27. *B. trifoliata*.
- XI. SERICEAE
 Bractlets broadly ovate, subcordate at the base, almost as long as the calyx.
 Bractlets lanceolate or elliptic, much shorter than the calyx.
 Calyx densely silky.
 Leaves and young branches silvery-white when young; young branches mostly white-hairy; leaflets broadly oblong.
 Stipules ovate.
 Stipules lanceolate.
 Leaves silky, but not silvery-white; young branches mostly black-hairy.
 Leaflets 7-13, rather thin, ovate or oval.
 Leaflets 13-25, firm, oblong.
 Leaflets 1-2 cm. long.
 Leaflets 2-3 cm. long.
 Calyx glabrous or nearly so.
 Leaflets ovate or oval.
 Leaflets oblong.
28. *B. lupinoides*.
 29. *B. argentea*.
 30. *B. sericea*.
 31. *B. Pringlei*.
 32. *B. vicoides*.
 33. *B. Benthamiana*.
 34. *B. mollis*.
 35. *B. magnibracteata*.
- XII. PARRYANAE
 One species.
36. *B. Parryi*.
- XIII. OLIGOSPERMAE
 One species.
37. *B. oligosperma*.

1. *Brongniartia bilabiata* M. Micheli, Mém. Soc
 Genève 34: 248. 1903.

A shrub, 1.5 m. high; branches glabrous; leaves about 1 dm. long; stipules very small, deciduous; leaflets 7-9, broadly ovate or obovate, rounded at both ends or retuse at the apex, short-petioled, glabrous on both sides, 2-4 cm. long, 1-3 cm. wide, faintly reticulate; flowers 5-7, in terminal or axillary fascicles; pedicels 1.5-2 cm. long; bractlets very small, subulate; calyx glabrous, 1.5 cm. long, distinctly 2-lipped, the upper two lobes united four-fifths, the lower three three-fourths their length; corolla 2 cm. long; banner broad, short-stipitate, tinged with purplish-violet; wings obliquely ovate, falcate, purple; keel-petals obtuse, pale greenish-violet; pod glabrous, narrowed at the base and short-stipitate, 5 cm. long, 5-6-seeded; seed 8 mm. long, 5 mm. wide.

TYPE LOCALITY: Banks of Río San Luis, Guerrero or Michoacán.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Mém. Soc. Genève 34: pl. 589.

2 *Brongniartia inconstans* S. Wats. Proc. Am. Acad. 22: 404.
 1887.

A shrub, about 1 m. high; branches glabrous, or more or less pilose with brownish hairs; leaves 3-10 cm. long; stipules large, foliaceous, broadly obliquely cordate, 1.5-3.5 cm. long, strongly reticulate, often connate on one side; leaflets 1-5, broadly oval or ovate, abruptly

acute, 2-4 cm. long, strongly reticulate, glabrous; stipels present, small, spinulose; flowers axillary, 1-4 together; pedicels 1-3 cm. long; bractlets obsolete; calyx nearly 2 cm. long, glabrous, the lobes lanceolate, acuminate, the lowest one slightly longer than the rest; corolla 2-2.5 cm. long, yellowish-brown, drying purple; pod glabrous, 7-8 cm. long, nearly 2 cm. wide, 3-7-seeded.

TYPE LOCALITY: Tequila, Jalisco.

DISTRIBUTION: Jalisco, Guerrero, and Michoacán.

3. *Brongniartia glabrata* H. & A. Bot. Beech. Voy. 288. 1836.

A low shrub; branchlets glabrous; leaves 6-18 cm. long; stipules lanceolate or ovate-lanceolate, 5 mm. long or less, deciduous; petioles and rachis glabrous; petioles 2-4 mm. long; leaflets 5-13, oval, rounded or obtuse at each end, mucronate at the apex, 1-4 cm. long, 0.5-2 cm. wide, somewhat reticulate, apparently glabrous, but under a lens sparingly and minutely strigillose; flowers pseudo-racemose, the inflorescence naked, *i. e.*, the floral leaves reduced to the inconspicuous, caducous stipules; flowers 1 or 2 at each node; pedicels 2-3 cm. long, strigillose; bractlets ovate, strigillose, early caducous; calyx about 18 mm. long, strigillose, the lobes lanceolate, acute; corolla purple; banner broadly obovate, about 2 cm. long, with a thick claw 4 mm. long; wings obliquely obovate, with a deltoid basal auricle, nearly 2 cm. long, the claw 2 mm. long; keel-petals obliquely oblanceolate, 2-3 mm. long; pod glabrous, about 8 cm. long, 1.5 cm. wide, the stipe about 1 cm. long; seed about 8 mm. long, 5 mm. wide.

TYPE LOCALITY: Tepic.

DISTRIBUTION: Tepic.

4. *Brongniartia paniculata* Rose, sp. nov.

A shrub; branches terete, glabrous, light-green; leaves about 15 cm. long; stipules caducous; petiole and rachis glabrous; petiolules 2-3 mm. long; leaflets 11-13, oval, rounded at each end, mucronate, 3-4 cm. long, glabrous on both sides, reticulate; flowers pseudo-racemose, the inflorescence leafless, *i. e.*, the floral leaves reduced to the small bractlike stipules, which are lanceolate, 2-4 mm. long, caducous; flowers 1 or 2 at each node; pedicels 1-2 cm. long; bractlets early caducous; calyx 15 mm. long, glabrous, the lobes lanceolate, acute, the upper two united three-fourths their length; corolla pink; banner broadly obovate, fully 2 cm. long; wings obliquely obovate, with a small basal auricle; keel-petals obliquely obovate, somewhat shorter; pod glabrous, not seen mature.

Type collected near Cuernavaca, Morelos, November 19, 1895, *Pringle 7051* (Gray Herb.).

5. *Brongniartia podalyrioides* H.B.K. Nov. Gen. & Sp. 6: 468.

1823.

Brongniartia galegoides Presl, Symb. Bot. 2: 21. 1852.

Astragalus frutescens Kunth, Ind. Sem. Hort. Berol 1845: 12. 1845.

A shrub, 3-30 dm. high; erect or procumbent; branches glabrous; leaves 1-2 dm long; stipules semicordate or semi-hastate, 1-2.5 cm. long, glabrous, reticulate, acute or obtuse, sparingly silky when young, glabrate in age, persistent; petioles 1-2 cm. long; leaflets 5-13, or on sterile shoots 15-17, elliptic or oval, rounded or acute at either end, mucronate or cuspidate, reticulate-venose, membranous, appressed-silky when young, glabrate in age, 2-5 cm. long, 1-2 cm. wide; flowers pseudo-racemose; pedicels 1-2 cm. long, usually 2-4 in each leaf-axil, the upper leaves being reduced to the foliaceous stipules; bractlets minute or wanting; calyx campanulate, glabrous, 1.5 cm. high, the lobes lanceolate, 7-8 mm. long, acute, the upper two united three-fourths their length; corolla purplish or flesh-colored; banner sub-orbicular, with a short claw, slightly retuse, 2-2.5 cm. long; wings obliquely obovate, subfalcate, with a short claw; keel-petals similar, but broader at the apex; pod 5-7 cm. long, 1.5 cm. wide, glabrous, reticulate, short-stipitate, 4-9-seeded.

TYPE LOCALITY: La Puente de Ixtla, between Tasco and Cuernavaca, Morelos.

DISTRIBUTION: Morelos and Guerrero.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. *pl.* 588; Presl, Symb. Bot. *pl.* 67.

6. *Brongniartia Palmeri* Rose, Contr. U. S. Nat. Herb. 1: 97.
1891.

A shrub, 4-7 dm. high; young branches sparingly pilose-ciliate with light-brown hairs; leaves 5-10 cm. long; stipules large, ovate, semicordate at the base, 12-16 mm. long, ciliate on the margins and veins beneath; petiole and rachis ciliate; leaflets 13-17, oblong, apiculate, glabrous above, ciliate on the margins and midrib beneath, thin, not strongly reticulate; inflorescence pseudo-racemose, the floral leaves usually reduced to the large persistent stipules; flowers 2-5 at each node; calyx glabrous, about 12 mm. long, the lobes broadly lanceolate, acute; corolla rose-purple; banner obovate-orbicular, 18 mm. long, short-clawed; wings about as long, obliquely oblanceolate, with a deltoid basal auricle and short claw; keel-petals oblanceolate, falcate; pod 3-5.5 cm. long, 1.5 cm. wide, 3-6-seeded, the stipe very short; seeds 6-7 mm. long, 4-5 mm. wide.

TYPE LOCALITY: Alamos, Sonora.
DISTRIBUTION: Sonora.

7. *Brongniartia nudiflora* S. Wats. Proc. Am. Acad. 25: 146.
1890.

A low shrub; branches more or less villous-pilose with yellow-hairs; leaves 10-12 cm. long; stipules large, 1-2 cm. long, broadly ovate, semicordate, strongly reticulate, more or less pilose; petiole and rachis pilose; leaflets 7-13, oval, apiculate, 3-5 cm. long, 1.5-3 cm. wide, strongly reticulate, subcoriaceous, sparingly pilose on both sides; inflorescence pseudo-racemose, the floral leaves reduced to the large stipules; flowers 1-6 at each node; pedicels 1-2 cm. long; bractlets obsolete or setaceous; calyx glabrous, 12-14 mm. long, the lobes lanceolate, acute; corolla maroon or dark-purple, 1 cm. long, as in the preceding; pod glabrous, 4-4.5 cm. long, 12-13 mm. wide, 6-8-seeded, somewhat spongy between the seeds; seeds 7 mm. long, 5 mm. wide.

TYPE LOCALITY: Guadalajara, Jalisco.
DISTRIBUTION: Jalisco.

8. *Brongniartia foliolosa* Benth.; Hemsl. Diag.
Pl. Nov. 7. 1878.

A low shrub; branches glabrous or slightly short-hirsute when young; leaves 4-8 dm. long; stipules obliquely ovate, 5-8 mm. long; petiolules 0.5 mm. long; leaflets 15-45, oblong, rounded at each end, mucronate, glabrous, strongly reticulate, 3-10 mm. long; flowers axillary, solitary or 2 together; pedicels 1-2 cm. long; bractlets ovate-cordate, reticulate, deciduous, about 8 mm. long; calyx glabrous, about 1 cm. long, the lobes lanceolate, acuminate; corolla 15-18 mm. long; banner orbicular, short-clawed; pod 3-4 cm. long, 1.5 cm. wide, 5-6-seeded, the stipe equaling the calyx.

TYPE LOCALITY: Zimapán, Hidalgo.
DISTRIBUTION: Hidalgo to Puebla.

9. *Brongniartia diffusa* Rose, Contr. U. S. Nat.
Herb. 5: 194. 1899.

A low diffuse shrub, perhaps 1 m. high, glabrous or nearly so; leaves 6-12 cm. long; stipules oblong to ovate, 6-8 mm. long, acute, deciduous; petiolules about 1 mm. long; leaflets 7-21, oblong, 1-2 cm. long, rounded at each end, mucronate, glabrous, thin; flowers 1 or 2 in each axil; pedicels 2.5-3.5 cm. long, slender; bractlets ovate or oval, subcordate at the base, 8-10 mm. long, membranous, caducous; calyx 8-10 mm. long, glabrous without; corolla 18 mm. long, purple; banner rounded-ovate, the claw 5 mm. long; pod glabrous, about 4 cm. long and 12 mm. wide, the stipe about equaling the calyx.

TYPE LOCALITY: Between Pedro Paulo and San Blascito, Tepic.
DISTRIBUTION: Known only from the type locality.

10. *Brongniartia pauciflora* Rose, sp. nov.

A low shrub; branches glabrous; leaves about 5 cm. long; stipules large, obliquely cordate, 8-10 mm. long, acute; petiolules scarcely 1 mm. long; leaflets 5-11, broadly oval, acutish at the base, cuspidate at the apex, 1-1.5 cm. long, thin, faintly veined, glabrous; flowers solitary in the axils; pedicels about 1 cm. long; calyx glabrous, 10-12 mm. long, the lobes lanceolate, acute; corolla about 1.5 cm. long; banner orbicular, short-clawed; wings and keel-petals obliquely obovate, the former with a deltoid basal auricle; ovary glabrous; pod unknown.

TYPE COLLECTED at the mouth of Rio Quintepec, district of Cuicatlan, Oaxaca, June 20, 1919, *Conzatti & Cancino 2439* (U. S. Nat. Herb. no. 841050).

11. *Brongniartia Goldmanii* Rose, Contr. U. S. Nat.
Herb. 12: 269. 1909.

A small tree, 2-3 m. high; young branches short-pilose with spreading hairs; leaves about 1 dm. long; stipules early deciduous; petiole about 1 cm. long, as well as the rachis short-pilose; leaflets 7-9, oblong or elliptic, 1-2.5 cm. long, rounded at each end or retuse at the apex, finely pubescent on both sides when young, glabrate above; flowers 1 or 2, rarely 3 or 4 in each axil; pedicels 1-1.5 cm. long, pilose; bractlets rounded-oval, 7 mm. long, densely pubescent; calyx subvelutinous with dark-brownish hairs, 15 mm. long; corolla 18 mm. long, rose-purple; pod 4-5 cm. long, 1.5 cm. wide, abruptly acute at the apex, more tapering at the base, glabrous, the stipe very short.

TYPE LOCALITY: Between Las Flechas and La Rastra, Sinaloa.

DISTRIBUTION: Known only from the type locality.

12. *Brongniartia lunata* Rose, Contr. U. S. Nat.
Herb. 5: 194. 1899.

A low shrub; young branches slender, short-villous with spreading hairs; leaves 15-20 cm. long; stipules broadly semicordate, somewhat lunate, acute at the apex; petiole 3-5 cm. long, as well as the rachis short-villous; leaflets 7-11, broadly oblong or oval, 4-5 cm. long, 2-3 cm. wide, rounded at the base, rounded to acutish and apiculate at the apex, short-strigose, becoming glabrous above, sparingly appressed-silky and reticulate beneath; flowers mostly 2 in each axil; pedicels 2.5-3 cm. long, glabrous; bractlets rudimentary; calyx glabrous, 15 mm. long, distinctly 2-lipped, sometimes only 4-lobed, the upper 2 lobes united three-fourths their length, the lower 3 or 2 united one-half to two-thirds their length, all lance-ovate, acute; corolla 25 mm. long, rose-colored; pod unknown.

TYPE LOCALITY: East of Huasemote, Durango.

DISTRIBUTION: Known only from the type locality.

13. *Brongniartia bracteolata* M. Micheli, Mém. Soc.
Genève 34: 249. 1903.

A shrub, 1 m. high; young branches sparingly strigulose, soon glabrate; leaves 10-17 cm. long; stipules lanceolate or narrowly ovate, acute, 8-10 mm. long; petiole 1-2 mm. long; leaflets 13-15, oval, subcoriaceous, 4-5 cm. long, 2-2.5 cm. wide, rounded at each end or subemarginate at the apex, sparingly strigose-puberulent on both sides, soon glabrate and shining above, paler beneath, reticulate; petiolules 2 mm. long; flowers axillary, 1 or 2 in each axil; pedicels about 2 cm. long; bractlets broadly ovate, subcordate at the base, strigulose, rather persistent; calyx strigulose, 1.5 cm. long, the lobes lanceolate, acute, equaling the tube; corolla blood-red, with a greenish blotch at the base; banner orbicular, 2-2.5 cm. long, short-clawed; wings and keel-petals scarcely shorter, the former with a rounded basal auricle, narrower than the keel-petals; pod glabrous, 7-8 cm. long, 2 cm. broad, 6-7-seeded; seeds about 1 cm. long, 6 mm. wide.

TYPE LOCALITY: Sierra Madre, Guerrero (or Michoacan?).

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Mém. Soc. Genève 34: pl. 2.

14. *Brongniartia discolor* Brand. Univ. Calif. Publ.

Bot. 4: 272. 1912.

? *Brongniartia Parryi* Hemsl. Biol. Centr. Am. Bot. 2: 254, in part. 1880.

A shrub; branches densely silky-strigose; leaves 5-10 cm. long; stipules lanceolate, 3-5 cm. long, deciduous; petiole less than 1 cm. long, as well as the rachis silky-strigose; leaflets 10-25, subcoriaceous, oblong, 1-2 cm. long, 5-10 mm. wide, appressed-silky on both sides when young, densely so beneath, in age almost glabrous except the veins beneath, strongly reticulate, rounded at both ends, mucronate; flowers axillary, 1-4 in each axil; pedicels 1-2 cm. long; bractlets ovate-lanceolate or ovate, about 6 mm. long, somewhat silky, especially on the margins, or glabrate, deciduous; calyx about 1 cm. long, glabrous, the lobes lanceolate, acute; corolla 14-18 mm. long; banner suborbicular, with a short claw; pod 4-5 cm. long, 1-1.5 cm. wide, glabrous, 4-6-seeded; stipe nearly 1 cm. long; seeds 10 mm. long, 6 mm. wide

TYPE LOCALITY: Bagre, San Luis Potosí.

DISTRIBUTION: San Luis Potosí to Jalisco and Oaxaca.

15. *Brongniartia revoluta* Rose, Contr. U. S. Nat.

Herb. 12: 269. 1909.

A shrub, 6-10 dm. high; branches strigose-canescens; leaves 4-6 cm. long; stipules lanceolate, caducous; leaflets 9-15, oblong, 8-18 mm. long, coriaceous, with revolute margins, not strongly veined, except the midrib, glabrous or nearly so above, silky-strigose beneath; bracts oblanceolate, 4 mm. long, strigose; calyx about 1 cm. long, black-strigose, the lobes lanceolate, acute; corolla unknown; pod glabrous, 3-4 cm. long, 1 cm. wide, tapering at the base, 2-4-seeded, its stipe very short.

TYPE LOCALITY: Mount Zempoaltepec, Oaxaca.

DISTRIBUTION: Known only from the type locality.

16. *Brongniartia alamosana* Rydberg, sp. nov.

A low shrub; branches finely strigulose; leaves 1-2 dm. long; petiole about 2 cm. long, as well as the rachis strigulose; stipules obliquely ovate, sometimes falcate, 8-20 mm. long; leaflets 9-13, oval, acutish at both ends, 3-5 cm. long, 1.5-2.5 cm. wide, mucronate, strigose on both sides when young, glabrate in age; flowers mostly solitary in the axils; pedicels 3-4 cm. long; flowers unknown; pod 6-8 cm. long, 2-2.5 cm. wide, with a minute stipe.

Type collected at Alamos, Sonora, 1890, E. Palmer 658 (U. S. Nat. Herb. no. 24693).

DISTRIBUTION: Type locality and vicinity.

17. *Brongniartia peninsularis* Rose, Contr. U. S. Nat.

Herb. 12: 268. 1909.

A shrub, 2-3 m. high; branches densely silky-pubescent; leaves about 1 dm. long; stipules broadly lanceolate, 1 cm. long; leaflets 5-13, lanceolate, acute, 1-2 cm. long, cinereous-strigose on both sides; flowers axillary; pedicels 2-2.5 cm. long, strigose; bractlets small, deciduous; calyx glabrous without, pubescent within, the lobes lanceolate, 4 mm. long, the upper obtuse, the lower acute; corolla 1.5 cm. long; pod glabrous, shining, 4 cm. long, 1.5 cm. wide.

TYPE LOCALITY: El Potrero, Lower California.

DISTRIBUTION: Lower California.

18. *Brongniartia strigillosa* Rydberg, sp. nov.

A shrub, 1.5 m. high; young branches finely strigillose; leaves 5-8 cm. long; stipules lanceolate, 2 mm. long; leaflets 5-7, elliptic or oblong, acutish at each end, mucronate, 1-2.5 cm. long, the terminal one sometimes 3-4 cm. long, glabrous above, strigillose and glabrate beneath; flowers 1 or 2 in each axil; pedicels about 2 cm. long; bractlets about 8 mm. long; calyx strigillose, 12 mm. long, the lobes lanceolate, acute; corolla purple, 2 cm. long; banner orbicular, the other petals obliquely obovate; pod glabrous, 6 cm. long or more, probably about 1.5 cm. wide when mature, 6-7-seeded.

Type collected in the vicinity of Acapometa, Tepic, April 11, 1910, Rose, Standley & Russell 14395 (U. S. Nat. Herb. no. 637272).

19. *Brongniartia molliuscula* Brand. Univ. Calif. Publ.

Bot. 3: 380. 1909.

A shrub; branches strigose-puberulent when young; leaves 5-10 cm. long; stipules oval, semicordate at the base, obtuse, 8-12 mm. long, 4-7 mm. wide; petioles about 1 cm. long, puberulent; rachis puberulent; leaflets 7-9, orbicular or broadly oval, or obovate, rounded or retuse at the apex, mucronate; flowers mostly solitary in the axils; pedicels 1-2 cm. long; calyx-lobes lanceolate, acute, the lower 3 somewhat united at the base, the upper 2 united to near the apex; corolla nearly 2 cm. long, purple; banner orbicular; pod 5-6 cm. long, fully 1.5 cm. broad, attenuate at the base, with a very short stipe, 4-6-seeded.

TYPE LOCALITY: Vicinity of San Luis Tultitlanapa, Puebla.

DISTRIBUTION: Known only from the type locality.

20. *Brongniartia luisana* Brand. Univ. Calif. Publ.

Bot. 3: 381. 1909.

A shrub; branches densely short-pubescent with ascending hairs, often blackish; leaves 10-15 cm. long; stipules ovate-lanceolate, 5 mm. long, acuminate; petioles 1-2 cm. long; leaflets 17-21, elliptic, round at each end, mucronate, 1.5-2.5 cm. long, 8-14 mm. wide, appressed-silky on both sides; flowers mostly 1 or 2 in each axil; pedicels 2-3 cm. long; bractlets ovate-lanceolate, silky, deciduous; calyx glabrous without, 1.5 cm. long, the lobes lanceolate, acute; corolla about 18 mm. long; pod glabrous, narrowed at the base into a stipe.

TYPE LOCALITY: Vicinity of San Luis Tultitlanapa, Puebla.

DISTRIBUTION: Known only from the type locality.

21. *Brongniartia minutifolia* S. Wats. Proc. Am.

Acad. 20: 360. 1885.

A low shrub, 3-10 dm. high, much branched; branches glaucous-green, nearly glabrous; leaves 3-5 cm. long; stipules herbaceous, lanceolate or oblong, 2 mm. long; leaflets 21-41, linear, revolute, 2-3 mm. long; flowers solitary in the axils; pedicels about 6 mm. long; calyx 6 mm. long, glabrous, the lobes lanceolate, acute; corolla unknown; pod glabrous, oblanceolate, 18-20 mm. long, attenuate below, the stipe equaling the calyx-tube.

TYPE LOCALITY: Chisos Mountains, Texas.

DISTRIBUTION: Known only from the type locality.

22. *Brongniartia canescens* (S. Wats.) Rydberg, sp. nov.*Brongniartia minutifolia canescens* S. Wats. Proc. Am. Acad. 23: 271. 1888.

A branching shrub, about 6 dm. high; branches strigose, wand-like; leaves 3-7 cm. long; petiole 1-3 mm. long, as well as the rachis strigose; stipules linear-filiform, 3 mm. long; leaflets 31-51, linear-subulate, revolute, 3-4 mm. long; flowers solitary in the axils; pedicels 3-5 mm. long; bractlets linear-filiform, strigose; calyx 8 mm. long, strigose-canescens, the lobes narrowly lanceolate, acute; corolla 12 mm. long, apparently yellowish; banner broadly obovate; pod subrhombic, 1.5 cm. long, 8 mm. wide, glabrous, 2-3-seeded; stipe 3-4 mm. long.

TYPE LOCALITY: Plains at "Oriz" [Ortiz], Chihuahua.

DISTRIBUTION: Type locality and vicinity.

23. *Brongniartia parvifolia* Rose, Contr. U. S. Nat.

Herb. 12: 268. 1909.

A low spreading shrub, 1.5-5 dm. high; young branches densely pilose; leaves 3-6 cm. long; stipules lanceolate, similar to the leaflets; petiole and rachis densely pilose; leaflets 19-31, lanceolate or narrowly lance-elliptic, acute at both ends, cuspidate, 6-10 mm. long, pilose on both sides; flowers solitary in the axils; pedicels about 1 cm. long, pilose; bractlets ovate, acute, pilose; calyx glabrous without, 8 mm. long, the lobes lanceolate, acute; corolla dark-red, 15 mm. long; pod glabrous, 2.5-4 cm. long, 3-4-seeded.

TYPE LOCALITY: Between San Geronimo and La Venta, Oaxaca.

DISTRIBUTION: Known only from the type locality.

24. *Brongniartia angustata* Rydberg, sp. nov.

A shrub; young branches densely pilose; leaves 5-15 cm. long; stipules deciduous; petiole about 1 cm. long, as well as the rachis densely pilose; leaflets 13-17, linear-lanceolate or rarely oblong, mostly 2-3.5 cm. long, 7-10 mm. wide, glabrous above, silky beneath, strongly reticulate, acute at each end, mucronate; flowers axillary; pedicels about 2 mm. long, densely villous-pilose; calyx fully 1 cm. long, densely pubescent; corolla unknown; pod 7-8 cm. long, 3 cm. wide, rugose, glabrous, 5-6-seeded, wing-margined on the upper suture.

Type collected between Mitla and Oaxaca City, September 5-6, 1906, *Rose & Rose 11295* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Oaxaca, Michoacán, and Puebla.

25. *Brongniartia hirsuta* Rydberg, sp. nov.

A shrub; young branches rather densely villous; leaves 8-12 cm. long; stipules narrowly lance-linear, 15 mm. long, caducous; petiole 1.5 cm. long, as well as the rachis more or less villous-pilose; leaflets 11-15, ovate or lance-elliptic, rounded at the base, obtuse or acute and cuspidate at the apex, 3-4 cm. long, strongly reticulate, glabrate above, silky-pilose on the ribs beneath; flowers axillary, usually 2 in each axil; pedicels 2-2.5 cm. long, villous; calyx 15 mm. long, densely long-villous; corolla unknown; pod 5-6 cm. long, 2-2.5 cm. wide, glabrous, narrowly wing-margined on the upper suture, 3-5-seeded.

Type collected at Hacienda Cierno, Querétaro, August 20, 1905, *Rose, Painter & Rose 9652* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Querétaro.

26. *Brongniartia suberea* Rose, Contr. U. S. Nat.

Herb. 5: 134. 1897.

An upright shrub, 2.5-3.5 m. high; young branches at first densely pubescent with ascending hairs, later often with high corky ridges; leaves 5-10 cm. long; stipules caducous; leaflets 3-5, ovate to oblong-ovate, 2.5-5 cm. long, 1-3 cm. wide, rounded at the base, mostly acutish at the apex, apiculate, glabrous above, finely short-strigose beneath; flowers axillary, solitary; pedicels 0.5-1.5 cm. long, short-pubescent; bractlets ovate, fully 1 cm. long, finely strigose; calyx about 15 mm. long, nearly glabrous, the lobes lanceolate, acuminate, puberulent on the margins; corolla brownish or "cherry-colored," about 2 cm. long, retuse, suborbicular; pod glabrous, 4-7 cm. long, 15-18 mm. wide, abruptly acute at the apex, tapering at the base into a very short stipe, 3-6-seeded; seeds 8 mm. long, light-brown.

TYPE LOCALITY: Acapulco, Guerrero.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Contr. U. S. Nat. Herb. 5: pl. 13.

27. *Brongniartia trifoliata* Brand. Zoe 5: 105. 1901.

A spreading shrub, 2-4 m. high; young branches short-pilose; leaves 5-10 cm. long; stipules caducous; petiole 1-1.5 cm. long, as well as the rachis short-pilose; leaflets 3, coriaceous, glabrous, rounded-oval to suborbicular, truncate or subcordate at the base, rounded or retuse at the apex, the lateral ones 2-4 cm. long, 1.5-3 cm. wide, the terminal one 3-5 cm. long, 3-5 cm. wide; petiolules 2-3 mm. long; flowers unknown; pedicels axillary 3-3.5 cm. long; pod 3-3.5 cm. long, 1.5-2 cm. wide, glabrous, narrowly wing-margined on the upper sutures, the stipe 3 mm. long.

TYPE LOCALITY: Cape Region mountains [Sierra de San Francisquito], Lower California.

DISTRIBUTION: Known only from the type locality.

28. *Brongniartia lupinoides* (H.B.K.) Standley, Contr. U. S. Nat.

Herb. 23: 468. 1922.

Peraltea lupinoides H.B.K. Nov. Gen. & Sp. 6: 471. 1824.

Peraltea oxyphylla DC. Mém. Legum. 463. 1825.

Brongniartia thermoides Spreng. Syst. 4: 287. 1827.

Megastegia speciosa G. Don, Gen. Hist. 2: 468. 1832.

Brongniartia oxyphylla Hemsl. Biol. Centr. Am. Bot. 1: 254. 1880.

A shrub; branches villous-tomentose; leaves 1-2 dm. long, silky-villous throughout; stipules lanceolate, acute, about 1 cm. long, deciduous; petioles short, 0.5-2 cm. long; leaflets 13-27, short-petioluled, oblong, obtuse, or acute at each end, mucronate-aristate at the apex, lanuginous-sericeous, silvery-white on both sides, 2.5-3.5 cm. long, 10-12 mm. wide; flowers axillary, 2 or 3 in each axil; pedicels 1-3 cm. long; bracts ovate, acute, subcordate at the base, 1.5 cm. long, membranous, sericeous without; calyx campanulate, 15 mm. long, sericeous, the lobes lanceolate, acute, the upper two united three-fourths their length; corolla violet, 18-20 mm. long; banner short-clawed, suborbicular, emarginate; wings and keelpetals similar, obliquely obovate, falcate, short-clawed, with a small basal auricle; pod oblong, somewhat narrowed below, tapering at the base, about 5 cm. long, nearly 2 cm. broad near the apex, about 5-seeded.

TYPE LOCALITY: Between Chilpanzingo and Zumpango, Guerrero.

DISTRIBUTION: Guerrero, Puebla, Guanajuato, and Oaxaca.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. *pl.* 589.

29. *Brongniartia argentea* Rydberg, sp. nov.

A shrub; young branches densely white-villous, almost tomentose; leaves 5-8 cm. long; petiole 0.5-1.5 cm. long, as well as the rachis white-tomentose; stipules ovate, 5-8 mm. long; leaflets 13-17, elliptic, about 1.5 cm. long, silvery on both sides, white beneath; petiolules very short; flowers mostly solitary in the axils; pedicels 1 cm. long or less; bractlets ovate, 4-6 mm. long, white-silky; calyx 15 mm. long, silky, the lobes narrowly lanceolate, attenuate, the lowest slightly longer; corolla about 2 cm. long, rose-purple; petals all broad, the banner orbicular.

Type collected in the district of Miahuatlán, Oaxaca, May 17, 1917, *Conzatti & Reko 3280* (U. S. Nat. Herb. no. 763898).

30. *Brongniartia sericea* Schlecht. *Linnaea* 12: 336. 1838.

? *Brongniartia gracilis* Benth.; Hemsl. *Biol. Centr. Am. Bot.* 2: 253. 1880.

A shrub, about 1 m. high; young branches short-villous, almost velutinous, with white or sometimes blackish hairs; leaves 5-15 cm. long; stipules lanceolate, acute, deciduous; leaflets 15-25, silvery-silky on both sides when young, in age glabrate, often becoming glabrous except on the midrib beneath, 1.5-3 cm. long, oblong or elliptic, rounded at both ends, mucronate; flowers 1-4 in each axil; pedicels about 2 cm. long; bractlets ovate, oblique, 6-8 mm. long, sericeous without, deciduous; calyx sericeous, 15 mm. long, the lobes lanceolate, acute; corolla about 2 cm. long, purple; pod glabrous, the body 4-5 cm. long, about 2 cm. wide, 4-6-seeded, the stipe about 1 cm. long; seeds 11 mm. long, 7 mm. broad.

TYPE LOCALITY: Near Mexico.

DISTRIBUTION: Federal District, Mexico (state), and Hidalgo.

31. *Brongniartia Pringlei* Rydberg, sp. nov.

A shrub, 1 m. high; young branches densely short-villous with brown hairs; leaves 5-10 cm. long; stipules thin, ovate, acuminate, nearly 1 cm. long; petiole 1-1.5 cm. long, subvelutinous; leaflets 11-18, rather thin, somewhat reticulate, ovate or oval, 1.5-2.5 cm. long, mucronate, rather sparingly silky on both sides; petiolules 1-2 mm. long; flowers 1 or 2 in each axil; pedicels about 3 cm. long; bractlets ovate or lanceolate, about 8 mm. long, acute, densely silky; calyx about 2 cm. long, densely brown-silky, its lobes lanceolate, acuminate, the lowest the longest; corolla 2.5 cm. long, rose-purple; pod glabrous, 4-6-seeded, the body 3.5-4.5 cm. long, 18-20 mm. wide, abruptly acute at both ends, slightly wing-margined on the upper suture, the stipe less than 0.5 cm. long.

Type collected on hills near Tultenango, State of Mexico, July 13, 1901, *C. G. Pringle 9431* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Mexico (state), Querétaro, and Hidalgo.

32. *Brongniartia vicioides* Mart. & Gal. Bull. Acad.
Brux. 10²: 49. 1843.

A shrub; young branches densely fuscous-villous, subvelutinous; leaves 5–10 cm. long, stipules lanceolate, 5 mm. long, deciduous; petiole and rachis subvelutinous; leaflets 15–29; oblong or elliptic, 1–2 cm. long, dark-green and somewhat silky above, densely white-silky beneath when young, less so in age, strongly reticulate, rounded at each end, mucronate; flowers 1–3 in each axil; pedicels about 1 cm. long; bractlets lanceolate or ovate, acute, 4–5 mm. long, silky; calyx densely silky, 1.5 cm. long, the lobes lanceolate, acute; corolla rose-purple, 2–2.5 cm. long; pod glabrous, 4–6-seeded, its body 3.5–5 cm. long, 15–18 mm. wide.

TYPE LOCALITY: Misteca Alta, Peñoles, Oaxaca.

DISTRIBUTION: Puebla and Oaxaca.

33. *Brongniartia Benthamiana* Hemsl. Biol. Centr.
Am. Bot. 2: 252. 1880.

? *Brongniartia intermedia* Moric. Mém. Soc. Genève 7: 253. 1836.

Peraltea lupinoides Benth. Pl. Hartw. 10. 1839. Not *P. lupinoides* H.B.K. 1824.

A shrub or undershrub; young branches densely fuscous-villous, subvelutinous; leaves 10–15 cm. long; stipules obliquely oblong or lanceolate, acute, 8–10 mm. long, fuscous-pubescent; petioles about 1 cm. long, fuscous-velutinous; stipels setaceous; leaflets 13–19, oblong, 1.5–3 cm. long, 12–15 mm. wide, rounded at both ends, mucronate, rather densely silky on both sides when young, glabrate in age, firm, strongly reticulate beneath; flowers 1–4 in each axil; pedicels 1.5–2.5 cm. long, velutinous; bractlets oblong or lanceolate, 8–10 mm. long, deciduous; calyx densely fuscous-villous, 15 mm. long, the lobes narrowly lanceolate, acuminate; corolla about 2 cm. long, rose-purple; banner orbicular, clawed; pod glabrous, 4–6-seeded, the body 6–7 cm. long, 2 cm. broad or more, slightly winged on the upper suture, the stipe 0.5 cm. long.

TYPE LOCALITY: León.

DISTRIBUTION: Guanajuato to Puebla and Morelos.

ILLUSTRATION: Mém. Soc. Genève 7: pl. 10 (?); Moric. Pl. Am. pl. 10 (?).

34. *Brongniartia mollis* H.B.K. Nov. Gen. & Sp. 6: 467. 1824.

Shrub 3–6 dm. high; branches terete, tomentose and somewhat black-hairy; leaves short-petioled; leaflets 9–11, short-petiolulate, ovate-elliptic, acutish, rounded at the base, reticulate-venose with light-green prominent veins beneath, puberulent above, softly villous beneath and on the margins with dark hairs, 2–3 cm. long; petiole and rachis subvillous; pedicels 2 or 3 in each axil, 15–20 mm. long, pilose; bracts ovate-acute, reticulate, ciliate, caducous; calyx campanulate-turbinate, reticulate, glabrous, violet-green, the upper two lobes united to near the apex, acute, the lower three free, lanceolate, acute; corolla about 2 cm. long; banner suborbicular, emarginate, violet; wings obliquely oblong, shortclawed, violet; keel-petals semilunate, obtuse, with a rounded basal auricle on the upper side, yellowish; pod stipitate, compressed, glabrous, about 5-seeded, spongy between the seeds; seeds dark, 6 mm. long.

TYPE LOCALITY: Quebrada de Sopilote, between Zumpango and Tasco, Guerrero.

DISTRIBUTION: Guerrero and Puebla.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. pl. 587.

35. *Brongniartia magnibracteata* Schlecht. Linnaea 12: 338. 1838

? *Brongniartia obliqua* Schlecht. Linnaea 12: 339. 1838.

Brongniartia stipitata Hemsl. Diag. Pl. Nov. 8. 1878.

A shrub, perhaps 1 m. high; young branches velutinous-pubescent; leaves 10–15 cm. long; stipules lanceolate or elliptic, acute, about 1 cm. long; velutinous; petioles about 1 cm. long, as well as the rachis velutinous; leaflets 15–37, rarely less, oblong, 1.5–2 cm. long, 5–8 mm. wide, reticulate, sparingly silky on both sides when young, in age glabrate, rounded at both ends, mucronate; flowers 1 or 2 in each axil; pedicels 2–3 cm. long; bractlets oval, 10–12 mm. long, 8 mm. wide, sparingly silky; calyx glabrous, about 1 cm. long, the lobes

lanceolate, acuminate; corolla about 15 mm. long; pod glabrous, 4-6-seeded, the body about 4 cm. long, 15-18 mm. wide, the stipe about as long as the calyx.

TYPE LOCALITY: Barranca near San Bartolo, Hidalgo.

DISTRIBUTION: Hidalgo to Querétaro, Veracruz, and the Federal District.

36. *Brongniartia Parryi* Hemsl. Biol. Centr. Am. Bot. 1: 254. 1880.

A tree or shrub; young branches densely white-velutinous, thick; leaves about 5-15 cm. long; stipules deciduous; leaflets usually 7, subsessile, thick, grayish-velutinous above, brownish-velutinous and strongly reticulate beneath, elliptic or ovate-elliptic, 3-5 cm. long, up to nearly 3 cm. wide, rounded or subcordate at the base, rounded and mucronate at the apex; flowers axillary, 1-3 together; pedicels 12-30 mm. long; calyx velutinous, about 15 mm. long; corolla unknown; pod 5-7 cm. long, nearly 2 cm. wide, glabrous and shining, abruptly acute at the apex, tapering at the base, 5-6-seeded, the stipe equaling the calyx; seeds light-brown, 1 cm. long, 5 mm. wide.

TYPE LOCALITY: San Luis Potosí.

DISTRIBUTION: San Luis Potosí, and perhaps Querétaro.

37. *Brongniartia oligosperma* Baillon, Adansonia 9: 240. 1870.

Brongniartia lasiocarpa Rose, Contr. U. S. Nat. Herb. 13: 268. 1909.

Brongniartia oligospermoides Standley, Contr. U. S. Nat. Herb. 23: 470. 1922.

A low bush, 3-4 dm. high; young branches densely brown-villous; leaves 1-3 cm. long; stipules lanceolate; rachis brown-villous; leaflets 11-17, oval to orbicular, 5-7 mm. long, rounded at each end, mucronate, shining and sparingly villous above, densely so beneath, reticulate-veined; flowers axillary, mostly solitary; pedicels 4-8 mm. long, villous; bractlets oval, 3-4 mm. long, villous; calyx villous without, 8 mm. long; corolla dark rose-purple, 15 mm. long; pod 1.5-2 cm. long, densely long-villous, the stipe very short.

TYPE LOCALITY: Xoehicalco, "Mexico."

DISTRIBUTION: Puebla and type locality.

6. *HARPALYCE* DC. Mém. Leg. 496. 1825; Prodr. 2: 523.
1825.

Trees or shrubs, with alternate odd-pinnate leaves and small stipules. Leaflets entire-margined, petioluled, sprinkled with yellow or orange sessile glands or gland-like scales beneath. Flowers in racemes, either terminal or also in the upper axils, then forming small leafy panicles; bracts and bractlets small. Calyx 2-lipped, the upper 2 and the lower 3 lobes wholly united to the tip into two linear entire lips. Corolla papilionaceous; banner rounded, broad, short-clawed or sessile; wings oblanceolate-falcate, short-clawed, with a deltoid basal auricle on the upper side, or obovate and with a basal auricle on the upper and a more or less developed median lobe on the lower; keel-petals lanceolate, falcate, in the Mexican species equaling the banner and wings, strongly falcate, united above the middle but the obtuse tips free, in the Cuban species much longer than the other petals and less curved. Stamens monadelphous, the upper filament united with the rest at least half its length, but the staminal tube split to the base; anthers alternately longer and shorter, in the Cuban species acute. Ovary sessile, several or many-ovuled; style more or less strongly curved; stigma terminal. Pod sessile, elongate, 2-valved, several-seeded, in some species (especially the Brazilian ones) divided by spongy tissue between the seeds.

Type species, *Harpalyce formosa* DC.

Pod woody; leaflets broadest below the middle, pubescence not ferruginous.

I. MEXICANAE.

Pod leathery; leaflets broadest at or above the middle; pubescence usually more or less ferruginous.

Petals membranous; keel strongly incurved, shorter than or merely equaling the other petals; pod 1.5-2.5 cm. broad.

II. FORMOSAE.

Petals fleshy; keel slightly arched, at least half longer than the other petals; pod 1-1.5 cm. broad.

III. CUBENSES.

- One species.
- I. MEXICANAE
1. *H. mexicana*.
- II. FORMOSAE
- Leaflets obovate, acute at the base. 2. *H. formosa*.
 Leaflets oblong to oval, rounded or refuse at each end.
 Leaves densely ferruginous-villous, subvelutinous beneath; branches subvelutinous. 3. *H. Goldmanii*.
 Leaflets 11-21. 4. *H. Loeseneriana*.
 Leaflets 5-9.
 Leaves sparingly villous, puberulent, or glabrate beneath.
 Leaflets 11-15, elliptic or oblong, coriaceous; lateral veins indistinct.
 Leaf-margins not revolute; branches puberulent; corolla about 12 mm. long. 5. *H. hidalgensis*.
 Leaf-margins revolute; branches ferruginous-pubescent; corolla about 18 mm. long. 6. *H. rupicola*.
 Leaflets 7-11, oval or broadly elliptic. 7. *H. arborescens*.
 Leaflets thin, not reticulate. 8. *H. Pringlei*.
 Leaflets firm, strongly reticulate.
- III. CUBENSES
- Leaflets reticulate-veined beneath; pod 5-6 cm. long. 9. *H. macrocarpa*.
 Leaflets with indistinct lateral veins; pod 2-4 cm. long.
 Branches and lower surface of the leaves subvelutinous when young; pod 3.5-4 cm. long, 5-7-seeded. 10. *H. villosa*.
 Branches and lower surface of the leaves puberulent when young; pod 2-2.5 cm. long, 1- or 2-seeded. 11. *H. cubensis*.

1. *Harpalyce mexicana* Rose, Contr. U. S. Nat. Herb.

8: 42. 1903.

A small tree; young branches densely grayish-villous, not ferruginous, in age glabrate with conspicuous white lenticels; leaves 15-20 cm. long; petiole 3-4 cm. long, as well as the rachis densely white- or grayish-villous; leaflets 11-15, lance-oblong, 3-6 cm. long, 2-4 cm. wide, rounded at the base, obtuse or acutish and mucronate at the apex, broadest near the base, sparingly pubescent on both sides when young, glabrate in age, with orange glands and strongly veined and reticulate beneath; flowers not known; pod woody, oblong, 5-6 cm. long, 2.5 cm. wide, glabrous, 2-3-seeded; seeds brown, 12 mm. long, 10 mm. wide, obovoid. Perhaps this species does not belong to *Harpalyce*.

TYPE LOCALITY: West of Bolaños, Jalisco.

DISTRIBUTION: Known only from the type locality.

2. *Harpalyce formosa* DC. Prodr. 2: 523. 1825.

Astragalus carnosus Moc. & Sessé; DC. Mém. Leg. 496; Prodr. 2: 523, as synonym. 1825.

Astragalus formosus Sessé & Moc. Pl. Nov. Hisp. 119. 1889.

A shrub, up to 1.5 m. high, subsericeous; leaves 5 cm. long or more; leaflets obovate or elliptic, about 2 cm. long, rounded at the apex, acute at the base, subsericeous, slightly ferruginous; racemes 5-10 cm. long; calyx 2-2.5 cm. long; corolla rose-colored; banner obovate, 2.5-3 cm. long, longer than the other petals; wings oblanceolate, falcate; keel-petals linear, strongly incurved; pod glabrous, about 5 cm. long and 2.5 cm. wide.

TYPE LOCALITY: Warmer regions of Mexico.

DISTRIBUTION: Known only from the type locality and Yucatan.

ILLUSTRATIONS: Moc. & Sessé, Calq. Dess. pl. 249; Jour. Bot. Hook. 3: pl. 5.

3. *Harpalyce Goldmanii* Rose, Contr. U. S. Nat.

Herb. 8: 313. 1905.

? *Harpalyce macrobotrya* Harms; Loesener, Abh. Bot. Ver. Prov. Brand. 51: 22. 1909.

A shrub; branches when young densely ferruginous-villous, almost velutinous, in age light-gray with white lenticels; stipules linear-filiform, caducous; leaves about 1 dm. long; petiole 1-5.3 cm. long, as well as the rachis densely ferruginous; leaflets 11-19, oblong, rounded or obtuse at each end, 2-3 cm. long, about 1 cm. wide, dark and puberulent but soon glabrate above, densely ferruginous beneath, with strong midrib beneath but the veins faint; panicle 1-1.5 dm. long, densely flowered; densely ferruginous-villous; calyx-lips somewhat unequal,

the upper 16 mm., the lower 20 mm. long; corolla purple or red, 20-24 mm. long; banner obovate, slightly longer than the other petals; ovary and pod glabrous; mature pod unknown.

TYPE LOCALITY: Canjob, Chiapas.

DISTRIBUTION, Chiapas.

4. *Harpalyce Loeseneriana* Taubert; Loesener, Bull. Herb.

Boiss. 3: 612. 1895.

Harpalyce ferruginea Brand. Zoe. 5: 234. 1906.

A shrub; young branches densely ferruginous-pubescent, almost velutinous, later more canescent and in age glabrate; bark of the old branches with white lenticels; leaves 5-12 cm. long; petiole 1-4 cm. long, as well as the rachis densely ferruginous; leaflets 5-9, elliptic or oblong, obtuse and mucronate or acutish at the apex, obtuse at the base, 2-5 cm. long, 1-2 cm. wide, chartaceous, short-villous, or in age almost glabrous above, densely ferruginous-villous, sub-velutinous, and with orange glands beneath, the midrib very prominent beneath and the lateral veins less so; panicles and calyces densely ferruginous; upper lip of the calyx 11-15 mm., the lower 16-22 mm. long, both narrowly lanceolate and obtuse; corolla purple; banner obovate, 18-30 mm. long, 10-18 mm. wide; wings falcately oblanceolate, 12-25 mm. long, with a lanceolate recurved basal auricle; keel-petals similar but more linear, more strongly incurved, the basal auricle lanceolate; pod oblong, thin, leathery, 6-8 cm. long, 2-2.5 cm. wide, glabrous, 6-9-seeded.

TYPE LOCALITY: Near Mitla, district of Tlacolula, Oaxaca.

DISTRIBUTION: Oaxaca and Puebla.

5. *Harpalyce hidalgensis* Taubert; Loesener, Bull. Herb.

Boiss. 3: 613. 1895.

A shrub; branches when young cinereous-puberulent or somewhat ferruginous with appressed short hairs, in age glabrous, and the yellowish bark with white lenticels; stipules setaceous, 3 mm. long, caducous; leaves 8-15 cm. long; petiole 1.5-3 cm. long, as well as the rachis ferruginous; leaflets 11-15, elliptic, obtuse at both ends, 2-5 cm. long, 1-2 cm. wide, almost glabrous and dull above, pale, puberulent, and with yellow glands, and on the ribs somewhat ferruginous beneath; panicles and calyces ferruginous-villosulous; calyx-lips subequal, about 11 mm. long; corolla purplish; banner obovate, about 12 mm. long; wings oblanceolate, falcate, with a basal auricle; keel strongly incurved, 12 mm. long; ovary glabrous; fruit unknown.

TYPE LOCALITY: Near Huejutla, Hidalgo.

DISTRIBUTION: Hidalgo.

6. *Harpalyce rupicola* Donn. Smith, Bot. Gaz. 13: 26. 1888.

A shrub; branches ferruginous-pubescent; leaves 10-12 cm. long; petiole 1-2 cm. long, as well as the rachis ferruginous-pubescent; leaflets 11-15, oblong, retuse at the apex, rounded at the base, 2-2.5 cm. long, 1 cm. broad, puberulent above, with golden glands beneath, soon glabrate, with revolute margins; racemes or panicles 12-18-flowered, ferruginous; calyx about 1 cm. long, tomentose; petals purple; banner 18 mm. long, 14 mm. wide, round-obovate, longer than the other petals; wings oblanceolate, 5 mm. wide; keel-petals somewhat shorter; anthers alternately larger and smaller; ovary linear, 6-7-ovuled.

TYPE LOCALITY: Santa Rosa, Baja Verapaz, Guatemala.

DISTRIBUTION: Known only from the type locality.

7. *Harpalyce arborescens* A. Gray, Proc. Am. Acad. 5: 178. 1861.

Brongniartia retusa Benth.; Hemsl. Diag. Pl. Nov. 8. 1878.

Harpalyce retusa Rose, Contr. U. S. Nat. Herb. 8: 43. 1903.

A shrub or small tree; branches more or less ferruginous or grayish short-villous, in age becoming glabrate, gray, with white lenticels; leaves 9-15 cm. long; petioles 1.5-3 cm. long, as well as the rachis yellowish or light ferruginous-villous; leaflets 7-11, oval or broadly

elliptic, thin, 2.5-5 cm. long, 1-4 cm. wide, puberulent on both sides, or in age glabrate above, with yellow glands beneath, rounded or retuse at each end and the midrib strong beneath, but the veins faint; panicles and calyces yellowish-ferruginous; lips of the calyx subequal, 12 mm. long; corolla apparently white or pinkish, 15 mm. long; banner obovate; wings narrowly oblanceolate, falcate, with an acute lanceolate recurved basal auricle; keel strongly curved, the petals free and rounded at the tip; pod 5-6 cm. long, 1.5 cm. wide, coriaceous, glabrous.

TYPE LOCALITY: Wartenburg, near Tantoyuca, Veracruz.

DISTRIBUTION: San Luis Potosí, northern Veracruz, and southern Tamaulipas.

8. *Harpalyce Pringlei* Rose, Contr. U. S. Nat. Herb. 8: 42.
1903.

A low shrub, 3-20 dm. high; branches when young densely short-villous, more or less ferruginous, in age glabrate and gray, with white lenticels; stipules minute, caducous; leaves 1-2 dm. long; petiole 2-4 cm. long, as well as the rachis densely ferruginous-villous, with short hairs; leaflets 7-11, broadly elliptic or oblong, 2-4 cm. long, 1.5-2 cm. wide, rounded at each end or retuse at the apex, thickish, strongly veined and reticulate, sparingly short-pubescent on both sides, except the ribs beneath, which have the same pubescence as the rachis, glabrate in age above, and with golden glands beneath; panicle and calyx densely ferruginous; sepals about 18 mm. long; corolla bluish or white, about 2 cm. long; banner obovate, 2 mm. wide; wings falcate, oblanceolate, with an acute basal auricle; keel-petals strongly incurved, with rounded tips; pod oblong, 8-9 cm. long, 2-2.5 cm. wide, glabrous, reticulate., 3-5-seeded.

TYPE LOCALITY: Barranca above Cuernavaca, Morelos.

DISTRIBUTION: Morelos.

9. *Harpalyce macrocarpa* Britton & Wilson; Britton, Mem. Torrey Club 16: 67. 1920.

A tree, 4 m. high, with slender branches; young twigs densely ferruginous-puberulent and glandular-granuliferous; leaves 10-14 cm. long; petioles 1-3 cm. long, as well as the rachis ferruginous-puberulent; leaflets 11-15, oblong or oblong-elliptic, 2-4 cm. long, 1-1.5 cm. wide, rounded or emarginate at the apex, rounded or subcordate at the base, coriaceous, glabrous and dark-green above, paler, finely reticulate-veined and dotted with yellow glands beneath, the prominent midrib ferruginous-puberulent; flowers unknown; pod spatulate-oblong, 5-6 cm. long, 1.5 cm. broad near the apex, somewhat falcate, glabrous, 6-7-seeded.

TYPE LOCALITY: Border of arroyo, palm-barren, Santa Clara, Cuba.

DISTRIBUTION: Known only from the type locality.

10. *Harpalyce villosa* Britton & Wilson; Britton, Mem. Torrey Club 16: 67. 1920.

A tree, 3-4 m. high; branches when young densely ferruginous-villous, in age more gray and grooved; leaves 6-7.5 cm. long; petiole 1-1.5 cm. long, as well as the rachis ferruginous-villous; leaflets 11-13, oblong or elliptic-oblong, 2-2.7 cm. long, 6-12 mm. wide, thick, coriaceous, rounded or retuse at each end, dark-green, glabrous or shiny above, densely ferruginous-villous when young beneath, but in age glabrate, conspicuously glandular-punctate and paler beneath, with a strong ferruginous midrib and indistinct lateral veins; calyx ferruginous-villous, 2.5 cm. long; lips subequal, acutish; banner obovate, about 1 cm. long and 7 mm. wide; wings obliquely obovate, 7 mm. long, with a small auricle on each side, that on the upper side near the base; keel-petals linear, slightly falcate, about 28 mm. long, with a rounded basal auricle on the upper side; pod oblong, 3.5-4 cm. long, 1-1.2 cm. wide, 5-7-seeded; seeds 5 mm. long, 4-4.5 mm. broad.

TYPE LOCALITY: Among rocks along stream, vicinity of Camp San Benito, Oriente, Cuba.

DISTRIBUTION: Oriente, Cuba.

COMPLETED VOLUME

9 : i-iv, 1-542. (Agaricales:) Polyporaceae (pars), Boletaceae, Agaricaceae (pars). Complete in 7 parts.

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VOLUME 24

PART 4

NORTH AMERICAN FLORA

(ROSALES)

FABACEAE

GALEGEAE (pars)

PER AXEL RYDBERG



PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

OCTOBER 4, 1924

ANNOUNCEMENT

NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

Volume 1. Myxomycetes, Schizophyta.

Volumes 2 to 10. Fungi.

Volumes 11 to 13. Algae.

Volumes 14 and 15. Bryophyta.

Volume 16. Pteridophyta and Gymnospermae

Volumes 17 to 19. Monocotyledones.

Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. W. A. Murrill, and Dr. J. H. Barnhart.

Professor John M. Coulter, of the University of Chicago; Mr. Frederick V. Coville, of the United States Department of Agriculture; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or five parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

THE NEW YORK BOTANICAL GARDEN

BRONX PARK

NEW YORK CITY

11. *Harpalyce cubensis* Griseb. Cat. Pl. Cub. 71. 1866.

A shrub, 2-3 m. high; branches when young ferruginous-puberulent and glandular-granuliferous, in age glabrate; stipules minute, caducous; leaves 5-9 cm. long; petioles about 1 cm. long, as well as the rachis ferruginous-puberulent; leaflets 9-17, coriaceous, oblong, 1-3 cm. long, 5-10 mm. wide, dark-green and glabrous above, densely yellowish and densely glandular-lepidote beneath, ferruginous-puberulent on the strong midrib, the lateral veins indistinct; racemes axillary, few-flowered, shorter than the leaves; calyx densely glandular-lepidote; calyx-lips subequal, about 15 mm. long, lanceolate, acutish; petals dark-crimson, fleshy; banner erect, oblong-obovate, fully 1 cm. long, 4-5 mm. wide; wings oblanceolate, irregularly contorted, with a lobe on each side, nearly 1 cm. long; keel-petals oblanceolate, somewhat falcate, with a basal auricle on the upper side, the upper one-third adnate but often separating in age, 18-20 mm. long; staminal sheath straight, split on upper side; filaments free about one third their length; anthers lanceolate, acuminate; pod rhomboid in outline, 2-2.5 cm. long, 1-1.5 cm. wide, glabrous, 1-2-seeded.

TYPE LOCALITY: Western Cuba.

DISTRIBUTION: Western Cuba.

ILLUSTRATION: Am. Jour. Bot. 10: pl. 34 F, f. 9-12.

Subtribe 4. **BARBIERIANAE**. Shrubs, with alternate odd-pinnate leaves, narrow stipules and stipels; leaflets netted-veined. Flowers in axillary and terminal racemes, each subtended by a pair of bractlets. Calyx cylindrical, 5-lobed. Corolla somewhat papilionaceous, the petals narrow, with long claws, the banner not spreading. Stamens diadelphous; anthers uniform. Pod flat, 2-valved, many-seeded. Seeds not strophiolate.

7. *Barbieria* DC. Mém. Leg. 241. 1825.

Shrubs, with alternate odd-pinnate leaves, and subulate stipules and stipels. Calyx subtended by 2 bracteoles, tubular, colored, with 5 subequal lobes. Corolla red, the petals contracted below into long slender claws. Banner with an oblanceolate blade. Wings shorter than the banner and keel, with an elliptic blade. Keel-petals with oblanceolate or oblong obtuse blades, united above the middle. Stamens diadelphous, the upper filament free, straight; sheath straight; anthers uniform. Ovary sessile, many-ovuled, pubescent, the style long, slightly curved above, hairy along the upper side; stigma minute, terminal. Pod flat, straight, 2-valved, transversely septate within, and impressed without between the seeds; seeds transversely oblong-reniform.

Type species, *Clitoria polyphylla* Poir.

1. *Barbieria pinnata* (Pers.) Baillon, Hist. Pl. 2: 263. 1870.

Galactia pinnata Pers. Syn. Pl. 2: 302. 1807.

Clitoria polyphylla Poir.; Lam. Encyc. Suppl. 2: 300. 1811.

Barbieria polyphylla DC. Mém. Leg. 242. 1825.

Barbieria maynensis Poepp. & Endl. Nov. Gen. & Sp. 3: 58. 1845.

A shrub, 0.5-4 m. high, sometimes somewhat climbing; branches terete, somewhat hirsute when young; stipules lance-subulate, 1 cm. long, acuminate, several-ribbed; leaves 1-2 cm. long; rachis sparingly hirsute; stipules subulate-setaceous, 3 mm. long; leaflets 17-23, oblong, 2-4 cm. long, 8-15 mm. wide, rounded at each end, mucronate, green and glabrous above, pale and appressed-silky beneath; racemes 1-1.5 dm. long; bracts lance-subulate, persistent; bractlets under the calyx lanceolate, acuminate; calyx-tube about 2 cm. long, pilose, the lobes fully 1 cm. long, with a deltoid base, tapering into a filiform tip; corolla 5-5.5 cm. long; pod 3-6 cm. long, 5 mm. wide, hirsute, 4-9-seeded; seeds 5 mm. long, 3 mm. broad, black.

TYPE LOCALITY: Antilles.

DISTRIBUTION: Cuba, Hispaniola, and Porto Rico; southern Mexico to Bolivia and Brazil.

ILLUSTRATIONS: DC. Mém. Leg. pl. 39; Poepp. & Endl. Nov. Gen. & Sp. pl. 264; Mart. Fl. Bras. 25: pl. 9; E. & P. Nat. Pfl. 3²: f. 116 C-G; Am. Jour. Bot. 10: pl. 34 G.

Subtribe 5. **SESBANIANAE**. Trees, shrubs, or herbs, with abruptly pinnate leaves, caducous stipules, and no stipels. Flowers in axillary racemes. Calyx rounded-campanulate, fully as broad as high, short-lobed. Banner with a broad reflexed blade, short-clawed. Keel-petals united in the middle, the tips and claws distinct, the lower edge of the blades strongly curved. Stamens diadelphous, the staminal sheath usually dilated below, often with a basal auricle on each side. Pod 2-valved but often indehiscent, stipitate and beaked, compressed, with cross-partitions between the seeds, but not articulate, the valves usually separating into two layers of which the inner is papery. Seeds reniform to subcylindric.

Pod flattened or terete, neither 4-winged nor 4-angled.

Pod 2-seeded, with thin margins, lance-elliptic; seeds oblong-reniform, enclosed in the inner membranous layer of the valves; calyx decidedly oblique.

Pod many-seeded, linear, with thick margins; calyx not conspicuously oblique.

Pod not torulose.

Flowers middle-sized or small; banner suborbicular; blades of the broad keel-petals with a basal auricle; seeds subcylindric-oblong.

Flowers large; banner elliptic; blades of the rather narrow keel-petals without a basal auricle; seed reniform-oblong.

Pod torulose; banner suborbicular; blades of the broad keel-petals without a basal auricle; seeds reniform-oblong.

Pod 4-angled, often 4-winged, not torulose.

12. *GLOTTIDIUM*.

8. *SESBAN*.

9. *AGATI*.

10. *DAUBENTONIOPSIS*.

11. *DAUBENTONIA*.

8. *SESBAN* Adans. Fam. Pl. 2: 327. 1763.

Sesbania Scop. Introd. 308. 1777.

Darwinia Raf. Fl. Ludov. 106. 1817.

Herbs or shrubs. Leaves abruptly pinnate, the rachis ending in a setaceous point, the leaflets numerous, in ours linear-oblong, obtuse or rounded and mucronate at the apex; stipules small, membranous, caducous. Flowers in axillary racemes, with a bract at the base of the pedicels, and a pair of bractlets below the calyx, both bracts and bractlets similar to the stipules and caducous. Calyx broadly campanulate with a turbinate base, as broad as long; lobes short, deltoid, acute or acuminate, shorter than the tube. Corolla yellow or the banner dotted, streaked, or tinged with purple. Banner longer than the other petals, often with one or two callous appendages, the blade suborbicular, reflexed, the claw about equaling the calyx. Wings short-clawed, the blades obliquely oblanceolate or oblong, with a basal auricle. Keel-petals with distinct, longer claws, the blades strongly and broadly lunate, obtuse or rounded at the free tips, united along the lower margins, with a basal auricle on the upper edge, the claw about twice as long as the calyx. Stamens diadelphous, the staminal sheath slightly auricled at the base, the free filament slightly bent below. Pod slender, terete or slightly compressed, linear, neither winged or angled, short-stipitate, beaked, many-seeded, with cross partitions between the seed, 2-valved. Seeds many, cylindric-oblong, slightly compressed, subtruncate at the ends, brown and smooth, about twice as long as high.

Type species, *Aeschynomene Sesban* L.

Leaves and stem glabrous or slightly strigose when young.

Racemes about equaling the leaves; calyx-lobes very short, triangular, merely acute, less than 1 mm. long.

Racemes much shorter than the leaves; calyx-lobes acuminate, more than 1 mm. long, except in no. 3.

Pod 4-6 mm. broad; seeds 4-5 mm. long; corolla 18-25 mm. long.

Pod about 3-4 mm. broad; seeds 3-4 mm. long; corolla usually less than 20 mm. long.

Stem usually with scattered small prickles; calyx-lobes acute; corolla 10-12 mm. long.

Stem unarmed; calyx-lobes acuminate.

Corolla 15-20 mm. long; plant shrubby at the base.

1. *S. Sesban*.

2. *S. exasperatus*.

3. *S. bispinosus*.

4. *S. Emerus*.

Corolla 15 mm. long or less; plant herbaceous, annual.
 Leaflets 30-70; pod 30-40-seeded; calyx-lobes with subulate tips.
 Leaflets 16-30; pod 15-30-seeded; calyx-lobes short-acuminate.

Leaves beneath and stem silky-villous.

5. *S. exaltatus*.

6. *S. Sonorae*.

7. *S. sericeus*.

1. *Sesban Sesban* (L.) Britton, Brooklyn Bot. Gard.

Mem. 1: 54: 1918.

Aeschynomene Sesban L. Sp. Pl. 714. 1753.
Aeschynomene picta Cav. Ic. 4: 7. 1797.
Coronilla Sesban Willd. Sp. Pl. 3: 1147. 1803.
Coronilla picta Willd. Sp. Pl. 3: 1148. 1803.
Sesban aegyptiacus Poir. in Lam. Encyc. 7: 128. 1806.
Sesban pictus Poir. in Lam. Encyc. 7: 129. 1806.
Sesbania aegyptiaca Pers. Syn. Pl. 2: 316. 1807.
Sesbania picta Pers. Syn. Pl. 2: 316. 1807.
Emerus Sesban Kuntze, Rev. Gen. 180. 1891.
Sesbania Sesban Fawcett & Rendle, Fl. Jam. 4: 23. 1920.

An herb or soft-wooded shrub, 2-3 m. high; branches glabrous, or sparingly hairy on the younger parts; stipules linear-lanceolate, caducous; leaves 8-15 cm. long; leaflets 20-30, glabrous, linear-oblong, pale-green, 2-3 cm. long, 4-6 mm. wide, rounded at each end, mucronate; racemes usually equaling or exceeding the leaves, 5-12-flowered; bracts and bractlets linear-subulate, early caducous; calyx 4-5 mm. high, 6 mm. broad, the lobes broadly triangular, acute, less than 1 mm. long; corolla yellow, the banner usually streaked or dotted with dark-purple or sometimes (var. *pictus*) tinged with purple; banner about 15 mm. long; wings broadly obliquely oblanceolate, with a rounded basal auricle; keel-petals with a triangular basal auricle; pod linear, 12-20 cm. long, 3 mm. wide, somewhat twisted, slightly torulose, 15-30-seeded; seeds oblong, 3.5-4 mm. long, about 2 mm. high, brown.

TYPE LOCALITY: Egypt.

DISTRIBUTION: West Indies; also in Guiana; native of tropical and subtropical Africa and Asia.

ILLUSTRATIONS: Cav. Ic. pl. 314; Bot. Reg. pl. 873; Am. Jour. Bot. 10: pl. 34 H.

2. *Sesban exasperatus* (H.B.K.) Rydberg.

Sesbania exasperata H.B.K. Nov. Gen. & Sp. 6: 534. 1823.
Lotus palustris Vell. Fl. Flum. 315. 1825.
Sesbania dubia Steud. Nom. ed. 2: 2: 572. 1841. Not *S. dubia* H.B.K. 1825.
Emerus exasperatus Kuntze, Rev. Gen. 1: 181. 1891.

A shrub, 1-3 m. high; branches angled, striate, glabrous; stipules lanceolate, 8 mm. long; leaves 1.5-2 dm. long; leaflets 50-60, linear-oblong, rounded at each end, mucronate, glabrous, light-green and often black-dotted above, glaucescent beneath, 11-25 mm. long, 3-5 mm. wide; rachis sometimes slightly minutely prickly on the back; racemes 3-6-flowered, half as long as the leaves; pedicels 6-10 mm. long; bracts and bractlets linear-lanceolate, 4-5 mm. long, caducous; calyx glabrous, yellowish, red-dotted, 7-8 mm. long, the lobes deltoid, short-acuminate, 3 mm. long; banner 18-25 mm. long, the blade yellow, red-striate; wings and keel pale-yellow; blades of the former obliquely oblong, obtuse, with a deltoid subulate-tipped basal auricle; those of the keel-petals with a broadly deltoid basal auricle; pod 1.5-2.5 dm. long, 4-6 mm. broad, 20-40-seeded; seeds 4-5 mm. long, 2-2.5 mm. high, brown, shining.

TYPE LOCALITY: Sandy places along Apure River, Venezuela.

DISTRIBUTION: Nicaragua; Jamaica; St. Kitts; also in South America, from Trinidad to Colombia and Paraguay.

ILLUSTRATION: Vell. Fl. Flum. Ic. 7: pl. 137.

3. *Sesban bispinosus* (Jacq.) Rydberg.

Aeschynomene Sesban Jacq. Coll. 2: 283. 1788. Not *A. Sesban* L. 1753.
Aeschynomene bispinosa Jacq. Ic. Pl. Rar. 3: 13. 1793.
Coronilla aculeata Willd. Sp. Pl. 3: 1147. 1803.
Sesban aculeatus Poir. in Lam. Encyc. 7: 128. 1806.

- Sesbania aculeata* Pers. Syn. Pl. 2: 316. 1807.
Sesbania muricata Macfad. Fl. Jam. 1: 257. 1837.
Sesbania bispinosa Spreng.; Steud. Nom. ed. 2: 2: 572. 1841.
Emerus Sesban aculeata Kuntze, Rev. Gen. 181. 1891.

Stem 2-3 m. high, shrubby at the base, glabrous, usually more or less armed with short prickles, somewhat angled; stipules linear-subulate, caducous; leaves 1-3 dm. long; rachis glabrous, often prickly; leaflets 40-80, linear-oblong, 1-1.5 cm. long, 2-3 mm. wide, glabrous, rounded at each end, mucronate; racemes lax, 1-1.5 dm. long, 3-10-flowered; bracts and bractlets subulate, caducous; pedicels about 1 cm. long; calyx 5 mm. high, 4 mm. broad, the lobes deltoid, acute, 1 mm. long; corolla 10-12 mm. long, pale-yellow; banner dotted with reddish-brown, rarely orange throughout; blades of the wings oblanceolate, rounded at the apex, with a lanceolate basal auricle; those of the keel-petals with a sharp basal auricle; pod 1.5-2 dm. long, 3 mm. wide, 35-45-seeded; seeds 3 mm. long, 1.5 mm. high, brown.

TYPE LOCALITY: Egypt.

DISTRIBUTION: Southern Mexico; Jamaica; Porto Rico; Lesser Antilles; Curaçao; native of tropical Africa and Asia, and China.

ILLUSTRATION: Jacq. Ic. Pl. Rar. pl. 564.

4. *Sesban Emerus* (Aubl.) Britton & Wilson, Sci. Surv.

Porto Rico 5: 395. 1924.

- Aeschynomene Emerus* Aubl. Pl. Guian. 775. Tabl. Noms 1. 1775.
Coronilla occidentalis Willd. Sp. Pl. 3: 1147. 1803.
Sesban occidentalis Poir. in Lam. Encyc. 7: 129. 1806.
Sesbania occidentalis Pers. Syn. Pl. 2: 316. 1807.
 ? *Sesbania macrocarpa* Muhl.; Ell. Bot. S. C. & Ga. 2: 221. 1823.
Emerus Sesban occidentalis Kuntze, Rev. Gen. 181. 1891.
Sesbania Emerus Urban, Repert. Sp. Nov. 16: 149. 1919.

Stem shrubby, at least at the base, 2-5 m. high, glabrous, more or less angled; stipules linear-subulate, caducous; leaves 7-18 cm. long; leaflets 24-50, linear-oblong, 1.5-3 cm. long, 3-7 mm. wide, rounded at each end, glabrous or with a few scattered hairs when young; racemes 5-10 cm. long, much shorter than the leaves, 3-6-flowered; bracts and bractlets linear, 5 mm. long, caducous; calyx about 8 mm. long, 7 mm. wide; lobes with a triangular base, acuminate, 2-2.5 mm. long, more or less mottled; corolla yellow, 15-20 mm. long; banner dotted with dark-purple; wings oblong-oblanceolate; blades of the keel-petals with a triangular basal auricle; pod straight, about 2 dm. long, 3.5-4 mm. wide, 30-40-seeded; seeds oblong, 3 mm. long, 2 mm. wide.

TYPE LOCALITY: Not given.

DISTRIBUTION: Florida; Veracruz; Morelos; Guatemala; Panama; West Indies.

ILLUSTRATION: Plumier, Pl. Am. pl. 125.

5. *Sesban exaltatus* (Raf.) Rydberg.

- Darwinia exaltata* Raf. Fl. Ludov. 106. 1817.
Sesbania macrocarpa Muhl. (Cat. 65, hyponym. 1813); Nutt. Gen. 2: 112. 1818.

An annual; stem glabrous, terete or slightly angled, 1-4 m. high; stipules linear-lanceolate, 1 cm. long, caducous; leaves 12-30 dm. long; leaflets 30-70, linear-oblong, rounded and mucronate at the apex, acute or obtuse at the base, 1-2.5 cm. long, 3-6 mm. wide, glabrous, somewhat glaucous beneath; racemes 2-10 cm. long, 2-6-flowered; bracts and bractlets linear-subulate, caducous; calyx about 5 mm. long and broad, the lobes with a triangular base and a subulate tip, nearly 2 mm. long; corolla yellow or the banner sometimes turning pink-purple; banner 12-15 mm. long; blades of the wings oblanceolate, with a triangular basal auricle, those of the keel-petals with a sharp basal auricle; pod 1.5-2 dm. long, 3 mm. broad, glabrous, 30-40-seeded; seeds 3-4 mm. long, 1.5-2 mm. high. Perhaps a northern variety of *S. occidentalis*.

TYPE LOCALITY: New Orleans, Louisiana.

DISTRIBUTION: Missouri to Louisiana and Texas.

ILLUSTRATION: W. Barton. Fl. N. Am. pl. 28.

6. *Sesban Sonorae* Rydberg, sp. nov.

Sesbania macrocarpa picta S. Wats. Proc. Am. Acad. 24: 46. 1889. Not *Sesban pictus* Poir. 1806.
Sesban macrocarpa Standley, Contr. U. S. Nat. Herb. 22: 477. 1922.

An annual; stem 3-10 dm. high, striate, glabrous; stipules lance-subulate, 4 mm. long, caducous; leaves 5-10 cm. long; leaflets 16-20, linear-oblong, 1-2.5 cm. long, 3-6 mm. wide, glabrous, rounded or obtuse at each end or retuse at the apex; racemes 2-7 cm. long, 2-5-flowered; bracts and bractlets narrowly linear; pedicels about 5 mm. long; calyx as in the preceding; corolla about 15 mm. long, pale-yellow, the banner usually purple-streaked and purple-dotted; blades of the wings broadly obliquely oblanceolate, with a triangular basal auricle; those of the keel-petals with a small tooth-like basal auricle; pod 10-15 cm. long, 3 mm. wide, 15-20-seeded; seeds 4 mm. long, 2 mm. high.

TYPE LOCALITY: Guaymas, Sonora.

DISTRIBUTION: Arizona, southern California, Sonora, Sinaloa, and Lower California.

7. *Sesban sericeus* (Willd.) Britton & Wilson, Sci. Surv.

Porto Rico 5: 395. 1924.

Coronilla sericea Willd. Enum. 773. 1809.

Sesbania sericea Link, Enum. 2: 244. 1822.

Agati sericea Hitchc. Rep. Mo. Bot. Gard. 4: 75. 1893.

Stem suffrutescent below, slightly angled, more or less pubescent, sometimes slightly spiny; stipules subulate, 5 mm. long; leaves 5-15 cm. long; leaflets 20-40, oblong, rounded at both ends, mucronate, 1-2.5 cm. long, 3-6 mm. wide, glabrous above, silky-villous beneath; racemes 2-6 cm. long, 1-6-flowered; bracts and bractlets linear-lanceolate, acuminate; calyx 5 mm. long and broad, glabrous, the lobes deltoid, short-acuminate, fully 1 mm. long; corolla dull-yellow, 9-12 mm. long; blades of the wings oblong-oblanceolate, those of the keel-petals with an acute basal auricle; pod 10-16 cm. long, 3 mm. wide, 20-30-seeded; seeds 3 mm. long, 2 mm. high.

TYPE LOCALITY: Unknown.

DISTRIBUTION: Houston, Texas; British Guiana; West Indies; native of Ceylon.

9. AGATI Adans. Fam. Pl. 2: 326. 1763.

Resupinaria Raf. Sylva Tell. 115. 1838.

Small trees. Leaves abruptly pinnate, with many leaflets and lanceolate caducous stipules. Flowers large, in small axillary racemes, with a caducous bract at the base of the pedicel and two bractlets under the calyx. Calyx campanulate, truncate, slightly bilabiate, the upper lip with 2, the lower with 3 short or obsolete lobes. Banner clawed, with an oblong blade, shorter than the wings. Wings and keel-petals almost equal, clawed, with lunate, acutish blades, the latter united at the middle along the lower edge. Stamens diadelphous, the staminal sheath with large rounded auricles near the base. Style filiform, glabrous. Pod linear, elongate, compressed, somewhat 4-angled by the thick sutures, with partitions between the seeds, short-stipitate; seeds oblong-reniform.

Type species, *Robinia grandiflora* L.

1. *Agati grandiflora* (L.) Desv. Jour. de Bot. Desv.

II. 1: 120. 1813.

Robinia grandiflora L. Sp. Pl. 722. 1753.

Aeschynomene grandiflora L. Sp. Pl. ed. 2. 1060. 1763.

Aeschynomene coccinea L.f. Suppl. 330. 1781.

Coronilla grandiflora Willd. Sp. Pl. 3: 1145. 1803.

- Coronilla coccinea* Willd. Sp. Pl. 3: 1146. 1803.
Sesban grandiflora Poir. in Lam. Encyc. 7: 127. 1806.
Sesban coccineus Poir. in Lam. Encyc. 7: 127. 1806.
Sesbania grandiflora Pers. Syn. Pl. 2: 316. 1807.
Sesbania coccinea Pers. Syn. Pl. 2: 316. 1807.
Agati coccinea Desv. Jour. de Bot. Desv. II. 1: 120. 1813.
Resupinaria grandiflora Raf. Sylva Tell. 115. 1838.
Agati grandiflora coccinea Wight & Arn. Prodr. Ind. Or. 1: 216. 1834.
Emerus grandiflorus Kuntze, Rev. Gen. 180. 1891.

A small tree; leaves 1-3.5 dm. long; leaflets 14-50, oblong, glabrous or puberulent, 2.5-6 cm. long, 1-1.5 cm. wide, rounded or retuse at the apex, acute or obtuse at the base; racemes 1-3-flowered; bracts and bractlets ovate, minute, caducous. Calyx about 2 cm. long and broad, slightly 2-lipped, the lobes very short or obsolete; corolla white or pinkish, or bright-red (var. *coccinea*), 6-8 cm. long; pod pendulous, 3-4 dm. long, 8 mm. wide and 4 mm. thick, 25-35-seeded; seeds reniform, 6 mm. long and 4 mm. high, brown, smooth.

TYPE LOCALITY: India.

DISTRIBUTION: Florida; Yucatan; West Indies; also in Venezuela and Colombia; naturalized; native from India to northern Australia and the Philippines.

ILLUSTRATIONS: Jour. de Bot. Desv. II. 1: pl. 4, f. 6; Tussac, Fl. Ant. 3: pl. 6; Britton, N. Am. Trees f. 517; Am. Jour. Bot. 10: pl. 35 I.

EXCLUDED SPECIES

AGATI TOMENTOSA (H. & A.) Nutt.; A. Gray, Bot. U. S. Expl. Exp. 1: 409. pl. 46. 1854.
Sesbania tomentosa H. & A. Bot. Beechey Voy. 286. 1836. In the original publication, the type locality of this was given as Acapulco, Mexico, but the specimens undoubtedly came from the Hawaiian Islands.

10. DAUBENTONIOPSIS Rydb. Am. Jour. Bot. 10: 497. 1923.

Shrubs. Leaves abruptly pinnate, with many leaflets, and caducous stipules, bracts, and bractlets. Flowers in axillary racemes. Calyx rounded-campanulate, broader than high, its 5 lobes very short. Corolla yellow. Banner short-clawed with a suborbicular reflexed blade. Wings short-clawed, with obliquely oblong blades. Keel-petals with a longer claw and a nearly semi-circular blade, without a basal auricle. Stamens diadelphous, the staminal sheath much dilated at the base and with a rounded basal auricle. Pod coriaceous, stipitate, compressed, linear, decidedly torulose, several-seeded, constricted and with transverse partitions between the seeds. Seeds oblong-reniform, about twice as long as high.

Type species, *Aeschynomene longifolia* Cav.

1. *Daubentoniopsis longifolia* (Cav.) Rydb. Am. Jour. Bot. 10: 497. 1923.

- Aeschynomene longifolia* Cav. Ic. 4: 8. 1797.
Aeschynomene longifolia Ortega, Dec. 70. 1800.
Piscidia longifolia Willd. Sp. Pl. 3: 920. 1803.
Daubentonia longifolia DC. Mém. Leg. 286. 1823.
Sesbania longifolia DC. Prodr. 2: 265. 1825.
Sesbania Cavanillesii S. Wats. Bibl. Index 258. 1878; Proc. Am. Acad. 17: 342, in part, as to synonym. 1882.
Emerus longifolius Kuntze, Rev. Gen. 181. 1891.
Sesbania mexicana Pollard, Bull. Torrey Club 24: 154. 1897.
Sesban mexicanus Standley, Contr. U. S. Nat. Herb. 23: 476. 1922.

A shrub; branches glabrous or strigose above, terete; stipules linear-lanceolate, yellowish, sericeous, caducous; leaves 1-1.5 dm. long; leaflets 14-20, oblong-lanceolate, acute at each end, cuspidate, glabrous or strigulose beneath when young; racemes 7-14 cm. long, 5-13-flowered; pedicels 1.5-2 cm. long; calyx 6-8 mm. high, 7-9 mm. broad; lobes broadly triangular, 1 mm. long, broader than long, acute; corolla 15-18 mm. long; pod coriaceous, the

stipe about 2 cm. long, the body 6-8 mm. long, 6-7 mm. wide, tapering at each end, the beak less than 1 cm. long; seeds dull-brown, 7 mm. long, half as high.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Jalisco.

ILLUSTRATION: Cav. Ic. *pl.* 315; Am. Jour. Bot. 10: *pl.* 35 J.

11. DAUBENTONIA DC. Mém. Leg. 285. 1823.

Shrubs or trees. Leaves abruptly pinnate, with small oblong caducous stipules and many leaflets. Flowers in axillary racemes, with one bract at the base of the pedicel and two bractlets under the calyx, the bracts and bractlets caducous. Calyx rounded-campanulate, broader than high, undulately 5-toothed, the lobes ciliolate on the margin. Corolla yellow or rose-red. Banner slightly longer than the other petals, the blade orbicular, reflexed, the claw short, bent. Wings oblong with a short bent claw. Keel-petals lunate, obtuse, without a basal auricle, the claw longer than the calyx. Stamens diadelphous, the free filament and the staminal sheath as if articulate near the base. Style filiform, glabrous. Pod linear-oblong, beaked, and stipitate, coriaceous, 4-winged or at least 4-angled, the seeds separated by cross-partitions. Seeds subglobose.

Type species, *Piscidia punicea* Cav.

Pod distinctly 4-winged.

Corolla rose-colored or purplish; calyx-lobes obtusish; pod rather gradually tapering at the ends.

Corolla yellow; calyx-lobes acute; pod abruptly acuminate.

Pod merely 4-angled; corolla yellow.

1. *D. punicea*.
2. *D. Drummondii*.
3. *D. virgata*.

1. *Daubentonia punicea* (Cav.) DC. Mém. Leg. 286. 1823.

Piscidia punicea Cav. Ic. 4: 8. 1797.

Aeschynomene miniata Ortega, Dec. 28. 1797.

? *Ormocarpum elegans* G. Don, Gen. Hist. 2: 279. 1832.

Sesbania punicea Benth. in Mart. Fl. Bras. 15: 43. 1859.

Emerus puniceus Kuntze, Rev. Gen. 181. 1891.

A shrub, 2 m. high or more, or sometimes a small tree; branches terete, glabrous or with scattered hairs on the young parts, often purplish; stipules lanceolate, 4-5 mm. long, caducous; leaves 1-2 dm. long; rachis glabrous; leaflets 12-40, linear-oblong, obtuse or rounded and mucronate at the apex, acute or obtuse at the base, 1.5-3 cm. long, 4-7 mm. wide, rather firm, glabrous or slightly strigose when young; racemes 5-10 cm. long; bracts and bractlets linear-subulate, caducous; calyx about 3 mm. high and 5 mm. broad, undulate on the margin, the lobes very broad and obtusish; corolla rose-red or purplish, sometimes turning orange; banner 12-15 mm. long; pod normally 5-7 cm. long, 12-15 mm. wide, rather gradually tapering at both ends, short-beaked, 5-8-seeded; stipe 8-15 mm. long, or longer if some of the lower seeds are abortive; seeds subglobose.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Florida to Mississippi; also from Brazil to Argentina.

ILLUSTRATIONS: Cav. Ic. *pl.* 316; Am. Jour. Bot. 10: *pl.* 35 K.

2. *Daubentonia Drummondii* Rydb. Am. Jour. Bot.

10: 498. 1923.

Daubentonia longifolia DC. Mém. Leg. 286, in part, as to description. 1823.

Daubentonia longifolia ? T. & G. Fl. N. Am. 1:293. 1838.

Sesbania Cavanillesii S. Wats. Proc. Am. Acad. 17: 342, in part, as to specimens. 1882.

Daubentonia Cavanillesii Standley, Contr. U. S. Nat. Herb. 23: 476. 1922.

A shrub, 2-6 m. high; stem and branches terete, glabrous or with a few scattered hairs when young; stipules lanceolate, 3-4 mm. long, early caducous; leaves 1-2 dm. long; rachis glabrous; leaflets 20-50, linear-oblong, mostly rounded and mucronate at the apex, acute or obtuse at the base, 1.5-3.5 cm. long, 4-7 mm. wide, sparingly strigose when young, soon

becoming glabrous; racemes 5–10 cm. long; bracts and bractlets linear-subulate, 1–2 mm. long, caducous; pedicels spreading, about 1 cm. long; calyx about 3 mm. high and 4 mm. broad, the lobes short, broadly triangular, acute; corolla pale-yellow; banner 12–15 cm. long; wings and keel-petals about 10 cm. long; pod 5–6 cm. long, 1 cm. wide, glabrous, abruptly acuminate at each end, short-beaked, usually 4–6-seeded, the wings about 3 mm. wide; seeds quadrate-orbicular, 5 mm. broad and long, 3 mm. thick, brown.

TYPE LOCALITY: Texas.

DISTRIBUTION: Florida to Texas and San Luis Potosí.

* ILLUSTRATION: Cocks, Legum. Louisiana *pl.* (as *Daubentonia longifolia*).

3. *Daubentonia virgata* (Cav.) Rydberg.

Aeschynomene virgata Cav. Ic. 3: 47. 1794.

Coronilla virgata Willd. Sp. Pl. 3: 1148. 1800.

Sesbania virgata Poir. in Lam. Encyc. 7: 129. 1806.

Agati virgata Desv. Jour. de Bot. Desv. II. 1: 120. 1813.

Courssetia virgata DC. Ann. Sci. Nat. 4: 92. 1824.

Sesbania tetragona Pamp. Nuovo Giorn. Bot. Ital. II. 14: 604. 1907.

Herbaceous; stem simple, glabrous, about 6 dm. high; stipules setaceous, caducous; leaflets 28–38, oblong, rounded at each end, mucronate, 3–4 cm. long, 6–8 mm. wide, minutely sericeous when young, soon glabrous; racemes 10–14-flowered, 3–6 cm. long, glabrous, the pedicels in flower about 4 mm., in fruit 6–8 mm. long; calyx 4 mm. long, angulate-dentate; corolla yellow; banner orbicular, deeply emarginate, 13 mm. broad; keel strongly arcuate; pod 4–7 cm. long, 5–8 mm. broad, stipitate, beaked, indehiscent, 4-angled, 4–6-seeded, obscurely subtorulose, the angles scarcely callous, the stipe 5–8 mm. long; seeds 6–7 mm. long, grayish-red.

TYPE LOCALITY: Described from cultivated specimens, raised from Mexican (?) seeds.

DISTRIBUTION: Mexico.

ILLUSTRATION: Cav. Ic. *pl.* 293.

12. *Glottidium* Desv. Jour. de Bot. Desv. II. 1: 119. 1813.

Annual herbs. Leaves abruptly pinnate, with numerous leaflets and deciduous stipules, the primordial leaves simple, ovate. Flowers in axillary racemes or panicles, small, yellow or deep-red. Calyx campanulate, decidedly oblique, 5-toothed, with small nearly equal lobes. Banner with a broad, reniform, reflexed blade, and short claw. Wings with an obliquely oblong blade, auricled at the base, and a short claw. Keel-petals with a long claw, the blades broadly oval-lunate, acute or short-beaked at the apex and with a sharp basal auricle. Stamens diadelphous, the staminal tube merely slightly arched below. Style short, incurved at the apex, glabrous. Pod elliptic, tapering at each end, short-beaked, stipitate, 1-celled, 2-valved, 2-seeded, the valves at length separating into two layers, the outer thicker, the inner very thin, membranous. Seeds compressed, oblong-reniform, dull.

Type species, *Aeschynomene platycarpa* Michx.

1. *Glottidium vesicarium* (Jacq.) Harper, Bull. Torrey Club 28: 472. 1901.

Robinia vesicaria Jacq. Ic. Pl. Rar. 1: 15. 1786.—Jacq. Coll. 1: 105. 1786.

Phaca floridana Willd. Sp. Pl. 3: 1252. 1803.

Aeschynomene platycarpa Michx. Fl. Bor. Am. 2: 75. 1803.

Sesbania platycarpa Pers. Syn. Pl. 2: 316. 1807.

Colutea floribunda Poir. in Lam. Encyc. Suppl. 1: 562. 1810.

Dalbergia polyphylla Poir. in Lam. Encyc. Suppl. 2: 446. 1811.

Sesbania disperma Pursh, Fl. Am. Sept. 483. 1814.

Glottidium floridanum Desv. Jour. de Bot. Desv. II. 1: 119. 1813.

Sesbania vesicaria Ell. Bot. S.C. & Ga. 2: 222. 1822.

Emerus vesicarius Kuntze, Rev. Gen. 181. 1891.

Glottidium floridanum atrorubrum Nash, Bull. Torrey Club 23: 101. 1896.

Glottidium vesicarium atrorubrum Small, Fl. SE. U.S. 615. 1903.

Glottidium vesicarium sericeum Cocks, Legum. Louisiana 11. 1910.
Sesbania vesicaria atrorubra S.C. Brooks, Proc. Am. Acad. 49: 503. 1913.

An annual herb; stem 1-2 m. high, glabrous or sparingly pubescent when young; leaves 1-1.5 dm. long; leaflets 20-40, oblong, rounded and mucronate at the apex, obtuse or acute at the base, short-petioled, 1-3 cm. long, 3-6 mm. wide, glabrous, or slightly silky when young beneath, rarely more pubescent (var. *sericeum*); racemes slender, 8-12 cm. long, simple or sometimes branched, 5-15-flowered; bracts and bractlets subulate, caducous; calyx about 3 mm. high and broad, lobes broadly triangular, acute; corolla yellowish sometimes with the lower petals tinged with pink, or the whole corolla dark-red (var. *atrorubrum*); petals subequal in length; body of the pod 5-6 cm. long, 1.5-2 cm. wide; stipe about 1 cm. long; seeds fully 1 cm. long, nearly half as high.

TYPE LOCALITY: Florida.

DISTRIBUTION: South Carolina to Florida and Texas.

ILLUSTRATIONS: Jacq. Ic. Rar. pl. 148; Jour. de Bot. Desv. II. 1: pl. 4, 5, 1; Cocks, Legum. Louisiana pl.; Am. Jour. Bot. 10: pl. 35 L.

Subtribe 6. **DIPHYSANAE.** Trees or shrubs, with odd-pinnate leaves, caducous stipules, and no stipels. Flowers in axillary racemes, articulated to the pedicels and subtended by two caducous bractlets. Calyx surmounting an evident hypanthium, 5-lobed, but the lobes unequal, the upper two broadest and united higher up. Pod stipitate, oblong, the pericarp separating into two layers; endocarp chartaceous, forming a flattened cell somewhat interrupted between the seeds; exocarp papery, reticulate, becoming strongly inflated, forming a bladder along each side of the legume.

13. DIPHYSA Jacq. Enum. Pl. Carib. 7, 28. 1760.

Trees or shrubs. Leaves alternate, odd-pinnate, but the leaflets often arranged more or less alternately on the rachis, short-petiololed; stipules small and caducous; stipels none. Flowers solitary at the nodes of the peduncle; bracts caducous; bractlets 2 under the flower, caducous. Calyx-tube campanulate, surmounting an evident turbinate or obconic hypanthium below the insertion of the staminal sheath; lobes 5, unequal, the uppermost two broad and rounded at the apex, the lateral two of about the same length but narrower, obtuse or acute, the lowest one narrow, lanceolate or subulate, acute or acuminate, somewhat longer than the rest. Petals unequal, the banner usually the longest and the keel-petals the shortest, all short-clawed; blade of the banner reflexed, suborbicular, with two callosities above the base; those of the wings obliquely obovate, falcate, auriculate at the base on the upper side; those of the keel-petals lunate, strongly falcate, acutish to rostrate, free at the tip, auriculate or angled at the base. Stamens diadelphous, the upper filament distinct; anthers subuniform. Ovary stipitate, many-ovuled. Seeds transversely oblong, somewhat oblique, attached near one end to the slender funicle; radicle incurved.

Type species, *Diphysa carthagenensis* Jacq.

Branches, peduncles, and pedicels glabrous or slightly pubescent, rarely hispid or prickly but not conspicuously glandular-viscid; hypanthium short; calyx-lobes and bractlets not glandular-dentate.

Leaflets medium-sized or large, 8-35 mm. long.

Leaflets small, 2-6 mm. long.

Branches, peduncles, and pedicels conspicuously glandular-viscid; hypanthium at least half as long as the corolla-tube; calyx-lobes and bractlets glandular-denticulate.

I. ROBINIODES.

II. MINUTIFOLIAE.

III. GLANDULIFERAE.

I. ROBINIODES

Peduncles, rachises of the leaves, and often the young branches more or less hispid (the hairs with pustulate bases) or weakly prickly as well as hirsute-strigose.

- Leaflets 9-13, oval or suborbicular, 15-20 mm. long, pale and puberulent beneath.
- Leaflets 11-25, oblong to oval, 8-15 mm. long, glabrous, except the veins beneath.
- Peduncles, rachises, and branches neither hispid nor prickly.
- Leaflets thin, neither revolute-margined nor prominently veined beneath; pod elliptic in cross-section, 15-20 mm. broad.
- Branches, peduncles, and leaves more or less pubescent, at least when young.
- Leaflets short-villous on both sides; pod distinctly dotted by dark pustulate hair-bases.
- Leaflets strigose or glabrate; pod not dotted.
- Branches, peduncles, and leaves glabrous or rarely sparingly strigose in *D. carthagenensis*.
- Leaflets 15-35 mm. long, rounded at both ends; corolla 18-20 mm. long.
- Leaflets 7-15 mm. long.
- Corolla about 15 mm. long; leaflets mostly acute.
- Corolla about 10 mm. long; leaflets rounded or retuse at the apex.
- Leaflets rather firm, strongly veined beneath, the margin somewhat revolute; pod subrhombic in cross-section, about 1 cm. broad.
1. *D. echinata*.
2. *D. sennioides*.
3. *D. punctata*.
4. *D. floribunda*.
5. *D. robiniioides*.
6. *D. occidentalis*.
7. *D. carthagenensis*.
8. *D. suberosa*.

II. MINUTIFOLIAE

- Branches, peduncles, rachises, and leaflets decidedly pilose-puberulent; lateral lobes of the calyx ovate.
- Branches, peduncles, and rachises sparingly strigose-puberulent; leaflets usually glabrous or nearly so, the pubescence most on the ribs beneath; lateral lobes of the calyx lanceolate.
- Bractlets oblanceolate; rachises not prickly.
- Bractlets ovate; rachises usually minutely prickly.
9. *D. minutifolia*.
10. *D. microphylla*.
11. *D. spinosa*.

III. GLANDULIFERAE

- Leaflets 7-33; pod oval in cross-section, the sutures not carinate.
- Calyx glabrous except the ciliolate margins; leaflets hispidulous-ciliolate.
- Pod 1 cm. broad, not much inflated; bractlets obovate or elliptic.
- Pod 1.5 cm. broad, decidedly inflated; bractlets oblong.
- Calyx glandular-pubescent; leaflets not hispidulous-ciliolate.
- Corolla about 1 cm. long; leaflets puberulent or glabrate.
- Bracts and bractlets obovate; inflorescence merely glandular; pod oval to broadly oblong.
- Bracts and bractlets oblanceolate or lanceolate; pod narrowly oblong.
- Corolla about 1.5 cm. long; leaflets villous.
- Leaflets 5-9; pod sub-rhombic in cross-section, the sutures carinate.
12. *D. Thurberi*.
13. *D. macrocarpa*.
14. *D. racemosa*.
15. *D. puberulenta*.
16. *D. villosa*.
17. *D. humilis*.

1. *Diphysa echinata* Rose, Contr. U. S. Nat. Herb.

12: 271. 1909.

A low shrub; young branches hirsute-strigose and usually with yellowish bristles which develop into weak prickles; stipules lance-linear, 5-7 mm. long; leaves 5-10 cm. long; rachis sparingly hirsute in age, glabrate; leaflets 9-13, oval to suborbicular, 1.5-2 cm. long, very thin, glabrous above, pale and puberulent or glabrate beneath; racemes 5-7 cm. long; peduncle and pedicels hispid-prickly, the latter 1-2 cm. long; bracts linear, 5-7 mm. long; calyx glabrous, the tube 6 mm. long; upper two lobes broadly ovate, rounded at the apex, ciliolate on the margins, the lateral ones similar but narrower, the lowest one lanceolate, 4 mm. long.

TYPE LOCALITY: Between Rosario and Colomas, Sinaloa.

DISTRIBUTION: Known only from the type locality.

2. *Diphysa sennioides* Benth.; Benth. & Oerst. Vidensk.

Meddel. 1853: 12. 1853.

A shrub or small tree; branches sparingly hirsute-strigose, in age straw-colored; stipules linear or lance-linear, falcate, 5-7 mm. long; leaves 5-10 cm. long; leaflets 11-25, oblong to

oval, mucronate, rounded at each end, 8-15 mm. long, glabrous or sparingly strigose on the veins; rachis slightly pubescent, usually with more or less numerous bristles which develop into slender prickles; racemes 3-5 cm. long, 3-5-flowered; bracts linear; bractlets oblanceolate, acute; calyx glabrous, 6-7 mm. long; lobes 3-3.5 mm. long, the upper two rounded-ovate, the lateral ones triangular, acute, the lowest one lanceolate, slightly longer; corolla yellow, 12 mm. long; pod 3-9 cm. long, 2 cm. broad, glabrous or nearly so; stipe fully 1 cm. long; seeds light-brown, 6-7 mm. long, 4 mm. broad.

TYPE LOCALITY: Zimapán, Hidalgo.

DISTRIBUTION: Veracruz to San Luis Potosí, Jalisco, and Oaxaca.

3. *Diphysa punctata* Rydberg, sp. nov.

Apparently a small tree; branches finely strigose; stipules subulate, falcate, 5-7 mm. long; leaves 7-12 cm. long; rachis strigose-puberulent; leaflets 15-25, oval, rounded at each end or retuse at the apex, mucronate, 12-20 mm. long, softly puberulent on both sides; racemes 4-6 cm. long; bracts, bractlets, and flowers unknown; pod 7-11 cm. long, fully 2 cm. broad, sparingly dotted, each dot with a short stiff hair with a pustulate colored base; stipe fully 1 cm. long.

Type collected near Cuernavaca, Morelos, September 9, 1903, *Rose & Painter 6900* (U. S. Nat. Herb. no. 450460).

4. *Diphysa floribunda* Peyr. *Linnaea* 30: 78. 1859.

A shrub or small tree; branches glabrous, or slightly puberulent when young; stipules lanceolate, 2-3 mm. long, caducous; leaves 5-10 cm. long; rachis puberulent; leaflets 7-13, alternate or subopposite, 1-2 cm. long, sparingly puberulent or glabrate, rounded at each end; petiolule about 1 mm. long; racemes 3-5 cm. long; bracts and bractlets linear, caducous; pedicels 6-8 mm. long; calyx glabrous, the tube (including the hypanthium) 6 mm. long, the lobes 2-3 mm. long; uppermost two lobes broadly ovate, rounded at the apex, the lateral ones ovate, acute, the lowest one lanceolate, acute; corolla yellow, 12-15 mm. long, similar to that of *D. robinoides*; ovary puberulent; pod glabrate, 4-6 cm. long, 15-18 mm. wide, reticulate; stipe about 1 cm. long; seeds light-brown.

TYPE LOCALITY: Mirador, Veracruz.

DISTRIBUTION: Veracruz and Puebla to Guatemala.

5. *Diphysa robinoides* Benth.; Benth. & Oerst. *Vidensk.*

Meddel. 1853: 11. 1853.

Diphysa carthaginensis Benth. & Oerst. *Vidensk. Meddel.* 1853: 13, in part. 1853. Not *D. carthaginensis* Jacq. 1760.

A tree, 4-6 m. high; branches glabrous, often purplish when young; stipules linear, 2-3 mm. long, caducous; leaves 7-15 cm. long; rachis glabrous; leaflets 9-15, oval or obovate, glabrous on both sides, paler beneath, short-petioluled, 1.5-3.5 cm. long, rounded or retuse at the apex, often subalternate; racemes 4-7 cm. long, 3-6-flowered; peduncle and pedicels glabrous; pedicels 4-6 mm., in fruit 15-20 mm. long; calyx glabrous, the tube (including the hypanthium) 6-7 mm. long, the lobes 2 mm. long; upper two lobes broadly ovate, rounded at the apex, the lateral ones deltoid-ovate, acute or obtuse, the lowest one lanceolate, acuminate, slightly longer; banner 18-20 mm. long; keel-petals 15 mm. long, the basal auricles prominent; pod 6-11 cm. long, 18-20 mm. broad, glabrous, distinctly venose-reticulate, the stipe 5-8 mm. long; seeds light-brown, 6 mm. long, 3 mm. wide.

TYPE LOCALITY: At the base of the volcano Mombacho, near Granada, Nicaragua.

DISTRIBUTION: Guatemala and Oaxaca to Panama.

ILLUSTRATION: *Am. Jour. Bot.* 11: *pl.* 33 *M.*

6. *Diphysa occidentalis* Rose, Contr. U. S. Nat. Herb.
12: 271. 1909.

A shrub or small tree; branches grayish, glabrous; stipules linear-lanceolate, 5–7 mm. long, caducous; leaves 4–6 cm. long; leaflets 13–19, elliptic or oval, mostly acute at each end, 8–15 mm. long, thin, glabrous; racemes 2–4 cm. long; bracts oblong to linear, 6–7 mm. long; bractlets ovate, 2 mm. long; pedicels 1–2 cm. long; calyx glabrous, except the ciliate margins of the lobes, the tube (including the hypanthium) 5–6 mm. long, the upper 4 lobes 3 mm. long, ovate, the uppermost two rounded, the lateral ones acute at the apex, the lowest one 4–5 mm. long, lanceolate, acute; corolla yellow, about 15 mm. long, similar to that of *D. robinoides*; pod oblong, 4–8 cm. long, 15–20 mm. broad, with a few hispid hairs; seeds light-brown, 5 mm. long, 2.5 mm. broad.

TYPE LOCALITY: Guaymas, Sonora.
DISTRIBUTION: Sonora to Guerrero.

7. *Diphysa carthagensis* Jacq. Enum. Pl. Carib. 28. 1760.

Diphysa robinoides Millsp. Field Mus. Publ. Bot. 1: 367. 1898. Not *D. robinoides* Benth. 1853.

A tree, up to 20 m. high; young branches glabrous or sparingly strigose, slender; stipules subulate, 3 mm. long; leaves 4–10 cm. long; rachis glabrous or nearly so; leaflets 9–19, oblong, 7–15 mm. long, rounded or obtuse at the base, rounded to retuse at the apex, glabrous, green on both sides; racemes 3–5 cm. long, 1–4-flowered; bracts oblong, 2 mm. long, caducous; bractlets oblanceolate, obtuse, 3 mm. long; calyx glabrous; tube (including the hypanthium) 5 mm. long; uppermost two lobes ovate, rounded or obtuse at the apex, 2 mm. long, the lateral ones lanceolate, acute, the lowest narrowly lanceolate, 3 mm. long; corolla about 1 cm. long; pod about 4 cm. long, and d 1.5 m. broad, wrinkled, glabrous; stipe about 5 mm. long.

TYPE LOCALITY: Cartagena, Colombia.
DISTRIBUTION: Yucatan; also in Colombia and Venezuela.
ILLUSTRATIONS: Jacq. Sel. Stirp. Am. pl. 180, f. 58; Lam. Tab. Encyc. pl. 605.

8. *Diphysa suberosa* S. Wats. Proc. Am. Acad. 22: 405. 1887.

A low shrub, 1–3 m. high; branches glabrous, often short and somewhat spinescent, the trunk with corky bark; stipules lance-subulate, falcate, about 5 mm. long; leaves 3–10 cm. long; rachis glabrous; leaflets 7–11, subalternate, oval or oblong-obovate, acute or obtuse, apiculate, 4–15 mm. long, firm, glabrous, prominently veined beneath; racemes 2–4 cm. long, 1–3-flowered; bracts lanceolate, 1–2 mm. long, caducous; bractlets ovate, 5–6 mm. long, acute or short-acuminate, more persistent; calyx glabrous, the tube (including the hypanthium) 7–8 mm. long; uppermost two lobes broadly ovate, rounded at the apex, 3 mm. long, the lateral ones ovate, acute, the lowest one lanceolate, acuminate; pod 5–6 cm. long, about 1 cm. broad, round-carinate on the backs of the valves; seeds light-brown, 6 mm. long, 2 mm. wide.

TYPE LOCALITY: Barranca near Guadalajara, Jalisco.
DISTRIBUTION: Sonora to Morelos and Oaxaca.

9. *Diphysa minutifolia* Rose, Contr. U. S. Nat. Herb. 12: 271.
1909.

A shrub, 1–2 m. high; branches often very short, rather densely pilose-puberulent with spreading hairs; stipules subulate, 4–5 mm. long, falcate; leaves 4–6 cm. long; rachis pilose-puberulent; leaflets numerous, 25–39, oblong, 3–6 mm. long, rounded at each end, more or less short-pilose on both sides; racemes 2–3 cm. long, 1- or 2-flowered; peduncles and pedicels pilose; calyx nearly glabrous, except the ciliate margins; tube (including the hypanthium) 5 mm. long; uppermost two lobes rounded-ovate, the lateral ones ovate, acutish, the lowest one

lanceolate, acute, somewhat longer; corolla yellow, about 1 cm. long; pod 4-5 cm. long, 2 cm. wide or more, wrinkled, pubescent when young.

TYPE LOCALITY: Barranca near Cuernavaca, Morelos.

DISTRIBUTION: Morelos to Chiapas.

10. *Diphysa microphylla* Rydberg, sp. nov.

A low shrub; branches short, often spinescent, strigose-puberulent with ascending hairs; stipules subulate, 3 mm. long; leaves 2-3 cm. long; rachis sparingly strigose, sometimes with minute prickles; leaflets 13-17, oblong, 2-6 mm. long, glabrous or somewhat short-pilose; racemes 1-2 cm. long, 1- or 2-flowered; bracts lanceolate, 1-2 mm. long; bractlets oblanceolate, obtuse; pedicels 6-8 mm. long; calyx glabrous, the tube (including the hypanthium) 5 mm. long; uppermost two lobes rounded-ovate, obtuse, the lateral ones lanceolate, acute, the lowest one lanceolate, acuminate; corolla pale-yellow, 1 cm. long; pod puberulent when young, 4-6 cm. long, 12-15 cm. broad; stipe 1 cm. long; seeds 4.5 mm. long, 3 mm. wide.

Type collected in the vicinity of Victoria, Tamaulipas, February 1 to April 9, 1907, *Edward Palmer 367* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Tamaulipas and Nuevo León.

11. *Diphysa spinosa* Rydberg, sp. nov.

A low shrub; branches short, usually spinescent, sparingly pubescent when young, and with minute prickles; stipules lanceolate, 2 mm. long; leaves about 2 cm., rarely 3 cm. long; rachis puberulent and minutely prickly; leaflets 9-15, oval to oblong, 2-5 mm. long, glabrous or with a few hairs along the rib and margins; racemes 1-2 cm. long, 1- or 2-flowered; bracts oblong or linear, 2 mm. long; bractlets ovate, acute, 3-4 mm. long; calyx glabrous, the tube (including the hypanthium) 5-6 mm. long; uppermost two lobes rounded-ovate, rounded at the apex, 3 mm. long, the lateral ones lanceolate, acute, the lowest one lanceolate, acuminate, somewhat longer; corolla yellow, 10-12 mm. long; pod slightly puberulent when young, 4 cm. long, or more.

Type collected at Canjob, Chiapas, March 27, 1904, *E. A. Goldman 796* (U. S. Nat. Herb. no. 470601).

DISTRIBUTION: Oaxaca to Yucatán and Guatemala.

12. *Diphysa Thurberi* (A. Gray) Rydb.; Standley, Contr. U. S. Nat. Herb. 23: 479. 1922.

~ *Daubentonia*? *Thurberi* A. Gray, Mem. Am. Acad. II. 5: 313. 1854.

~ *Ormocarpum Thurberi* Benth. & Hook.; Hemsl. Biol. Centr. Am. Bot. 1: 270. 1880.

~ *Emerus Thurberi* Kuntze, Rev. Gen. 181. 1891.

~ *Solulus Thurberi* Kuntze, Rev. Gen. 205. 1891.

A shrub, 3-6 dm. high; branches densely glandular-hirsute; stipules lanceolate, acuminate, deciduous, 5 mm. long; leaves about 1 dm. long; rachis densely glandular-hirsutulous; leaflets 19-25, oval or obovate, 6-10 mm. long, 4-6 mm. wide, glabrous on both sides, with dark veins, glandular-ciliolate on the margins; racemes 4-6 cm. long, 4-7-flowered; peduncle and pedicels glandular-hirsute; bracts oblong, 2 mm. long; pedicels 7-8 mm. long; bractlets elliptic or obovate, 2 mm. long, glandular-ciliolate; calyx campanulate with an obconic base (hypanthium), glabrous; tube (including the hypanthium) 5-6 mm. long; lobes lanceolate, 2 mm. long, acute or obtuse; corolla yellowish, 1 cm. long; banner rounded-obovate, emarginate, almost clawless; wings short-clawed, the blades obliquely oblanceolate, with a rounded apex and a rounded basal auricle; keel-petals similar but broader, united above the middle, with the acutish tips free; ovary stipitate, densely pubescent; pod linear, 6-8 cm. long, 1 cm. broad, tapering at each end, somewhat tomentose, muricate.

TYPE LOCALITY: Mabibi, Sonora.

DISTRIBUTION: Sonora, southern Arizona, and western Chihuahua.

13. *Diphysa macrocarpa* Standley, Contr. U. S. Nat. Herb.
23: 479. 1922.

Diphysa scnnioides Benth.; Benth. & Oerst. Vidensk. Meddel. 1853: 12, in part, as to the fruit. 1853.

A shrub or small tree; young branches densely glandular-viscid and pilose; leaves 1-1.5 dm. long; stipules subulate, 7-8 mm. long; rachis densely glandular-viscid; leaflets 25-33, oblong or elliptic, 10-15 mm. long, rounded at each end, mucronate, minutely hispidulous-denticulate on the margins, otherwise glabrous; peduncles and pedicels densely glandular-viscid; bracts deciduous; bractlets oblong, 3 mm. long, hispidulous-ciliolate; calyx glabrous, except the ciliolate margins of the lobes; tube (including the hypanthium) 5 mm. long; upper two lobes ovate, obtuse, 2.5 mm. long, the lateral ones ovate, acute, the lowest one lanceolate, acute, 3 mm. long; pod 5-10 cm. long, 1.5 cm. broad, 3-4-seeded, more or less glandular-hispid, the hairs with postulate bases, the stipe twice as long as the calyx.

TYPE LOCALITY: Tecozantla, Hidalgo.
DISTRIBUTION: Hidalgo.

14. *Diphysa racemosa* Rose, Contr. U. S. Nat. Herb.
1: 97. 1891.

A shrub, 2-3 m. high; young branches densely glandular-viscid; leaves about 4 cm. long; leaflets 9-17, oblong, 3-5 mm. long, viscid-pubescent, obtuse; racemes 1-2 dm. long, many-flowered; peduncle and pedicels densely glandular-viscid; bracts oblong to obovate, glandular, 4-5 mm. long; bractlets ovate to obovate, densely glandular, 5 mm. long; calyx densely glandular; hypanthium and calyx-tube together 8 mm. long; upper two calyx-lobes ovate, acutish, 4 mm. long, the lateral ones lanceolate, acute, the lowest one lanceolate, acuminate, 5 mm. long; corolla 12 mm. long; pod 3-4 cm. long, 15-18 mm. thick, glandular-pubescent and black-dotted; stipe 10-12 mm. long; seeds almost white, 7 mm. long, 3 mm. wide.

TYPE LOCALITY: Hill-slopes near Alamos, Sonora.
DISTRIBUTION: Sonora, Sinaloa, and Durango.
ILLUSTRATION: Contr. U. S. Nat. Herb. 1: pl. 3.

15. *Diphysa puberulenta* Rydberg, sp. nov.

A low shrub; branches densely glandular as well as grayish-puberulent when young, in age brown or gray; stipules caducous, lanceolate; leaves 2-5 cm. long; rachis puberulent and somewhat glandular; leaflets 7-11, oblong to broadly oval, from rounded to acutish at each end, finely puberulent, 4-10 mm. long; racemes numerous, 4-10 cm. long; peduncle and pedicels densely glandular as well as puberulent; bracts oblong or lanceolate, 3-4 mm. long; bractlets oblanceolate, obtuse; calyx densely puberulent and glandular; tube and hypanthium together 6 mm. long; calyx-lobes 2-3 mm. long, the uppermost two lobes ovate, obtuse, the lateral ones lanceolate, acute, the lowest one lanceolate-subulate, acuminate; corolla yellowish, about 1 cm. long; pod 3-5 cm. long, black-dotted and glandular; stipe about 1 cm. long.

Type collected at Acaponeta, Tepic, February, 1895, *F. H. Lamb 520* (herb. N. Y. Bot. Gard., flower); same locality, April, 1910, *Rose, Standley & Russell 14417* (fruit).
DISTRIBUTION: Sinaloa to Guerrero.

16. *Diphysa villosa* Rydberg, sp. nov.

A low shrub; young branches densely glandular-viscid and somewhat short-villous, in age with straw-colored bark; stipules subulate, 2-3 mm. long, caducous; leaves 7-12 cm. long; rachis glandular and short-villous; leaflets 17-29, elliptic or oval, 9-12 mm. long, rounded at each end, finely villous on both sides; racemes 4-8 cm. long; peduncles and pedicels densely glandular; bractlets oblanceolate, 7 mm. long, glandular and villous; hypanthium 5 mm. long, villous; calyx villous and with scattered glands, the tube 3 mm. long, the lobes 6-7 mm. long, the upper two lobes broadly oblong, obtuse, the lateral ones narrower, similar, the lowest

one lanceolate, acute; corolla yellow, about 15 mm. long, the banner broadly rounded-ovate, the wings obovate, the keel-petals lunate; pod (not fully developed) 2.5-3.5 cm. long, 12-13 mm. broad, glandular-hispid and short-villous, 2-3-seeded.

Type collected at Yantepec, Morelos, June 18, 1901, *Pringle 9636* (U. S. Nat. Herb. no. 396280).

17. *Diphysa humilis* Oerst.; Benth. & Oerst. Vidensk.

Meddel. 1853: 12. 1853.

A low shrub, with horizontal stem; branches 1.5-3 dm. high, the floral ones short, glandular-puberulent and sparingly hairy; stipules caducous; leaves 4-7 cm. long; leaflets 5-9, oval to broadly oblong, about 1 cm. long, rounded or obtuse at the apex, 2-2.5 cm. long; racemes 3-5 cm. long; peduncles and pedicels glandular-puberulent; pedicels about 6 mm. long; bracts and bractlets ovate, strongly striate; calyx sparingly glandular, especially on the margins of the lobes, the tube with the hypanthium 5 mm. long, the uppermost two lobes ovate, obtuse, 2 mm. long, the lowest lobe lanceolate, acute, somewhat longer; all pellucid-punctate, venose; corolla yellow, 10 mm. long; pod 3-4 cm. long, puberulent and glandular, somewhat quadrangular in cross-section, the sutures carinate.

TYPE LOCALITY: At the base of Vulcan Rincon, province of Guanacaste, Costa Rica.

DISTRIBUTION: Costa Rica.

Subtribe 7. **CORYNELLANAE.** Shrubs or trees, with abruptly pinnate leaves. Flowers in axillary small racemes or fascicles on short axillary branches. Calyx campanulate, the tube as broad as long or nearly so, the lobes minute. Banner suborbicular to obovate, short-clawed, more or less reflexed. Wings short-clawed, with oblong or obliquely oblanceolate blades, distinct, usually with small basal auricles. Keel-petals similar, often broader, usually more lunate, their blades united from the middle to or nearly to the tip. Stamens diadelphous, the staminal sheath not more dilated below, straight, the upper filament free, straight. Style glabrous. Pod 2-valved, flat, linear, sessile or short stipitate, sometimes slightly torulose, but neither with cross-partitions, nor breaking up into joints. Seeds from orbicular to reniform, somewhat flattened, without a funicle.

Style not bearded, more or less arcuate; calyx-lobes very short.

Calyx truncate, with 5 minute lobes, of which the upper two are close together; banner orbicular.

Stigma subterminal under the strongly hooked and more or less flattened tip of the style; leaf-rachis not winged.

Stigma terminal at the end of the curved but scarcely hooked style.

Rachis of the leaves not winged; keel broad, strongly arcuate, not exceeding the banner in length, the blades nearly semicircular.

Rachis of the leaves distinctly wing-margined; keel narrower, less arcuate, longer than the banner.

Calyx 2-lipped; banner obovate; style bent at the base, thereafter nearly straight; petals subequal; rachis winged.

Style bearded along the upper margin, bent at the base; calyx-lobes prominent, usually longer than the tube.

15. **CORYNELLA.**

14. **SABINEA.**

16. **NOTODON.**

17. **BEMBICIDIUM.**

20. **COURSEZIA.**

14. *SABINEA* DC. Ann. Sci. Nat. 4: 92. 1825.

Trees or shrubs. Leaves abruptly pinnate, with stipules and sometimes with minute stipels. Flowers purplish, in small fascicles or short racemes in the axils of old leaves, appearing with or before the new leaves; bracts small; bractlets none. Calyx open-campanulate or turbinate, as broad as high, truncate, with 5 minute lobes. Banner broad, short-clawed, spreading or reflexed. Wings short-clawed; blades oblong or oblanceolate, slightly falcate,

with a basal auricle. Keel-petals clawed, rounded at the apex; blades obliquely oblanceolate or obovate, nearly semicircular. Stamens 10, diadelphous, the free portion of at least the 5 lower filaments as long as the sheath, the filaments subequal or the lower 5 much longer than the upper. Style glabrous. Pod stipitate, flat, acute at each end, 2-valved, with neither partitions nor constrictions between the seeds. Seeds compressed, ovate.

Type species, *Robinia florida* Vahl.

Filaments unequal in length, the lower 5 nearly twice as long as the upper 5; style falcate-incurved; keel-petals obliquely obovate.

1. *S. florida*.

Filaments nearly equal in length; style nearly straight; keel-petals oblong-oblanceolate.

Keel about 2 cm. long; leaflets oval.

2. *S. punicea*.

Keel about 3 cm. long; leaflets oblong.

3. *S. carinalis*.

1. *Sabinea florida* (Vahl) DC. Ann. Sci. Nat. 4: 92. 1825.

Robinia florida Vahl, in West, Bidr. St. Croix 300. 1793.

Sabinea dubia DC. Prodr. 2: 263, in part. 1825.

A shrub or tree, up to 6 m. high; branches sericeous-strigose when young, soon glabrate; stipules lanceolate, 4–5 mm. long; leaves 6–10 cm. long; rachis glabrous, sulcate above; leaflets 16–30, elliptic-oblong, 1–1.5 cm. long, rounded at each end, mucronate at the apex, sericeous beneath when young, soon glabrous on both sides, reticulate, pale-green; calyx 4 mm. high and about as broad, subtruncate; corolla light-purple, 15–18 mm. long; banner suborbicular; wings elliptic-oblanceolate, with a lanceolate basal auricle; those of the keel-petals broadly obliquely obovate, with a deltoid basal auricle; style strongly incurved; pod stipitate, the body linear, about 7 cm. long and 6 mm. wide, acute at each end; stipe about 1 cm. long; beak curved upwards.

TYPE LOCALITY: St. Thomas.

DISTRIBUTION: Porto Rico, Virgin Islands, and Dominica.

ILLUSTRATIONS: Vahl, Symb. 3: pl. 70; Am. Jour. Bot. 11: pl. 33 N, f. 1–8.

2. *Sabinea punicea* Urban, Symb. Ant. 1: 323. 1899.

Sabinea florida Bello, Anal. Soc. Esp. Hist. Nat. 10: 259. 1881. Not *S. florida* DC. 1825.

A shrub, 1–2 m. high; branches glabrous or sparingly strigose when young, terete; stipules deltoid, with a subulate tip, 3–5 mm. long; leaves spreading, 7–15 cm. long; rachis glabrous or sparingly strigose, sulcate above; leaflets 19–20, oval or obovate, rounded, truncate, or retuse and mucronate at the apex, rounded at the base, 1–2.5 cm. long, 5–15 mm. wide, glaucous-green, glabrous, reticulate above, pale or yellowish and glabrous or puberulent only on the veins beneath, the petiolules 1 mm. long; stipels manifest, small, lanceolate; bracts lanceolate, 1.5–2 mm. long, pubescent; pedicels 7–15 mm. long; bractlets 2, minute; calyx 5 mm. long, 5–6 mm. wide, subtruncate, the lobes minute, subulate, less than 1 mm. long; banner suborbicular, obtuse or emarginate, 17–18 mm. long, 13–14 mm. broad, the claw 4 mm. long; blades of the wing oblong, 1 cm. long, with a rather large basal auricle; keel-petals obliquely oblanceolate, rounded at the apex, with a small basal auricle; body of the pod linear, the stipe nearly 1 cm. long; beak straight.

TYPE LOCALITY: Near Mayagüez, Porto Rico.

DISTRIBUTION: Porto Rico.

ILLUSTRATION: Am. Jour. Bot. 11: pl. 33 N, f. 9–11.

3. *Sabinea carinalis* Griseb. Fl. Brit. W. Ind. 183. 1859.

A shrub; branches glabrous, terete; stipules lanceolate; leaves 5–10 cm. long; rachis pubescent; leaflets 12–16, oblong, 10–16 mm. long, 3–6 mm. wide, glabrous, rounded at each end, minutely mucronate; flowers 3–5 in axillary fascicles; pedicels about 8 mm. long; calyx about 6 mm. high and broad, the lobes obsolete; corolla bright-scarlet; banner about 25 mm. long, the blade suborbicular, reflexed; wings 25 mm. long, the blades spatulate-oblong, strongly

falcate with an acute basal auricle; keel-petals 27–30 mm. long; blade oblong-oblanccolate, rounded at the apex; filaments subequal; style exerted; pod unknown.

TYPE LOCALITY: Dominica.

DISTRIBUTION: Known only from the type locality.

15. CORYNELLA DC. Ann. Sci. Nat. 4: 93. 1825.

Corynites Spreng. Syst. 4²: 263, 280. 1827.

Toxotropis Turcz. Bull. Soc. Nat. Mosc. 19²: 506. 1846.

Low shrubs. Leaves abruptly pinnate, with subulate spinescent erect stipules and coriaceous leaflets. Flowers purple, fascicled on short axillary branches, appearing before the leaves. Calyx campanulate, with short lobes. Banner broadly obovate or suborbicular, short-clawed. Wings lanceolate or oblong, with rather conspicuous basal auricles, the claws strongly curved. Keel-petals longer than the banner, clawed, the blades strongly lunate, with obtuse to acuminate tips and small basal auricles. Stamens diadelphous, the staminal sheath equally broad throughout, the filaments subequal. Style glabrous, bent at the base, strongly hooked and dilated at the end, the stigma sub-terminal, under the tip. Pod linear, slightly stipitate, many-seeded, not torulose.

Type species, *Robinia polyantha* Sw.

Keel-petals acuminate, united to the tip; leaves pubescent beneath.

1. *C. dubia*.

Keel-petals acute or obtuse, with free tips; leaves glabrous or nearly so beneath.

2. *C. paucifolia*.

1. *Corynella dubia* (Poir.) Urban, Symb. Ant. 1: 322. 1899.

Robinia dubia Poir. in Lam. Encyc. 6: 227. 1804.

Robinia polyantha Sw. Fl. Ind. Occ. 1260. 1806.

Robinia martinicensis Pers. Syn. Pl. 2: 312. 1807.

Tephrosia moschata Tussac, Fl. Ant. 2: 23. 1818.

Sabinea dubia DC. Ann. Sci. Nat. 4: 92. 1825.

Corynella polyantha DC. Ann. Sci. Nat. 4: 93. 1825.

Corynites polyantha Spreng. Syst. 4²: 280. 1827.

Toxytropis Jaegeri Turcz. Bull. Soc. Nat. Mosc. 19²: 507. 1846.

Corynites Jaegeri Kuntze, Rev. Gen. 173. 1891.

A small shrub, 1–3 m. high; branches densely pilose when young; stipules subulate, spinescent, 3–6 mm. long; leaves 4–6 cm. long; rachis pilose, slightly sulcate above; leaflets 10–14, obovate, rounded and mucronate at the apex, acute at the base, at first puberulent but soon glabrous above, appressed silky-pilose beneath, the petiolules less than 1 mm. long; bracts subulate, 1–2 mm. long; pedicels about 5 mm. long; calyx densely brown-pilose, the tube 2 mm. long, 3 mm. broad, the teeth lance-subulate, 2 mm. long; corolla purple; banner about 8 mm. long and broad, short-clawed, the blade broadly ovate, acutish; wings of about the same length, the blades narrowly lanceolate, with a rather large basal auricle, the claws curved, 1.5 mm. long, acute; keel-petal lunate, 12 mm. long, the blade united to the tip, acuminate, with a small basal auricle, the claws 2 mm. long; style hooked and strongly dilated at the apex; pod 4–5 cm. long, 5–6 mm. wide, glabrous, 12–16-seeded, linear, slightly stipitate; seeds suborbicular, lenticular, almost black, shining, 4 mm. broad.

TYPE LOCALITY: "Martinique," but probably erroneous.

DISTRIBUTION: Hispaniola.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 606, f. 2; Tussac, Fl. Ant. 2: pl. 6; Am. Jour. Bot. 11: pl. 33 O.

2. *Corynella paucifolia* DC. Ann. Sci. Nat. 4: 93. 1825.

Robinia domingensis Spreng. Syst. 3: 245. 1826.

Corynites domingensis Spreng. Syst. 4²: 280. 1827.

Corynites paucifolia Kuntze, Rev. Gen. 173. 1891.

A shrub, 0.5–2 m. high; branches strigose when young; stipules subulate, 5 mm. long, spinescent; leaves 1.5–4 cm. long; rachis strigose, sulcate above; leaflets 4–8, oval or obovate, mucronate, glabrous above, 5–18 mm. long, 3–8 mm. wide, sparingly strigose and glabrate

beneath, coriaceous, dark-green above, brownish beneath, reticulate; flowers in fascicles on short axillary branches, appearing before the leaves; pedicels 2-3 cm. long; calyx strigose, the tube 2.5 mm. long, 2 mm. wide, the lobes lanceolate, 2 mm. long; corolla purple; banner orbicular, spreading, 8 mm. long; blades of the wings oblong, with a rounded basal auricle; keel-petals lunate, free at the tip, obtuse or acutish, 1 cm. long; style as in the preceding species, but less dilated at the apex; pod 4-5 cm. long, 5-6 mm. wide, glabrous, 8-10-seeded.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Hispaniola and Porto Rico.

16. NOTODON Urban, Symb. Ant. 1: 324. 1899.

Shrubs, with or without infra-petiolar curved prickles. Leaves abruptly pinnate; stipules lanceolate, with a subulate stiff apex, deciduous; petiole and rachis more or less winged, the wings discontinuous at the insertion of the leaflets, the rachis produced into a short point; leaflets entire, coriaceous, veinless; stipules minute. Flowers in small fascicles in the axils of old leaves, appearing before the new ones. Calyx short-campanulate, remotely and minutely 5-lobed, the upper two lobes close together. Banner suborbicular, reflexed, with a very short claw. Wings oblong, straight, with a curved claw. Keel-petals united by their upper half, lunate, with the base truncate on one side, obtuse, much longer than the banner and less so than the wings. Stamens diadelphous, the upper filament free, the rest united into a linear sheath, nearly equal in length. Ovary short-stipitate, linear, several-ovuled. Style arcuate, glabrous. Stigma minute, terminal. Pod linear-oblancoate, acute at both ends.

Type species, *Fagara gracilis* Griseb.

Branches armed under the nodes with solitary recurved short prickles.

1. *N. gracilis*.

Branches unarmed.

Leaflets strigose beneath.

2. *N. Roigii*.

Leaflets glabrous beneath.

Leaflets 2 or 4, mostly 7-12 mm. long; rachis merely margined.

3. *N. cayensis*.

Leaflets 4-8, 4-8 mm. long; rachis distinctly winged.

4. *N. savannarum*.

1. *Notodon gracilis* (Griseb.) Urban, Symb. Ant. 1: 324. 1899.

Fagara gracilis Griseb. Cat. Fl. Cub. 48. 1866.

Zanthoxylum gracile C. Wright; Sauv. Anal. Acad. Ci. Habana 5: 288. 1868.

A slender shrub; branches grayish, glabrous, or the younger ones brown or yellowish and slightly puberulent; prickles curved, 1 mm. long; stipules scarcely 3 mm. long; leaves 1 cm. long or less, spreading; rachis puberulent, its wings somewhat recurved-margined; terminal point filiform, 1 mm. long; leaflets 4-10, oval or elliptic or obovate, rounded at the apex, veinless, the rib prominent beneath, glabrous and dark above, pale or brown and strigose beneath, revolute-margined, entire, those of the primary leaves 10-12 mm. long, 4-5 mm. wide, those of the secondary fascicled leaves 5-7 mm. long, 2-3 mm. wide; pedicels 1-2 mm. long; calyx 2.5 mm. high, 3 mm. broad, puberulent, its lobes minute; corolla purple; banner 4 mm. long and fully as broad; wings 6-7 mm. long, 2 mm. broad, the claw 1.5 mm. long; keel-petals 7-8 mm. long, 2 mm. broad, united from the middle to near the obtuse tip; pod glabrous, 4 cm. long, 5 mm. wide.

TYPE LOCALITY: Toscano, western Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Am. Jour. Bot. 11: pl. 33 P.

2. *Notodon Roigii* Britton & Wilson.

Corynella gracilis Griseb. Cat. Pl. Cub. 71. 1866. Not *Notodon gracilis* Urban, 1899.

A slender shrub; branches pubescent and brown when young, in age glabrate; leaves 3-4 cm. long; stipules subulate, deciduous; petiole and rachis with narrow wings, sparingly pu-

bescent, produced into a subulate tip 1-1.5 mm. long; leaflets 10-16, oblong, coriaceous, 5-12 mm. long, 2-5 mm. wide, dark and glabrous above, pale and strigulose beneath, rounded at each end; pedicels 3-5 cm. long; calyx 3 mm. long and broad, brown, puberulent, its lobes minute; corolla pink-purple; banner rounded-obovate, 7 mm. long; wings oblong-oblancoate, obtuse, 9 mm. long, the claw 2 mm. long; keel-petals fully 1 cm. long, oblancoate-lunate, obtuse; pod linear, glabrous, somewhat torulose.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Eastern Cuba.

3. *Notodon cayensis* Britton & Wilson; Britton, Mem. Torrey Club 16: 68. 1920.

A shrub, 1-2 m. high, with grayish-brown branches, the young twigs brownish-hirsutulous; leaves 1-2 cm. long; petiole and rachis merely wing-margined, produced into a minute point; leaflets 2 or 4, obovate, 7-12 mm. long, rounded at the apex, cuneate at the base, glabrous on both sides, glaucous-green above, white or yellowish beneath, revolute; pedicels 4-5 mm. long; calyx glabrous, 2 mm. high and 3 mm. broad; corolla bluish; banner rounded-obovate, 6 mm. long, nearly as broad; wings obovate, 6-7 mm. long, rounded at the apex, with a small basal auricle; keel-petals 8-10 mm. long, united from the middle to near the rounded summit; ovary glabrous, about 6-ovuled; pod unknown.

TYPE LOCALITY: Cayo Guayaba, Camagüey, Cuba.

DISTRIBUTION: Known only from the type locality.

4. *Notodon savannarum* Britton & Wilson; Britton, Mem. Torrey Club 16: 69. 1920.

A shrub, 0.5-2.5 m. high, the branches stiff and subspinescent, the young shoots brownish-strigose; stipules subulate, 1 mm. long; leaves 1-1.5 cm. long; petiole and rachis rather broadly winged, the free tip minute; leaflets 4-8, obovate or oblong-obovate, 4-8 mm. long, rounded at the apex, obtuse at the base, dark-green above, white or pale-yellow and with a strong midrib beneath; flowers solitary or few on short axillary branches; pedicels about 2 mm. long; calyx glabrous, 2.5 mm. high, 3 mm. broad; corolla rose-purple; banner orbicular, 6 mm. long, the claw less than 1 mm. long; wings oblong-oblancoate, 7 mm. long, with an acute basal auricle; keel-petals 8 mm. long, oblancoate-lunate, with a broad basal auricle; pod 3-4 cm. long, 4 mm wide, 5-6-seeded, somewhat torulose.

TYPE LOCALITY: Savannas near Camagüey, Cuba.

DISTRIBUTION: Eastern Cuba.

17. *BEMBICIDIUM* Rydb.; Britton, Mem. Torrey Club 16: 68. 1920.

Low unarmed shrubs. Leaves abruptly pinnate; stipules lanceolate, persistent; petiole and rachis broadly winged, the wings discontinuous, the rachis slightly produced above the uppermost leaflets; leaflets entire, coriaceous, without veins, the midrib prominent beneath, obsolete above; stipules obsolete. Flowers solitary in the axils. Calyx turbinate, tapering at the base, as broad as long, with two broad, subequal, acute lips. Corolla purplish, with subequal petals. Banner obovate, slightly retuse, gradually tapering into the short broad claw. Wings and keel-petals equal in length and shape, the blades obliquely oblancoate, rounded at the apex, slightly auricled at the base, the claws short, straight, the blades of the keel-petals united at the middle only. Ovary slightly stipitate, linear, many-ovuled; style glabrous, bent inward at the base, slightly arcuate, not hooked at the apex; stigma minute, terminal. Fruit unknown.

Type species, *Bembicidium cubense* Rydb.

1. *Bembicidium cubense* Rydb.; Britton, Mem. Torrey Club 16: 68. 1920.

A shrub, 5-6 dm. high; branches ferruginous-pubescent, almost velutinous when young; stipules lanceolate, 2 mm. long; leaves 1-2 cm. long, spreading; petiole and rachis broadly winged, the apical free tip minute; leaflets 2-6, oblong or elliptic or obovate, rounded at the apex, rounded or obtuse at the base, dark-green above, brownish beneath, glabrous on both sides, revolute-margined, 5-8 mm. long; flowers solitary on short axillary branches; pedicels about 1 cm. long, brown; calyx 5 mm. high and broad, glabrous, red-purple; corolla red-purple; petals subequal in length; banner obovate, 12-13 mm. long, 8 mm. wide; blades of the wing- and keel-petals 10-11 mm. long, 4.5 mm. broad, the claws nearly 2 mm. long.

TYPE LOCALITY: Mountain woods, vicinity of Baracoa, Oriente, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Am. Jour. Bot. 11: pl. 33 Q.

Subtribe 8. **ROBINIANAE**. Trees or shrubs, or rarely herbs suffrutescent only at the base. Leaves usually odd-pinnate with petioluled leaflets and often with small stipels, or the rachis with more or less distinct nodes. Flowers in axillary racemes, usually with caducous bracts, without bractlets. Calyx mostly with a campanulate tube and 5-lobed. Corolla usually with petals subequal in length, except in *Sauvallella* and *Poitea*. Stamens diadelphous or monadelphous; anthers subequal, not appendaged. Ovary many-ovuled, stipitate or sessile; style inflexed or incurved; stigma terminal, minute. Pod linear, flat, 2-valved, several-seeded. Seeds without a strophiole, usually compressed.

Style more or less hairy.

Style, at least the upper part, hairy all around; stipular spines often present.

Pod flat, wing-margined or ridged on the seed-bearing suture, banner without callosities; plant not caescent.

18. ROBINIA.

Pod turgid, neither wing-margined nor ridged; banner with two callosities; plant caescent.

19. OLNEYA.

Style hairy on the upper side only; spines absent.

Style long-hairy, bent, but not spirally incurved.

Pod not strongly impressed between the orbicular seeds.

20. COURSETIA.

Pod strongly impressed between the seeds, which are rectangular in outline.

Seeds not constricted at the middle; flowers racemose.

28. BENTHAMANTHA.

Seeds constricted at the middle; flowers solitary or rarely two in the axils; leaves unifoliate.

29. SPHINCTOSPERMUM.

Style short-hairy, spirally incurved.

21. LENNEA.

Style glabrous.

Stamens more or less monadelphous, the upper filament free at the base, united with the sheath at least at the middle.

Calyx-lobes 5, short, distinct; stipels absent.

22. WILLARDIA.

Calyx-lobes apparently 4, *i. e.*, the upper two united to or nearly to the apex; stipels present, filiform.

23. HESPEROTHAMNUS.

Stamens diadelphous.

Keel-petals united up to the apex, more or less arcuate; staminal sheath not dilated at the apex.

Stigma pubescent; pod with woody-corky masses between the seeds.

24. HEBESTIGMA.

Stigma not pubescent; pod not corky between the seeds.

Plants woody.

Petals subequal; keel-petals obtuse.

25. GLIRICIDIA.

Petals very unequal, the banner the shortest, the keel-petals the longest, acute.

26. SAUVALLELLA.

Plants herbaceous (see *Homalobus*, *Kentrophyta*, etc., in the subtribe *Astragalanae*).

Keel-petals narrow, straight, free at the tip; banner shorter than the keel-petals; staminal sheath fan-shaped-dilated at the apex.

27. POITEA.

18. *ROBINIA* L. Sp. Pl. 722 1753.

Pseudo-Acacia (Tourn.) Medic. Vorl. Churpf. Phys. Ges. 2: 364. 1787.

Trees or shrubs. Leaves odd-pinnate, with setaceous or spinose stipules, and small stipels. Flowers in axillary racemes, the bracts caducous. Calyx more or less 2-lipped; upper lip with 2 broad short teeth united to near the tip, the lower one more deeply 3-lobed. Corolla white or purple. Banner with a broad blade and short claw, reflexed. Wings free, clawed, the blades obliquely oblong or obovate, with a basal auricle. Keel-petals obtuse, incurved, the blades obliquely obovate, with a basal auricle, united from the middle to the tip. Stamens more or less monadelphous, the upper filament free at the base, more or less united with the sheath at the middle. Ovary more or less stipitate, many-ovuled; style inflexed, short-hairy towards the apex; stigma terminal, minute. Pod linear, flat, 2-valved, continuous within, narrowly winged or merely ridged along the upper suture. Seeds oblong, oblique, without strophiole, but with a rather slender funicle.

Type species, *Robinia Pseudo-Acacia* L.

Flowers white or rarely pink, on drooping peduncles; pod glabrous, broadly wing-margined on the seed-bearing suture; calyx-lobes short, acute.

Flowers pink to rose-purple on erect or spreading peduncles; pod usually glandular-hispid, in no. 14 hirsutulous, and in no. 13 glabrous, but the wing-margin always very narrow or obsolete; calyx-lobes longer, usually more or less acuminate.

I. PSEUDO-ACACIÆ.

Bracts inconspicuous, small or narrow, early caducous; bristles on the branches and peduncles, if any, rather long and with inconspicuous gland-tips.

Calyx rounded at the base; sinuses between the lobes open; bracts linear or subulate; spines weak or none.

II. HISPIDÆ.

Calyx acute at the base; sinuses between the lobes narrow; bracts short and broad; spines stout.

III. NEOMEXICANÆ.

Bracts conspicuous, lanceolate, caudate-acuminate, longer than the calyx; branches and peduncles densely glandular, with sessile or short-stalked, conspicuous glands; leaflets 11-27.

IV. VISCOSÆ.

I. PSEUDO-ACACIÆ

Lowest calyx-lobe lanceolate, longer than the rest.

1. *R. Pseudo-Acacia*.

Lowest calyx-lobe deltoid, equaling the lateral ones.

2. *R. Pringlei*.

II. HISPIDÆ

Branches not at all bristly, the peduncles not hispid or slightly so with short hairs.

Leaflets oblong to oval.

Branches, peduncles, and lower surface of the leaves short-villous, somewhat caescent when young; peduncles not at all glandular-hispid.

3. *R. Elliottii*.

Branches, peduncles, and leaves finely puberulent when young and glabrate; peduncles somewhat glandular-hispid.

Plant 1.5-2 m. high; calyx-lobes not longer than the tube.

Plant about 3 dm. high; calyx-lobes longer than the tube.

4. *R. Boyntoni*.

5. *R. nana*.

6. *R. Kelseyi*.

Leaflets lanceolate.

Branches and peduncles more or less hispid.

Branches with rather few and short glandular bristles.

Branches usually copiously glandular-bristly with long hairs.

7. *R. longiloba*.

Branches, leaf-rachis, and peduncles rather densely pubescent.

Leaflets broadly oval, rounded at the apex.

8. *R. grandiflora*.

Leaflets ovate, acutish or obtuse at the apex.

Leaflets decidedly villous beneath.

Leaflets glabrate on both sides.

9. *R. speciosa*.

10. *R. pallida*.

Branches, leaf-rachis, and peduncles merely hispid, or with a few scattered hairs.

Leaflets oval, rounded at the apex.

Bristles 1-2 mm. long; spines usually present.

Bristles 3-5 mm. long; spines usually wanting.

Leaflets lanceolate or ovate, acute at the apex.

11. *R. pedunculata*.

12. *R. hispida*.

13. *R. fertilis*.

III. NEOMEXICANÆ

Pod glabrous; leaflets oval or elliptic, rather thin; spines small.

14. *R. Rusbyi*.

Pod hirsute to glandular-hispid; leaflets firmer; spines usually stout.

Leaflets lanceolate or ovate, bluish-green on both sides; pod merely hirsutulous, gradually acute.

15. *R. neomexicana*.

Leaflets oblong to oval, paler beneath; pod glandular-hispid as well as hirsutulous.

Leaflets and rachis strigose-puberulent; pod about 1 cm. broad.

Calyx-lobes longer than the tube, long-acuminate; leaflets oblong or elliptic; spines straight.

Calyx-lobes shorter than the tube, abruptly acute; leaflets oval; spines somewhat curved.

Leaflets and rachis loosely short-villous; calyx-lobes acute or short acuminate, about equaling the tube; pod about 14 mm. broad.

16. *R. luxurians*.

17. *R. breviloba*.

18. *R. subvelutina*.

IV. VISCOSÆ

Leaflets puberulent or glabrate on both sides; branches and peduncles with subsessile glands, not densely puberulent.

Leaflets densely villous beneath; branches and peduncles with stalked glands, as well as densely puberulent.

19. *R. viscosa*.

20. *R. Hartwigii*.

1. *Robinia Pseudo-Acacia* L. Sp. Pl. 722. 1753.

Robinia Acacia L. Syst. ed. 10. 1161. 1759.

Pseudo-Acacia ["*Pseudacacia*"] *odorata* Moench, Meth. 145. 1794.

Robinia fragilis Salisb. Prodr. 336. 1796.

A tree, 20–27 m. high; branches terete or somewhat angled, more or less silky when very young, green, turning reddish in autumn; stipules subulate, developing into spines 3–25 mm. long; leaves 2–3 dm. long; petiole and rachis puberulent or glabrate; leaflets 7–19 (in cultivated forms 1–5), oval or ovate, rounded or truncate and mucronate at the apex, acute or obtuse at the base, blue-green above, pale beneath, puberulent on both sides or glabrate in age, 3–5 cm. long, 1–2 cm. wide; petiolules 2–4 mm. long; racemes 1–1.5 dm. long, lax, puberulent; pedicels about 1 cm. long; bracts minute, caducous; calyx silky-puberulent, ciliate on the margin; tube 5 mm. long, campanulate, the upper lobes united high up, broadly triangular, fully 1 mm. long, the lateral ones deltoid, the lowest one lanceolate, 2 mm. long; corolla white, 15–22 mm. long; banner rounded-obovate, emarginate; wings obliquely obovate, with a prominent triangular obtuse basal auricle; blades of the keel-petals lunate, with a smaller basal auricle; pod short-stipitate, 6–10 cm. long, 10–12 mm. broad, glabrous, 4–16-seeded, the seed-bearing suture narrowly winged; seeds 5.5 mm. long, 3 mm. broad, oblique.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Pennsylvania to Arkansas, Louisiana, and Georgia; extensively cultivated and escaped throughout the United States and southern Canada.

ILLUSTRATIONS: Wangelin, Beytr. Nordam. Holz. pl. 7; Schmidt, Baumz. 1: pl. 32; Gaert. Fruct. pl. 145; Oelhafen, Abbild. 2: pl. 42; Nouv. Duham. 2: pl. 16; Lam. Tab. Encyc. pl. 606; f. 1; Michx. f. Hist. Arb. Am. 3: 245, pl. 1; N. Am. Sylva pl. 76; Audubon, Birds pl. 104; Loud. Arb. pl. 83–86; f. 305; Baillon, Hist. Pl. 2: f. 159; Emerson, Trees Mass. ed. 2. 2: 523, pl. 1; Sargent, Silva pl. 112, 113; Medic. Akazien pl. 1, 2; Rev. Hort. 1863: pl. opp. 150; 1875: pl. opp. 191; Ill. Hort. 12: pl. 427; Garden 9: pl. opp. 36; 34: 174; Britton, N. Am. Trees f. 511, 512; Rogers, Tree Book pl. opp. 337; Sargent, Man. f. 472; Hough, Handb. f. 341, 342, 343; Keeler, Nat. Trees 99, 100, 101; Lounsberry, Guide Trees pl. 108; Newhall, Trees N. Am. f. 96; Am. Jour. Bot. 11: pl. 34 R.

Robinia Boyntonii × *Pseudo-Acacia*. See under *R. Boyntonii*.

Robinia hispida × *Pseudo-Acacia*. See under *R. hispida*.

Robinea luxurians × *Pseudo-Acacia*. *Robinia Holdtii* Beissn. Mitt. Deuts. Dendr. Ges. 11: 117. 1902. *Robinia neomexicana* × *Pseudo-Acacia*, l.c., as synonym, 1902. *Robinia coloradensis* Dode, Bull. Soc. Bot. France 55: 650. 1909. Leaflets larger and darker and firmer than those of *R. Pseudo-Acacia*; corolla light-pink or rose, or nearly white (*R. Holdtii britzensis* Spaeth, Gartenflora 52: 557. 1903), the pod with scattered glands.

Robinia Pseudo-Acacia × *viscosa*. See under *R. viscosa*.

2. *Robinia Pringlei* Rose, Contr. U. S. Nat. Herb. 12: 274. 1909.

A medium-sized tree, apparently unarmed; branches terete, puberulent when young, soon glabrous; stipules subulate, 3 mm. long; leaves about 2 dm. long; rachis puberulent, grooved above; leaflets 13–15, oval, rounded at both ends, 2.5–5 cm. long, 1.5–3 cm. wide, puberulent on both sides, pale beneath, mucronate; racemes 1–1.5 dm. long, puberulent; bracts minute; pedicels 10–12 cm. long; calyx puberulent, ciliate on the margins, the tube 5 mm. high, 7 mm. broad, the upper 2 lobes broadly triangular-ovate, united to near the top, the lower three sub-

equal, deltoid; corolla about 2 cm. long; petals similar to those of the preceding; pod 3-6 cm. long, 12 mm. wide, 3-5-seeded, glabrous.

TYPE LOCALITY: Tula, "State of Mexico" [the label gives State of Hidalgo, which is probably correct].

DISTRIBUTION: Known only from the type locality.

3. *Robinia Elliottii* (Chapm.) Ashe; Small, Fl. SE.

U. S. 613. 1903.

Robinia rosea Ell. Bot. S. C. & Ga. 243. 1822.

Robinia hispida Elliottii Chapm. Fl. S. U. S. 94. 1860.

Robinia hispida rosea Ell.; Chapm. Fl. S. U. S. 94, as synonym. 1860.

† *Robinia hispida inermis* Petz. & Kirchn. Arb. Musc. 372. 1864.

A shrub, 0.5-2 m. high; branches canescent when young, brown and glabrate in age; stipular spines, when present, short and stout; leaves 1-2 dm. long; rachis short-villous; stipels 2-3 mm. long; leaflets 9-15, oval or elliptic, 1.5-5 cm. long, 1-3 cm. wide, villous-canescens beneath when young, in age glabrate, rounded at the base, rounded to acute and mucronate at the apex; racemes 5-10 cm. long, 5-10-flowered; peduncle, pedicels, and calyces villous-canescens, often with a few bristles; calyx-tube 6 m. long, the lobes deltoid, acuminate, subulate-tipped, 4-5 mm. long; pod linear, hispid, 3-5-seeded.

TYPE LOCALITY: Pine-barrens between Waynesborough and Wrightborough, Georgia.

DISTRIBUTION: North Carolina to Georgia and Alabama; apparently also Maryland.

4. *Robinia Boyntoni* Ashe, Jour. Elisha Mitchell Soc.

14: 52. 1897.

Robinia hispida rosea Pursh, Fl. Am. Sept. 488. 1814. Not *R. rosea* Mill. 1768.

Robinia hispida macrophylla DC. Prodr. 2: 262. 1825.

Robinia macrophylla G. Don, Gen. Hist. 2: 238. 1832. Not *R. macrophylla* Spreng. 1826.

A shrub, 1.5-2 m. high; branches at first puberulent, in age glabrate, brown, glossy; stipules subulate, often caducous; stipular spines, if present, short, 5 mm. long or less; leaves 10-15 cm. long; rachis somewhat puberulent or glabrate; leaflets 9-13, oval or oblong-ovate, 2-4 cm. long, 1-2 cm. wide, mucronate, rounded to acutish at the apex, minutely puberulent when young, soon glabrate; racemes 7-9 cm. long, loosely 9-12-flowered; peduncle, pedicels, and calyces puberulent and slightly glandular-hispid; pedicels 4-5 mm. long; calyx-tube 5-6 mm. long, the lobes ovate, short-acuminate; corolla rose-purple or pink, often paler at the base, about 2 cm. long; pod glandular-hispid.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Mountains of North Carolina, South Carolina, Georgia, Alabama, and Tennessee.

ILLUSTRATION: Garden 77: 268.

Robinia Boyntoni × *Pseudo-Acacia*. *Robinia albicans* Ashe, Bull. Torrey Club 50: 362. 1923. A shrub, 1-2 m. high, with short slender or no spines; leaves yellowish-green; leaflets 9-17, elliptic-oblong; peduncles 6-12 flowered; corolla 20-22 mm. long, white or pale-lilac; calyx-lobes ovate, abruptly short-acuminate. Type from Transylvania County, North Carolina.

5. *Robinia nana* Ell. Bot. S. C. & Ga. 2: 243. 1822.

Robinia hispida nana T. & G. Fl. N. Am. 1: 295. 1838.

A shrub, 2-3 dm. high; stem ascending, minutely puberulent, mostly unarmed, or with very short conic spines; leaves 1-1.5 dm. high; leaflets 7-11, elliptic, rounded or subtruncate at the base, rounded to acutish to the apex, 3-4 cm. long, 1.5-2 cm. wide; racemes few-flowered, sparingly glandular; calyx pilose and sparingly hispid, the tube 5 mm. long, the lobes lanceolate, caudate-acuminate, 6-8 mm. long; corolla rose-colored, 16-18 mm. long.

TYPE LOCALITY: Sand-barrens near Columbia, South Carolina.

DISTRIBUTION: North and South Carolina, in sandy soil.

6. *Robinia Kelseyi* Cowell, Cycl. Am. Hort. 1538. 1902.

A shrub, 1-3 m. high; branches flexuose, glabrous; stipules 2-3 mm. long, subulate, rarely developed into spines; leaves 1-1.5 dm. long; rachis glabrous or nearly so; leaflets 9-13, oblong-lanceolate, acute, mucronate at the apex, obtuse at the base, 2-4 cm. long, 8-15 mm. wide, glabrous or slightly pilose when unfolding; stipels subulate, 2 mm. long; racemes 5-8-flowered, 5-8 cm. long; peduncle, pedicels, and calyces more or less glandular-hirsute; pedicels 4-5 mm. long; calyx-tube 5 mm. long, the lobes deltoid, subulate-tipped, 7-8 mm. long; corolla rose-colored, about 2 cm. long; pod linear, acute at each end, 4-5 cm. long, 1 cm. wide, densely glandular-hispid, 3-4-seeded.

TYPE LOCALITY: [Not given, but supplied in Stand. Cycl. Hort. 2967 as] North Carolina.

DISTRIBUTION: North Carolina.

ILLUSTRATION: Bot. Mag. pl. 8213; Mitt. Deuts. Dendr. Ges. 19: 102, f. 4; C. K. Schneid. Handb. Laubh. 2: f. 600; Addisonia pl. 3; Jour. Hort. Soc. London 36: f. 134.

7. *Robinia longiloba* Ashe, Bull. Charleston Mus. 14: 30. 1918.

A shrub, 4-6 dm. high; branches more or less pubescent with curved hairs and short-stalked glands; stipules filiform and deciduous, rarely becoming spinose on vigorous shoots; leaves 10-15 cm. long; rachis slightly pubescent or glabrate; leaflets 7-17, oval, 3.5-5 cm. long, 1.5-2.5 cm. wide, rounded at each end, mucronate at the apex, glabrous above, silky-canescens beneath when young, glabrate but pale in age; racemes 9-21-flowered, 7-12 cm. long; peduncle and pedicels decidedly glandular-hispid; calyx puberulent and glandular-hispid, tinged with purple, the tube 4-6 mm. long, the lobes ovate with slender tips, 6-8 mm. long; corolla rose or purple, 18-20 mm. long; pod unknown.* (Intermediate between *R. Boytoni* and *R. grandiflora*; perhaps a hybrid.)

TYPE LOCALITY: Oconee County, South Carolina.

DISTRIBUTION: Mountains of North and South Carolina.

8. *Robinia grandiflora* Ashe, Jour. Elisha Mitchell Soc. 37: 176. 1922.

A shrub, 1-5 dm. high; branches appressed-puberulent, as well as glandular-hispid; stipules mostly filiform and deciduous, sometimes developing into slender short spines; leaves about 1.5-3 dm. long; rachis puberulent; leaflets 7-17, oval, 2-5 cm. long, 1-2.5 cm. wide, somewhat silky when unfolding, glabrate on both sides when mature or somewhat silky beneath; racemes 5-18-flowered, 7-9 cm. long; peduncle, pedicels, and calyces grayish-puberulent or short-villous, as well as glandular-hispid; calyx-tube 5-6 mm. long, the lobes 7-10 mm. long, ovate, with a long slender filiform tip; corolla rose or purple, 20-23 mm. long; pod oblong, 6-8 cm. long, hispid with short gland-tipped hairs.

TYPE LOCALITY: Grandfather Mountain, North Carolina.

DISTRIBUTION: North Carolina to Georgia and Alabama.

9. *Robinia speciosa* Ashe, Rhodora 25: 181. 1923.

A shrub, 1-2 m. high; branches densely puberulent and sparingly bristly; stipules subulate; spines wanting; leaves 1.5-2 dm. long, the rachis puberulent; leaflets 9-13, ovate or elliptic-ovate, acute or sometimes obtuse, 3-5 cm. long, 1.5-2.5 cm. wide, sparingly pubescent or glabrate above, villous beneath; peduncles puberulent and slightly glandular-hispid, 5-8-flowered; calyx villous-puberulent, the tube 6 mm. long, the lobes ovate, acuminate, 4-5 mm. long; corolla 2-2.5 cm. long, bright rose or pink; pod unknown.

TYPE LOCALITY: Grandmother Mountains, North Carolina.

DISTRIBUTION: Mountains of North Carolina.

*Originally described as "oblong, 6-8 cm. long, pubescent with short coarse gland-tipped hairs." Later the author himself has claimed that the specimen from which this description was drawn belongs to *R. pedunculata*.

10. *Robinia pallida* Ashe, *Rhodora* 25: 182. 1923.

A shrub, 3–20 dm. high; branches rather densely puberulent, glabrate in age, sparingly bristly; leaves 1–2 dm. long, the rachis slightly puberulent, soon glabrate, with scattered bristles; leaflets 9–15, ovate or elliptic-ovate, acute or sometimes obtuse, glabrous above, pale, glabrous or slightly pubescent beneath, 4–5.5 cm. long; peduncles 5–6 cm. long, 5–9-flowered; calyx grayish-pubescent and sparingly bristly, the tube 5 mm. long, the lobes 4–5 mm. long, abruptly acuminate; corolla 21–23 mm. long, pale rose-colored; pod unknown.

TYPE LOCALITY: Blue Ridge, Caldwell County, North Carolina.

DISTRIBUTION: Mountains of North Carolina.

11. *Robinia pedunculata* Ashe, *Jour. Elisha Mitchell*

Soc. 39: 111. 1923.

A shrub, 2–4 m. high; branches puberulent and with short glandular bristles; spines often present, straight, about 1 cm. long; leaves 1–2 dm. long, the rachis puberulent and sparingly hispid; leaflets 7–13, oval, glabrate, 3–4.5 cm. long, rounded at each end, glabrous or nearly so; peduncle 7–9 cm. long, 7–12-flowered, glandular-hispid; calyx pubescent and glandular, the tube 4 mm. long, the lobes ovate, abruptly acuminate, 4 mm. long; corolla rose or white, 20–23 mm. long; pod oblong, thick, 3–5 cm. long, densely hispid. May be a hybrid of *R. hispida* and *R. Boyntoni*.

TYPE LOCALITY: Wolf Creek, Tennessee.

DISTRIBUTION: Known only from the type locality.

12. *Robinia hispida* L. *Mant.* 101. 1767.

Robinia rosea Marsh. *Arb.* 134. 1785. Not *R. rosea* Mill. 1768.

Pseudo-Acacia ["*Pseudacacia*"] *hispida* Moench, *Meth.* 145. 1794.

Robinia hispida-rosea Mirb. *Nouv. Duham.* 2: 64. 1804.

Robinia montana Bartr.; Pursh, *Fl. Am. Sept.* 488, as synonym. 1814.

Robinia Unaka Ashe, *Jour. Elisha Mitchell Soc.* 39: 110. 1923.

A straggling shrub, 3–20 dm. high; branches usually densely hispid and somewhat pilose; stipular spines short, 3–5 mm. long, or wanting; leaves 1–2 dm. long; rachis usually hispid; stipels subulate-setaceous, 2–4 mm. long; leaflets 7–13, oblong-oval to suborbicular, 1.8–5 cm. long, 1–3.5 cm. wide, wholly glabrous or with scattered hairs on the veins beneath, rounded at both ends; racemes 3–5-flowered, 5–10 cm. long; peduncle, pedicels, and calyces more or less hispid; calyx-tube 6 mm. long, the lobes deltoid-lanceolate, acuminate, 6–7 mm. long; corolla 22–25 mm. long, purple or reddish-purple; pod 5–8 cm. long, 1 cm. wide, densely hispid, abruptly acuminate, 3–5-seeded.

TYPE LOCALITY: Carolina.

DISTRIBUTION: In and near the mountains, from Virginia to Illinois, Alabama, and Georgia.

ILLUSTRATIONS: Mill. *Fig. Pl.* *pl.* 244; Catesby, *Nat. Hist. Car.* *App.* *pl.* 20; *Bot. Mag.* *pl.* 311; St. Hil. *Pl. Fr.* *pl.* 320; Guimp. Otto & Hayne, *Abb. Fremden Holz.* *pl.* 66; Loud. *Arb.* *pl.* 88; *f.* 307; *Rev. Hortie.* 1867: *f.* 38; *Nouv. Duham.* 2: *pl.* 18; Nichols, *Dict. Gard.* 3: *f.* 382; *Garden* 34: 175; Lounsbury, *Guide Trees* *pl.* 110.

Robinia hispida × *Pseudo-Acacia*. *Robinia Margaretta* Ashe, *Jour. Elisha Mitchell Soc.* 37: 176. 1922. A shrub, 1–3 m. high, often with slender spines, the branches glabrous or hispidulous; leaflets 15–19, usually rounded at each end; flowers faintly fragrant; calyx-lobes broadly ovate, short-acuminate; corolla pale-lilac or pinkish with a yellow spot, 16–20 mm. long; pod flat, oblong, 6–8 cm. long, sparingly bristly. Type from Augusta, Georgia; also in South Carolina.

13. *Robinia fertilis* Ashe, *Rhodora* 25: 182. 1923.

Robinia hispida Michx. *Fl. Bor. Am.* 2: 65, in part. 1803.

Robinia nana Ashe; Small, *Fl. SE. U. S.* 614, in part. 1903.

A low shrub, usually less than 1 m. high; branches more or less hispid and puberulent; stipular spines 3–8 mm. long, slender or often wanting; leaves 1–1.5 dm. long; rachis often

more or less hispid; stipels subulate, minute; leaflets 7-19, lanceolate or ovate, 1.5-4 cm. long, dark-green and glabrous above, paler and glabrous or sparingly pilose beneath, acute and mucronate at the apex; racemes 3-5-flowered, 4-5 cm. long; peduncle, pedicels, and calyces more or less hispid; calyx-tube 4-5 mm. long, the lobes deltoid-lanceolate, acuminate, about 5 mm. long; corolla 15-20 mm. long, purple or lilac; pod 5-6 cm. long, 10-12 mm. broad, densely glandular-hispid, abruptly acuminate, 3-5-seeded.

TYPE LOCALITY: Not given.

DISTRIBUTION: North Carolina to Georgia.

14. *Robinia Rusbyi* Wooton & Standley, Contr.
U. S. Nat. Herb. 16: 140. 1913.

A shrub; branches puberulent when young, soon glabrous, red or brown; stipular spines stout, straight, 5-15 cm. long; leaves about 15 cm. long; rachis slender, minutely puberulent or glabrate, sulcate above; leaflets 11-17, oval or broadly oblong, rounded at both ends and mucronate at the apex, minutely strigillose on both sides, 2-4 cm. long, 1.5-3.5 cm. wide; racemes dense, 1 dm. long or less; peduncle, pedicels, and calyces hirsutulous and somewhat glandular-hispid; calyx-tube 6 mm. long, the lobes lanceolate, acuminate, 6 mm. long; corolla about 2 cm. long, rose-purple; pod 5-8 cm. long, 14-18 mm. wide, glabrous, abruptly acute, 4-8-seeded.

TYPE LOCALITY: Fifteen miles east of Mogollon, New Mexico.

DISTRIBUTION: Mogollon Mountains, New Mexico.

15. *Robinia neomexicana* A. Gray, Mem. Am. Acad.
II. 5: 314. 1854.

Robinia Rusbyi Wooton & Standley, Contr. U. S. Nat. Herb. 16: 140, in part. 1913.

A shrub, 1-2 m. high; branches grayish-puberulent, in age reddish or purplish; stipular spines mostly straight, 2-10 mm. long, puberulent; leaves 1-1.5 dm. long; rachis puberulent, sulcate above; leaflets 9-15, elliptic-lanceolate, mostly acutish at each end, 1-3 cm. long, 5-15 mm. wide, bluish-green, rather firm, strigulose on both sides; stipels subulate, 1-1.5 mm. long; racemes about 1 dm. long, the peduncle, pedicels, and calyces puberulent and glandular-hispid; pedicels about 5 mm. long; calyx-tube 7-7 mm. long, the lobes lanceolate, acuminate, 7-8 mm. long; corolla rose-colored, about 15 mm. long; pod 6-8 cm. long, 8 mm. wide, hirsutulous, but not glandular-hispid, gradually acute at each end, merely margined on the seed-bearing suture, 4-8-seeded.

TYPE LOCALITY: Dry hills on the Mimbres, New Mexico.

DISTRIBUTION: Southwestern New Mexico.

ILLUSTRATION: Sargent, Man. f. 473.

16. *Robinia luxurians* (Dieck) Rydberg.

Robinia neomexicana (A. Gray, Mem. Am. Acad. II. 5: 314, in part.* 1854); Porter & Coult. Syn. Fl. Colo. 23. 1874.

Robinia neomexicana luxurians Dieck; Goeze, Gard. Chron. III. 12: 669. 1892.

A small tree, 6-8 m. high, or sometimes a shrub; branches puberulent or in the southwestern part of the range glandular-hispid (v. *perglandulosa*), becoming bright reddish-brown, or when several years old gray; stipular spines spreading or somewhat reflexed, mostly straight, 5-20 mm. long, puberulent; leaves 1-2 dm. long; rachis puberulent, sulcate above; leaflets 13-17, rather thick, oblong to oval, mostly rounded at each end, mucronate, 1.5-4 cm. long, 8-20 mm. wide, dark-green above, paler beneath, strigose-puberulent; stipels subulate, 1-2 mm. long; racemes about 1 dm. long; peduncle, pedicels, and calyces glandular-hispid and puberulent; calyx-tube 7-8 mm. long, the lobes lanceolate, long-acuminate; corolla rose-pink,

* Only as to the fruit collected by Bigelow and mentioned in the footnote.

2-2.5 cm. long; pod 6-10 cm. long, about 1 cm. wide, glandular-hispid as well as hirsutulous, 4-8-seeded, rather abruptly acute.

TYPE LOCALITY: "The Colorado Plateau and the Southern Rocky Mountains."

DISTRIBUTION: Mountains of southern Colorado to western Texas, Sonora, and southern Nevada.

ILLUSTRATION: Sargent, *Silva pl.* 114; Lounsbury, *Guide Trees pl.* 67; Britton, *N. Am. Trees f.* 514; Rogers, *Tree Book opp.* 342; Clements, *Rocky Mt. Fl. pl.* 28, f. 7 (all as *R. neomexicana*).

Robinia luxurians × *Pseudo-Acacia*. See under *R. Pseudo-Acacia*.

17. *Robinia breviloba* Rydberg, sp. nov.

A low scraggly shrub; branches short, puberulent; stipular spines 5-10 mm. long, puberulent, mostly somewhat incurved; leaves rarely more than 1 dm. long; rachis puberulent, sulcate above; stipels 1-2 mm. long; leaflets oval, mostly rounded at both ends, 1-3 cm. long, 0.6-2 cm. wide, rather densely strigose-puberulent on both sides, paler beneath; racemes 5-8 cm. long; peduncle, pedicels, and calyces viscid-puberulent and more or less glandular-hispid; calyx tinged with red, the tube 5 mm. long, the lobes ovate, acute or abruptly short-acuminate, 4-5 mm. long; corolla rose-colored, nearly 2 cm. long; pod 4-6 cm. long, 12-13 mm. wide, hirsutulous and glandular-hispid, abruptly acute, 2-4-seeded.

Type collected in the Burrow Mountains, Grant County, New Mexico, June 20, 1903, *Metcalf 189* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Mountains of southern New Mexico.

18. *Robinia subvelutina* Rydberg, sp. nov.

A shrub; young branches canescent with short spreading hairs and more or less glandular-hispid; stipular spines straight, 5-10 mm. long; leaves 1-2 dm. long; rachis subvelutinous-villous and the lower part and the petiole more or less glandular-hispid; stipels subulate, 2-4 mm. long; leaflets oblong to oval, rounded at the base, rounded, obtuse, or acute, and mucronate at the apex, 2-5 cm. long, 1-2.5 cm. wide, softly short-villous on both sides, when young subvelutinous; racemes short and dense, about 7 cm. long; peduncle, pedicels, and calyces densely glandular-hispid; bracts ovate, acuminate; calyx-tube 5-7 mm. long, the lobes ovate-lanceolate, 4-6 mm. long, short-acuminate; corolla pink, nearly 2 cm. long; pod glandular-hispid, 6-8 cm. long, 12-15 mm. wide, 3-6-seeded.

Type collected on the Natanes Plateau, Bisbee, Arizona, June 26, 1912, *Goodding 1092* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Arizona and southwestern Utah.

19. *Robinia viscosa* Vent. *Descr. Pl. Cels pl.* 4. 1800.

? *Robinia echinata* Mill. *Gard. Diet.* ed. 8, *Robinia* no. 2. 1768.

Robinia glutinosa Sims, *Bot. Mag.* *pl.* 560. 1802.

Robinia montana Bartr.; *Michx. Fl. Bor. Am.* 2: 65, as synonym. 1803.

A shrub or small tree, 3-8 m. high; branches glandular-viscid, with mostly sessile glands, dark reddish-brown, the trunk with rough dark-gray bark; stipules subulate, 2-3 mm. long, rarely becoming spiny on vigorous shoots; leaves 1-2 dm. long; rachis puberulent and sparingly glandular; leaflets 11-27, thick and firm, ovate or elliptic, acute to rounded and mucronate, 2-4 cm. long, 1-2 cm. wide, puberulent or glabrate on both sides, dark-green above, paler beneath; stipels minute; racemes 5-8 cm. long, 6-15-flowered; peduncles and pedicels glandular-viscid as well as puberulent; calyx puberulent, red-purple, the tube 4 mm. long, the lobes deltoid, acuminate, 4 mm. long; corolla 15-20 mm. long, pink; pod 5-8 cm. long, abruptly acute, glandular-hispid with short hairs, 6-9-seeded.

TYPE LOCALITY: Alleghany Mountains, central Carolina, towards the sources of Savanna River.

DISTRIBUTION: Pennsylvania to North Carolina and Alabama; escaped from cultivation as far north as Nova Scotia and Wisconsin.

ILLUSTRATIONS: Cornuti, *Pl. Can. pl.* 172; Vent. *Descr. Pl. Cels pl.* 4; Nouv. Duham. 2: *pl.* 17; Bart. *Elem. Bot. pl.* 21; Michx. f. *Hist. Arb. Am.* 3: 262, *pl.* 2; N. Am. *Sylva* 2: *pl.* 77; Guimp. Otto & Hayne, *Abb. Fremden Holz.* *pl.* 65; Loud. *Arb. pl.* 87; f. 306; *Bot. Mag.* *pl.* 560; Britton, *N. Am. Trees f.* 513; Rogers, *Tree Book pl. opp.* 342, 346; Sargent, *Man. f.* 474; Sargent, *Silva pl.* 115; Lounsbury, *Guide Trees pl.* 109; Hough, *Handb. f.* 344, 345.

Robinia Pseudo-Acacia × *viscosa*. This appears in two forms:—

1. *Robinia dubia* Foucauld, Jour. de Bot. Desv. II. 2: 204. 1813. *Robinia ambigua* Poir. in Lam. Encyc. Suppl. 4: 690. 1816. *Robinia intermedia* Soulange, Ann. Soc. Hort. Paris 2: 42. 1828. This form resembles most *R. Pseudo-Acacia*, but differs in the slightly viscid and less prickly branches, the 15–21 leaflets and light-pink flowers.
2. *Robinia bella-rosea* Nichols.; Sargent, Silva 3: 46. 1892. *Robinia amoena* C. Koch, Dendr. 1: 60. 1869. *Robinia viscosa bella-rosea* Voss; Vilmorin, Blumenz, ed. 3, 219. 1896. *Robinia Pseudo-Acacia bella-rosea* Cowell, Cycl. Am. Hort. 1538. 1902. *Robinia dubia bella-rosea* Rehder, Mitt. Deuts. Dendr. Ges. 24: 223. 1915. This resembles more *R. viscosa*, being more viscid and with deeper rose-colored flowers.

20. *Robinia Hartwigii* Koehne, Mitt. Deuts. Dendr. Ges.

22: 1. 1913.

Robinia viscosa Hartwigii ["*Hardwegii*"] Ashe, Jour. Elisha Mitchell Soc. 16: 175. 1922.

A shrub, about 3 m. high; branches densely puberulent as well as glandular with mostly short-stalked glands; stipules subulate-setaceous, rarely becoming spiny; leaves 1–1.5 dm. long; rachis densely villous-puberulent and with scattered glands; leaflets 13–23, elliptic to lanceolate, mucronate, 2–3.5 cm. long, 1–2 cm. wide, villous on both sides or glabrate above, densely villous beneath, dark above, pale beneath; racemes dense, 5–10 cm. long; peduncle and pedicels densely puberulent and glandular; calyx villous-puberulent, 4 mm. long, the lobes^{*} deltoid, acute, 4 mm. long; corolla rose-colored, 18 mm. long; pod linear, 6–10 cm. long, 12 mm. wide, 5–12-seeded, densely glandular-hispid.

TYPE LOCALITY: Cultivated material.

DISTRIBUTION: North Carolina to Alabama and Georgia.

DOUBTFUL AND EXCLUDED SPECIES

- ROBINIA VIOLACEA Jacq. Enum. Pl. Carib. 28. 1762. This is a species of *Lonchocarpus*.
- ROBINIA ROSEA Mill. Gard. Dict. ed. 8. Robinia no. 4. 1768. This is, according to Britten and Baker f.,* *Lonchocarpus roseus*.
- ROBINIA GLABRA Mill. Gard. Dict. ed. 8. Robinia no. 5. 1768. This is, according to Britten and Baker f., *Dalbergia campeachiana* Benth.
- ROBINIA ALATA Mill. Gard. Dict. ed. 8. Robinia no. 6. 1768. This is *Piscidia Erythrina* L.
- ROBINIA PYRAMIDATA Mill. Gard. Dict. ed. 8. Robinia no. 7. 1768. According to Britten and Baker f., this is a species of *Caesalpinia*.
- ROBINIA VIOLACEA Mill. Gard. Dict. ed. 8. Robinia no. 8. 1768. This is *Peltophorum Linnaei* Benth.
- ROBINIA LATIFOLIA Mill. Gard. Dict. ed. 8. Robinia no. 9. 1768. According to Britten and Baker f., this is *Lonchocarpus violaceus*.
- ROBINIA ACULEATA Vahl, in West, Bidr. St. Croix 300. 1793. This is a species of *Pictelia*.
- ROBINIA SERICEA Poir. in Lam. Encyc. 6: 226. 1804. This is *Lonchocarpus sericeus*.
- ROBINIA SPINIFOLIA Desv. Jour. de Bot. Desv. II. 1: 78. 1814. This is a species of *Pictelia*.
- ROBINIA LUDOVICIANA Raf. Fl. Ludov. 164. 1817. Insufficiently described, perhaps a spineless form of *R. Pseudacacia* L.
- ROBINIA PURPUREA Link, Enum. Hort. Berol. 2: 242. 1822. Described as having purple flowers, from garden specimens of unknown origin. The *Index kewensis* gives the habitat as North America, but no American plant agrees with the description.
- ROBINIA ACUMINATA Schlecht. Linnaea 12: 306. 1838. This was described from Matlques, Mexico, without fruit. Schlechtendal suggests that it may be a *Lonchocarpus*.
- ROBINIA SCHIEDEANA Schlecht. Linnaea 12: 306. 1838. Schlechtendal suggests *Lonchocarpus*. It was collected between Veracruz and Santa Fé.
- ROBINIA ASHEI Schallert, Torreya 23: 105. 1923. Unknown; said to be related to *R. longiloba*.

* Jour. Bot. 35: 227. 1897.

19. *OLNEYA* A. Gray, Mem. Am. Acad. II. 5: 328. 1855.

Tesota C. Mueller, in Walp. Ann. 4: 479. 1857.

Canescent spinose trees, with abruptly pinnate or odd-pinnate leaves, with obsolete stipules and no stipels. Calyx campanulate, 5-lobed, the upper two lobes united to near the apex. Banner short-clawed, the blade orbicular, emarginate, reflexed, with two callosities at the base. Wings obliquely obovate, strongly falcate, with small basal auricles, short-clawed. Keel-petals short-clawed, the blades broadly lunate, almost semi-circular, with a broad rounded basal auricle. Stamens diadelphous, nearly of equal length, the sheath cylindrical, curved; anthers uniform. Ovary short-stipitate, several-ovuled; style arcuate, incurved, pubescent above; stigma capitate, terminal. Pod rather turgid, 2-valved, torulose, puberulent and glandular-hispid. Seeds erect, rounded-ellipsoid, scarcely compressed.

Type species, *Olneya Tesota* A. Gray.

1. *Olneya Tesota* A. Gray, Mem. Am. Acad. II. 5: 328. 1855.

A tree, 5-8 m. high; branches striate, densely canescent, subvelutinous; spines 5-10 mm. long, paired or solitary under the leaves, with brown or black tips; leaves 3-10 cm. long; leaflets 8-24, oblong or cuneate, rounded at the apex, 5-20 cm. long, densely canescent; racemes axillary, 3-5 cm. long; bracts minute, deciduous; calyx canescent, the tube 3-4 mm. long, the lobes oblong-ovate, 2.5-3 mm. long, abruptly acute; corolla yellow, nearly 1 cm. long; pod 4-6 cm. long, 9 mm. thick, canescent and glandular-hispid, with a broad stipe and a broad beak; seeds black, 8-9 mm. long and 6 mm. broad, shining.

TYPE LOCALITY: Table-lands on the Gila River, Arizona.

DISTRIBUTION: Arizona to Southern California, Lower California, and Sonora.

ILLUSTRATIONS: Pacif. R. R. Rep. 7: pl. 5; Sargent, *Silva pl.* 116; Britton, *N. Am. Trees f.* 515; Sargent, *Man. f.* 475; *Am. Jour. Bot.* 11: pl. 34 S.

20. *COURSETIA* DC. Ann. Sci. Nat. 4: 92. 1824.

Humboldtiella Harms, *Repert. Sp. Nov.* 19: 12. 1923.

Shrubs or trees. Leaves abruptly pinnate or odd-pinnate, with many entire petiolulate leaflets and narrow subulate persistent and somewhat spinescent stipules. Flowers in axillary racemes, solitary in the axils of small deciduous bracts. Calyx-tube campanulate or turbinate, about as broad as high; lobes subequal in length, but the upper two often united higher up. Corolla white, ochroleucous, reddish, or purplish; petals subequal, or the wings shorter. Banner suborbicular with a short claw, sometimes with a pair of callosities. Wings short-clawed, the blades obliquely oblanceolate or oblong, with a basal auricle. Keel-petals with somewhat longer claws, the blades broader, more or less lunate, often semiorbicular, with a small basal auricle, obtuse to acuminate. Stamens diadelphous, the upper filament bent near the base, the staminal sheath often somewhat dilated below. Style strongly inflexed at the base, then straight, hairy above on the upper side. Pod linear, 2-valved, compressed, without partitions, usually constricted around the seeds and more or less torulose, sessile or short-stipitate, but the lower portion often narrower and without seeds. Seeds suborbicular, without strophiole, compressed.

Type species, *Coursetia tomentosa* DC.

Leaves abruptly pinnate; stipels usually wanting.

Leaves odd-pinnate; stipels usually present.

I. GLANDULOSAE.

Banner without callosities or if present these not well defined and near the basal sinuses; keel-petals obtuse or acutish.

II. POLYPHYLLAE.

Banner with a pair of well defined callosities some distance above the base; keel-petals acuminate.

III. MADRENSES.

I. GLANDULOSAE

Inflorescence and pod more or less glandular.

Leaflets less than 2 cm. long; leaves 2-5 cm. long.

Leaflets acutish; racemes usually longer than the short leaves.

1. *C. microphylla*.

Leaflets rounded or obtuse at each end; racemes shorter than the leaves.

2. *C. glandulosa*.

Leaflets 3-4 cm. long; leaves 10-15 cm. long.

3. *C. Scleri*.

Inflorescence and pod not glandular.

Leaves 2 cm. long or less; leaflets 3-8 mm. long; pod torulose; racemes short, 1-4-flowered.

Leaves 15-20 cm. long; leaflets 20-50 mm. long; pod not torulose; racemes many-flowered.

4. *C. axillaris*.

5. *C. arborea*.

II. POLYPHYLLAE

Leaflets glabrous throughout or sparingly strigulose beneath.

Leaf-rachis not winged; peduncles and pods glabrous.

Leaf-rachis winged; peduncles and pods glandular-pubescent.

Leaflets densely pilose on both sides; peduncles and pods pubescent and glandular.

6. *C. polyphylla*.

7. *C. planipetiolata*.

8. *C. mollis*.

III. MADRENSES

One species.

9. *C. madrensis*.

1. *Coursetia microphylla* A. Gray, Proc. Am. Acad. 17: 201. 1882.

A low shrub; branches cinereous when young, soon glabrate, brown, striate; stipules subulate, 3-5 mm. long, subspinescent, ascending; leaves 2-3 cm. long; rachis strigose-canescens; leaflets 10-16, elliptic, 5-8 mm. long, acute at the base, acute and cuspidate-mucronate at the apex, sericeous-strigose on both sides, subcoriaceous; racemes 3-4 cm. long, few-flowered, rather lax, the peduncles and its branches glandular and puberulent; bracts small, lanceolate, deciduous; calyx glandular, the tube turbinate, 3 mm. long, the lobes deltoid-lanceolate, 2 mm. long; corolla white, tinged with rose, about 1 cm. long, the petals sub-equal, short-clawed; banner suborbicular, retuse; blades of the wings oblong, with a rounded basal auricle; those of the keel-petals semiorbicular, obtuse, with a broad basal auricle; pod sessile, torulose, 5 cm. long, 5-6 mm. wide, densely glandular; seeds suborbicular. Closely related, to the next species, and perhaps not distinct.

TYPE LOCALITY: Santa Catalina Mountains, Arizona.

DISTRIBUTION: Southern Arizona and northern Sonora.

ILLUSTRATION: Am. Jour. Bot. 11: pl. 34 T, f. 1-8.

2. *Coursetia glandulosa* A. Gray, Proc. Am. Acad. 5: 156. 1861.

A low shrub; branches sericeous when young, soon glabrate, purplish, striate; stipules subulate, subspinescent, 3 mm. long, ascending; leaves 3-5 cm. long; rachis strigose, sulcate on the upper side; leaflets 12-18, without stipels, 5-18 mm. long, 3-8 mm. wide, oblong or elliptic, rounded or obtuse at each end, mucronate, sparingly strigulose on both sides, in age glabrate; racemes short, few-flowered, axillary, often 2 or 3 together, 2-3 cm. long, the peduncle and its branches subvelutinous and glandular-pubescent; bracts lanceolate; calyx puberulent and densely glandular, the tube turbinate, 3 mm. long, the lobes 1.5 mm. long, deltoid, acute; corolla yellow, tinged with rose, about 1 cm. long; wings oblong-obovate, with a large basal auricle and a claw about 2 mm. long; keel-petals with claws 5 mm. long, the blades semiorbicular, obtuse, with a broad basal auricle; pod sessile, 4-5 cm. long, 7 mm. wide, torulose, puberulent and glandular, 6-12-seeded; seeds compressed, suborbicular, 4-5 mm. in diameter, brown.

TYPE LOCALITY: Cape San Lucas, Lower California.

DISTRIBUTION: Lower California, Sonora, and Sinaloa.

3. *Coursetia Seleri* Harms, Repert. Sp. Nov. 19: 14. 1823.

Coursetia microphylla M. Micheli, Mém. Soc. Genève 34: 253. 1903. Not *C. microphylla* A. Gray, 1882.

Coursetia Seleri Caeciliae Harms, Repert. Sp. Nov. 19: 14. 1823.

A shrub or tree, 5-6 m. high; branches silky when young, soon glabrous, densely warty with lenticels, straw-colored; stipules subulate-setaceous, 5-8 mm. long; leaves 1-1.5 dm. long; rachis sparingly strigose, sulcate above; leaflets 16-22, elliptic, 2-4 cm. long, 1-1.5 cm. wide, sparingly strigulose or soon glabrate, thin, mucronate, rounded at each end; racemes often 2 or 3 in each axil, 3-6 cm. long, 5-10-flowered, the peduncle and its branches glandular and puberulent;

calyx glandular, the tube turbinate, 3-4 mm. long, the teeth lance-deltoid; corolla white, ochroleucous or pinkish; banner orbicular-ovate, 12-13 mm. long, retuse; blades of the wings elliptic, with a rounded basal auricle; blades of the wing-petals semiorbicular; keel acute; pod 6-7 cm. long, 7 mm. wide, densely glandular-puberulent, 6-8-seeded, often without seeds below.

TYPE LOCALITY: Below Totolapan, District of Yauhtepec, Oaxaca.
DISTRIBUTION: Guerrero and Oaxaca.

4. *Coursetia axillaris* Coult. & Rose, Bot. Gaz. 16: 180, 217. 1891.

Shrub or small tree (?); branches cinereous-strigose when young, with ash-colored bark; stipules subulate, 1-2 mm. long; leaves spreading, 1.5-2 cm. long; rachis strigose, terete; leaflets 6-10, reticulate, broadly oval or obovate, 3-8 mm. long, 2-5 mm. wide, rounded at each end, glabrous or nearly so above, sparingly strigose beneath; racemes very short, 1-4-flowered, axillary; pedicels 5-8 mm. long; bracts linear-lanceolate; calyx strigose, the tube 2 mm. broad, the lobes 3 mm. long, deltoid-lanceolate, acute; corolla apparently white, about 1 cm. long; petals subequal; banner broadly obovate, retuse; blades of the wings broadly and obliquely oblanceolate, with a rounded basal auricle; blades of the keel-petals nearly semiorbicular, with a small basal auricle; pod 3.5-4 cm. long and 5 mm. broad, torulose, glabrate, 4-8-seeded; seeds brown, shining, orbicular and lenticular.

TYPE LOCALITY: San Diego, Texas.
DISTRIBUTION: Southern Texas and Tamaulipas.
ILLUSTRATION: Britton, N. Am. Trees f. 516.

5. *Coursetia arborea* Griseb. Fl. Brit. W. Ind. 183. 1859.

Humboldtiella ferruginea Harms, Repert. Sp. Nov. 19: 12, in part. 1923. Not *Robinia ferruginea* H.B.K. 1825.

A tree or shrub, 3-12 m. high, branches glabrous or cinereous-puberulent when young, with light-brown bark; stipules subulate, 3 mm. long, erect; leaves 1.5-2 dm. long; rachis puberulent, sulcate above; leaflets 16-30, elliptic or oblong, 2-5 cm. long, 1-2 cm. wide, glabrous above, sparingly strigulose, glabrate beneath, rounded at each end, thin, reticulate; petiolules 2 mm. long; racemes 5-10 cm. long, 5-many-flowered, sometimes branched below, the pedicels 8-12 mm. long; calyx cinereous-puberulent, the tube turbinate, 4 mm. long, the teeth deltoid, 1-1.5 mm. long, acute or obtuse, villous-ciliolate on the margins; corolla whitish, tinged with violet, the petals subequal in length, 16-18 mm. long; banner rounded-obovate; blades of the wings obliquely obovate, with a small basal auricle; blades of the keel-petals broadly lunate, acute, with a small broad acute basal auricle; pod 7-12 cm. long, about 6 mm. broad, not torulose, glabrous or puberulent, acute at each end, 15-20-seeded.

TYPE LOCALITY: Trinidad.
DISTRIBUTION: St. Jean (?);* Martinique (native ?); Panama; also in Trinidad, Venezuela, and Colombia.

6. *Coursetia polyphylla* Brand. Univ. Calif. Publ. Bot. 4: 376. 1813.

A branched shrub; branches glabrous or slightly strigose when young, the bark straw-colored; stipules subulate, erect, 2 mm. long; leaves 5-6 cm. long, odd-pinnate; rachis sparingly strigose, sulcate above; stipules subulate, 1 mm. long; leaflets 9-13, elliptic, rounded or retuse at the apex, obtuse or acute at the base, 1.5-3 cm. long, 1-1.5 cm. wide, glabrous above, strigose-puberulent beneath, reticulate; racemes axillary, shorter than the leaves, several-flowered;

* Reported by Grisebach, but doubtful.

calyx pubescent, the tube 2 mm. long and broad, the teeth deltoid; corolla about 8 mm. long, ochroleucous, tinged with reddish, the petals subequal; banner suborbicular, emarginate; pod about 6 cm. long, torulose, glabrous, 3-5-seeded.

TYPE LOCALITY: Baños del Carrizal, Veracruz.

DISTRIBUTION: Known only from the type locality.

7. *Coursetia planipetiolata* M. Micheli, Mém. Soc.

Genève 34: 253. 1903.

A shrub, 2 m. high; branches sparingly pubescent when young, soon glabrate, the bark light-yellow; stipules subulate, 3 mm. long; leaves 6-15 cm. long, odd-pinnate; rachis puberulent, winged; leaflets 5-7, ovate or elliptic, rounded or obtuse at each end, mucronate, 2-5.5 cm. long, 1-2.5 cm. broad, the petiolules 2 mm. long; racemes axillary or terminal, lax, 8-12-flowered, 1-1.5 dm. long, longer than the subtending leaves; peduncle and pedicels glandular-pubescent; pedicels about 1 cm. long; calyx densely glandular, the tube 4 mm. long and broad, the teeth deltoid, 4 mm. long; corolla light rose-colored, 15-18 mm. long; petals nearly equal, the wings slightly shorter than the rest; banner suborbicular, retuse; blades of the wings broadly oblong, with a large round basal auricle; those of the keel-petals semiorbicular, acutish, with a rather indistinct rounded basal auricle; style strongly bent below; pod linear, 7-12 cm. long, glandular-puberulent, torulose, 9-12-seeded.

TYPE LOCALITY: San Luis River, Guerrero or Michoacán.

DISTRIBUTION: Type locality and in Oaxaca.

ILLUSTRATIONS: Mém. Soc. Genève 34: pl. 5.

8. *Coursetia mollis* Rob. & Greenm. Proc. Am. Acad. 29: 384.

1894.

A shrub, 1-2 m. high, branches glandular-tomentose, in age glabrate, the bark straw-colored or gray, striate; stipules subulate, spinescent, erect, 5 mm. long; leaves 5-15 cm. long, odd-pinnate; rachis glandular and villous; leaflets 15-21, elliptic-oblong, rounded at each end, grayish-pilose on both sides, 15-25 cm. long, 7-10 mm. wide; racemes 4-10 cm. long; pedicels about 6 mm. long; peduncle and pedicels pilose and glandular; calyx pilose, the tube 3 mm. long, the teeth 5 mm. long, deltoid-lanceolate; corolla 14-18 mm. long, rose-purple; banner orbicular; wings obliquely obovate, with a minute basal auricle; blades of the wing-petals lunate, long-acuminate at the apex, with a rounded basal auricle; pod 5-7 cm. long, 5 mm. wide, hirsute and glandular, 7-9-seeded.

TYPE LOCALITY: Barranca of Beltran.

DISTRIBUTION: Sinaloa to Guerrero.

9. *Coursetia madrensis* M. Micheli, Mém. Soc. Genève

34: 253. 1903.

A shrub, 3 m. high; branches canescent when young, soon glabrate, the bark gray; stipules subulate, 3 mm. long; leaves 5-10 cm. long, odd-pinnate; rachis canescent, sulcate above; leaflets 17-21, ovate or oval, mucronate, rounded or obtuse at each end, strigulose above, densely sericeous beneath, 1-2 cm., 6-10 mm. wide, the petiolules 1 mm. long; stipels subulate 1 mm. long; racemes short, 3-10-flowered; bracts linear-subulate; pedicels 1.5-2 cm. long, glandular-pubescent; calyx glandular-pubescent, the tube 3-4 mm. long and fully as wide, the teeth fully equaling the tube, deltoid, subulate-tipped; corolla blood-red, with a yellow or orange spot; banner broadly oval, acutish, about 2 cm. long, with a pair of callosities above the base; wings shorter than the banner, the blades oblong, with a rounded basal auricle; keel-petals equaling the banner, semi-ovate, long acuminate, with a rounded basal auricle; pod torulose, tomentose, 15-20-seeded.

TYPE LOCALITY: Sierra Madre, Guerrero or Michoacán.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Mém. Soc. Genève 34: pl. 6; Am. Jour. Bot. 11: pl. 34 T, f. 9-11.

EXCLUDED SPECIES

COURSETIA VIRGATA DC. Ann. Sci. Nat. 4: 92. 1824. This is *Daubentonia virgata*.

21. **LENNEA** Klotzsch; Link, Klotzsch, & Otto, Ic. Pl. Rar. Hort. Berol. 2: 65. 1842.

Trees or shrubs, with odd-pinnate leaves, and subulate or setaceous deciduous stipules and stipels. Flowers in axillary racemes with subulate or setaceous bracts. Calyx campanulate, with 5 short teeth. Corolla with subequal petals. Banner reflexed, the blade orbicular, the claw short. Wings short-clawed, the blades obliquely oblong, with a basal auricle. Keel-petals somewhat lunate, obtuse, united above, with a rounded basal auricle. Stamens 10, monadelphous, the upper filament free and somewhat kneeed at the base, then united to the sheath to above the middle, and then again free; anthers uniform. Ovary short-stipitate, many-ovuled; style short-pubescent along the upper margin, strongly spirally curved towards the apex; stigma terminal. Pod linear, slightly stipitate, many-seeded, without cross-partitions. Seeds lenticular.

Type species, *Lennea robinioides* Klotzsch.

Flowers appearing with the leaves; leaflets elliptic or oblanceolate, rounded at the apex.

Flowers purple, in lax racemes; leaves glabrous; upper calyx-lobes united halfway to the apex.

Flowers light-yellow or greenish, in dense erect racemes; leaves strigose beneath; branches ferruginous; upper calyx-lobes united nearly to the apex.

Flowers light-yellow, in short dense racemes, appearing before the leaves; leaflets ovate, blunt-acute, hirsutulous.

1. *L. melanocarpa*.

2. *L. brunnescens*.

3. *L. viridiflora*.

1. **Lennea melanocarpa** (Schlecht.) Vatke; Harms, Repert.

Sp. Nov. 19: 68. 1923.

Robinia melanocarpa Schlecht. Linnaea 12: 305. 1838.

Lennea robinioides Klotzsch; Link, Klotzsch & Otto, Ic. Pl. Rar. Hort. Berol. 2: 65. 1842.

Calomorphe Ehrenbergiana Kunze; Walp. Rep. 1: 680, as synonym. 1842.

A shrub, 1 m. high or more, perhaps sometimes a low tree; branches slender, glabrous; leaves about 1 dm. long; stipules 1-2 mm. long, subulate; stipels less than 1 mm. long; rachis slender, glabrous; leaflets 9-13, elliptic, rounded at the apex, acutish at the base, short-petioled, glabrous, entire, 4-5 cm. long, 1.5-2 cm. wide; racemes slender, drooping, often paired; pedicels 2-3 mm. long; calyx about 2 mm. high and broad; teeth triangular, acute; corolla red-purple, about 1 cm. long, the petals subequal and yellowish at the base; banner orbiculate; keel-petals united at the apex; pod 5-7 cm. long, 12 mm. wide, tapering into a short stipe at the base, reddish-fuscous, 3-4-seeded, glabrous.

TYPE LOCALITY: Cultivated specimens from Mexican seeds.

DISTRIBUTION: Veracruz.

ILLUSTRATIONS: Link, Klotzsch, & Otto, Ic. Pl. Rar. Hort. Berol. pl. 26; Am. Jour. Bot. 11: pl. 34 U.

2. **Lennea brunnescens** Standley, Contr. U. S. Nat. Herb. 23:

480. 1922.

A tree, 7-9 m. high, with gray bark; young branches ferruginous-pubescent, almost velutinous; stipules lanceolate, 2-3 mm. long, ferruginous; leaves 1-1.5 dm. long; rachis and petiole ferruginous-pubescent; leaflets 11-13, elliptic or oblanceolate, rounded at the apex, 2-5 cm. long, 1-2 cm. wide, glabrous and reticulate above, sparingly strigose beneath, yellowish-green; racemes 2-5 cm. long; bracts small, lanceolate, brown, 1-2 mm. long; calyx ferruginous, the

tube 2 mm. long, the upper two teeth ovate, united to near the apex, the lower three lanceolate, 1.5 mm. long; corolla light greenish-yellow, nearly 1 cm. long; petals subequal; pod ferruginous-pubescent, 6-7 cm. long, 1.5 cm. wide.

TYPE LOCALITY: Carrizal, Veracruz.

DISTRIBUTION: Known only from the type locality.

3. *Lennea viridiflora* Seem. Bot. Voy. Herald 107. 1852.

A small tree, 3-5 m. high; branches ferruginous-hispidulous when young, becoming glabrate and with grayish bark; stipules lance-subulate, erect, stiff, 2 mm. long; leaves 1-1.5 dm. long; rachis somewhat ferruginous-hispidulous; leaflets 9-13, ovate or ovate-oblong, sometimes somewhat acuminate, but the tip obtuse or retuse, shining above, pale beneath, sparingly hirsutulous, reticulate, often sub-alternate; racemes short and rather dense, 2-3 cm. long, the peduncle, bracts, and calyx ferruginous; bracts minute, ovate; pedicels 2 mm. long; calyx-tube 2 mm. long, the lobes deltoid, acute, corolla 8 mm. long, greenish or light-yellow; petals subequal; banner suborbicular; blades of the other petals obliquely oblong-oblancoleate.

TYPE LOCALITY: Santiago de Veraguas, Panama.

DISTRIBUTION: Panama.

22. *WILLARDIA* Rose, Contr. U. S. Nat. Herb. 1: 97. 1890.

Small trees or shrubs. Leaves odd-pinnate, with petiolulate entire leaflets, deciduous stipules and no stipels. Flowers in axillary racemes; bractlets absent. Calyx short-campanulate, fully as broad as long, truncate, with five minute equal teeth. Corolla lilac, white, or ochroleucous, the banner and keel subequal, the wings somewhat shorter. Banner suborbicular, retuse at the apex, reflexed, short-clawed. Wings short-clawed, the blades oblong-falcate, apparently without a basal auricle. Keel-petals lunate, obtuse, united to near the end, the claws equaling the calyx. Stamens monadelphous, the upper filament free at the base, above united with the rest into a closed sheath. Anthers uniform. Ovary subsessile, several-ovuled; style incurved, glabrous; stigma small, capitate. Pod flat, oblong-lanceolate, acute at each end, without partitions, 2-valved. Seeds reniform, strongly compressed.

Type species, *Coursetia mexicana* S. Wats.

Leaves puberulent, or in age glabrous above; corolla 1 cm. long or less.

Leaflets 11-21, only 8-15 mm. long; corolla 6-7 mm. long; fruit glabrous.

Leaflets 9-15, usually 2-3 cm. long; corolla 1-1.5 cm. long; fruit pubescent.

Leaves finely velutinous above, silky-villous beneath; leaflets 11-21, usually 1.5-3 cm. long; corolla nearly 2 cm. long.

1. *W. parviflora*.

2. *W. mexicana*.

3. *W. eriophylla*.

1. *Willardia parviflora* Rose, Contr. U. S. Nat. Herb. 8: 313.

1905.

A small shrub, 3-4 m. high, much branched; branches densely puberulent when young; stipules broadly ovate, 1 mm. long or less, caducous; leaves about 5 cm. long; rachis densely short-pubescent, sulcate above; leaflets 11-21, oblong, 8-16 mm. long, rounded at the apex, thickish with revolute margins, finely pubescent when young, in age glabrate above; racemes appearing with or before the leaves, 4-5 cm. long; bracts ovate, reddish, very small; pedicels 2-4 cm. long; calyx pubescent, 2 mm. long, brownish, the lower three lobes broadly triangular, the upper two rounded or obsolete; corolla 6-7 mm. long; banner orbicular, retuse; wings obliquely obovate; keel-petals semi-orbicular, the claw equaling the calyx-tube; pod very flat, lance-oblong, acute at each end, 3-6 cm. long, 1 cm. wide, glabrous; 1-3-seeded; seeds 10-12 mm. long, 6-7 mm. high, reniform, reddish-brown.

TYPE LOCALITY: Yautepec, Morelos.

DISTRIBUTION: Morelos.

2. *Willardia mexicana* (S. Wats.) Rose, Contr. U. S. Nat.
Herb. 1: 98. 1891.

Coursetia mexicana S. Wats. Proc. Am. Acad. 21: 424. 1886.

A small tree, 3-10 m. high, with smooth bark; twigs minutely pubescent when young, soon glabrate; leaves 7-10 cm. long; rachis sparingly pubescent, sulcate above; leaflets 9-15, elliptic, obtuse at each end, 1.5-3 cm. long, 12-16 mm. wide, glaucous-green above, yellowish-green beneath, finely pubescent on both sides; racemes somewhat paniced; calyx, 4 mm. long and broad, puberulent, the lobes minute; corolla lilac, about 1 cm. long; pod thin, tapering at each end, 5-6 cm. long, 10-12 mm. wide, puberulent, 8-10-seeded; seeds about 1 cm. long, smooth and shining, salmon-colored.

TYPE LOCALITY: Hacienda San Miguel, Chihuahua.

DISTRIBUTION: South-western Chihuahua, Sonora, and Sinaloa.

3. *Willardia eriophylla* (Benth.) Standley, Contr. U. S. Nat.
Herb. 19: 483. 1922.

Lonchocarpus eriophyllus Benth. Jour. Linn. Soc. 4: Suppl. 94. 1860.
Willardia velutina Rose, MS.

A shrub or tree, 3-5 m. high; young branches grayish-velutinous; stipules minute, lanceolate; leaves 6-8 cm. long; rachis densely velutinous; leaflets 11-23, elliptic or lance-elliptic, thick, obtuse at each end, or subacute at the apex, 1.5-3.5 cm. long, 8-10 mm. wide, finely velutinous above, densely silky-villous and strongly veined beneath; racemes 7-10 cm. long; peduncle and pedicels velutinous; flowers often 2 at the nodes; calyx-tube 5 mm. long and broad, velutinous, the lobes short-triangular, about 1 mm. long; corolla pinkish-white or reddish-purple, somewhat pubescent, nearly 2 cm. long; banner suborbicular, reflexed; blades of wings oblong-oblancoate, with a rounded basal auricle; keel-petals similar, united to near the tip, more falcate; pod white-velutinous, 10-13 cm. long, 13 mm. wide, acutish at each end, 6-8-seeded; seeds 12 mm. long, 8 mm. high.

TYPE LOCALITY: Chilla, Puebla.

DISTRIBUTION: Puebla, Morelos, and Guerrero.

ILLUSTRATION: Am. Jour. Bot. 11: pl. 35 V.

23. *HESPEROTHAMNUS* Brand. Univ. Calif. Publ. Bot. 6: 499.
1919.

Selerothamnus Harms, Repert. Sp. Nov. 17: 325. 1921.

Shrubs or small trees. Leaves odd-pinnate, with petioluled entire leaflets, deciduous stipules and filiform stipels. Flowers in axillary racemes or raceme-like panicles, *i. e.*, the flowers several fascicled on short branches at each node of the peduncle; bracts filiform; bractlets wanting. Petals subequal, the claw slender, nearly half as long as the blade. Blade of the banner rounded-obovate, erect. Blades of the wings oblong, falcate, rounded at the apex, truncate on the upper margin at the base. Blades of the keel-petals strongly lunate, their upper half united, the apex obtuse, and the base with a rounded auricle; stamens monadelphous, the upper stamen free at the base, adnate to the staminal sheath at the middle. Anthers uniform. Ovary subsessile, several-ovuled; style abruptly bent at the base, glabrous; stigma minute, capitate. Pod flat, linear or linear-oblong, acute at each end, 2-valved, without partitions. Seeds suborbicular, compressed.

Type species, *Lonchocarpus littoralis* Brand.

Pubescence of the lower surface of the leaves and of the calyx spreading.

Pod 1.5-2 cm. wide; leaflets ovate, cuspidate-acuminate.

Pod 6-7 mm. wide; leaflets oval or oblong, acute or short-acuminate.

Pubescence of the lower surface of the leaves and of the calyx appressed.

Calyx-lobes lanceolate, acuminate, 4 mm. long.

Calyx-lobes ovate, 2-3 mm. long, the uppermost rounded at the apex, the rest acute or obtuse.

1. *H. littoralis*.

2. *H. Purpusi*.

3. *H. pentaphyllus*.

Leaflets broadly oval.
Leaflets oblong to lanceolate.

4. *H. brachycalyx*.
5. *H. Ehrenbergii*.

1. *Hesperothamnus littoralis* Brand. Univ. Calif. Publ. Bot. 6:
499. 1919.

Lonchocarpus littoralis Brand. Zoe 5: 157. 1903.
Coursetia littoralis Brand. MS.

A spreading shrub, about 2 m. high; branches subvelutinous; leaves 1.5 dm. long; rachis subvelutinous; stipels subulate, 1 mm. long; leaflets 5, broadly ovate, 2.5–7 cm. long, 1.5–5 cm. wide, sparingly hairy but soon glabrate above, more densely short-villous beneath, strongly veined, rounded at the base, acute to retuse and mucronate at the apex; racemes about 1 dm. long; peduncle subvelutinous; calyx densely pubescent, the tube 3 mm. high and broad, the lobes deltoid-lanceolate, acuminate, 3 mm. long; corolla purple or sometimes white; petals subequal in length, about 12 mm. long; banner with an orbicular blade and short claw; wings obliquely oblanceolate, with a prominent acute basal auricle; keel-petals broader, obliquely obovate, with a rounded basal auricle; alternating stamens somewhat shorter; ovary 4-ovuled; pod 5–7 cm. long, about 1.5–2 cm. wide, velutinous, somewhat torulose, usually 2–3-seeded, tapering at each end.

TYPE LOCALITY: Cape Region, Lower California.
DISTRIBUTION: Type locality and vicinity.
ILLUSTRATION: Am. Jour. Bot. 11: pl. 35 W.

2. *Hesperothamnus Purpusi* (Harms) Rydberg.

Sclerothamnus Purpusi Harms, Repert. Sp. Nov. 17: 326. 1921.
Hesperothamnus grandis Standley, Contr. U. S. Nat. Herb. 23: 484. 1922.

A shrub, 3–6 m. high; bark of the older branches dark-gray; young branches subvelutinous, with short spreading hairs; leaves 8–20 cm. long; stipules caducous; rachis subvelutinous; stipels subulate-filiform, about 2 mm. long; leaflets 5, oval or the terminal one obovate, usually more or less abruptly short-acuminate, 4–9 cm. long, 2–6 cm. wide, subcoriaceous, strongly veined, glabrate above, subvelutinous beneath, especially on the veins; racemes 9–15 cm. long; flowers 2–5 at each node; bracts narrowly linear, 3–4 mm. long; calyx subvelutinous, the tube nearly 4 mm. long, the lobes lanceolate, acute, 2–3 mm. long; corolla pinkish, 10–12 mm. long; banner rounded-obovate, pubescent without, the claw about half as long as the blade; blades of the wings oblong, falcate, obtuse, twice as long as the claw; those of the keel-petals obliquely-obovate, with a rounded basal auricle; pod about 5 cm. long, 6–7 mm. wide, subvelutinous.

TYPE LOCALITY: El Riejo, Puebla.
DISTRIBUTION: Puebla and Oaxaca.

3. *Hesperothamnus pentaphyllus* (Harms) Rydberg.

Sclerothamnus pentaphyllus Harms, Repert. Sp. Nov. 17: 325. 1921.

A shrub, 5–8 m. high; bark of the stem gray; young branches finely subvelutinous; stipules caducous; leaves 1–1.5 dm. long; rachis subvelutinous; stipules filiform, about 4 mm. long; leaflets 5, strongly veined, oval or the terminal one obovate, 3–7 cm. long, 1.5–5 cm. wide, acute, or the terminal one obtuse or rounded at the apex, or rarely short-acuminate, glabrous above, silky-strigose with short appressed hairs beneath; racemes 10–15 cm. long; flowers 2–3 at each node; calyx silky-strigose, the tube 3–4 mm. long, the lobes lanceolate, acuminate, 4 mm. long; corolla 15 mm. long, similar to that of the preceding species, but the wings broader; pod about 6 cm. long and 8 mm. wide, 3–4-seeded, silky-strigose, with yellowish hairs.

TYPE LOCALITY: Salome, Oaxaca.
DISTRIBUTION: Oaxaca and Puebla.

4. *Hesperothamnus brachycalyx* Rydberg, sp. nov.

A low shrub; bark of the stem dark-gray; young branches finely velutinous; stipules caducous; leaves 6–10 cm. long; rachis finely velutinous; leaflets 5, broadly oval, 2–4 cm. long, 1.5–3.5 cm. wide, strongly veined, densely and finely strigose on both sides when young, glabrate in age above, rounded or somewhat subcordate at the base, acute to rounded at the apex; racemes 5–8 cm. long; flowers rather crowded; calyx silky, the lobes scarcely 2 mm. long, the upper one broadly ovate and rounded or slightly retuse at the apex, the lower three ovate, acute or obtusish; corolla 10–13 mm. long, similar to that of *H. grandis*; pod unknown.

Type collected six miles above Dominguillo, Oaxaca, *E. W. Nelson 1826a* (U. S. Nat. Herb. no. 763608).

5. *Hesperothamnus Ehrenbergii* (Harms) Rydberg.

Sclerothamnus Ehrenbergii Harms, Repert. Sp. Nov. 17: 326. 1921.

A low shrub; leaflets 5, oblong, oblong-lanceolate, or lanceolate, 3–7 cm. long, 1–3.5 cm. wide; inflorescence 7–10 cm. long; calyx pubescent, 6–7 mm. long, the lobes 3 mm. long, the lower ovate-lanceolate, acuminate, the uppermost ovate, subtruncate, obtuse or slightly bifid at the apex; ovary villous on the sutures, glabrous on the sides, the stipe villous.

TYPE LOCALITY: Mestitlán, Mexico.
DISTRIBUTION: Known only from the type locality.

24. *HEBESTIGMA* Urban, Symb. Ant. 2: 289. 1900.

Trees, with subopposite or alternate, odd-pinnate leaves, apparently without stipules and stipels. Flowers in racemes, theoretically axillary but the subtending leaves not developed, appearing before and below the leaves on young shoots. Calyx short, obliquely turbinate, 5-toothed, the lobes short and broad. Banner orbicular, reflexed, without callosities, short-clawed. Wings obliquely obovate, clawed, with a prominent basal auricle. Keel-petals obovate, falcate, obtuse, united at the apex, with a rounded basal auricle. Stamens diadelphous; staminal sheath cylindrical; anthers uniform. Ovary stipitate, 5–9-ovuled; style glabrous, inflexed at the base at nearly a right angle, subulate; stigma terminal, villous. Pod subsessile, woody, linear, flat, 2-valved, the exocarp leathery, the endocarp woody, with woody-corky masses between the seeds. Seeds compressed, suborbicular-obovate, suberect.

Type species, *Robinia cubensis* H.B.K.

1. *Hebestigma cubense* (H.B.K.) Urban, Symb. Ant. 2: 289. 1900.

Robinia ? cubensis H.B.K. Nov. Gen. & Sp. 6: 392. 1823.
Louchoarpus latifolius A. Rich.; Sagra, Hist. Cub. 10: 179. 1845. Not *L. latifolius* H.B.K. 1825.
Gliricidia platycarpa Griseb. Cat. Pl. Cub. 70. 1866.
Gliricidia latifolia Griseb. Cat. Pl. Cub. 70. 1866.
Gliricidia cubensis C. Wright; Sauv. Anal. Acad. Ci. Habana 5: 333. 1869.
Gliricidia Sagraei Benth.; Urban, Symb. Ant. 2: 289, as synonym. 1900.
Hebestigma cubense latifolium Urban, Symb. Ant. 2: 290. 1900.

A tree, 5–12 m. high; branches when young ferruginous- or canescent-velutinous, soon glabrous; leaves 1.5–3 dm. long; rachis glabrous; petiolules 6–8 mm. long; leaflets mostly 7 or 9 very variable in outline, 5–15 cm. long, 3–8 cm. broad, lanceolate, ovate, or oval, acute or acuminate at the apex, acute to rounded or subcordate at the base, dark-green above, paler and dull beneath, reticulate; racemes 8–15 cm. long, subvelutinous; bracts minute; pedicels 3–10 mm. long; calyx 4–5 mm. high, 6–7 mm. broad, tomentulose, the lobes broadly triangular;

corolla 12–18 mm. long, pink, often with a yellow eye on the banner; pod 10–15 cm. long, 2–3.2 cm. wide, 5–6-seeded, dark-brown; seeds 18–20 mm. high and 15–18 mm. broad.

TYPE LOCALITY: Batabano, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Sagra, Hist. Cub. 10: pl. 38 bis; Am. Jour. Bot. 11: pl. 35 Y.

25. *GLIRICIDIA* H.B.K. Nov. Gen. & Sp. 6: 393.
1823.—Endl. Gen. 1273. 1840.

Hybosema Harms, Repert. Sp. Nov. 19: 66. 1923.

Trees or shrubs, with odd-pinnate leaves and small stipules but no stipels. Flowers in axillary racemes often appearing before the leaves; bracts small, deciduous; bractlets none. Calyx short-campanulate, as broad as long, truncate; teeth 5, broad and short or obsolete. Banner orbicular, reflexed, often with two callosities at the base of the blade, short-clawed. Wings oblong-ob lanceolate, erect, free, with a basal auricle, short-clawed. Keel-petals strongly arcuate above the middle, obtuse, united at the end, tapering at the base. Stamens diadelphous; sheath cylindrical, not dilated at either end; anthers uniform. Ovary stipitate, 7–12-ovuled; style glabrous, inflexed at nearly a right angle; stigma capitate, papillose, not pubescent. Pod short-stipitate, linear, compressed, 2-valved. Seeds rounded, compressed.

Type species, *Robinia sepium* Jacq.

Corolla more than 15 mm. long; leaflets 2–7 cm. long; the three lower calyx-teeth distant. [EU-GLIRICIDIA.]

Calyces, peduncles, and pedicels glabrous or nearly so; bracts lanceolate, puberulent; corolla pink or white, with a yellow or white eye.

Calyces silky-pubescent; peduncles and pedicels puberulent; bracts ovate or orbicular, pubescent.

Leaflets acuminate with a blunt apex, rather thin; corolla blue with a yellow eye.

Leaflets rounded or obtuse at each end, rather firm; corolla blotched with dark-purple.

Corolla 10–15 mm. long; leaflets 1–3 (rarely 3.5) cm. long; the lower three calyx-teeth close together. [HYBOSEMA.]

Leaflets appressed-pubescent beneath; corolla 12–15 mm. long.

Stipules lanceolate, acuminate or acute.

Stipules subulate-setaceous.

Leaflets glabrous except the midrib beneath; corolla 10–12 mm. long.

1. *G. sepium*.

2. *G. Lambii*.

3. *G. maculata*.

4. *G. guatemalensis*.

5. *G. Ehrenbergii*.

6. *G. meistophylla*.

1. *Gliricidia sepium* (Jacq.) Steud. Nom. Bot.
ed. 2. 1: 688. 1841.

Robinia sepium Jacq. Enum. Pl. Carib. 28. 1760.

Robinia hispida L. Mant. 101, in part. 1767.

Lonchocarpus sepium DC. Prodr. 2: 260. 1825.

Robinia variegata Schlecht. Linnaea 12: 301. 1838.

Tree, 3–10 m. high; branches puberulent especially when young; stipules ovate or lanceolate, 2 mm. long, deciduous; leaves 1–2 dm. long; rachis puberulent, sulcate; leaflets 7–15, elliptic or oval, 3–7 cm. long, 2–3 cm. wide, acute at the base, bluntly acuminate or acute at the apex, short-silky on both sides when young, glabrate in age; racemes 5–10 cm. long, often 2 or 3 from the same axil, many-flowered; bracts ovate, 1 mm. long, deciduous; pedicels about 5 mm. long, articulate below the flower; calyx-tube proper 4 mm. long, and as wide, with a stipe-like base 2 mm. long; corolla pink, usually with a yellow or white spot on the banner or wholly white, 15–20 mm. long, the keel slightly shorter than the banner and wings; pod 10–15 cm. long, 1.5 cm. wide, glabrous, short-stipitate; seeds lenticular, about 1 cm. high, dark-brown.

TYPE LOCALITY: West Indies.

DISTRIBUTION: West Indies, southern Mexico, and Central America; also in Colombia, Venezuela, and Guiana.

ILLUSTRATIONS: Jacq. Sel. Am. pl. 179, f. 101; Am. Jour. Bot. 11: pl. 35 Z.

2. *Gliricidia Lambii* Fernald, Bot. Gaz. 20: 533. 1895.

A tree, 5-8 m. high; branches minutely puberulent; leaves 1.5-2 dm. long; leaflets mostly 7, ovate-oblong, 5-7 cm. long, tapering to an obtuse tip, glabrous on both sides or puberulent-silky beneath; rachis appressed-silky; racemes clustered, 5-10 cm. long, appressed-pubescent; pedicels about 12 mm. long; bracts suborbicular, fuscous-pubescent; calyx appressed-silky, 7 mm. long, 10 mm. broad; corolla pale-blue, fading in age; banner yellow at the base, suborbicular, 2.5 cm. long; wings 22 mm. long, broadly oblanceolate, semi-hastate at the base; keel 2 cm. long, 5 mm. wide.

TYPE LOCALITY: Rosario, Sinaloa.
DISTRIBUTION: Sinaloa and Tepic.

3. *Gliricidia maculata* (H.B.K.) Steud. Nom. Bot.
ed. 2. 1: 688. 1841.

Robinia maculata H.B.K. Nov. Gen. & Sp. 6: 393. 1823.
Lonchocarpus maculatus DC. Prodr. 2: 260. 1825.
Gliricidia sepium f. *maculata* Urban, Symb. Ant. 2: 289. 1900.

A tree; 3-5 m. high; branches puberulent when young; leaves 1-1.5 dm. long; leaflets 13-17, oblong or elliptic, obtuse at each end, reticulate-venose, glabrous above, sparingly pubescent beneath; glaucescent and usually spotted, 3-5 cm. long; rachis terete; racemes 1-1.5 cm. long, puberulent; pedicels about 6 mm. long, articulate under the flower; calyx as in *G. sepium*, puberulent; corolla 18-20 mm. long; banner blotched with purple, with a yellow eye; wings purple-spotted; pod 10-11-seeded.

TYPE LOCALITY: Campeche.
DISTRIBUTION: Yucatan and Campeche.

4. *Gliricidia guatemalensis* M. Micheli, Bull.
Herb. Boiss. 2: 442. 1894.

A shrub; branches sparingly appressed-pubescent when young, in age glabrous, dotted with conspicuous lenticels; stipules lanceolate, acuminate or acute, pubescent, 5-6 mm. long; leaves 8-10 cm. long; rachis appressed-pubescent; leaflets 15-17, ovate or oblong, rounded at the base, mucronate at the apex, glabrous above, paler and appressed-pubescent beneath, 1.5-2 cm. long, 8-10 mm. broad; racemes 2 or 3, on short axillary branches, 8-10 cm. long; bracts minute, hirsute, deciduous; calyx 7-8 mm. long, puberulent above, somewhat 2-lipped; lobes 5, the upper 2 and the lower 3 close together; corolla 12-15 mm. long; banner broadly obovate, retuse, with prominent callosities above the short claw; wings oblong, with a rounded basal auricle the claw half as long as the blade; keel-petals broadly obliquely oblanceolate, with an obsolete basal auricle; ovary stipitate, 7-8 ovuled; style inflexed, glabrous.

TYPE LOCALITY: Sacabajá, Quiché, Guatemala.
DISTRIBUTION: Guatemala.
ILLUSTRATION: Bull. Herb. Boiss. 2: pl. 10.

5. *Gliricidia Ehrenbergii* (Schlecht.) Rydberg.

Robinia Ehrenbergii Schlecht. Linnaea 12: 303. 1838.
Hybosema Ehrenbergii Harms, Repert. Sp. Nov. 19: 66. 1923.
Robinia spilophylla Standley, MS.

A shrub, about 1 m. high; branches brownish, with white lenticels, sparingly strigose; stipules subulate-setaceous from a broad base, pubescent, 6-10 mm. long; leaves 1-1.5 dm. long; rachis appressed-pubescent; leaflets 9-17, oval or elliptic, rounded at both ends and mucronate, glabrous above, appressed-pubescent beneath, 2-3.5 cm. long, 1-2 cm. wide;

racemes about 1 dm. long; bracts minute, deciduous; calyx 4-5 mm. long, ciliate on the margin, upper two lobes united to near the tip forming a broadly deltoid ovate lip, the lower three deltoid, close together; corolla pale-violet, about 15 mm. long; banner broadly obovate, retuse, with prominent callosities; wings with rounded basal auricles; keel-petals oblanceolate, without basal auricles; pod about 7 cm. long, glabrous.

TYPE LOCALITY: Grande, Hidalgo.

DISTRIBUTION: Oaxaca, Chiapas, and Hidalgo.

6. *Gliricidia meistophylla* (Donn. Smith) Pittier,
Contr. U. S. Nat. Herb. 20: 86. 1917.

Lonchocarpus meistophyllus Donn. Smith, Bot. Gaz. 56: 55. 1913.

A shrub, 3-5 dm. high, branched from the base; branches glabrous or sparingly pubescent when young; leaves 3-5 cm. long; stipules subulate, 2-3 mm. long; leaflets 15-19, oblong, 9-13 mm. long, 5-7 mm. wide, glabrous except the midrib beneath, rounded at both ends or retuse at the apex, revolute on the margins; racemes 4-6 cm. long; calyx glabrous, except the puberulent margin, 5 mm. long; upper lip retuse, the lower minutely 3-toothed; corolla rose-purple, 10-12 mm. long; banner orbicular; blades of the wings oblong, with indistinct basal auricles; keel-petals strongly falcate towards the apex; ovary with a stipe 3 mm. long, glabrous, 8 mm. long, 6-ovuled; pod unknown.

TYPE LOCALITY: Cuesta de Quililhá, near Perulhá, Baja Verapaz, Guatemala.

DISTRIBUTION: Known only from the type locality.

26. *SAUVALLELLA* Rydb. Am. Jour. Bot. 11: 480. 1924.

Shrubs, with odd-pinnate leaves, subulate free stipules, and minute lanceolate stipels. Flowers in axillary racemes, with small bracts and no bractlets. Calyx short-turbinate, broader than high, the teeth minute, the lower three triangular-subulate, the upper two minute, close together, obtuse. Banner suborbicular, short-clawed, with somewhat spreading sides, shorter than the wings. Wings obliquely obovate, short-clawed, with a prominent basal auricle. Keel-petals lunate, acute, united to the apex, longer than the other petals. Stamens diadelphous, the sheath cylindrical, not dilated above. Ovary many-seeded, glabrous; style glabrous, slightly curved at the base; stigma terminal; pod flat, linear, stipitate, many-seeded.

Type species, *Corynella immarginata* C. Wright.

1. *Sauvallella immarginata* (C. Wright) Rydb. Am. Jour.
Bot. 11: 480. 1924.

Corynella immarginata C. Wright; Sauv. Anal. Acad. Ci. Habana 5: 333. 1869.
Corynites immarginata Kuntze, Rev. Gen. 1: 173. 1891.

A shrub; branches puberulent, in age gray; stipules lance-deltoid, 3-5 cm. long, acuminate; leaves 9-12 cm. long; rachis puberulent, strongly sulcate; leaflets 11-15, lance-oblong to nearly linear, acute at the apex, acute or obtuse at the base, mucronate, 1-3 cm. long, glabrous on both sides or puberulent beneath; stipels minute, lanceolate; racemes short, axillary; pedicels 3-5 cm. long; calyx turbinate, 4 mm. high, 5 mm. broad, 5-lobed, the lower three lobes less than 1 mm. long, the upper two minute, close together, obtuse; corolla rose-red; banner sub-orbicular, retuse, 1 cm. long; wings obliquely obovate, obtuse, 13 mm. long, with a lanceolate basal auricle; keel-petals lunate, acute, 15-17 mm. long.

TYPE LOCALITY: Cajábana, Cuba.

DISTRIBUTION: Western Cuba.

ILLUSTRATION: Am. Jour. Bot. 11: pl. 36 A.

27. POITEA Vent. Choix *pl.* 36. 1807.

Vilmorina DC. Prodr. 2: 239. 1825.

Shrubs, with distichous odd-pinnate leaves, without stipels, the stipules subulate from a broader base, united with each other inside the petioles. Flowers in axillary racemes, with small bracts and no bractlets. Calyx cylindro-turbinate, acute at the base, more or less distinctly articulate, 5-lobed, the teeth short and the upper two close together. Corolla reddish-purple to white. Banner obovate, usually retuse, narrowed at the base, but scarcely clawed, enclosing the bases of the other petals, not reflexed. Wings narrow, straight, linear or linear-oblancoaleate. Keel-petals narrow, straight, longer than the banner, oblancoaleate, obtuse, only slightly united, but with free tips. Stamens diadelphous, often exerted, the sheath long and dilated above. Ovary stipitate, many-ovuled; style straight or slightly curved upward, glabrous; stigma minute, terminal. Pod flat, linear, stipitate, 2-valved. Seeds compressed, orbicular or obovate.

Type species, *Poitea galegioides* Vent.

Leaflets 23-41; wings equaling the keel or nearly so.
Leaflets 7-15; wings shorter than the keel.

1. *P. galegioides*.

Wings longer than the banner and as broad as the keel-petals.

Leaflets elliptic or oval, glabrous on both sides; corolla 18-20 mm. long. 2. *P. glyciophylla*.

Leaflets ovate, minutely puberulous beneath; corolla 45-50 mm. long. 3. *P. longiflora*.

Wings shorter than the banner and narrower than the keel-petals.

Leaves sericeous beneath; racemes 7-8 cm. long; calyx-lobes all acutish, minute. 4. *P. multiflora*.

Leaves short-pilose beneath; racemes 2.5-3 cm. long; upper calyx-lobes broader, obtuse. 5. *P. Plumieri*.

1. *Poitea galegioides* Vent. Choix *pl.* 36. 1807.

Poitea viciaefolia DC. Ann. Sci. Nat. 4: 99. 1825.

Robinia viciaefolia Bert.; DC. Prodr. 2: 263, as synonym. 1825.

Galega Berterii Spreng.; DC. Prodr. 2: 263, as synonym. 1825.

Poitea galegiformis Spreng. Syst. 3: 272. 1826.

A shrub; branches subvelutinous-villous, with brownish hairs; stipules subulate-filiform, from a broader base, 4-6 mm. long; leaves distichous, 6-10 cm. long; rachis subvelutinous, usually narrowly winged; leaflets 23-41, oblong, 1-2.5 cm. long, 3-5 mm. wide, obtuse at both ends, mucronate, villous on both sides with brown hairs, in age more glabrate above; racemes slender, 5-8 cm. long; peduncle brown-villous; bracts lanceolate-subulate, 2 mm. long; pedicels 1-1.5 cm. long; calyx-tube deeply turbinate, slightly pubescent, 7-8 mm. long, 5 mm. wide, the lobes short, triangular; corolla rose-purple; banner obovate, about 2 cm. long and 1 cm. wide, emarginate, tapering at the base; wings and keel-petals subequal and similar, about 3 cm. long, 4-5 mm. wide, linear-oblancoaleate, obtuse, with an oblong basal auricle and a claw 3 mm. long; pod about 7 cm. long, many-seeded, the stipe about equaling the calyx.

TYPE LOCALITY: Hispaniola.

DISTRIBUTION: Hispaniola.

ILLUSTRATIONS: Vent. Choix *pl.* 36; Am. Jour. Bot. 11: *pl.* 36 B.

2. *Poitea glyciophylla* (Poir.) Urban, Symb.

Ant. 1: 321. 1899.

Robinia glyciophylla Poir. in Lam. Encyc. 6: 227. 1804.

Poitea Campanilla DC. Prodr. 2: 263. 1825.

Robinia latifolia Bert.; DC. Prodr. 2: 263, as synonym. 1825. Not *R. latifolia* Mill. 1763.

A shrub, 1-2 m. high; young branches strigose, in age glabrate and gray; stipules subulate, 5-6 mm. long; leaves 1-1.5 dm. long; rachis glabrous, channeled above, not winged; leaflets usually 7-11, elliptic or oval, 2-4 cm. long, 1-1.5 cm. wide, rounded at the apex, obtuse at the base, green above, pale beneath, glabrous on both sides; racemes few-flowered, 2-3 cm. long; calyx-tube cylindro-turbinate, 6-7 mm. long, glabrous brown, the lobes deltoid, 1 mm. long; corolla red, pink, or white; banner obovate, emarginate. 12 mm. long; wings linear-oblancoaleate,

15 mm. long; keel-petals oblanceolate, nearly straight, 18–20 mm. long, united at the middle, obtuse; stamens exerted, fully 25 mm. long.

TYPE LOCALITY: "Martinique" (probably erroneous).
DISTRIBUTION: Hispaniola.

3. *Poitea longiflora* Urban, Symb. Ant. 2: 290. 1900.

A shrub; branches sparingly short-pilose when young, soon glabrous, grayish; stipules linear-subulate, 4–5 mm. long, connate at the base; leaves distichous, the rachis not winged; leaflets 7–13, narrowly ovate or ovate-oblong, obtuse, mucronate, 3–6.5 cm. long, 1.5–3 cm. wide, glabrous above, minutely pilulose beneath, rounded at the base, green above, grayish-brown beneath; racemes axillary, corymbiform, 2–3.5 cm. long; bracts ovate, acuminate, 1–1.5 mm. long; bractlets none; calyx-tube cylindric-turbinate, 7 mm. long, the lobes very short, triangular; corolla red; banner obovate, truncate-emarginate, 20–25 mm. long, 13 mm. broad, the claw 6 mm. long; wings oblong-linear, 25–30 mm. long, 4 mm. wide, obtuse, somewhat falcate; keel-petals linear-oblong, obtuse, 45–50 mm. long, 5 mm. broad, the claw 5 mm. long; stamens exerted, 5.5 cm. long, diadelphous, the sheath somewhat dilated above, the alternate filaments longer; ovary stipitate, linear, about 25-ovuled; mature pod unknown.

TYPE LOCALITY: On granite rocks, on the banks of Nigua River, Santo Domingo.
DISTRIBUTION: Known only from the type locality.

4. *Poitea multiflora* (Sw.) Urban, Symb. Ant. 2: 291. 1900.

Citoria multiflora Sw. Prodr. 106. 1788.
Vilmorinia multiflora DC. Prodr. 2: 239. 1825.

A shrub, 1–2 m. high; young branches yellowish, tomentose, in age glabrate, grayish; stipules subulate-setaceous, from a lanceolate base, connate at the base; leaves distichous, the rachis not winged; leaflets 9–15, with petiolules 2.5–3 mm. long, ovate or ovate-elliptic, rounded at the base, dark-green and short-pilose or glabrate above, paler and densely sericeous and somewhat ferruginous beneath; racemes many-flowered, 7–10 cm. long, light-yellowish villous; bracts oblong-lanceolate to linear-subulate, 2–4 mm. long; calyx-tube oblong-campulate, short-pubescent or glabrate, 5–6 mm. long, the lobes very short, the upper two very small or obsolete, all acutish; corolla violet or blood-red; banner obovate, rounded or emarginate at the apex, 2–3.5 cm. long, 1–2 cm. wide; wings 14–17 mm. long, linear, straight, rounded at the apex, 1.2–1.4 mm. wide; keel-petals nearly straight, oblong-linear, 23–28 mm. long, 4 mm. wide, united above; stamens 2.5–3 cm. long, the sheath dilated above; pod linear, 12–16-seeded, glabrous; seeds subrotund, compressed.

TYPE LOCALITY: Santo Domingo.
DISTRIBUTION: Hispaniola.

5. *Poitea Plumieri* Urban, Symb. Ant. 6: 11. 1909.

A shrub, 2.5–3 m. high; young branches densely pilose, especially at the top, the pubescence first yellowish, in age white; stipules linear-subulate from a broader base, 5–8 mm. long; leaves distichous, the rachis short-pilose, sulcate; leaflets 11–13, ovate or oval, rounded at the apex, mucronate, 3–5 cm. long, 1.5–2.5 cm. wide, glabrous above, short-pilose and paler beneath; racemes up to 2.5–3 cm. long; pedicels 10–12 mm. long; bracts subulate from a broader base, 2–4 mm. long, persistent; calyx 6–7 mm. long, cylindric-turbinate, pilosulous on the margin; upper two lobes broadly triangular, obtuse, the lower three narrower, minute; corolla red; banner oblong, rounded and emarginate at the apex, 23–26 mm. long, 8 mm. wide; wings linear, straight, obtuse, 15 mm. long, 1 mm. wide; keel-petals linear-oblong, obtuse at the apex, 25–28 mm. long, 3.5 mm. wide, united at the middle; stamens equaling the keel; pod linear, 7–8.5 cm. long, 5–7 mm. wide, the stipe 7–8 mm. long; seeds obovate.

TYPE LOCALITY: Aux Caye, between Camp-Perrin and la Ravine, Haïti.
DISTRIBUTION: Hispaniola.
ILLUSTRATION: Plumier, Pl. Am. pl. 233, f. 1.

28. BENTHAMANTHA Alef. Bonplandia 10: 264.1862.

Tephrosia § *Craccoides* DC. Mém. Leg. 267. . 1823.

Cracca Benth.; Benth. & Oerst. Vidensk. Medd. 1853: 8. 1853. Not *Cracca* L. 1753.

Brittonamra Kuntze, Rev. Gen. 164. 1891.

Suffrutescent perennials. Leaves odd-pinnate, with stipules and stipels. Flowers in axillary racemes; bracts subulate or setaceous, caducous. Calyx with a campanulate tube and 5 subequal lobes, with setaceous or subulate acuminations. Corolla yellowish or white, the petals subequal. Banner clawed, the blade orbicular or reniform, with reflexed margins. Wings clawed, with oblong blades, free. Keel-petals broadly obliquely obovate, acute or acuminate, united to the apex. Stamens diadelphous. Ovary sessile, many-ovuled; style rigid, inflexed, longitudinally bearded above; stigma capitate. Pod linear, flat, 2-valved, conspicuously constricted between the seeds externally, internally with cross-partitions between the seeds. Seeds subrectangular or subquadrate in outline, without strophiole.

Type species, *Tephrosia ochroleuca* Pers.

Plants fruticose or suffruticose, with erect branches.

Leaflets 5-27.

Calyx-lobes, at least the lowest one, nearly twice as long as the tube.

Pod glabrous.

Leaflets 5-7, softly pilose; stem softly pubescent.

Leaflets 11-15, strigose; stem glabrous or nearly so.

Pod pubescent.

Leaflets 11-17, rounded-oval, 1-3 mm. long.

Leaflets oblong to oval, more than 5 mm. long, usually more than 1 cm. long.

Stem with spreading pubescence.

Leaflets 11-17, usually less than 1.5 cm. long; peduncles more or less glandular.

Branches short-pilose; corolla 1 cm. long or more.

Branches long-pilose; corolla about 9 mm. long.

Leaflets 7-11, rarely 13, 1-4 cm. long, usually more than 1.5 cm. long, especially the upper leaflets; peduncles not glandular.

Stem with appressed pubescence.

Corolla 10-12 mm. long; leaflets 11-25.

Corolla 6-8 mm. long; leaflets 9-13.

Leaflets elliptic or oblong, 1-3 cm. long; corolla 7-8 mm. long.

Leaflets lanceolate or ovate, often 4-7 cm. long; corolla 6 mm. long.

Calyx-lobes only slightly longer than the tube.

Leaflets 13-21, less than 1.5 cm. long, sparingly pilose along the margins and the veins; pod puberulent.

Leaflets 7-13, uniformly pubescent.

Pod puberulent; stem sparingly pilose with spreading hairs; leaflets 1-3.5 cm. long.

Pod glabrous; stem pubescent with ascending or appressed hairs.

Stem and lower surface of the leaves sparingly strigose, green on both sides.

Stem and lower surface of the leaves silky-canescenscent.

Leaflets 3.

Leaflets oval, rounded at the apex; racemes 3-5 cm. long.

Leaflets lanceolate or elliptic-ovate, acutish; racemes 2 cm. long or less.

Plants herbaceous, perennial, low, spreading, 1-2 dm. high; roots fusiform-thickened or tuber-bearing; corolla 6-8 mm. long.

Leaflets 11-21; root elongate-fusiform.

Pod puberulent; leaflets 13-21.

Pod glabrous; leaflets 11-15.

Leaflets 3-9; roots with small tubers.

Leaflets 5-9.

Corolla ochroleucous, 8 mm. long; calyx-lobes longer than the tube.

Corolla ochroleucous, with purplish banner, 6 mm. long; calyx-lobes equaling the tube.

Leaflets 3-5; corolla cream-white; calyx-lobes nearly twice as long as the tube.

1. *B. ochroleuca*.

2. *B. panamensis*.

3. *B. microphylla*.

4. *B. chiapensis*.

5. *B. bicolor*.

6. *B. mollis*.

7. *B. caribaea*.

8. *B. Brandegei*.

9. *B. micrantha*.

15. *B. glabella*.

10. *B. Wrightii*.

11. *B. Painteri*.

12. *B. Edwardsii*.

13. *B. trifoliolata*.

14. *B. robusta*.

15. *B. glabella*.

16. *B. pumila*.

17. *B. glandulosa*.

18. *B. tuberosa*.

19. *B. Greenmanii*.

1. *Benthamantha ochroleuca* (Jacq.) Alef. Bonplandia
10: 264. 1862.

Galega ochroleuca Jacq. Ic. Pl. Rar. 1: 15. 1786.

Tephrosia ochroleuca Pers. Syn. Pl. 2: 329. 1807.

Cracca ochroleuca Benth. & Oerst. Vidensk. Meddel. 1853: 9. 1853.

Brittonamra caribaea ochroleuca Kuntze. Rev. Gen. 165. 1891.

A perennial, shrubby below; stem about 1 m. high, erect, terete, softly pubescent; stipules subulate-setaceous, 8-10 mm. long; leaflets 5-7, oval or ovate, 1-3 cm. long, softly pilose, mucronate; racemes about 1 dm. long, lax; bracts subulate; calyx pilose, the tube 2 mm. long, the lobes subulate, 4 mm. long; corolla about 1 cm. long, ochroleucous, tinged with red; pod glabrous, 3-5 cm. long, 3 mm. broad. 12-16-seeded.

TYPE LOCALITY: Garden specimen raised from seeds of unknown origin.

DISTRIBUTION: Peru to Panama.

ILLUSTRATION: Jacq. Ic. Pl. Rar. *pl.* 150.

2. *Benthamantha panamensis* Rydberg, sp. nov.

A suffrutescent perennial; stem 3 dm. high or more; branches slightly silky-strigose when young, soon glabrous, terete, green or tinged with purple; stipules setaceous, 3-5 mm. long; leaves 5-8 cm. long; rachis sparingly puberulent; leaflets 11-15, oblong or elliptic, 1-2.5 cm. long, thin, sparingly silky-strigose above, more densely so beneath, green on both sides; stipels setaceous-subulate, 1 mm. long; racemes 5-8 cm. long, 5-10-flowered; peduncle pilose; bracts setaceous, 5 mm. long, deciduous; calyx pilose, the tube 2 mm. long, the lobes subulate, attenuate, 4-5 mm. long; corolla 8-9 mm. long, the keel yellow, the wings slightly tinged with purple, the banner rose, with purple veins; pod glabrous or slightly granuliferous.

Type collected around Alhajuela, Panama, January 11 and 12, 1911, *Pittier 2340** (U. S. Nat. Herb. no. 676582).

3. *Benthamantha microphylla* Rydberg, sp. nov.

A shrub, 1.5 m. high; young branches sparingly silky-puberulent, in age glabrate, and the second year ash-colored; stipules setaceous, 3 mm. long; leaves 1-2.5 cm. long; rachis silky; leaflets 13-17, rounded-oval, 1-3 mm. long sparingly silky above, densely so and almost white beneath; racemes 1-2 cm. long, 1-4-flowered; calyx silky, the tube 2 mm. long, the lobes lance-subulate, 4 mm. long; corolla ochroleucous, 8-9 mm. long, the banner with brownish-purple veins; pod 4-5 cm. long, nearly 3 mm. wide, puberulent, 14-17-seeded.

Type collected at Rio Coajaguillo, Michoacán or Guerrero, February, 1899, *Langlassé 830* (U. S. Nat. Herb. no. 385557).

4. *Benthamantha chiapensis* Rydberg, sp. nov.

A shrub, 6-10 dm. high; branches densely short-pilose when young, soon glabrous, light-green, angled, grooved; stipules setaceous, 5-8 mm. long; leaves 4-6 cm. long; leaflets 11-17, oval, rounded at each end, cuspidate, 6-15 mm. long, silky-pilose on both sides, densely so beneath; stipels setaceous, 1 mm. long; racemes 5-8 cm. long, the peduncle densely pilose and glandular, 5-10-flowered; calyx pilose, the tube 2 mm. long, the lobes subulate, attenuate, 4 mm. long; corolla about 1 cm. long, ochroleucous, the banner with brown-purple veins.

Type collected near Jalisco, Chiapas, December 12, 1907, *C. B. Doyle 50* (U. S. Nat. Herb. no. 574700).

* The same number in the herbarium of the New York Botanical Garden is dated May 12 to 15, 1911.

5. *Benthamantha bicolor* (M. Micheli) Rose, Contr. U. S.
Nat. Herb. 10: 99. 1906.

- *Cracca bicolor* M. Micheli, Bull. Herb. Boiss. 2: 444. 1894.

A suffrutescent perennial; stem erect, villous-canescens; stipules subulate-setaceous, 6-8 mm. long; leaves 5-8 cm. long, densely villous, stipels minute, setaceous; leaflets 11-13, oval, obtuse at both ends, mucronate, 8-18 mm. long, 4-8 mm. wide, silky-villous on both sides; racemes 4-10 cm. long, 4-7-flowered; bracts lance-subulate, 3 mm. long; calyx appressed-pubescent, the tube 2 mm. long, the lobes lance-subulate, 4 mm. long; corolla about 9 mm. long, ochroleucous, the banner purplish, retuse; pod puberulent, 4 cm. long, nearly 3 mm. wide.

TYPE LOCALITY: Near Cumén, Quiché, Guatemala.

ILLUSTRATION: Bull. Herb. Boiss. 2: pl. 11.

6. *Benthamantha mollis* (H.B.K.) Alef. Bonplandia
10: 264. 1862.

- *Tephrosia mollis* H.B.K. Nov. Gen. & Sp. 6: 463. 1823.

⁴ *Cracca mollis* Benth. & Oerst. Vidensk. Meddel. 1853: 9. 1853.

Benthamantha fruticosa Rose, Contr. U. S. Nat. Herb. 10: 99. 1906.

A shrub, perhaps 2 m. high; branches silky-villous when young, straw-colored and glabrous the second year; stipules setaceous, 4-8 mm. long; leaves about 5 cm. long; rachis short-villous; stipels subulate, minute; leaflets 7-13, elliptic, 1-4 cm. long, rounded at the apex, mucronate, silky on both sides (the hairs short on the upper side, longer on the lower); racemes 5-10 cm. long, 5-10-flowered; bracts subulate, 3 mm. long; calyx silky-pilose, the tube 2 mm. long, the lobes 3-4 mm. long, lance-subulate, attenuate; corolla about 9 mm. long, greenish-yellow, the banner more or less tinged with purple; pod 4-6 cm. long, 3 mm. wide, puberulent, 20-25-seeded, 6-7 cm. long, 3 mm. wide.

TYPE LOCALITY: Cumanacoa, Venezuela.

DISTRIBUTION: Yucatán to San Luis Potosí, Guerrero, and south to Ecuador and Venezuela.

7. *Benthamantha caribaea* (Jacq.) Kuntze, Rev.
Gen. 3³: 53. 1898.

- *Galega caribaea* Jacq. Sel. Stirp. Am. 212. 1763.

- *Galega pubescens* Lam. Encycl. 2: 597. 1786.

Tephrosia caribaea DC. Prodr. 2: 251. 1825.

Cracca caribaea Benth.; Benth. & Oerst. Vidensk. Meddel. 1853: 9. 1853.

- *Tephrosia aniloides* Bello, Anal. Soc. Esp. Hist. Nat. 10: 258. 1881.

Brittonamra caribaea Kuntze, Rev. Gen. 164. 1891.

Brittonamra caribaea Grisebachiana Kuntze, Rev. Gen. 165. 1891.

Brittonamra caribaea Jacquiniana Kuntze, Rev. Gen. 165. 1891.

Cracca aniloides Cook & Collins, Contr. U. S. Nat. Herb. 8: 128. 1903.

A shrub, 5-15 dm. high; branches more or less strigose-canescens, in age glabrate and straw-colored; stipules setaceous, 4-10 mm. long; leaves 4-10 cm. long; rachis strigose or pilose; leaflets 11-25, elliptic, from rounded to acute at each end, cuspidate, 0.6-3 cm. long, silky-strigose on both sides, sometimes densely sericeous beneath; stipels 1 mm. long or less, subulate; racemes 4-6 cm. long, 1-6-flowered; bracts subulate, 3-5 mm. long; calyx silky-strigose, the tube 2.5 mm. long, the lobes lance-subulate, attenuate, 3 mm. long; corolla 10-12 mm. long, white, or the banner ochroleucous, often veined with purple, or wholly pink or purplish; pod 5-6 cm. long, 3 mm. wide, puberulent, 16-22-seeded; seeds subrectangular, 2 mm. long, 1.5 mm. broad.

TYPE LOCALITY: The Caribbeans.

DISTRIBUTION: Hispaniola; Porto Rico; Lesser Antilles; Panama; also in northern South America.

ILLUSTRATIONS: Jacq. Sel. Stirp. Am. pl. 125; Sel. Stirp. Am. Pict. pl. 193; Am. Jour. Bot. 11: pl. 36 C.

8. *Benthamantha Brandegei* Rydberg, sp. nov.

A low shrub; stem sparingly appressed-pubescent, soon glabrous, striate, in age straw-colored; stipules setaceous, 5–8 mm. long; leaves 5–8 cm. long; rachis sparingly strigose; stipules subulate, minute; leaflets 9–13, thin, elliptic or oblong, 1–3 cm. long, green but strigose on both sides, mucronate; racemes 3–8 cm. long, 6–12-flowered; peduncle pilose; bracts setaceous, 3–5 mm. long; calyx pilose, the tube 2 mm. long, the lobes 3–4 mm. long; corolla ochroleucous or the banner purplish, about 7 mm. long; pod 6–8 cm. long, 3 mm. wide, 2–28-seeded, puberulent.

Type collected on the west slope of Cape Region mountains, Lower California, November, 1902, *Brandege* (U. S. Nat. Herb. no. 397951).

DISTRIBUTION: Lower California and Sonora to Guerrero and Morelos; apparently also Costa Rica.

9. *Benthamantha micrantha* (M. Micheli) Rose,
Contr. U. S. Nat. Herb. 10: 99. 1906.

Cracca micrantha M. Micheli, Bull. Soc. Bot. Belg. 30¹: 286. 1891.
Brittonanra caribaea f. *micrantha* Kuntze, Rev. Gen. 165. 1891.

A suffruticose perennial; stems erect, angled, sparingly pilose or glabrate; stipules setaceous, 5–8 mm. long; leaves 1–1.5 dm. long; rachis sparingly pilose; leaflets 9–13, lanceolate or ovate, often 4–7 cm. long, mucronate, acute, sparingly puberulent-strigose on both sides, or nearly glabrous, thin, 2–5 cm. long, or the terminal one up to 7 cm. long; racemes 3–6-flowered, 4–6 cm. long; bracts subulate, caducous; calyx strigose-puberulent, the tube 2 mm. long, the lobes lance-subulate, 2 mm. long, or the lowest one 3 mm. long; corolla 6 mm. long; pod puberulent or glabrate, 5–7 cm. long, 6 mm. wide, 14–25-seeded.

TYPE LOCALITY: Near San José, Costa Rica.

DISTRIBUTION: Costa Rica.

10. *Benthamantha Wrightii* Rydberg, sp. nov.

Cracca Edwardsii A. Gray, Pl. Wright. 2: 35, in part. 1853.—A. Gray, Proc. Am. Acad. 17: 201. 1882.

A suffruticose perennial; stem 3–5 dm. high, at first sparingly pilose with spreading hairs; stipules subulate-setaceous, 4–5 mm. long; leaves 7–10 cm. long; rachis sparingly pilose; stipules subulate, 1 mm. long or less, often caducous; leaflets 7–13, elliptic, 1–3.5 cm. long, sparingly appressed-silky on both sides, obtuse at both ends, often purplish along the veins beneath; racemes 1–1.5 dm. long, often exceeding the leaves; bracts tinged with purple; calyx-tube 2 mm. long, the lobes lance-subulate, acuminate, the upper two 2 mm. long, the lowest one 3 mm. long; corolla 7 mm. long, the banner purple, the wings and keel yellowish; pod 6 mm. long, 3 mm. wide, puberulent, nearly straight.

Type collected between San Pedro and the Sonoita, Sonora, *C. Wright 963*, in part (herb. Columbia Univ.).

DISTRIBUTION: Sonora and Arizona.

11. *Benthamantha Painterii* Rydberg, sp. nov.

A perennial, suffruticose below; branches sparingly hairy, 3–5 dm. high, angled, tinged with purple above; leaves 4–7 cm. long; stipules setaceous, 5–7 mm. long; rachis sparingly pubescent with spreading hairs; leaflets 7–15, oval or elliptic, green and sparingly strigose on both sides, 1–2 cm. long, rounded at each end, mucronate; racemes lax, 1–1.5 dm. long; bracts subulate; calyx purplish, sparingly strigose, the tube 2 mm. long, the lobes lance-subulate, acuminate, 2 mm. long; corolla 6–7 mm. long, ochroleucous, tinged with purple; pod 4–5 cm. long, 3 mm. wide, glabrous, 16–25-seeded.

Type collected near Guadalajara, Jalisco, September 30, 1903, *Rose & Painter 7455* (U. S. Nat. Herb. no. 451059).

DISTRIBUTION: Jalisco and Durango.

12. *Benthamantha Edwardsii* (A. Gray) Rose,
Contr. U. S. Nat. Herb. 10: 99. 1906.

- *Cracca Edwardsii* A. Gray, Pl. Wright. 2: 35. 1853.
- *Cracca* sp. Benth. & Oerst. Vidensk. Meddel. 1853: 9. 1853.
- *Benthamantha Grayi* Alef. Bonplandia 10: 264. 1862.
- *Cracca Edwardsii sericea* A. Gray, Proc. Am. Acad. 17: 201. 1882.
- *Cracca sericea* A. Gray, Proc. Am. Acad. 19: 74. 1883.
- *Brittonanra caribaea Edwardsii* Kuntze, Rev. Gen. 165. 1891.
- *Brittonanra sericea* Kearney, Trans. N. Y. Acad. 14: 32. 1894.
- *Benthamantha sericea* Britten & Baker f. Jour. Bot. 38: 19. 1900.

A low, suffruticose perennial; stem branched, 2-3 dm. high, woody at the base; branches canescent with ascending hairs; stipules subulate-setaceous, 3-5 mm. long; leaves 3-10 cm. long; rachis villous-canescens; stipels less than 1 mm. long; leaflets 9-13, elliptic, 1-2.5 cm. long, acute or obtuse, sparingly silky above, densely silky-canescens beneath, cuspidate, the cusps and petiolules about 1 mm. long; racemes 4-10 cm. long, slender, as long as or longer than the leaves; bracts subulate, 2-3 mm. long; calyx silky-pilose, the tube 2 mm. long, the lobes lance-subulate, 2-3 mm. long, the lowest longer than the rest; corolla 7-8 mm. long, the banner purple, the keel and the wings ochroleucous; pod 5-5.5 cm. long, 3 mm. wide, glabrous, 12-16-seeded.

TYPE LOCALITY: Near Monterey, Nuevo León.

DISTRIBUTION: Southern Arizona and northern Sonora to Nuevo León.

13. *Benthamantha trifoliolata* Rydberg, sp. nov.

A shrub, 5 dm. high or more; branches silky-canescens when young, angled, dark-brown or purplish, in the second year glabrate and straw-colored; stipules setaceous, 6-10 mm. long, leaves 3-5 cm. long; rachis canescens; stipels setaceous, 1-1.5 mm. long; leaflets 3, oval, 1.5-4 cm. long, 0.8-2 cm. wide, hirsutulous above, densely hirsute beneath, rounded or obtuse at each end or acutish at the base, mucronate; racemes 3-5 cm. long, 3-6-flowered; calyx pilose; the tube about 2 mm. long, the lobes lance-subulate, attenuate, the lowest one 3 mm. long; corolla purplish, 7 mm. long; pod 4-5 cm. long, fully 3 mm. wide, minutely puberulent or glabrate, 9-15-seeded.

Type collected at Tehuacán, Puebla, June, 1912, *Purpus* 5715 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Puebla and Guerrero.

14. *Benthamantha robusta* Rydberg, sp. nov.

A stout perennial; stem simple, probably 1 m. high, densely short-villous, grayish-subvelutinous, striate; leaves 5-10 cm. long; stipules setaceous, 8-10 mm. long; rachis subvelutinous; leaflets lanceolate to elliptic-ovate, 2-7 cm. long, 1-3 cm. wide, acute or acutish at each end, subvelutinous on both sides; racemes 2 cm. long or less, 2-4-flowered; calyx canescens, the tube 3 mm. long, the lobes lance-subulate, 3 mm. long; corolla unknown; pod 6-8 mm. long, 3 mm. wide, glabrous or slightly pruinose, 20-25-seeded.

Type collected in the Iguala Cañon, Guerrero, November 31, 1903, *Holway* 40 (U. S. Nat. Herb. no. 472548).

15. *Benthamantha glabella* (A. Gray) Rydb.

- *Cracca Edwardsii* A. Gray, Pl. Wright. 2: 35, in part. 1853.
- *Cracca Edwardsii glabella* A. Gray, Proc. Am. Acad. 17: 201. 1882.
- *Benthamantha Grayi glabella* Britten & Baker f. Jour. Bot. 38: 19. 1900.

A suffruticose perennial, woody at the base, with a fusiform root; stem 2-4 dm. high, sparingly pilose; stipules subulate, 2 mm. long; leaves 4-7 cm. long; leaflets 13-21, elliptic or oval, 0.5-1.5 cm. long, rounded at each end, sparingly pilose along the margin and the veins or glabrate above, often purple along the veins beneath, mucronate; stipels minute or obsolete; racemes 4-7 cm. long, sparingly pilose; bracts subulate, 2 mm. long; calyx silky, the tube 2

mm. long, the lobes lance-subulate, acuminate, 3 mm. long, the lowest only slightly longer; corolla 7 mm. long, ochroleucous, the banner veined with brownish-purple; pod 5 cm. long, 3 mm. wide, puberulent.

TYPE LOCALITY: (Not given, but by inference) hills between the Barbocomori [Arizona] and Santa Cruz, Sonora.

DISTRIBUTION: Southern Arizona, northern Sonora, Chihuahua, and Durango.

16. *Benthamantha pumila* Rose, Contr. U. S. Nat.
Herb. 10: 99. 1906.

A perennial, with woody fusiform roots, the stem woody only at the branched base; branches 1-2 dm. high, purplish, sparingly silky, decumbent or ascending; stipules subulate, 3 mm. long; leaves 5-8 cm. long; stipels subulate, 1 mm. long; leaflets 11-15, oblong to oval, 1-2 cm. long, rounded at each end, mucronate, glabrous above, sparingly silky beneath; racemes 3-9 cm. long, 3-6-flowered; bracts subulate, 2-3 mm. long; calyx sparingly pilose, the tube 1.5 mm. long, the lobes lanceolate, acuminate, 2 mm. long; corolla 6 mm. long, yellowish, the banner partly purplish, with dark veins; pod 4-5 cm. long, 3.5 mm. broad, glabrous or granulariferous, 12-15-seeded.

TYPE LOCALITY: On the road between San Juan del Rio and Cadereyta, Querétaro.

DISTRIBUTION: Querétaro to Puebla.

ILLUSTRATION: Contr. U. S. Nat. Herb. 10: pl. 30.

17. *Benthamantha glandulosa* Rose, Contr. U. S.
Nat. Herb. 10: 99. 1906.

A perennial, woody only at the base; stem branched, spreading, sparingly pilose, 2-3 dm. high; stipules subulate-setaceous, 2-3 mm. long; leaves 3-6 cm. long; rachis sparingly pilose; stipels minute; leaflets 5-7, elliptic or obovate, sparingly short-pubescent on both sides, often mottled along the veins, rounded and mucronate at apex; racemes 5-10 cm. long; peduncle pilose and slightly glandular, 4-7-flowered; bracts setaceous, 3 mm. long, caducous; calyx pilose, the tube 1.5 mm. long, the lobes nearly 3 mm. long, lanceolate, acuminate; corolla ochroleucous, about 8 mm. long; pod glabrous.

TYPE LOCALITY: Chiapas, Santa Rosa, Guatemala.

DISTRIBUTION: Guatemala.

18. *Benthamantha tuberosa* Brand. Univ. Calif.
Publ. Bot. 4: 376. 1913.

A perennial, woody at the branched base only, the roots bearing small fusiform tubers; stems branched, diffuse, 1-2 dm. high, sparingly hairy; stipules subulate, 2-3 mm. long; leaves 3-5 cm. long; stipels minute; rachis with a few minute hairs; leaflets 5-9, oblong-obovate, 1-2 cm. long, rounded at the apex, rounded to cuneate at the base finely strigose on both sides or glabrate above; racemes 3-4 cm. long, 3-5-flowered; calyx sparingly strigose, the tube 1.5 mm. long, the lobes lance-subulate, 1.5 mm. long; corolla 6 mm. long, yellowish, the banner tinged and veined with purple; pod 4 cm. long, 2.5 mm. wide, glabrous, 16-seeded.

TYPE LOCALITY: Baños del Carrizal, Veracruz.

DISTRIBUTION: Known only from the type locality.

19. *Benthamantha Greenmanii* Britten & Baker f.
Field Mus. Publ. Bot. 2: 50. 1900.

Cracca Greenmanii Millsp. Field Mus. Publ. Bot. 1: 299. 1896.

A perennial, woody at the branched base, the roots bearing small fusiform tubers; stems decumbent or spreading, 1-2 dm. high, finely strigose; stipules subulate, 2 mm. long; leaves 3-4 cm. long; rachis sparingly strigose; stipels minute; leaflets 3-5, obovate, obtuse to retuse and mucronate at the apex, 1-2 cm. long, glabrous above, finely strigose beneath; racemes 5-7

cm. long; peduncle pilose and glandular; bracts subulate, 2-3 mm. long; calyx strigose, the tube 2 mm. long, the lobes lanceolate, acuminate, 3 mm. long; corolla cream-white; pod 16-seeded.

TYPE LOCALITY: Chichen Itza, Yucatán.
DISTRIBUTION: Yucatán and Campechy.
ILLUSTRATIONS: Field Mus. Publ. Bot. 1: pl. 13.

EXCLUDED SPECIES

BENTHAMANTHA GLABRESCENS (Benth.) Alef. Bonplandia **10**: 264. 1862. *Tephrosia glabrescens* Benth. Bot. Voy. Sulph. 81. 1844. *Cracca glabrescens* Benth.; Benth. & Oerst. Vidensk. Meddel. **1853**: 9. 1853. *Brittonnara caribaea glabrescens* Kuntze, Rev. Gen. 165. 1891. This has been reported erroneously from Mexico. It is a native of Colombia.

29. **SPHINCTOSPERMUM** Rose, Contr. U. S.

Nat. Herb. **10**: 107. 1906.

Annual herbs, with simple linear leaves. Flowers single or rarely paired in the axils, short-pedicelled, with minute bracts and no bractlets. Calyx turbinate, with 5 subequal lobes. Corolla pinkish. Banner rounded-obcordate, with a very short claw. Wing-petals short-clawed, the blade obliquely oblong with an acute basal auricle. Keel-petals strongly lunate, united above almost semi-orbicular, with a prominent basal lobe. Stamens 10, diadelphous, the upper filament free, the other nine united less than half their length, the alternate ones shorter; anthers uniform. Ovary sessile; style slender, hairy near the top. Pod linear, flat, 2-valved, transversely septate between the seeds. Seeds prismatic, constricted at the middle, roughened.

Type species, *Tephrosia constricta* S. Wats.

1. **Sphinctospermum constrictum** (S. Wats.) Rose,

Contr. U. S. Nat. Herb. **10**: 107. 1906.

Tephrosia constricta S. Wats. Proc. Am. Acad. **24**: 46. 1889.

Annual; stem simple or with a few ascending branches, 2-4 dm. high, glabrous or sparingly strigose, slender; leaves sessile, simple, linear, 2-7 cm. long, 1-3 mm. wide, glabrous or nearly so; pedicel 2-5 mm. long, jointed below the middle, recurved; calyx glabrous, the tube about 1 mm. long, the lobes lanceolate, acute, somewhat spreading, 1.5 mm. long; corolla about 5 mm. long; pod 3-4 cm. long, 3 mm. wide, glabrous, straight, pendent; seeds fully 2 mm. long, nearly as broad, prismatic, constricted in the middle, the lateral angles with rounded ribs.

TYPE LOCALITY: Guaymas, Sonora.
DISTRIBUTION: Arizona, Sonora, and Lower California.
ILLUSTRATIONS: Contr. U. S. Nat. Herb. **10**: pl. 34; Am. Jour. Bot. **11**: pl. 36 D.

Subtribe 9. **COLUTEANAE**. Shrubs or suffrutescent herbs. Leaves odd-pinnate. Flowers in axillary racemes; bracts and sometimes bractlets present. Calyx campanulate, 5-lobed. Corolla in ours rather showy. Stamens usually diadelphous; anthers all alike. Style hairy on the upper margin. Pod inflated, papery, 1-celled, often indehiscent.

Style strongly hooked at the end, with the stigma subterminal in the sinus; petals nearly equal, broad; banner porrect; keel-petals blunt. 30. **COLUTEA**.
Style not hooked, with a terminal capitate stigma; petals unequal, long and narrow; keel-petals acute, longer than the banner and much longer than the wings. 31. **COLUTIA**.

30. **COLUTEA** L. Sp. Pl. 723. 1753.

Shrubs, with odd-pinnate leaves, small caducous stipules, and no stipels. Flowers in axillary racemes; bracts minute or none. Calyx-tube campanulate; lobes short, subequal or the upper two shorter. Corolla yellowish or reddish. Banner short-clawed, the blade

spreading, suborbicular, with two folds or callosities near the base. Wings with oblong falcate blades. Keel-petals broad, strongly curved, obtuse, the long claws united. Stamens diadelphous; anthers subequal. Ovary stipitate, many-ovuled; style incurved, long-bearded along the upper margin, inflexed or spiral at the apex, the stigma inside the thickened apex. Pod membranous, inflated. Seeds many, reniform, with a slender funicle.

Type species, *Colutea arborea* L.

1. *Colutea arborea* L. Sp. Pl. 723. 1753.

Colutea florida Salisb. Prodr. 337. 1796.

A shrub, 2-4 m. high, much branched; young branches grayish-strigose; stipules triangular-lanceolate, acuminate, 3-4 mm. long; leaves 7-10 cm. long; rachis strigose, grooved on the upper side; leaflets mostly 9, obovate, retuse at the apex, 1-3 cm. long, 7-18 mm. wide, glabrous above, sparingly strigose beneath; racemes 5-8 cm. long; bracts oblong, 2 mm. long; calyx strigose, the tube campanulate, 5 mm. long, the upper two lobes broadly triangular, 1.5 mm. long, the lower three deltoid, acute, 2 mm. long; corolla yellow, 1.5-2 cm. long; pod inflated, ovoid, tapering at each end, 6-7 cm. long, 2.5-3.5 cm. broad; seeds brown, round-reniform, 4 mm. long.

TYPE LOCALITY: Austria.

DISTRIBUTION: Occasionally escaped from cultivation in the eastern states, from Massachusetts and Minnesota southward, native of southern Europe.

ILLUSTRATIONS: Bot. Mag. pl. 81; Sibth. Fl. Graeca pl. 707; Guimp. Holzgew. pl. 133; Nouv. Duham. 3; pl. 22; Fl. Deuts. ed. 5. pl. 2423; Thome, Fl. Deuts. pl. 438; ed. 2: pl. 366A; Coste, Fl. Fr. f. 978.

31. COLUTIA Medic. Vorles. Churpf. Phys.

Ges. 2: 366. 1787.

Sutherlandia R. Br. in Ait. Hort. Kew. ed. 2. 4: 327. 1812. Not *Sutherlandia* Gmel. 1791.

Shrubs, with odd-pinnate leaves, many leaflets, minute deciduous stipules, and no stipels. Flowers in axillary racemes, with small deciduous bracts and minute bractlets. Calyx-tube campanulate; lobes short, subequal, acute, the upper two somewhat broader. Corolla scarlet, rarely white. Banner spreading at the apex, shorter than the keel, obovate, short-clawed. Wings about half as long, with semisagittate blades. Blades of the keel-petals obliquely obovate, acute at the apex, semicordate at the base. Stamens diadelphous; anthers uniform. Ovary stipitate, many-ovuled; style filiform, slightly incurved, bearded on the upper margin and in front below the minute terminal stigma. Pod membranous, inflated, one-celled. Seeds many, reniform, with a slender funicle.

Type species, *Colutea frutescens* L.

1. *Colutia frutescens* (L.) Medic. Phil. Bot. 1: 210. 1789.

Colutea frutescens L. Sp. Pl. 723. 1753.

Colutia amoena Medic. Vorl. Churpf. Phys. Ges. 2: 366. 1787.

Colutia rubra Moench, Meth. 160. 1794.

Colutea grandiflora Salisb. Prodr. 338. 1796.

Sutherlandia frutescens B. Br. in Ait. Hort. Kew. ed. 2. 4: 327. 1812.

A shrub; branches strigose-canescens; leaves 5-8 cm. long; stipules lanceolate, 3-4 mm. long; leaflets 11-19, oblong to oval, rounded at each end, or retuse at the apex, 5-10 mm. long, glabrate above, strigose-canescens beneath; racemes 3-6 cm. long; bracts lanceolate, caducous; calyx strigose-canescens, the tube 4-10 mm. long, the lobes lanceolate, 3-6 mm. long; corolla 2-3.5 cm. long; pod glabrous, the body 4-5 cm. long, 2-2.5 cm. wide, the stipe somewhat exceeding the calyx.

TYPE LOCALITY: Africa.

DISTRIBUTION: Hidalgo, Zacatecas, and Coahuila; escaped from cultivation and naturalized; native of South Africa.

ILLUSTRATIONS: Mill. Fig. Pl. pl. 99; Bot. Mag. pl. 181.

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- 33¹: 1-110. Carduales: Ambrosiaceae, Carduaceae (pars).
- 34¹: 1-80. 34²: 81-180. 34³: 181-288 (Carduales:) Carduaceae (pars).

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VOLUME 24

PART 5

NORTH AMERICAN FLORA

(ROSALES)

FABACEAE

GALEGEAE (pars)

✓
PER AXEL RYDBERG



PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

FEBRUARY 19, 1929

ANNOUNCEMENT

NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

- Volume 1. Myxomycetes, Schizophyta.
- Volumes 2 to 10. Fungi.
- Volumes 11 to 13. Algae.
- Volumes 14 and 15. Bryophyta.
- Volume 16. Pteridophyta and Gymnospermae.
- Volumes 17 to 19. Monocotyledones
- Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. M. A. Howe, and Dr. J. H. Barnhart.

Dr. Frederick V. Coville, of the United States Department of Agriculture; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or more parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

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Subtribe 10. **ASTRAGALANAE**. Herbs, or rarely shrubs or trees. Leaves usually odd-pinnate, reduced to a single leaflet in some species of *Homalobus* and *Jonesiella*; abruptly pinnate in *Caragana*, and digitate-trifoliate in *Orophaca*. Flowers in axillary racemes, with small, persistent bracts, usually racemose, but with short pedicels. Calyx with a campanulate or cylindrical tube and 5 lobes. Corolla usually consisting of an obovate banner, longer than the other petals and with flaring margins, rather broad wings with a large basal auricle directed downward, and shorter keel-petals with more or less lunate blades. Stamens usually diadelphous, with equal anthers. Ovary usually many-seeded, style glabrous and incurved above, and stigmas minute, terminal. Pods very variable, from papery to woody in texture, stipitate or sessile, perfectly 1-celled, or perfectly or partially 2-celled by a false septum formed by the intrusion and coalescence of the valves at either suture, usually many-seeded.

Herbs, with odd-pinnate or ternate leaves.

Keel not produced into a distinct beak.

Fruit * wholly 1-celled, the lower suture rarely sulcate but never inflexed and forming a partition.

Pod * more or less compressed laterally, both sutures prominent.

Leaflets spine-tipped; fruit 1-4-seeded.

Leaflets not spine-tipped; fruit several- to many-seeded.

Fruit without a gynophore.

Fruit with a gynophore, exceeding the calyx.

Pod not laterally compressed, or if slightly so, the lower suture not prominent.

Legume * usually leathery or woody in texture.

Leaves pinnate.

Valves of the pod not winged.

Legume stipitate, the body with two grooves on the upper side, one on each side of the suture.

Legume sessile, without two grooves on the upper side.

Calyx campanulate; stems usually elongate.

Pod erect, not cross-ribbed; corolla middle-sized, the banner narrow, moderately arched.

Legume rounded at the base, ovoid or ellipsoid, terete in cross-section or nearly so.

Legume mostly acute at each end, more or less lunate, ovate or cordate in cross-section.

Pod spreading, cross-ribbed; corolla small, the banner broad, strongly arched.

Calyx cylindrical; flowers large; plants mostly low with decumbent stems; pod horizontal.

Valves of the pod winged.

Leaves digitately 3-foliolate; pod ovoid, few-seeded, indehiscent; plant mostly pulvinate.

Legume membranaceous or papery.

Pod linear- or oblong-cylindric, straight, not inflated, the valves rather close-fitting to the seeds.

Legume sulcate on both sutures, more or less ∞ -shaped in cross-section.

Legume not sulcate on either suture.

Pod distinctly stipitate, without fibers within; calyx-tube cylindrical; calyx-teeth very short; corolla rather large, the banner narrow and slightly arched.

Pod subsessile, the cavity more or less traversed by fibers; calyx-tube campanulate; calyx-teeth longer; corolla small, the banner broad and strongly arched.

32. KENTROPHYTA.

33. HOMALOBUS.

34. GYNOPHORARIA.

35. DIHOLCOS.

36. CNEMIDOPHACOS.

43. BATIDOPHACA.

37. MICROPHACOS.

38. XYLOPHACOS.

39. PTEROPHACOS.

40. OROPHACA.

41. HOLCOPHACOS.

42. LONCHOPHACA.

44. PISOPHACA.

* No distinction in meaning is here intended between "fruit," "pod," and "legume," but different words are used merely to help the eye in using the key. In giving the measurements of the pod, "wide" or "broad" is used to denote the distance from suture to suture, and "thick" the extreme distance across the pod from valve to valve.

- Pod inflated, the valves extended from the seeds.
 Legume membranous, lunate or obliquely ovoid in side view, the upper suture less curved than the lower.
- Legume papery or, if membranous, ellipsoid or ovoid.
 Pod membranous, when young the cavity filled with spongy tissue, which in age becomes fibrous.
 Pod not filled with spongy or fibrous tissue.
- Fruit perfectly or imperfectly 2-celled, the lower suture inflexed, forming a false, complete or partial partition (septum).
 Septum incomplete, not meeting the upper suture.
 Pod membranous or papery, more or less inflated.
 Body of the pod oblong to oval or oblong-oblancoelate in outline, obtuse, the sutures equally curved or the upper more than the lower, the cross-section elliptic to orbicular, rarely slightly cordate.
- Body of the pod more or less lunate, the lower suture strongly upcurved, the upper less so or straight, the cross-section broadly cordate or broadly deltoid-ovate.
 Corolla large; pod short-stipitate, not sulcate on the lower suture.
- Corolla small; pod sessile, deeply sulcate on the lower suture. (Abnormal form of *Phaca diurna*.)
- Pod leathery or woody.
 Body of the leathery pod linear, lance-linear, or narrowly lunate in outline, cordate or sub-terete in cross-section.
 Body of the pod broadly oval to elliptic in outline.
 Pod mostly woody or somewhat fleshy, and somewhat compressed; septum broad, not reaching to the apex.
 Pod somewhat inflated, leathery, turgid; septum narrow.
- Septum complete, meeting the upper suture.
 Pod strongly inflated, papery or membranous.
 Pod sessile or subsessile, circular or oval in cross-section.
 Pod distinctly stipitate, deltoid in cross-section.
 Pod neither strongly inflated nor papery.
- Fruit dry, dehiscent.
 Body of the pod elongate, linear or lance-linear, rarely oblong, spreading.
 Pod sessile or nearly so.
 Legume strongly falcate, splitting through the middle into two pod-like parts, the walls of which are formed one by the valve, the other by half of the split septum.
 Legume not so split in the middle.
 Pod leathery or woody, if membranous compressed, not inflated.
 Pod membranous, terete, somewhat inflated and filled with a spongy tissue.
 Pod distinctly stipitate.
- Body of the pod short, ovoid or broadly oblong or broader.
 Pod distinctly stipitate.
 Pod sessile or nearly so.
 Pod erect or ascending, neither didymous nor cross-wrinkled.
 Pod reflexed, more or less didymous, cross-wrinkled.
- Fruit fleshy, indehiscent or very tardily dehiscent.
 Keel produced into a distinct beak.
 Pod narrow, 2-celled by a false septum formed by the inflexed lower suture.
 Pod usually thick, 1-celled or more or less 2-celled by the inflexion of the upper suture.
- Shrubs or trees, with abruptly pinnate leaves.
43. BATIDOPHACA.
 44. PISOPHACA.
 45. PHACA.
 46. ATELOPHRAGMA.
 47. PHACOMENE.
 48. TIUM.
 49. BRACHYPHRAGMA.
 50. JONESIELLA.
 51. CYSTIUM.
 52. ONIX.
 53. CONTORTUPLICATA.
 54. HAMOSA.
 55. HEDOPHYLLA.
 56. HESPERONIX.
 57. ASTRAGALUS.
 58. HESPERASTRAGALUS.
 59. GEOPRUMNON.
 60. OXYTROPIS.
 61. CARAGANA.

32. KENTROPHYTA Nutt.; T. & G. Fl. N. Am. 1: 353. 1838.

Perennial caespitose herbs, with a woody caudex and diffusely branched stems. Leaves pinnate, the stipules either scarious and connate high up, or spine-tipped and less connate; leaflets 3-7, mostly 5, divergent, linear-subulate or lance-subulate, stiff, strongly-ribbed, spine-tipped. Racemes short, usually 2-flowered, and usually shorter than the leaves. Calyx campanulate, the teeth subequal, subulate, about as long as the tube. Corolla ochroleucous

or purplish. Banner obovate or oval, retuse, rather strongly arched. Wings shorter, falcate, the blade broadly oblanceolate, longer than the claw, with a large reflexed auricle. Keel-petals still shorter, the blade about equaling the claw, broadly lunate, acutish or obtuse at the apex, auricled at the base. Stamens diadelphous (9 and 1), the sheath arched above. Pod ovoid, somewhat compressed, acute at least on the upper suture, few-seeded, indehiscent. Seeds obliquely reniform, with a deep-seated hilum.

Type species, *Kentrophyta montana* Nutt.

Stipules connate only at the very base, distinctly spinulose-tipped, or partly green.

Pod about 1 cm. long; stem 1-2 dm. high, densely canescent.

Pod 4-7 mm. long; stem less densely pubescent.

Stem 2-4 dm. long, usually rather simple; stipules decidedly spinulose-tipped; pod lanceolate in outline, 6-7 mm. long.

Stem 1-2 dm. long, much branched; stipules partly green, with a rather weak tip; pod ovate, 4 mm. long.

Stipules decidedly connate below, scarious, not spinulose.

Leaflets linear-filiform to subulate, not narrowed towards the base; pod ovate, compressed.

Leaflets linear-lanceolate or oblanceolate, distinctly narrowed towards the base.

Pubescence of the stem and leaves strictly appressed, strigose; pod rather turgid, lanceolate to oblong-ovate.

Leaves almost silvery-white on both sides; pod lanceolate.

Leaves grayish-strigose beneath, glabrate above; pod lance-ovoid.

Pubescence of the stem and leaves looser, the hairs mostly ascending; pod broadly ovate or oval.

Corolla 3-5 mm. long, ochroleucous, usually with purple-tipped keel; leaflets less than 5 mm. long.

Flower-clusters very short-peduncled or subsessile; calyx-lobes shorter than the tube.

Leaves short-hairy; stipules with long spreading tips.

Leaves long-hairy; stipules without long tips.

Flower-clusters on peduncles equaling or exceeding the leaves; calyx-lobes equaling or exceeding the tube.

Corolla 5-7 mm. long, purple; leaflets more than 5 mm. long.

1. *K. coloradensis*.

2. *K. impensa*.

3. *K. viridis*.

4. *K. montana*.

5. *K. unguolata*.

6. *K. rotunda*.

7. *K. minima*.

8. *K. Wolfii*.

9. *K. tegetaria*.

10. *K. aculeata*.

1. *Kentrophyta coloradensis* (M. E. Jones) Rydberg, sp. nov.

Astragalus Kentrophyta coloradensis M. E. Jones, Contr. W. Bot. 10: 63. 1902.

Astragalus montanus coloradensis M. E. Jones, Rev. Astrag. 80. 1923.

A perennial, with a caespitose caudex; stems bushy, branched, 1-2 dm. long, terete, densely canescent-strigose; stipules nearly free, subulate, with a lanceolate base and a spinulose tip, 3-6 mm. long; leaves spreading, with a strong midrib, strigose, spinulose-tipped, 8-15 cm. long, about 1 mm. wide; flowers unknown; pod obliquely lanceolate, about 1 cm. long and 4 mm. wide, gradually tapering to the apex, white-strigose, the beak 2-3 mm. long; seeds 2, brown, about 3 mm. long and 2 mm. wide.

TYPE LOCALITY: Lee's Ferry, Arizona.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 5; Contr. W. Bot. 10: pl. 1.

2. *Kentrophyta impensa* (Sheldon) Rydb. Bull. Torrey Club

32: 665. 1906.

Astragalus Kentrophyta elatus S. Wats. Bot. King's Expl. 77. 1871.

Astragalus viridis impensus Sheldon, Minn. Bot. Stud. 1: 118. 1894.

Astragalus viridis elatus Cockerell, Bot. Gaz. 26: 437. 1898.

Astragalus Kentrophyta impensus M. E. Jones, Contr. W. Bot. 10: 63. 1902.

Astragalus impensus Wootton & Standley, Contr. U. S. Nat. Hist. 19: 369. 1915.

Astragalus montanus impensus M. E. Jones, Rev. Astrag. 80. 1923.

A perennial, with a caespitose caudex; stems terete, branched at the base and otherwise, striate, terete; stipules united and scarious at the base, partly green and with a strong midrib ending in a rather stiff spinulose tip, 6-10 mm. long; leaves spreading, 1.5-2 cm. long; leaflets usually 5, linear-subulate, with a strong midrib, strigose, spinulose-tipped, 8-15 mm. long, 1-2 mm. wide; peduncles 5 mm. long or less, usually 2-flowered; calyx strigose, the tube 1.5 mm. long, the lobes subulate, 1 mm. long; corolla ochroleucous, 4 mm. long; pod strigose,

lanceolate in outline, 6-7 mm. long, 2.5-3 mm. wide, gradually tapering at the apex; beak 1 mm. long; seeds usually 2, brown, 3 mm. long, 1.5 mm. wide.

TYPE LOCALITY: Homes Creek Valley, Nevada.

DISTRIBUTION: Western Colorado to eastern Oregon, Nevada, Arizona, and northwestern New Mexico.

ILLUSTRATIONS: M. E. Jones, *Contr. W. Bot.* 10: *pl. 1*; *Rev. Astrag.* *pl. 5*.

3. *Kentrophyta viridis* Nutt.; T. & G. Fl. N. Am. 1: 353. 1838.

Astragalus Kentrophyta A. Gray, *Proc. Acad. Phila.* 1863: 60, in part. 1863.

Astragalus viridis Sheldon, *Minn. Bot. Stud.* 1: 118. 1894.

Phaca viridis Britton, *Mem. Torrey Club* 5: 201. 1894.

A perennial, with a densely caespitose caudex; stems much branched, 1-2 dm. long, strigose, at first canescent; stipules united and scarious at the base, deltoid-subulate, partly green, acuminate, 5-8 mm. long, the upper ones sometimes with a spinulose tip; leaves about 15 mm. long, spreading, strigose but green; leaflets mostly 5, linear-subulate, spinulose-tipped, about 1 cm. long and 1 mm. wide, the midrib less prominent than in the preceding; peduncles 5 mm. long or less, usually 2-flowered; calyx strigose, the tube 1.5-2 mm. long, the lobes subulate-setaceous, 2-2.5 mm. long; corolla ochroleucous, 4-5 mm. long; pod ovoid, compressed, 4 mm. long, 2 mm. wide.

TYPE LOCALITY: Hills of the Platte, Nebraska or Wyoming.

DISTRIBUTION: Wyoming, northern Colorado, and (?) western Nebraska.

4. *Kentrophyta montana* Nutt.; T. & G. Fl. N. Am. 1: 353. 1838.

Astragalus Kentrophyta A. Gray, *Proc. Acad. Phila.* 1863: 60. 1863.

Tragacantha montana Kuntze, *Rev. Gen.* 941. 1891.

Homalobus montanus Britton, in *Britt. & Brown*, III. Fl. 2: 306. 1897.

Astragalus kentrophyta Clements, *Rocky Mt. Fl.* 173. 1914.

Astragalus montanus M. E. Jones, *Rev. Astrag.* 80. 1923. Not *A. montanus* L. 1753.

A perennial, with a densely caespitose caudex; stems intricately branched, 1-1.5 dm., rarely 2 dm. long, grayish-strigose; stipules scarious, united half their length, deltoid, acuminate, 3-5 mm. long; leaves 1-1.5 cm. long; leaflets mostly 5, subulate, 1 cm. long, about 0.5 mm. wide, strigose, spinulose-tipped; peduncles very short, sometimes almost none; calyx grayish-strigose, the tube 2 mm. long, the lobes subulate-filiform, 2 mm. long; corolla ochroleucous, nearly 5 mm. long; pod ovate, 4-5 mm. long, 2.5 mm. wide, the beak minute; seeds 2 mm. long, 1.5 mm. wide.

TYPE LOCALITY: Hills of the Platte, Nebraska or Wyoming.

DISTRIBUTION: Saskatchewan and Alberta to New Mexico and western Nebraska.

ILLUSTRATIONS: M. E. Jones, *Contr. W. Bot.* 10: *pl. 1*; *Rev. Astrag.* *pl. 5, f. 16*; *Britt. & Brown*, III. Fl. *f. 2152*; *ed. 2. f. 2558*; *Fl. Neb.* 21: *pl. 11, f. 82-87* (as *A. viridis*); *Am. Jour. Bot.* 15: *pl. 44 C*.

5. *Kentrophyta ungulata* (M. E. Jones) Rydb. *Bull. Torrey Club* 51: 23. 1924.

Astragalus Kentrophyta ungulatus M. E. Jones, *Proc. Calif. Acad. II.* 5: 650. 1895.

Astragalus montanus ungulatus M. E. Jones, *Rev. Astrag.* 80. 1923.

A perennial, with caespitose caudex; stems densely branched, about 1 dm. long, densely strigose-canescens; stipules scarious, ovate, pubescent, united nearly half their length, acuminate, 2-3 mm. long; leaves spreading, about 1 cm. long; leaflets subulate, 6-8 mm. long, 0.5-0.8 mm. wide, spinulose-tipped, strigose-canescens; peduncles very short, shorter than the pedicels; calyx strigose-canescens, the tube 2 mm. long, the lobes subulate, 2 mm. long; corolla ochroleucous, 5 mm. long; pods lanceolate in outline, more turgid than in *K. montana*, 6 mm. long, 2.5 mm. wide, the beak about 1 mm. long.

TYPE LOCALITY: Monitor Valley, Nevada.

DISTRIBUTION: Nevada and western Utah (?).

ILLUSTRATION: M. E. Jones, *Rev. Astrag.* *pl. 5*.

6. *Kentrophyta rotunda* (M. E. Jones) Rydb. Bull. Torrey Club
51: 23. 1924.

Astragalus tegetarius rotundus M. E. Jones, Proc. Calif. Acad. II. 5: 650. 1895.

Astragalus Kentrophyta rotundus M. E. Jones, Contr. W. Bot. 10: 63. 1902.

Astragalus montanus rotundus M. E. Jones, Rev. Astrag. 80. 1923.

A perennial, with a caespitose caudex; stems intricately branched, 1-2 dm. long, strigose; stipules scarious, connate, deltoid, acuminate, strigose throughout; leaves about 1 cm. long, spreading; leaflets 5, linear-lanceolate, narrowed at each end, with short spinulose tips, strigose-canescens beneath, mostly glabrate above, 5-8 mm. long, 1-1.5 mm. wide; peduncles very short; calyx strigose, the tube 2 mm. long, the lobes subulate-filiform, 1.5 mm. long; corolla 5-6 mm. long, apparently pinkish; pod lance-ovate, strigose, 6 mm. long, 2.5 mm. thick, rather turgid, the beak recurved.

TYPE LOCALITY: Loa and Panguitch Lake, Utah.

DISTRIBUTION: South and central Utah.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: *pl. 1*; Rev. Astrag. *pl. 5*.

7. *Kentrophyta minima* Rydb. Bull. Torrey Club 34: 420. 1907.

A perennial, with a densely caespitose caudex; stems intricately branched, 1-10 cm. long; stipules scarious, deltoid, 1-3 mm. long, sparingly canescens; leaves 5-8 mm. long; leaflets 5-7, linear-lanceolate, conduplicate, canescens with ascending hairs, 3-5 mm. long, with short spinulose tips; flowers usually solitary; calyx strigose, the tube 1-1.5 mm. long, the lobes subulate, 1 mm. long; corolla ochroleucous with purple-tipped keel, 3 mm. long; pod ovoid, rather turgid, 3 mm. long, strigose.

TYPE LOCALITY: Yellowstone National Park.

DISTRIBUTION: Northwestern Wyoming.

8. *Kentrophyta Wolfii* Rydb. Bull. Torrey Club 32: 665. 1906.

Astragalus tegetarius implexus Canby; Porter & Coult. Syn. Fl. Colo. Add. 1874.

Homalobus Wolfii Rydb. Bull. Torrey Club 31: 562. 1904.

A perennial, with a densely caespitose caudex; stems intricately branched, less than 1 dm. long; stipules scarious, broadly ovate-deltoid, strongly veined, hirsute-canescens, acuminate, 3 mm. long; leaves 5-6 mm. long; leaflets 5, approximate, lanceolate or linear-lanceolate, grayish-hirsute, 3-4 mm. long, with short spinulose tips, strongly conduplicate; peduncles very short, 1- or 2-flowered; calyx canescens-hirsute, the tube scarcely 2 mm. long, the lobes about 1 mm. long, subulate; corolla ochroleucous with purple-tipped keel, about 4 mm. long; pod unknown.

TYPE LOCALITY: South Park, Colorado.

DISTRIBUTION: Mountains of Colorado.

9. *Kentrophyta tegetaria* (S. Wats.) Rydb. Bull. Torrey Club
34: 421. 1907.

Astragalus tegetarius S. Wats. Bot. King's Expl. 76. 1871.

Tragacantha tegetaria Kuntze, Rev. Gen. 948. 1891.

Homalobus tegetarius Rydb. Bull. Torrey Club 31: 563. 1904.

Astragalus montanus tegetarius M. E. Jones, Rev. Astrag. 81. 1923.

A perennial, with a densely caespitose caudex; stems 0.5-1.5 dm. long, slender, strigose, prostrate; stipules scarious, acuminate, deltoid, connate, with scattered hairs; leaves 1-2 cm. long; leaflets 5-9, linear-lanceolate, conduplicate, 3-5 mm. long, less than 0.5 mm. wide, hirsutulous with ascending or spreading hairs, with short spinulose tips; peduncles 1-3 cm. long, 1-3-flowered; calyx strigose, the tube 1.5 mm. long, the lobes subulate-filiform, 1.5 mm. long; corolla about 5 mm. long, ochroleucous with purple-tipped keel; pod ovate-oblong, about 5 mm. long, compressed.

TYPE LOCALITY: Peaks of East Humboldt Mountains, Nevada.

DISTRIBUTION: Mountains of eastern Nevada.

ILLUSTRATION: Bot. King's Expl. *pl. 13, f. 7-10*.

10. *Kentrophyta aculeata* (A. Nelson) Rydb. Bull. Torrey Club

32: 665. 1906.

Kentrophyta montana β Nutt.; T. & G. Fl. N. Am. 1: 353. 1838.*Astragalus aculeatus* A. Nelson, Bull. Torrey Club 26: 10. 1899.*Homalobus aculeatus* Rydb. Mem. N. Y. Bot. Gard. 1: 249. 1900.*Kentrophyta montana* Jepson, Man. Fl. Pl. Calif. 583, mainly. 1925.

A perennial, with a cespitose, tufted caudex; stems numerous, decumbent, intricately branched, 0.5-3 dm. long, hirsutulous-canescens with ascending hairs; stipules scarious, hirsute along the margins, deltoid, acuminate or often long-attenuate and somewhat pungent, 4-6 mm. long; leaves 1-1.5 cm. long, spreading; leaflets 5-7, linear-lanceolate, narrowed at each end, hirsutulous on both sides, green, 5-8 mm. long, 1-1.5 mm. wide, spinulose-tipped; peduncles 2-10 mm. long or less, 1-3-flowered; calyx hirsutulous, the tube 2.5 mm. long, the lobes subulate-filiform, 2 mm. long; corolla purple, 5-7 mm. long; pod ovoid, 5 mm. long, 2.5 mm. wide, hirsutulous, compressed; seeds 2.5 mm. long, obliquely reniform.

TYPE LOCALITY: Big Horn Mountains, near Dome Lake, Wyoming.

DISTRIBUTION: Montana to Colorado, northern Utah, and California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 5 (as *A. montanus* var. *tegetarius*); Jepson, Man. Fl. Pl. Calif. f. 552 (as *K. montana*).33. *HOMALOBUS* Nutt.; T. & G. Fl. N. Am. 1: 350. 1838.

Perennial herbs. Leaves pinnate, sometimes, however, reduced to the terminal leaflets, or the lateral leaflets reduced, linear or filiform, and the terminal one similar to and continuous with the rachis. Flowers in axillary racemes. Calyx from campanulate to cylindro-campanulate, 5-toothed. Corollas white to purple. Banner obovate, usually strongly arched, usually with a very short claw. Blades of the wings obliquely oblanceolate or obovate, with a reflexed basal auricle, about equaling the claw. Keel-petals shorter, the blade broader and shorter, from round to acute at the apex. Stamens diadelphous (9 and 1), the sheath straight to near the apex, the free portion of the filaments upcurved. Style glabrous, arched upwards near the apex, the stigma minute. Pod elliptic to linear in outline, sessile to slender-stipitate, compressed laterally, mostly flat, both sutures being prominent, especially when the pod is more turgid, the sutures neither inflexed nor produced into a false partition. Seeds obliquely reniform, with a deep-seated hilum.

Type species, *Homalobus dispar* Nutt.

- | | |
|--|-------------------|
| Leaves unifoliolate or some 3-foliolate or (in <i>H. detritalis</i>) 5-foliolate; plant pulvinate-cespitose; pod sessile. | 1. SIMPLICIFOLII. |
| Leaves several-foliolate; plant not pulvinate-cespitose. | |
| Pod sessile or short-stipitate, the stipe rarely exceeding the calyx. | |
| Legume oval, ovate, broadly oblong, or elliptic. | |
| Pod without long black hairs. | 2. TENELLI. |
| Pod with long black hairs. | 3. BOURGOVIANI. |
| Legume linear, 1.5 cm. long or more. | 4. CAMPESTRES. |
| Pod long-stipitate, the stipe decidedly longer than the calyx. | |
| Calyx not gibbous at the base, less than half as long as the corolla; pod membranous. | 5. STENOPHYLLI. |
| Pod pendulous. | 6. PORRECTI. |
| Pod erect on an upcurved pedicel. | |
| Calyx strongly gibbous at the base, more than half as long as the corolla; pod more coriaceous. | 7. COLLINI. |

1. SIMPLICIFOLII

- | | |
|---|-----------------------------|
| Corolla purple or pink; calyx-teeth about as long as the tube; pod nearly flat, thickest along the middle. | |
| Corolla about 1.5 cm. long; leaves mostly 3-5-foliolate. | 1. <i>H. detritalis</i> . |
| Corolla less than 1 cm. long; leaves mostly 1-foliolate or simple. | |
| Peduncles 3-10-flowered; bracts ovate to lanceolate, shorter than the flowers; pod oblong. | |
| Pod long-acute; bracts narrowly lanceolate; leaves usually narrowly oblanceolate. | 2. <i>H. caespitosus</i> . |
| Pod abruptly acute; bracts short, ovate to lanceolate, scarious; leaves oblanceolate or spatulate. | 3. <i>H. brachycarpus</i> . |
| Peduncles 1-flowered; bracts subulate, longer than the flowers; pod lanceolate. | 4. <i>H. uniflorus</i> . |
| Corolla ochroleucous or whitish; calyx-teeth about half as long as the tube; pod lanceolate in cross-section, thickest near the lower suture. | |

Leaves oblanceolate, canescent, not pungent; pod not mottled.
Leaves (except the earliest ones) almost filiform, sparingly hairy, pungent-pointed; pod mottled.

5. *H. simplicifolius*.6. *H. lingulatus*.

2. TENELLI

Pod short-stipitate.

Flowers ochroleucous; plant blackening in drying.

Legume glabrous.

Stipe of the pod rarely exceeding the tube of the calyx; leaves usually spreading in age; leaflets oblong or oval, obtuse or mucronate

Stipe of the pod usually exceeding the calyx-teeth; leaves strongly ascending; leaflets narrowly linear, mostly acute.

Stipe 3-4 mm. long; stem strigose; calyx-teeth half as long as the tube.

Stipe 5-7 mm. long; stem glabrous; calyx-teeth about equaling the tube.

Legume strigose.

Flowers white or tinged with purple or blue; plant not blackening.

Corolla 5-8 mm. long; pod about 1 cm. long, 3 mm. wide.

Legumes with both of the sutures curved.

Pod glabrous.

Pod strigose.

Legumes with the lower suture straight.

Corolla 12-15 mm. long; pod 2.5-3 cm. long and 6 mm. wide.

Pod strictly sessile.

Leaflets narrowly linear; corolla 10-15 mm. long.

Corolla white, 10-12 mm. long; pod broadly oblong, straight.

Corolla purple, about 15 mm. long; pod linear-oblong, arcuate, pubescent.

Leaflets oblong to oval; corolla 4-8 mm. long.

Stem more simple, 2 dm. high or more; racemes many-flowered, elongate.

Pod hairy; plant green.

Pod glabrous; plant canescent.

Stem densely cespitose, 1-2 dm. high; racemes few-flowered.

Leaflets oblong or lanceolate, 5-10 mm. long; corolla 6-8 mm. long.

Pod oblique, straight or slightly concave on the upper suture; leaflets lanceolate, long-acute.

Pod elliptic, both sutures convex; leaflets oblong, abruptly acute or orbiculate.

Leaflets obovate or orbiculate, 2-5 mm. long; corolla 4 mm. long.

7. *H. dispar*.8. *H. tenellis*.9. *H. stipitatus*.10. *H. strigosus*.11. *H. acerbus*.12. *H. Standleyi*.13. *H. Dodgeanus*.14. *H. Episcopus*.15. *H. lancearius*.16. *H. Woodruffi*.17. *H. Clementis*.18. *H. wingatanus*.19. *H. amphidoxus*.20. *H. vexilliflexus*.21. *H. tegetarioides*.

3. BOURGOVIANI

Calyx-teeth subulate or lance-subulate, attenuate.

Leaflets lance-oblong, mostly acute, those of the lower leaves obtuse or rounded at the apex.

Leaflets oblong or oval, at least those of the lower leaves retuse or emarginate at the apex.

Calyx-teeth deltoid, obtuse; leaflets oval or obovate, retuse at the apex.

22. *H. Bourgovii*.23. *H. retusus*.24. *H. amblyodon*.

4. CAMPESTRES

Corolla ochroleucous, usually without tinge of purple; upper leaves reduced to filiform phyllodes or the rachis greatly produced, without a terminal leaflet; canescent rush-like plants with branched root-stocks.

Pod 2-3 mm. wide, 2.5-3.5 cm. long.

Calyx more or less black-hairy; pods tapering towards the base.

Calyx-teeth subulate, longer than broad; leaflets linear-subulate or linear.

Calyx-teeth triangular, as broad as long; leaflets linear to linear-oblong.

Calyx white-hairy; teeth triangular; pods strictly linear; leaflets narrowly linear to filiform.

Pod 4 mm. wide, less than 2 cm. long.

Corolla white, pink, or purplish, rarely ochroleucous, at least the keel tipped with purple; terminal leaflet usually well developed, and with cespitose caudices.

Pod strigose, rarely becoming glabrate in age.

Leaflets strigose on both sides, usually densely canescent.

Leaflets narrowly linear or narrowly lance-linear.

Pod straight.

Calyx-teeth almost as long as the tube; plant 2-4 dm. high; corolla purplish.

Calyx-teeth shorter than the tube; plant less than 2 dm. high; corolla ochroleucous with purple-tipped keel.

Pod arcuate; plant 1-2 dm. high.

Leaflets lanceolate or lance-oblong, 4-8 mm. long, 1-2.5 mm. wide; plant less than 1 dm. high.

25. *H. campestris*.26. *H. junciformis*.27. *H. junceus*.28. *H. orthocarpus*.29. *H. strigosus*.30. *H. tenuifolius*.31. *H. decumbens*.32. *H. divergens*.

- Leaflets glabrous above, green.
 Calyx black-hairy, its teeth fully half as long as the tube.
 Legume less than 2 cm. long; corolla 6-8 mm. long; leaflets small, less than 1 cm. long; plant decumbent-cespitose, less than 2 dm. high.
 Leaflets 7-17, the terminal one resembling the rest, short-stalked.
 Pod obliquely oblanceolate, fully 3.5 mm. wide near the apex.
 Pod linear, with parallel sutures, 3 mm. wide.
 Leaflets 1-5, the terminal one narrowly oblanceolate, falcate, gradually tapering into the rachis.
 Legume 2-2.5 cm. long; corolla about 1 cm. long; plant erect, 2-4 dm. high.
 Pod linear, white-strigose or glabrate.
 Leaflets elliptic or oblong, obtuse, the terminal one short-stalked and similar to the rest.
 Leaflets lanceolate or oblanceolate, somewhat falcate, the terminal one long-stalked and tapering into the rachis.
 Pod oblanceolate, slightly arched, minutely black-strigulose.
 Calyx white-hairy, its teeth one third as long as the tube.
- Pod glabrous.
 Terminal leaflet elongate, tapering into the rachis.
 Terminal leaflet similar to the rest.
 Pod 1.5-2 cm. long; calyx-teeth one third as long as the tube; leaflets linear or lance-linear.
 Pod 2-2.5 cm. long; calyx-teeth more than one third as long as the tube; leaflets lanceolate to oval.
5. STENOPHYLLI
- Pod glabrous, except the stipe.
 Leaflets narrowly linear.
 Leaflets few, the terminal one wanting or continuous with the rachis; calyx-lobes lanceolate, 1.5-2 mm. long.
 Leaflets many, the terminal one present; calyx-lobes triangular, 1 mm. long or less.
 Leaflets slightly strigose beneath or glabrous throughout.
 Leaflets strigose-cinereous on both sides.
 Stipe of the pod fully half as long as the body; corolla ochroleucous or white.
 Stipe about one third as long as the body; corolla purple.
 Leaflets linear-oblong to oval, glabrous above, strigose beneath.
- Pod strigose throughout.
 Leaflets linear; raceme elongate, lax.
 Body of the pod 2-2.5 cm. long, abruptly contracted at the base, straight.
 Body of the pod 2.5-3 cm. long, gradually tapering at each end, slightly arcuate.
 Leaflets elliptic; raceme short, dense.
6. PORRECTI
- Leaflets obovate, glabrous above.
 Leaflets linear, strigose on both sides.
7. COLLINI
- Pod not with prominent coriaceous sutures.
 Pod straight or nearly so.
 Body of the pod 2-2.5 cm. long, not mottled, short-villous.
 Body of the pod 2.5-3 cm. long, usually mottled, strigose.
- Pod distinctly curved.
 Pod curved in less than a circle.
 Pod erect; leaflets linear.
 Pod pendulous.
 Body of the pod 1-1.5 cm. long; leaflets oblong.
 Body of the pod 2-3 cm. long; leaflets obovate or orbiculate.
 Stem and leaves decidedly pubescent.
 Stem and leaves long-villous; body of pod curved usually in less than a semicircle.
 Pod about 4 mm. wide.
 Pod about 6 mm. wide.
 Stem and leaves short-hairy with incurved hairs.
 Body of the fruit 6-7 mm. wide, curved about one third of a circle, sinuate on the lower suture.
 Body of the fruit 4-5 mm. wide, curved in about a semicircle or more, not sinuate on the lower suture.
 Stem glabrous; leaves glabrous above, sparingly short-hairy beneath, often only on the margin and ribs.
33. *H. humilis*.
 34. *H. microcarpus*.
 35. *H. paucijugus*.
 36. *H. oblongifolius*.
 37. *H. decurrens*.
 38. *H. Hitchcockii*.
 39. *H. serotinus*.
 37. *H. decurrens*.
 40. *H. Palliseri*.
 41. *H. hylophilus*.
 42. *H. Coltoni*.
 43. *H. stenophyllus*.
 44. *H. MacGregorii*.
 45. *H. canovirens*.
 46. *H. Antiselli*.
 47. *H. filipes*.
 48. *H. inversus*.
 49. *H. gaviotus*.
 50. *H. porrectus*.
 53. *H. Tweedyi*.
 51. *H. collinus*.
 52. *H. californicus*.
 53. *H. Tweedyi*.
 54. *H. Laurentii*.
 55. *H. Gibbsii*.
 56. *H. Plummerae*.
 57. *H. sinuatus*.
 58. *H. Whitedii*.
 59. *H. subglaber*.

Pod spirally curved, the body forming one and a half to two circles; leaflets linear or oblong.

Corolla more than 1 cm. long; pod 4-4.5 mm. broad, strongly reticulate.

Corolla 5-6 mm. long; pod 3-3.5 mm. broad.

Pod with thick coriaceous sutures; leaflets linear.

Stipe of the pod nearly as long as the flat body.

Stipe of the pod about half as long as the more turgid body.

60. *H. speirocarpus*.

61. *H. alvordensis*.

62. *H. podocarpus*.

63. *H. bicristatus*.

1. **Simplicifolii**. Low acaulescent, densely caespitose-pulvinate perennials, with short woody caudices. Leaves mostly simple, or unifoliolate, sometimes 3-5-foliolate, tufted at the ends of the short branches, linear to narrowly spatulate, mostly sericeous. Stipules scarious, more or less imbricate. Peduncles rather short, 1-flowered; bracts subulate or linear. Calyx short; tube campanulate, the lobes subulate. Corolla purplish or ochroleucous. Banner obovate or oblanceolate, with a short broad claw. Wings and keel-petals shorter, with slender claws equaling the blades, and with small basal auricles, the keel petals with a rounded apex. Pod oblong or oblong-ovate, not strongly compressed, sessile, few-seeded.

1. *Homalobus detritalis* (M. E. Jones) Rydb. Fl. Rocky Mts.

511, 1063. 1917.

Astragalus detritalis M. E. Jones, Contr. W. Bot. 13: 9. 1910.

A subacaulescent perennial, with a wooded matted short-branched caudex; leaves clustered, 5-8 cm. long; stipules ovate or lanceolate, scarious, 5-8 mm. long; leaflets 1-5, articulate to the rachis, usually narrowly oblanceolate, 1-2 cm. long, silky-canescens, pointed; peduncles 2-4 cm. long; raceme 3-6-flowered, short, subcapitate; bracts lanceolate, scarious, with green midrib and tip, about 8 mm. long; calyx campanulate, the tube 4 mm. long and nearly 3 mm. broad, the teeth subulate, fully 3 mm. broad; corolla purple; banner obovate, notched, gently arched, with reflexed sides; wings a little shorter, the blades oblong-falcate, with a narrow reflexed auricle, obtuse at the apex, longer than the claw; keel-petals much shorter, the blade lunate, longer than the claw, rounded at the apex; pod narrowly linear, falcate, 2-3 cm. long, 2 mm. wide, mottled, white-strigose.

TYPE LOCALITY: Theodore, Utah.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 5, f. 15.

2. *Homalobus caespitosus* Nutt.; T. & G. Fl. N. Am.

1: 352. 1838.

Homalobus canescens Nutt.; T. & G. Fl. N. Am. 1: 352. 1838. Not *A. canescens* DC. 1802.

Astragalus caespitosus A. Gray, Proc. Am. Acad. 6: 230. 1864. Not *A. caespitosus* Pallas. 1800.

Tragacantha caespitosa Kuntze, Rev. Gen. 943. 1891.

Astragalus spatulatus Sheldon, Minn. Bot. Stud. 1: 22. 1894.

Astragalus simplicifolius caespitosus M. E. Jones, Proc. Calif. Acad. II, 5: 647. 1895.

Astragalus simplicifolius spatulatus M. E. Jones, Contr. W. Bot. 10: 65. 1902.

An acaulescent perennial, with a caespitose, densely tufted caudex; leaves clustered on the ends of the caudex, unifoliolate or rarely 3-5-foliolate, silky-canescens, 2-4 cm. long; stipules scarious, pubescent, lanceolate or ovate; leaf-blades or leaflets linear-oblanceolate, acute, 1-3 mm. wide; peduncles 2-6 cm. long, 3-7-flowered; bracts subulate or lanceolate, scarcely half as long as the flowers; calyx silky-canescens, the tube campanulate, 2 mm. long, the teeth subulate, nearly as long; corolla bluish-purple; banner 8-9 mm. long, obovate, with a broad claw, reflexed, retuse at the apex; wings about as long, the blade obliquely oblanceolate, rounded at the apex, with an acute basal auricle, the claw two thirds as long; keel-petals much shorter than the wings, the blade nearly semicircular, rounded at the apex, the claw nearly as long; pod oblong, gradually acute, 8-12 mm. long, 2.5-3 mm. broad, strigose, sessile; seeds obliquely oblong, 2 mm. long, nearly 1.5 mm. broad, with the funicle near the broader end.

TYPE LOCALITY: Dry hills of the Platte towards the Rocky Mountains [Nebraska or Wyoming].

DISTRIBUTION: Hills and bad-lands, Saskatchewan and North Dakota to northeastern Utah and northern Colorado.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 1; Rev. Astrag. pl. 5; Fl. Neb. 21: pl. 11, f. 98-103; Britt. & Brown, Ill. Fl. f. 2153; ed. 2. f. 2557.

3. *Homalobus brachycarpus* Nutt.; T. & G. Fl. N. Am.

1: 352. 1838.

Astragalus simplicifolius S. Wats. Bot. King's Expl. 77. 1871. Not *A. simplicifolius* A. Gray. 1864.

An acaulescent perennial, with a densely tufted caespitose caudex, unifoliolate or rarely 3-foliolate, 1-3 cm. long, silky-canescens; stipules scarious, ovate, pubescent; blades or leaflets oblanceolate or spatulate, 2-3 mm. broad, acute or the earlier ones obtuse; peduncles 2-5 cm. long, 3-7-flowered; bracts lanceolate or ovate, scarious, shorter than the calyx; calyx silky-canescens, the tube 2 mm. long, the teeth subulate; about as long; corolla bluish-purple, similar to that of *H. caespitosus*, but smaller, 6-8 mm. long; pod oblong, abruptly acute, 6-8 mm. long, 3 mm. wide, strigose; seed 2-2.5 mm. long, scarcely 1.5 mm. wide.

TYPE LOCALITY: Hills of the Platte, towards the Rocky Mountains [Wyoming].

DISTRIBUTION: Wyoming, northern Colorado, and northeastern Utah.

ILLUSTRATIONS: S. Wats. Bot. King's Expl. pl. 12, f. 3-9; M. E. Jones, Contr. W. Bot. 10: pl. I; Rev. Astrag. pl. 5, f. 14 (all as *A. simplicifolius*).4. *Homalobus uniflorus* Rydb. Bull. Torrey Club 34: 49. 1917.

An acaulescent perennial, with a caespitose tufted caudex; leaves unifoliolate, tufted at the end of its branches, 1-3 cm. long, 1-3 mm. wide, silky-canescens; stipules scarious, ovate or lanceolate, pubescent, free; leaf-blades oblanceolate, acute, tapering below into narrow petioles; bracts filiform-subulate, usually as long as or longer than the flowers; calyx canescens, the tube campanulate, 2 mm. long, the teeth subulate, about the same length; corolla dark bluish-purple; banner 8 mm. long; wings about the same length, the blade obliquely oblong-lanceolate, rounded at the apex, with an acute basal auricle, the claw half as long as the blade; keel-petals shorter, the blade broadly lunate, almost semicircular, rounded at the apex and with a rounded basal auricle; pod lanceolate, 5-8 mm. long, 2.5-3 mm. wide, tapering at each end, strigose; seeds obliquely oblong, 2 mm. long, 1 mm. wide.

TYPE LOCALITY: Evanston, Wyoming.

DISTRIBUTION: Uintah County, Wyoming.

5. *Homalobus simplicifolius* (Nutt.) Rydb. Bull. Torrey Club

40: 52. 1913.

Phaca simplicifolia Nutt.; T. & G. Fl. N. Am. 1: 350. 1838.*Astragalus simplicifolius* A. Gray, Proc. Am. Acad. 6: 231. 1864.*Tragacantha simplicifolia* Kuntze, Rev. Gen. 948. 1891.

An acaulescent perennial, with a caespitose, densely tufted caudex; leaves densely crowded at the ends of its branches; stipules thin, membranous, pubescent, ovate, erose, 3-4 mm. long, free; leaves unifoliolate, 5-20 mm. long, 1-2 mm. wide, narrowly linear-oblanceolate, somewhat conduplicate or involute, silvery-canescens, acute; peduncles 3-10 mm. long, 1- or 2-flowered; bracts subulate; calyx-tube campanulate, 2.5-3 mm. long, more or less pubescent, the teeth subulate, 1-1.5 mm. long; corolla ochroleucous; banner oblanceolate, with a broad claw; wings slightly shorter, the blade lunate, with an acute basal auricle, the claw slender, two-thirds as long as the blade; keel-petals 5 mm. long, the blade broadly lunate, rounded at the apex, and with a rounded basal auricle, the claw broad, nearly as long as the blade; pod glabrous, according to the original description "somewhat triquetrous, longer than the calyx," obovate in cross-section.

TYPE LOCALITY: Rocky Mountains towards the sources of the Platte [Wyoming].

DISTRIBUTION: Dry hills, southern Wyoming and Colorado.

6. *Homalobus lingulatus* (Sheldon) Rydb. Bull. Torrey Club.

40: 52. 1913.

Astragalus lingulatus Sheldon, Minn. Bot. Stud. 1: 118. 1894.*Astragalus exilifolius* A. Nels. Bull. Torrey Club 26: 10. 1899.*Homalobus exilifolius* Rydb. Bull. Torrey Club 40: 52. 1913.

An acaulescent perennial, with a deep-seated large root and a densely tufted caespitose caudex; leaves unifoliolate, densely crowded, blackening in drying; stipules scarious, free, 5 mm.

long, pubescent; blade linear or narrowly linear-oblong, pungently acute, involute, 2-4 cm. long, less than 2 mm. wide, silvery-canescens, tapering below into the filiform petiole; peduncles 1- or 2-flowered, 2-3 cm. long; bracts small, scarious; calyx-tube campanulate, more or less strigose, 3-4 mm. long; lobes subulate, 1.5-2 mm. long; corolla 10-15 mm. (in the original description up to 20) long, ochroleucous or nearly white, the keel tipped with purple; petals similar to those of *H. simplicifolius*; pod sessile, oblong, slightly curved, acuminate, purple-mottled, 12-15 mm. long, 4 mm. wide, somewhat turgid, few-seeded; seeds 2-5 mm. long, broadly obliquely oblong, with the funicle near one end.

TYPE LOCALITY: Foot of Big Horn Mountains, Wyoming.

DISTRIBUTION: Wyoming.

2. **Tenelli.** Cespitose caulescent perennials, with a branched caudex or rootstock. Stems mostly erect, except in the last three species. Racemes several-flowered. Calyx campanulate, mostly strigose, the teeth mostly subulate. Corolla purple, white, or ochroleucous, the banner varying from slightly to strongly arched, usually a little longer than the wings. Keel-petals with a lunate blade about equaling the claw and rounded at the apex. Pod membranous, sessile or short-stipitate, oblong to oval, usually abruptly acute at each end, glabrous or short-hairy, mostly strigose, if black-hairy merely strigulose.

7. *Homalobus dispar* Nutt.; T. & G. Fl. N. Am. 1: 350. 1838.

Orobis dispar Nutt. Gen. 2: 95. 1818.

Phaca nigrescens Hook. Fl. Bor. Am. 1: 143. 1831.

Physandra dispar Raf. Atl. Jour. 145. 1832.

Homalobus nigrescens Nutt.; T. & G. Fl. N. Am. 1: 351, in part, as synonym. 1838.

A perennial, with a cespitose rootstock or caudex; stems 2-5 dm. high, sparingly strigose or glabrate, striate; stipules ovate or deltoid, connate, the upper green, the lower scarious, soon blackening; leaves 4-6 cm. long, blackening in drying; leaflets 11-21, linear-oblong to oval, 8-15 mm. long, 2-6 mm. wide, obtuse or acute, glabrous above, with scattered hairs beneath; racemes many-flowered, lax, 4-8 cm. long, very short-peduncled; bracts subulate, 2 mm. long; calyx sparingly strigose, the tube 2 mm. long, the teeth lanceolate, 1 mm. long; corolla ochroleucous, the keel purple-tipped; banner 6-7 mm. long, obovate, retuse; wings 5-6 mm. long, the blade broadly obliquely oblanceolate, with a rounded basal auricle; keel-petals slightly shorter, with a rounded inflexed tip and a rounded basal auricle, the blade somewhat longer than the claw; pod short-stipitate, ellipsoid, acute at each end, about 1 cm. long and 4 mm. wide, glabrous, reticulate, the stipe shorter than the calyx; seeds black, oblong-reniform, 3 mm. long, 1.5 mm. broad.

TYPE LOCALITY: Hills near Fort Mandan, North Dakota.

DISTRIBUTION: Saskatchewan and Alberta to Wyoming, Colorado, and western Nebraska.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 1, f. 2d; Am. Jour. Bot. 15: pl. 44 B.

8. *Homalobus tenellus* (Pursh) Britton; Britt. & Brown,

Ill. Fl. 2: 305. 1897.

Astragalus tenellus Pursh, Fl. Am. Sept. 2: 473. 1814.

Ervum multiflorum Pursh, Fl. Am. Sept. 2: 739. 1814.

Homalobus multiflorus T. & G. Fl. N. Am. 1: 351. 1838.

Homalobus nigrescens Nutt.; T. & G. Fl. N. Am. 1: 351, in part, as synonym. 1838.

Astragalus nigrescens A. Gray, Am Jour. Sci. II. 33: 410. 1862.

Astragalus multiflorus A. Gray, Proc. Am. Acad. 6: 226. 1864.

Tragacantha tenella Kuntze, Rev. Gen. 942. 1891.

A perennial, with a cespitose caudex, closely resembling the preceding; stems 3-5 dm. high, sparingly strigose; stipules ovate to lanceolate, connate; leaves 5-10 cm. long; leaflets 13-21, linear or oblong, obtuse, 1-2 cm. long, 1-3 mm. wide, glabrous on both sides, or with scattered hairs beneath; racemes 4-8 cm. long, short-peduncled, many-flowered; flowers as in the preceding, but the corolla usually smaller, rarely more than 6 mm. long; pod glabrous, stipitate, the stipe 3-4 mm. long, the body 8-10 mm. long, 3 mm. wide, reticulate; seeds 3 mm. long, 1.5 mm. wide.

TYPE LOCALITY: Banks of the Missouri, Montana.

DISTRIBUTION: Manitoba to Yukon, Nevada, and Colorado.

ILLUSTRATIONS: Fl. Neb. 21: pl. 9, f. 33-36; M. E. Jones, Rev. Astrag. pl. 1, f. 2; Britt. & Brown, Ill. Fl. f. 2151; ed. 2. f. 2556.

9. *Homalobus stipitatus* Rydb. Bull. Torrey Club 34: 419. 1907.

A perennial, with somewhat caespitose caudex; stems slender, 3-4 dm. high, erect, branched, sparingly strigose or glabrate, leafy; stipules lanceolate or the lower deltoid, connate, 2-3 mm. long, turning black in drying; leaves ascending, 4-6 cm. long; leaflets 9-15, narrowly linear, 1-2 cm. long, 1-2.5 mm. wide, glabrous on both sides or sparingly strigose beneath; racemes lax, including the short peduncle 3-10 cm. long, 5-20-flowered; calyx strigose, the tube 1.5-2 mm. long, the teeth subulate, 1.5 mm. long; corolla ochroleucous; banner obovate, slightly retuse, 7-8 mm. long; wings 6-7 mm. long, the blade obliquely oblanceolate, with an acute basal auricle, and about twice as long as the claw; keel-petals 5-6 mm. long, with a rounded incurved tip; pod glabrous, stipitate, the stipe 5-7 mm. long, the body elliptic, acute at each end, about 1 cm. long, 3 mm. wide; seeds as in *H. tenellus*.

TYPE LOCALITY: Upper Missouri [South or North Dakota, between Fort Pierre and Devil's Lake].
DISTRIBUTION: Minnesota to Saskatchewan and South Dakota.

10. *Homalobus strigulosus* Rydb. Bull. Torrey Club 34: 420. 1907.

Astragalus tenellus f. *strigulosus* F. Macbr. Contr. Gray Herb. 65: 34. 1922.

A perennial, with a caespitose caudex; stem erect or ascending, branched, 1-3 dm. high, strigulose; stipules ovate, short, blackening; leaves 3-4 cm. long; leaflets 11-17, linear, acute, 8-12 mm. long, 1-2 mm. wide, thick, glabrous above, strigose beneath; racemes lax, including the short peduncle 2-4 cm. long, 4-7-flowered; bracts subulate, minute; calyx strigulose, the tube 1.5-2 mm. long, the teeth subulate, less than 1 mm. long; corolla ochroleucous, similar to that of the preceding; banner 6 mm. long; wings about 5 mm. long and keel-petals fully 5 mm. long; pod strigulose, shining, stipitate, the stipe about 3 mm. long, the body 1-10 mm. long, 3 mm. wide.

TYPE LOCALITY: East Humboldt Mountains, Nevada.
DISTRIBUTION: Utah and eastern Nevada.

11. *Homalobus acerbus* (Sheldon) Rydb. Bull. Torrey Club
32: 666. 1906.

Astragalus acerbus Sheldon, Minn. Bot. Stud. 1: 123. 1894.
Astragalus tenellus f. *acerbus* F. Macbr. Contr. Gray Herb. 65: 35. 1922.

A perennial, with a caespitose caudex; stems white-strigose, 3-3.5 dm. high, erect, striate below; stipules triangular-ovate, 1-2 mm. long, scarious; leaves 2.5-5 cm. long, the rachis sulcate above; leaflets 5-7, those of the upper leaves linear, the lateral ones 4-8 mm. long, the terminal one sometimes 15-20 mm. long, those of the lower leaves oval or obovate, 5-8 mm. long, 2-3 mm. wide; racemes lax, including the peduncle 1-2 dm. long; calyx sparingly strigose with black hairs, the tube 1.5 mm. long, the teeth deltoid-subulate, 1 mm. long; corolla white, tinged with greenish hue; banner 5 mm. long; wings slightly longer than the keel; keel-petals 3 mm. long, with roundish tips; pod 10-12 mm. long, oblong, short-stipitate, glabrous, 3 mm. wide; seeds black, oblong-reniform, nearly 3 mm. long, 1.5 mm. wide.

TYPE LOCALITY: Glenwood Springs, Colorado.
DISTRIBUTION: Western Colorado.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 1, f. b, e [as var. *Dodgeanus*].

12. *Homalobus Standleyi* Rydb. Bull. Torrey Club 50: 182. 1923.

Astragalus tenellus *Clementis* F. Macbr. Contr. Gray Herb. 65: 35, in part. 1922.

A perennial, with a caespitose caudex; stems 2-3 dm. high, sparingly strigose; stipules deltoid, about 2 mm. long, connate; leaves 3-5 cm. long; leaflets 9-15, elliptic or oblong, 5-10 mm. long, 2-3 mm. wide, glabrous above, strigose beneath; racemes lax, including the short peduncle 4-7 cm. long; bracts lance-subulate, 1-2 mm. long; calyx strigose, the tube 2 mm. long, the teeth subulate, fully 1 mm. long; corolla white or tinged with purple, the keel purple-tipped; banner 6 mm. long, obovate, slightly retuse; wings 5 mm. long; keel-petals 5 mm. long,

with a rounded apex; pod about 1 cm. long, 3 mm. broad, strigose, elliptic-oblong, acute at each end, short-stipitate, the stipe shorter than the calyx-tube.

TYPE LOCALITY: Ponchuelo Creek, New Mexico.
DISTRIBUTION: Known only from the type locality.

13. *Homalobus Dodgeanus* (M. E. Jones) Rydb. Bull. Torrey
Club 40: 52. 1913.

Astragalus Dodgeanus M. E. Jones, Zoe 3: 289. 1893.
Astragalus wingatensis Dodgeanus M. E. Jones, Rev. Astrag. 69. 1923.

A perennial, with a caespitose caudex; stems slender, flexuose, strigose, 1.5-6 dm. high; stipules scarious, broadly triangular, connate; leaves 3-5 cm. long; leaflets 9-11, narrowly elliptic to linear, 4-8 mm. long; racemes lax, including the peduncle 1-2 dm. long; calyx strigose with black hairs, the tube 2 mm. long, the teeth deltoid, 2 mm. long; corolla white or light-pink, with purple-tipped keel; banner 8 mm. long, obovate, deeply notched; wings 7 mm. long, the blade obliquely oblanceolate; keel-petals 6 mm. long, with a rounded inflexed tip; pod short-stipitate, linear-oblong, the upper suture straight, the lower one curved, abruptly acute.

TYPE LOCALITY: Thompson Springs, eastern Utah.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 1, f. a.

14. *Homalobus Episcopus* (S. Wats.) Rydb. Bull. Torrey
Club 40: 53. 1913.

Astragalus Episcopus S. Wats. Proc. Am. Acad. 10: 346. 1875.
Tragacantha Episcopus Kuntze, Rev. Gen. 944. 1891.

A perennial; stem glabrate below, strigose above, 4-6 dm. high, erect or ascending; stipules 4-6 mm. long, deltoid; leaves 5-10 cm. long; leaflets 1-3 pairs, narrowly linear, strigose-canescens, 1 cm. long or less, the terminal one represented by the elongation of the rachis; peduncles 8-10 cm. long, strigose; racemes 4-6 cm. long, 4-10-flowered; bracts subulate; calyx strigose, the tube deeply campanulate, 4 mm. long, the teeth subulate, 1-1.5 mm. long; corolla probably yellowish; banner obovate, 12-15 mm. long; wings shorter, the keel-petals about 1 cm. long, rounded at the apex; pod glabrous, 2.5-3 cm. long, 6 mm. wide, tapering at both ends, with a very short stipe.

TYPE LOCALITY: Southern Utah.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 4, f. 12.

15. *Homalobus lancearius* (A. Gray) Rydb. Bull. Torrey
Club 40: 52. 1913.

Astragalus lancearius A. Gray, Proc. Am. Acad. 13: 370. 1878.

A perennial, with a rootstock or caudex; stems 3-5 dm. high, glabrous, flexuose; leaves 8-10 cm. long; stipules deltoid, 3 mm. long, free or nearly so; leaflets 5-9, linear or linear-filiform, about 1 cm. long, 1 mm. wide, strigose, involute, the terminal one often wanting and represented by the prolonged rachis; peduncles about 1 dm. long; racemes several-flowered; bracts subulate, 1-2 mm. long; calyx strigulose with short black hairs, the tube 3-4 mm. long, the teeth about 1 mm. long; corolla white, the keel purple-tipped; banner narrowly obovate, slightly notched, 12-14 mm. long; wings shorter, the blade oblong, falcate, obtuse, equaling the claw, with a large reflexed auricle; keel-petals broader, 8-9 mm. long, the blade lunate, rounded at the apex, tipped with purple; pod broadly oblong, acute at each end, 18-25 mm. long, 6 mm. wide, glabrous or sparingly strigose when young; seeds obliquely reniform, 3 mm. long.

TYPE LOCALITY: Near Beaverdam, on Rio Virgen, northwestern Arizona.
DISTRIBUTION: Southern Utah and northern Arizona.
ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 2; Rev. Astrag. pl. 4, f. 12a.

16. *Homalobus Woodruffi* (M. E. Jones) Rydberg.

Astragalus Woodruffi M. E. Jones, Rev. Astrag. 77. 1923.

A perennial, with a woody rootstock; stems 3-5 dm. high, branched below, erect, strigose-canescenscent, terete; leaves 4-7 cm. long, ascending; stipules large, rigid, green, ovate or lanceolate; leaflets 1-5, filiform or narrowly linear, 1-3 cm. long, strigose-canescenscent, not articulate to the rachis, channeled; peduncles 1-2 dm. long, strict; racemes elongate, 1.5-2 dm. long; bract lance-subulate, green, rigid, 3-5 mm. long; pedicels 2-3 mm. long; calyx campanulate, silky-strigose, the tube 5 mm. long, 3 mm. broad, the teeth subulate, 5 mm. long; corolla purple, with white claws, about 15 mm. long; banner narrowly obovate, slightly arcuate; wings shorter, the blade oblong, falcate, obtuse, with a long reflexed auricle; keel-petals 12 mm. long, the blade lunate, rounded at the apex, as long as the claw, with a large basal auricle; pod linear, about 2 cm. long and 4 mm. broad, grayish-strigose, more or less arcuate.

TYPE LOCALITY: San Rafael Swell, Utah.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 4, f. 13.

17. *Homalobus Clementis* Rydb. Bull. Torrey Club 31: 563. 1904.

Astragalus tenellus Clementis F. Macbr. Contr. Gray Herb. 65: 35. 1922.

A perennial, with a caespitose caudex or rootstock; stems ascending or erect, 2-3 dm. high, sparingly strigose or glabrate; stipules broadly triangular, acuminate, connate, about 3 mm. long; leaves 5-8 cm. long; leaflets 11-21, oblong or lanceolate, acute, 7-12 mm. long, glabrous above, sparingly strigose beneath; racemes 8-12-flowered, including the petiole 7-10 cm. long; bracts lanceolate, 2 mm. long; calyx strigose with black hairs, the tube 2.5-3 mm. long, the teeth about 1.5 mm. long; corolla purplish; banner 7-8 mm. long, obovate; wings 6-7 mm. long, the blade obliquely oblanceolate; wing-petals 5-6 mm. long, with a rounded tip; pod oblong, sessile, about 1 cm. long and 4 mm. wide, black-hairy, the upper suture almost straight; seeds black, obliquely reniform, 2.5 mm. long, nearly 2 mm. broad.

TYPE LOCALITY: Sangre de Cristo, Colorado.

DISTRIBUTION: Colorado.

18. *Homalobus wingatanus* (S. Wats.) A. Heller, Muhlenbergia

1: 145. 1906.

Astragalus wingatanus S. Wats. Proc. Am. Acad. 18: 192. 1883.

Astragalus wingatensis M. E. Jones, Proc. Calif. Acad. II. 5: 636. 1895.

Homalobus wingatensis Rydb. Bull. Torrey Club 31: 563. 1904.

A perennial, with a caespitose caudex; stems 1.5-3 dm. high, strigose; stipules scarious, deltoid, acuminate, connate, 5 mm. long; leaves 3-6 dm. long; leaflets 9-13, linear-oblong or oblanceolate, 6-15 mm. long, 2-3 mm. wide, grayish-green, glabrous above, strigose beneath; racemes rather lax, 10-16-flowered, including the peduncle 10-15 cm. long; calyx strigose with mixed black and white hairs, the tube scarcely 2 mm. long, the teeth subulate, 1 mm. long; corolla white, tinged with purple, and the keel tipped with purple; banner 6 mm. long, obovate; wings and keel-petals about 5 mm. long, the latter with a rounded tip; pod oblong, acute at each end, sessile, glabrous, 10-22 mm. long, 4 mm. wide; seeds obliquely reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Fort Wingate, New Mexico.

DISTRIBUTION: New Mexico, Southern Colorado, and southeastern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 1, f. 1.

19. *Homalobus amphi-doxus* (Blankinship) Rydberg.

?*Astragalus miser* A. Gray, Proc. Am. Acad. 6: 228. 1864. Not *A. miser* Dougl. 1831.

Astragalus amphi-doxus Blankinship, Mont. Agr. Coll. Stud. 1: 72. 1905.

Homalobus miser Rydb. Bull. Torrey Club 40: 52, in part. 1913.

A caespitose perennial, with a thick woody root; stems numerous, 1-1.5 dm. high, sparsely strigose; leaves ascending, 5-8 cm. long; stipules strigose, deltoid, 3-4 mm. long; leaflets 13-17, lanceolate to lance-linear, acute, glabrous above, strigulose beneath, 1-1.5 cm. long, 2-4 mm.

wide; peduncles 4-6 cm. long; racemes 2-3 cm. long, 6-8-flowered; bracts lanceolate, 2 mm. long; pedicels 1 mm. long; calyx strigose with black hairs, the tube 2 mm. long, the teeth subulate, 1.5-2 mm. long; corolla violet-purple, 8 mm. long; banner obovate, notched at the apex; wings shorter, the blade obliquely obovate, with a rounded auricle; keel-petals much shorter, similar but broader, rounded at the apex; pod obliquely oval, 7-8 mm. long, 2.5 mm. wide, strigose, the upper suture nearly straight.

TYPE LOCALITY: Sky High, Unionville, Montana.

DISTRIBUTION: Montana to Washington.

20. *Homalobus vexilliflexus* (Sheldon) Rydb. Mem. N. Y.
Bot. Gard. 1: 249. 1900.

Astragalus pauciflorus Hook. Fl. Bor. Am. 1: 149. 1831. Not *A. pauciflorus* Pall. 1800.

Tragacantha pauciflora Kuntze, Rev. Gen. 947. 1891.

Astragalus vexilliflexus Sheldon, Minn. Bot. Stud. 1: 21. 1894.

A perennial, with a caespitose caudex; stems many, ascending, or decumbent, 1-2 dm. high, strigose; leaves 2-5 cm. long; upper stipules lanceolate, green, 2-3 mm. long, strigose, the lower deltoid, connate, more or less purplish; leaflets 7-11, oblong, acute, 6-15 mm. long, 2-4 mm. wide, strigose beneath, slightly so or glabrate above; peduncles 2-3 cm. long; racemes short, 2-5-flowered; bracts lanceolate, 2 mm. long; calyx strigose, the tube 2 mm. long, the teeth subulate, 1 mm. long; corolla purple; banner obovate, 6-7 mm. long, retuse; wings 5 mm. long, the blades obliquely oblanceolate, falcate, the claw short; keel-petals strongly lunate, ochroleucous, with purple rounded tip; pod elliptic, 8-10 mm. long, 3 mm. wide, acute at each end, sessile, strigose; seed almost black, rounded-reniform, 2.5 mm. long, nearly 2 mm. broad.

TYPE LOCALITY: Rocky Mountains, Canada.

DISTRIBUTION: Saskatchewan to British Columbia and Wyoming.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 8, f. 31.

21. *Homalobus tegetarioides* (M. E. Jones) Rydberg.

Astragalus tegetarioides M. E. Jones, Contr. W. Bot. 10: 66. 1902.

A densely caespitose perennial, with numerous subterranean stems; stems decumbent, branched, about 1 dm. long, finely pubescent with crisp hairs; leaves 2-4 cm. long, with slender petioles; stipules deltoid, green, 3-5 mm. long; leaflets 7-9, obovate or obcordate, 3-5 mm. long, crisp-hairy on both sides, folded; peduncles about 1 cm. long or less; racemes very short, 3-6-flowered; bracts lanceolate; calyx pubescent, the tube 1 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous, purple-striate; banner 4 mm. long, broadly obovate, strongly arched; wings shorter, the blades broadly obovate, very oblique; keel-petals much shorter, the blade broadly lunate, almost semicircular, obtuse; pod obliquely broadly elliptic, 4 mm. long, 3 mm. wide, and 1-1.5 mm. thick, mostly 1-seeded.

TYPE LOCALITY: Southern Blue Mountains, Oregon.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 7, f. 22.

3. *Bourgoviani*. Caespitose caulescent perennials, with a branched, rather slender caudex or rootstock. Stems usually decumbent at the base. Leaves pinnate, with several pairs of leaflets. Stipules mostly scarios, the lower broad and connate. Peduncles elongate, the racemes several- or few-flowered. Calyx campanulate, black-hairy. Corolla purple, the banner rather strongly arched, a little longer than the wings, the keel-petals with lunate blades, obtuse at the apex. Pod linear-oblong, short-stipitate or sessile, acute at each end, black-hairy with rather long hairs.

22. *Homalobus Bourgovii* (A. Gray) Rydb. Mem. N. Y.
Bot. Gard. 1: 247. 1900.

Astragalus Bourgovii A. Gray, Proc. Am. Acad. 6: 227. 1864.

Tragacantha Bourgovii Kuntze, Rev. Gen. 943. 1891.

A perennial, with a caespitose caudex; stem decumbent to erect, 2-30 cm. high; leaves 3-10 cm. long, ascending or erect; stipules lanceolate or the lower ovate, connate, 1-3 cm. long;

leaflets narrowly lance-oblong to oval, 3–20 mm. long, 1–6 mm. wide, strigose on both sides or nearly glabrate above, acute to rounded at the apex; peduncles 4–10 cm. long; racemes at first short, in age elongate, 2–8 cm. long; bracts subulate, 1–2 mm. long, black-hairy; calyx black-hairy, the tube 2.5–3 mm. long, the teeth subulate, 1–2 mm. long; corolla dark-purple; banner 7–9 mm. long, slightly notched; wings 6–8 mm. long, the blade obliquely obovate, with a large basal auricle, slightly longer than the claws; blade of the keel-petals broadly lunate, with a rounded tip and a rounded basal auricle; pod short-stipitate, lance-oblong, flat, 10–15 mm. long, 3–3.5 mm. broad, acute, black-hairy; seeds dark-brown, oblong-reniform, 3 mm. long, 2 mm. wide.

TYPE LOCALITY: Rocky Mountains, on the British Boundary.

DISTRIBUTION: Alberta, British Columbia, Idaho, and Montana.

ILLUSTRATION: M. E. Jones, Rev. *Astragal. pl. 8, f. 29*.

23. *Homalobus retusus* Rydb. Bull. Torrey Club 50: 186. 1923.

A perennial, with a slender caespitose rootstock; stems decumbent or ascending, 1–2 dm. long; leaves 5–8 cm. long; stipules lanceolate or the lower ovate or triangular, connate, 1–2 mm. long; leaflets 9–11, oblong to oval, often retuse or emarginate, 5–12 mm. long, 2–4 mm. wide, glabrous above, sparingly strigose beneath; peduncles 6–10 cm. long, slender; racemes short, 5–10-flowered; bracts lanceolate, 2 mm. long; calyx black-hairy, the tube 2 mm. long, the teeth subulate, 1 mm. long; corolla purplish; banner 8–9 mm. long, obovate; wings 7–8 mm. long, the blade obliquely oblanceolate, with a long basal auricle; keel-petals slightly shorter, with a rounded apex; pod black-hairy, sessile, 8 mm. long, 3.5 mm. wide.

TYPE LOCALITY: Fort Selkirk, Yukon.

DISTRIBUTION: Yukon and Mackenzie territories.

24. *Homalobus amblyodon* (Kearney) Rydberg, sp. nov.

Astragalus amblyodon Kearney, MS.

A caespitose perennial; stems less than 1 dm. long, decumbent or prostrate; leaves 1–2.5 cm. long, spreading; stipules mostly connate, broadly deltoid, 2–3 mm. long; leaflets 5–13, oval or obovate, retuse at the apex, 3–5 mm. long, glabrous above, sparingly strigose, especially along the midrib and margins beneath; peduncles 1.5–3 cm. long; racemes few-flowered, very short; bracts ovate, 1–2 mm. long, ciliate on the margins; calyx black-hairy, the tube 3 mm. long, 2 mm. broad, the teeth deltoid, obtuse, 1 mm. long; corolla purple, 10–12 mm. long; banner broadly obovate, notched at the apex; wings 8–10 mm. long, the blade broadly obliquely oblanceolate, somewhat falcate, with a reflexed auricle; keel-petals slightly shorter, similar but broader; mature pod not seen; young pod 1-celled, black-hairy, neither suture reflexed, with a flat beak.

Type collected at Stepvak Bay, Alaska Peninsula, Alaska, July 8–19, 1899, *Charles Palache* (U. S. Nat. Herb. 375154).

DISTRIBUTION: Known only from the type locality.

4. **Campestris.** Caespitose caulescent perennials with a branched caudex or rootstock. Stems erect to decumbent, elongate or short. Racemes several-flowered. Calyx campanulate, mostly strigose, the teeth subulate to deltoid, acute. Corolla ochroleucous, white, or purplish, small, the banner usually rather strongly arched, longer than the wings. Blades of wings and keel-petals longer than the claws, lunate, the tip of the keel-petals deltoid or lanceolate, but often blunt. Pod membranous, elongate-linear, sessile, strigose or glabrous.

25. *Homalobus campestris* Nutt.; T. & G. Fl. N. Am.

1: 351. 1838.

Homalobus decumbens A. Gray, Proc. Acad. Phila. 1863: 60. 1863. Not *H. decumbens* Nutt. 1838.

Astragalus campestris A. Gray, Proc. Am. Acad. 6: 229. 1864. Not *A. campestris* L. 1753.

Tragacantha campestris Kuntze, Rev. Gen. 943. 1891.

Astragalus convallarius Greene, Erythra 1: 207. 1893.

Astragalus serotinus campestris M. E. Jones, Proc. Calif. Acad. II. 5: 668. 1895.

Astragalus decumbens convallarius M. E. Jones, Contr. W. Bot. 10: 58. 1902.

Astragalus diversifolius roborum M. E. Jones, Contr. W. Bot. 10: 61, in part. 1902.

Phaca convallaria Piper, Contr. U. S. Nat. Herb. 11: 373. 1906.

Astragalus campestris diversifolius F. Macbr. Contr. Gray Herb. 65: 35, in part. 1922.

A perennial, with a creeping rootstock; stem 2-5 dm. high, strigose, angled; leaves 5-10 cm. long, pinnate, but the leaflets few, often irregularly inserted or lacking, especially the terminal one, the rachis being prolonged, sometimes flattened at the end or arcuate-recurved; stipules triangular, acute, 2-3 mm. long, the lower more or less connate; lateral leaflets linear or filiform, 1-2 mm. long, involute, strigose, acute; racemes lax, together with the peduncle 8-16 cm. long; bracts subulate, 2-3 mm. long; pedicels 2-3 mm. long; calyx strigose with black and white hairs mixed, the tube campanulate, 3-4 mm. long, the teeth subulate, about 1 mm. long, black-hairy; corolla ochroleucous, rarely tinged with purple, the keel tipped sometimes with purple; banner obovate, retuse, with a broad short claw; wings about as long, the blade lunate-oblancheolate, with an acute basal auricle, the claw half as long as the blade; keel-petals similar, with a lanceolate obtuse apex, the claw half as long as the blade; pod linear-oblancheolate in outline, tapering towards the base, with a cuneate apex, 2.5-3 cm. long, 3 mm. wide, strigose.

TYPE LOCALITY: Sandy plains of the Colorado of the West near the sources of the Platte [Green River Basin, Wyoming].

DISTRIBUTION: Wyoming to Utah and Colorado.

ILLUSTRATION: M. E. Jones, Contr. W. Bot. 10: pl. 2.

26. *Homalobus junciformis* (A. Nelson) Rydb. Bull.

Torrey Club 32: 666. 1906.

Astragalus junciformis A. Nelson, Bull. Torrey Club 26: 9. 1899.

A perennial, with a rootstock, usually branching below ground; stem cinereous-strigose, 2-4 dm. high, striate or angled; leaves 4-7 cm. long, with 5-9 leaflets, or the upper reduced to the mere rachis; stipules triangular, 2-3 mm. long, scarious, the lower connate; lateral leaflets linear or oblong, 5-15 mm. long, 1-3 mm. wide, strigose, the terminal one similar or often wanting and represented by the prolonged rachis; racemes lax, together with the peduncle 8-15 cm. long; bracts lanceolate, 1-2 mm. long; calyx strigose, more or less black-hairy, the tube 4 mm. long, the teeth 0.6 mm. long, broadly deltoid; corolla ochroleucous, 10 mm. long, the petals similar to those of *H. campestris*; pod strigose, linear, 3 cm. long.

TYPE LOCALITY: Point of Rocks, Sweetwater County, Wyoming.

DISTRIBUTION: Southern Wyoming and northeastern Utah.

27. *Homalobus junceus* Nutt.; T. & G. Fl. N. Am. 1: 351. 1838.

Tragacantha juncea Kuntze, Rev. Gen. 945. 1891.

Astragalus diversifolius Sheldon, Minn. Bot. Stud. 1: 120, in part. 1894.

Astragalus diversifolius junceus M. E. Jones, Contr. W. Bot. 8: 13. 1898.

Astragalus diversifolius roborum M. E. Jones, Contr. W. Bot. 10: 61. 1902.

Astragalus junceus attenuatus M. E. Jones, Rev. Astrag. 76. 1923.

A perennial, with a creeping rootstock, usually branched underground; stem 2-5 dm. high, strigose, slender, angled; leaves 5-10 cm. long, pinnate or the upper often reduced to the mere rachis; stipules triangular, 2-3 mm. long, scarious, the lower more or less connate; lateral leaflets few, linear or linear-filiform, 1-2 cm. long, strigose, the terminal one usually wanting or represented by the flattened upper part of the rachis, which is often arcuate or hooked; racemes lax, 5-15 cm. long; bracts subulate or lanceolate, 1.5-3 mm. long; calyx white-strigose, the tube 3.5-4 mm. long, the teeth about 1 mm. long, deltoid; corolla ochroleucous, rarely tinged with purple, 8-10 mm. long, similar to that of *H. campestris*; pod linear, nearly uniform in thickness, acute at each end, 2.5-3.5 cm. long, 2 mm. broad, strigose; seeds oblong, 2.5 mm. long, 1.5 mm. broad.

TYPE LOCALITY: "In the Rocky Mountain Range towards the Oregon" [probably Idaho].

DISTRIBUTION: Montana and Idaho to Nevada and Arizona.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 1 (as *A. diversifolius*); Rev. Astrag. pl. 3, f. 11; pl. 4 (as var. *attenuatus*).

28. *Homalobus orthocarpus* Nutt.; T. & G. Fl. N. Am.

1: 351. 1838.

Astragalus diversifolius A. Gray, Proc. Am. Acad. 6: 230. 1864.*Astragalus ibapensis* M. E. Jones, Zoe 3: 290. 1893.*Atelophragma ibapense* Rydb. Bull. Torrey Club 40: 51. 1913.*Astragalus campestris diversifolius* F. Macbr. Contr. Gray Herb. 65: 35. 1922.*Astragalus junceus orthocarpus* M. E. Jones, Rev. Astrag. 76. 1923.*Astragalus junceus diversifolius* M. E. Jones, Rev. Astrag. Index. 1923.

A perennial, with a rootstock, branching near the surface; stems 2-4 dm. high, strigose-canescens; leaves 3-8 cm. long, the lower 3-5-foliolate, the middle sometimes 7-9-foliolate, and the uppermost simple; stipules triangular or ovate, the lower connate; leaflets linear or lance-linear, acute at each end, 5-20 mm. long, strigose beneath, glabrous above, the terminal one longer, the simple leaves sometimes nearly filiform; racemes lax, with the peduncle 5-10 cm. long, 3-10-flowered; bracts lanceolate, about 1 mm. long; calyx white-strigose, the tube 3-3.5 mm. long, the teeth lance-subulate, nearly 1 mm. long; corolla ochroleucous, 8 mm. long, the petals similar to those of *H. campestris*; pod oblong, acute at each end, 15-18 mm. long, 4 mm. wide, strigose.

TYPE LOCALITY: Colorado of the West [probably Ham's Fork, Wyoming].

DISTRIBUTION: Wyoming and Utah; perhaps New Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 3 (except the lower pod); pl. 42, f. 139.

29. *Homalobus strigosus* (Coult. & Fisher) Rydb. Bull. Torrey Club

40: 53. 1913.

Astragalus strigosus Coult. & Fisher, Bot. Gaz. 18: 299. 1893.*Astragalus griseopubescens* Sheldon, Minn. Bot. Stud. 1: 24. 1894.*Astragalus serotinus strigosus* F. Macbr. Contr. Gray Herb. 65: 37. 1922.

A perennial, with a caespitose caudex; stems 1.5-3 dm. high, strigose-canescens; leaves 7-12 cm. long; upper stipules lanceolate, the lower triangular, scarious, connate, 3-4 mm. long; leaflets 13-21, from lance-linear to narrowly linear, 1-3 cm. long, 1-3 mm. wide, acute at each end, cinereous-strigose on both sides, often somewhat falcate; racemes lax, including the peduncles 1-1.5 dm. long, 10-16-flowered; calyx strigose, the tube 2-2.5 mm. long, the teeth subulate, 1.5 mm. long; corolla white or ochroleucous or tinged with purple, the keel purple-tipped; banner 8-10 mm. long, obovate; wings 6-7 mm. long, the blade obliquely oblanceolate, much longer than the claw; blades of keel-petals lunate, 6-8 mm. long, with a lanceolate tip; pod 18-20 mm. long, 3-3.5 mm. wide, linear, straight, acute at each end, strigose; seeds broadly reniform-oblong, 2.5 mm. long, fully 1.5 mm. wide.

TYPE LOCALITY: Basin, Montana.

DISTRIBUTION: Montana to eastern Washington and northern Wyoming.

30. *Homalobus tenuifolius* Nutt.; T. & G. Fl. N. Am.

1: 352. 1838.

Astragalus campestris Coult. & Nels. Man. 291. 1909; M. E. Jones, Rev. Astrag. 74. 1923.Not *A. campestris* L. 1753; nor *A. campestris* A. Gray. 1866.

A perennial, with a caespitose rootstock, branching near the surface; stems decumbent, 1-2 dm. high, strigose-canescens; leaves 2-6 cm. long; stipules lanceolate or the lower triangular, scarious and connate; leaflets 7-11, narrowly linear, involute or folded, strigose-canescens on both sides, 8-15 mm. long, 1-2 mm. wide; racemes lax, including the peduncle 5-10 cm. long; bracts subulate, 1-2 mm. long; calyx strigose, the tube 1.5-2 mm. long, the teeth triangular-subulate, scarcely 1 mm. long; corolla ochroleucous or white, the keel purple-tipped; banner 6-7 mm. long, broadly obovate; wings falcate, 5-6 mm. long, the blade obliquely oblanceolate, rounded at the apex, with an acute basal auricle, twice as long as the claw; keel-petals 5-6 mm. long, the blades lunate, with a rather long lanceolate tip; pod oblong-linear, 12-15 mm. long, 2.5-3 mm. wide, strigose.

TYPE LOCALITY: Hills of the Rocky Mountains [Wyoming or Idaho].

DISTRIBUTION: Colorado, Wyoming, and Montana.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 2 (except lower pod); Rev. Astrag. pl. 2, f. a, c (as var. *decumbens*).

31. *Homalobus decumbens* Nutt.; T. & G. Fl. N. Am.

1: 351. 1838.

Astragalus decumbens A. Gray, Proc. Am. Acad. 6: 229. 1864.*Tragacantha decumbens* Kuntze, Rev. Gen. 944. 1891.*Phaca decumbens* Piper, Contr. U. S. Nat. Herb. 11: 373. 1906.*Astragalus campestris decumbens* M. E. Jones, Rev. Astrag. 74. 1923.

A perennial, with a rootstock, branched near the surface; stems 1-2 dm. long, decumbent, striate, sparingly strigose; upper stipules lanceolate, the lower triangular, connate, scarious, 2-4 mm. long; leaves 4-9 cm. long; leaflets 7-17, linear or narrowly lance-linear, 5-10 mm. long, mostly 1 mm. wide, often conduplicate, sparingly strigose; peduncles 6-8 cm. long; racemes short, 5-10-flowered; bracts subulate, 2 mm. long; calyx strigose, the tube 2 mm. long, the teeth subulate, less than 1 mm. long; corolla white or cream-colored, with a purple-tipped keel; banner broadly obovate, nearly 1 cm. long, strongly arched below the middle; wings 8 mm. long, the blade oblong, falcate; keel-petals shorter, the blade lunate; pod linear, arcuate, 2.5 cm. long, 3 mm. wide, strigose, acute at each end.

TYPE LOCALITY: Sandy plains of the Colorado of the West, near the sources of the Platte [Green River Basin, Wyoming].

DISTRIBUTION: Wyoming and Colorado.

32. *Homalobus divergens* (Blankinship) Rydb. Bull.

Torrey Club 34: 417. 1907.

Astragalus divergens Blankinship, Mont. Agr. Coll. Stud. 1: 73. 1905.*Homalobus camporum* Rydb. Bull. Torrey Club 32: 666. 1906.*Astragalus campestris crispatus* M. E. Jones, Rev. Astrag. 75. 1923.

A perennial, with a caespitose caudex; stems 1-1.5 dm. high, strigose-canescens; leaves 3-5 cm. long; stipules triangular, acuminate, 3-5 mm. long, pubescent, the lower connate; leaflets 9-13, elliptic to linear-oblong, 4-10 mm. long, 1-2 mm. wide, strigose-canescens on both sides; peduncles 5-8 cm. long; racemes short, 6-15-flowered; bracts subulate, 2 mm. long; calyx strigose with mixed dark and light hairs, the tube 2 mm. long, the teeth lance-subulate, 1 mm. long; corolla ochroleucous or white, tinged with blue, the keel purple-tipped; banner 7-8 mm. long, obovate; wings 6 mm. long, the blade obliquely oblanceolate, falcate; keel-petals 6-7 mm. long, lunate, with a lanceolate, obtusish tip; pod 12-18 mm. long, 2-2.5 mm. wide, strigose, straight, somewhat mottled with light-brown, sessile or short-stipitate; seeds 2 mm. long, 1.5 mm. wide.

TYPE LOCALITY: Uplands near Big Coulee, about 30 miles northeast of Big Timber, Sweet Grass County, Montana.

DISTRIBUTION: Montana, Wyoming, eastern Idaho, and northeastern Utah.

ILLUSTRATION: Mont. Agr. Coll. Stud. 1: pl. 2.

33. *Homalobus humilis* Rydb. Bull. Torrey Club 34: 417. 1907.*Astragalus Carltonii* F. Macbr. Contr. Gray Herb. 65: 36. 1922.

A perennial, with a caespitose caudex; stem 2-10 cm., rarely 15 cm. high, grayish-strigose, decumbent or spreading; leaves 2-7 cm. long; stipules ovate or triangular, scarious, 2-3 mm. long, the lower connate; leaflets 11-17, oblong to linear, 3-10 mm. long, usually 2-3 mm. wide, grayish-strigose beneath, glabrous above; peduncles 2-8 cm. long; racemes short, 1-2 cm. long, 3-8-flowered; calyx strigose with black hairs, the tube 1.5-2 mm. long, the teeth triangular or triangular-subulate, 1-1.5 mm. long; corolla white, tinged with purple, and the keel purple-tipped; banner obovate, 7-8 mm. long; wings and keel-petals 6-7 mm. long, similar to those of *H. microcarpus*; pod about 1.5 cm. long, 3 mm. wide, widest near the abruptly acute apex, tapering towards the base, the upper suture nearly straight, the lower arched at the apex; seeds broadly oblong-reniform.

TYPE LOCALITY: Mountains north of Bullion Creek, near Marysvale, Utah.

DISTRIBUTION: South-central Utah.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 2 (as *A. tenuifolius*, in part, as to lower pod); Rev. Astrag. pl. 2, f. b.

34. *Homalobus microcarpus* Rydb. Bull. Torrey Club
34: 417. 1907.

Homalobus camporum Rydb. Bull. Torrey Club 32: 666, in part. 1906.

A perennial, with a caespitose rootstock, branching near the surface; stem decumbent, 1-2 dm. high, strigose; leaves numerous, 5-8 cm. long; stipules scarious, ovate, 2-3 mm. long; leaflets 9-15, elliptic to linear, 5-15 mm. long, 1-3 mm. wide, glabrous above, sparingly strigose beneath, obtuse or acutish; peduncles 4-6 cm. long; racemes short, 3-8-flowered; calyx strigose with black hairs, the tube about 2 mm. long, the teeth about 1 mm. long, subulate; corolla white, the keel tipped with purple; banner broadly obovate, 8 mm. long; wings and keel-petals 6 mm. long, similar to those of *H. hylophilus*; pod sessile, strigose, straight, 12-18 mm. long, nearly 3 mm. wide; seeds oblong-reniform, 2 mm. long.

TYPE LOCALITY: East slope of Rabbit Ear Range, Colorado.

DISTRIBUTION: Northern Colorado, southern Wyoming and Utah.

35. *Homalobus paucijugus* Rydb. Bull. Torrey Club 34: 418. 1907.

Astragalus Garretii F. Macbr. Contr. Gray Herb. 65: 36. 1922.

A perennial, with a caespitose caudex, bushy; stems 1-2 dm. high, sparingly strigose; leaves numerous, 5-10 cm. long; stipules scarious, ovate, 2-3 mm. long; leaflets 1-5, the lateral ones lanceolate to linear-subulate, 1 cm. or less long, glabrous above, sparingly strigose beneath, sometimes lacking, the terminal one 1-2 cm. long, linear or linear-oblancoelate, gradually tapering into the rachis; peduncles 3-6 cm. long; racemes short, 3-6-flowered; bracts lanceolate, 2 mm. long; calyx strigose with black hairs, the tube about 2 mm. long, the teeth subulate, fully 1 mm. long; corolla as in *H. microcarpus*; legume 12-15 mm. long, 2 mm. wide, straight, strigose, acute at each end; seeds olive-brown, 2.5 mm. long, 1.5 mm. broad.

TYPE LOCALITY: Big Cottonwood Canon, Utah.

DISTRIBUTION: Known only from the type locality.

36. *Homalobus oblongifolius* Rydb. Bull. Torrey Club 34: 50. 1907.

Astragalus hylophilus oblongifolius F. Macbr. Contr. Gray Herb. 65: 37. 1922.

A perennial, with a rootstock and caespitose caudex; stem ascending, branched, 2-3 dm. high, sparingly strigose or glabrate; leaves 8-10 cm. long; stipules ovate or lanceolate, scarious, the lower connate; leaflets 11-19, from elliptic to linear-oblong, usually oblong, 1-2 cm. long, 3-6 mm. wide, glabrous above, sparingly strigose beneath, rounded at the apex; peduncles 5-10 cm. long; racemes short, 3-5 cm. long, 5-10-flowered; bracts lanceolate, scarious, 1 mm. long; calyx strigose with black hairs, the tube 2-2.5 mm. long, the teeth subulate, fully 1 mm. long; corolla white, tinged with purple, the keel purple-tipped; banner 1 cm. long, obovate, retuse; wings and keel-petals 8 mm. long, similar to those of *H. hylophilus*; pod about 2 cm. long, 3 mm. wide, usually broadest above the middle, acute, the tip slightly curved upwards; seeds oblong.

TYPE LOCALITY: Cerro Summit, Colorado.

DISTRIBUTION: Colorado.

37. *Homalobus decurrens* Rydb. Bull. Torrey Club 31: 563. 1904.

Astragalus Rydbergii F. Macbr. Contr. Gray Herb. 65: 37. 1922.

A perennial, with a caespitose rootstock or caudex; stems erect, 3-4 dm. high, slightly strigose and angled; leaves 1-1.5 dm. long; upper stipules lanceolate, free, 4-5 mm. long, green, the lower ones scarious, broader, and connate; leaflets 11-15, linear-oblong or oblanceolate, glabrate above, strigose beneath, the terminal one usually larger, more or less decurrent on the rachis, without a distinct node, 2-5 cm. long, 3-6 mm. wide, the lateral ones 1.5-4 cm. long, all mucronate or cuspidate; racemes slender, lax, including the peduncle 1-2 dm. long, 5-10-flowered; bracts subulate, about 2 mm. long; calyx more or less black-hairy, the tube about 2.5 mm. long, the teeth subulate, nearly 2 mm. long; corolla white, the keel tipped with purple; banner obovate, retuse, 10-12 mm. long; wings and keel-petals 9-10 mm. long, the blade of

the former obliquely oblanceolate, falcate, with an acute basal auricle, twice as long as the claw; blade of the keel-petals lunate, with a lanceolate tip; pod fully 2 cm. long and 3 mm. wide, sessile, linear, straight, glabrous or sparingly white-strigose when young; seeds oblong-remiform, fully 2 mm. long and 1.5 mm. broad.

TYPE LOCALITY: Estes Park, Colorado.

DISTRIBUTION: Colorado.

38. *Homalobus Hitchcockii* Rydberg, sp. nov.

A caespitose perennial; stems several, about 2 dm. high, branched at the base, sparingly strigose; leaves erect, 10–13 cm. long, the rachis sulcate, sparingly strigose; stipules broadly deltoid, acuminate; leaflets 9–15, lanceolate or lance-oblong, acute at each end, 1–2.5 cm. long, 2–5 cm. wide, glabrous above, strigulose beneath; peduncles 10–12 cm. long, erect; racemes about 2 cm. long, few-flowered; bracts lance-subulate, 2 mm. long, slightly exceeding the pedicels; calyx sparingly black-hairy, the tube 2–2.5 mm. long, the teeth subulate, 1.5 mm. long; corolla cream-colored, the keel purple-veined and purple-tipped; banner about 9 mm. long, obovate, strongly arcuate below the middle; wings 7 mm. long, the blade oblanceolate-falcate; keel-petals 6 mm. long, the blade lunate, long-acute at the apex; pod oblanceolate in outline, slightly arched, broadest one third from the apex, minutely black-strigulose, the lower suture strongly arched.

Type collected at Duck Creek, Eli, Nevada, August 17, 1913, *Hitchcock 1344* (U. S. Nat. Herb. no. 76659).

39. *Homalobus serotinus* (A. Gray) Rydb. Mem. N. Y. Bot. Gard. 1: 248. 1900.

Astragalus serotinus A. Gray, Pacif. R. R. Rep. 12: 51. 1860.

Tragacantha serotina Kuntze, Rev. Gen. 948. 1891.

Astragalus decumbens serotinus M. E. Jones, Contr. W. Bot. 10: 58. 1902.

Phaca serotina Piper, Contr. U. S. Nat. Herb. 11: 374. 1906.

Astragalus campestris serotinus M. E. Jones, Rev. Astrag. 75. 1923.

A perennial, with a branched rootstock; stem adscurgent or erect, sparingly strigose, in age often glabrate; leaves 7–15 cm. long, ascending; upper stipules lanceolate, green, 2–3 mm. long, the lower scarious, triangular, connate; leaflets 9–21, linear, glabrous above, strigose beneath, 1–2.5 cm. long, 1–3 mm. wide; racemes lax, with the peduncle 1–1.5 dm. long, 8–20-flowered; bracts lanceolate, 2 mm. long; calyx white-hairy, the tube 2–2.5 mm. long, the teeth subulate, less than 1 mm., often only 0.5 mm. long; corolla white, the keel tipped with purple; banner obovate, retuse, 8–9 mm. long; wings 7 mm. long, the blade obliquely oblanceolate, slightly longer than the claw; keel-petals similar, but broader, with a lanceolate tip and a rounded basal auricle; pod strigose, linear, about 2 cm. long, 3 mm. wide, acute at each end, sessile; seeds oblong, 2 mm. long, brown.

TYPE LOCALITY: Near Columbia River, lat. 48°, Washington.

DISTRIBUTION: Alberta and British Columbia to Oregon and western Montana; Colorado (?).

ILLUSTRATIONS: Pacif. R. R. Rep. 12: pl. 5; M. E. Jones, Contr. W. Bot. 10: pl. 2; Rev. Astrag. pl. 3.

40. *Homalobus Palliseri* (A. Gray) Rydb. Mem. N. Y. Bot. Gard. 1: 248. 1900.

Astragalus Palliseri A. Gray, Proc. Am. Acad. 6: 227. 1864.

Tragacantha Palliseri Kuntze, Rev. Gen. 947. 1891.

Astragalus serotinus Palliseri F. Macbr. Contr. Gray Herb. 65: 37. 1922.

A perennial, with a caespitose rootstock, branched near the surface; stem 2–3 dm. high, slender, sparingly strigose; leaves 5–10 cm. long, ascending; upper stipules lanceolate, green, nearly distinct, the lower scarious, triangular, more or less connate; leaflets 9–19, linear or lance-linear, 1–2 cm. long, 1–2 mm., rarely 3 mm. wide, glabrous above, strigose beneath, obtuse or acutish; racemes lax, 7–15-flowered, including the peduncle 1–2 dm. long; bracts lanceolate, about 2 mm. long; calyx strigose with mixed white and dark hairs, the tube 2–2.5 mm. long, the teeth subulate, less than 1 mm. long, often only 0.5 mm. long; corolla white, only the keel

purple-tipped; banner obovate, 8 mm. long; blades of the wings obliquely lunate-oblong, 6 mm. long, those of the keel-petals lunate, with a lanceolate obtuse tip and a rounded basal auricle; pod sessile or slightly stipitate, 15-20 mm. long, 2-2.5 mm. wide, glabrous; seeds olive-brown, oblong, 2 mm. long, 1.5 mm. wide.

TYPE LOCALITY: Rocky Mountains on the British Boundary.

DISTRIBUTION: Montana, Alberta, British Columbia, and Washington.

41. *Homalobus hylophilus* Rydb. Mem. N. Y. Bot. Gard. 1: 247. 1900.

Astragalus hylophilus A. Nelson; Coult. & Nels. Man. Rocky Mt. 291. 1909.

Astragalus campestris hylophilus M. E. Jones, Rev. Astrag. 75. 1923.

A caespitose perennial, with a rootstock, branched near the surface; stems many, 1-3 dm. high, slender, slightly strigose or glabrate; stipules scarious, the upper lanceolate, 5 mm. long, the lower triangular, connate around the stem and somewhat adnate to the petioles; leaves 0.8-1.5 dm. long, pinnate; leaflets 13-25, usually about 17, oblong or oval, or in open places linear, glabrous above, sparingly strigose beneath, 8-30 mm. long, 2-10 mm. wide, rounded to acute at each end; peduncles 5-12 cm. long; racemes short, 6-12-flowered, in fruit more lax; bracts lanceolate to linear, subulate, 1-2 mm. long; calyx strigose with dark hairs, the tube 2.5-3 mm. long; corolla almost white, tinged with purple, and the keel purple-tipped; banner broadly obovate, retuse, reflexed at the middle; blades of the wings 8 mm. long, obliquely lunate-obovate, rounded at the apex, with an acute basal auricle, the claws less than half as long as the blade; keel-petals 8 mm. long, the blade lunate, with a lanceolate obtuse tip and a rounded basal auricle; pod linear, sessile, glabrous, 2.5-3 cm. long, 3 mm. wide; seeds broadly oblong, fully 2.5 mm. long, barely 2 mm. wide, brown.

TYPE LOCALITY: Bridger Mountain, Montana.

DISTRIBUTION: Montana to South Dakota, Utah, and Idaho.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 2 (as *A. decumbens*); Rev. Astrag. pl. 3.

5. *Stenophylli*. Caulescent perennials, with a branched caudex. Stems comparatively tall, erect. Racemes elongate, many-flowered. Calyx campanulate, mostly strigose, the teeth subulate or deltoid. Corolla middlesized, white or purplish. Banner narrowly obovate, much exceeding the wings, moderately arched. Wings with an oblong-falcate or obliquely oblong blade about equaling the claw, the keel-petals with a lunate blade, rounded at the apex. Pod membranous, flat, stipitate, the stipe longer than the calyx, the body linear or lance-linear, long-tapering at the base.

42. *Homalobus Coltoni* (M. E. Jones) Rydb. Bull. Torrey Club 50: 269. 1923.

Astragalus Episcopus S. Wats. Proc. Am. Acad. 10: 346, in part. 1875.

Astragalus Coltoni M. E. Jones, Zoe 2: 237. 1891.

Homalobus Episcopus Rydb. Bull. Torrey Club 40: 53, in part. 1913.

Astragalus Coltoni aphyllus M. E. Jones, Rev. Astrag. 71. 1923.

A perennial, with a caespitose woody caudex; stems 3-6 dm. high, erect or ascending, glabrous, striate and angled; leaves 5-10 cm. long; lower stipules scarious and connate, the upper ones deltoid, green, mostly free; leaflets 5-7, linear or those of the lower leaves oblong, obtuse, 5-10 mm. long, 1-2 mm. wide, strigose, the terminal one often wanting and represented by the prolonged rachis; peduncles 1-2 dm. long; racemes lax, rather few-flowered; bracts subulate, about 2 mm. long; calyx strigose, often with some black hairs, especially at the margin, the tube 4 mm. long, the teeth subulate, 1.5 mm. long; corolla red-purple; banner 12-13 mm. long, obovate; wings 11-12 mm. long; keel-petals 9-10 mm. long, rounded at the apex; pod glabrous, stipitate, the stipe about 8 mm. long, the body oblong, acute at each end, about 2.5 cm. long, 3-4 mm. wide; seeds obliquely reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Castle Gate, Utah.

DISTRIBUTION: Utah and northwestern New Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 1, f. 3.

43. *Homalobus stenophyllus* (T. & G.) Rydb. Mem. N. Y. Bot.
Gard. 1: 249. 1900.

Astragalus leptophyllus Nutt. Jour. Acad. Phila. 7: 18. 1834. Not *A. leptophyllus* Desf. 1800.
Astragalus stenophyllus T. & G. Fl. N. Am. 1: 329. 1838.
Astragalus filipes S. Wats. Bot. King's Expl. 75. 1871. Not *H. filipes* Torr. 1864.
Tragacantha stenophylla Kuntze, Rev. Gen. 948. 1891.
Phaca stenophylla Piper, Contr. U. S. Nat. Herb. 11: 371. 1906.

A perennial, with a caespitose woody caudex; stems erect, 3-10 dm. high, glabrous, striate and slightly angled; leaves 6-10 cm. long, erect or ascending; stipules lanceolate or deltoid, distinct or the lower connate; leaflets 9-15, linear, 1-2 cm. long, 1-2 mm. wide, glabrous on both sides or sparingly hairy beneath; peduncles 5-12 cm. long; racemes rather lax, 5-10 cm. long; bracts lanceolate, 1-2 mm. long; calyx black-strigose, the tube 3-4 mm. long, the teeth triangular, often obtuse, 1 mm. long or less; corolla yellow; banner obovate, 10-12 mm. long; wings 9-10 mm. long, the blade obliquely oblanceolate, acute or acutish, hastately auriculate at the base, about equaling the claw; keel-petals 8-9 mm. long, the blade broadly lunate, rounded at the apex and with a rounded basal auricle; pod stipitate, the stipe strigose, about 1 cm. long, the body linear-oblong, acute at each end, 2-2.5 cm. long, 4-5 mm. wide; seeds obliquely reniform, 3-3.5 mm. long, 2-2.5 mm. broad.

TYPE LOCALITY: Headwaters of the Missouri.

DISTRIBUTION: British Columbia to central Idaho, eastern Nevada, and California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 1, f. 4.

44. *Homalobus MacGregorii* Rydb. Bull. Torrey Club
50: 270. 1923.

A perennial, with a caespitose caudex; stems strigose, striate; leaves 5-8 cm. long; lower stipules triangular, scarious, connate, the upper ones more herbaceous, distinct; leaflets 13-19, linear, 10-15 mm. long, 1-2 mm. wide, strigose on both sides; peduncles 1-2 dm. long; racemes lax, 5-12 cm. long; bracts subulate, 2-3 mm. long; calyx strigose, the tube 4-5 mm. long, the teeth triangular, 1 mm. long or less; corolla ochroleucous or white; banner 12 mm. long, obovate; wings 11 mm. long, the blade obliquely oblanceolate, equaling the claw; keel-petals 10 mm. long, rounded at the apex, the blade broadly lunate, with a rounded basal auricle; pod stipitate, the stipe 12-15 mm. long, slightly pubescent, the body glabrous, linear-elliptic, acute at each end, 2.5 cm. long, 5-6 mm. broad.

TYPE LOCALITY: Near Frazier Borax Mine, Mount Pinos, Ventura County, California.

DISTRIBUTION: Southern California and northern Lower California.

45. *Homalobus canovirens* Rydb. Fl. Rocky Mts.
ed. 2. 1126. 1922.

Astragalus Coltoni moabensis M. E. Jones, Contr. W. Bot. 8: 11. 1898.

A perennial, with a caespitose rootstock; stem 3-5 dm. high, grayish-strigose and angled; leaves 4-6 cm. long; stipules deltoid, 2-3 mm. long; leaflets 7-15, linear or linear-oblong, strigose on both sides, 5-12 mm. long, obtuse; peduncles 5-15 cm. long, strigose; racemes 5 cm. long or less, 5-10-flowered; bracts subulate, 1 mm. long or less; calyx black-hairy, the tube 4 mm. long, the teeth 1 mm. long, subulate; corolla dark bluish-purple with yellowish claws; banner obovate, nearly 1.5 cm. long; wings with a large basal auricle; keel-petals rounded at the apex; pod glabrous, stipitate, the stipe 1 cm. long or less, the body oblong, 2-2.5 cm. long, 5 mm. wide; seeds obliquely reniform, 3 mm. long, fully 2 mm. wide.

TYPE LOCALITY: Western slope of La Sal Mountains, Utah.

DISTRIBUTION: Southeastern Utah, northwestern New Mexico, and western Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 1.

46. *Homalobus Antiselli* (A. Gray) Rydb. Bull. Torrey Club
50: 271. 1923.

Homalobus multiflorus Torr. Pacif. R. R. Rep. 7: 10. 1855. Not *H. multiflorus* T. & G. 1838.

Astragalus Antiselli A. Gray, Bot. Calif. 1: 152. 1876.

Astragalus Hasseanus Sheldon, Minn. Bot. Stud. 1: 124. 1894.

Astragalus trichopodus Antiselli Jepson, Man. Fl. Calif. 572. 1925.

A perennial, with a caespitose caudex; stems 3-10 dm. high, more or less cinereous-strigose, erect, branching, nearly terete, striate; leaves 5-15 cm. long; stipules lanceolate to deltoid, distinct, 3-5 mm. long; leaflets 11-27, oblong or elliptic, 5-20 mm. long, 2-5 mm. wide, glabrous above, grayish-strigose beneath, obtuse to retuse at the apex; peduncles 5-10 cm. long; racemes rather short in flower, lax in fruit, 4-8 cm. long; calyx canescent-strigose, the tube 3.5 mm. long, the teeth subulate, 1 mm. long; corolla ochroleucous, similar to that of *H. stenophyllus*; banner about 1 cm. long, obovate; wings somewhat shorter, obtuse; keel-petals about 8 mm. long; pod glabrous, stipitate, the stipe 12-14 mm. long, the body elliptic, acute at each end, 15-18 mm. long; seed olive-brown, obliquely reniform, 2.5 mm. long, 2 mm. broad.

TYPE LOCALITY: Hillsides, Santa Barbara, California.

DISTRIBUTION: Southern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 2, f. 5; Contr. W. Bot. 10: pl. 2.

47. *Homalobus filipes* (Torr.) A. Heller, Muhlenbergia 9: 67. 1913.

Astragalus filipes Torr.; A. Gray, Proc. Am. Acad. 6: 226. 1864.

Tragacantha filipes Kuntze, Rev. Gen. 944. 1891.

A perennial, with a caespitose caudex; stems erect, slender, branched, 3-10 dm. high, strigose; leaves 5-8 cm. long; stipules lanceolate to triangular, more or less adnate to the petioles but not connate; leaflets 7-11, linear to filiform, strigose, 8-15 mm. long, 1 mm. or less wide; racemes lax, including the peduncle 1-2 dm. long; bracts subulate, 1-2 mm. long; calyx strigose with mixed white and black hairs, the tube 3 mm. long, the teeth deltoid, 1 mm. long, acute; corolla white; banner 8 mm. long, obovate; wings nearly as long, the blade obliquely oblanceolate, with a rounded basal auricle, about equaling the claw; keel-petals lunate, with a rounded apex and a large rounded basal auricle; pod sparingly strigulose, the stipe 8-10 mm. long, the body oblong, about 2 cm. long, 4-5 mm. broad.

TYPE LOCALITY: Interior of Washington, near Fort Okanogan.

DISTRIBUTION: Washington, Oregon, Idaho, and Nevada.

48. *Homalobus inversus* (M. E. Jones) Rydb. Bull. Torrey Club 50: 271. 1923.

Astragalus inversus M. E. Jones, Zoe 4: 276. 1893.

Astragalus filipes inversus Jepson, Man. Fl. Calif. 571. 1925.

A perennial, with a caespitose woody caudex; stems glabrous, striate, flexuose, 4-7 dm. high; leaves 5-10 cm. long; stipules deltoid, 4-8 mm. long; leaflets linear, 8-20 mm. long, 1-2 mm. wide, glabrous; peduncles 1-1.5 dm. long; racemes 5-10 cm. long, laxly 5-10-flowered; calyx strigose, the tube 3 mm. long, the teeth 1 mm. long; corolla ochroleucous, about 12 mm. long; banner obovate, scarcely longer than the other petals; keel-petals blunt; pod glabrous, the stipe about 1 cm. long, the body tapering at each end, the upper suture arched, the lower straight or somewhat concave, 2-3 cm. long, 3.5-4 mm. wide; seeds brown, obliquely reniform, nearly 3 mm. long, 2 mm. wide.

TYPE LOCALITY: Susanville, California.

DISTRIBUTION: Modoc and Lassen counties, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 2, pl. 77, f. 8.

49. *Homalobus gaviotus* (Elmer) Rydb. Bull. Torrey Club
50: 272. 1923.

Astragalus Antiselli phoxus M. E. Jones, Contr. W. Bot. 10: 65. 1902.

Astragalus gaviotus Elmer, Bot. Gaz. 39: 54. 1905.

Astragalus trichopodus gaviotus Jepson, Man. Fl. Calif. 571. 1925.

A perennial, with a caespitose caudex; stems stout, terete, cinereous-strigose, 3-5 dm. high, branched above; stipules lanceolate, distinct, 3-5 mm. long; leaves 5-10 cm. long; leaflets

15-31, oblong or elliptic, 1-2.5 cm. long, 4-5 mm. wide, obtuse, rounded or retuse at the apex, strigose on both sides; peduncles about 1 dm. long; racemes 2-3 cm. long, dense; bracts lanceolate, 3 mm. long; calyx strigose with mixed black and white hairs, the tube 3 mm. long, somewhat gibbous, the teeth subulate, 1 mm. long; corolla white, 15 mm. long; banner obovate, moderately arched; wings a little shorter, the blades obliquely oblanceolate; keel-petals much shorter, the blade broadly lunate; pod spreading or pendent, finely strigose, stipitate, the stipe 6-8 mm. long, the body elliptic, 2.5-3 cm. long, 6-10 mm. wide, acute at each end, finely reticulate, straighter on the upper than on the lower suture; seeds brown, orbicular-reniform, 3 mm. long, nearly as broad.

TYPE LOCALITY: Gaviota, Santa Barbara County, California.

DISTRIBUTION: Type locality and vicinity.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 2; Contr. W. Bot. 10: pl. 2.

6. **Porrecti**. Tall caulescent perennials. Stems erect. Leaves pinnate, with several obovate or orbiculate leaflets. Racemes elongate and many-flowered. Calyx campanulate, black-strigulose, the teeth subulate. Corolla white, the banner strongly arcuate, retuse at the apex, the sides broadly reflexed, much longer than the wings, the blade of the wings obliquely oblanceolate, equaling the claw, the blade of the keel-petals semicircular, rounded at the apex. Pod stipitate, the stipe stout, upcurved, the body flat, oblong, slightly arcuate, almost erect.

50. *Homalobus porrectus* (S. Wats.) Rydb. Bull. Torrey Club

51: 19. 1924.

Astragalus porrectus S. Wats. Bot. King's Expl. 75. 1871.

Tragacantha porrecta Kuntze, Rev. Gen. 947. 1891.

A perennial; stems 3-6 dm. high, sparingly strigose or glabrate; leaves 6-10 cm. long; stipules large, membranous, triangular, acuminate, 4-5 mm. long, the lower ones sheathing-connate; leaflets 8-13, broadly obovate, 8-15 mm. long, 7-12 mm. wide, glabrous above, sparingly strigose (especially along the margin and the midrib) or glabrate beneath, rounded or slightly emarginate at apex; peduncles 5-10 cm. long; racemes many-flowered, in fruit elongate, 1-2 dm. long; calyx sparingly hispidulous-strigose with black hairs, the tube 4-4.5 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla yellow; banner obovate, with a broad claw, 12 mm. long; wings about 10 mm. long, the blade obliquely oblanceolate, acute at the apex, about equaling the claw, with a rather large oblong basal auricle; keel-petals 8 mm. long, the blade about equaling the claw, obliquely semicircular, rounded at the apex, with a small rounded basal auricle; pod glabrous, stipitate, strongly bent at the union of the stipe and the body, the stipe 4-6 mm. long, the body oblong, arcuate, erect, about 1.5 cm. long, 4 mm. wide; seeds obliquely reniform, 3 mm. long, 1.5 mm. broad.

TYPE LOCALITY: Trinity Mountains, Nevada.

DISTRIBUTION: Western Nevada.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 2, f. 6 (poor); pl. 73, f. 6.

7. **Collini**. Perennials, with a cespitose caudex. Stems erect. Leaves pinnate, with many leaflets, spreading. Racemes many-flowered, strict. Flowers drooping. Calyx cylindrical-campanulate, gibbous on the upper side at the base, the teeth subulate. Corolla ochroleucous. Banner abruptly arched above, only slightly exceeding the wings. Blades of the wings shorter than the claws, with a semisagittate base; keel-petals shorter and broader. Pod leathery or woody, not strongly flattened, stipitate, the body linear, or oblong, or lance-oblong, often arcuate, with strong sutures.

51. *Homalobus collinus* (Dougl.) Rydb. Bull. Torrey Club

40: 53. 1913.

Phaca collina Hook. Fl. Bor. Am. 1: 141. 1831.

Astragalus collinus Dougl.; Hook. Fl. Bor. Am. 1: 141, as synonym. 1831.

Astragalus syrtoides A. Gray, Proc. Am. Acad. 6: 201. 1864.

Tragacantha collina Kuntze, Rev. Gen. 944. 1891.

A perennial, with a cespitose caudex; stems branched, 3-5 dm. high, short-villous with incurved hairs; leaves 5-10 cm. long; stipules lanceolate, distinct, 3-5 mm. long, short-villous;

leaflets 11–23, linear or oblong, or those of the lower leaves obovate, acute at the base, obtuse to retuse at the apex, 5–15 mm. long, 2–5 cm. wide, short-pubescent on both sides with curved hairs; peduncles 5–12 cm. long; racemes 5–10 cm. long; bracts lanceolate, 3–4 mm. long; pedicels very short, shorter than the bracts; calyx villous, the tube 7 mm. long, 4–5 mm. broad, gibbous below on the upper side, the upper two teeth triangular, the lower three lanceolate, 2 mm. long; corolla pale-yellow; banner obovate, 12–14 mm. long, tapering into the broad claw; wings about as long, the blade oblong, acutish, with a semisagittate base, shorter than the long claw; keel-petals slightly shorter, the broadly lunate blade rounded at the apex, with a rounded basal auricle, a little more than half as long as the claw; pod short-villous, stipitate, the body linear, nearly straight or slightly curved upwards, 2–2.5 cm. long, 4 mm. broad, acute at each end, the stipe about 8 mm. long; seeds obliquely reniform, fully 2 mm. long, 1.5 mm. broad.

TYPE LOCALITY: On the subalpine range of the Blue Mountains, Oregon.

DISTRIBUTION: British Columbia to Idaho and Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 28, f. 97; pl. 73.

52. *Homalobus californicus* (A. Gray) A. Heller, *Muhlenbergia*
2: 86. 1905.

Astragalus collinus californicus A. Gray, Proc. Am. Acad. 12: 54. 1876.

Astragalus californicus Greene, Bull. Calif. Acad. 1: 157. 1885.

A perennial, with a caespitose caudex; stems 3–6 dm. high, pilose, striate, branched; leaves 3–9 cm. long; stipules lanceolate, 3–4 mm. long; leaflets oblong, 5–20 mm. long, 2–6 mm. wide, pilose on both sides or glabrate above, obtuse to retuse at the apex; peduncles 6–8 mm. long; racemes 3–6 cm. long; bracts lanceolate, 3 mm. long, longer than the pedicels; calyx villous with mixed dark and light hairs, the tube 4–5 mm. long, 3–4 mm. broad, gibbous below on the upper side, the upper two teeth deltoid, the lower three subulate, 1 mm. long; corolla ochroleucous, 12 mm. long, similar to that of *H. collinus*; pod villous-pilose, stipitate, the stipe 12 mm. long, the body 2.5–3 cm. long, 4 mm. wide, nearly straight, often mottled with brown.

TYPE LOCALITY: Yreka, California.

DISTRIBUTION: Northern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 2, f. 7; pl. 77, f. 7.

53. *Homalobus Tweedyi* (Canby) Rydb. Bull. Torrey Club
51: 14. 1924.

Astragalus Tweedyi Canby, Bot. Gaz. 15: 150. 1890.

Phaca Tweedyi Piper, Contr. U. S. Nat. Herb. 11: 371. 1906.

A perennial, with a caudex; stem 3–6 dm. high, strigose, striate, branched above; leaves 6–10 cm. long; stipules broadly triangular, free, 2 mm. long; leaflets 13–21, linear, 1–2.5 cm. long, 1–3 mm. wide, short-pubescent on both sides with incurved hairs, obtuse; peduncles 10–15 cm. long; racemes in flower 3–6 cm. long, in fruit 5–10 cm. long; bracts lanceolate, 2–3 mm. long, longer than the pedicel; calyx short-villous, the tube 6 mm. long, 3 mm. broad, the upper two teeth triangular, the rest lanceolate, less than 1 mm. long; corolla yellow; banner 12 mm. long, obovate, with a long claw; wings as long, the blade obliquely oblanceolate, scarcely exceeding the claw; keel-petals 8 mm. long, the blade nearly semicircular, rounded at the apex; pod glabrate, stipitate, the stipe 8–9 mm. long, the body arcuate, erect, 15–20 mm. long, 4 mm. wide.

TYPE LOCALITY: Columbia River, Yakima County, Washington.

DISTRIBUTION: East of the Cascades in southern Washington and northern Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 28, f. 96; pl. 73.

54. *Homalobus Laurentii* Rydb. Bull. Torrey Club 51: 15. 1924.

A perennial, with a caespitose caudex; stems 3–4 dm. high, striate, short-pubescent with incurved hairs; leaves 3–7 cm. long; stipules triangular, 3–5 mm. long; leaflets 7–17, oblong, 8–13 mm. long, short-villous on both sides; racemes 1–2 dm. long; bracts lanceolate, 2–3 mm. long; calyx short-villous, the tube 8 mm. long, gibbous on the upper side, the two upper teeth

triangular, the three lower lanceolate, 2 mm. long; corolla ochroleucous; pod villous, stipitate, the stipe 5-7 mm. long, the body slightly curved, 10-15 mm. long, 4 mm. wide; seeds obliquely reniform, 3 mm. long, 2 mm. wide.

TYPE LOCALITY: East of Heffner, Oregon.

DISTRIBUTION: Known only from the type locality.

55. *Homalobus Gibbsii* (Kellogg) Rydb. Bull. Torrey Club
51: 15. 1924.

Astragalus Gibbsii Kellogg, Proc. Calif. Acad. 2: 161. 1862.

Astragalus cyrtoides A. Gray, Proc. Am. Acad. 6: 525. 1865. Not *A. cyrtoides* A. Gray. 1864.

Tragacantha Gibbsii Kuntze, Rev. Gen. 945. 1891.

A perennial, with a caespitose rootstock; stems flexuose, branched, 2-4 dm. high, terete, villous with spreading hairs; leaves 5-8 cm. long; stipules ovate to lanceolate, distinct, 2-4 mm. long; leaflets obovate or orbiculate, 8-15 mm. long, 4-8 mm. wide, rounded, retuse, or emarginate at the apex, villous on both sides; peduncles 5-8 mm. long; racemes 2-8 mm. long; bracts lanceolate, 2 mm. long, nearly as long as the pedicels; calyx villous, 5 mm. long, 3 mm. broad, gibbous below on the upper side; corolla ochroleucous; banner obovate, 14 mm. long; wings about as long, the blade obliquely obovate, acutish at the apex, hastately auricled at the base, shorter than the claw; keel-petals 12 mm. long, the blade broadly lunate, rounded at the apex, a little more than half as long as the claw; pod villous, stipitate, the stipe about 1 cm. long, the body 2.5-3 cm. long, 4-5 mm. wide, curved in a semicircle or less.

TYPE LOCALITY: Headwaters of the Carson River, Nevada.

DISTRIBUTION: Eastern California and western Nevada.

ILLUSTRATIONS: Proc. Calif. Acad. 2: f. 50; M. E. Jones, Contr. W. Bot. 10: pl. 12; Rev. Astrag. pl. 29, f. 98.

56. *Homalobus Plummerae* Rydb. Bull. Torrey Club 51: 16. 1924.

Astragalus cyrtoides M. E. Jones, Zoe 4: 31. 1893. Not *A. cyrtoides* A. Gray. 1864.

A perennial, with a caespitose woody caudex; stems terete, striate, and villous with spreading hairs, 2-3 dm. high; stipules triangular, striate, distinct, 2-3 mm. long; leaves 4-7 cm. long; leaflets 7-13 orbiculate, 8-15 mm. long, 5-10 mm. wide, villous on both sides; peduncles 5-8 cm. long; raceme short and dense, in flower 2-3 cm. long, in fruit 5-7 cm. long; bracts lanceolate, 2-3 cm. long, longer than the pedicels; calyx pilose-villous, the tube 8 mm. long, gibbous below on the upper side, the upper two teeth triangular, the lower three lanceolate, 1 mm. long; corolla ochroleucous, about 14 mm. long, similar to that of *H. Gibbsii*; pod short-villous, stipitate, the stipe about 8 mm. long, the body lunate, gradually tapering at each end, 2-2.5 cm. long, 7-8 mm. wide, reticulate; seeds reniform, 2.5 mm. long.

TYPE LOCALITY: Sierra County, California.

DISTRIBUTION: Northeastern California.

57. *Homalobus sinuatus* (Piper) Rydb. Bull. Torrey Club
51: 16. 1924.

Astragalus sinuatus Piper, Bull. Torrey Club 28: 40. 1901.

Phaca sinuata Piper, Contr. U. S. Nat. Herb. 11: 370. 1906.

A perennial; stem decumbent, 3-5 dm. high, terete, villous with short white incurved hairs; leaves 4-5 cm. long; stipules deltoid, 2-3 mm. long; leaflets 11-13, elliptic-obovate, truncate or slightly retuse, 10-12 mm. long, short-villous; peduncles about 6 cm. long; flowers reflexed on short pedicels, probably closely resembling those of *H. Whitteii*; pod short-pubescent, arcuate, the stipe about 1 cm. long, the body tapering at each end, 2-2.5 cm. long, 5-6 mm. broad, reticulate, the lower suture curiously sinuate.

TYPE LOCALITY: Eastern Washington.

DISTRIBUTION: Known only from the type locality.

58. *Homalobus Whitedii* (Piper) Rydb. Bull. Torrey Club
51: 16. 1924.

- Astragalus speirocarpus falciformis* A. Gray, Bot. Calif. 1: 152. 1876. Not *A. falciformis* Desf. 1802.
Astragalus speirocarpus curvicaarpus Sheldon, Minn. Bot. Stud. 1: 125. 1894.
Astragalus Gibbsii falciformis M. E. Jones, Contr. W. Bot. 8: 23. 1898.
Astragalus Gibbsii curvicaarpus M. E. Jones, Contr. W. Bot. 10: 62. 1902.
Astragalus Whitedii Piper, Bull. Torrey Club 29: 224. 1902.
Homalobus curvicaarpus A. Heller, Muhlenbergia 2: 86. 1905.
Astragalus curvicaarpus F. Macbr. Contr. Gray Herb. 65: 38. 1922.

A perennial, with a cespitose woody caudex; stems decumbent at the base, 2-4 dm. high, striate, short-pubescent with incurved hairs; leaves 4-7 cm. long; stipules triangular or deltoid, 3 mm. long; leaflets 9-13, obovate or obcordate, 5-15 mm. long, 3-8 mm. wide, short-hairy on both sides, with incurved hairs, obtuse to retuse at the apex; peduncles 5-10 cm. long; racemes 5-8 cm. long, 10-18-flowered; bracts lanceolate, 2 mm. long, nearly equaling the pedicels; calyx short-pilose, the tube 8 mm. long, gibbous on the upper side, the two upper teeth triangular, the three lower lanceolate, 1 mm. long; corolla ochroleucous; banner 15 mm. long, obovate, with a rather long claw; wings of about the same length, the blades obliquely oblanceolate, with a rounded basal auricle, about as long as the claws; keel-petals about 12 mm. long, the blade nearly semicircular, with a rounded apex and a rounded basal auricle, shorter than the claw; pods short-pubescent, stipitate, the stipe about 1 cm. long, the body strongly curved in a semicircle or more, 2-3 cm. long, 3 mm. wide; seeds obliquely reniform, 3 mm. long, nearly 2 mm. broad.

TYPE LOCALITY: Sierra County, California.

DISTRIBUTION: Idaho, Oregon, Nevada, and northern California.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 12 (except lower pod); Rev. Astrag. pl. 29.

59. *Homalobus subglaber* (A. Gray) Rydb. Bull. Torrey Club
51: 17. 1924.

Astragalus collinus subglaber A. Gray; Rydb. Bull. Torrey Club 51: 17, as synonym. 1924.

A perennial, with a cespitose caudex; stems 2-3 dm. high, striate, glabrous or nearly so; stipules deltoid, distinct, 2 mm. long; leaves 4-8 cm. long; leaflets 11-25, oblong, obovate, or oblanceolate, 5-10 mm. long, 2-5 mm. wide, glabrous above, sparingly short-hairy beneath, often only on the margins and midrib, truncate or retuse at the apex, acute at the base; peduncles 5-10 cm. long; raceme 3-5 cm. long; bracts lanceolate, 2 mm. long; calyx villous, the tube 8 mm. long, gibbous on the upper side, the upper two teeth broadly triangular, the lower three lanceolate, 0.5 mm. long; corolla ochroleucous, 14 mm. long, similar to that of *H. collinus*; pod sparingly short-pubescent, stipitate, the stipe 8-10 mm. long, the body arcuate, 12-18 mm. long, 3 mm. wide.

TYPE LOCALITY: John Day River, Oregon.

DISTRIBUTION: Northern Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 29, f. a (as *A. collinus*).

60. *Homalobus speirocarpus* (A. Gray) Rydb. Bull. Torrey Club
51: 18. 1924.

- Astragalus speirocarpus* A. Gray, Proc. Am. Acad. 6: 225. 1864.
Tragacantha speirocarpa Kuntze, Rev. Gen. 948. 1891.
Phaca speirocarpa Piper, Contr. U. S. Nat. Herb. 11: 370. 1906.

A perennial; stems 2-3 dm. high, branched, grayish-strigose; leaves 3-6 cm. long; stipules broadly triangular, 1-2 mm. long, free; leaflets 9-19, oblong or cuneate-oblong, 4-12 mm. long, 2-4 mm. wide, cinereous-strigose, truncate or retuse at the apex; peduncles 4-6 cm. long; racemes short, few-flowered; calyx strigose, the hairs especially at the margin and on the teeth often black, the tube 4.5 mm. long, 3 mm. broad, the teeth deltoid, less than 1 mm. long; corolla yellowish; banner 15-18 mm. long, obovate, retuse; wings 14-15 mm. long, the blade oblong, slightly falcate, with a large reflexed auricle; keel-petals 12 mm. long, the blade obliquely obovate, obtuse; pod stipitate, strigose, strongly reticulate, the sutures strong, the stipe

slightly exceeding the calyx, the body spirally twisted into about two complete coils, 4-4.5 mm. broad; seeds obliquely reniform, 2.5 mm. long.

TYPE LOCALITY: Wenass, in the valley of the Upper Columbia.

DISTRIBUTION: Washington, east of the Cascades.

ILLUSTRATIONS: M. E. Jones, *Contr. W. Bot.* 10: *pl. 12*; *Rev. Astrag.* *pl. 29, f. 99*.

61. *Homalobus alvordensis* (M. E. Jones) Rydb. *Bull. Torrey Club* 51: 18. 1924.

Astragalus alvordensis M. E. Jones, *Contr. W. Bot.* 10: 67. 1902.

A perennial; stems slender, flexuose, much branched, 1.5-4 dm. high, strigose; leaves 3-5 cm. long; stipules triangular, free, 1-2 mm. long; leaflets 13-17, obovate-cuneate, emarginate, 3-8 mm. long, 2-6 mm. wide, canescent with incurved hairs; racemes including the peduncle 3-6 cm. long, few-flowered; calyx with short incurved hairs, the tube 2 mm. long, only slightly gibbous, the teeth deltoid, less than 1 mm. long; corolla ochroleucous, purple-veined; banner obovate, 5-6 mm. long; wings somewhat shorter, the blade narrowly obliquely oblanceolate, acutish; keel-petals 3-4 mm. long, with a rounded apex; pod pubescent, flat, stipitate, the stipe 5-6 mm. long, the body curved, forming a complete coil to a coil and a half; reticulate, 3-3.5 mm. broad.

TYPE LOCALITY: Alvord Valley, Oregon.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: M. E. Jones, *Contr. W. Bot.* 10: *pl. 2*; *Rev. Astrag.* *pl. 29, f. 100*.

62. *Homalobus podocarpus* (Hook.) Rydb. *Bull. Torrey Club* 51: 18. 1924.

Phaca podocarpa Hook. *Fl. Bor. Am.* 1: 142. 1831. Not *Astragalus podocarpus* C. A. Meyer. 1831. *Astragalus sclerocarpus* A. Gray, *Proc. Am. Acad.* 6: 225. 1864. *Tragacantha sclerocarpa* Kuntze, *Rev. Gen.* 948. 1891.

A perennial, with a caespitose rootstock; stems branched, canescent-strigose, striate, 3-6 dm. high; stipules triangular, free, 3-4 mm. long; leaves 8-10 cm. long; leaflets 13-19, linear or oblong, 1-2 cm. long, 1-3 mm. wide, strigose-canescens, obtuse; peduncles 5-10 cm. long; racemes lax, 5-8 mm. long; bracts lanceolate, 2-3 mm. long, about equaling the pedicels; calyx strigose, more or less black-hairy, the tube about 5 mm. long, 3 mm. broad, slightly gibbous above, the teeth lanceolate, 1.5 mm. long; corolla ochroleucous; banner 14 mm. long, obovate, with a broad claw; wings 12 mm. long, the blade about equaling the claw, obliquely oblong-lanceolate, with a rounded basal auricle; keel-petals about 10 mm. long, the blade shorter than the claw, nearly semicircular; pod strigose, stipitate, the stipe 15-18 mm. long, bent, the body lunate, long-attenuate at both ends, reticulate, coriaceous, with very strong thick sutures; seeds nearly black, obliquely reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Great Falls of the Columbia, Washington.

DISTRIBUTION: Washington and northern Oregon.

ILLUSTRATIONS: M. E. Jones, *Rev. Astrag.* *pl. 31, f. 108*; *pl. 74*.

63. *Homalobus bicristatus* (A. Gray) Rydb. *Bull. Torrey Club* 51: 19. 1924.

Astragalus bicristatus A. Gray, *Proc. Am. Acad.* 19: 75. 1883.

Astragalus bicristatus tetrapteroides M. E. Jones, *Contr. W. Bot.* 10: 58. 1902.

A perennial, with a caespitose caudex; stems 3-6 dm. high, more or less strigose, striate; leaves 7-10 cm. long; stipules triangular, free, 2-3 mm. long; leaflets 15-21, linear, 12-20 mm. long, 1-3 mm. wide, strigose-canescens; peduncles 7-10 cm. long; racemes short, dense at first, elongate in fruit; bracts lanceolate, 2-3 mm. long, longer than the pedicels; calyx strigose with black hairs, the tube 5 mm. long, 3 mm. broad, gibbous below on the upper side, the teeth lanceolate, 2 mm. long; corolla ochroleucous; banner obovate, acute, long-clawed, about 15 mm. long; wings 14 mm. long, the blades equaling the claw, obliquely lanceolate, acutish, with a large basal auricle; keel-petals 12 mm. long, the blade shorter than the claw, nearly semicircular, rounded at the apex, with a rounded basal auricle; pod stipitate, glabrous, the stipe

slightly longer than the calyx, the body lunate, strongly incurved, tapering at each end, coriaceous, 2.5 cm. long, 6-7 mm. broad, in age turgid, the sutures prominent, the upper nearly straight, the lower curved; seeds obliquely reniform, 3.5 mm. long, 2.5 mm. broad.

TYPE LOCALITY: San Bernardino Mountains, southeastern California, in a cañon on the Mohave side.

DISTRIBUTION: Mountains of southern California.

ILLUSTRATIONS: M. E. Jones, *Contr. W. Bot.* 10: *pl. 12*; Rev. Astrag. *pl. 31, f. 109*.

34. GYNOPHORARIA Rydberg, gen. nov.

Perennial decumbent herbs. Leaves odd-pinnate. Flowers perfect, in axillary racemes. Calyx campanulate, with 5 subulate teeth. Banner broadly obovate, distinctly clawed. Wings and keel-petals unknown; if present, they are very early deciduous. Pod borne on a distinct gynophore and articulate to it, merely acute at each end, papery, somewhat inflated but compressed, strongly falcate, forming fully a half-circle, without a partition. Seeds 15-18, obliquely reniform.

Type species, *Gynophoraria falcata* Rydb.

1. *Gynophoraria falcata* Rydberg, sp. nov.

A perennial, with a caespitose rootstock; stems decumbent, at least at the base, 1 dm. long or less; leaves 2-5 cm. long, spreading; stipules broadly deltoid, membranous, often slightly purple-tinged; leaflets 11-15, oval or elliptic, 3-4 mm. long, strigose beneath, glabrate above, rounded at each end; peduncles 4-6 cm. long; racemes 1-3-flowered, short; bracts lanceolate, 1-2 mm. long; pedicels 3 mm. long, hirsutulous; calyx minutely black-hairy, the tube campanulate, 3 mm. long, the teeth subulate, 2 mm. long; corolla apparently white or ochroleucous, fully 1 cm. long; banner broadly obovate, distinctly clawed; pod borne on a curved gynophore, 5-7 mm. long, the pod itself strongly arched upwards, acute at each end, papery, 1-celled, somewhat compressed, slightly inflated, 7-8 mm. wide, curved in a half-circle, 2-2.5 cm. in diameter, minutely hirsutulous with black hairs; seeds obliquely round-reniform, 3 mm. long.

Type collected between Lake Kluane and Don Jek River, Yukon, August 11-27, 1920, August Muller (type in herb. Acad. Nat. Sci. Phila.).

35. DIHOLCOS Rydb. Bull. Torrey Club 32: 664. 1906.

Stout perennials, usually forming clumps. Leaves pinnate, with many thick leaflets, the stipules free. Flowers numerous in dense, spikelike racemes. Calyx campanulate, gibbous at the base on the upper sides, the teeth shorter than the tube, unequal, subulate, the lowest much the longest. Corolla purple, white, or ochroleucous. Banner oblanceolate, or narrowly obovate, retuse, gradually arched, clawless. Wings about equaling the banner, the blade obliquely oblanceolate, with a prominent, acute basal auricle. Keel-petals similar but broader, the blade broadly lunate. Stamens diadelphous (9 and 1), the sheath arched above the middle. Ovary stipitate, the style glabrous, arched throughout, the stigma minute. Pod coriaceous, stipitate, the body oblong, straight, 1-celled, rounded on the lower suture, deeply 2-grooved above, the upper suture prominent. Seeds 6-20, obliquely reniform, with a deep-seated hilum.

Type species, *Astragalus bisulcatus* Hook.

Calyx strigose or glabrate, the tube cylindrical, not at all inflated.

Pod glabrous; body about 1.5 cm. long; upper calyx-teeth 3-4 mm. long; corolla white.

1. *D. decalwans*.

Pod strigose; upper calyx-teeth less than 3 mm. long.

Body of the pod 12-15 mm. long; corolla usually purple.

2. *D. bisulcatus*.

Body of the pod rarely 10 mm. long; corolla white or straw-colored, only the keel sometimes tipped with purple.

Leaflets thin, mostly obovate, oval, or elliptic, the broader ones retuse.

3. *D. Jepsoni*.

Leaflets thick, linear or oblong.

Pod distinctly cross-ribbed.

Corolla more than 1 cm. long; pod very acute at each end; stipe 5 mm. long.

4. *D. scobinatulus*.

Corolla less than 1 cm. long; pod obtusish or abruptly acuminate at each end; stipe 3 mm. long.

5. *D. Haydenianus*.

Pod not cross-ribbed; corolla 6 mm. long.

6. *D. micranthus*.

Calyx villous, the tube more or less urnshaped, in age inflated.

7. *D. oocalycis*.

1. *Diholcos decalvans* (Gand.) Rydb. Bull. Torrey Club

32: 664. 1906.

Astragalus bisulcatus decalvans Gand. Bull. Soc. Bot. Fr. 48: xv. 1902.
Astragalus Haydenianus leiocarpa Gand. Bull. Soc. Bot. Fr. 48: xv. 1902.

A perennial, with a thick woody root; stems usually several from the short caudex, 3-10 dm. high, angled and sulcate, more or less strigose; leaves ascending, 7-15 cm. long, the rachis sulcate and strigose; stipules lance-deltoid, acuminate, 5 mm. long; leaflets 21-27, elliptic or oblong, 1.5-2.5 cm. long, 4-10 mm. wide, thick, glabrous above, sparingly strigose beneath, obtuse at both ends or mucronate at the apex; peduncles 1-1.5 cm. long; racemes 7-15 cm. long, many-flowered; bracts subulate, 6-7 mm. long; flowers nodding; pedicels 2 mm. long; calyx sparingly pilose, the tube gibbous at the base on the upper side, 6 mm. long, the teeth subulate, 4-6 mm. long; corolla white, nearly 2 cm. long; banner arched at the middle, oblanccolate, retuse; wings shorter, the blade lunate, as long as the claw, with a spreading basal auricle, acutish; keel-petals similar, a little shorter and rounded at the apex; pod glabrous, stipitate, the stipe 4 mm. long, the body oblong, 12-20 mm. long, 2 mm. wide, 3 mm. thick; seeds brown, obliquely reniform, 3.5-4 mm. long.

TYPE LOCALITY: Fort Collins, Colorado.

DISTRIBUTION: Northern New Mexico to southern Wyoming.

2. *Diholcos bisulcatus* (Hook.) Rydb. Bull. Torrey Club

32: 664. 1906.

Phaca bisulcata Hook. Fl. Bor. Am. 1: 145. 1831.
Astragalus bisulcatus A. Gray, Pacif. R. R. Rep. 12: 42. 1860.
Tragacantha bisulcata Kuntze, Rev. Gen. 943. 1891.
Astragalus bisulcatus hedsyariformis Gand. Bull. Soc. Bot. Fr. 48: xiv. 1902.

A perennial, with a thick woody root; stems several from the short caudex, 3-10 dm. high sulcate, more or less strigose; leaves ascending, 6-10 cm. long; stipules deltoid, acute or acuminate, 4-6 mm. long; leaflets 15-25, oblong to oval, 1-2.5 cm. long, 3-10 mm. wide, firm; peduncles 7-15 cm. long; racemes many-flowered, 5-10 cm. long; bracts lance-subulate, 4-6 mm. long; flowers drooping; pedicels 2-3 mm. long; calyx strigose, the tube about 4 mm. long and 3 mm. broad, the teeth subulate, 2-3 mm. long; corolla purple or rarely white, 12-15 mm. long; banner obovate, moderately arched at the middle; wings nearly as long, the blade oblong, with a long, recurved auricle; keel-petals a little shorter, the blade broadly obliquely lunate, more curved towards the rounded apex, with a rather large auricle; pod strigose, the stipe 3-4 mm. long, the body 12-15 mm. long; seeds dark-brown or black, reniform, 4 mm. long, 2 mm. wide.

TYPE LOCALITY: Plains of the Saskatchewan, Canada.

DISTRIBUTION: Manitoba to Nebraska, Colorado, Idaho, and Alberta.

ILLUSTRATIONS: Pacif. R. R. Rep. 12: pl. 1 B; M. E. Jones, Rev. Astrag. pl. 63, f. 206; Britt. & Brown, Ill. Fl. f. 2135; ed. 2, f. 2538; Clements, Rocky Mt. Fl. pl. 29, f. 14; Am. Jour. Bot. 15: pl. 45 H.

3. *Diholcos Jepsoni* (Sheldon) Rydberg.

Astragalus Haydenianus nevadensis M. E. Jones, Zoe 2: 241. 1891.
Astragalus demissus Greene, Erythea 1: 221. 1893. Not *A. demissus* Boiss. & Heldr. 1849.
Astragalus Jepsoni Sheldon, Minn. Bot. Stud. 1: 22. 1894.

A perennial; stems several, 4-10 dm. high, sparingly strigose; leaves ascending, 7-12 cm. long; stipules deltoid, 4 mm. long; leaflets 17-21, oval, ovate, or elliptic, thin, rounded or retuse at the apex, 8-25 mm. long, 3-10 mm. wide; peduncles 1-1.5 cm. long; racemes rather lax, 5-10 cm. long; bracts lanceolate, 2-3 mm. long; pedicels 2-4 mm. long; calyx strigose, the tube 3 mm. long, 2.5 mm. broad, the teeth 2 mm. long; corolla white, with purple-tipped keel; banner about 8 mm. long, obovate, strongly arcuate at the middle; wings about as long, the blade oblong-oblanccolate, with a long reflexed auricle; keel-petals as long, similar but broader and rounded at the apex; pod strigose, the stipe 4 mm. long, the body elliptic, acute at each end, 8-10 mm. long, 4 mm. thick, 5-seeded.

TYPE LOCALITY: Palisades, Nevada.

DISTRIBUTION: Type locality and vicinity.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 63, 2 05b [as *A. Haydenianus*].

4. *Diholcos scobinatus* (Sheldon) Rydb. Bull. Torrey Club
40: 51. 1913.

Astragalus Haydenianus major M. E. Jones, Zoe 2: 241. 1891.
Astragalus scobinatus Sheldon, Minn. Bot. Stud. 1: 24. 1894.
Astragalus Haydenianus Nelsonii Gand. Bull. Soc. Bot. Fr. 48: xv. 1902.

A perennial, with a woody root; stems several from the short caudex, erect or decumbent at the base, strigose; leaves 5–8 cm. long, ascending; stipules deltoid, 3–4 mm. long; leaflets 15–19, elliptic or oblong, firm, glabrous above, strigose beneath, 7–15 mm. long, 3–5 mm. wide; peduncles 5–10 cm. long; racemes many-flowered, 5–10 cm. long; bracts lance-subulate, acuminate, 3–4 mm. long; pedicels 2–3 mm. long; calyx strigose with white or black hairs, the tube 3 mm. long, the teeth subulate, 1.5–2 mm. long; corolla white, 10–12 mm. long; banner obovate, rather strongly arched at the middle, retuse; wings nearly as long, the blade obliquely oblanceolate, with a long recurved auricle; keel-petals as long, similar but broader, more falcate, and rounded at the apex; pod strigose, cross-rugose when mature, the stipe 5 mm. long, the body oblong, acute at each end, about 1 cm. long, 2 mm. wide, 3.5 mm. thick; seeds dark-brown, 3 mm. long.

TYPE LOCALITY: Johnson, southern Utah.
DISTRIBUTION: Wyoming, Utah, and New Mexico.

5. *Diholcos Haydenianus* (A. Gray) Rydb. Bull. Torrey Club
32: 664. 1906.

Astragalus Haydenianus A. Gray, in Brand. Fl. S. W. Colo. 235. 1876.
Tragacantha Haydeniana Kuntze, Rev. Gen. 945. 1891.
Astragalus bisulcatus Haydenianus M. E. Jones, Zoe 2: 240. 1891.
Astragalus grillator S. Wats. Zoe 3: 52. 1892. (Abnormal form.)
Homalobus grillator Rydb. Bull. Torrey Club 32: 666. 1905.

A perennial, with a woody root; stems several, erect or ascending, 3–5 dm. high, strigose and striate; leaves 5–8 cm. long, ascending; stipules deltoid, 4–5 mm. long, membranous; leaflets 15–23, oblong, 1–2 cm. long, 3–5 mm. wide, thick, glabrous above, strigose beneath, usually pale, rounded or retuse at the apex; peduncles 5–8 cm. long; racemes many-flowered, 5–10 cm. long; bracts lance-subulate, 4–5 mm. long; pedicels 3 mm. long, recurved; calyx strigose, often with black hairs, the tube 3 mm. long, the teeth subulate, 1–1.5 mm. long; corolla white, about 8 mm. long, similar to that of *D. scobinatus*; pod strigose, cross-rugose when mature, the stipe 3 mm. long, the body ellipsoid, 8–9 mm. long.

TYPE LOCALITY: Grand River, Middle Park, Colorado.
DISTRIBUTION: Colorado and southern Wyoming.
ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 62; pl. 63, f. 205.

6. *Diholcos micranthus* Rydb. Fl. Rocky Mts. 500. 1917.

A perennial, with a woody root; stems several, erect or ascending, sparingly strigose, 2–4 dm. high; leaves 5–7 cm. long; stipules deltoid, 4 mm. long; leaflets 17–25, linear to lance-oblong, acute at each end, 7–20 mm. long, 2–4 mm. wide, glabrous above, strigose beneath; peduncles 5–7 cm. long; racemes many-flowered, 5–7 cm. long; bracts lance-subulate, 4 mm. long; pedicels 2–3 mm. long, recurved; calyx strigose, the tube 2–2.5 mm. long, the teeth subulate-filiform, 1–1.5 mm. long, the upper shorter; corolla 6–7 mm. long, cream-colored; pod strigose, the stipe 3–4 mm. long, the body about 8 mm. long, acute at each end, scarcely 2 mm. wide and 3 mm. thick; seeds obliquely reniform, 3 mm. long, dark-brown.

TYPE LOCALITY: [La Veta,] Colorado.
DISTRIBUTION: Colorado.

7. *Diholcos oocalycis* (M. E. Jones) Rydberg.

Astragalus oocalycis M. E. Jones, Contr. W. Bot. 8: 10. 1898.
Cnemidophacos urceolatus Rydb. Fl. Rocky Mts. 502. 1917.
Astragalus urceolatus Greene; Rydb. Fl. Rocky Mts. 503, as synonym. 1917.

A perennial; stem 3–6 dm. high, angled and sulcate, more or less strigose, often flexuose; leaves about 1 dm. long, ascending or spreading; stipules deltoid, reflexed, 5–7 mm. long;

leaflets 15-19, linear or oblong, acute at each end, 1-4 cm. long, 1-3 mm. wide, glabrous above, strigose beneath; peduncles 5-8 cm. long; racemes dense, 3-5 cm. long; bracts linear-lanceolate, 6-8 mm. long, ciliate, at last reflexed; flowers nearly sessile, in age reflexed; calyx shaggy-villous, the tube 8 mm. long, somewhat urceolate when young, in age inflated, the calyx-teeth lanceolate, 2-3 mm. long; corolla white, 15-16 mm. long; banner obovate, arched above the middle; wings nearly as long, the blade oblanceolate, slightly falcate, with a large auricle; keel-petals shorter, the blade broadly lunate, purple-tipped; young pod short-stipitate, glabrous, the stipe curved, the body oval in outline, with a sulcus on each side of the upper suture; mature pod not seen.

TYPE LOCALITY: Aztec, New Mexico.

DISTRIBUTION: Southern Colorado and northern New Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 63.

36. CNEMIDOPHACOS Rydb. Bull. Torrey Club 32: 663. 1906.

Ctenophyllum Rydb. Bull. Torrey Club 32: 663. 1906.

Stout perennial herbs, with a caespitose woody caudex. Leaves pinnate, usually with many narrow leaflets; stipules usually slightly united with the petioles, but strongly connate around the stem. Flowers perfect, mostly in strict many-flowered racemes. Calyx campanulate, the teeth linear-lanceolate, mostly equaling the tube in length. Corolla yellow, ochroleucous, white, or purplish. Banner obovate, tapering at the base, often retuse at the apex, only slightly arched. Wings shorter, the blade oblanceolate, usually with a rounded auricle, longer than the claw. Keel-petals broader and shorter, the blade obliquely obovate, or semi-orbicular, with a reflexed auricle, shorter than the claw. Stamens diadelphous (9 and 1), the sheath straight to near the oblique apex, the free portion of the filaments arched upward. Ovary sessile; style curved towards the apex; stigma minute. Pod one-celled, coriaceous, sessile, ovoid or ellipsoid in outline, often thicker than wide (*i.e.*, the diameter from center to center of the valves greater than the distance between the sutures), rounded at the base, abruptly contracted at the apex, both sutures rather prominent. Seeds numerous, obliquely reniform, with a deep-seated hilum.

Type species, *Astragalus flavus* Nutt.

Plant more or less caulescent; pod more than 1 cm. long.

Pod erect or ascending; leaflets articulate to the rachis.

Calyx-lobes more than half as long as the tube.

Corolla more than 15 mm. long; pod not sulcate, 1.5-3 cm. long.

Calyx more or less black-hairy.

Leaflets glabrous or slightly hairy on the upper side; pod glabrous.

Flowers nodding; leaflets loosely villous or pilose beneath.

Flowers ascending; leaflets strigose beneath.

Leaflets nearly equally appressed-canescens on both sides; pod short-pubescent, at least when young.

Calyx white-hairy, its teeth nearly equaling the tube; leaflets loosely pubescent on both sides; pod pubescent.

Corolla less than 15 mm. long; pod usually more or less sulcate on the lower suture, less than 1.5 cm. long, canescens.

Calyx-tube considerably longer than broad; inflorescence much exceeding the leaves.

Calyx villous with long loose hairs, the teeth as long as the tube.

Calyx strigose or pilose with short hairs, the teeth shorter than the tube.

Corolla ochroleucous, 12-15 mm. long; pubescence of the calyx rather loose.

Corolla white or purple, 7-11 mm. long; pubescence of the calyx strictly appressed.

Plant canescens; corolla white, the keel tipped with purple.

Plant nearly glabrous; corolla purple.

Calyx-tube about as broad as long; inflorescence scarcely exceeding the leaves.

Calyx-lobes less than half as long as the tube.

Stem flexuose; leaflets few or none, about 1 cm. long.

Plant sparingly strigose; leaflets linear, as well as the rachis rather firm.

Plant glabrous; leaflets and upper part of the rachis filiform.

1. *C. revertus*.
2. *C. revertiformis*.
3. *C. Knowlesianus*.
4. *C. hoodianus*.
6. *C. argillosus*.
7. *C. flavus*.
8. *C. confertiflorus*.
9. *C. moencoppensis*.
10. *C. sopheroides*.
11. *C. loanus*.
12. *C. rafaclensis*.

Stem strict; leaflets well developed.

Leaflets thin, elliptic or oval; corolla about 1.5 cm. long; pod cross-wrinkled.

Leaflets thick, linear, 2-3 cm. long; corolla 2-2.5 cm. long; pod smooth.

Pod drooping; leaflets narrow, channeled, not articulate to the rachis.

Plant acaulescent; pod 5-6 mm. long.

5. *C. adanus*.

13. *C. Grayi*.

14. *C. pectinatus*.

15. *C. troglodytus*.

1. *Cnemidophacos reventus* (A. Gray) Rydb. Bull. Torrey Club 40: 52. 1913.

Astragalus reventus A. Gray, Proc. Am. Acad. 15: 46. 1879.

Astragalus reventus Canby M. E. Jones, Contr. W. Bot. 8: 11. 1898.

Phaca reventa Piper, Contr. U. S. Nat. Herb. 11: 372. 1906.

A perennial, with a caespitose caudex; stem angled, sparingly pilose or glabrate, 1-2 dm. high; leaves ascending, 1-1.5 dm. long; stipules deltoid, 4-5 mm. long; leaflets 25-31, oblong, 10-15 mm. long, 2-7 mm. wide, glabrous above, villous or pilose with curved hairs beneath, obtuse or retuse at the apex; peduncles 1-2 dm. long, sparingly pilose; racemes about 5 cm. long; bracts lanceolate, 3-5 mm. long; flowers nodding in anthesis; calyx loosely pilose, more or less black-hairy, the tube 7 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla white, fully 2 cm. long; banner broadly obovate, rather abruptly arched; wings with broadly oblong blades; keel-petals much shorter, the blade broadly lunate; pod obliquely ovoid, cross-wrinkled, about 2.5 cm. long, 1 cm. thick, glabrous, neither suture inflexed, the upper prominent.

TYPE LOCALITY: Grand Valley and Blue Mountains, Oregon.

DISTRIBUTION: Northeastern Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 36, f. 119.

2. *Cnemidophacos reventiformis* Rydberg, sp. nov.

Astragalus reventus A. Gray, Proc. Am. Acad. 15: 46, in part. 1879.

A perennial, with a woody caespitose caudex; stems 1-2 dm. high, angled, glabrous or nearly so; leaves 6-10 cm. long, ascending; stipules deltoid, scarious, 3 mm. long, mostly connate; leaflets 15-21, linear or oblong, 1-1.5 cm. long, 1-3 mm. wide, glabrous or slightly strigose above, strigose beneath, obtuse to retuse; peduncles 1-2 dm. long, overtopping the leaves; racemes 3-6 cm. long, in fruit up to 10 cm. long; bracts lance-subulate, 3-4 mm. long, black-hairy; calyx black-hairy with ascending straight hairs, the tube 5-6 mm. long, 4 mm. broad, the teeth lance-subulate, about 4 mm. long; corolla cream-colored or white; banner 17-20 mm. long, moderately arcuate; wings somewhat shorter, the blades broadly oblong; keel-petals much shorter, the blades broadly lunate, rounded at the apex; pod obliquely ovoid, 1.5-2 cm. long, 7-9 mm. thick, glabrous, reticulate, the sutures rather prominent.

Type collected at Klickitat, Washington, April 26, 1882 (herb. Columbia University).

DISTRIBUTION: Washington and Oregon.

3. *Cnemidophacos Knowlesianus* Rydberg, sp. nov.

A perennial, with a woody caespitose caudex; stem 1-2 dm. high, angled and somewhat sulcate, sparingly pubescent; leaves 5-10 cm. long, erect; stipules deltoid, 3 mm. long, somewhat connate; leaflets 25-33, linear-oblong, 5-10 mm. long, 2-3 mm. wide, canescent on both sides, obtuse; peduncles erect, 1.5-2 dm. long, black-hairy above; raceme in anthesis 3-5 cm. long, in fruit 5-10 cm. long; bracts lance-subulate, 3-4 mm. long, black-hairy; calyx black-hairy with loose hairs, the tube 5 mm. long, 3 mm. broad, the teeth subulate, 4 mm. long; corolla apparently white, 18-19 mm. long; banner narrowly obovate, moderately arcuate; wings nearly as long, the blades obliquely oblanceolate, with a large basal auricle; keel-petals shorter, the blade broadly lunate, obtuse; pod erect, obliquely ovoid, short-pubescent, wrinkled, 1.5-2 cm. long, 7-8 mm. thick, upper suture prominent, transversely oval in cross-section.

Type collected on mountain sides, western Klickitat County, Washington, April 23 and in June 1886, *Suksdorf 482* (herb. Columbia Univ.).

DISTRIBUTION: Washington and Oregon.

4. *Cnemidophacos hoodianus* (Howell) Rydberg.

Astragalus hoodianus Howell, *Erythea* 1: 111. 1893.

Astragalus conjunctus Hoodianus M. E. Jones, *Contr. W. Bot.* 8: 9. 1898.

Phaca hoodiana Piper, *Contr. U. S. Nat. Herb.* 11: 373. 1906.

A perennial, with a woody caespitose caudex; stems 1-2 dm. high, sulcate and angled, more or less canescent-pubescent; leaves erect, 10-12 cm. long, the rachis villous with ascending hairs; stipules deltoid, connate, 5 mm. long; leaflets 21-31, linear or oblong, 8-18 mm. long, canescent on both sides, obtuse or acute; peduncles erect, 1.5-2.5 dm. long; racemes rather dense, 5-8 cm. long; bracts subulate, 3-5 mm. long; pedicels 1-2 mm. long; calyx white-villous, the tube 5 mm. long, 3 mm. broad, the teeth subulate, 5 mm. long; corolla white, about 2 cm. long; banner narrowly obovate, moderately arcuate; wings shorter, the blade obliquely oblong, falcate, with a large basal auricle; keel-petals much shorter, the blade broadly lunate, rounded at the apex; pod erect, rather long-hairy, about 18 mm. long, 6-7 mm. thick, oval in cross-section, the upper suture prominent.

TYPE LOCALITY: Hood River, Oregon.

DISTRIBUTION: Columbia Valley, Oregon and Washington.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl.* 36 (as *A. revertus* var.).

5. *Cnemidophacos adanus* (A. Nelson) Rydberg.

Astragalus adanus A. Nelson, *Bot. Gaz.* 53: 222. 1912.

Ctenophyllum adanum Rydb. *Fl. Rocky Mts.* 502, 1063. 1917.

A perennial, with a woody root and caespitose caudex; stems numerous, glabrate or sparingly strigose, striate, 2-4 dm. high; leaves numerous, 1-2 dm. long, the rachis sparingly pubescent; stipules scarious, deltoid, acuminate, 4-5 mm. long; leaflets 13-25, oblong to obovate, 7-14 mm. long, glabrous above, sparingly strigose beneath; peduncles strict, 7-12 cm. long; racemes 3-6 cm. long, 5-15-flowered; bracts lance-subulate, 2-3 mm. long; pedicels 2 mm. long; calyx sparingly black-hairy, the tube 4-5 mm. long, the teeth subulate, 1.5 mm. long; corolla ochroleucous, resembling that of *C. revertus* but smaller; pod obliquely ovoid, rounded at the base, short-acuminate at the apex, cross-reticulate, about 1 cm. long, 6 mm. thick and 5 mm. wide.

TYPE LOCALITY: Boise Hills, Idaho.

DISTRIBUTION: Idaho.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl.* 37, f. 120.

6. *Cnemidophacos argillosus* (M. E. Jones) Rydb. Bull. Torrey Club

40: 52. 1913.

Astragalus argillosus M. E. Jones, *Zoe* 2: 241. 1891.

A perennial, with a caespitose caudex; stems many, decumbent at the base, silky-canescens; leaves 7-10 cm. long, ascending, the rachis silky; stipules lanceolate, acuminate, 3 mm. long, or the lower deltoid and connate; leaflets 9-13, linear, acute, 2.5-3 cm. long, 2-5 mm. wide, silvery on both sides; peduncles about 1 dm. long, erect; racemes 3-5 cm. long; bracts subulate, 5 mm. long; pedicels very short; calyx pilose with long loose hairs, the tube 3 mm. long, the teeth narrowly subulate, fully as long; corolla purplish or white, veined with purple, 9-10 mm. long; banner narrowly obovate, rather strongly arched; wings shorter, the blade obliquely oblanceolate, with a reflexed auricle; keel-petals shorter, the blade broadly lunate; pod ovate, long-strigose, 7 mm. long, oblong in cross-section.

TYPE LOCALITY: Green River, Utah.

DISTRIBUTION: Type locality and vicinity.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl.* 62, f. 202.

7. *Cnemidophacos flavus* (Nutt.) Rydb. Bull. Torrey Club

32: 664. 1906.

Astragalus flavus Nutt.; T. & G. *Fl. N. Am.* 1: 335. 1838.

Tragacantha flaviflora Kuntze, *Rev. Gen.* 941. 1891.

Astragalus flaviflorus Sheldon, *Minn. Bot. Stud.* 1: 158. 1894.

Astragalus confertiflorus flaviflorus M. E. Jones, *Rev. Astrag.* 241. 1923.

A perennial, with a woody root and short caespitose caudex; stems many, 1-2 dm. high, decumbent at the base; leaves ascending, 5-10 cm. long, the rachis canescent; stipules deltoid,

4-5 mm. long, the lower connate; leaflets 15-21, linear or oblong, 8-18 mm. long, glabrate above, strigose beneath, obtuse or acute; peduncles 1-1.5 dm. long; bracts lanceolate, 4-6 mm. long; pedicels 1 mm. long; calyx rather loosely pilose, the tube 5 mm. long, 2.5 mm. broad, the teeth subulate, 3 mm. long; corolla ochroleucous, 12-15 mm. long; banner obovate, moderately arcuate; wings of about the same length, the blade broadly oblanceolate, with a small reflexed auricle; keel-petals shorter, the blade obliquely obovate-lunate; pod 8-12 mm. long, ovate-oblong, strigose, the upper suture acute, the lower slightly sulcate.

TYPE LOCALITY: Hills of the central chain of the Rockies towards the Oregon [Wyoming or Idaho].

DISTRIBUTION: Wyoming, western Colorado, and northeastern Utah.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl.* 62; Am. Jour. Bot. 15: *pl.* 45 G.

8. *Cnemidophacos confertiflorus* (A. Gray) Rydb. Bull. Torrey Club 40: 52. 1913.

Astragalus flavus candicans A. Gray, Proc. Am. Acad. 12: 54. 1876.

Astragalus confertiflorus A. Gray, Proc. Am. Acad. 13: 368. 1878.

A perennial, with a woody root and caespitose caudex; stems 1-2 dm. high, more or less densely canescent; stipules deltoid, acuminate, 3-4 mm. long, the lower connate; leaves nearly erect, the rachis canescent, 5-8 cm. long; leaflets 11-15, linear, 1-2.5 cm. long, silvery-canescens on both sides; peduncles 7-12 cm. long; racemes 5-10 cm. long; bracts lance-subulate, 3 mm. long; pedicels almost obsolete; calyx silvery-canescens, the tube 4 mm. long, 3 mm. broad, the teeth subulate, about 2 mm. long; corolla 9-11 mm. long, white or tinged with purple, the keel tipped with purple; banner obovate, slightly arcuate; wings slightly shorter, the blade obliquely oblanceolate; keel-petals slightly shorter, the blade broadly lunate, almost semicircular, with a rounded basal auricle; pod oblong-ovate, canescent-strigose, 10-15 mm. long, 4-5 mm. thick, 3-4 mm. wide, the upper suture acute, the cross-section oval.

TYPE LOCALITY: Richfield, Utah.

DISTRIBUTION: Southern Colorado, New Mexico, and southeastern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 62, *f.* 201.

9. *Cnemidophacos moencoppensis* (M. E. Jones) Rydberg.

Astragalus moencoppensis M. E. Jones, Zoe 2: 12. 1891.

A perennial, with a woody root and caespitose caudex; stems several, 3-4 dm. high, sparingly strigose; leaves ascending, 5-10 cm. long, the rachis grooved, slender; stipules scarious, deltoid, 2 mm. long; leaflets 9-11, linear, 1-2 cm. long, 1-2 mm. wide, glabrous above, sparingly strigose beneath, acute at each end; peduncles 1-1.5 dm. long, slender; racemes 5-10 cm. long, lax; bracts lanceolate, 2 mm. long; pedicels less than 1 mm. long; calyx strigose-canescens, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla purplish, 7-8 mm. long; banner broadly obovate; wings much shorter, the blade oblong-falcate; keel-petals still shorter, the blade broadly lunate; pod 6-7 mm. long, canescent, transversely oblong in cross-section.

TYPE LOCALITY: Limestone cliffs, at Willow Springs, near Moencoppa, northern Arizona.

DISTRIBUTION: Arizona and southwestern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 62, *f.* 203.

10. *Cnemidophacos sophoroides* (M. E. Jones) Rydberg.

Astragalus sophoroides M. E. Jones, Zoe 2: 12. 1891.

A perennial, with a woody root and short caespitose caudex; stems erect, 1-3 dm. high, densely strigose-canescens; leaves 5-10 cm. long, ascending, the rachis canescent; stipules deltoid, acuminate, connate, 3-5 mm. long; leaflets 9-15, elliptic or oblong, 4-15 mm. long, white-canescens on both sides, obtuse at the apex; peduncles 1-5 cm. long; racemes 2-4 cm. long; bracts lanceolate, 4 mm. long; pedicels very short; calyx white-silky, the tube 3 mm. long and broad, the teeth subulate, 3 mm. long; corolla cream-colored, 8-9 mm. long; banner obovate, slightly arcuate; wings nearly as long, the blades obliquely obovate; keel-petals

shorter, the blade semicircular; pod white-strigose, about 8 mm. long, 3.5 mm. thick, and 2.5 mm. wide, acute on the dorsal suture, oval in cross-section.

TYPE LOCALITY: Willow Springs on the Moencoppa, northern Arizona.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 62, *f.* 200.

11. *Cnemidophacos toanus* (M. E. Jones) Rydberg.

Astragalus toanus M. E. Jones, *Zoe* 3: 296. 1893.

A caespitose perennial; stems many, sulcate, sparingly strigose, 3-6 dm. long; leaves ascending, about 1 cm. long, often reduced to the rachis; stipules broadly deltoid, subulate-tipped; leaflets few, linear, 1-2 cm. long, or wanting, especially the terminal one; peduncles 1-1.5 dm. long, erect; racemes about 5 cm. long; bracts lanceolate, 2 mm. long; pedicels 1.5-2 mm. long; calyx strigose, 5 mm. long, cleft more deeply above, the teeth deltoid, 1 mm. long; corolla purple; banner oblanceolate, strongly arcuate; wings shorter, the blade slightly falcate, linear, white-tipped; keel-petals still shorter, the blades obliquely oblanceolate; pod obliquely lance-oblong, 1.5-2 cm. long, 4-5 mm. wide, subterete, glabrous, acuminate at the apex, rounded at the base.

TYPE LOCALITY: Toano Range, eastern Nevada.

DISTRIBUTION: Nevada.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl.* 29, *f.* 101; *pl.* 73.

12. *Cnemidophacos rafaensis* (M. E. Jones) Rydberg.

Astragalus rafaensis M. E. Jones, Rev. Astrag. 146. 1924.

Astragalus linifolius Osterhout, Bull. Torrey Club 55: 75. 1928.

Ctenophyllum linifolium Osterhout, Bull. Torrey Club 55: 75, as synonym. 1928.

A caespitose perennial; stems many, about 5 dm. high, glabrous, somewhat striate, slightly flexuose; leaves ascending, 5-10 cm. long, the rachis filiform, channeled, with a long slender tip, without a distinct terminal leaflet; leaflets 2-4, filiform, 1-2 cm. long, less than 1 mm. wide, glabrous; stipules deltoid, connate, 2-3 mm. long; peduncles erect, slender, 1-1.5 dm. long; raceme lax, 5-10 cm. long; bracts lanceolate, 2 mm. long; calyx glabrous except the ciliolate margins, the tube 5 mm. long, the teeth subulate, 2 mm. long; corolla pink, or white tinged with pink, the keel purple-tipped; banner obovate, about 2 cm. long, moderately arched at the middle; wings 18 mm. long, the blade oblong, with a reflexed basal auricle, twice as long as the claw; keel-petals 15 mm. long, the blade broadly obliquely lunate, with a small auricle; pod according to Jones reflexed, but in better specimens ascending, with both sutures prominent, elliptic-oblong, 12-15 mm. long, 5 mm. wide, and 4 mm. thick, slightly wrinkled; seed dark-brown, nearly round, 1.5 mm. long.

TYPE LOCALITY: Cedar Mountain, near Woodside, Utah.

DISTRIBUTION: Type locality and Grand Junction, Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 30.

13. *Cnemidophacos Grayi* (Parry) Rydberg.

Astragalus Grayi Parry; S. Wats. Am. Nat. 8: 212. 1874.

Tragacantha Grayi Kuntze, Rev. Gen. 945. 1891.

Ctenophyllum Grayi Rydb. Bull. Torrey Club 40: 50. 1913.

A perennial, with a woody root and short caespitose caudex; stems several, erect and strict, 3-4 dm. high, sulcate, sparingly strigose; leaves ascending, 5-8 cm. long, the rachis grooved above, sparingly strigose; stipules connate, deltoid, 6-8 mm. long; leaflets 7-9, linear, 2-3 cm. long, 3-5 mm. wide, firm, veined, acute at the base, obtuse at the apex, sessile; peduncles 5-8 cm. long, strict; racemes dense, 4-5 cm. long; bracts lanceolate, 4-6 mm. long; pedicels about 2 mm. long; calyx black-hairy, the tube 8 mm. long, 4 mm. broad, the teeth lance-subulate, 3-4 mm. long; corolla ochroleucous, about 2.5 cm. long; banner ovate, only slightly arcuate; wings fully 2 cm. long, the blades oblong, scarcely falcate, with a reflexed auricle; keel-petals much shorter, about 16 mm. long, the blade obliquely obovate, with a reflexed auricle, the apex

of the keel strongly incurved, obtuse; pod oblong-ovoid, rounded at the base, abruptly acuminate at the apex, cross-reticulate, 1 cm. long, 4-5 mm. thick and wide.

TYPE LOCALITY: Owl Creek Valley, Wyoming.

DISTRIBUTION: Wyoming.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl.* 30, *f.* 103; *pl.* 73.

14. *Cnemidophacos pectinatus* (Dougl.) Rydberg.

Phaca pectinata Hook. Fl. Bor. Am. 1: 141. 1831.

Astragalus pectinatus Dougl.; Hook. Fl. Bor. Am. 1: 142, as a synonym. 1831.

Tragacantha pectinata Kuntze, Rev. Gen. 947. 1890.

Astragalus pectinatus platyphyllus M. E. Jones, Contr. W. Bot. 10: 87. 1902.

Ctenophyllum pectinatum Rydb. Bull. Torrey Club 32: 663. 1906.

A caespitose perennial; stems several from an underground rootstock or root, 3-6 dm. high, sulcate, sparingly strigose, strict; leaves spreading, 6-10 cm. long, the rachis sulcate above, sparingly strigose; stipules connate at the base, 5-7 cm. long, the lower deltoid, the upper lanceolate from a broad base; leaflets 9-17, spreading, narrowly linear, firm, strongly veined, 2-6 cm. long, about 2 mm. wide, obtuse, not articulate to the rachis; peduncles 3-10 cm. long; racemes dense, 4-7 cm. long; bracts lanceolate, 4 mm. long; pedicels 2 mm. long; calyx strigose, usually with black hairs, the tube 7-8 mm. long, 3-4 mm. broad, the teeth subulate, 2 mm. long; corolla ochroleucous or cream-colored, 18-20 mm. long; banner ovate, notched at the apex, slightly arcuate; wings slightly shorter, the blade linear-oblong, with a reflexed basal auricle; keel-petals 15-16 mm. long, the blade broadly lunate, shorter than the claw; pod reflexed, oblong-ellipsoid, 1-2.5 cm. long, 5-6 mm. wide and thick, said to be fleshy when young, the sutures prominent.

TYPE LOCALITY: Pastures of the Saskatchewan.

DISTRIBUTION: Saskatchewan to Kansas, Utah, and Montana.

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl.* 54; M. E. Jones, Rev. Astrag. *pl.* 30, *f.* 104; Fl. Neb. 21: *pl.* 11, *f.* 75-78; Britt. & Brown, Ill. Fl. *f.* 2136; ed. 2. *f.* 2539.

15. *Cnemidophacos froglydytus* (S. Wats.) Rydberg.

Astragalus troglodytus S. Wats. Proc. Am. Acad. 20: 362. 1885.

A subcaulescent perennial, with a woody root and short caespitose caudex; stems very short, covered by the imbricate stipules; leaves numerous, erect, about 1 dm. long, with comparatively long petioles; stipules lanceolate or ovate, 5 mm. long, hirsute; leaflets 13-17, oval or obovate, silvery-silky, 5-10 mm. long; peduncles 15 cm. long, overtopping the leaves; racemes short, 2-3 cm. long, dense; bracts linear-lanceolate, 5 mm. long, in age reflexed; calyx hirsute, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla 8-10 mm. long; banner obovate; wings shorter, the blade rhombic-oblong, acute; keel-petals strongly arched, rounded at the apex; pod obliquely ovoid, 5-6 mm. long, 4 mm. wide and thick, loosely pubescent, nearly orbicular in cross-section.

TYPE LOCALITY: San Francisco Mountains, Arizona, near Cliff-dweller Ravine.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 62 (but cross-section of pod not correct).

37. *MICROPHACOS* Rydb. Bull. Torrey Club 32: 663. 1905.

Slender-stemmed perennial, subcinereous-strigose. Leaves pinnate, with linear or oblong leaflets and broad stipules free from the petioles, but the lower more or less united with each other. Flowers small, in lax elongate racemes. Calyx short-campanulate, with very short teeth. Corolla purple, small, all petals strongly arched. Banner broadly obovate, almost clawless, retuse. Wings shorter, the blade obliquely obovate, with a comparatively small basal auricle. Keel-petals still shorter, similar, but broader, more oblique, and more truncate at the apex. Pod small, inversely boat-shaped, *i.e.*, upper suture prominent and curved, the lower almost straight, flat or slightly sulcate, oval in dorsal view, coriaceous, cross-ribbed; seeds reniform, rather few.

Type species, *Astragalus gracilis* as interpreted by Dr. Gray, *i.e.*, *Dalea parviflora* Pursh.

Pod slightly sulcate on the lower suture, transversely veined; leaflets narrowly linear.

1. *M. parviflorus*.

Pod flattened on the lower suture, cross-ribbed; leaflets linear-oblong or linear-cuneate, truncate or emarginate.

2. *M. gracilis*.

1. *Microphacos parviflorus* (Pursh) Rydb. Bull. Torrey Club

40: 51. 1913.

Dalea parviflora Pursh, Fl. Am. Sept. 474. 1814.

Psoralea parviflora Poir. in Lam. Encyc. Suppl. 4: 590. 1816.

Phaca parvifolia Nutt.; T. & G. Fl. N. Am. 1: 348. 1838.

Astragalus gracilis A. Gray, Proc. Am. Acad. 6: 202. 1864. Not *A. gracilis* Nutt. 1818.

Astragalus parvifolius Nutt.; A. Gray, Proc. Am. Acad. 6: 202, as synonym. 1864.

Tragacantha parviflora Kuntze, Rev. Gen. 941. 1891.

Astragalus parviflorus MacM. Metasp. Minn. Valley 325. 1892. Not *A. parviflorus* Lam. 1783.

Phaca gracilis MacM. Metasp. Minn. Valley 325, as synonym. 1892.

Microphacos gracilis Rydb. Bull. Torrey Club 32: 663, in part. 1906.

A perennial, with a woody root; stems several, the lower part often subterranean, from prostrate to decumbent or ascending, the upper portion erect, flexuose, slender, 3-6 dm. high, branched, strigose; leaves ascending, 3-7 cm. long; stipules deltoid, 1-3 mm. long, the lower connate; leaflets 5-9, narrowly linear, 1-2.5 cm. long, 1-2 mm. wide, glabrous above, sparingly strigose beneath; peduncles 4-10 cm. long, slender; racemes 3-10 cm. long, lax; bracts lanceolate, 1 mm. long; pedicels 1 mm. long; calyx strigose, the tube 1.5 mm. long, and as broad, the teeth deltoid, 0.5 mm. long; corolla purplish, 5-6 mm. long; banner obovate, strongly arched below the middle; wings shorter, the blade oblanceolate, falcate, with a rounded spreading auricle; keel-petals still shorter, the blade broadly lunate, strongly incurved toward the rounded apex; pod sessile, obliquely ovoid, cross-ribbed, 5-6 mm. long, 2 mm. wide, 3 mm. thick, the cross-section reniform, the upper suture acute, the lower sulcate; seeds usually 2, obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Banks of the Missouri [perhaps South Dakota].

DISTRIBUTION: South Dakota to Texas, Colorado, and Wyoming.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 43, f. 152; Britt. & Brown, Ill. Fl. f. 2140; ed. 2. f. 2551; Fl. Neb. 21: pl. 9, f. 1-5; Clements, Rocky Mt. Fl. pl. 29, f. 20.

2. *Microphacos gracilis* (Nutt.) Rydb. Bull. Torrey Club

32: 663. 1906.

Astragalus gracilis Nutt. Gen. 2: 100. 1818.

Astragalus microlobus A. Gray, Proc. Am. Acad. 6: 203. 1864.

Tragacantha microloba Kuntze, Rev. Gen. 946. 1891.

Microphacos microlobus Rydb. Bull. Torrey Club 32: 663. 1906.

Astragalus parviflorus microlobus M. E. Jones, Rev. Astrag. 193. 1923.

A perennial, with a woody root; stems decumbent at the base or ascending, branched and flexuose, strigose-canescens, 2-5 dm. high; leaves mostly spreading, 3-8 cm. long; stipules deltoid, 2-3 mm. long; leaflets 11-15, linear or oblong, 5-15 mm. long, 1-3 mm. wide, glabrous above, strigose beneath, rounded, truncate or retuse at the apex; peduncles 3-8 cm. long; racemes 4-8 cm. long; bracts lanceolate, 1 mm. long; calyx strigose, the tube 1.5 mm. long, the teeth deltoid, 0.5 mm. long; corolla purple, 7-8 mm. long; banner obovate, strongly arched below the middle; wings obliquely obovate, falcate, with a rounded auricle, rounded at the apex; pod obliquely ovoid, cross-ribbed, grayish-strigose, 7-9 mm. long, 2.5 mm. wide, and 4 mm. thick, the upper suture acute, the lower concave, the cross-section reniform; seeds usually 2, brown, obliquely round-reniform, 2.5 mm. long.

TYPE LOCALITY: "From White River to the mountains, on the plains of the Missouri" [South or North Dakota].

DISTRIBUTION: South Dakota, Oklahoma, New Mexico, Utah, and Montana.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 43; Britt. & Brown, Ill. Fl. f. 2141; Fl. Neb. 21: f. 6-9.

38. *XYLOPHACOS* Rydb.; Small, Fl. SE. U. S. 619, 1332. 1903.

Perennial herbs, mostly copiously pubescent, usually low, often subcaulescent. Leaves pinnate, the stipules nearly free, the leaflets entire-margined. Flowers in dense, short, sometimes head-like racemes. Calyx cylindric, the lobes shorter than the tube. Corolla purple,

ochroleucous, or in one species crimson. Banner oblanceolate, often retuse at the apex, moderately arched beyond the middle. Wings shorter, narrow, oblanceolate, with a reflexed basal auricle, scarcely longer than the claw. Keel-petals shorter, the blade broadly lunate, rounded at the apex, slightly auricled at the base, shorter than the long claw. Stamens diadelphous (9 and 1), the sheath with a broad base, straight to near the top. Ovary sessile; style glabrous, straight to near the apex; stigma minute. Pod coriaceous or woody, one-celled, sessile, straight or incurved, strigose or villous, ovoid, lance-ovoid, lance-oblong, or lunate, the lower suture often slightly sulcate, but never producing a false partition. Seeds numerous.

Type species, *Astragalus Shortianus* Nutt.

Pod strigose, short-pilose, or glabrous.

Exocarp of the fruit not spongy; stem evident, but often short.

Pod more or less curved, or at least decidedly oblique.

Leaves sparingly hairy or glabrous, scarcely canescent.

Leaves densely silvery-canescens on both sides.

Pod straight or nearly so; leaves silvery.

Exocarp of the fruit spongy, at least in age; plant subcaulescent.

Pod long-villous.

Corolla purple or ochroleucous.

Pubescence of the leaves strictly appressed.

Pubescence of the leaves loosely villous.

Corolla crimson.

1. IODANTHI.
2. CYANEI.
3. MISSOURIENSES.
4. PYGMAEI.

5. ERIOCARPI.
6. GLAREOST.
7. COCCINEI.

1. IODANTHI

Calyx more or less black-hairy; pod more or less strigose; leaves strigose or glabrous.

Leaflets glabrous or sparingly hairy on the margins and veins; pod mottled.

Leaflets strigose beneath; pod not mottled.

Pod 2.5-4 cm. long, long-acuminate.

Pod 2-2.5 cm. long, abruptly acute at each end.

Calyx white-hairy; pod glabrous; leaves, at least below, and calyx long-pilose.

1. *X. iodanthus*.
2. *X. cibaricus*.
3. *X. cuspidocarpus*.
12. *X. iodopetalus*.

2. CYANEI

Pod tapering at the base, narrowly lanceolate-lunate, decidedly arcuate.

Leaves linear, obtuse; racemes elongate; calyx black-hairy.

Leaves oval or ovate to elliptic or lanceolate, if narrow, acute; racemes mostly short.

Pod mottled, 2-3 cm. long; calyx more or less black-hairy, the teeth less than half as long as the tube; leaflets oval, acute.

Pod not mottled, 3-4 cm. long.

Calyx-teeth less than half as long as the tube; leaflets obovate or oval, obtuse or acutish; bracts 2-3 mm. long.

Leaflets oval, or elliptic, or narrowly obovate.

Calyx white-hairy; pod forming nearly half a circle.

Calyx black-hairy; pod forming one fourth to one third of a circle.

Leaflets broadly obovate.

Calyx more or less black-hairy, the teeth more than half as long as the tube; leaflets lanceolate, very acute; pod about 8 mm. wide, slightly arcuate; bracts 5-8 mm. long.

Pod rounded, obtuse, or merely acute at the base, obliquely lanceolate or ovate, less arcuate.

Corolla white or ochroleucous; calyx with mixed black hairs; leaflets mostly oblong or elliptic.

Corolla usually purplish; calyx mostly white-hairy.

Leaflets elliptic to obovate; pod strictly strigose.

Calyx loosely pubescent.

Pod pubescent; leaves pubescent on both sides.

Pod 3-4 cm. long, arcuate, sulcate on the lower suture; corolla more than 2 cm. long.

Pod 2-2.5 cm. long, slightly arcuate, not sulcate; corolla less than 2 cm. long.

Pod glabrous; leaves often glabrate above, at least in age.

Calyx-lobes about half as long as the tube.

Calyx-lobes less than one fourth as long as the tube.

Calyx with strictly appressed hairs.

Pod lance-ovoid, 2 cm. long or more.

Leaflets elliptic or elliptic-obovate.

Calyx black-hairy; peduncles 3 dm. long; plant green.

Calyx white-hairy; peduncles 1-2 dm. long.

Calyx-teeth about one third as long as the tube.

Calyx-teeth less than one fourth as long as the tube.

Leaflets broadly obovate.

4. *X. Casei*.
5. *X. Zionis*.
6. *X. amphioxys*.
7. *X. melanocalyx*.
17. *X. Tidestromii*.
8. *X. aragaloides*.
9. *X. Webberi*.
10. *X. Shortianus*.
11. *X. pephragmenus*.
12. *X. iodopetalus*.
13. *X. remulus*.
14. *X. Chloridae*.
15. *X. cyaneus*.
16. *X. brachylobus*.
17. *X. Tidestromii*.

Pod broadly ovoid, 1.5 cm. long or less.

Leaflets 9-13, obovate, about 1 cm. long; pod broader than high.

Leaflets 15-25, oval or elliptic, 5-7 mm. long; pod higher than broad.

Leaflets lance-oblong, acute; pod hirsutulous.

18. *X. castaneaeformis*.

19. *X. lephrodos*.

20. *X. argophyllus*.

3. MISSOURIENSES

Pod obcompressed, the upper suture only prominent; hairs acute at each end.

Pod compressed, both sutures prominent.

Corolla nearly 2 cm. long, purple; calyx-lobes nearly half as long as the tube.

Corolla about 15 mm. long, white or merely purple-tinged, with a purple keel; calyx-lobes about one fourth as long as the tube.

21. *X. vespertinus*.

22. *X. missouriensis*.

23. *X. cymboides*.

4. PYGMAEI

Leaflets 7-11, obovate, obtuse.

Pod straight, elliptic in outline.

Pod somewhat arcuate, lance-ovoid in outline.

Leaflets 1-5, lanceolate, acute; pod arcuate.

23. *X. cymboides*.

24. *X. pygmaeus*.

25. *X. musiniensis*.

5. ERIOCARPI

Leaflets elliptic or oblanceolate to obovate; calyx-teeth one fourth to one third as long as the tube.

Leaflets 5-7, broadly oblanceolate to obovate, silvery-white; pod densely villous.

Leaflets mostly obovate, obtusish; peduncles much shorter than the leaves.

Leaflets oblanceolate, mostly acute; peduncles about equaling the leaves.

Leaflets 9-19, merely canescent, rarely more than 1 cm. long; pubescence of the pod comparatively sparse.

Leaflets 3-8 mm. long, elliptic to oval, obtuse.

Leaflets 8-15 mm. long, lance-elliptic, acute.

Leaflets broadly obovate-cuneate, rounded, truncate or retuse at the apex; calyx-teeth half as long as the tube.

26. *X. Newberryi*.

27. *X. medius*.

28. *X. marianus*.

29. *X. eurekaensis*.

30. *X. Watsonianus*.

6. GLAREOSI

Corolla 2-3 cm. long.

Calyx-teeth nearly half as long as the tube; bracts subulate; pod strongly incurved.

Stems usually 1-3 dm. long; pod 2-2.5 cm. long, bent at the middle; corolla purplish.

Stem less than 1 dm. long; pod about 2 cm. long, abruptly bent above the middle; corolla ochroleucous, the keel tipped with purple.

Calyx-teeth less than one third as long as the tube; stems usually less than 1 dm. long.

Leaflets obovate, mostly rounded to retuse at the apex.

Calyx black-hairy.

Corolla bluish, 25-30 mm. long; pod 3 cm. long or more.

Corolla pink-purple and whitish, 15-18 mm. long; pod about 2 cm. long.

Calyx white-hairy; corolla rose-purple, white, or ochroleucous.

Pod comparatively sparingly hairy; bracts subulate, slightly longer than the pedicels; corolla 2 cm. long, ochroleucous or white.

Pod very densely villous; bracts lanceolate, more than twice as long as the pedicels.

Leaves densely white-floccose; corolla about 2.5 cm. long, rose-purple.

Leaves sparingly white-villous; corolla about 2 cm. long, ochroleucous.

Leaflets elliptic or lanceolate, acute or obtuse.

Corolla ochroleucous or white, the keel only tipped with purple.

Corolla purple or purple-tinged.

Peduncles usually not exceeding the leaves.

Leaflets oblanceolate, acute; pod rather long-acuminate.

Leaflets elliptic, obtuse; pod short-acuminate.

Calyx white-hairy.

Calyx black-hairy.

Peduncles in flower usually exceeding the leaves; pod short-acuminate.

Calyx-lobes 2 mm. long; pubescence appressed; peduncles much exceeding the leaves.

Calyx-lobes 3 mm. long; pubescence loose; peduncles slightly exceeding the leaves.

31. *X. inflexus*.

32. *X. incurvus*.

33. *X. funereus*.

34. *X. Blyae*.

35. *X. nudisiliquus*.

36. *X. utahensis*

37. *X. subvillosus*.

38. *X. Purshii*.

39. *X. glareosus*.

40. *X. candellarius*.

41. *X. ventosus*.

42. *X. leucolobus*.

43. *X. consectus*.

- Corolla 15 mm. long or less.
 Corolla ochroleucous; leaflets broadly obovate. 44. *X. argentinus*.
 Corolla purplish; leaflets narrowly obovate or oblanceolate.
 Racemes usually more than 6-flowered, on very short peduncles;
 bracts lanceolate, scarcely exceeding the pedicels. 45. *X. lectulus*.
 Racemes 2-6-flowered, shorter than the peduncles; bracts subulate,
 almost half as long as the calyx. 46. *X. lagopinus*.
7. COCCINEI
 One species. 47. *X. coccineus*.

1. **Iodanthi.** Cespitose perennials, but with better developed stems than in the other sections. Leaves sparingly hairy or glabrous, not canescent. Pod rather thin-walled, elongate, falcate, strigose, often somewhat sulcate on the lower or both sutures when mature.

1. **Xylophacos iodanthus** (S. Wats.) Rydb. Bull. Torrey Club
 52: 144. 1925.

Astragalus iodanthus S. Wats. Bot. King's Expl. 70. 1871.
Tragacantha iodantha Kuntze, Rev. Gen. 945. 1891.

A perennial, with a cespitose woody caudex; stems decumbent, flexuose, 2-6 dm. long, glabrate or sparingly strigose; stipules triangular, 2-4 mm. long, hyaline, reflexed; leaves spreading, 4-10 cm. long; leaflets 17-21, obovate or oval, 8-12 mm. long, 4-6 mm. wide, glabrous or ciliolate on the margins and ribs, obtuse, rounded, or retuse at the apex; peduncles 3-5 cm. long; racemes short and rather dense; bracts lanceolate, 3 mm. long, longer than the pedicels; calyx sparingly strigose with black hairs, the tube about 5 mm. long, the teeth subulate, 2 mm. long; corolla light-purple or white, 12-15 mm. long; banner oblong, abruptly bent at the middle, deeply notched at the apex; wings shorter, the blades obliquely oblanceolate, with a rounded basal auricle; keel-petals much shorter, broader, strongly arcuate, and rounded at the apex; pod lanceolate in outline, strongly arcuate, about 3 cm. long and 8 mm. wide, mottled, sparingly strigose, finely cross-reticulate, acute at each end, usually depressed, and somewhat sulcate on the sutures.

TYPE LOCALITY: Virginia City, Nevada.
 DISTRIBUTION: Nevada and eastern California.
 ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 45, f. 163.

2. **Xylophacos cibarius** (Sheldon) Rydb. Bull. Torrey Club
 40: 48. 1913.

Astragalus iodanthus (form) S. Wats. Bot. King's Expl. 71. 1871.
Astragalus iodanthus M. E. Jones, Zoe 3: 294. 1893. Not *A. iodanthus* S. Wats. 1871.
Astragalus cibarius Sheldon, Minn. Bot. Stud. 1: 149. 1894.
Astragalus arietinus M. E. Jones, Proc. Calif. Acad. II. 5: 653. 1895.
Astragalus Webberi cibarius M. E. Jones, Contr. W. Bot. 10: 87. 1902.

A perennial, with a cespitose caudex; stems 1.5-3 dm. long, decumbent and spreading, striate, sparingly strigose; leaves 6-9 cm. long; stipules large, ovate or deltoid, ciliate, erect; leaflets 11-17, obovate-oblong to orbicular, obtuse to retuse, glabrate above, strigose beneath, 5-10 mm. long; peduncles 8-11 cm. long; racemes 8-12-flowered, short; bracts lanceolate, scarious, 5 mm. long; calyx black-hairy, the tube 5 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous and purple, about 15 mm. long; banner obovate, strongly bent at the middle, slightly retuse; wings slightly shorter, the blades oblanceolate-oblong, with a large rounded auricle; keel-petals broadly lunate, rounded at the apex; pod lanceolate in outline, acute at each end, 2.5-4 cm. long, about 1 cm. wide, sparingly strigose or glabrate in age, cross-reticulate, arcuate, obcompressed and often sulcate on the lower suture.

TYPE LOCALITY: Utah Valley, Utah.
 DISTRIBUTION: Montana to Utah and Colorado.
 ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 45, f. 162.

3. *Xylophacos cuspidocarpus* (Sheldon) Rydb. Bull. Torrey Club

40: 48. 1913.

Astragalus cuspidocarpus Sheldon, Minn. Bot. Stud. 1: 147. 1894.*Astragalus thermalis* Greene, Erythraea 3: 76. 1895.*Astragalus missouriensis cuspidocarpus* M. E. Jones, Rev. Astrag. 213. 1923.

A perennial, with a woody caudex; stems 1-2 dm. long, spreading, sparingly canescent; leaves 4-8 cm. long; stipules large, membranous, deltoid; leaflets 11-17, obovate to oblong, 8-12 mm. long, 4-8 mm. wide, rounded to retuse at the apex, strigose beneath, glabrate above; peduncles 5-8 cm. long; racemes short, 7-9-flowered; calyx strigose with blackish hairs, the tube nearly 4 mm. long, the teeth subulate, 2 mm. long; corolla 15-20 mm. long, ochroleucous or lemon-yellow, tinged with purple, closely resembling that of *A. cibarius*; pod 2-2.5 cm. long, 8 mm. wide, coriaceous, glabrate or sparingly strigose, arcuate, obcompressed, cross-reticulate.

TYPE LOCALITY: Grafton, Montana.

DISTRIBUTION: Montana and Wyoming.

2. *Cyanei*. Cespitose perennials, usually with short stems. Leaves usually densely strigose-canescens on both sides. Pod leathery or rarely woody, elongate, more or less falcate, strigose or rarely glabrous, gradually acute at the apex.

4. *Xylophacos Casei* (A. Gray) Rydb. Bull. Torrey Club

52: 147. 1925.

Astragalus Casei A. Gray, Bot. Calif. 1: 154. 1876.*Tragacantha Casei* Kuntze, Rev. Gen. 943. 1891.

A perennial, with a deep root and cespitose caudex; stems erect, 2-5 dm. high, somewhat flexuose, canescent-strigose; leaves ascending, 3-10 cm. long; stipules green, deltoid, reflexed, 3-5 mm. long; leaflets 5-15, linear or rarely linear-oblong, 8-18 mm. long, 1-2.5 mm. wide, canescent-strigose on both sides, obtuse, truncate or retuse at the apex; peduncles 5-10 cm. long; raceme rather lax, 5-10 cm. long; bracts lanceolate, 2-3 mm. long, longer than the pedicels; calyx more or less black-hairy, the tube 7-8 mm. long, the teeth subulate, 2 mm. long; corolla purple, 15-18 mm. long; banner oblong-obovate, deeply notched, with a fan-shaped white spot; wings oblanceolate, slightly arcuate; keel-petals much shorter, abruptly arched, obtuse at the apex; pod 3-3.5 cm. long, short-acuminate at the base, long-acuminate at the apex, obcompressed, or even sulcate on the lower suture, reticulate, strigulose, somewhat mottled, 3.5-4 cm. long; 5 mm. wide, 8 mm. thick.

TYPE LOCALITY: High plateau, near Pyramid Lake, Nevada.

DISTRIBUTION: Western Nevada and eastern California, apparently also southeastern Washington.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 30, f. 105; pl. 73.

5. *Xylophacos Zionis* (M. E. Jones) Rydb. Bull. Torrey Club

40: 48. 1913.

Astragalus Zionis M. E. Jones, Proc. Calif. Acad. II. 5: 652. 1895.

A perennial, with a rootstock and short caudex; stems ascending, 1-2 dm. high, strigose-canescens; leaves spreading, 1-1.5 dm. long; stipules deltoid, 3-4 mm. long, strigose; leaflets 11-17, ovate or rhombic-oval, 5-20 mm. long, strigose-canescens on both sides; peduncles 8-10 cm. long; bracts lanceolate, 5 mm. long, longer than the pedicels; calyx black-hairy, the tube 7 mm. long, the teeth subulate, about 1 mm. long; corolla 1.5 cm. long, pink-purple; banner obovate, strongly bent at the middle, the sides reflexed at the middle, with a white spot, purple-veined; wings linear-oblanceolate, obtuse; keel-petals shorter, strongly arcuate, acute at the apex; pod lanceolate in outline, arcuate, acute at each end, 2.5-3 cm. long, 7 mm. wide, somewhat obcompressed, mottled, cross-reticulate, short-pilose.

TYPE LOCALITY: Springdale, Utah.

DISTRIBUTION: Southwestern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 47, f. 168.

6. *Xylophacos amphioxys* (A. Gray) Rydb. Bull. Torrey Club
32: 662. 1906.

Astragalus succumbens A. Gray, in J. C. Ives, Rep. Colorado Riv. Bot. 10. 1860. Not *A. succumbens* Dougl. 1831.

Astragalus Shortianus minor A. Gray, Proc. Am. Acad. 6: 211, in part. 1864.

Astragalus cyaneus S. Wats. Am. Nat. 9: 270. 1875. Not *A. cyaneus* A. Gray. 1849.

Astragalus Shortianus S. Wats.; Wats. & Rothr. Cat. Pl. Wheeler's Surv. 7. 1874. Not *A. Shortianus* Nutt. 1838.

Astragalus amphioxys A. Gray, Proc. Am. Acad. 13: 366. 1878.

Astragalus crescenticarpus Sheldon, Minn. Bot. Stud. 1: 148. 1894.

Astragalus selenaceus Greene, Erythra 3: 76. 1895.

A perennial or biennial, with a deep root; stems several from the base, about 1 dm. high, silvery-canescens; leaves ascending, 5–10 cm. long; stipules deltoid, scarious, 3–5 mm. long, canescens; leaflets 11–17, obovate, silky-canescens with hairs tapering at each end, 6–12 mm. long, 4–6 mm. wide, mostly obtuse at the apex; peduncles 5–10 cm. long; racemes 4–12-flowered, 2–6 cm. long; bracts lanceolate, 2–4 mm. long; calyx silky-canescens, the tube 8 mm. long, the teeth subulate, 3 mm. long; corolla purple, moderately arched at the middle, with a pale spot; blades of the wings oblanceolate, slightly lunate, obtuse, about as long as the claws; keel-petals broadly lunate, rounded at the apex; pod narrowly lunate, tapering at each end, arched nearly into a semicircle, 3–4 cm. long, 6–7 mm. wide, and 4–5 mm. thick, somewhat sulcate on the lower suture, cross-reticulate, silky-strigose.

TYPE LOCALITY: Dona Ana, New Mexico.

DISTRIBUTION: Texas to southern Utah, Arizona, and northern Chihuahua.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 50; pl. 51, f. 174.

7. *Xylophacos melanocalyx* Rydb. Bull. Torrey Club
52: 149. 1925.

Astragalus amphioxys M. E. Jones, Rev. Astrag. 214, in part. 1923.

Astragalus amphioxys × *Layneae* M. E. Jones, Rev. Astrag. 215. 1923.

A perennial, with a caespitose calyx; stems many, 2–7 cm. long, decumbent or ascending, white-strigose, densely covered with leaves; leaves 5–10 cm. long, ascending or spreading; stipules deltoid, 5–8 mm. long, white-strigose; leaflets 11–19, oval or obovate, 5–10 mm. long, 2–5 mm. wide, white silky-strigose on both sides, obtuse at each end; peduncles 7–15 cm. long, erect, white-strigose; bracts lanceolate, 2–3 mm. long, membranous; flowers subsessile; calyx black-hairy, the tube 6–7 mm. long, 3–3.5 mm. broad, the lobes deltoid-subulate, 2 mm. long; corolla bluish-purple, 15–18 mm. long; banner obovate, moderately arched; wings shorter, the blade oblong, acutish, with a large reflexed basal auricle; keel-petals nearly as long as the keel, the blades lunate, rounded at the apex; pod crescent-shaped, about 3 cm. long, 1 cm. thick, and 5–7 mm. wide, cross-wrinkled, white-strigose with somewhat kinked hairs.

TYPE LOCALITY: Copper Mine (west of St. George), Utah.

DISTRIBUTION: Northwestern Arizona and southwestern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 57.

8. *Xylophacos aragaloides* Rydb. Bull. Torrey Club 34: 48. 1907.

Astragalus cyaneus S. Wats. Am. Nat. 9: 270, in part. 1875.

Astragalus amphioxys A. Gray, Proc. Am. Acad. 13: 366, in part. 1878.

A perennial, with a caespitose caudex; stem about 1 dm. long, densely white-strigose; leaves 10–15 cm. long; stipules scarious, strigose, deltoid, 5–8 mm. long; leaflets 11–19, lanceolate or lance-elliptic, silky-canescens, 5–12 mm. long, 2–4 mm. wide; peduncles 5–10 cm. long; racemes 4–10-flowered; bracts lanceolate, 5–7 mm. long, attenuate; calyx strigose with black and white hairs, the tube 8 mm. long, the teeth subulate, 3–4 mm. long; corolla purplish, about 2 cm. long, similar to that of the preceding; pod lunate, tapering at each end, about 4 cm. long, 7–8 mm. wide, deeply sulcate below, cross-reticulate, sparingly silky-strigose, curved about one third of a circle.

TYPE LOCALITY: St. George, Utah.

DISTRIBUTION: Southwestern Utah and northern Arizona.

9. *Xylophacos Webberi* (A. Gray) Rydb. Bull. Torrey Club
52: 151. 1925.

Phaca leucophylla T. & G. Fl. N. Am. 1: 694, in part. 1840.
Astragalus Webberi A. Gray, Bot. Calif. 1: 154. 1876.
Tragacantha Webberi Kuntze, Rev. Gen. 949. 1891.

A perennial, with a caespitose caudex; stems 1-3 dm. high, more or less canescent-strigose; leaves 5-10 cm. long; stipules deltoid, 3-4 mm. long; leaflets 11-19, oblong, 1-2 cm. long, 3-6 cm. wide, obtuse or retuse at the apex, acute at the base, silvery strigose-canescens; peduncles 4-10 cm. long; bracts lanceolate, about 3 mm. long; racemes short, 2-4 cm. long; calyx strigose with mixed blackish hairs; tube 5-6 mm. long, the teeth subulate, 3 mm. long; corolla ochroleucous; banner obovate, nearly 1.5 mm. long, slightly arched; wings about 12 mm. long, the blade broadly oblong, shorter than the claw, with a large basal auricle; keel-petals similar, but broader, more arcuate, rounded at the apex; pod lunate in outline, obtuse at the base, acute at the apex, glabrous, cross-wrinkled, 3-3.5 cm. long, 4-5 mm. wide, and 1 cm. thick, somewhat obcompressed.

TYPE LOCALITY: Indian Valley, northeastern Sierra Nevada, California.

DISTRIBUTION: Northeastern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 44, f. 161.

10. *Xylophacos Shortianus* (Nutt.) Rydb.; Small, Fl. SE. U. S.
1332. 1903.

Astragalus Shortianus Nutt.; T. & G. Fl. N. Am. 1: 331. 1838.
? *Astragalus humilis* Geyer, Lond. Jour. Bot. 6: 211. 1847.
Astragalus cyaneus A. Gray, Proc. Acad. Phila. 1863: 60. 1863. Not *A. cyaneus* A. Gray. 1849.
Tragacantha Shortiana Kuntze, Rev. Gen. 948. 1891.

A perennial, with a caespitose caudex; stems short, usually less than 1 dm. high, rarely 2 dm. high, silky-canescens; leaves crowded, 5-10 cm. long; stipules deltoid, scarious, pubescent, 5-6 mm. long; leaflets 7-17, obovate or oval, 8-20 mm. long, 4-8 mm. wide, silvery-silky on both sides, rounded at the apex, often acute at the base; peduncles 4-8 cm. long, strigose; racemes short and headlike; calyx silky-villous with long white hairs, the tube 8 mm. long, the teeth subulate, 3-4 mm. long; corolla purple, about 18 mm. long; banner obovate, slightly arcuate; wings slightly shorter, the blade about equaling the claw, oblong, slightly arcuate; keel-petals similar, but the blade more arcuate, shorter, rounded at the apex; pod coriaceous, cross-reticulate, strigose, arcuate, obcompressed, sulcate on the lower suture, about 4 cm. long, 8 mm. wide, and 12 mm. thick.

TYPE LOCALITY: Rocky Mountains, towards the plains of the Oregon [probably in Wyoming].
DISTRIBUTION: Nebraska, Wyoming, Colorado, and New Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 45, f. 166; pl. 46; Britt. & Brown, Ill. Fl. f. 2139; ed. 2, f. 2548; Am. Jour. Bot. 15: pl. 45 E; Fl. Neb. 21: pl. 10, f. 65-69.

11. *Xylophacos pephragmenus* (M. E. Jones) Rydb. Bull. Torrey Club 52: 151. 1925.

Astragalus pephragmenus M. E. Jones, Zoe 4: 267. 1893.
Astragalus intermedium M. E. Jones, Proc. Calif. Acad. II. 5: 656. 1895.
Astragalus Phoenicis M. E. Jones, Contr. W. Bot. 8: 12. 1898.
Xylophacos lenophyllus Rydb. Fl. Rocky Mts. ed. 2. 1126. 1922.
Astragalus remulcus M. E. Jones, Rev. Astrag. 209, in part. 1923.
Astragalus argophyllus pephragmenus M. E. Jones, Rev. Astrag. 208. 1923.

A perennial, with a woody caespitose caudex; stems decumbent at the base, mostly less than 1 dm. long, canescent-strigose; leaves 5-10 dm. long; stipules scarious, deltoid, acuminate, 3-4 mm. long; leaflets 15-31, oval or obovate, loosely strigose-canescens, densely so beneath, less so above, 5-10 mm. long; peduncles about 1 dm. long, overtopping the leaves; racemes 3-5 cm. long, 3-12-flowered; calyx white-hairy, the hairs short and loose, the tube 8 mm. long, the teeth lance-deltoid, 1.5-2 mm. long; corolla purple, 15-20 mm. long, similar to that of *X.*

Shortianus but paler; pod slightly curved, 22–25 mm. long, 8 mm. wide, canescent with short kinked hairs, rounded at the base, acute at the apex.

TYPE LOCALITY: Pinal Mountains, Arizona.

DISTRIBUTION: Arizona, New Mexico, and southern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 47.

12. *Xylophacos iodopetalus* (Greene) Rydb. Bull. Torrey Club

52: 152. 1925.

Xylophacos stipularis Rydb. Fl. Rocky Mts. 504, 1063, mainly. 1917. Not *Astragalus arietinus stipularis* M. E. Jones. 1895.

Astragalus iodopetalus Greene, Bull. Torrey Club 52: 152, as a synonym. 1925.

A perennial, with a caespitose caudex; stems 1–2 dm. high, sparingly pilose or glabrate; leaves 1–2 dm. long; stipules large, scarious, deltoid, 6–8 mm. long; leaflets 21–27, obovate to elliptic, 5–15 mm. long, 4–8 mm. wide, glabrate above, silky-pilose beneath; peduncles 5–10 cm. long; racemes short and dense; bracts lanceolate, 4–7 mm. long; calyx silky-pilose, the tube 8–10 mm. long, the teeth lance-subulate, 3 mm. long; corolla purple, fully 2 cm. long; banner obovate, slightly retuse; wings shorter, the blades oblong, with a large basal auricle; keel-petals still shorter, the blades broadly obliquely obovate, arched and rounded at the apex; pod lanceolate in outline, arcuate, acuminate at the apex, obtuse at the base, cross-reticulate, 2.5–3 cm. long, glabrous.

TYPE LOCALITY: Arboles, Colorado.

DISTRIBUTION: Southern Colorado and northern New Mexico.

13. *Xylophacos remulcus* (M. E. Jones) Rydb. Bull. Torrey Club

52: 153. 1925.

Astragalus remulcus M. E. Jones, Proc. Calif. Acad. II. 5: 658. 1895.

A perennial, with a caespitose caudex; stems decumbent at the base, 1–2 dm. high, silky-canescenscent with rather short loose hairs; leaves 7–12 cm. long; stipules broadly deltoid, 4–5 mm. long; leaflets 15–31, obovate, 8–15 mm. long, 4–8 mm. wide, rounded at the apex, glabrous or nearly so above, pilose beneath; peduncles 5–10 cm. long; bracts lanceolate, 2 mm. long; calyx rather loosely short-pilose, the tube 7–8 mm. long, the teeth deltoid, 1.5 mm. long; corolla about 15 mm. long, light-purple, similar to that of the preceding; pod (not mature) ovoid, slightly arcuate, less than 2 cm. long, glabrous, the upper suture prominent.

TYPE LOCALITY: Bangharte's Ranch, Arizona.

DISTRIBUTION: Southern Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 48, f. 169.

14. *Xylophacos Chloridae* (M. E. Jones) Rydb. Bull. Torrey Club

52: 153. 1925.

Astragalus remulcus Chloridae M. E. Jones, Rev. Astrag. 210. 1923.

A perennial, with a woody root and short caudex; stems short, sparingly canescent; leaves ascending, 7–20 cm. long, the rachis sparingly strigose; stipules deltoid, scarious, 5–7 mm. long, pubescent; leaflets 19–25, oval, 5–20 mm. long, rounded to acute at the apex, sparingly strigose on both sides or glabrate above, green; peduncles 2–4 dm. high, stout, striate; bracts lanceolate, 4 mm. long, longer than the pedicels; calyx more or less black-hairy, the tube 1 cm. long, the teeth subulate, 4 mm. long; corolla purple, about 2 cm. long; banner obovate, moderately arcuate; wings shorter, the blade oblanceolate; keel-petals still shorter, broadly lunate, obtuse; pod oblong, 3–4 cm. long, 7–8 mm. wide, arcuate, strigose, abruptly acute, slightly sulcate on the lower suture.

TYPE LOCALITY: Chloride, Arizona.

DISTRIBUTION: Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 48.

15. *Xylophacos cyaneus* (A. Gray) Rydb. Bull. Torrey Club
52: 154. 1925.

Astragalus cyaneus A. Gray, Mem. Am. Acad. II. 4: 34. 1854.
Astragalus Shortianus minor A. Gray, Proc. Am. Acad. 6: 211. 1864.
Tragacantha cyanea Kuntze, Rev. Gen. 944. 1891.
Astragalus stipularis M. E. Jones, Contr. W. Bot. 7: 655. 1895.
Astragalus Shortianus cyaneus M. E. Jones, Contr. W. Bot. 8: 5. 1898.
Xylophacos utintensis Rydb. Bull. Torrey Club 32: 662, in part. 1906.

A perennial, with a caespitose caudex; stems less than 1 dm. high, densely strigose-canescens; leaves 5-8 cm. long; stipules broadly deltoid, about 2 mm. long, canescens; leaflets 11-17, elliptic, 5-10 mm. long, 2-5 mm. wide, grayish-canescens on both sides, acute or obtuse at the apex; peduncles 3-7 cm. long; bracts lanceolate, 3-5 mm. long; racemes 5-12; calyx strigose-canescens, the tube 5-6 mm. long, the teeth subulate, nearly 3 mm. long; corolla bluish-purple, about 15 mm. long; banner obovate, arched at the middle; wings slightly shorter, the blade oblong, about equaling the claw, with a large basal auricle; keel-petals still shorter, strongly lunate, with a rounded apex; pod oblong-ovoid, slightly arcuate, rounded at the base, acuminate at the apex, strigose and cross-reticulate, about 2 cm. long, 5 mm. wide, and 8 mm. thick.

TYPE LOCALITY: Santa Fé, New Mexico.

DISTRIBUTION: Arizona to Colorado, Oklahoma, and Texas.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 46; Contr. W. Bot. 10: pl. 4 (as *A. Shortianus minor*).

16. *Xylophacos brachylobus* (A. Gray) Rydb. Bull. Torrey Club
52: 154. 1925.

Astragalus amphioxys brachylobus A. Gray, Proc. Am. Acad. 13: 367. 1878.

A perennial, with a caespitose caudex; stems less than 1 dm. high, strigose-canescens, much branched and leafy; leaves ascending, 5-8 cm. long; stipules deltoid, strigose, 3 mm. long; leaflets 9-21, oval, usually acute, 5-10 mm. long, 3-5 mm. wide, strigose-canescens on both sides; peduncles 2-5 cm. long; raceme 3-9-flowered; bracts lanceolate, 5 mm. long, strigose; calyx strigose-canescens, the tube 7-8 mm. long, the teeth subulate, less than 2 mm. long; corolla bluish-purple, fully 2 cm. long; banner obovate, notched at the apex, moderately arcuate; wings nearly as long, the blade falcate-oblong; keel-petals shorter, broadly lunate; pod lunate, strigose, somewhat arcuate, 2.5 cm. long, obtuse at the base, acuminate at the apex, sulcate on the lower suture.

TYPE LOCALITY: Arizona.

DISTRIBUTION: Southern Nevada to Arizona, New Mexico, and southern Colorado.

17. *Xylophacos Tidestromii* Rydb. Bull. Torrey Club
52: 155. 1925.

A perennial, with a deep woody root and short caespitose caudex, subcaulescent; stems 1-5 cm. long, white-woolly; leaves 5-8 cm. long, spreading; stipules broadly deltoid, about 5 mm. long; leaflets 11-15, broadly obovate, 6-12 mm. long and nearly as broad, densely white-silky-villous on both sides, cuneate at the base, rounded at the apex; peduncles 5-7 cm. long; racemes 2-4 cm. long; bracts lanceolate, 2-4 mm. long; calyx with mixed white and black hairs, the tube 6-8 mm. long, the teeth subulate, 2 mm. long; corolla unknown, except the keel-petals, which are 12 mm. long, the blade broadly lunate, with a large auricle, purple-tipped, shorter than the claw; pod tapering at each end, strongly arched above the middle, strigose-canescens, cross-reticulate, about 4 cm. long, 4 mm. wide, and nearly 1 cm. thick.

TYPE LOCALITY: Charleston Mountains, Nevada.

DISTRIBUTION: Southern Nevada.

18. *Xylophacos castaneaeformis* (S. Wats.) Rydb. Bull. Torrey
Club 52: 155. 1925.

Astragalus castaneaeformis S. Wats. Proc. Am. Acad. 20: 361. 1885.
Astragalus argophyllus castaneaeformis M. E. Jones, Contr. W. Bot. 10: 62. 1902.

A perennial, with a deep root and caespitose caudex; stems very short, less than 5 cm. long, leafy, mostly covered by the stipules; leaves 5-8 cm. long, ascending; stipules deltoid, 3-5 mm.

long; leaflets 7-17, oval or obovate, rounded at the apex, 5-12 mm. long, 3-8 mm. wide, silky-canescens, strigose on both sides; peduncles 2-5 cm. long, shorter than the leaves; racemes 4-7-flowered; bracts lanceolate, 3 mm. long; calyx strigose-canescens, the tube about 8 mm. long, the teeth subulate, 2 mm. long; corolla purplish, about 15 mm. long; banner narrowly obovate, slightly retuse; wings slightly shorter, with oblong blades; keel-petals much shorter, strongly lunate; pod ovoid, comparatively thin-valved, strigose, about 15 mm. long, abruptly acuminate.

TYPE LOCALITY: William Station, Arizona.

DISTRIBUTION: Central Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 47.

19. *Xylophacos tephrodes* (A. Gray) Rydb. Bull. Torrey Club
52: 156. 1925.

Astragalus tephrodes A. Gray, Pl. Wright. 2: 45. 1855.

Tragacantha tephrodes Kuntze, Rev. Gen. 948. 1891.

A perennial, with a woody root and caespitose caudex; stems decumbent or ascending, 2-8 cm. long, white-canescens; leaves 4-7 cm. long, the rachis canescens; stipules deltoid, canescens, 2-3 mm. long, the lower connate; leaflets 13-21, obovate to oblong, 5-10 mm. long, white-silky-villous beneath, glabrate above, rounded at the apex; peduncles 5-8 cm. long; racemes dense, 2-4 cm. long; bracts lance-subulate, 4 mm. long; calyx white-silky-villous, the tube 5 mm. long, the teeth subulate, 2 mm. long; corolla purple, 12-14 mm. long; banner obovate, moderately arched; wings about 1 cm. long, the blade oblong, somewhat falcate; keel-petals shorter, the blade broadly lunate, rounded at the dark apex; pod obliquely ovoid, slightly arched upwards, about 15 mm. long, 5 mm. thick, and 6 mm. wide, strigose-canescens.

TYPE LOCALITY: Organ Mountains, New Mexico.

DISTRIBUTION: Southern New Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 48.

20. *Xylophacos argophyllus* (Nutt.) Rydb. Bull. Torrey Club
40: 49. 1913.

Astragalus argophyllus Nutt.; T. & G. Fl. N. Am. 1: 331. 1838.

Astragalus uintensis M. E. Jones, Proc. Calif. Acad. II. 5: 670. 1895.

Xylophacos uintensis Rydb. Bull. Torrey Club 32: 662. 1906.

Astragalus argophyllus Martini M. E. Jones, Rev. Astrag. 207. 1923.

Astragalus argophyllus cnicensis M. E. Jones, Rev. Astrag. 208. 1923.

A perennial, with a caespitose caudex; stems usually less than 1 dm. high, decumbent at the base, hirsute-strigose; leaves 5-10 cm. long, ascending; lower stipules deltoid and short, the upper narrowly lanceolate, 5-15 mm. long; leaflets 13-21, lanceolate, acute, 8-15 mm. long, 2-4 mm. wide, long-strigose on both sides; peduncles 4-8 cm. long, shorter than the leaves; bracts linear-lanceolate, about 5 mm. long; raceme 3-8-flowered; calyx white-strigose, the tube about 1 cm. long, the teeth subulate, 4-5 mm. long; corolla 2-2.5 mm. long, pink-purple; banner oblong-obovate, deeply notched; wings shorter, the blade oblong, shorter than the claw, with a broad basal auricle; keel-petals much shorter, the blade broadly lunate, obtuse; pod ovoid, hirsute with ascending hairs, 2-2.5 cm. long, 8 mm. wide and thick, short-acuminate, slightly falcate.

TYPE LOCALITY: Valleys of the Rocky Mountains, near the sources of the Platte, Wyoming.

DISTRIBUTION: Montana and Idaho to Nevada, Utah, and Wyoming.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 46; also var. *cnicensis*; pl. 47, var. *Martini*.

3. *Missourienses*. Caespitose perennials, with short stems. Leaves densely strigose-canescens on both sides. Pod leathery or woody, oblong, straight, strigose, with both sutures prominent, abruptly acute.

21. *Xylophacos vespertinus* (Sheldon) Rydb. Bull. Torrey Club

32: 662. 1906.

Astragalus vespertinus Sheldon, Minn. Bot. Stud. 1: 150. 1894.*Astragalus Chamaeluce panguiensis* M. E. Jones, Proc. Calif. Acad. II. 5: 671. 1895.*Astragalus argophyllus panguiensis* M. E. Jones, Contr. W. Bot. 8: 5. 1898.*Astragalus panguiensis* M. E. Jones, Contr. W. Bot. 10: 62. 1902.*Astragalus amphioxys vespertinus* M. E. Jones, Rev. Astrag. 215. 1923.

A perennial, with a caespitose caudex; stems 4-6 cm. long, decumbent or ascending, strigose-canescens; leaves 2-10 cm. long; stipules deltoid, acute, 5-6 mm. long; leaflets 11-15, obovate-elliptic, 4-12 mm. long, white-strigose on both sides with hairs tapering at each end; peduncles 5-10 cm. long; racemes 3-6-flowered; bracts lanceolate, 5 mm. long; calyx strigose with mixed black and white hairs, the tube 8 mm. long, the teeth subulate, 2 mm. long; corolla purple, tinged with magenta or green, 2.5 cm. long or more; banner obovate, deeply notched; wings nearly as long, the blades oblong; keel-petals with the blade broadly lunate; pod straight, oblong, abruptly acute, obcompressed, strigose, finely cross-reticulate, the upper suture prominent, 2.5-3.5 cm. long, 6 mm. wide, and 8 mm. thick.

TYPE LOCALITY: Grand Junction, Colorado.

DISTRIBUTION: Southwestern Colorado, New Mexico and southern Utah.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 47 (as var. *panguiensis*); pl. 51 (as var. *vesp-*
perlinus); Contr. W. Bot. 10: pl. 4.22. *Xylophacos missouriensis* (Nutt.) Rydb.; Small, Fl. SE U. S.

620, 1332. 1903.

Astragalus missouriensis Nutt. Gen. 2: 99. 1818.*Astragalus melanocarpus* Nutt.; [Fraser, Cat. 1, hyponym. 1813.] Richards. in Frankl. Journey 746.
1823.*Tragacantha missouriensis* Kuntze, Rev. Gen. 946. 1891.

A perennial, with a caespitose caudex; stems several, less than 1 dm. long, leafy, decumbent, or descending; leaves 5-10 cm. long, ascending; stipules deltoid, 3-5 mm. long; leaflets 9-15, elliptic or oval, 5-10 mm. long, strigose-canescens on both sides; peduncles erect, stout, 8-10 cm. long, usually exceeding the leaves; racemes short, 5-12-flowered; bracts lanceolate, often 5 mm. long; pedicels very short; calyx strigose, more or less black-hairy, the tube about 7 mm. long, oblique at the base, the teeth about 2 mm. long; corolla 15-20 mm. long, rose-purple; banner obovate, retuse at the apex; wings slightly shorter, the blade lunate, with a broad basal auricle; keel-petals somewhat shorter and broader, with a smaller auricle; pod oblong, straight, abruptly acute at the apex, strigulose, strongly cross-reticulate, about 2 cm. long, 7-8 mm. wide, splitting along the prominent sutures, somewhat compressed in age.

TYPE LOCALITY: "Upper Louisiana" [probably South Dakota].

DISTRIBUTION: Alberta and Saskatchewan to Oklahoma and New Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 50, f. 173; Fl. Neb. 21: pl. 10, f. 58-59; Britt. &
Brown, Ill. Fl. f. 2138; ed. 2, f. 2547.

4. *Pygmaei*. Cespitose subcaulescent perennials. Leaves densely silvery strigose-canescens. Pod oblong or elliptic, leathery, strigose, the pericarp becoming spongy in age.

23. *Xylophacos cymboides* (M. E. Jones) Rydb. Bull. Torrey Club

40: 49. 1913.

Astragalus cymboides M. E. Jones, Proc. Calif. Acad. II. 5: 650. 1895.*Astragalus amphioxys cymbellus* M. E. Jones, Rev. Astrag. 115. 1923.

A perennial, with a caespitose matted caudex; stems very short, covered by leaf-bases and stipules; leaves 3-8 cm. long, ascending; stipules triangular-ovate, 5-8 mm. long, pubescent; leaflets 7-11, oval or obovate, 5-10 mm. long, 4-6 mm. wide, acutish, strigose-canescens; peduncles decumbent, rarely exceeding the leaves; racemes 5-10-flowered; bracts ovate or lanceolate, 3-5 mm. long; calyx strigose-canescens, the tube 7 mm. long, oblique at the base, the teeth subulate, about 1 mm. long; corolla about 1.5 mm. long, usually dirty-white, with purplish tips; banner obovate, deeply notched; blades of the wings oblong, slightly arcuate;

keel-petals sharply arched, shorter than the wings; pod straight, acute at each end, 2-2.5 cm. long, 8 mm. wide, with prominent sutures, strigulose, cross-reticulate and pitted; the exocarp in age separating from the endocarp.

TYPE LOCALITY: Cottrell's Ranch, Henry Mountains, Utah.

DISTRIBUTION: Eastern Utah.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 50, f. 172; pl. 51 (as var. *cymbellus*).

24. *Xylophacos pygmaeus* (Nutt.) Rydb. Bull. Torrey Club
32: 662. 1906.

Phaca pygmaea Nutt.; T. & G. Fl. N. Am. 1: 349. 1838.

Astragalus Chamaluce A. Gray, in J. C. Ives, Rep. Colorado Riv. Bot. 10. 1860.

Tragacantha pygmaea Kuntze, Rev. Gen. 941. 1891.

Astragalus Cicadae M. E. Jones, Zoe 4: 35. 1893.

Astragalus Chamaluce laccoliticus M. E. Jones, Contr. W. Bot. 7: 672. 1895.

Astragalus Chamaluce Cicadae M. E. Jones, Contr. W. Bot. 8: 12. 1898.

Astragalus pygmaeus M. E. Jones, Rev. Astrag. 210. 1923. Not *A. pygmaeus* Pall. 1800.

Astragalus pygmaeus Cicadae M. E. Jones, Rev. Astrag. 211. 1923.

Astragalus pygmaeus laccoliticus M. E. Jones, Rev. Astrag. 211. 1923.

A caespitose perennial, subacaulescent; stems very leafy, 1-2 cm. long; leaves 2-6 cm. long; stipules deltoid, strigose, about 2 mm. long; leaflets 5-11, broadly obovate, rounded to acutish at the apex, 4-10 mm. long, 3-5 mm. wide, silky-strigose canescent with white hairs; peduncles 2-4 cm. long; racemes 3-8-flowered; bracts lanceolate, acute, 2-3 mm. long; calyx strigose, often purple-tinged, the tube 8-10 mm. long, the teeth subulate, about 2 mm. long; corolla light-purple, nearly 2 cm. long; banner obovate, the claw exceeding the calyx-tube; wings somewhat shorter, the blades narrowly oblong, arcuate, shorter than the claw; keel-petals much broader, strongly arcuate above; pod obliquely ovoid, arcuate, mottled, strigose, 3-3.5 cm. long, 1 cm. broad, pulpy at first, the exocarp thin and papery, in age separated from the endocarp by air-spaces.

TYPE LOCALITY: Rocky Mountains on the hills of Ham's Fork of the Colorado of the West, Wyoming.

DISTRIBUTION: Green River and Grand River basins of Wyoming, Colorado, and Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 49, f. 170.

25. *Xylophacos musiniensis* (M. E. Jones) Rydb. Bull. Torrey Club
40: 49. 1913.

Astragalus musiniensis M. E. Jones, Proc. Calif. Acad. II. 5: 671. 1895.

Astragalus musiniensis Neuberryoides M. E. Jones, Rev. Astrag. 212. 1923.

A perennial, with a deep taproot and caespitose caudex, almost acaulescent; leaves ascending, 4-5 cm. long; stipules lanceolate, 7-8 mm. long; petioles about 2 cm. long, strigose-canescens; leaflets 1-5, lanceolate, 1.5-2.5 cm. long, silvery-strigose, acute; peduncles 2-4 cm. long; racemes 1-3-flowered; bracts lanceolate, 1-2 mm. long; calyx purple-tinged, sericeous-strigose, the tube about 1 cm. long, the teeth subulate, 2 mm. long; corolla purple, about 2 cm. long; banner narrowly obovate, slightly arched; wings shorter, the blade lanceolate, with a small auricle; keel-petals nearly as long, the blade broadly lunate, with a broad auricle, rounded at the apex; pod ovoid, 2-2.5 cm. long, 1.5 cm. wide, somewhat arcuate and slightly sulcate, the pericarp spongy and separating into membranous layers.

TYPE LOCALITY: Ferren, Utah.

DISTRIBUTION: Central Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 49, f. 171.

5. *Eriocarpus*. Caespitose subacaulescent perennials. Leaves densely silvery strigose-canescens. Pod short, more or less incurved-falcate, densely long-villous. Corolla ochroleucous or purplish, the petals (except the banner) lunate.

26. *Xylophacos Newberryi* (A. Gray) Rydb. Bull. Torrey Club
32: 662. 1906.

Astragalus Chamaeluce A. Gray, in J. C. Ives, Rep. Colorado Riv. Bot. 10, in part. 1860.

Astragalus Newberryi A. Gray, Proc. Am. Acad. 12: 55. 1876.

Astragalus candelarius exiguus Sheldon, Minn. Bot. Stud. 1: 143, in part. 1894.

Astragalus Newberryi castoreus M. E. Jones, Proc. Calif. Acad. II. 5: 658. 1895.

A subcaulescent perennial, with a caespitose caudex; stems very short, covered with the deltoid stipules, which are 4-6 mm. long, densely strigose; leaves crowded, ascending, 3-6 cm. long; leaflets 5-7, obovate, thick, densely white-strigose, 5-14 mm. long, 3-10 mm. wide; peduncles 2 cm. long or less, in fruit often recurved; racemes very short, 2-5-flowered; bracts lanceolate, 3-5 mm. long; calyx silky-strigose with white hairs, only those of the teeth sometimes blackish, the tube about 1 cm. long, the teeth subulate, 2-3 mm. long; corolla about 2 cm. long, dark-purple; banner obovate, only slightly arched upwards; wings a little shorter, the blade linear, with a prominent auricle, shorter than the claws; keel-petals still shorter, the blade lunate, rather slightly arcuate, rounded at the apex; pod obliquely ovoid, densely silky-villous, about 2 cm. long and fully 1 cm. wide and 1.5 cm. thick, the tip upturned.

TYPE LOCALITY: Frontiers of Utah and Arizona.

DISTRIBUTION: Central Nevada, Arizona, Utah, and western New Mexico; apparently also Inyo County, California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 51, f. 175; pl. 52 (var. *castoreus*); Contr. W. Bot. 10: pl. 6.

27. *Xylophacos medius* Rydb. Bull. Torrey Club 52: 232. 1925.

Astragalus eriocarpus M. E. Jones, Zoe 3: 293. 1893. Not *A. eriocarpus* S. Wats. 1871.

Astragalus consectus Sheldon, Minn. Bot. Stud. 1: 143, in part. 1894.

Astragalus Newberryi × *eurekaensis* M. E. Jones, Rev. Astrag. 217. 1923.

A subcaulescent perennial, with a caespitose leafy caudex; leaves 4-7 cm. long, ascending; stipules lanceolate, 3-5 mm. long; leaflets 5-9, oblanceolate or rhombic-oblanceolate, acute, 1-2.5 cm. long, 5-8 mm. wide, silky-canescens on both sides; peduncles 5-8 cm. long; racemes 3-6-flowered; bracts lanceolate, 5-6 mm. long; calyx strigose, somewhat nigrescent, the tube about 1 cm. long, the teeth 2-3 mm. long; corolla 2-2.5 cm. long, purple-tinged, the keel with a dark purple tip, otherwise as that of *X. Newberryi*; pod villous, the hairs becoming tawny in age, obliquely lance-ovoid in outline, rounded at the base, arcuate, 2 cm. long, 1 cm. thick and 5-7 mm. wide.

TYPE LOCALITY: Lake Point, Utah.

DISTRIBUTION: Utah.

28. *Xylophacos marianus* Rydb. Bull. Torrey Club 52: 233. 1925.

A subcaulescent perennial, with a caespitose caudex; stems 1-3 dm. long; leaves 3-7 cm. long, with a slender rachis; stipules ovate or deltoid, 2-4 mm. long; leaflets 11-19, oval, obovate, or broadly elliptic, mostly obtuse, 3-8 mm. long, grayish-strigose; peduncles 2-4 cm. long; racemes 2-6-flowered; bracts lanceolate, 3 mm. long; calyx villous, the tube 8-10 mm. long, the teeth subulate, 3 mm. long; corolla about 2 cm., rarely 2.5 cm. long, apparently only purple-tinged; banner obovate, slightly arcuate; wings shorter, the blades oblong, with a broad auricle; keel-petals still shorter, the blade broadly linear, rounded at the apex; pod lance-ovoid, 15-18 mm. long, 8 mm. wide and thick, moderately arcuate throughout, villous but not densely so.

TYPE LOCALITY: Marysvale, Utah.

DISTRIBUTION: Central Utah.

29. *Xylophacos eurekaensis* (M. E. Jones) Rydb. Fl. Rocky Mts.
504, 1063. 1917.

Astragalus glareosus M. E. Jones, Zoe 3: 291. 1893. Not *A. glareosus* Dougl. 1831.

Astragalus eurekaensis M. E. Jones, Contr. W. Bot. 8: 12. 1898.

A caespitose perennial, with a deep root; stems very short, covered with the remains of leaf-bases; leaves ascending, 5-15 cm. long; stipules lanceolate, 4-5 mm. long; leaflets 7-15,

lanceolate-elliptic, 8-15 mm. long, 3-5 mm. wide, acute at each end, strigose-canescens; peduncles 5-12 cm. long, slender; racemes 2-7-flowered; bracts lanceolate, 3-6 mm. long; calyx silky-villous with black and white hairs, the tube 7-9 mm. long, the teeth subulate, 3-4 mm. long; corolla cream-white with purple-tipped keel, 2-2.5 mm. long; banner obovate, notched, slightly arcuate; wings shorter, the blades linear-oblong, nearly straight; keel-petals shorter and twice as broad, strongly arcuate and rounded at the tip; pod lanceolate in outline, 2-3 cm. long, 8 mm. thick, and 5 mm. wide, strongly arcuate at the middle, sulcate below, rather sparingly loosely silky-villous.

TYPE LOCALITY: Not given [presumably Eureka, Utah].
 DISTRIBUTION: Central Utah.
 ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 52, f. 176.

30. *Xylophacos Watsonianus* (Kuntze) Rydb. Bull. Torrey Club 40: 49. 1913.

Astragalus eriocarpus S. Wats. Bot. King's Expl. 71. 1871. Not *A. eriocarpus* DC. 1802.
Tragacantha Watsoniana Kuntze, Rev. Gen. 942. 1891.
Astragalus suturalis Sheldon, Minn. Bot. Stud. 1: 23. 18
Astragalus Watsonianus Sheldon, Minn. Bot. Stud. 1: 144. 1894.
Astragalus Newberryi eriocarpus M. E. Jones, Proc. Calif. Acad. II. 5: 676. 1895.
Astragalus Newberryi Watsonianus M. E. Jones, Contr. W. Bot. 10: 68. 1902.

A subcaulescent perennial, with a deep root and short caudex; stems less than 5 cm. long, very leafy; leaves 10-15 cm. long, ascending; stipules lanceolate, 5-10 mm. long; leaflets broadly cuneate-obovate, 1-1.5 cm. long, 4-10 mm. wide, rounded, truncate, or retuse at the apex, densely appressed-silvery-silky on both sides; peduncles 10-12 cm. long; bracts lance-subulate, 6-10 mm. long; calyx black-villous, the tube 12-14 mm. long, somewhat gibbous at the base, the teeth subulate, about 5 mm. long; corolla purplish, fully 3 cm. long; banner obovate, retuse; wings shorter, the blade oblong, with a broad auricle; keel-petals about 25 mm. long, the blade broadly lunate, rounded at the apex; pod 2.5-3 cm. long, about 1 cm. broad and deep, strongly arched above the middle, densely white-villous.

TYPE LOCALITY: Foothills of Trinity Mountains, Nevada.
 DISTRIBUTION: Central Nevada.
 ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 52; Contr. W. Bot. 10: pl. 6.

6. *Glareosi*. Cespitose perennials, usually with short stems. Leaves usually densely white-villous. Corolla purplish or ochroleucous, the petals more or less arched. Pod short, incurved, densely white-villous.

31. *Xylophacos inflexus* (Dougl.) Rydb. Bull. Torrey Club 40: 49. 1913.

Astragalus inflexus Dougl.; Hook. Fl. Bor. Am. 1: 151. 1831.
Tragacantha inflexa Kuntze, Rev. Gen. 945. 1891.
Phaca inflexa Piper, Contr. U. S. Nat. Herb. 11: 369. 1906.

A cespitose perennial; stems 1-5 dm., usually 2-3 dm. long, white-villous; leaves 7-12 cm. long, ascending; lower stipules deltoid-lanceolate, attenuate, the upper subulate, 5-8 mm. long; leaflets 15-27, lance-elliptic, acute at each end, 8-15 mm. long, 4-6 mm. wide, white-villous; peduncles 5-10 cm. long, villous; racemes 6-12-flowered, 3-5 cm. long; bracts linear-subulate, attenuate, 8-15 mm. long; calyx white-villous, the tube about 1 cm. long, 4-5 mm. wide, the teeth subulate, 5-7 mm. long; corolla rose-purple, 20-22 mm. long; banner obovate, retuse, slightly arcuate; wings 3-4 mm. shorter, the blade oblong, with a large basal auricle; keel-petals still shorter, the blade broadly lunate, almost semicircular, obtuse, much shorter than the claw; pod 2-3 cm. long, 7-8 mm. thick, and 5-7 mm. wide, strongly arcuate throughout, densely villous, the upper suture sulcate except towards the tip.

TYPE LOCALITY: "Barren sandy grounds of the Columbia from the junction of the Lewis and Clark's River to the mountains" [probably Washington].
 DISTRIBUTION: Washington, Oregon, Idaho, and western Montana.
 ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 54, f. 180; Contr. W. Bot. 10: pl. 4.

32. *Xylophacos incurvus* Rydb. Bull. Torrey Club 52: 366. 1925.

A subcaulescent perennial, with a caespitose caudex; stems 1-5 cm. long, densely leafy; leaves 5-9 cm. long; stipules lanceolate, 4-5 mm. long, villous-canescens; leaflets 11-17, oblanceolate or elliptic, acute at each end, 10-15 mm. long, 2-4 mm. wide, villous-canescens; peduncles 3-5 cm. long; racemes 3-7-flowered, dense; bracts subulate, 5-10 mm. long, attenuate; calyx white-villous, the tube about 1 cm. long, 3.5 mm. broad, the teeth subulate, 5-7 mm. long; corolla nearly 2 cm. long, white or tinged with rose-purple, the keel purple-tipped; banner obovate, retuse; wings about 2 mm. shorter, the blade oblong, acutish, shorter than the claw; keel-petals still shorter and broader, the blade strongly arcuate and rounded at the apex; pod densely white-villous, 2 cm. long, 1 cm. thick, and 7 mm. wide, usually sulcate on both sutures except at the apex, strongly incurved almost to a semicircle; seeds obliquely reniform, brown, 2.5 mm. long, 2 mm. broad.

TYPE LOCALITY: California.

DISTRIBUTION: Northeastern California and western Nevada.

33. *Xylophacos funereus* (M. E. Jones) Rydb. Bull. Torrey Club 52: 367. 1925.

Astragalus funereus M. E. Jones, Contr. W. Bot. 12: 11. 1908.

A perennial, with a caespitose caudex; stems many, 3-10 cm. long, white-villous, densely leafy; leaves spreading, 4-8 cm. long; stipules ovate, about 5 mm. long; leaflets 13-17, obovate, 5-10 mm. long, 4-6 mm. wide, rounded at the apex, densely white-villous on both sides; peduncles 3-7 cm. long, arched, white-woolly; racemes short, 5-10-flowered; bracts ovate to lanceolate, 3-5 mm. long; calyx black-villous, the tube 7-8 mm. long, 4 mm. broad, the teeth subulate, 4-5 mm. long; corolla bluish, 2.5-3 cm. long, the tip of the keel dark-blue; banner oval-obovate, slightly arcuate; wings shorter, nearly straight, the blades lance-oblong, with a large basal auricle; keel-petals as long as the wings, the blade oblanceolate, slightly falcate, rounded at the apex; pod inflated, arcuate, densely white-villous, 3 cm. long or more and 1 cm. wide (according to Jones "5 cm. long, 1.5 cm. wide"), obcompressed.

TYPE LOCALITY: Rhyolite, Nevada.

DISTRIBUTION: Southern Nevada and southeastern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 53, f. 178.

34. *Xylophacos Blyae* Rose, sp. nov.

A perennial, with a caespitose caudex; stems many, very short, densely covered with leaves; leaves spreading, 5-8 cm. long; stipules ovate, 5 mm. long; leaflets 9-13, obovate, 8-10 mm. long, densely white-villous with spreading hairs; peduncles 5-9 cm. long, densely villous; racemes 5-10-flowered, head-like; bracts lance-subulate, 5-10 mm. long; calyx villous with blackish hairs, the tube 6 mm. long, the teeth subulate, 2 mm. long; corolla 12-15 mm. long; banner obovate, purple-tinged and striate towards the tip; wings shorter, the blade obliquely oblong, with a large basal auricle; keel-petals still shorter, the blade broadly lunate, rounded at the apex, dark-purple, the claw white; pod broadly ovoid, strongly incurved, 2 cm. long, 6 mm. wide, and 10 mm. thick, densely white-woolly; seeds almost black, obliquely reniform, 2 mm. long, 2 mm. broad.

Type collected at an altitude of 3500 feet on ridges one and one half mile northwest of Kingman, Arizona, in 1927, Mrs. Charles Bly, also in fruit, in 1925 (U. S. Nat. Herb.).

35. *Xylophacos nudisiliquus* (A. Nelson) Rydb. Bull. Torrey Club 52: 368. 1925.

Astragalus nudisiliquus A. Nelson, Bot. Gaz. 54: 410. 1912.

A caespitose perennial, with a much branched caudex; stems very short, less than 1.5 dm. long; leaves 3-6 dm. long, spreading; stipules lanceolate, 3-5 mm. long; leaflets 9-19, obovate, more or less densely white-villous, 5-10 mm. long, rounded at the apex; peduncles 2-4 cm. long;

racemes 5-8-flowered; bracts subulate, 3-5 mm. long; calyx white-villous, the tube 9-10 mm. long, about 3 mm. broad, the teeth subulate, 2 mm. long; corolla ochroleucous or slightly tinged with purple; banner obovate, retuse; wings slightly shorter, the blade linear; keel-petals slightly shorter than the wings, the blade short and broad, strongly arched and rounded at the apex; pod 2-2.5 cm. long, 1 cm. thick, and 5 mm. wide, slightly sulcate on the upper suture, rather sparingly villous, strongly incurved above the middle; seeds obliquely reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: King Hill, Elmore County, Idaho.

DISTRIBUTION: Type locality and Malheur County, Oregon.

36. *Xylophacos utahensis* (Torr.) Rydb. Bull. Torrey Club
40: 49. 1913.

Phaca mollissima utahensis Torr. in Stansb. Expl. Utah 385. 1852.

Astragalus utahensis T. & G. Pacif. R. R. Rep. 2: 120. 1854.

Tragacantha utahensis Kuntze, Rev. Gen. 949. 1891.

A densely caespitose perennial, with a deep root and woody caudex; stems of the season very short, 1-4 cm. long, decumbent; leaves spreading, 4-10 cm. long; stipules deltoid or ovate, 5-7 mm. long, scarious, villous; leaflets 11-19, white-floccose, broadly obovate or rounded-oval, 5-15 mm. long, 4-10 mm. wide, usually rounded at the apex, or the terminal one slightly retuse; peduncles 5-15 cm. long, villous; bracts deltoid, hyaline, 5-7 mm. long; calyx loosely villous, often purple-tinged, the tube about 1 cm. long, 4 mm. wide, the teeth about 4 mm. long, subulate; corolla about 2.5 cm. long, purple, in age bluish; banner broadly obovate, deeply notched; wings much shorter, the blade lance-oblong, with a very large auricle; keel-petals still shorter, broad, with a rounded apex; pod very densely woolly, only slightly arcuate, 2 cm. long, 1 cm. thick, and 7-8 mm. wide.

TYPE LOCALITY: Shores and island of Great Salt Lake, Utah.

DISTRIBUTION: Western Montana and western Wyoming to Utah, Nevada, and central Idaho.

ILLUSTRATIONS: Stansb. Expl. Utah *pl.* 2; M. E. Jones, Rev. Astrag. *pl.* 53; *pl.* 54, *f.* 179.

37. *Xylophacos subvillosus* Rydb. Bull. Torrey Club 52: 368. 1925.

? *Astragalus inflexus ordensis* Jepson, Man. Fl. Pl. Calif. 573. 1925.

A caespitose perennial, with a much branched caudex; stems 5 cm. long or less, leafy; leaves 5-6 cm. long; stipules narrowly lanceolate, 5 mm. long; leaflets 9-15, obovate or oval, 5-12 mm. long, 3-5 mm. wide, rather sparingly white-villous, rounded at the apex; peduncles 2-6 cm. long; racemes 2-6-flowered; bracts linear-attenuate, 4-5 mm. long; calyx loosely villous, the tube 8-9 mm. long, 3 mm. wide, the teeth subulate, 2-3 mm. long; corolla apparently ochroleucous, about 18 mm. long; banner rather broadly obovate, retuse; wings shorter, the blade acutish, oblong; pod densely villous, scarcely 2 mm. long, nearly 1 cm. thick, evenly arcuate throughout.

TYPE LOCALITY: Sierra Valley, California.

DISTRIBUTION: Sierra Nevada, California.

38. *Xylophacos Purshii* (Dougl.) Rydb. Bull. Torrey Club
32: 662. 1906.

Astragalus Purshii Dougl.; Hook. Fl. Bor. Am. 1: 152. 1831.

Phaca mollissima Nutt.; T. & G. Fl. N. Am. 1: 350. 1838.

Tragacantha Purshii Kuntze, Rev. Gen. 947. 1891.

Astragalus lanocarpus Sheldon, Minn. Bot. Stud. 1: 144. 1894.

Astragalus leucocystis Greene, Erythra 3: 76. 1895.

Phaca Purshii Piper, Contr. U. S. Nat. Herb. 11: 369. 1906.

Astragalus Purshii interior M. E. Jones, Rev. Astrag. 222. 1923.

A subcaulescent perennial, with a caespitose woody caudex; stems less than 1 dm. long, decumbent; leaves 5-8 cm. long, the petiole nearly as long as the rachis; stipules lanceolate, 5-7 mm. long; leaflets 7-11, ascending, lance-elliptic or rarely oval, usually acute at each end, 5-15 mm. long, silky-villous; peduncles 2-5 cm. long; racemes 5-10-flowered; bracts lanceolate,

5-6 mm. long; calyx white-villous, the tube 1 cm. long, 3 mm. broad, the teeth subulate, 5 mm. long; corolla about 2 cm. long, dull-white or ochroleucous, the keel tipped with purple; banner broadly elliptic, retuse; wings shorter, the blades oblong, slightly falcate; keel-petals still shorter, the blades broader, rounded at the apex; pod ovate, about 2 cm. long, nearly 1 cm. thick, and 4-5 mm. wide, densely white-villous, slightly curved and scarcely sulcate.

TYPE LOCALITY: Spokane River, Washington.

DISTRIBUTION: British Columbia to Saskatchewan, Nebraska, northern Colorado, northern Nevada, and Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 55, f. 181, and var. *interior*; Contr. W. Bot. 10: pl. 5.

39. *Xylophacos glareosus* (Dougl.) Rydb. Fl. Rocky Mts.
506, 1063. 1917.

Astragalus glareosus Dougl.; Hook. Fl. Bor. Am. 1: 152. 1831.

Tragacantha glareosa Kuntze, Rev. Gen. 945. 1891.

Astragalus allanaris Sheldon, Minn. Bot. Stud. 1: 141. 1894.

Astragalus inflexus glareosus M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Phaca glareosa Piper, Contr. U. S. Nat. Herb. 11: 369. 1906.

Astragalus booneanus A. Nelson, Bot. Gaz. 53: 223. 1912.

A caespitose perennial, with a much branched caudex; stems 2-5 cm. long, decumbent; leaves 4-7 cm. long, ascending; stipules lance-subulate, 4-5 mm. long, villous; leaflets 13-19, oblanceolate or narrowly lance-elliptic, acute at each end, 5-15 mm. long, villous-canescens; peduncles 2-5 cm. long; racemes 5-10-flowered; bracts lanceolate, about 5 mm. long; calyx strigose, more or less black-hairy, the tube about 1 cm. long, 3-3.5 mm. wide, the teeth subulate, 2-3 mm. long; corolla purple, about 2 cm. long; banner obovate, retuse, moderately arched; wings 2 mm. shorter, acutish, the blades oblong, with a rounded auricle; keel-petals still shorter, the blade broadly lunate, rounded at the apex; pod densely villous, strongly arcuate above the middle, rather long-acuminate, about 2.5 cm. long, 1 cm. thick, and 7 mm. wide.

TYPE LOCALITY: "Confluence of the Lewis and Clark's River with the Columbia" [Washington].

DISTRIBUTION: British Columbia to southwestern Montana, western Wyoming and Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 54; Contr. W. Bot. pl. 5.

40. *Xylophacos candelarius* (Sheldon) Rydb. Bull. Torrey Club
52: 370. 1925.

Astragalus Purshii tinctus M. E. Jones, Zoe 4: 269. 1893.

Astragalus candelarius Sheldon, Minn. Bot. Stud. 1: 142. 1894.

Astragalus candelarius exiguus Sheldon, Minn. Bot. Stud. 1: 143. 1894.

Astragalus consectus Sheldon, Minn. Bot. Stud. 1: 143, in part. 1894.

Phaca Purshii tincta Piper, Contr. U. S. Nat. Herb. 11: 369. 1906.

Xylophacos consectus Rydb. Bull. Torrey Club 40: 49, in part. 1913.

Astragalus Newberryi Watsonianus M. E. Jones, Rev. Astrag. 216, mainly. 1923.

A subcaulescent densely caespitose perennial, with a deep root and short woody caudex; stems 1-3 cm. long; leaves ascending, 3-5 cm. long; stipules lanceolate, 3-5 mm. long; leaflets 9-13, elliptic or obovate, obtuse, 5-10 mm. long, densely villous-canescens; peduncles 1-3 cm. long; racemes 3-8-flowered; bracts subulate, 4-5 mm. long; calyx short-villous, the tube about 1 cm. long, 3 mm. broad, the teeth subulate, 2-3 mm. long; corolla fully 2 cm. long, purple; banner slightly arcuate, obovate, retuse; wings decidedly shorter, the blade elliptic, acutish; keel-petals broadly lunate, rounded at the apex; pod 15-18 mm. long, nearly 1 cm. thick, 5 mm. wide, slightly arcuate and scarcely sulcate.

TYPE LOCALITY: Candelaria, Esmeralda County, Nevada.

DISTRIBUTION: Western Nevada, northern California, and southern Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 52 (as *A. Newberryi Watsonianus*); pl. 56 (as *A. Purshii tinctus*); Contr. W. Bot. 10: pl. 6.

41. *Xylophacos ventosus* (Suksd.) Rydb. Bull. Torrey Club
52: 370. 1925.

Astragalus ventosus Suksd.; Rydb. Bull. Torrey Club 52: 370, as a synonym. 1925.

A perennial, with a tufted caespitose caudex; stems many, less than 5 cm. long, white-villous, densely leafy; leaves spreading, 2-5 cm. long; stipules lanceolate, acuminate, 5-6 mm.

long; leaflets elliptic, obtuse, 5-7 mm. long, 2-3 mm. wide, white-villous on both sides; peduncles 1-2 cm. long; racemes 3-6-flowered, subcapitate; bracts lance-subulate, 5 mm. long; calyx black-villous, often purple-tinged, the tube 10-11 mm. long, 2-3 mm. broad, the teeth subulate, 2 mm. long; corolla purplish, about 2 cm. long; banner obovate; wings slightly shorter, the blades oblong, with a large basal auricle; keel-petals slightly shorter, the blade strongly lunate, rounded at the apex; pod ovate, lunate, fully 1.6 cm. long, 8 mm. wide and thick, densely woolly.

TYPE LOCALITY: Windy rocky place several kilos east of Bingen, Washington.
DISTRIBUTION: Washington.

42. *Xylophacos leucolobus* (S. Wats.) Rydb. Bull. Torrey Club
52: 371. 1925.

Astragalus leucolobus S. Wats.; M. E. Jones, Zoe 4: 270. 1893.
Astragalus Purshii leucolobus M. E. Jones, Contr. W. Bot. 10: 61. 1902.
Phaca leucoloba A. Heller, Muhlenbergia 2: 85. 1905.
Astragalus inflexus leucolobus Jepson, Man. Fl. Pl. Calif. 573. 1925.

A caespitose perennial, with a woody caudex; stems ascending, less than 1 dm. high; leaves 5-8 cm. long; stipules lanceolate, 4-5 mm. long, canescent; leaflets 11-17, elliptic, obtuse or acutish, 5-10 mm. long, densely canescent; peduncles 4-12 cm. long; racemes 5-12-flowered, often more or less elongate; bracts lanceolate, 4-6 mm. long; calyx short-villous, the tube about 8 mm. long, often purple-tinged, the teeth subulate, 2-3 mm. long; corolla 15-18 mm. long, purple; banner obovate, retuse at the apex, slightly arcuate; wings nearly as long, the blade oblong, falcate, with a large basal auricle; keel-petals shorter, the blade lunate, strongly arched and rounded at the apex; pod densely villous, arched throughout, 2 cm. long, nearly 1 cm. thick, and 7 mm. wide, acuminate.

TYPE LOCALITY: Bear Valley, San Bernardino Mountains, California.
DISTRIBUTION: Southern California from Kern and Inyo counties south.
ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 55; Contr. W. Bot. 10: pl. 5.

43. *Xylophacos consectus* (Sheldon) Rydberg.

Astragalus consectus Sheldon, Minn. Bot. Stud. 1: 143. 1894.
Astragalus inflexus flocculosus Jepson, Man. Fl. Pl. Calif. 573. 1925.

A caespitose perennial, with a much branched caudex; stems 3-6 cm. long; stipules lanceolate, 5-7 mm. long, densely white-villous; leaflets 11-25, oblong to oval, 5-8 mm. long, rather loosely but densely villous; peduncles 3-6 cm. long; racemes short, 5-8-flowered; bracts lanceolate, 4-5 mm. long; calyx loosely villous, the tube about 8 mm. long, the teeth subulate, 3 mm. long; corolla purple, 15-18 mm. long; banner broadly obovate, retuse; wings slightly shorter, the blade oblanceolate; keel-petals shorter, the blade lunate, rounded at the apex; pod densely villous, 2 cm. long, more than 1 cm. thick, arcuate throughout, gradually acute.

TYPE LOCALITY: Tejon Pass, California.
DISTRIBUTION: Southern California.

44. *Xylophacos argentinus* Rydb. Bull. Torrey Club 52: 371. 1925.

A subcaulescent caespitose perennial; stems very short and leafy; leaves 4-7 cm. long; stipules lanceolate, 5 mm. long; leaflets 7-13, broadly obovate, about 1 cm. long, rounded or truncate at the apex, silvery-villous; peduncles 3-5 cm. long; bracts lance-subulate, 3-4 mm. long; racemes 2-5-flowered; calyx white-villous, the tube 5-6 mm. long, the teeth subulate, 2-3 mm. long; corolla ochroleucous, 13-14 mm. long; banner obovate; wings slightly shorter, the blades linear, acutish; keel-petals broader, arcuate and rounded at the apex; pod densely white-villous, about 2 cm. long, 8 mm. wide, arcuate above the middle, the sutures slightly sulcate.

TYPE LOCALITY: Lone Pine, California.
DISTRIBUTION: Inyo County, California.

45. *Xylophacos lectulus* (S. Wats.) Rydb. Bull. Torrey Club

52: 371. 1925.

Astragalus lectulus S. Wats. Proc. Am. Acad. 22: 471. 1887.*Astragalus Purshii lectulus* M. E. Jones, Contr. W. Bot. 10: 61. 1902.

A densely caespitose perennial, with a much-branched caudex; stems decumbent, rarely more than 1 cm. long; leaves 3-5 cm. long, the petioles usually as long as or longer than the rachis; stipules lanceolate, about 5 mm. long; leaflets 5-9, elliptic or oblanceolate, 5-10 mm. long, obtuse or acutish, silvery-villous; peduncles less than 1 cm. long; racemes 6-12-flowered; bracts lanceolate, 2-3 mm. long; calyx densely white-villous, the tube about 5-6 mm. long, 2 mm. thick, the teeth subulate, about 2 mm. long; corolla dark-purple, about 14 mm. long; banner obovate, retuse; wings 2 mm. shorter, the blade rather broad, elliptic, with a large basal auricle; wing-petals much shorter, strongly arched and rounded at the apex; pod densely white-villous, about 12 mm. long, nearly straight, both sutures sulcate.

TYPE LOCALITY: Bear Valley, San Bernardino Mountains.

DISTRIBUTION: San Bernardino Mountains, and near Sonora Pass, California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 56; Contr. W. Bot. 10: pl. 6.

46. *Xylophacos lagopinus* Rydb. Bull. Torrey Club 52: 372. 1925.

A caespitose perennial with a branched caudex; stems 2-10 cm. long, canescent; leaves ascending, 3-5 cm. long; stipules lanceolate, about 5 mm. long; leaflets 5-9, mostly 7, obovate, 5-10 mm. long, rounded at the apex, silvery-villous; peduncles 1-4 cm. long; racemes 2-6-flowered; bracts lance-subulate, 3-4 mm. long; calyx villous, the tube 4-5 mm. long, 2-2.5 mm. wide, the teeth 1-1.5 mm. long; corolla purplish, about 12 mm. long; banner obovate; wings shorter, the blades lance-linear, acutish; keel-petals much shorter, strongly arcuate and rounded at the apex; pod densely villous, 1.5 cm. long, 1 cm. wide, slightly inflexed.

TYPE LOCALITY: Plains between Preneville and Bear Buttes, Crook County, Oregon.

DISTRIBUTION: Oregon.

7. *Coccinei*. Caespitose perennials, with very short stems. Leaves densely white-villous. Corolla large, crimson, the petals nearly straight. Pod short, incurved, densely white-villous.

47. *Xylophacos coccineus* (Parry) A. Heller, Muhlenbergia

2: 217. 1906.

Astragalus grandiflorus S. Wats. Proc. Am. Acad. 11: 370. 1882. Not *A. grandiflorus* L. 1753.*Astragalus Purshii coccineus* Parry, West Am. Sci. 7: 10. 1890.*Astragalus coccineus* Brand. Zoe 2: 72. 1891.

A caespitose perennial, with a deep root and woody caudex; stems short and thick, less than 1 dm. long, densely covered with leaf-bases and stipules; leaves ascending, 5-10 cm. long, the rachis shaggy-villous with white hairs; stipules lanceolate, 5-10 mm. long; leaflets 7-15, obovate or oval, 5-15 mm. long, usually rounded or obtuse at the apex, densely white-silky-villous; peduncles 3-7 cm. long, shaggy-villous; bracts deltoid to lance-linear, 3-5 mm. long; calyx villous, tinged with red, the tube 12-15 mm. long, 3.5-5 mm. broad, the teeth subulate, about 5 mm. long; corolla crimson, 3.5-4 cm. long; banner oblanceolate, slightly arcuate; wings slightly shorter, the blade linear, with a rounded auricle; keel-petals slightly longer than the wings, about equaling the banner, the blade oblong, scarcely at all falcate, merely rounded on the upper edge at the base, without a distinct auricle; pod 3-3.5 cm. long, densely woolly, 1 cm. broad, only slightly arcuate, slightly sulcate on both sutures towards the base.

TYPE LOCALITY: Inyo Range, California.

DISTRIBUTION: Mountains from San Diego to Inyo counties, California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 52; pl. 53, f. 177; Jep. Man. Fl. Pl. Calif. f. 563.

39. **PTEROPHACOS** Rydb. Fl. Rocky Mts. 507, 1063. 1917.

Perennial, glabrous or strigose herbs, with a woody caespitose caudex. Leaves odd-pinnate, with linear-filiform leaflets, scarcely broader than the rachis; stipules nearly free and distinct. Flowers perfect, borne in short racemes. Calyx-tube oblong-campanulate; teeth short, subulate. Corolla white or purplish. Banner narrow, oblanceolate, only slightly arched. Wings shorter, narrow, the blade narrowly oblong-ob lanceolate or linear-oblong, with a reflexed basal auricle, about equaling the slender claw. Keel-petals still shorter, the blade lunate, with a rather prominent, reflexed auricle. Stamens diadelphous (9 and 1), the sheath nearly straight to near the truncate apex, the free portion of the filaments arched upwards. Ovary sessile, the style glabrous, slightly arched throughout; stigma minute. Pod woody, one-celled, sessile, cross-reticulate, 2-valved, the valves winged on the back, the sutures prominent or even winged. Seeds many, very obliquely lunate.

Type species, *Astragalus tetrapterus* A. Gray.

Pod flat and oval, ovate, or lanceolate in outline; sutures not winged.

Pod 4-angled, oblong, falcate; sutures wing-margined.

Plant, including the pod, glabrous or nearly so; leaflets obtuse, linear-filiform. 1. *P. pterocarpus*.

Plant canescent; pod strigose; leaflets lanceolate, acute. 2. *P. tetrapterus*.

3. *P. cinerascens*.

1. **Pterophacos pterocarpus** (S. Wats.) Rydberg.

Astragalus pterocarpus S. Wats. Bot. King's Expl. 71. 1871.

Tragacantha pterocarpa Kuntze, Rev. Gen. 947. 1891.

A perennial, forming clumps; stems several, decumbent at the base, branched, 3-5 dm. high, striate, sparingly strigose; leaves ascending, strigose, 5-10 cm. long, the rachis margined; stipules deltoid, 4-5 mm. long; leaflets 5-9, linear-filiform, similar to the rachis and indistinctly jointed to it, 2-5 cm. long, about 1 mm. wide, strigose, canescent when young; peduncles 8-15 cm. long; racemes 3-5 cm. long; bracts lanceolate, 1-2 mm. long; pedicels 2 mm. long; calyx pilose, usually with mixed white and black hairs, the tube 7-8 mm. long, 2.5-3 mm. broad, the teeth subulate, 2 mm. long; corolla purple, 15-17 mm. long; banner obovate, moderately arched; wings 12-13 mm. long, the blade obliquely oblanceolate, falcate, with a large reflexed auricle; keel-petals slightly shorter, the blade oblong, falcate, with a large reflexed auricle; pod obcompressed, oval-ovate or lanceolate in outline, 3.5-4 cm. long, 15-18 mm. thick, and 3 mm. wide, the sutures rather prominent but not winged, except at the apex, the pod depressed around the sutures, the cross-section resembling a pair of spectacles.

TYPE LOCALITY: Junction of Reese River with the Humboldt, Nevada.

DISTRIBUTION: Nevada.

ILLUSTRATIONS: S. Wats. Bot. King's Expl. pl. 12; M. E. Jones, Rev. Astrag. pl. 31, 73.

2. **Pterophacos tetrapterus** (A. Gray) Rydb. Fl. Rocky Mts. 507, 1063. 1917.

Astragalus tetrapterus A. Gray, Proc. Am. Acad. 13: 369. 1878.

Astragalus tetrapterus capricornus M. E. Jones, Rev. Astrag. 149. 1923.

A perennial; stems several, decumbent at the base, 1-4 dm. high, glabrous or nearly so, striate, branched; leaves ascending, 5-7 cm. long, the rachis wing-margined; stipules deltoid, 3-4 mm. long; leaflets 11-17, linear, 1-3 cm. long, 1-2 mm. wide, glabrous or slightly strigose; peduncles 3-6 cm. long; racemes 2-3 dm. long, rather dense; bracts lanceolate, 1-2 mm. long; calyx strigulose with black hairs, the tube 6 mm. long, 2.5-3 mm. broad, the teeth unequal, the lower three subulate, the upper two broader, with a deltoid base, 2 mm. long; corolla white or, according to Jones, purple, 18-20 mm. long; banner narrowly obovate, slightly arched; wing-petals much shorter, the blade linear-oblong; keel-petals still shorter, the blade broadly lunate; pod glabrous, 3-4 cm. long, 7-8 mm. thick and wide, falcate, 4-winged, *i. e.*, both the sutures and the middle of the valves winged.

TYPE LOCALITY: Southern Utah.

DISTRIBUTION: Southern Utah and Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 31.

3. *Pterophacos cinerascens* Rydberg, sp. nov.

A perennial; stems 1-2 dm. high, much branched, flexuose, strigose-canescens; leaves spreading, 3-5 cm. long, the rachis not margined, strigose; stipules deltoid, 2 mm. long; leaflets 7-11, lanceolate, 5-8 mm. long, stiff, acute, strigose-canescens; peduncles 2-4 cm. long; racemes 1-2 cm. long, few-flowered; bracts lanceolate, 1 mm. long; pedicels 2 mm. long; calyx black-hairy, the tube 4 mm. long, the teeth deltoid, 1 mm. long; corolla purplish, about 14 mm. long; banner obovate, moderately arched; wings 12 mm. long, the blade oblong, falcate; keel-petals slightly shorter, the blade broadly lunate, almost semi-orbicular, rounded at the apex; pod strigulose, strongly falcate, 4-winged, 1.5-2 cm. long, 5 mm. thick and 6 mm. wide.

Type collected on dry sandy bluffs southwest of Narrows, Harney County, Oregon, July 4, 1912, Morton E. Peck 3024 (Gray Herbarium).

40. *OROPHACA* (T. & G.) Britton; Britt. & Brown, Ill. Fl.

2: 306. 1897.

Phaca § *Orophaca* T. & G. Fl. N. Am. 1: 342. 1838.

Densely caespitose, usually pulvinate perennials, with a woody caudex. Branches of the stem usually very short, densely covered by stipules and old leaf-stalks. Leaves palmately 3-foliolate, the leaflets oblanceolate to cuneate, entire, silky-canescens. Flowers in small axillary racemes. Calyx from turbinate-campanulate to cylindrical, the teeth subulate, equaling to much shorter than the tube. Corolla ochroleucous or purplish. Banner oblanceolate to obovate, tapering into a broad claw. Wings shorter, the blade obliquely obovate, with a large basal auricle, shorter than the claw. Keel-petals much shorter, the blade broadly lunate, rounded at the apex. Pod ovoid or rounded ovoid, leathery, few-seeded, barely equaling the calyx, indehiscent.

Type species, *Phaca caespitosa* Nutt.

Flowers 1 or 2, subsessile in the axils of the leaves, 12-20 mm. long; corolla ochroleucous; calyx-tube cylindrical, longer than the teeth; plant pulvinate.

Corolla about 2 cm. long or more, glabrous; calyx-tube at least 3 times as long as the teeth.

Corolla 15-18 mm. long, pubescent without; calyx-tube about twice as long as the teeth.

Flowers in peduncled 1-3-flowered racemes; corolla purple, turning yellowish in age, less than 1 cm. long.

Plant pulvinate; flowers 8-10 mm. long; racemes not exceeding the leaves.

Flowers about 10 mm. long; pod puberulent.

Flowers about 8 mm. long; pod silky-hoary.

Plant broadly caespitose, the branches prostrate; flowers about 6 mm. long; peduncles usually exceeding the leaves; pod hoary.

1. *O. caespitosa*.2. *O. argophylla*.3. *O. tridactylca*4. *O. aretioides*.5. *O. sericea*.1. *Orophaca caespitosa* (Nutt.) Britton; Britt. & Brown, Ill. Fl.

2: 306. 1897.

Astragalus triphyllus Pursh, Fl. Am. Sept. 740. 1814. Not *A. triphyllus* Pall. 1800.

Phaca caespitosa Nutt. Gen. 2: 98. 1818.

Phaca triphylla Eaton & Wright, N. Am. Bot. 351. 1840.

Tragacantha triphylla Kuntze, Rev. Gen. 948. 1891.

Astragalus gilviflorus Sheldon, Minn. Bot. Stud. 1: 21. 1894.

A densely caespitose pulvinate perennial, with a branched woody caudex; branches 2-5 cm. high, densely covered with stipules and old leaf-stalks; leaves clustered, 2-6 cm. long, erect; stipules scarious, ovate or lanceolate, abruptly acuminate, 8-10 mm. long, sparingly hairy; petioles 1-3 cm. long; leaflets usually 3, oblanceolate, acute, 1-2 cm. long, silvery-silky; peduncles almost none; flowers 1 or 2, subsessile in the leaf-axils; calyx silvery-silky, the tube cylindrical, 10-15 mm. long, the teeth lance-subulate, 3 mm. long; corolla glabrous, ochroleucous, with purple-tipped keel; banner narrowly obovate, retuse, slightly arcuate; wings shorter, the blade obliquely obovate; keel-petals much shorter, the blade broadly lunate, rounded at the apex; pod broadly ovoid, 7-10 mm. long, turgid, silky-villous.

TYPE LOCALITY: "Confluence of Sawanee River with the Missouri" [South Dakota?].

DISTRIBUTION: Saskatchewan to Nebraska, Wyoming and Montana.

ILLUSTRATIONS: Hook. Fl. Bor. Am. pl. 55; Britt. & Brown, Ill. Fl. f. 2154; ed. 2, f. 2555; M. E. Jones, Rev. Astrag. pl. 7, f. 24; Fl. Neb. 21: pl. 11, f. 88-91; Am. Jour. Bot. 15: pl. 44 D.

2. *Orophaca argophylla* (Nutt.) Rydb.; Britton, Man.
ed. 2. 1067. 1905.

Phaca argophylla Nutt.; T. & G. Fl. N. Am. 1: 342. 1838.
Astragalus hyalinus M. E. Jones, Proc. Calif. Acad. II. 5: 648. 1895.

A pulvinate cespitose perennial, with a short woody caudex; branches about 5 cm. high; leaves 2-3 cm. long, spreading; stipules scarious, broadly ovate, sparingly hairy, about 8-15 mm. long; petioles 1-1.5 cm. long; leaflets oblanceolate, 8-15 mm. long, acute or obtuse, silvery-silky; flowers subsessile in the axils of the leaves; calyx densely white-silky, the tube cylindrical, about 8 mm. long, the teeth fully 3 mm. long; corolla ochroleucous, 15-18 mm. long, pubescent without; petals almost as in *O. caespitosa* but shorter; pod ovoid, white-silky.

TYPE LOCALITY: Upper waters of the Platte.

DISTRIBUTION: Western Nebraska, Wyoming, and northeastern Colorado.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 2560; M. E. Jones, Rev. Astrag. pl. 7, f. 25.

3. *Orophaca tridactylica* (A. Gray) Rydb. Bull. Torrey Club
32: 668. 1906.

Phaca digitata Torr.; Frém. Rep. 89, hyponym. 1845.
Astragalus tridactylicus A. Gray, Proc. Am. Acad. 6: 527. 1865.
Tragacantha tridactylica Kuntze, Rev. Gen. 942. 1891.
Astragalus sericoleucus tridactylicus M. E. Jones, Contr. W. Bot. 10: 69. 1902.

A pulvinate-cespitose perennial; stems less than 1 dm. long, densely covered by stipules and old leaf-stalks; leaves 1-6 cm. long, erect; stipules scarious, broadly ovate, 5-8 mm. long, pubescent; petioles 0.5-4 cm. long; leaflets of the early leaves obovate or cuneate, short, those of the later ones oblanceolate, 1-2 cm. long, silvery-silky; peduncles 0.5-1 cm. long; racemes 2-10-flowered; calyx silky, the tube 3 mm. long, the teeth subulate, nearly as long; corolla purplish, drying yellowish, about 1 cm. long; banner obovate, moderately arcuate; wing slightly shorter, the blade oblanceolate, longer than the claw, with a small auricle; keel-petals much shorter, the blade broadly lunate, about equaling the claw; pod rounded ovoid, puberulent or glabrate, 4-5 mm. long, 1-4-seeded; seeds broadly ellipsoid, yellowish, 2 mm. long, 1.5 mm. thick.

TYPE LOCALITY: Boulder City, Colorado.

DISTRIBUTION: Colorado.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 1; Rev. Astrag. pl. 6.

4. *Orophaca aretioides* (M. E. Jones) Rydb. Bull. Torrey Club
32: 668. 1906.

Astragalus sericoleucus aretioides M. E. Jones, Contr. W. Bot. 8: 13. 1898.

A cespitose pulvinate perennial, with a branched woody caudex; branches 4-10 cm. long, densely covered with stipules and old leaf-stalks; leaves crowded, spreading, 1-2 cm. long; stipules scarious, pubescent, broadly ovate; petioles 5-10 mm. long; leaflets oblanceolate, 5-10 mm. long, silvery-silky; peduncles 1-5 mm. long; racemes 1-3-flowered; calyx silky, the tube 2.5 mm. long, the teeth subulate, 2.5 mm. long; corolla purplish, with darker veins, in age yellowish, 7-8 mm. long; banner broadly obovate, retuse; wings somewhat shorter, the blades obliquely oblanceolate; keel-petals much shorter, the blades broadly lunate, almost semiorbicular, rounded at the apex; pod similar to that of *O. sericea*.

TYPE LOCALITY: Sweetwater River, Wyoming.

DISTRIBUTION: Wyoming and northern Colorado.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 6; Contr. W. Bot. 10: pl. 1.

5. *Orophaca sericea* (Nutt.) Britton; Britt. & Brown, Ill. Fl.
2: 307. 1897.

Phaca sericea Nutt.; T. & G. Fl. N. Am. 1: 343. 1838.
Astragalus sericoleucus A. Gray, Am. Jour. Sci. II. 33: 410. 1862.
Tragacantha sericea Kuntze, Rev. Gen. 942. 1891.

A broadly cespitose plant, with a woody caudex; branches 5-20 cm. long, decumbent, much branched, densely covered with stipules and remains of leaves; leaves crowded, 1-2 cm.

long, spreading; stipules pubescent, scarios, broadly ovate or suborbicular, 5-8 mm. long; leaflets 3, rarely 5, oblanceolate to cuneate, 5-10 mm. long, silvery-silky on both sides; peduncles about 1 cm. long, arcuate; racemes 1-4-flowered; bracts 1 cm. long, lanceolate; calyx campanulate, silky-canescens, the tube campanulate, 2 mm. long, the teeth subulate, 2 mm. long; corolla purple, in drying turning yellowish, 6-7 mm. long; banner broadly obovate, notched, abruptly arched at the middle; wings slightly shorter, the blade obliquely obovate, with an acute basal auricle and a slender claw; keel-petals much shorter, the blade broadly lunate, rounded at the apex; pod ovoid, scarcely exceeding the calyx, turgid, 4-5 mm. long, sericeous.

TYPE LOCALITY: High hills of the Platte, near the Rocky Mountains [probably Wyoming].

DISTRIBUTION: Plains, western Nebraska, Wyoming, and northeastern Colorado.

ILLUSTRATIONS: Fl. Neb. 21: pl. 11, f. 92-97; Britt. & Brown, Ill. Fl. f. 2155; ed. 2. f. 2501; M. E. Jones, Rev. Astrag. pl. 6, f. 21; Contr. W. Bot. 10: pl. 1.

41. *HOLCOPHACOS* Rydb.; Small, Fl. SE. U. S. 618, 1332. 1903.

Perennial herbs, with a taproot and a caespitose caudex. Leaves odd-pinnate, with many leaflets. Flowers perfect, in short head-like racemes. Calyx campanulate, the teeth subulate or lanceolate, shorter than the tube. Corolla lilac, pink or white. Banner broadly obovate, strongly arched, retuse at the apex. Wings much shorter than the banner, the blade oblanceolate, falcate, longer than the claw, with a reflexed rounded basal auricle. Keel-petals slightly shorter, the blade lunate-obovate, about one-third of a circle, longer than the claw. Stamens diadelphous (9 and 1), the sheath straight to near the apex, the free portion of the filaments arched upwards. Ovary sessile, glabrous, the style regularly arched upwards, glabrous. Pod sessile, glabrous, more or less arched, membranous, sulcate on both sutures, but not forming a false partition. Seeds numerous, obliquely reniform.

Type species, *Astragalus distortus* T. & G.

Pod lunate in outline, deeply sulcate on both sutures, 2-3 cm. long.

Pod obliquely obovoid, nearly straight on the upper suture, about 1.5 cm. long, the sutures less deeply sulcate.

1. *H. distortus*.

2. *H. Engelmanni*.

1. *Holcophacos distortus* (T. & G.) Rydb.; Small, Fl. SE. U. S. 618, 1332. 1903.

Astragalus distortus T. & G. Fl. N. Am. 1: 333. 1838.

Phaca debilis Nutt.; T. & G. Fl. N. Am. 1: 345. 1838.

Astragalus debilis A. Gray; S. Wats. Bibl. Index 192. 1878.

Tragacantha debilis Kuntze, Rev. Gen. 943. 1891.

Tragacantha distorta Kuntze, Rev. Gen. 944. 1891.

Homalobus debilis Rydb. Bull. Torrey Club 40: 53, in part. 1913.

A perennial, with a taproot and caespitose caudex; stems many, ascending or decumbent, glabrous or sparingly strigose, 1-3 dm. high; leaves ascending, 5-10 cm. long, the rachis glabrous or nearly so; stipules lance-deltoid, 4-7 mm. long, green; leaflets 13-25, oblong to obovate, cuneate at the base, rounded or the earlier ones retuse at the apex, light green, glabrous above, strigulose or glabrate beneath, 4-10 mm. long; peduncles 6-10 cm. long, slender; racemes short, 2-4 cm. long, 10-20-flowered; bracts lanceolate, 2 mm. long, longer than the pedicels; calyx strigose with black or white hairs, the tube campanulate, 2-3 mm. long, the teeth lanceolate, about 2 mm. long; corolla white or lilac, with purple-tipped keel; banner narrowly obovate or oval, retuse at the apex, 10-12 mm. long; wings 8-9 mm. long, the blade obliquely oblanceolate, arcuate, twice as long as the claw, with a large reflexed auricle; keel-petals slightly shorter, the blade broadly obliquely obovate-lunate, shorter and broader, with a smaller auricle; pod lunate in outline, tapering at each end, 2-3 cm. long, 4-4.5 mm. wide, glabrous, cross-reticulate, turgid, both sutures strongly sulcate and nearly meeting, but without a septum; cross-section ∞ -shaped.

TYPE LOCALITY: Arkansas.

DISTRIBUTION: Illinois to Iowa, Kansas, Texas, Mississippi, and West Virginia.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 64, f. 215 (but cross-section faulty); Britt. & Brown, Ill. Fl. f. 2143; ed. 2. f. 2545; Am. Jour. Bot. 15: pl. 45 F.

2. *Holcophacos Engelmanni* (Sheldon) Rydb.; Small, Fl. SE. U. S.
618, 1332. 1903.

Astragalus distortus A. Gray, Pl. Wright. 1: 52. 1852. Not *A. distortus* T. & G. 1838.
Astragalus Engelmanni Sheldon, Minn. Bot. Stud. 1: 152. 1894.
Astragalus flagellaris Engelm.; Sheldon, Minn. Bot. Stud. 1: 152, as synonym. 1894.
Astragalus distortus Engelmanni M. E. Jones, Rev. Astrag. 256. 1923.

A perennial, with a taproot and caespitose caudex; stems decumbent, glabrous or nearly so, 1-3 dm. long; leaves ascending, 3-7 cm. long, the rachis slender, glabrous; stipules lanceolate, green, 3-4 mm. long; leaflets 13-19, oblong to obovate, 3-8 mm. long, cuneate at the base, rounded to retuse at the apex, glabrous on both sides or sparingly strigulose beneath; peduncles 4-7 cm. long; racemes short, 5-10-flowered; bracts lanceolate, 1-2 mm. long, longer than the pedicels; calyx sparingly strigulose, the tube campanulate, about 2 mm. long, the teeth lance-deltoid, 1-1.5 mm. long; corolla lilac or pink, the keel purple-tipped; banner narrowly obovate, often slightly retuse at the apex, 7-8 mm. long; wings 6 mm. long, the blade oblanceolate, nearly three times as long as the claw; keel-petals shorter and broader, the blade almost semicircular; pod obliquely obovate, glabrous, about 1.5 cm. long, 5-6 mm. wide, the upper suture nearly straight and slightly sulcate, the lower more deeply so and strongly convex.

TYPE LOCALITY: Brazos, Texas.

DISTRIBUTION: Texas, Oklahoma, and Arkansas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 65.

42. *LONCHOPHACA* Rydberg, gen. nov.

Perennial, rush-like herbs, with a short woody caespitose caudex. Leaves odd-pinnate, the leaflets linear or linear-filiform. Flowers perfect, borne in many-flowered elongate racemes. Calyx-tube campanulate, its teeth short. Corolla white, ochroleucous, or purplish. Banner oblanceolate, rather moderately arched. Wings shorter. Blade oblong-oblanceolate, scarcely equaling the claw, with a prominent but blunt reflexed auricle. Stamens diadelphous (9 and 1), the sheath straight, slightly oblique at the apex, the free portion of the filaments somewhat curved upwards. Pod stipitate, one-celled, coriaceous, the body linear in outline, tapering at both ends, terete or dorso-ventrally compressed, many-seeded, the suture prominent. Seeds almost orbicular in outline, notched at the deep-seated hilum.

Type species, *Phaca macrocarpa* A. Gray.

Stipe of the fruit longer than the calyx-tube; stem, foliage, and calyx strigose-canescens.

Body of the pod nearly linear, tapering at both ends, 3-4 cm. long, about 4 mm. thick.

Body of the pod oblanceolate, 2.5-3 cm. long, about 6 mm. thick.

Stipe of the fruit shorter than the calyx-tube.

Body of the pod 2.5-4 cm. long, linear-oblanceolate, tapering more towards the base than the apex.

Pod glabrous, attenuate at each end; corolla 2 cm. long; stem and leaves green, slightly strigose.

Pod strigose-canescens, acute at each end; corolla 10-12 mm. long, purplish; stem and leaves strigose-canescens.

Body of the pod 2-2.5 cm. long, oblong, equally acute at each end, glabrous; corolla white, about 12 mm. long.

1. *L. macrocarpa*.

2. *L. macra*.

3. *L. Osterhoutii*.

4. *L. duchesnensis*.

5. *L. kaibensis*.

1. *Lonchophaca macrocarpa* (A. Gray) Rydberg.

Phaca macrocarpa A. Gray, Mem. Am. Acad. II, 4: 36. 1849.

Astragalus lonchocarpus Torr. Pacif. R. R. Rep. 4: 80. 1857.

Tragacantha lonchocarpa Kuntze, Rev. Gen. 946. 1891.

Homalobus macrocarpus Rydb. Bull. Torrey Club 32: 667. 1906.

A perennial, with a woody root and short caudex; stems several, striate, strigose, 3-10 dm. high, with erect branches; leaves 6-10 cm. long, the rachis strigose, sulcate; stipules deltoid, acute, 3-4 mm. long; leaflets 3-7, linear-filiform, canescens, 1-2 cm. long, 1-2 mm. wide, or the terminal one longer, and continuous with the rachis; peduncles 1-3 cm. long; racemes 1-1.5 dm. long, strigose; bracts subulate, 3 mm. long, early deciduous; pedicels recurved, 1-2 mm. long; calyx brownish, strigose, the tube 5-6 mm. long, the teeth deltoid, 1 mm. long; corolla

white, 18–20 mm. long; banner oblanceolate, only slightly arched; wings nearly as long, the blade linear-oblong, falcate, with a long recurved auricle, obtuse; keel-petals shorter, the blade lunate with a long, lanceolate, reflexed auricle; pod glabrous, stipitate, the stipe nearly 1 cm. long, the body linear, acute at each end, 3–4 cm. long, 2 mm. wide, and 3 mm. thick, the cross-section rhombic; seeds brown, obliquely reniform, 4 mm. long, 2 mm. wide.

TYPE LOCALITY: Near Santa Fé, New Mexico.

DISTRIBUTION: Colorado, Utah, and New Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 64, f. 214, a, b; Clements, Rocky Mt. Fl. pl. 29, f. 21.

2. *Lonchophaca macra* (A. Gray) Rydberg.

Astragalus lonchocarpus cymbocarpus A. Gray, ms.

Astragalus macer A. Nels. Bot. Gaz. 56: 65. 1913.

A perennial; stem striate, canescent-strigose, erect and strict, 3–4 dm. high; leaves 4–8 cm. long, ascending; stipules deltoid, 2–4 mm. long; leaflets 3–7, linear or oblong, 1–2 cm. long, or the terminal one longer and continuous with the rachis, canescent-strigose; peduncles 10–15 cm. long, erect; bracts lanceolate, 2 mm. long; pedicels 2–4 mm. long; calyx canescent, the tube 5 mm. long, 3 mm. broad, the teeth broadly triangular, 1 mm. long; corolla ochroleucous, 10–12 mm. long, similar to that of *L. macrocarpa*; pod glabrate, leathery, reticulate, the stipe 8–12 mm. long, strigose, the body oblanceolate in outline, obcompressed, 2.5–3 cm. long, about 4 mm. wide, 5–6 mm. thick, subrhombic in cross-section, the sutures prominent; seeds dark-brown, shining, obliquely reniform, 3.5 mm. long, 2 mm. wide.

TYPE LOCALITY: Paradox Valley, Colorado.

DISTRIBUTION: Western Colorado to central Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 64, f. 214, c.

3. *Lonchophaca Osterhoutii* (M. E. Jones) Rydberg.

Astragalus Osterhoutii M. E. Jones, Rev. Astrag. 251. 1923.

A perennial; stem 5–10 dm. high, angled, glabrous or nearly so; leaves ascending, 5–10 cm. long, the rachis sulcate, glabrous; stipules broadly deltoid, connate around the stem; leaflets 9–11, thick, linear, obtuse, often somewhat falcate, 2–3 cm. long, 2–4 mm. wide, involute on the margins; peduncle 10–15 cm. long; racemes 3–10 cm. long; bracts lanceolate, 1–2 mm. long; pedicels 3–4 mm. long; calyx strigose with black hairs, the tube 6 mm. long, 2.5 mm. broad, the teeth lance-deltoid, 1 mm. long, obtuse; corolla ochroleucous, about 2 cm. long; banner oblanceolate, moderately arched at the middle; wings shorter, the blade oblanceolate, with a recurved auricle; keel-petals very much shorter, the blade lunate with a rounded auricle; pod short-stipitate, glabrous, the stipe shorter than the calyx-tube, the body linear, tapering at each end, about 4 cm. long, 4–5 mm. wide, and about as thick, the cross-section elliptic, the sutures prominent; seed obliquely reniform, 5 mm. long, 3 mm. wide.

TYPE LOCALITY: Sulphur Springs, Colorado.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 64, f. 212.

4. *Lonchophaca duchesnensis* (M. E. Jones) Rydberg.

Astragalus duchesnensis M. E. Jones, Contr. W. Bot. 13: 9. 1910.

A perennial, with a horizontal rootstock, branched at the base; stem striate, canescent-strigose; 3–4 dm. high; leaves 5–10 cm. long; stipules deltoid, about 5 mm. long; leaflets 7–9, linear, 1–2 cm. long, 1–2 mm. wide, glabrate above, grayish-strigose beneath, the margins involute; racemes lax, 1–2 dm. long; bracts deltoid, 1–2 mm. long; pedicels about 2 mm. long; calyx short-cylindric, often reddish, black- and white-strigose, the tube about 3 mm. long, 2 mm. broad, the teeth deltoid, 1 mm. long; corolla purplish with a purple-tipped keel; banner 10–12 mm. long, rather strongly arched at the middle, obovate; wings slightly shorter, the blade obliquely oblanceolate, falcate; keel-petals shorter, the blade lunate, rounded at the apex;

pod linear-oblongate, straight, 2.5-3.5 cm. long, 5-7 mm. wide, canescent-strigose, tapering below into a short stipe, the cross-section transversely elliptic.

TYPE LOCALITY: Thirteen miles below Theodore, Utah.

DISTRIBUTION: Northeastern Utah and northwestern Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 64.

5. *Lonchophaea kaibensis* (M. E. Jones) Rydberg.

Astragalus kaibensis M. E. Jones, Contr. W. Bot. 10: 64. 1902.

A perennial, with a rootstock; stem flexuous, branched, sparingly strigose, 3-5 dm. high, rush-like, striate; leaves 3-6 cm. long, the terminal leaflet not differentiated from the rachis; stipules deltoid, 3 mm. long, caducous; lateral leaflets 0-4, linear, strigose, 3-8 mm. long, involute; racemes including the peduncle 1.5-2 dm. long, lax; bracts deltoid, 2 mm. long; pedicels 2 mm. long; calyx white-strigose, the tube 5 mm. long, 2 mm. broad, the teeth deltoid, 1 mm. long; corolla white; banner obovate, 12 mm. long; wings slightly shorter, the blade oblongate, with a basal auricle; keel-petals about 11 mm. long, the blade obliquely lunate, rounded at the apex; pod elliptic-oblong, acute at each end, 2-2.5 cm. long, 5-6 mm. wide, glabrous, the cross-section transversely elliptic or oval.

TYPE LOCALITY: House Rock, Lee's Ferry, Arizona.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 64.

43. *BATIDOPHAEA* Rydb. gen. nov.

Perennial herbs, with a caespitose caudex, the stems short, or, if elongate, diffusely spreading. Leaves odd-pinnate, with mostly broad leaflets. Flowers perfect, in short, spike-like or head-like racemes. Calyx campanulate, the teeth subulate, at least half as long as the tube. Corolla of various colors. Banner broadly obovate, often retuse at the apex, strongly arched. Wings almost as long as the banner, the blade oblongate, longer than the claw, with a large basal auricle. Keel-petals slightly shorter, the blade broadly lunate, forming one third or one fourth of a circle, acutish. Stamens diadelphous (9 and 1), the sheath straight, broadest at the base, the free portion of the filaments arched upwards. Ovary sessile; style regularly arched upwards; stigma minute. Pod one-celled, sessile, membranous or leathery, more or less lunate or obliquely ovate in outline, tapering to both ends, the upper suture acute, straight or arched upwards, the lower suture rounded or inflexed at the middle, more strongly arched. Seeds many, obliquely round-reniform, with a deep-seated hilum.

Type species, *Astragalus villosus* Michx.

Stipules large and membranous, connate around the stem; stems decumbent and widely spreading, or in no. 8 and no. 9 very short and ascending.

Flowers several in short dense head-like or spike-like racemes.

Flowers 1 or 2 in small racemes.

Stipules narrow, distinct or nearly so; stems usually very short.

Flowers all alike, well developed, in peduncled racemes.

Flowers of two kinds, some well developed in long-peduncled racemes, others apparently cleistogamous, subsessile or on very short peduncles in the axils of the leaves.

1. HUMISTRATAE

Plant green.

Stem elongate, decumbent.

Leaflets lance-oblong, 5-18 mm. long, glabrate above.

Pod 1.5-2 cm. long, sulcate on the lower suture; leaflets mostly

oblong; corolla 10-12 mm. long.

Pod 10-12 mm. long, not sulcate; leaflets mostly linear-lanceolate or lance-oblong; corolla 8-10 mm. long.

Leaflets elliptic or oval, 2-4 mm. (rarely 6 mm.) long, equally pubescent on both sides.

Stem short; leaflets elliptic, pubescent on both sides.

Plant silvery-canescens, the leaflets equally pubescent on both sides.

Stems elongate, 2-4 dm. long; calyx-lobes as long as or longer than the tube.

Plant spreading; calyx-tube 3-4 mm. long, about as long as the teeth; pod firm.

Pubescence rather loose; pod distinctly sulcate at the middle on the lower suture, more than 15 mm. long.

1. HUMISTRATAE.

2. SESQUIFLORAE.

3. VILLOSAE.

4. LOTIFLORAE.

1. *B. humistrata*.

2. *B. Hosackiae*.

3. *B. tenerrima*.

17. *B. sabinarum*.

4. *B. stipulacea*.

COMPLETED VOLUME

9: i-iv, 1-542. (Agaricales:) Polyporaceae (pars), Boletaceae, Agaricaceae (pars). Complete in 7 parts.

PARTS OF VOLUMES PREVIOUSLY PUBLISHED

- 3¹: 1-88. Hypocreales: Nectriaceae, Hypocreaceae. Fimetariales: Chaetomiaceae, Fimetiariaceae.
- 6¹: 1-84. Phyllostictales: Phyllostictaceae (pars).
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PART 6

NORTH AMERICAN FLORA

(ROSALES)

FABACEAE

GALEGEAE (pars)

^v PER AXEL RYDBERG



PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

MAY 15, 1929

ANNOUNCEMENT

NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

Volume 1. Myxomycetes, Schizophyta.

Volumes 2 to 10. Fungi.

Volumes 11 to 13. Algae.

Volumes 14 and 15. Bryophyta.

Volume 16. Pteridophyta and Gymnospermae.

Volumes 17 to 19. Monocotyledones

Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. M. A. Howe, and Dr. J. H. Barnhart.

Dr. Frederick V. Coville, of the United States Department of Agriculture; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or more parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK CITY

Pubescence strictly appressed; pod not sulcate on the lower suture or only slightly so near the base.

Leaflets lance-oblong; pod 12-15 mm. long, sulcate near the base. Leaflets at least of the upper leaves narrowly lance-linear; pod about 10 mm. long, not sulcate.

Plant erect; calyx-tube 5-6 mm. long, longer than the teeth; pod of a thin texture.

Stems short, ascending, about 1 dm. high; calyx-lobes shorter than the tube.

Pod 12-15 mm. long; calyx-lobes one fourth to one third as long as the tube.

Pod 7-8 mm. long; calyx-lobes two thirds as long as the tube.

5. *B. humivagans*.

6. *B. Sonorae*.

7. *B. albula*.

8. *B. accumbens*.

9. *B. gilensis*.

2. SESQUIFLORAE

One species.

10. *B. sesquiflora*.

3. VILLOSAE

Pod hairy.

Pod villous.

Leaves and stem villous or hirsute; corolla yellowish or white, with purple-tipped keel.

Corolla 15 mm. long or more; pod subcoriaceous.

Corolla 10 mm. long; pod membranous.

Leaves and stem strigose; corolla purplish.

Pod oblong-falcate; corolla 10 mm. long.

Pod ovoid; corolla 7-8 mm. long.

11. *B. Parryi*.

12. *B. villosa*.

13. *B. desperata*.

14. *B. petrophila*.

Pod strigose.

Leaflets obovate; pod mottled.

Plant stout, about 3 dm. high; racemes many-flowered; pod 2 cm. long or more.

Plant slender, spreading; racemes 1-5-flowered; pod less than 1 cm. long.

Leaflets oblong or linear; pod not mottled.

15. *B. variegata*.

16. *B. sparsiflora*.

17. *B. sabinarum*.

18. *B. obcordata*.

Pod glabrous.

4. LOTIFLORAE

Pubescence silky, appressed or ascending.

Corolla 8-9 mm. long; pod 1.5-2 cm. long, equally abruptly acute at each end.

Corolla 10-11 mm. long; pod 2.5-3 cm. long, more tapering at the apex than at the base.

Pubescens villous, spreading.

19. *B. lotiflora*.

20. *B. cretacea*.

21. *B. nebraskensis*.

1. **Humistratae.** Plants perennial, with a woody caudex; stems decumbent, the stipules comparatively large, membranous, connate around the stem. Flowers in short dense racemes. Calyx campanulate; corolla small. Pods leathery, strigose, obliquely lance-oblong to broadly lunate, arcuate, acute on the upper suture, rounded or sulcate on the lower, at or below the middle.

1. *Batidophaca humistrata* (A. Gray) Rydberg.

Astragalus humistratus A. Gray, Pl. Wright. 2: 43. 1853.

Tragacantha humistrata Kuntze, Rev. Gen. 945. 1891.

Tium humistratum Rydb. Bull. Torrey Club 32: 660. 1905.

A perennial, with a caespitose caudex; stems several, branched, decumbent, terete, sparingly pilose with ascending or appressed hairs; leaves 4-5 cm. long, ascending, green; petioles 5-15 mm. long; stipules deltoid, 5-8 mm. long, connate around the stem, united three fourths their length, membranous, slightly pubescent; leaflets 13-19, oblong or rarely lance-oblong, obtuse, acute, or mucronate, 8-18 mm. long, 2-4 mm. wide, glabrate above, sparingly pilose with ascending hairs beneath; peduncles 3-8 cm. long; racemes 2-6 cm. long, rather dense; bracts lanceolate, 5-8 mm. long; calyx sparingly pilose, the tube 3 mm. long, the teeth subulate, 4 mm. long; corolla purplish to dirty-white, 10-12 mm. long; banner obovate, retuse, veined; wings nearly as long, the blade obliquely oblong, with a rounded auricle; keel-petals slightly shorter, the blade strongly arched at the middle, with a lance-triangular, but blunt tip; pod 15-20 mm. long, strigose, arcuate, acuminate at the apex, blunt at the base, laterally compressed at the apex, the upper suture acute throughout, the lower one acute at the apex, sulcate at the middle, and rather flat at the base.

TYPE LOCALITY: Copper Mines [Santa Rita del Cobre], New Mexico.

DISTRIBUTION: Southern Colorado to Chihuahua and Arizona.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. pl. 1.; Rev. Astrag. pl. 6, f. 17.

2. *Batidophaca Hosackiae* (Greene) Rydberg.

Astragalus Hosackiae Greene, Bull. Calif. Acad. 1: 157. 1885.

Astragalus humistratus Hosackiae M. E. Jones, Contr. W. Bot. 10: 58. 1902.

A perennial, with a caespitose caudex; stems several, decumbent, branched, 2-4 dm. long, terete, sparingly pilose with kinky hairs; leaves 2-4 cm. long; stipules deltoid, membranous, connate around the stem, 5-8 mm. long; petioles less than 1 cm. long; leaflets 11-15, lance-oblong, acute, glabrous above, pilose with loose hairs beneath, 5-12 mm. long, about 2 mm. wide, crowded; peduncles 3-6 cm. long; racemes usually short and dense, 2-4 cm. long; bracts lance-linear, about 5 mm. long; calyx pilose, the tube about 2 mm. long, the teeth subulate, fully 2 mm. long; corolla apparently dirty-white, 8 mm. long; banner obovate, retuse, striate; wings nearly as long, the blade obliquely obovate, with a large auricle; keel-petals broadly lunate, obtuse; pod about 1 cm. long, arcuate, strigose, acute on the upper suture, rounded on the lower, not sulcate, thicker than wide.

TYPE LOCALITY: Northern Arizona [Flagstaff].

DISTRIBUTION: Arizona and western New Mexico.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 1; Rev. Astrag. pl. 6.

3. *Batidophaca tenerrima* (M. E. Jones) Rydberg, sp. nov.

Astragalus humistratus tenerrimus M. E. Jones, Proc. Calif. Acad. II. 5: 649. 1894.

A perennial, with a taproot and woody caespitose caudex; stems many, prostrate, 1-3 dm. long, terete, slender, strigose; leaves spreading, 2-3 cm. long; stipules lanceolate or deltoid, acuminate, green, only the lowest scarious; leaflets 11-15, mostly 2-4 mm. long, elliptic or oval, the upper rarely narrower, 4-6 mm. long, green but equally strigose on both sides with long 2-forked hairs, the forks appressed and opposite, appearing as if the hair was attached at or near the middle; peduncles slender, 2-6 cm. long; racemes 1-2 cm. long, 5-10-flowered, dense; bracts lanceolate, 1-2 mm. long; pedicels about 1 mm. long; calyx purple-tinged, strigose, the tube 2-2.5 mm. long, the teeth usually a little longer; corolla white, slightly purple-veined, about 8 mm. long; banner broadly obovate, retuse; wings nearly as long, the blade broadly lunate, with a broad auricle; keel-petals similar, broader and more incurved at the purplish apex; pod strigose, compressed, lunate, 8 mm. long, 3 mm. wide.

TYPE LOCALITY: Buckskin Mountains, Arizona.

DISTRIBUTION: Buckskin Mountains, Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 6.

4. *Batidophaca stipulacea* Rydberg, sp. nov.

A perennial, with a deep root and caespitose caudex; stems many, decumbent, 2-3 dm. long, canescent with two kinds of pubescence, both pubescent with long white hairs and finely strigulose; leaves 3-5 cm. long, ascending; stipules large, membranous, scarious, sparingly pilose, deltoid, connate around the stem, united three fourths their length, 6-10 mm. long; petioles 4-5 mm. long; leaflets 13-17, oblong, acute, 6-15 mm. long, 2-3 mm. wide, white-hairy on both sides with ascending hairs; peduncles 3-5 cm. long; bracts lanceolate, scarious, 4-5 mm. long; calyx white-hairy, the tube about 3 mm. long, the teeth subulate, fully 3 mm. long; corolla ochroleucous, about 8 mm. long; banner obovate, striate-veined, strongly arcuate; wings slightly shorter, the blades oblong-oblancoate, with a rounded auricle; keel-petals strongly arcuate, lunate, acuminate but with a blunt tip; pod white-strigose, strongly arcuate, tapering at both ends, fully 15 mm. long, strongly sulcate on the lower suture at and below the middle, acute on the upper.

Type collected at Mangos Springs, Grant County, New Mexico, April 12, 1903, *Metcalf* 60 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Southwestern New Mexico and Sonora.

5. *Batidophaca humivagans* Rydberg, sp. nov.

Astragalus humistratus var. A. Gray, Proc. Am. Acad. 13: 369. 1878.

A perennial with a deep root and caespitose caudex; stems numerous, decumbent or prostrate, 2-4 dm. long, terete, branched, strigose-canescens; leaves ascending, 3-5 cm. long;

stipules deltoid or lance-deltoid, 5-8 mm. long, connate two thirds to three fourths their length, membranous, canescent; petioles 1 cm. long or less; leaflets oblong or elliptic, 5-15 cm. long, silvery-strigose on both sides; peduncles 5-7 cm. long; racemes at first short, in age elongate, 3-8 cm. long; bracts lance-linear, 5 mm. long; calyx silky-strigose, the tube 3 mm. long, the teeth subulate, 3 mm. long; corolla ochroleucous, 8 mm. long, similar to that of the preceding species; pod laterally compressed above the middle, depressed and somewhat sulcate at the base, strongly arcuate, 12-15 mm. long, 4-5 mm. wide, strigose.

Type collected at Mokiak Pass, Arizona, in 1877, *Palmer 108* (Gray Herb.).

DISTRIBUTION: Arizona, southern Utah, and New Mexico.

6. *Batidophaca Sonorae* (A. Gray) Rydberg.

Astragalus Sonorae A. Gray. Pl. Wright. 2: 44. 1853.

Tragacantha Sonorae Kuntze, Rev. Gen. 948. 1891.

Astragalus humistratus Sonorae M. E. Jones, Contr. W. Bot. 10: 58. 1902.

A perennial; stems slender, 3-5 dm. long, rather simple, terete, strigose-canescens; leaves 4-8 cm. long, ascending; stipules lanceolate to deltoid, 4-8 mm. long, membranous; petioles 5-15 mm. long; leaflets lance-linear, 0.5-2 cm. long, 1-2 mm. wide, silky-canescens, strigose on both sides, acute; peduncles 4-10 cm. long; racemes 3-6 cm. long; bracts lanceolate, 3-5 mm. long; calyx silky-canescens, the tube 3 mm. long, the teeth subulate, 3 mm. long; corolla purple, about 1 cm. long; banner striately veined, retuse, obovate, strongly arcuate; wings slightly shorter, the blade obliquely oblong, falcate; keel-petals lunate, strongly arched at the middle attenuate with a blunt tip; pod about 1 cm. long, 4-5 mm. wide, arcuate, somewhat laterally compressed, acute on both sutures, finely strigose.

TYPE LOCALITY: Mountain Valleys between San Pedro and the Sonoita, Sonora.

DISTRIBUTION: New Mexico, Arizona, and Sonora.

ILLUSTRATION: M. E. Jones, Contr. W. Bot. 10: pl. 1; Rev. Astrag. pl. 6.

7. *Batidophaca albula* (Wooton & Standley) Rydberg.

Astragalus albulus Wooton & Standley, Contr. U. S. Nat. Herb. 16: 136. 1913.

A perennial, from a woody root; stems several, 4-6 dm. high, much branched, canescent, with ascending hairs; leaves 5-8 cm. long, ascending; stipules whitish, deltoid, connate, 5-7 mm. long; leaflets 17-21, linear or oblong, 1-1.5 cm. long, acute at both ends or obtuse at the apex, white-strigose beneath, glabrate above; peduncles 2-5 cm. long; racemes about 1 dm. long, lax; bracts ovate, membranous, 3 mm. long; pedicels very short; calyx silky with mixed black and white hairs, the tube about 7 mm. long, the teeth 2 mm. long, subulate; corolla ochroleucous, about 12 mm. long; banner obovate, slightly arched; wings nearly as long, the blade oblong-oblancoate, with a large reflexed auricle; keel-petals slightly shorter, the blades obliquely oblancoate, abruptly arched near the rounded apex, with a large reflexed auricle; pod on a reflexed pedicel, glabrous, thin-walled, lanceolate in side view, 12 mm. long, 5 mm. thick, and 3 mm. wide, the upper suture acute, the lower sulcate.

TYPE LOCALITY: South of Gallup, New Mexico.

DISTRIBUTION: New Mexico.

8. *Batidophaca accumbens* (Sheldon) Rydberg.

Astragalus procumbens S. Wats. Proc. Am. Acad. 20: 361. 1885. Not. *A. procumbens* Mill. 1768.

Astragalus accumbens Sheldon, Minn. Bot. Stud. 1: 20. 1894.

A perennial, with a deep taproot and branched caudex, almost acaulescent; stems very short, 1-6 cm. long, strigose-canescens; leaves ascending, 2-4 cm. long; stipules broadly ovate, acute, 5 mm. long, strigose; leaflets 11-15, obovate or elliptic, rounded or obtuse at the apex, 5-7 mm. long, silvery-strigose; peduncles 4-10 cm. long, strigose-canescens; raceme short, 5-8-flowered, 1-2 cm. long; bracts lanceolate, about 2 mm. long; calyx strigose-canescens, the tube 3-3.5 mm. long, white-hairy, the teeth about 1 mm. long; corolla white, 6-8 mm. long; banner broadly obovate, strongly and abruptly arcuate; wings about as long, the blades falcate; keel-petals fully as long, the blade broadly lunate, with a small basal auricle; pod spreading,

oblong, about 1.5 cm. long, acutish at each end, coriaceous, strigose, wrinkled, the upper suture prominent, the lower one inflexed, sulcate.

TYPE LOCALITY: Fort Wingate, New Mexico.

DISTRIBUTION: New Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 28, f. 94 (faulty).

9. *Batidophaca gilensis* (Greene) Rydberg.

Astragalus gilensis Greene, Bull. Torrey Club 8: 97. 1881.

A subcaulescent perennial, with a densely caespitose caudex; stems very short, ascending or decumbent; leaves ascending, 2-6 cm. long; stipules deltoid, canescent; leaflets 15-19, elliptic or oblong, obtuse or acute, silvery-canescant, 5-10 mm. long; peduncles 3-7 cm. long; raceme head-like; bracts lance-linear, 3-4 mm. long; calyx silky-canescant, the tube about 3 mm. long, the teeth subulate, 1.5-2 mm. long; corolla ochroleucous, white or purple, 7 mm. long; banner rounded-obovate, abruptly arched, retuse; wings nearly as long, the blade oblong, falcate; keel-petals broadly lunate, the blade abruptly arched at the middle; pod 7-8 mm. long, 3 mm. wide, somewhat laterally compressed, slightly arcuate, abruptly acute, strigose, both sutures acute.

TYPE LOCALITY: Mouth of the cañon of Gila River, New Mexico.

DISTRIBUTION: New Mexico and Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 6, f. 20.

2. *Sesquiflorae*. Low tufted caespitose plant, with numerous short stems; leaflets narrowly oblanceolate to linear-subulate; racemes few-flowered; calyx acute at the base, the lobes elongate and more or less upcurved; pod strigose, leathery, mottled.

10. *Batidophaca sesquiflora* (S. Wats.) Rydberg.

Astragalus sesquiflorus S. Wats. Proc. Am. Acad. 10: 346. 1875.

Tragacantha sesquiflora Kuntze, Rev. Gen. 948. 1891.

Phaca sesquiflora Rydb. Bull. Torrey Club 40: 48. 1913.

A densely tufted perennial, with a deep taproot, and multicipital caudex; stems numerous, 3-10 cm. long, ashy-canescant; leaves ascending, 2-5 cm. strigose, brownish, 2-5 mm. long; leaflets 7-11, narrowly oblanceolate or nearly linear, 3-8 mm. long, acute at each end, strigose-canescant; peduncles 1-3 cm. long, slender; racemes 1-4; bracts subulate, 2 mm. long, longer than the pedicels; calyx strigose, the tube turbinate, 3 mm. long, the teeth subulate, unequal in length, the lowest fully as long as the tube, the upper shorter, all arcuate; corolla purple, 6-8 mm. long; banner broadly obovate, strongly arched; wings shorter, strongly arcuate, the blades oblanceolate, obtuse, with a large auricle; keel-petals shorter, the blade lunate, long-acute; pod semi-obovate, strongly arcuate, broader towards the apex, 1 cm. long, 3 mm. wide, strigose and mottled, abruptly cuspidate, the lower suture sulcate two thirds its length, but acute towards the apex, the cross-section broadly cordate.

TYPE LOCALITY: Southern Utah.

DISTRIBUTION: Southern Utah and northern Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 6, f. 18.

3. *Villosae*. Perennial herbs, usually with short, decumbent stems. Stipules narrow, distinct or nearly so. Flowers in short racemes on elongate peduncles. Calyx with a campanulate tube and rather long lobes. Corolla white, cream-colored, or purplish. Pod membranous or in *B. Parryi* leathery or coriaceous, more or less lunate in side-view, acute on the upper suture, rounded or somewhat inflexed along the lower.

11. *Batidophaca Parryi* (A. Gray) Rydberg.

Astragalus succumbens T. & G. Pacif. R. R. Rep. 2: 163. 1855. Not *A. succumbens* Dougl. 1831.

Astragalus Parryi A. Gray, Am. Jour. Sci. II. 33: 410. 1862.

Tragacantha Parryi Kuntze, Rev. Gen. 947. 1891.

Xylophacos Parryi Rydb. Bull. Torrey Club 32: 662. 1906.

A perennial, with a taproot and short caudex, densely caespitose; stems numerous, decumbent, 1-2 dm. long, pilose with long slender spreading hairs; leaves spreading, 5-12 cm. long;

stipules deltoid, 6–10 cm. long, acuminate, green, pilose; leaflets 19–25, elliptic to suborbicular, 7–15 mm. long, obtuse or cuneate at the base, rounded or those of the earlier leaves retuse at the apex, bright-green, more or less pilose on both sides; peduncles 3–5 cm. long; racemes short, 6–10-flowered; bracts subulate, 3–5 mm. long; calyx villous-pilose, the tube 4–5 mm. long, the teeth subulate, 5 mm. long; corolla white, about 15 mm. long; banner obovate, tapering to a claw-like base, rounded or broadly retuse at the apex; wings about 12 mm. long, the blade obliquely obovate, about as long as the slender claw, with a rather large rounded auricle; keel-petals similar but more oblique, slightly shorter, rounded at the apex, with a smaller auricle and a broader claw; pod leathery, cross-reticulate, pilose, lanceolate in outline, long-acuminate, arcuate, somewhat depressed, strongly sulcate on the lower suture, the upper suture slightly sulcate at least at the base, 2.5–3 cm. long, 5 mm. wide and 7 mm. thick.

TYPE LOCALITY: Gravelly banks along Clear Creek, Colorado.

DISTRIBUTION: Colorado and southern Wyoming.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 56, f. 182.

12. *Batidophaca villosa* (Michx.) Rydberg.

Astragalus villosus Michx. Fl. Bor. Am. 2: 67. 1803.

Phaca villosa Nutt. Gen. 2: 97. 1818.

Tragacantha villosa Kuntze, Rev. Gen. 949. 1891.

Astragalus intonsus Sheldon, Minn. Bot. Stud. 1: 23. 1894.

Tium intonsum Rydb.; Small, Fl. SE. U. S. 619, 1332. 1903.

A perennial, with a taproot and branched at the base; stems numerous, often partly subterranean, decumbent, 1–2 dm. long, pilose with long spreading white hairs; leaves spreading, 4–8 cm. long; stipules connate, green, lanceolate, attenuate, 6–9 mm. long; rachis pilose; leaflets 9–17, oval or orbicular, 5–10 mm. long, rounded or rarely retuse at the apex, glabrous above, pilose beneath; peduncles 5–10 cm. long, pilose; raceme dense and short, 2–3 cm. long; bracts subulate, 2–3 mm. long; calyx long-pilose, the tube 3 mm. long, the teeth subequal, subulate, 3 mm. long; corolla cream-colored or white, 8–10 mm. long; banner obovate, rounded at the apex; wings nearly as long, the blade obliquely ovate, arcuate, longer than the claw, with a reflexed rounded auricle; keel-petals broader, 7–8 mm. long; pod narrowly lanceolate in outline, arcuate, about 2 cm. long, 6 mm. wide, densely pilose, acute at each end, the upper suture acute, the lower suture sulcate, the cross-section cordate.

TYPE LOCALITY: Georgia.

DISTRIBUTION: Florida, Georgia, and Alabama.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 26, f. 81; Am. Jour. Bot. 16: pl. 16 M.

13. *Batidophaca desperata* (M. E. Jones) Rydberg.

Astragalus desperatus M. E. Jones, Zoe. 2: 243. 1891.

Tium desperatum Rydb. Bull. Torrey Club 32: 660. 1906.

?*Astragalus naturitensis* Payson, Bot. Gaz. 60: 317. 1915.

A caespitose perennial, with a deep woody root; stems numerous, very short; leaves spreading, 3–6 cm. long; stipules imbricate, 4–5 mm. long, ovate, hyaline, hirsute; leaflets 9–13, lance-elliptic to obovate, obtuse, 5–10 mm. long, silky-strigose on both sides; peduncles strict, 3–7 cm. long; bracts broadly elliptic or ovate, hyaline, 3–5 mm. long; flowers reflexed in age; calyx strigose, the tube 5 mm. long, 3 mm. broad, reddish, the teeth triangular, about 2 mm. long; corolla purple, 12–15 mm. long; banner obovate, abruptly arched, striately purple-veined; wings shorter, the blades linear-oblong, falcate; keel-petals shorter, gradually arched, 3 mm. wide, obtuse, dark-purple; pod lunate, acute at each end, more strongly curved towards the apex, hirsute with long hairs, which are pustulate at the base, 1–2.5 cm. long, 3–4 mm. wide, 4–5 mm. thick, acute on the upper suture, more or less sulcate on the lower, sometimes more or less dorso-ventrally compressed, broadly cordate in cross-section.

TYPE LOCALITY: Along Grand River, in eastern Utah.

DISTRIBUTION: Eastern Utah, western Colorado, and northern Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 45, f. 164.

14. *Batidophaca petrophila* (M. E. Jones) Rydberg, sp. nov.

Astragalus desperatus petrophilus M. E. Jones, Rev. Astrag. 204. 1923.

A perennial, with a taproot and a short caespitose caudex; stems 1-4 cm. long, crowded, covered with broad conspicuous stipules and leaf-bases; leaves 1-4 cm. long, ascending; stipules ovate, 2-3 mm. long, pubescent; leaflets 5-9, elliptic to oval, obtuse, 3-4 mm. long, ashly-strigose; peduncles 1-3 cm. long; racemes short, 3-5-flowered; bracts lanceolate, 2-3 mm. long; calyx strigose, the tube 3 mm. long, the teeth lance-subulate, less than 1 mm. long; corolla purple, about 8 mm. long; banner broadly obovate, rather strongly arched above the middle; wings nearly as long, the blade oblong, strongly falcate, with a long reflexed auricle; keel-petals about as long, the blade strongly lunate, obtuse; pod obliquely ovoid, scarcely 1 cm. long, 4-5 mm. wide and thick, white-villous, the upper suture slightly concave, the lower strongly convex, somewhat sulcate at the base, the cross-section broadly subcordate.

TYPE LOCALITY: San Rafael Swell, Utah.

DISTRIBUTION: Type locality and vicinity.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 45.

15. *Batidophaca variegata* Rydberg.

Astragalus sparsiflorus majusculus A. Gray, Proc. Am. Acad. 6: 206. 1864.

Tium variegatum Rydb. Bull. Torrey Club 34: 47. 1907.

A caespitose perennial, with a taproot; stems many, erect or ascending, more or less mottled with purple or brown, 3-4 dm. high; leaves ascending, 5-8 cm. long; the rachis glabrous or nearly so; stipules triangular or deltoid, distinct, 4-5 mm. long; leaflets 13-21, obovate to orbicular, rounded or retuse at the apex, sparingly strigose, soon glabrate, 5-10 mm. long; peduncles 4-7 cm. long; racemes short, 1-2 cm. long, or in fruit 3-6 cm. long, 5-16 flowered; calyx black-hairy, the tube 2-2.5 mm. long, the teeth subulate, 1-2 mm. long; corolla ochroleucous; banner 6-7 mm. long, obovate, purple-veined; wings 5 mm. long, the blade broadly oblanceolate, longer than the claw, with a rounded auricle; keel-petals shorter, the blade broadly lunate, rounded at the apex with a small auricle; pod about 2 cm. long, 4 mm. wide, lance-oblong, tapering at each end, slightly arched, mottled with purplish-brown, minutely strigose, sulcate on the lower suture except at the end, the cross-section cordate.

TYPE LOCALITY: Platte Cañon, Colorado.

DISTRIBUTION: Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 26 (as var. *majusculus*).

16. *Batidophaca sparsiflora* (A. Gray) Rydberg.

Astragalus sparsiflorus A. Gray (Proc. Acad. Phila. 1863: 60. 1863), Proc. Am. Acad. 6: 205. 1864.

Tragacantha sparsiflora Kuntze, Rev. Gen. 948. 1891.

Tium sparsiflorum Rydb. Bull. Torrey Club 32: 660. 1906.

A caespitose perennial, with a taproot; stems many, decumbent, slender, 1-3 dm. long, sparingly strigulose; leaves ascending, 2-8 cm. long, the rachis strigulose; stipules ovate, strigose, 2-3 mm. long; leaflets 11-15, obovate, often retuse at the apex, 4-7 mm. long, glabrous above, strigulose beneath; peduncles 3-5 cm. long, slender; racemes short, 2-5-flowered; bracts lanceolate, 1 mm. long, shorter than the pedicels; calyx strigose, the tube 1.5 mm. long, the teeth subulate, 1 mm. long; corolla white; banner obovate, purple-veined, deeply notched; wings shorter, the blade broadly oblanceolate, arcuate; keel-petals still shorter, broadly lunate, almost semi-circular; pod 8-10 mm. long, obliquely obovate, strongly curved, strigose, mottled, the upper suture acute and up-curved, the lower deeply sulcate, the cross-section deeply cordate.

TYPE LOCALITY: Rocky Mountains, Colorado.

DISTRIBUTION: Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 26, f. 83.

17. *Batidophaca sabinarum* Rydberg, sp. nov.

A caespitose perennial; stems short, decumbent, 4-8 cm. long, branched, canescent with ascending hairs; leaves ascending, 5-8 cm. long; stipules ovate, acuminate, about 5 mm. long; leaflets 11-17, elliptic, 4-8 mm. long, acute at each end, grayish-pilose on both sides with ascend-

ing hairs; peduncles 3-5 cm. long; racemes 3-5-flowered; calyx villous, the tube 4 mm. long, with some black hairs, the teeth subulate, 3 mm. long, black-hairy; corolla unknown; pod sessile, lunate, 15-18 mm. long, 3-4 mm. wide, acute at each end, strigose-canescens, the upper suture acute, concavely curved, the lower strongly convex, usually sulcate at the middle, the cross-section at the middle broadly cordate.

Type collected in Cedar Cañon, Iron County, Utah, July 19, 1920, *A. O. Garrett R2660* (herb. N. Y. Bot. Gard.).

18. *Batidophaca obcordata* (Ell.) Rydberg.

Astragalus obcordatus Ell. Bot. S. C. & Ga. 2: 227. 1824.
Astragalus Elliottii D. Dietr. Syn. Fl. 4: 1080. 1847.
Tragacantha obcordata Kuntze, Rev. Gen. 946. 1891.
Tium obcordatum Rydb.; Small, Fl. SE. U. S. 619, 1332. 1903.

A caespitose perennial, with a taproot; stems numerous, 1-3 dm. long, decumbent or prostrate, glabrous; leaves spreading, 3-12 cm. long, the rachis glabrous; stipules lanceolate, 2-3 mm. long; leaflets 15-27, obcordate, 2-10 mm. long, glabrous on both sides, cuneate at the base; peduncles 3-7 cm. long; racemes short, 1-2 cm. long, 6-15-flowered; bracts lanceolate, 1-2 mm. long, shorter than the pedicels; calyx strigulose, the tube 3 mm. long, the teeth subequal, lanceolate, 2 mm. long; corolla white or purplish, 8-10 mm. long; banner obovate, rounded or slightly notched at the apex; wings slightly shorter, arcuate, the blade longer than the claw, semi-ovate, obtuse at the apex, with a large basal auricle; keel-petals about 7 mm. long, with shorter claw, the blade nearly semicircular, with a broad auricle; pod leathery, lance-lunate in outline, glabrous, cross-reticulate, acute at each end, 2-3 cm. long, 7-8 mm. wide, sulcate on the lower suture, acute on the upper, the cross-section cordate.

TYPE LOCALITY: Southern districts of Georgia, near St. Mary's.

DISTRIBUTION: Florida and Georgia.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 26, f. 82.

4. *Lotiflorae*. Low, almost stemless, caespitose plants with perennial roots. Flowers usually of two kinds, one kind borne in peduncled several-flowered racemes, fully developed, but less fertile, the other kind few and subsessile in the axils of the leaves, less well developed (perhaps cleistogamous) and self-fertilized. Calyx campanulate. Corolla ochroleucous, or veined or tinged with purple. Pod leathery, oblong-ovoid, inflated, the upper sutures straight, the lower convex.

19. *Batidophaca lotiflora* (Hook.) Rydberg.

Astragalus lotiflorus Hook. Fl. Bor. Am. 1: 152. 1831.
Phaca lotiflora T. & G. Fl. N. Am. 1: 349. 1838.
Astragalus lotiflorus pedunculatus A. Gray, Proc. Am. Acad. 6: 209. 1864.
Tragacantha lotiflora Kuntze, Rev. Gen. 946. 1891.
Astragalus lotiflorus elatiocarpus Rydb. Mem. N. Y. Bot. Gard. 1: 244, in part. 1900.
Cystopora lotiflora Lunell, Am. Midl. Nat. 4: 428. 1916.

A perennial, but apparently blooming the first season, with a deep, at first rather slender taproot, in age crowned with a caespitose caudex; stems branched at the base, 2-10 cm. high, densely covered with the pubescent deltoid stipules; leaves 4-10 cm. long, canescent with ascending hairs; leaflets 9-13, or on the earlier leaves fewer, silky-canescens, oblong or elliptic, 5-15 mm. long; flowers usually of two kinds, the earlier in short racemes on elongate peduncles, the later (or in seedling plants often all) subsessile or short-peduncled in the axils; peduncles of the earlier flowers 3-10 cm. long; racemes 4-12-flowered; calyx silky-pilose, the tube about 3 mm. long, the lobes subulate, 3.5-4 mm. long; corolla ochroleucous or sulphur-yellow, 8-9 mm. long; later flowers usually setting fruit without fully opening; calyx-lobes shorter, 3 mm. long or less; fruit semi-ovoid, lunate, upcurved towards the apex, acute at each end, 15-18 mm. long, 7-8 mm. wide, villous with short hairs, the upper suture prominent; seeds obliquely round-reniform.

TYPE LOCALITY: Carlton House on the Saskatchewan.

DISTRIBUTION: Plains, Saskatchewan to Nebraska and Colorado.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 28, f. 95; Britt. & Brown, Ill. Fl. f. 2137; ed. 2. f. 2540.

20. *Batidophaca cretacea* (Buckl.) Rydberg.

- Phaca cretacea* Buckl. Proc. Acad. Phila. 1861: 452. 1861.
Astragalus lotiflorus brachypus A. Gray, Proc. Am. Acad. 6: 209. 1864.
Astragalus Reverchoni A. Gray, Proc. Am. Acad. 19: 74. 1883.
Astragalus elatiocarpus Sheldon, Minn. Bot. Stud. 1: 20. 1894.
Astragalus ammolutus Greene, Erythraea 3: 76. 1895.
Astragalus lotiflorus elatiocarpus Rydb. Mem. N. Y. Bot. Gard. 1: 254. 1900.
Astragalus lotiflorus Reverchoni M. E. Jones, Contr. W. Bot. 10: 61. 1902.
Phaca Reverchonii Rydb.; Small, Fl. SE. U. S. 619, 1332. 1903.
Phaca elatiocarpa Rydb. Bull. Torrey Club 32: 665. 1906.
Astragalus Batesii A. Nelson, Bot. Gaz. 54: 150. 1912.
Cystopora elatiocarpa Lunell, Am. Midl. Nat. 4: 428. 1916.

A caespitose perennial, but blooming the first season, with a deep at first slender taproot, and a short caudex; stems branched at the base, 2-10 cm. high, canescent; stipules deltoid, pubescent; leaves 3-10 cm. long; leaflets oblong to oval, 5-20 mm. long, 2-6 mm. wide, silky-strigose on both sides, less densely so or glabrate above; flowers of two kinds, the earlier in short, long-peduncled racemes, sometimes not fruiting, the later, or in young plants all, subsessile or short-peduncled in the axils, evidently fruit-producing without fully opening; peduncles in the early flowers 4-15 cm. long; bracts subulate; racemes 4-10-flowered; calyx silky-canescens, the tube 3 mm. long, the lobes subulate, 4 mm. long; corolla ochroleucous, sometimes tinged or streaked with purplish, fully 1 cm. long; pod more or less lunate, 2.5-3 cm. long, 7-8 mm. wide, silky-strigose; seeds obliquely round-reniform. The var. *brachypus* and *elatiocarpus* represent the form with subsessile flowers. The species represents perhaps a luxuriant form of *B. lotiflora*.

TYPE LOCALITY: Northern Texas.

DISTRIBUTION: Minnesota to Texas, New Mexico, and Montana.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 23.

21. *Batidophaca nebraskensis* (Bates) Rydberg.

- Astragalus lotiflorus nebraskensis* Bates, Am. Nat. 29: 670. 1895.
Astragalus nebraskensis Bates, Torrey 5: 216. 1906.

A perennial, with a deep root and caespitose caudex; stems branched at the base, less than 1 dm. high; stipules hirsute, deltoid, 4-5 mm. long; leaves 5-7 cm. long, erect; leaflets oblong or elliptic, 1-2 cm. long, 4-6 mm. wide, hirsute on both sides; flowers 1-3 in the axils; peduncle nearly obsolete (peduncled racemes like those of *P. lotiflora* and *P. cretacea* not seen); calyx hirsute, the tube 3 mm. long, the lobes subulate, about 3 mm. long; corolla ochroleucous, like that of *P. lotiflora*; pod lance-ovoid, about 2 cm. long and 8 mm. wide, densely hirsute.

TYPE LOCALITY: Long Pine, Nebraska.

DISTRIBUTION: Nebraska and South Dakota.

44. *PISOPHACA* Rydberg, gen. nov.

Perennial herbs, with slender stems, rootstocks, and caespitose caudices. Leaves odd-pinnate, with mostly oblong leaflets. Flowers perfect, borne in many-flowered racemes. Calyx-tube campanulate, the teeth subulate. Corolla purple or white. Banner obovate, broad, strongly arched. Wings slightly shorter, more or less falcate, with a reflexed basal auricle. Keel-petals broader, more or less lunate, rounded or obtuse at the apex. Stamens diadelphous (9 and 1), the sheath straight, the upper fourth of the filaments distinct, and upcurved; anthers equal. Ovary sessile or nearly so; style slightly arched; stigma minute. Pod leathery, oblong or linear to elliptic or obovoid, subsessile or short-stipitate, terete in cross-section, from very slightly to considerably inflated, when very young filled within with spongy tissue, which in age becomes fibrous; seeds obliquely reniform.

Type species, *Phaca flexuosa* Hook.

Pod oblong or linear, slightly or not at all inflated.

Corolla 6-10 mm. long.

Corolla 12-15 mm. long.

Pod elliptic to oval or obovoid, distinctly inflated.

1. FLEXUOSAE.

2. HALLIANAE.

3. FAMELICAE.

1. FLEXUOSAE

Pod abruptly contracted into a very short stipe.

Pod glabrous; corolla white.

Leaflets 5-11, narrowly linear, glaucous, sparingly strigulose beneath.

Leaflets 11-21, oblong to linear, canescent beneath, but not glaucous.

Pod strigulose.

Pod mottled; corolla dark-purple.

Pod not mottled; corolla light-purple to white.

Pod straight or nearly so.

Leaves glabrous above.

Stipe of pod obsolete; corolla white.

Stipe of pod about 1 mm. long; corolla usually purplish.

Leaves strigose on both sides.

Pod distinctly arcuate.

Pod gradually tapering into the stipe.

1. *P. proxima*.
2. *P. Sierrae-Blancae*.
3. *P. ratonensis*.
4. *P. Diehlii*.
5. *P. flexuosa*.
6. *P. pinonis*.
7. *P. elongata*.
8. *P. Salidae*.

2. HALLIANAE

Leaflets from oblong or elliptic to cuneate; pod straight; stems 3-5 dm. high.

Leaflets linear or rarely narrowly oblong; pod curved; stems 1-2 dm. high.

9. *P. Hallii*.
10. *P. coriacea*.

3. FAMELICAE

Pod strigose or short-hispidulous, not mottled.

Calyx-lobes half as long as the tube or shorter.

Corolla nearly 15 mm. long; pod oblong-elliptic.

Leaflets oblong or oblanceolate.

Body of the pod rounded at the base, sessile, somewhat sulcate on the lower sture.

Body of the pod acute at each end, short-stipitate, not sulcate.

Leaflets linear.

Corolla about 10 mm. long.

Pod obovoid-elliptic, 8-10 mm. broad.

Pod ellipsoid, 5-7 mm. broad, or less.

Leaflets linear or linear-cuneate; pod sessile; corolla purplish.

Leaflets oblong to elliptic; pod stipitate; corolla ochroleucous.

Calyx-lobes about as long as the tube.

Pod villous, mottled.

Corolla about 10 mm. long.

Corolla about 15 mm. long.

Leaflets 13-19, obtuse or retuse.

Leaflets 31-41, acute.

11. *P. Gertrudis*.
12. *P. famelica*.
13. *P. antonina*.
14. *P. Greenei*.
15. *P. gracilentia*.
16. *P. Saundersii*.
17. *P. datilensis*.
18. *P. stictocarpa*.
19. *P. pinicea*.
20. *P. neomexicana*.

1. *Pisophaca proxima* Rydberg.

Homalobus proximus Rydb. Bull. Torrey Club 32: 667. 1906.

A caespitose perennial; stems erect, branched, 2-4 dm. high, grayish-strigose; stipules strigose, more or less connate, the lower ovate-deltoid, the upper deltoid-lanceolate; leaves 4-6 cm. long; leaflets 5-11, linear or linear-oblong, obtuse, 5-11 mm. long, 1-2 mm. wide, glaucous, glabrous above, grayish-strigose beneath; peduncles 3-6 cm. long, strigose; racemes 3-9 cm. long; bracts lanceolate, 1-2 mm. long; calyx strigose, the tube 2-2.5 mm. long, the lobes deltoid-subulate, 0.5 mm. long; corolla white or ochroleucous; banner obovate, 5-6 mm. long; wings nearly as long, the blades lunate; keel-petals shorter, with a rounded apex; pod linear, terete, glabrous, about 12 mm. long and 3 mm. wide and thick, abruptly contracted at the base into a stipe 2 mm. long.

TYPE LOCALITY: Arboles, Colorado.

DISTRIBUTION: Southern Colorado and northern New Mexico.

2. *Pisophaca Sierrae-Blancae* Rydberg, sp. nov.

A perennial, with a caespitose caudex; stems branched, 4-6 dm. high, strigose, striate; stipules more or less connate, strigose, the lower ovate-deltoid, the upper deltoid-lanceolate, 4-6 mm. long; leaves 4-6 cm. long; leaflets 11-27, linear to linear-oblong, 5-10 mm. long, 1-3 mm. wide, glabrous above, strigose beneath; peduncles 5-10 cm. long; racemes 4-10 cm. long, lax; calyx strigose, the tube about 3 mm. long, the teeth nearly 1 mm. long; corolla whitish, about 9 mm. long; banner 8-9 mm. long, obovate; wings nearly as long, the blade lunate, acutish, longer than the claw, with an oblong reflexed basal auricle; keel-petals 6-7 mm. long, broadly

lunate, with a rounded apex; pods linear-oblong, cylindrical, 12-15 mm. long, about 3 mm. wide and thick, glabrous, the stipe scarcely 1 mm. long, much shorter than the calyx-tube.

Type collected in the White Mountains, Lincoln County, New Mexico, July 26, 1897, *E. O. Wootton 213* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: White Mountains, New Mexico, and apparently also Elk Mountains, Utah.

3. *Pisophaca ratonensis* Rydberg, sp. nov.

A perennial, with a woody root and caespitose caudex; stems ascending or decumbent at the base, branched, 2-3 dm. high, grayish-strigose; leaves ascending, 3-5 cm. long, the rachis strigose; stipules lanceolate or deltoid, acuminate, 4-5 mm. long; leaflets 11-19, linear or oblong, or those of the lower leaves cuneate-obovate, 4-12 mm. long, 2-3 mm. wide, glabrous above, strigose-canescens beneath, obtuse to truncate or emarginate at the apex; peduncles 3-7 cm. long; racemes 2-5 cm. long, bracts lance-subulate, 2-3 mm. long; pedicels 1 mm. long; calyx strigose-canescens, the tube 3 mm. long, 2 mm. broad, the teeth lance-subulate, 1.5 mm. long; corolla dark-purple, only the claws paler, about 1 cm. long; banner broadly obovate, rather strongly arcuate at the middle; wings nearly as long, the blade oblong-oblancoate, slightly falcate, obtuse, with a long reflexed auricle; keel-petals much shorter, the blade broadly lunate, strongly arched towards the rounded apex, with a smaller auricle; pod strigose, mottled with purple or brown, the stipe about 0.5 mm. long, the body oblong, acute at each end, 15-18 mm. long, 4 mm. wide, and nearly as thick, nearly round in cross-section.

Type collected at Des Moines, Union County, New Mexico, June 14, 1924, *Eggleston 20114* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: New Mexico.

4. *Pisophaca Diehlii* (M. E. Jones) Rydberg.

Astragalus Diehlii M. E. Jones, Rev. Astrag. 194. 1923.

A perennial, with a woody root; stems several, ascending, branched, flexuose, strigose-canescens; leaves spreading, 3-7 cm. long; stipules broadly deltoid, 2-3 mm. long; leaflets 11-19, linear to cuneate, 7-15 mm. long, 2-4 mm. wide, often conduplicate, obtuse or rounded at the apex, glabrous above, strigose beneath; peduncles 3-5 cm. long; racemes 2-5 cm. long; bracts lanceolate, 1-2 mm. long; pedicels 2 mm. long; calyx strigose, the tube 2 mm. long and broad, the teeth subulate, 1 mm. long; corolla white, about 8 mm. long; banner broadly obovate, abruptly arched at the middle; wings nearly as long, the blade oblong-oblancoate, strongly falcate, with a large reflexed auricle; keel-petals much shorter, the blade broadly lunate, the margin strongly arched towards the rounded apex; pod sessile, oblong, abruptly acute at each end, strigose, 1-1.5 cm. long, 3-3.5 mm. wide and thick; seeds brown, obliquely reniform, 3 mm. long, 2 mm. wide.

TYPE LOCALITY: Farnham, Utah.

DISTRIBUTION: Eastern Utah and western Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 43, f. 154*.

5. *Pisophaca flexuosa* (Dougl.) Rydberg.

Phaca flexuosa Hook. Fl. Bor. Am. 1: 141. 1831.

Astragalus flexuosus Dougl.; Hook. Fl. Bor. Am. 1: 141, as synonym. 1831.

Phaca Fendleri A. Gray, Mem. Am. Acad. II. 4: 36. 1849.

Astragalus Fendleri A. Gray, Pl. Wright. 2: 44. 1853.

Tragacantha Fendleri Kuntze, Rev. Gen. 944. 1891.

Tragacantha flexuosa Kuntze, Rev. Gen. 945. 1891.

Astragalus flexuosus Fendleri M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Homalobus flexuosus Rydb. Bull. Torrey Club 32: 666. 1906.

Homalobus Fendleri Rydb. Bull. Torrey Club 32: 667. 1906.

A perennial, with a branched rootstock; stems from erect to decumbent, branched, sometimes flexuose, strigose-canescens, leafy; lower stipules broadly deltoid, acuminate, connate, more or less scarious, the upper ones lanceolate, distinct, strigose; leaves 4-10 cm. long, spreading; leaflets 15-25, oblong or rarely obovate, acute at the base, obtuse to retuse at the apex, 5-18 mm. long, 1-4 mm. wide, strigose beneath, glabrous above; peduncles 5-10 cm. long; racemes about as long, lax; bracts subulate, 2 mm. long; calyx strigose, the tube 3 mm. long,

the teeth deltoid-subulate less than 1 mm. long; corolla whitish or tinged with purple; banner obovate, 8–10 mm. long, tapering below into a broad claw, retuse at the apex; wings 7–8 mm. long, the blade lunate, acutish, a little longer than the claw, with a rounded apex and a large basal auricle; pod linear, terete, 1.5–2 cm. long, 3–4 mm. wide and thick, strigose, the stipe about 1 mm. long; seeds obliquely reniform, 2.5 mm. long.

TYPE LOCALITY: Red River, Manitoba.

DISTRIBUTION: Manitoba to Alberta, New Mexico, and Kansas.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 43, f. 153; Britt. & Brown, Ill. Fl. f. 2142; ed. 2 f. 2552; Fl. Neb. 21: pl. 9, f. 10–12; Clements, Rocky Mt. Fl. pl. 29, f. 22.

6. *Pisophaca pinonis* (M. E. Jones) Rydberg.

Astragalus pinonis M. E. Jones, Contr. W. Bot. 8: 14. 1898.

A perennial, with a rootstock; stem branched below, flexuose, 1–2 dm. high, strigose-canescens; leaves 5–7 cm. long, spreading; stipules deltoid, 1–2 mm. long, distinct, membranaceous; leaflets 9–21, linear, rounded at each end, 8–15 mm. long, 2 mm. wide, strigose-canescens on both sides; peduncles 2–4 cm. long; racemes 2–3 cm. long; pedicels 3–4 mm. long; calyx strigose, the tube turbinate, 2 mm. long, the teeth subulate, 1.5 mm. long; corolla purple, about 8 mm. long; banner obovate, about equaled by the wings and keel; pods narrowly oblanceolate, short-stipitate, strigose, about 2 cm. long, 4 cm. wide, tapering at each end; many-seeded.

TYPE LOCALITY: Frisco, Utah.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones Rev. Astrag. pl. 44.

7. *Pisophaca elongata* (Hook.) Rydberg.

Phaca elongata Hook. Fl. Bor. Am. 1: 140. 1831.

Astragalus flexuosus elongatus M. E. Jones, Contr. W. Bot. 10: 58. 1902.

A perennial, with branched rootstock; stem erect, 3–5 dm. high, grayish-canescens; lower stipules broadly deltoid, connate, the upper ones lanceolate, distinct; leaves 4–8 cm. long, spreading; leaflets 15–19, linear or those of the lower leaves oblong or oblanceolate, 5–15 mm. long, 1–2 mm. wide, strigose beneath, glabrous above; peduncles 5–10 cm. long; racemes 5–10 cm. long, lax; calyx strigose, the tube 3 mm. long, the lobes deltoid, slightly more than 0.5 mm. long; corolla whitish; banner obovate, with a broad claw, deeply notched; wings nearly as long, the blade lunate, acutish; keel-petals 6–7 mm. long, with a rounded apex; pod linear, 12–18 mm. long, 2–2.5 mm. wide and thick, usually somewhat curved upwards.

TYPE LOCALITY: Plains of the Saskatchewan.

DISTRIBUTION: Saskatchewan to Alberta, Montana, and Minnesota.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 43.

8. *Pisophaca Salidæ* Rydberg.

Homalobus Salidæ Rydb. Bull. Torrey Club 32: 667. 1906.

A perennial; stem decumbent or ascending, about 3 dm. long; stipules deltoid-ovate, strigose; leaves 5–7 cm. long; leaflets 15–21, oblong-oblanceolate to linear, 8–15 mm. long, 0.5–3 mm. wide, strigose beneath, nearly glabrous above; peduncles 5–10 cm. long; racemes lax, 6–8 cm. long; pedicels 5 mm. long, ascending; calyx strigose, slightly black-hairy, the tube about 3 mm. long, the teeth deltoid, less than 1 mm. long; corolla purple-veined; banner about 8 mm. long; wings nearly as long, with a lunate blade; keel-petals 6 mm. long, with a rounded apex; pod narrowly linear-oblanceolate, terete or nearly so, 2–2.5 cm. long, 2 mm. wide and thick, finely strigose, acute at the apex, tapering into the short stipe below.

TYPE LOCALITY: Salida, Colorado.

DISTRIBUTION: Known only from the type locality.

9. *Pisophaca Hallii* (A. Gray) Rydberg.

Astragalus Hallii A. Gray, Proc. Am. Acad. 6: 224. 1864.
Tragacantha Hallii Kuntze, Rev. Gen. 945. 1891.
Astragalus gracilentus Hallii M. E. Jones, Contr. W. Bot. 8: 13. 1898.
Homalobus Hallii Rydb. Bull. Torrey Club 32: 667. 1905.

A caespitose perennial, with a woody root; stems numerous, sometimes partly under ground, 3-5 dm. long, decumbent, flexuose, branched, striate, sparingly strigose, 3-6 dm. long; leaves spreading, 5-10 cm. long, the rachis strigose; stipules lance-deltoid, 3-4 mm. long; leaflets 13-23, oblong or elliptic, cuneate at the base, rounded, truncate, or retuse at the apex, glabrous above, strigose beneath, 5-15 mm. long, 2-6 mm. wide; peduncles erect, 4-12 cm. long; racemes 3-8 cm. long; bracts subulate 2-3 mm. long, sometimes often purple-tinged, the tube 5 mm. long, 2.5 mm. thick, the teeth unequal, deltoid, about 1 mm. long; corolla 12-15 mm. long, purple; banner decidedly arcuate; wings slightly shorter, the blade broadly oblanceolate, about equaling the claw, with a reflexed auricle; keel-petals broader and shorter, the blade semi-orbicular, shorter than the claw; pod oblanceolate-ellipsoid, slightly broader above the middle, terrete, short-stipitate, acute at each end, glabrous, about 2 cm. long, 5-6 mm. wide and thick; seeds brown, obliquely reniform, 2 mm. long.

TYPE LOCALITY: Valleys of the Rocky Mountains of Colorado.
 DISTRIBUTION: Mountains of Colorado.
 ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 44.

10. *Pisophaca coriacea* (Hemsl.) Rydberg.

Astragalus coriaceus Hemsl. Biol. Centr. Am. Bot. 1: 263. 1880.

A perennial, with a caespitose caudex; stems flexuose, angled, puberulent, 1-2 dm. high; leaves ascending, 2-4 cm. long; stipules free, linear-lanceolate, about 2 mm. long; leaflets 13-17, thick, linear, strigillose, obtuse, 10-12 mm. long; peduncles 2-3 cm. long, erect; racemes few-flowered, short; bracts subulate; calyx hirsute, the tube about 5 mm. long, the teeth 1-1.5 mm. long, subulate; corolla 12-15 mm. long, apparently purplish; banner obovate, rather narrow; wings and keel-petals much shorter; pod coriaceous, glabrous, cylindrical, somewhat curved, about 1.5 cm. long and 6 mm. wide, rostrate.

TYPE LOCALITY: Zacatecas.
 DISTRIBUTION: Known only from the type locality.

11. *Pisophaca Gertrudis* (Greene) Rydberg.

Astragalus Gertrudis Greene, Leaflets 2: 43. 1910.

A perennial, with a woody root; stems numerous, ascending, flexuose, branched, purplish, 2-3 dm. long, more or less strigose; leaves 4-7 cm. long, spreading; lower stipules connate, the upper free, deltoid-lanceolate, 3-4 mm. long; leaflets 17-23, cuneate-oblong, rounded to retuse at the apex, 5-10 mm. long, 2-3 mm. wide, varying from strigose on both sides to glabrate; peduncles about 5 cm. long; racemes short, 2-4 cm. long; bracts lanceolate, 2-3 mm. long; pedicels about 2 mm. long; calyx loosely pilose to glabrate, the tube 5-6 mm. long, the lobes 2.5-3 mm. long, subulate; corolla about 15 mm. long, purple; banner with darker veins, obovate; wings shorter, the blade broadly oblanceolate, longer than the claw, with a large auricle; keel-petals shorter, the blade broadly lunate, shorter than the claw; pod short-villous, oblong, rounded at the base, acute at the apex, about 2 cm. long, 5 mm. wide, 6 mm. thick, the upper suture nearly straight, the lower more ventricose and sulcate.

TYPE LOCALITY: Toas County, New Mexico.
 DISTRIBUTION: Known only from the type locality.

12. *Pisophaca famelica* (Sheldon) Rydberg.

Astragalus fallax S. Wats. Proc. Am. Acad. 20: 362. 1885. Not *A. fallax* Fischer, 1853.
Astragalus famelicus Sheldon, Minn. Bot. Stud. 1: 23. 1894.
Astragalus gracilentus fallax M. E. Jones, Contr. W. Bot. 8: 14. 1898.

A caespitose perennial, with a woody root; stems several, decumbent at least at the base, striate, strigose, 3-4 dm. high; leaves ascending, 5-7 cm. long, the rachis strigose; stipules

deltoid, 2-3 mm. long, strigose; leaflets 13-21, oblanceolate, oblong or obovate, 4-12 mm. long, 2-5 mm. wide, rounded, truncate, or retuse at the apex, cuneate at the base, strigose on both sides, sparingly so or glabrate above, grayish beneath; peduncle 5-10 cm. long; racemes 2-4 cm. long; bracts lanceolate, 2 mm. long; calyx strigose, often more or less black-hairy, the tube 5 mm. long, 3 mm. wide, the teeth subulate, 1 mm. long; corolla purple, about 15 mm. long; banner obovate; wings nearly as long, the blade oblanceolate, about equaling the claw, with a reflexed auricle; keel-petals shorter and broader, the blade shorter than the claw; pod short-stipitate, obliquely semi-obovate in outline, terete, nearly straight on the upper suture, ventricose on the lower, 2-2.5 cm. long, 8 mm. wide, 7-8 mm. thick, broadest above the middle, acute at each end.

TYPE LOCALITY: Western New Mexico.

DISTRIBUTION: New Mexico, Arizona, and southern Colorado.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl. 44*.

13. *Pisophaca antonina* (S. Wats.) Rydberg.

Astragalus antoninus S. Wats. *Proc. Am. Acad.* 17: 343. 1882.

A caespitose perennial; stems several, branches flexuose, slender, 2-3 dm. high, canescent-strigose; leaves 5-8 cm. long; stipules deltoid, acuminate, 2 mm. long; leaflets 13-19, linear, about 1 cm. long, 1-2 mm. wide, strigose; peduncles 7-10 cm. long, erect; racemes few-flowered, 2-3 cm. long; bracts subulate, 2 mm. long, longer than the pedicels; calyx strigose with black hairs, the tube 5 mm. long, the teeth subulate, 1.5 mm. long; corolla light-purple, about 15 mm. long; banner obovate, retuse at the apex; wings nearly as long, the blade broadly oblanceolate, with a large reflexed auricle; keel-petals 12 mm. long, the blade nearly semi-orbicular, rounded at the apex, shorter than the claw; pod subsessile, ovoid-ellipsoid, 2 cm. long, strigulose, abruptly contracted at the base, acute at the apex, 7-8 mm. thick, 5 mm. wide.

TYPE LOCALITY: San Antonio de la Alanganes, Coahuila.

DISTRIBUTION: Coahuila.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl. 44, f. 157*.

14. *Pisophaca Greenei* (A. Gray) Rydberg.

Astragalus Greenei A. Gray, *Proc. Am. Acad.* 16: 105. 1880.

Astragalus gracilentus Greenei M. E. Jones, *Contr. W. Bot.* 8: 14. 1898.

A caespitose perennial; stems several, decumbent at least at the base, flexuose, branched, grayish-strigose; leaves ascending, 4-7 cm. long, the rachis strigose; stipules deltoid, 2-3 mm. long; leaflets oblong or oblong-oblanceolate, 5-10 mm. long, 2-4 mm. wide, pilose on both sides or glabrate above, rounded or retuse at the apex; peduncles 5-10 cm. long; raceme 3-5 cm. long; bracts subulate, 2 mm. long; calyx white-pilose with rather loose hairs, the tube 3.5-4 mm. long, the teeth subulate, 1.5-2 mm. long; corolla white, sometimes tinged with purple; banner 10-12 mm. long, obovate; wings nearly as long, the blade broadly oblanceolate, with a reflexed auricle; keel-petals much shorter, the blade broadly lunate; pod obovoid, strigulose, 1.5-2 cm. long, 10-13 mm. wide, 10-11 mm. thick, acutish at each end.

TYPE LOCALITY: Foothills of Mogollon Mountains, New Mexico.

DISTRIBUTION: New Mexico and northwestern Texas.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl. 44*.

15. *Pisophaca gracilenta* (A. Gray) Rydberg.

Phaca gracilenta A. Gray, *Mem. Am. Acad.* 4: 36. 1849.

Astragalus gracilentus A. Gray, *Proc. Am. Acad.* 6: 223. 1864.

Tragacantha gracilenta Kuntze, *Rev. Gen.* 943. 1891.

A perennial, with a caespitose caudex or rootstock; stems several, decumbent, flexuose, 3-4 dm. long, canescent-strigose; leaves 4-6 cm. long, spreading; stipules lanceolate, reflexed, 3 mm. long; leaflets 15-19, linear-oblong to elliptic, 5-10 mm. long, obtuse or retuse, glabrate above, canescent-strigose beneath; peduncles 4-7 cm. long, ascending; racemes short, 3-5 cm. long, 8-20-flowered; bracts lanceolate, 2 mm. long; calyx more or less black-hairy, the tube campanulate, 3-3.5 mm. long, the teeth subulate, 1.5-2 mm. long; corolla pale-purple or white,

about 10 mm. long; banner obovate, retuse, strongly arched; wings much shorter, the blade oblong, falcate, equaling the claw, with a large basal auricle; keel-petals broader and shorter, the blade lunate; pod slightly stipitate, the body strigulose, ellipsoid, tapering at each end, 15–20 mm. long, 5–7 mm. wide and thick.

TYPE LOCALITY: Santa Fé, New Mexico.

DISTRIBUTION: New Mexico and Arizona to Durango.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 44, f. 155.

16. *Pisophaca Saundersii* Rydberg, sp. nov.

A caespitose perennial; stems decumbent at the base, 3–5 dm. high, branched, sparingly strigose, terete; leaves ascending, 6–10 cm. long; stipules broadly deltoid, 3–5 mm. long; leaflets 15–19, oblong or oblanceolate, 1–2 cm. long, 3–6 mm. wide, glabrate above, sparingly strigose beneath, rounded, truncate or retuse at the apex, cuneate at the base; peduncles 5–10 cm. long; racemes 3–6 cm. long, rather lax; bracts lance-subulate, 2–3 mm. long; pedicels 1 mm. long; calyx grayish-strigose, the tube 3 mm. long, 2 mm. broad, the teeth subulate, 1.5 mm. long; corolla apparently ochroleucous, about 8 mm. long; banner broadly obovate, abruptly arched at the middle; wings shorter, the blade oblanceolate, falcate, keel-petals shorter, the blade broadly lunate, rounded at the apex; pod stipitate, strigose, the stipe 1.5 mm. long, the body oblong, 12–15 mm. long, 5–6 mm. thick, membranous.

Type collected at Glenwood Springs, Colorado, June 11, 1893, *D. A. Saunders* D (herb. Univ. Minn.).

17. *Pisophaca datilensis* Rydberg, sp. nov.

A caespitose perennial¹; stems decumbent at the base, 2–3 dm. high, sparingly strigose with rather long hairs; leaves spreading, 4–7 cm. long; stipules lance-deltoid, long-acuminate, 5–6 mm. long; leaflets 11–15, oblong-oblanceolate, abruptly short-acuminate at the apex, acute at the base, 5–18 mm. long, 2–5 mm. wide, green, sparingly strigose beneath, glabrous above; peduncles 5–6 cm. long; racemes 2–3 cm. long; bracts lanceolate, about 5 mm. long; pedicels 1 mm. long; calyx long-strigose, the tube 4 mm. long, 3 mm. wide, the teeth 3.5 mm. long, lanceolate; corolla light-purple, fully 1 cm. long; banner broadly obovate; wings nearly as long, the blade oblanceolate, slightly falcate, with a large basal auricle; keel-petals much shorter, the blade obliquely obovate, rounded at the apex; pod ovoid-elliptic, sparingly strigose, obtuse at the base, acute at the apex, sessile, 12–15 mm. long, 5 mm. wide and thick.

Type collected at Negrito Ranger Station, Datil Forest, New Mexico, September 22, 1919, *Eggleston*, 16087 (herb. N. Y. Bot. Gard.).

18. *Pisophaca stictocarpa* Rydberg, sp. nov.

A caespitose perennial; stems many, decumbent, flexuose, much branched, grayish-strigose, about 3 dm. long, leaves spreading, 4–8 cm. long, the rachis strigose; stipules deltoid, 3–4 mm. long, acuminate; leaflets 15–25, oblong or cuneate, 5–12 mm. long, rounded or retuse at the apex, pilose on both sides, sparingly so above; peduncles 4–6 cm. long; racemes 4–10 cm. long, many-flowered; bracts subulate, 2 mm. long, longer than the pedicels; calyx pilose, the tube 3–4 mm. long, the teeth subulate, 2 mm. long; corolla purple, 8–10 mm. long; banner obovate, moderately arched; wings shorter, the blade obliquely oblanceolate, somewhat falcate, with a large basal auricle; keel-petals shorter, the blade broadly lunate, almost semi-orbicular; pod sessile, short-villous, mottled, obliquely ovoid, 1.5–2 cm. long, 5 mm. wide, 6 mm. thick, rounded at the base, acute at the apex, membranous.

Type collected on hills at Santa Fé, New Mexico, May 28, 1897, *Heller*, 3606 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Type locality and Sandia Mountains, New Mexico.

19. *Pisophaca punicea* (Osterhout) Rydberg.

Astragalus puniceus Osterhout, *Muhlenbergia* 1: 140. 1906.

Xylophacos puniceus Rydb. Bull. Torrey Club 40: 48. 1913.

Astragalus gracilentus exsertus M. E. Jones, Rev. Astrag. 195. 1923.

A perennial, with a creeping rootstock; stems decumbent below, 3–5 dm. long, pilose-canescens; leaves ascending, 6–10 dm. long; stipules lanceolate, 4–6 mm. long, pilose, green;

leaflets 13-19, oblong to obovate, 5-15 mm. long, 3-5 mm. wide, grayish-pilose on both sides, rounded to retuse at the apex; peduncles 6-10 cm. long; racemes at first short, 2-3 cm. long, in age 5-8 cm. long; bracts lanceolate, 4-5 mm. long; calyx white-villous, the tube 5 mm. long, the teeth subulate, 2 mm. long; corolla purple, 12-18 mm. long; banner obovate, retuse; wings shorter, the blade oblanceolate; keel-petals short and broad, abruptly arcuate and rounded at the apex; pod sessile, coriaceous, 2 cm. long, arcuate, pilose-villous, somewhat mottled, cross-reticulate, 6-7 mm. broad, the lower suture impressed.

TYPE LOCALITY: Trinidad, Los Animas County, Colorado.

DISTRIBUTION: Southeastern Colorado and western Oklahoma.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 44*.

20. *Pisophaca* (?) *neomexicana* (Wooton & Standley) Rydberg.

Astragalus neomexicanus Wooton & Standley, Contr. U. S. Nat. Herb. 16: 136. 1913.

A perennial, with a caespitose caudex; stems ascending, sparingly and loosely pubescent, about 3 dm. high; leaves 10-18 cm. long, ascending; stipules narrowly deltoid-lanceolate, 8-10 mm. long, adnate to the petiole; leaflets 31-41, sparingly villous on both sides, glabrate above, elliptic or lanceolate, acute at each end, 8-12 mm. long; peduncle 1-1.5 dm. long, erect; racemes 5-10 cm. long; bracts linear-lanceolate, attenuate, 5-7 mm. long, twice as long as the pedicels; calyx black-hairy, the tube about 7 mm. long, 4 mm. wide, the teeth subulate, 3-4 mm. long, corolla purple, about 2 cm. long; banner obovate, moderately arched, slightly retuse; wings slightly shorter, the blade obliquely oblanceolate, nearly as long as the claw, with a large reflexed auricle; keel-petals much shorter, the blade obliquely lunate, very round at the apex; ovary densely villous; pod unknown.

TYPE LOCALITY: James Canyon, Sacramento Mountains, near Cloudercroft, New Mexico.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 44, f. 159*.

45. *PHACA* L. Sp. Pl. 755. 1753.

Physondra Raf. Atl. Jour. 145. 1832.

Cystophora Lunell, Am. Midl. Nat. 4: 428. 1916.

Perennial or annual herbs, mostly with well developed leafy stems. Leaves odd-pinnate, the stipules free or united, the leaflets entire. Flowers in axillary racemes. Calyx-tube campanulate, the lobes 5. Corolla purple, white, or yellowish. Banner obovate, almost clawless and with spreading margins. Wings usually shorter, clawed, the blade with a basal auricle. Keel-petals still shorter, the blade more or less lunate, not produced into a beak. Stamens diadelphous (9 and 1), the sheath straight, the free upper portion of the filaments up-curved. Ovary sessile or stipitate; style glabrous, upcurved at the apex; stigma minute. Pod papery or rarely membranous, decidedly inflated, sessile or stipitate, mostly rounded-ellipsoid, indehiscent or tardily dehiscent at the apex. Seeds numerous, mostly obliquely rounded-reniform.

Type species, *Phaca alpina* L.

Pod papery, indehiscent or tardily splitting.

Pod stipitate.

Pod sessile.

Pod more or less leathery, at maturity 2-valved at the apex.

Subgenus A. **PODOCYSTIS.**

Subgenus B. **CHARTOCYSTIS.**

Subgenus C. **DERMATOCYSTIS.**

A. **PODOCYSTIS**

Stipe exceeding the calyx.

Calyx-lobes broadly triangular, broader than long.

Calyx-lobes lanceolate to subulate, longer than broad.

Pod acuminate at each end, somewhat compressed.

Pod rounded and mucronate or merely acute at the apex, turgid.

Stipe shorter than the calyx.

Pod ellipsoid or rounded-ellipsoid, broadest near the middle.

Corolla more than 1 cm. long (except in *P. Wetherillii*), ochroleucous or white; banner slightly arcuate and usually above the middle; plants with a caespitose caudex.

Leaflets linear to oblong; stems 3 dm. high or more.

1. **FRIGIDAE.**

2. **OXYPHYSAE.**

3. **TRICHOPODAE.**

- Leaflets elliptic to broadly linear; corolla twice as long as the calyx or less.
- Leaflets narrowly linear; corolla about three times as long as the calyx.
- Leaflets broadly obovate or obcordate; stems usually less than 3 dm. high.
- Corolla less than 1 cm. long; banner rather strongly arcuate at the middle.
- Leaflets narrowly linear or abortive; plants with running rootstocks; corolla ochroleucous.
- Leaflets elliptic; plants with a cespitose caudex; corolla purple.
- Pod decidedly obovoid, broadest above the middle; low plants with a cespitose caudex.
3. TRICHOPODAE.
4. CUSICKIANAE.
5. MEGACARPAE.
7. PICTAE.
8. NUTANTES.
6. HOOKERIANAE.
- B. CHARTOCYSTIS
- Pod ellipsoid, round in cross-section, broadest at the middle, or, if somewhat ovoid (*P. oocarpa*) or with the upper suture straight (*P. topoensis* and *P. allochroa*), both sutures rounded.
- Pod more than 1 cm. long.
- Corolla more than 1 cm. long, ochroleucous or white, or rarely purplish (*P. candidissima* and *P. allochroa*).
- Plant mostly tall, the leaflets not crowded.
- Calyx-lobes deltoid, one fourth to one third as long as the tube; banner rather broad, abruptly arcuate at the middle.
- Calyx-lobes lanceolate or subulate, at least half as long as the tube.
- Plant green, neither densely white-tomentose nor white-villous (somewhat villous in *P. densifolia*).
- Racemes rather lax; banner broad and strongly arched at the middle, much longer than the wings.
- Racemes dense; banner narrower and moderately arched, slightly longer than the wings.
- Plant densely white-tomentose or white-villous.
- Plant low, the internodes short, the leaflets crowded, white-tomentose.
- Corolla 8 mm. long or less; banner strongly arched.
- Plants perennial.
- Stems numerous, decumbent or spreading, from a woody caudex; leaflets crowded, less than 5 mm. long; pod round-ellipsoid, mottled.
- Stems few, from creeping rootstocks; leaflets not crowded, 6-10 mm. long; pod narrowly ellipsoid, not mottled.
- Plants annual, or short-lived perennials; stem erect, branched at the base; leaflets more than 5 mm. long, not crowded.
- Pod less than 1 cm. long.
- Plant low, subcaulescent; leaves crowded, with numerous stiff linear leaflets.
- Plant with elongate slender stems; leaves and leaflets not crowded.
- Pod obliquely ovoid, broadest below the middle, the upper suture usually acute, straight or concavely curved, if convex less so than the lower.
- Annuals or short-lived perennials, not with a cespitose caudex; racemes usually lax.
- Perennials, with a cespitose caudex.
- Racemes few-flowered; plants low, decumbent.
- Racemes dense, many-flowered; plants tall, stout.
9. OOCARPAE.
10. DOUGLASIANAE.
11. DENSIFOLIAE.
12. CANDIDISSIMAE.
13. LUTOSAE.
14. SERPENTES.
15. POLARES.
16. CANDOLLEANAE.
20. JEJUNAE.
21. MICROCYSTES.
17. ANNUAE.
18. PUBENTISSIMAE.
19. PSYCHOSTACHYAE.
- C. DERMATOCYSTIS
- Corolla 15-20 mm. long, mostly purple; pod stipitate, ascending.
- Corolla 10-15 mm. long, white; pod strictly sessile, ascending ovoid.
22. PREUSSIANAE.
23. NEGLECTAE.
1. FRIGIDAE
- Leaves sparingly pilose beneath; calyx not black-hairy; pod glabrous.
- Leaves densely villous beneath; calyx and pod black-hairy.
1. *P. americana*.
2. *P. littoralis*.
2. OXYPHYSAE
- One species.
3. *P. oxyphysa*.
3. TRICHOPODAE
- Stipe of the pod much exceeding the calyx.
- Pod pubescent.
- Stipe of the pod two thirds as long to fully as long as the body; leaflets linear to oblong, appressed white-silky.
- Stipe of the pod less than half as long as the body; leaflets oval or oblong, loosely white-villous.
- Pod glabrous.
4. *P. asymmetrica*.
5. *P. leucopsis*.

- Corolla 12-15 mm. long; body of the pod 2.5-4 cm. long.
 Leaflets glabrous above, rather green, thin; body of the pod 2.5-3 cm. long, the stipe 1-1.5 cm. long.
 Leaflets silvery-silky on both sides; body of the pod 3-4 cm. long.
 Corolla 9-10 mm. long; body of the pod 1.5-2.5 cm. long; leaflets glabrous above.
 Pod with both sutures convex.
 Pod with the upper suture straight.
 Stipe of the pod short, not exceeding the calyx-lobes.
 Corolla 12-15 mm. long; pod 3-5 cm. long, obliquely ovate in outline, obtuse at the base.
 Body of the fruit 2.5-3 cm. long, usually more or less pubescent when young; calyx-lobes subulate.
 Body of the fruit 4-4.5 cm. long, glabrous; calyx-lobes deltoid.
 Corolla about 10 cm. long; pod 2-2.5 cm. long, obliquely lanceolate in outline, tapering at each end.
4. CUSICKIANAE
- One species.
5. MEGACARPAE
- Pod strigose; calyx distinctly black-hairy; corolla about 1 cm. long.
 Pod glabrous; calyx glabrous or nearly so, corolla 1.5-2 cm. long.
 Stem more or less elongate, 1-3 dm. high; stipe of the pod about as long as the calyx-tube; corolla 15-18 mm. long.
 Pod ellipsoid, 4-5 cm. long, equally gibbous on both sutures.
 Leaflets elliptic; corolla ochroleucous.
 Leaflets broadly oval, often retuse; corolla purple.
 Pod obliquely ovoid, 2.5-3 cm. long, more gibbous on the lower suture; leaflets obcordate or obovate; flowers ochroleucous.
 Stem very short, less than 1 dm. long; stipe much shorter than the calyx-tube; corolla 18-20 mm. long.
6. HOOKERIANAE
- Pod pubescent; leaves hirsute-strigose.
 Pod glabrous.
 Leaves strigose.
 Leaflets obovate or oval, silvery; corolla purplish, 15 mm. long.
 Leaflets oblong, merely canescent; corolla yellowish, 10-12 mm. long.
 Calyx scarcely dark-hairy, except the lanceolate teeth; leaflets broadly oblong; pod 3-3.5 cm. long.
 Calyx dark-hairy, its teeth subulate; leaflets linear-oblong or linear; pod 2-2.5 cm. long.
 Leaves canescent.
 Leaves strigose, not canescent.
 Leaves villous.
7. PICTAE
- Terminal leaflet represented by the prolonged rachis; lateral leaflets also sometimes lacking.
 Terminal and lateral leaflets present; rachis not produced.
8. NUTANTES
- One species.
9. OOCARPAE
- Leaflets glabrous or nearly so, at least above.
 Pod glabrous, ovoid, broadest near the base, rather firm, ascending, 2-2.5 cm. long.
 Pod pubescent, oval- or lance-ellipsoid, broadest at the middle, membranous, spreading, 4-5 cm. long.
 Upper suture of the pod as well as the lower gibbous; leaflets oblong or broadly elliptic.
 Racemes longer than the leaves; calyx-teeth broadly deltoid; pod 3.5-4 cm. long.
 Racemes scarcely exceeding the leaves; calyx-teeth lance-deltoid; pod 4-5 cm. long, papery.
 Upper suture of the pod straight or nearly so; leaflets narrowly oblong.
 Leaflets decidedly strigose on both sides; pod pubescent.
 Pod 4 cm. long or less, not very thin, more than half as broad as long; peduncles spreading and arcuate.
 Pod 5-6 cm. long, thin, papery, half as broad as long; peduncles ascending, strict.
10. DOUGLASIANAE
- Corolla yellowish.
 Leaflets elliptic to oblong-linear, obtuse.
 Calyx densely white-strigose; pod 3-4 cm. long.
 Calyx sparingly black-hairy; pod 5-6 cm. long.
 Leaflets lance-linear, acuminate.
 Corolla purple-tinged.
6. *P. Encenadae*.
 4. *P. asymmetrica*.
 7. *P. trichopoda*.
 8. *P. capillipes*.
 9. *P. curtipes*.
 10. *P. potosina*.
 11. *P. fastidia*.
 12. *P. Cusickii*.
 13. *P. Wetherilli*.
 14. *P. oophora*.
 15. *P. jucunda*.
 16. *P. artipes*.
 17. *P. megacarpa*.
 18. *P. Hookeriana*.
 19. *P. argentata*.
 20. *P. siskiyouensis*.
 21. *P. Whitneyi*.
 22. *P. pinosa*.
 23. *P. lenophylla*.
 24. *P. longifolia*.
 25. *P. picta*.
 26. *P. nutans*.
 27. *P. oocarpa*.
 28. *P. pseudocarpa*.
 29. *P. vallicola*.
 30. *P. topoensis*.
 31. *P. Parishii*.
 32. *P. perstricta*.
 33. *P. Douglasii*.
 34. *P. megalophysa*.
 35. *P. glaberrima*.

- Leaflets elliptic, spreading; pod 3-4 cm. long, the upper suture straight. 36. *P. allochroa*.
 Leaflets linear-oblancoate, more or less reflexed; pod about 2.5 cm. long, both sutures convex. 37. *P. piscina*.
11. DENSIFOLIAE
- Pod pubescent.
 Leaflets and calyces loosely villous.
 Plant densely white-pubescent. 38. *P. unde*.
 Plant merely canescent. 39. *P. densifolia*.
 Leaflets and calyces appressed-pubescent or glabrate.
 Calyx-teeth lanceolate or lance-deltoid, about half as long as the tube. 40. *P. pomonensis*.
 Calyx-teeth subulate, about as long as the tube. 41. *P. virgata*.
 Pod glabrous; leaves sparingly villous or glabrous. 42. *P. franciscana*.
12. CANDIDISSIMAE
- Plant silvery-silky; corolla purple or purple-tinged.
 Leaflets broadly obovate; corolla 8-10 mm. long. 43. *P. candidissima*.
 Leaflets oblong or elliptic; corolla about 12 mm. long. 44. *P. nivea*.
 Plant white-woolly; corolla ochroleucous.
 Calyx-teeth as long as the tube; leaflets acute or obtuse. 45. *P. macrodon*.
 Calyx-teeth shorter than the tube; leaflets rounded at the apex.
 Banner distinctly longer than the wings; flowers spreading; leaflets not retuse at the apex.
 Calyx-teeth subulate, fully half as long as the tube; pods 2-2.5 cm. long, not densely crowded. 46. *P. miguelensis*.
 Calyx-teeth deltoid, one-fourth as long as the tube; pods 3.5-4 cm. long, densely crowded in headlike clusters. 47. *P. vestita*.
 Banner scarcely longer than the wings; flowers reflexed-drooping, at least the lower ones; leaflets retuse at the apex. 38. *P. unde*.
13. LUTOSAE
- One species. 48. *P. lutoa*.
14. SERPENTES
- One species. 49. *P. serpens*.
15. POLARES
- One species. 50. *P. polaris*.
16. CANDOLLEANAЕ
- Pod glabrous.
 Plant glabrous or nearly so; pod mottled. 51. *P. Wardii*.
 Plant hirsute-strigose; pod not mottled. 52. *P. Candolleana*.
 Pod pubescent at least when young.
 Leaflets linear to oblong.
 Calyx-lobes lanceolate, at least one half as long as the tube.
 Peduncles much exceeding the leaves. 37. *P. piscina*.
 Peduncles not exceeding the leaves.
 Pod 2-3 cm. long.
 Corolla pink or whitish, tinged with purple; pod ellipsoid. 53. *P. Wootoni*.
 Corolla dark-purple; pod obliquely ellipsoid. 55. *P. Pondii*.
 Pod 1-1.5 cm. long. 54. *P. Tracyi*.
 Calyx lobes deltoid, about one fourth as long as the tube; plant canescent. 56. *P. subcinerea*.
 Leaflets broadly oblong to oval or obovate, often retuse, villous.
 Pod convex-arcuate on both sutures; racemes longer than the leaves.
 Leaflets pubescent on both sides; calyx and pod with spreading hairs.
 Stems simple; pod deeply sulcate on the lower suture. 57. *P. Silerana*.
 Stems much branched; pod not deeply sulcate.
 Plant green; calyx-lobes about equaling the tube; pod not mottled. 58. *P. cerussata*.
 Plant canescent; calyx-lobes decidedly longer than the tube; pod mottled. 59. *P. pardalina*.
 Leaflets glabrous above; calyx and pod appressed-pubescent. 60. *P. zacatecana*.
 Pod straight on the upper suture; racemes very short. 61. *P. diurna*.
17. ANNUAE
- Pubescence of the pod appressed or none.
 Racemes rather few-flowered, barely equaling the leaves.
 Pod sparingly strigose or glabrous.
 Leaflets obovate or cuneate; plant perennial. 61. *P. diurna*.
 Leaflets linear to elliptic; plant annual.
 Corolla ochroleucous; pod 2 cm. long or more, the upper suture curved upward.
 Pod not sulcate on the lower suture; leaflets linear or linear-oblong. 62. *P. annua*.
 Pod sulcate on the lower suture; leaflets elliptic or oblong, retuse. 63. *P. triquetra*.

- Corolla purplish; pod less than 1.5 cm. long, the upper suture straight.
 Pod densely white-strigose.
 Racemes many-flowered, about twice as long as the leaves.
 Pod turgid at least below.
 Plant canescent; corolla dark, blue-purple.
 Calyx white-hairy.
 Calyx black-hairy.
 Plant glabrate; corolla white.
 Pod compressed; plant slightly strigose; corolla white.
 Pubescence of the pod spreading.
 Pod short-villous; racemes many-flowered.
 Flowers purple, subsessile; pod densely pubescent.
 Flowers whitish, distinctly pedicelled; pod sparingly pubescent.
 Pod long-villous; racemes few-flowered.
 Branches not decumbent; plant mainly strigose.
 Leaflets oblong; inflorescence much shorter than the leaves; plant annual.
 Leaflets obovate; inflorescence as long as the leaves; plant suffruticose.
 Branches decumbent; plant loosely villous.
64. *P. insularis*.
 65. *P. arida*.
 66. *P. Vaseyi*.
 67. *P. melana*.
 68. *P. Deanei*.
 69. *P. Palmeri*.
 70. *P. prorifera*.
 71. *P. juliana*.
 72. *P. sabulonum*.
 73. *P. arenicola*.
 74. *P. lerdoensis*.
18. PUBENTISSIMAE
- Pod villous, acutish on the upper suture.
 Pod strongly incurved.
 Pod straight or slightly upcurved.
 Pod minutely strigose; upper suture not acute, gibbous.
75. *P. pubentissima*.
 76. *P. Pulsiferae*.
 49. *P. serpens*.
19. PYCHNOSTACHYAE
- Leaves and stem densely canescent; pod glabrous.
 Plant merely canescent; calyx-teeth at least half as long as the tube.
 Plant silver-white; calyx-teeth one fourth to one third as long as the tube.
 Leaves green and stem strigose or pilose, green; pod pubescent.
 Leaves sparingly pubescent or glabrate; peduncles 5-10 cm. long.
 Leaflets obtuse or rounded at the apex; pod rather long-hairy.
 Leaflets retuse at the apex; pod sparingly short-hairy.
 Leaves rather copiously long-pilose or villous; peduncles 1-4 cm. long.
77. *P. pychnostachya*.
 78. *P. lanosissima*.
 79. *P. Hornii*.
 80. *P. bajaensis*.
 81. *P. tularensis*.
20. JEJUNAE
- Rachis of the leaves not spinescent; pod slightly puberulent, mottled, nearly 1 cm. long.
 Rachis of the leaves spinescent; pod white-pubescent, 4-6 mm. long.
82. *P. jejuna*.
 83. *P. humillima*.
21. MICROCYSTES
- Pod globose, sparingly canescent-strigose.
 Pod obovoid or ellipsoid, longer than broad.
 Pod pubescent.
 Leaves with 6-12, rarely 5, pairs of leaflets.
 Pod black-hairy.
 Plant 3-6 dm. high; racemes many-flowered, longer than the leaves.
 Plant 1-2, rarely 3 dm. high; racemes few-flowered.
 Leaflets lance-linear to oblong, mostly acute or obtuse.
 Leaflets oval or elliptic, mostly retuse.
 Pod white-hairy, straight on the upper suture.
 Leaves with 3-5, rarely 6 pairs of leaflets; pod grayish-strigose or short-villous.
 Peduncles many times as long as the few-flowered raceme; pod narrowly ellipsoid.
 Corolla purple; leaflets glabrous above, usually retuse at the apex.
 Racemes short; pod oval, with both sutures convex, black-hairy.
 Leaflets 5-13, elliptic or lance-elliptic; corolla 7-8 mm. long; flowers ascending.
 Leaflets 9-19, oval or rarely elliptic; corolla 8-10 mm. long; flowers spreading.
 Racemes lax; corolla about 10 mm. long; pod nearly straight on the upper suture, white-hairy.
 Corolla white; leaflets pubescent on both sides, rounded at the apex.
 Peduncles about equaling the racemes; pod obovoid.
 Pod glabrous; racemes very long and lax.
84. *P. Thurberi*.
 85. *P. Bodini*.
 86. *P. leptalea*.
 87. *P. stragala*.
 89. *P. Prebblei*.
 88. *P. Yukonis*.
 87. *P. stragala*.
 89. *P. Prebblei*.
 90. *P. quinqueflora*.
 91. *P. microcystis*.
 92. *P. scalaris*.
22. PREUSSIANAE
- Stipe 1.5-2 cm. long, much exceeding the calyx.
 Stipe not exceeding the calyx.
93. *P. ampullaria*.

- Stipe 5-6 mm. long, a little shorter than or equaling the calyx-tube. 94. *P. Preussii*.
 Stipe 1-2 mm. long, less than half as long as the calyx-tube.
 Leaflets broadly obovate; pod more than 2 cm. long.
 Pod and leaflets glabrous.
 Pod obliquely ellipsoid, 7-8 mm. broad. 95. *P. Davidsonii*.
 Pod ovoid or broadly ellipsoid, more than 1 cm. broad. 96. *P. laxiflora*.
 Pod and lower surface of the leaves (at least when young) pubescent. 97. *P. Crotalariae*.
 Leaflets, at least of the upper leaves, linear or oblong; pod about 1.5 cm. long. 98. *P. Eastwoodiae*.

23. NEGLECTAE

One species.

99. *P. neglecta*.

1. **Frigidae.** Stipe of the pod long and slender, considerably exceeding the calyx, the body considerably inflated, papery, abruptly narrowed at each end; corolla ochroleucous; calyx-lobes broadly triangular, broader than long. Perennial herbs with more or less pilose thin foliage.

1. ***Phaca americana* (Hook.) Rydb.; Britt. & Brown, Ill. Fl. 2: 304. 1897.**

- Phaca frigida* Richards. in Frankl. Journey 756. 1823. Not *P. frigida* L. 1753.
Phaca frigida americana Hook. Fl. Bor. Am. 1: 140. 1831.
Astragalus frigidus A. Gray, Proc. Am. Acad. 6: 219, in part. 1864.
Astragalus frigidus americanus S. Wats. Bibl. Ind. 193. 1878.
Astragalus alpinus americanus Sheldon, Minn. Bot. Stud. 1: 133. 1894.
Astragalus americanus M. E. Jones, Contr. W. Bot. 8: 8. 1898.

Perennial, with a short branched woody caudex or rootstock; stems several, glabrous or sparingly pilose, striate, straw-colored, 5-12 dm. high; lower leaves reduced to the mere stipules, the rest 1-1.5 dm. long, ascending; stipules membranous, free, reflexed, yellowish-green, oblong, 1-2 cm. long; petioles 1-3 cm. long, as well as the rachis striate or nearly glabrous; leaflets 9-13, oblong, thin, acute at the base, mostly rounded at the apex, 2-6 cm. long, 0.7-2 cm. wide, thin, glabrous above, sparingly pubescent beneath; peduncles 5-10 cm. long; racemes 2-4 cm. long; bracts oblong, ciliate, 5 mm. long, reflexed, deciduous; calyx oblong-campanulate, about 5 mm. long, somewhat oblique, yellowish, glabrous except the ciliate margin, the lobes very short, broadly triangular, rather broader than long; corolla ochroleucous, about 15 mm. long; banner obovate, retuse at the apex, moderately arched, with reflexed margins, gradually tapering below; wings 12 mm. long, the blade oblong-lunate, obtuse, shorter than the long claw, with an acute basal auricle; keel-petals similar, but broader, rounded at the apex, and with an obtuse auricle; pod glabrous, very thin, yellowish, unspotted, the stipe 7-10 mm. long, the body ellipsoid, acute at each end, 2-2.5 cm. long, 8-10 mm. wide and thick; seeds dark olive-brown, obliquely round-ovate, 3 mm. long, 2 mm. wide, the scar near the middle of one side.

TYPE LOCALITY: Rocky Mountains, in lat. 52° to 56°.

DISTRIBUTION: Wooded banks in the Rocky Mountains from Yukon to Wyoming, in the Black Hills, South Dakota, and on Gaspé Peninsula, Quebec.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 2148; ed. 2. f. 2553; M. E. Jones, Rev. Astrag. pl. 27, f. 90; Am. Jour. Bot. 16: pl. 44 A.

2. ***Phaca littoralis* (Hook.) Rydb. Bull. N. Y. Bot. Gard. 2: 176. 1901.**

- Phaca frigida littoralis* Hook. Fl. Bor. Am. 1: 140. 1831.
Astragalus frigidus littoralis S. Wats. Bibl. Ind. 193. 1878.
Astragalus alpinus littoralis Sheldon, Minn. Bot. Stud. 1: 133. 1894.

Perennial, with a branched rootstock; stem more or less villous-pilose, 1-3 dm. high; leaves 5-10 cm. long; stipules large, membranous, obliquely ovate, 1-1.5 cm. long, 4-6 mm. wide, ciliate; petioles 0.5-2 cm. long, as well as the rachis sparingly pilose; leaflets 9-13, oval to oblong, 1-2.5 cm. long, 4-8 mm. wide, rounded at the apex, glabrate above, villous-pilose beneath, usually densely so; peduncles 4-7 cm. long, villous-pilose; racemes short; bracts broad, oval or elliptic; calyx oblong-campanulate, 7-8 mm. long, black-villous; lobes 1 mm. long, triangular; corolla ochroleucous, about 15 mm. long; petals as in *P. americana* but comparatively

broader; pod black-hairy, the stipe 4-5 mm. long, the body ellipsoid, 1.5 cm. long, 6-7 mm. wide, and thick, acute at each end.

TYPE LOCALITY: Arctic shores, westward of the Mackenzie River, Canada.

DISTRIBUTION: Arctic North America from the Coronation Gulf to Bering Strait, south to Mt. St. Elias.

2. *Oxyphysae*. Tall perennial herbs, with leafy stems and grayish pubescence. Calyx-lobes lanceolate or subulate, longer than broad. Corolla ochroleucous or greenish-white. Pod long-stipitate, the body papery, acute at each end, somewhat compressed and not strongly inflated; cross-section lance-elliptic.

3. *Phaca oxyphysa* (A. Gray) A. Heller, *Muhlenbergia* 2: 86. 1905.

Astragalus oxyphysus A. Gray, Proc. Am. Acad. 6: 218. 1864.

Tragacantha oxyphysa Kuntze, Rev. Gen. 947. 1891.

Perennial, with a rootstock; stem more or less silky-canescens, 3-10 dm. high, striate, usually canescent, branched; leaves 1-1.5 dm. long, ascending; stipules membranous, ovate, deciduous; petioles 0.5-1.5 cm. long; leaflets 11-21, oblong, obtuse, 1.2-5 cm. long, 2-5 mm. wide, silky-canescens, at least when young; peduncles 1-1.5 dm. long, strict; racemes in flower 5-8 cm. long, in fruit about 1 dm. long; bracts subulate; pedicels 4-5 mm. long; calyx oblong-campanulate, sericous, 8-9 mm. long; lobes subulate, half as long as the tube; corolla greenish-white or ochroleucous, about 18 mm. long; pod stipitate, the stipe 5-6 mm. long, somewhat pubescent, the body obliquely lanceolate in outline, somewhat compressed, acutish on the sutures, glabrous, membranous, distinctly acute at the apex, attenuate at the base, 3-4 cm. long, 12-13 mm. wide; seeds dark-brown, obliquely obovate-reniform, 3 mm. long, 2 mm. wide.

TYPE LOCALITY: Arroyo del Puerto, in the Mt. Diablo Range, California.

DISTRIBUTION: Coast-ranges of central and southern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 18, f. 68.

3. *Trichopodae*. Tall perennials, with linear or oblong leaflets, pubescent at least beneath. Calyx-lobes lanceolate or subulate, at least half as long as the tube. Corolla ochroleucous or white. Pod stipitate, the stipe slender, usually exceeding the calyx, the body broadly ellipsoid, papery; cross-section oval.

4. *Phaca asymmetrica* (Sheldon) Rydberg.

Astragalus leucophyllus T. & G. Fl. N. Am. 1: 336. 1838. Not *A. leucophyllus* Willd. 1803.

Phaca leucophylla H. & A. Bot. Beech. Voy. 333. 1840.

Tragacantha leucophylla Kuntze, Rev. Gen. 946. 1891.

Astragalus asymmetricus Sheldon, Minn. Bot. Stud. 1: 23. 1894.

Astragalus leucopsis leucophyllus M. E. Jones, Contr. W. Bot. 8: 23. 1898.

Astragalus leucopsis asymmetricus M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Perennial, perhaps up to 1 m. high; stem white, silky-canescens, strigose; leaves 8-12 cm. long, ascending; stipules broadly deltoid, about 5 mm. long and fully as broad; petioles 0.5-2 cm. long, as well as the rachis canescens; leaflets 19-37, linear or oblong, rather firm, white-silky on both sides, 1-2 cm. long, 3-5 mm. wide; peduncles 5-15 cm. long; racemes about 5 cm. long, in fruit sometimes 1 dm. long; bracts subulate, calyx silvery-canescens, the tube cylindrocarnulate, 5-6 mm. long, the lobes subulate, 2-4 mm. long; corolla ochroleucous, 14-16 mm. long; banner obovate, gradually tapering into the broad claw; blade of the wings oblong-lunate, obtuse, about equaling the claw in length, with a large acute basal auricle; keel-petals similar but the blades broader; fruit silky-canescens when young, becoming glabrate except the stipe; the stipe in fruit 2.5-3 cm. long, the body oval-ellipsoid, 3-4 cm. long, 1.5-2 cm. wide and thick.

TYPE LOCALITY: California.

DISTRIBUTION: Central and southern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 18, f. 71.

5. *Phaca leucopsis* T. & G. Fl. N. Am. 1: 694. 1840.

Phaca canescens Nutt.; T. & G. Fl. N. Am. 1: 344. 1838. Not *P. canescens* H. & A. 1833.
Astragalus leucopsis Torr. Bot. Mex. Bound. Surv. 56. 1859.
Tragacantha leucopsis Kuntze, Rev. Gen. 246. 1891.
Astragalus leucopsis lonchus M. E. Jones, Rev. Astrag. 119. 1925.

Perennial; stem branched, 3–10 dm. high, often suffruticose at the base, white-villous with short hairs; leaves 5–15 cm. long, ascending; stipules deltoid or lance-deltoid, 5–7 mm. long; petioles 8–15 mm. long, as well as the rachis more or less canescent; leaflets 19–37, oval to oblong, 0.5–2.5 cm. long, white-villous on both sides with short hairs when young, in age canescent or greener, rounded at the apex; peduncles 5–15 cm. long, erect; racemes 4–6 cm. long, in fruit sometimes 1 dm. long; bracts subulate or lanceolate, 2 mm. long; calyx canescent, the tube 4–5 mm. long, the lobes subulate, about 2–2.5 mm. long, acuminate; corolla ochroleucous, 12 mm. long, resembling that of *P. leucophylla* but the banner longer in comparison with the other petals; pod minutely strigose, the stipe 10–12 mm. long, the body oval-ellipsoid, 2–3 cm. long, 1.2–2 cm. wide and thick; seeds obliquely reniform, 3 mm. long, 2 mm. wide.

TYPE LOCALITY: Santa Barbara, California.

DISTRIBUTION: Southern California, Lower California, and northern Sonora.

ILLUSTRATIONS: Bot. Mex. Bound. Surv. *pl. 16*; M. E. Jones, Rev. Astrag. *pl. 19, f. 73* (including var. *lonchus*).

6. *Phaca Encenadae* Rydberg, sp. nov.

Perennial, with a woody caudex; stem 3–5 dm. high, finely canescent; leaves 10–15 cm. long, ascending; stipules broadly deltoid, 4 mm. long; petioles 1–3 cm. long, as well as the rachis somewhat canescent; leaflets 25–35, thin, elliptic, 1–1.5 cm. long, 4–6 mm. wide, somewhat canescent-pilose beneath, glabrous above; peduncles 15–20 cm. long; bracts lanceolate, 2–3 mm. long; calyx 6–7 mm. long, sparingly silky-canescens, the lobes subulate, attenuate, 2 mm. long; corolla ochroleucous, 12–15 mm. long, like that of *P. leucopsis*; pod glabrous, the stipe about 1 cm. long, the body obliquely ovoid, about 2.5 cm. long and half as wide and thick.

Type collected at Encenada, Lower California, April 12, 1882, *M. E. Jones 3672* (herb. N. Y. Bot. Gard., named *Astragalus curtipes*).

DISTRIBUTION: Lower California and San Diego County, California.

7. *Phaca trichopoda* Nutt.; T. & G. Fl. N. Am. 1: 343. 1838.

Astragalus trichopodus A. Gray, Proc. Am. Acad. 6: 218. 1864.
Tragacantha trichopoda Kuntze, Rev. Gen. 948. 1891.

Perennial; stem 3–6 dm. high, sparingly strigose, angled; leaves 6–10 cm. long, ascending; stipules lanceolate, acuminate, 3–5 mm. long; petioles about 1 cm. long, as well as the rachis slightly strigose; leaflets 25–37, oblong, 1–2 cm. long, 3–5 mm. wide, strigose beneath, glabrous above, rounded at the apex; peduncles 5–10 cm. long; racemes 3–5 cm., in fruit up to 8 mm. long; bracts lanceolate, 1–2 mm. long; calyx strigose, the tube 3–3.5 mm. long, the hairs on the lobes usually blackish, the lobes subulate, 1 mm. long; corolla ochroleucous; banner obovate, gradually tapering below, 10–12 mm. long; wings somewhat shorter, the blade oblong-lunate, obtuse, about equaling the narrow claw, with an acute basal auricle; keel-petals similar but broader; pod glabrous, except the stipe, the stipe 8–10 mm. long, the body ellipsoid, 1.5–2 cm. long, 8–9 mm. wide.

TYPE LOCALITY: Borders of woods near the sea, Santa Barbara, California.

DISTRIBUTION: Southern California and Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 18, f. 69*.

8. *Phaca capillipes* (M. E. Jones) Rydberg.

Astragalus capillipes M. E. Jones, Rev. Astrag. 117. 1923.

Perennial; stem 3–8 dm. high, sparingly strigose; leaves about 1 dm. long, ascending or spreading; stipules deltoid, 3–5 mm. long; leaflets 25–35, oblong or elliptic, 8–15 mm. long, obtuse or retuse, strigose beneath, glabrate above; peduncles 10–12 cm. long; racemes 6–10 cm. long; bracts subulate, 2–3 mm. long; calyx strigose, the tube 3 mm. long, the teeth subulate, 1.5 mm. long; corolla ochroleucous; banner obovate, 12 mm. long; wings shorter, the blade

oblong-lunate, obtuse; keel-petals similar but broader; pod glabrous, the stipe 8–10 mm. long, the body semi-obovoid, tapering gradually at the base, more abruptly at the apex, about 2.5 cm. long, 8 mm. wide, the lower suture strongly convex, the upper nearly straight.

TYPE LOCALITY: Santa Catalina Island, California.

DISTRIBUTION: Santa Catalina Island.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 18, f. 70.

9. *Phaca curtipes* (A. Gray) Rydberg.

Astragalus curtipes A. Gray, Proc. Am. Acad. 6: 217. 1864.

Astragalus leucopsis brachypus Greene, Pittonia 1: 33. 1887.

Tragacantha curtipes Kuntze, Rev. Gen. 944. 1891.

Astragalus curtus Sheldon, Minn. Bot. Stud. 1: 134. 1894.

Astragalus leucopsis curtipes M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Perennial; stem canescent, 3–5 dm. high; leaves 1–1.5 dm. long, ascending; stipules broadly deltoid, acuminate, 5–7 mm. long; petioles 1–2 cm. long, as well as the rachis canescent; leaflets 25–35, oblong to linear, rounded to retuse at the apex, 1–1.5 cm. long, silky-canescens beneath, glabrous above; peduncles 1–1.5 dm. high, canescent; bracts lanceolate, 2 mm. long; calyx more or less black-hairy, the tube 5 mm. long, the lobes subulate, 2 mm. long; corolla ochroleucous, 12–15 mm. long; banner obovate, gradually tapering below; wings 11–13 mm. long, the blades oblong-lunate, obtuse, shorter than the claw, with an acute basal auricle; keel-petals similar, but the blade broader and more lunate; pod minutely strigulose, the stipe 4–6 mm. long, shorter than the calyx, the body obliquely ovoid, about 3 cm. long and 1.5 cm. wide, the upper suture nearly straight, the lower strongly convex; seeds dark-brown, obliquely reniform, 3 mm. long.

TYPE LOCALITY: San Luis Obispo, California.

DISTRIBUTION: San Luis Obispo County, and San Miguel Island, California; also Coronado Islands, Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 20.

10. *Phaca potosina* Rydberg, sp. nov.

Perennial; stem tall, erect, stiff, branched above, with stiff, ascending branches, densely strigose-canescens, angled; leaves 5–7 cm. long, ascending; stipules subulate, 3–5 mm. long; leaflets 17–21, oblong to obovate, 5–12 mm. long, glabrate above, strigose-canescens beneath, rounded or retuse at the apex; peduncles 2–3 cm. long; racemes 4–5 cm. long; calyx strigose, the tube 4.5–5 mm. long, the teeth deltoid, short-acuminate, 2 mm. long; corolla unknown; pod glabrous, the stipe 8–10 mm. long, the body semi-ellipsoid, 4–4.5 cm. long, about 2 cm. wide and thick, the upper suture straight or slightly curved upwards, the lower strongly ventricose.

Type collected between San Luis Potosí and Tampico, December, 1878 to February, 1879, *E. Palmer 1051* (herb. Acad. Phila.).

11. *Phaca fastidia* Kellogg, Hesperian 4: 145. 1860; Curran, Bull. Calif. Acad. 1: 136. 1885.

Astragalus fastidiosus Greene, Bull. Calif. Acad. 1: 186. 1886.

Astragalus fastidius M. E. Jones, Contr. W. Bot. 8: 7. 1898.

Astragalus leucopsis fastidius M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Perennial, somewhat suffruticose at the base; stems branched, 3–5 dm. high, white-canescens; leaves 5–10 cm. long, ascending; stipules lance-deltoid, 2–3 mm. long; petioles about 1 cm. long, as well as the rachis canescens; leaflets 15–31, obovate to elliptic, 6–15 mm. long, 3–8 mm. wide, truncate or retuse at the apex, somewhat canescens-strigose beneath, glabrous above; peduncles 5–10 cm. long, canescens; racemes 3–5 cm. long; bracts subulate, 2 mm. long; calyx black-hairy, the tube 4 mm. long, the lobes 2 mm. long, subulate; pod strigose, stipitate, the stipe shorter than the calyx, the body obliquely obovate, 3–3.5 cm. long, 1.5 cm. wide, the upper suture only slightly convex, the lower strongly so; seeds very obliquely reniform, 3 mm. long.

TYPE LOCALITY: Cedros Island.

DISTRIBUTION: Cedros Island, off Lower California.

ILLUSTRATIONS: Hesperian 4: pl.; Bull. Calif. Acad. Sci. 1: pl.; M. E. Jones, Rev. Astrag. pl. 19.

4. *Cusickiana*. Tall rush-like perennials with narrowly linear leaflets. Calyx-lobes lanceolate but short. Corolla white, three times as long as the calyx. Pod stipitate, the stipe shorter than the calyx-lobes, the body papery, inflated, broadly ellipsoid, glabrous; cross-section oval.

12. *Phaca Cusickii* (A. Gray) Rydb. Bull. Torrey Club 40: 47.
1913.

Astragalus Cusickii A. Gray, Proc. Am. Acad. 13: 370. 1878.

Perennial, with a caespitose woody caudex; stems several, 3-4 dm. high, glabrous, angled and striate, leaves 5-10 cm. long, strongly ascending; stipules triangular, 2 mm. long and fully as broad; leaflets 11-17, narrowly linear, 6-20 mm. long, 0.5-1.5 mm. wide, strigulose on both sides; peduncles 5-10 cm. long, glabrous; bracts ovate or lanceolate, 1 mm. long; calyx-tube campanulate, 4 mm. long, sparingly strigulose with black hairs, the lobes triangular, less than 1 mm. long; corolla ochroleucous, 12-15 cm. long; banner with an ovate obtuse blade and broad claw, slightly arched; wings shorter, the blade oblong, falcate, with a large rounded auricle; keel-petals much shorter, the blade broadly lunate; pod glabrous, the stipe about 3 mm. long, the body ellipsoid, 3-3.5 cm. long, 1-1.5 cm. wide; seeds obliquely reniform, 4 mm. long, 3 mm. broad, light-brown, smooth.

TYPE LOCALITY: Union County, Oregon.

DISTRIBUTION: Eastern Oregon and Washington and western Idaho.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 17, f. 66.

5. *Megacarpae*. Low caespitose perennials, mostly glabrous, with conspicuous stipules and broad leaflets. Calyx-lobes subulate. Corolla white, straw-colored, or purplish, large. Pod papery, much inflated, large, with a very short stipe not exceeding the calyx; cross-section oval or round.

13. *Phaca Wetherilli* (M. E. Jones) Rydb. Bull. Torrey Club 32:
665. 1906.

Astragalus Wetherilli M. E. Jones, Zoe 4: 34. 1893.

Perennial; stems several, ascending, 3-5 dm. high, glabrous below, sparingly pubescent above; leaves 5-10 cm. long; stipules small, lanceolate, 5 mm. long; leaflets 9-17, rounded-ovate to oval, obtuse or retuse, 5-10 mm. long, 3-5 mm. wide, glabrous or slightly strigose beneath when young; peduncles 3-5 cm. long; racemes short, subcapitate, 6-8-flowered; bracts ovate; calyx strigose with mixed black and white hairs, the tube 3 mm. long, the lobes subulate, 2 mm. long; corolla 8 mm. long, white with the tip of the banner pink; banner broadly obovate, rounded; wings shorter than the banner, longer than the keel; keel abruptly incurved; legume short-stipitate, strigulose, the body nearly 2 cm. long, 1 cm. wide, obliquely ovoid, straight on the upper suture, strigulose.

TYPE LOCALITY: Grand Junction, Colorado.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 17, f. 64.

14. *Phaca oophora* (S. Wats.) Rydberg.

Astragalus oophorus S. Wats. Bot. King's Expl. 73. 1871.

Tragacantha oophora Kuntze, Rev. Gen. 947. 1891.

Perennial, somewhat caespitose; stems 3-5 dm. high, glabrous, striate, decumbent at the base; leaves 5-10 cm. long; stipules deltoid, distinct, acuminate, about 5 mm. long; leaflets 9-17, oblong-elliptic, 15-20 mm. long, 4-7 mm. wide, minutely mucronate, glabrous; peduncles about 5 cm. long; racemes short, 6-10-flowered; calyx-tube campanulate, 5 mm. long, glabrous, the lobes subulate, 4 mm. long; corolla ochroleucous, 15 mm. long; banner obovate, gradually tapering below; wings somewhat shorter, the blade oblong-lunate, about equaling the claw, with a rounded basal auricle; keel-petals similar but broader and rounded at the apex; pod glabrous, the stipe 5 mm. long, the body ellipsoid, 4-5 cm. long, 2-2.5 cm. wide, mottled (?).

TYPE LOCALITY: Reese River Pass of the Shoshone Mountains, Nevada.

DISTRIBUTION: Eastern Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 21, f. 76.

15. *Phaca jucunda* Jepson & Rydberg, sp. nov.

Perennial, with a caespitose caudex; stems decumbent at the base, glabrous, 2-4 dm. high, striate; leaves ascending, 10-15 cm. long, the rachis glabrous; stipules broadly deltoid, 5-8 mm. long; leaflets 11-19, broadly oval or obovate, mostly retuse at the apex, glabrous on both sides, 5-20 mm. long, 4-10 mm. wide; peduncles 7-15 cm. long, glabrous; racemes 3-7 cm. long; bracts subulate, 3 mm. long, nearly equaling the pedicels; calyx glabrous, the tube campanulate, 5 mm. long, the lobes lance-subulate, 4 mm. long; corolla purple, at least the banner; banner obovate, 15-18 mm. long, moderately arcuate; wings 13-15 mm. long, the blade oblanceolate, fully as long as the claw, rounded at the apex, with a large reflexed auricle; keel-petals 12-13 mm. long, the blade broadly lunate, rounded at the apex; pod ellipsoid, more or less mottled, about 4 cm. long and 2 cm. wide, acutish at each end, the stipe a little exceeding the calyx-tube.

Type collected on Telescope Peak, Panamint Mountains, California, 1917, *W. L. Jepson*.
DISTRIBUTION: Eastern California and western Nevada.

16. *Phaca artipes* (A. Gray) Rydb. Bull. Torrey Club 32: 664.
1906.

Astragalus artipes A. Gray, Proc. Am. Acad. 13: 370. 1878.
Astragalus megacarpus caulescens M. E. Jones, Proc. Calif. Acad. II. 5: 643. 1895.

Perennial, with a caespitose caudex; stems many, branched, decumbent or ascending, glabrous, 1-3 dm. high; leaves ascending, 7-15 cm. long; stipules broadly deltoid, acuminate, about 5 mm. long; leaflets 13-21, obovate, retuse to rounded at the apex, 1-1.5 cm. long, 4-10 mm. wide, glabrous; peduncles 5-15 cm. long; racemes short, 5-10-flowered; bracts lanceolate, 4-5 mm. long, deciduous; calyx-tube campanulate, glabrous, 4-5 mm. long, the lobes subulate, 3-4 mm. long; corolla ochroleucous, about 13 mm. long; banner obovate, gradually tapering below; wings somewhat shorter, the blade ovate-lunate, equaling the claw, with a large rounded basal auricle; keel-petals similar, but broader, shorter, and more rounded at the apex; pod glabrous, the stipe 5-8 mm. long, the body obliquely ovoid, with the tip somewhat curved upwards, 3-3.5 cm. long, about 2 cm. wide, mottled; seeds obliquely reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Mokiah Pass, Arizona.
DISTRIBUTION: Central Colorado to Idaho(?), Nevada, and Arizona.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 22.

17. *Phaca megacarpa* Nutt.; T. & G. Fl. N. Am. 1: 343. 1838.

Astragalus megacarpus A. Gray, Proc. Am. Acad. 6: 215. 1864.
Astragalus megacarpus Parryi A. Gray, Bot. Calif. 1: 148. 1876.
Tragacantha megacarpa Kuntze, Rev. Gen. 946. 1891.
Astragalus megacarpus prodigus Sheldon, Minn. Bot. Stud. 1: 136. 1894.

Perennial, with a caespitose caudex; stems mostly 1-7 cm. high, covered by numerous scale-like, persistent stipules; leaves 7-12 cm. long, ascending; stipules scarious, deltoid, 5 mm. long; leaflets 7-21, broadly oval or obovate, 1-2 cm. long, 5-15 mm. wide, often retuse, glabrous and somewhat glaucous; peduncles 2-5 cm. long; racemes 3-8-flowered; calyx-tube campanulate, 9-10 mm. long, the lobes lance-subulate, 5-6 mm. long; corolla ochroleucous, nearly 2 cm. long; banner oblanceolate, gradually tapering below; wings shorter, the blade oblong-lunate, obtuse, only slightly falcate, shorter than the claw; keel-petals about 15 mm. long, the blade broader, rounded at the apex, a little more than half as long as the claw; pod glabrous, the stipe 3-5 mm. long, the body ellipsoid, 4-6 cm. long, 2-2.5 cm. wide; seeds obliquely reniform.

TYPE LOCALITY: Plains of the Rocky Mountains [Wyoming].
DISTRIBUTION: Wyoming to southwestern Utah.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 20, f. 75.

6. *Hookeriana*. Low caespitose perennials, with decumbent stems and oblong canescent leaflets. Calyx-lobes subulate, but short. Corolla ochroleucous, white, or purplish, with a long banner, strongly arched at the middle. Pod papery, inflated obovoid, rounded at the apex, acute at the base; cross-section orbicular.

18. *Phaca Hookeriana* T. & G. Fl. N. Am. 1: 693. 1838.

Astragalus Hookerianus A. Gray, Proc. Am. Acad. 6: 215. 1864. Not *A. Hookeriana* D. Dietr. 1850.

Tragacantha Hookeriana Kuntze, Rev. Gen. 945. 1891.

Astragalus Sonneanus Greene, Pittonia 3: 186. 1897.

Perennial, with a deep root and short caespitose rootstock; stems numerous, 1–2.5 dm. long, decumbent or ascending, more or less coarsely strigose; leaves ascending, 3–7 cm. long; stipules deltoid, 3–4 mm. long; leaflets 9–17, linear to obovate, acutish to retuse, 5–15 mm. long, 2–4 mm. wide, hirsute or hirsute-strigose; peduncles 2–4 cm. long; racemes short and dense, 5–12-flowered; bracts subulate, 3 mm. long; calyx-tube campanulate, 4 mm. long, hirsute, the teeth 2 mm. long, subulate; corolla ochroleucous, 12–13 mm. long; banner obovate, gradually tapering below; wings shorter, the blade lunate, obtuse, with a small reflexed basal auricle, half longer than the claw; keel-petals similar and about as large as the wings; pod short-strigose, mottled, the stipe 4–5 mm. long, the body obovoid or ellipsoid, 2.5–5 cm. long, 1.5–2 cm. wide; seeds obliquely reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Interior of Oregon.

DISTRIBUTION: Idaho and eastern Washington to northeastern California and northern Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 18, f. 67.

19. *Phaca argentata* Rydberg, sp. nov.

Perennial, with a deep root and short caespitose caudex; stems many, decumbent, branched, canescent, more or less purple-tinged, leaves 4–8 cm. long, ascending; stipules broadly deltoid, 4 mm. long; leaflets 11–25, obovate to oblong, 6–10 mm. long, 2–6 mm. wide, rounded or retuse at the apex, silvery-white, strigose; peduncles 3–7 cm. long; racemes short, 5–7-flowered; calyx-tube campanulate, 4 mm. long, silvery-strigose, the lobes subulate from a broad base, 1.5 mm. long; corolla tinged with purple, 12–14 mm. long; banner obovate, gradually tapering below; wings shorter, the blade oblong-lunate, obtuse, longer than the claw, with a prominent, recurved basal auricle; keel-petals broader, rounded at the apex; pod glabrous, beautifully mottled, the stipe 4–5 mm. long, the body obovoid, 2.5–3 cm. long, 1.5 cm. wide.

Type collected on the west slope of Star Peak, West Humboldt Mountains, Nevada, July 31, 1912, Heller 10633 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Western Nevada.

20. *Phaca siskiyouensis* Rydberg, sp. nov.

Perennial, with a deep root and caespitose caudex; stems several, 1–2 dm. long, decumbent, more or less strigose; leaves 3–7 cm. long; stipules broadly deltoid, 3–4 mm. long, the lower connate; leaflets 9–17, oblong, 7–20 mm. long, 2–4 mm. wide, strigose on both sides; peduncles 2–6 cm. long; racemes 5–10-flowered; calyx-tube 4 mm. long, pilose, the lobes lanceolate, about 1 mm. long; corolla ochroleucous, about 1 cm. long; banner obovate, tapering gradually below; wings shorter, the blade oblong-lunate, obtuse, longer than the claw; keel-petals similar, but the blade broader; pod glabrous, often mottled, the stipe about 4 mm. long, the body obovoid, 3–4 cm. long, 1.5–2.5 cm. wide.

Type collected on Mt. Eddy, Siskiyou County, California, August 30, 1912, Alice Eastwood 2006 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Northern California.

21. *Phaca Whitneyi* (A. Gray) A. Heller, Muhlenbergia 9: 67. 1913.

Astragalus Whitneyi A. Gray, Proc. Am. Acad. 6: 526. 1865.

Tragacantha Whitneyi Kuntze, Rev. Gen. 949. 1891.

Astragalus Hookerianus Whitneyi Jepson, Man. Fl. Pl. Calif. 564. 1925.

Perennial, with a very thick woody root and short branched caudex; stems numerous, 1–2 dm. high, decumbent, branched, strigose; leaves 4–7 cm. long; stipules lanceolate or deltoid, 2–3 mm. long; leaflets 11–19, linear or linear oblong, 5–10 mm. long, 1–3 mm. wide, canescent-strigose, obtuse; peduncles 3–5 cm. long; racemes short, 5–8-flowered; bracts lanceolate, 2–3 mm. long; calyx-tube 3–4 mm. long, sometimes somewhat black-hairy, the lobes

subulate, 1 mm. long; corolla pale-purple or ochroleucous, about 1 cm. long; petals as in the preceding; pod glabrous, the stipe 3-4 mm. long, the body obovoid, about 2 mm. long and 1.5 cm. wide, mottled.

TYPE LOCALITY: Mountain near Sonora Pass, California.

DISTRIBUTION: Mountains of central California and western Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 18.

22. *Phaca pinosa* (Elmer) Rydberg, sp. nov.

Astragalus Whitneyi pinosus Elmer, Bot. Gaz. 39: 54. 1905.

Astragalus Hookerianus pinosus Jepson, Man. Fl. Pl. Calif. 564. 1925.

Perennial, with a thick woody root; stems numerous, 1-2 dm. long, decumbent, glabrous or nearly so; leaves 3-5 cm. long; stipules scarious, broadly deltoid, about 3 mm. long, the lower connate; leaflets 15-19, sparingly strigulose or glabrate, 6-10 mm. long, linear or oblong; peduncles 4-6 cm. long; racemes short, 5-10-flowered; bracts deltoid, 2-3 mm. long; calyx-tube campanulate, 3 mm. long, white- and black-hairy, the lobes subulate, 1 mm. long; corolla ochroleucous, about 1 cm. long, similar to those of the preceding species; pod glabrous, the stipe 2-3 mm. long, the body obovoid, 2-2.5 cm. long, 15-18 mm. wide, mottled.

TYPE LOCALITY: Mt. Pinos, Ventura County, California.

DISTRIBUTION: Known only from the type locality.

23. *Phaca lenophylla* Rydberg, sp. nov.

Perennial, with a deep root and caespitose caudex; stems many, branched, 1-2 dm. long, villous; leaves 3-5 cm. long, spreading; stipules broadly deltoid or triangular, 3-4 mm. long, the lower scarious and connate; leaflets 11-17, linear to lance-oblong, 6-16 mm. long, 2-4 mm. wide, villous, mostly acute; peduncles 2-5 cm. long; racemes short, 5-10-flowered; bracts subulate, 2 mm. long; calyx-tube 4 mm. long, more or less black-hairy, the lobes lanceolate, 2-2.5 mm. long; corolla purplish, 10-12 mm. long; banner obovate, gradually tapering below; wings somewhat shorter, the blade oblong-lunate, obtuse, with a reflexed basal auricle, slightly longer than the claw; keel-petals similar but broader and darker; pod glabrous, mottled, the stipe 3 mm. long, the body obovoid, 3-3.5 cm. long, about 2 mm. wide; seeds brown, very obliquely reniform, 3 mm. long.

Type collected on Tinker's Knobs, Placer County, California, altitude 9,000 feet, July 24, 1892, Sonne (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Sierra Nevada of central California.

7. *Pictae*. Slender, rush-like perennials, with horizontal rootstocks, and linear-filiform leaflets, often much reduced in number and the terminal one replaced by the prolonged rachis. Calyx-teeth lance-subulate. Corolla ochroleucous, with purple-tipped keel; banner strongly arched. Pod papery, mottled, broadly ellipsoid, much-inflated; cross-section orbicular.

24. *Phaca longifolia* (Pursh) Nutt.; T. & G. Fl. N. Am. 1: 346.

1838.

↳ *Psoralea longifolia* Pursh, Fl. Am. Sept. 741. 1814.

↳ *Orobus longifolius* Nutt. Gen. 2: 95. 1818.

↳ *Physandra longifolia* Raf. Atl. Jour. 145. 1832.

↳ *Astragalus filifolius* A. Gray, Pacif. R. R. Rep. 12: 42. 1860. Not *A. filifolius* Clos, 1846.

↳ *Astragalus pictus filifolius* A. Gray, Proc. Am. Acad. 6: 215. 1864.

↳ *Astragalus ceramicus imperfectus* Sheldon Minn. Bot. Stud. 1: 19. 1894.

↳ *Astragalus ceramicus* Sheldon, Minn. Bot. Stud. 1: 137 [not of page 19]. 1894.

↳ *Astragalus ceramicus longifolius* Rydb. Bot. Surv. Neb. 3: 31. 1894.

↳ *Astragalus longifolius* Rydb. Fl. Neb. 21: 47. 1895.

↳ *Astragalus angustus longifolius* M. E. Jones, Proc. Calif. Acad. II, 5: 635. 1895.

↳ *Astragalus angustus imperfectus* M. E. Jones, Contr. W. Bot. 10: 62. 1902.

↳ *Astragalus angustus ceramicus* M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Perennial, with a creeping rootstock; stem ascending or decumbent, slender, 1-3 dm. high, often branched, canescent-strigose; leaves erect or nearly so, 7-20 cm. long, canescent; stipules deltoid-subulate, 4-5 mm. long, the lower connate; terminal leaflet represented by the prolonged rachis; lateral leaflets wanting or few, linear, 1-2 cm. long; peduncles 2-5 cm. long; racemes

1-5-flowered; bracts subulate, 1 mm. long; calyx-tube grayish-strigose, 3 mm. long, the lobes lance-subulate, 1.5 mm. long; corolla ochroleucous, 8-9 mm. long, the keel tipped with purple; banner obovate, gradually tapering below; wings somewhat shorter, the blade lunate, longer than the claw, with a rounded basal auricle; keel-petals as long as the wings, similar but broader and acutish; pod glabrous, mottled, the stipe 3-4 mm. long, the body ovate-ellipsoid, 3-3.5 cm. long and about 2 cm. wide; seeds obliquely reniform, 3 mm. long, 2 mm. broad.

TYPE LOCALITY: Upper Louisiana [now South Dakota].

DISTRIBUTION: Western Nebraska and South Dakota to Idaho and New Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl. 12*; Britt & Brown, Ill. Fl. *f. 2150*; ed. 2. *f. 2555*; Fl. Neb. *22: pl. 11, f. 79-81*.

25. *Phaca picta* A. Gray, Mem. Am. Acad. II. 4: 37. 1849.

Astragalus pictus A. Gray, Proc. Am. Acad. 6: 214. 1864. Not *A. pictus* Steud. 1840.

Astragalus pictus foliolosus A. Gray, Proc. Am. Acad. 6: 215. 1864.

Tragacantha picta Kuntze, Rev. Gen. 947. 1891.

Astragalus pictus angustus M. E. Jones, Zoe 4: 37. 1893.

Astragalus ceramicus Sheldon, Minn. Bot. Stud. 1: 19. 1894.

Astragalus ceramicus Jonesii Sheldon, Minn. Bot. Stud. 1: 19. 1894.

Astragalus angustus M. E. Jones, Proc. Calif. Acad. II. 5: 634. 1895.

Astragalus angustus pictus M. E. Jones, Proc. Calif. Acad. II. 5: 635. 1895.

Astragalus angustus ceramicus M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Astragalus pictus magnus M. E. Jones, Rev. Astrag. 109. 1923.

Perennial, with a creeping rootstock; stems 1-2 dm. long, grayish-canescens, often flexuose; leaves more or less spreading, 5-10 cm. long; stipules deltoid, more or less connate; leaflets 5-11, linear, 1-3 cm. long, canescens, 1-2 mm. wide, the terminal one rarely much longer; peduncles 2-5 cm. long; racemes 5-15-flowered; bracts subulate, 1 mm. long; calyx-tube canescens, 2.5 mm. long, the lobes subulate, 1.5 mm. long; corolla about 7 mm. long, ochroleucous, the keel tipped with purple, the petals similar to those of *P. longifolia*; pod glabrous, mottled with brown or purple, the stipe about 3 mm. long, the body broadly ellipsoid, 1.5-2.5 cm. long, 10-12 mm. wide; seeds obliquely reniform.

TYPE LOCALITY: Banks of the Rio del Norte, New Mexico.

DISTRIBUTION: New Mexico, southern Utah, and Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 12, f. 54* and var. *magnus*.

8. *Nutantes*. Low branched perennials, with elliptic, canescens leaflets. Calyx-lobes subulate. Corolla purple, with a white spot; banner strongly arched at the middle. Pod short-stipitate, the stipe shorter than the calyx, the body broadly ellipsoid, inflated, round in cross-section.

26. *Phaca nutans* (M. E. Jones) Rydberg.

Astragalus nutans M. E. Jones, Rev. Astrag. 108. 1923.

Astragalus deserticolus Jepson, Man. Fl. Pl. Calif. 565. 1925.

Perennial, branched at the base, strigose; leaves 4-5 cm. long, ascending; stipules broadly deltoid, 3 mm. long; leaflets 7-13, elliptic, 8-15 mm. long, strigose-canescens on both sides; peduncles 2-4 cm. long; racemes short, 3-7-flowered; bracts lanceolate, 2 mm. long; calyx strigose, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla purple, nearly 1 cm. long; banner obovate, arched at the middle at an angle of about 45°, with a white spot, purple-veined; wings slightly shorter, the blade obliquely obovate; keel-petals still shorter and broadly lunate; pod stipitate, strigulose, unspotted, or nearly so, the stipe 2 mm. long, the body rounded ellipsoid, 2-2.5 cm. long, 1.5 cm. wide or more.

TYPE LOCALITY: Province Mountains, California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 12, f. 53*.

9. *Oocarpae*. Tall perennials, with strigose or glabrous, linear to elliptic leaflets. Calyx-teeth deltoid, one fourth to one third as long as the tube. Corolla ochroleucous, more than 1 cm. long, the banner strongly arched, somewhat reflexed. Pod strongly inflated, large, ellipsoid, round in cross-section.

27. *Phaca oocarpa* (A. Gray) Rydberg.

Astragalus Crotalariae Torr. Bot. Mex. Bound. Surv. 56. 1859. Not *Phaca Crotalariae* Benth. 1848.

Astragalus crotalarioides Torr. Bot. Mex. Bound. Surv. pl. 17, hyponym. 1859.

Astragalus oocarpus A. Gray, Proc. Am. Acad. 6: 213. 1864.

Tragacantha oocarpa Kuntze, Rev. Gen. 946. 1891.

Perennial; stem 1-2 m. high, sulcate and angled, glabrous or nearly so, sometimes tinged with purple, branched; leaves ascending, 8-15 cm. long; stipules deltoid, 3-4 mm. long; leaflets 15-21, oval, rather thick, 1-2 cm. long, 5-10 mm. wide, glabrous or nearly so, rounded or retuse at the apex; peduncles 5-7 cm. long; racemes lax, 9-12 cm. long; bracts lanceolate, 1-2 mm. long; flowers ascending, with very short pedicels; calyx-tube 4 mm. long, finely pubescent, the lobes triangular, 1 mm. long; corolla ochroleucous; banner obovate, 10-12 mm. long; wings decidedly shorter, the blade oblong-lunate, with a reflexed basal auricle, obtuse, fully as long as the claw; keel-petals broader, more curved; pod erect, glabrous, rather firm, ovoid, short-acute at the base, more tapering at the apex, 2.5 cm. long, fully 1 cm. wide; seeds obliquely reniform.

TYPE LOCALITY: Mountains east of San Diego, California.

DISTRIBUTION: San Diego County, California.

ILLUSTRATIONS: Torr. Bot. Mex. Bound. Surv. pl. 17; M. E. Jones, Rev. Astrag. pl. 14, f. 60.

28. *Phaca pseudoocarpa* Rydberg, sp. nov.

Perennial; stem 5-10 dm. high, striate, glabrous, branched; leaves spreading, 6-10 cm. long; stipules deltoid, reflexed, 3-4 mm. long; leaflets 19-25, rather firm, elliptic or oblong, 7-15 mm. long, glabrous on both sides, or sparingly hairy when young on the midrib and margins beneath, rounded, truncate, or retuse at the apex; racemes including the peduncle about 15 cm. long, spreading, arcuate, laxly flowered above the middle, glabrous; bracts subulate, 2 mm. long; calyx silky-strigose, the tube 3 mm. long, the teeth broadly deltoid, scarcely 1 mm. long; corolla ochroleucous, 8-9 mm. long; banner obovate, strongly reflexed; wings somewhat shorter, the blades obliquely obovate, with a large basal auricle; blades of the keel-petals broadly lunate; pod broadly ellipsoid, 3-4-5 cm. long, about 2 cm. wide, sparingly pubescent, comparatively firm.

Type collected in the Cuamaca Mountains, southern California, 1875, *Palmer 68* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Southern California.

29. *Phaca vallicola* Rydberg, sp. nov.

Perennial, often caespitose at the base; stems 3-4 dm. high, striate, glabrous; leaves ascending, 7-10 cm. long; stipules deltoid, 3-4 mm. long; leaflets 13-19, elliptic or oblong, 8-20 mm. long, glabrous above, sparingly strigose and glabrate beneath, often retuse at the apex; racemes 5-8 cm. long, somewhat arcuate; bracts subulate 2 mm. long; calyx silky-strigose, the tube 4 mm. long, the teeth deltoid, about 1 mm. long; corolla ochroleucous, 8-9 mm. long, like that of the preceding; pod sparingly pubescent, broadly ellipsoid, 4-5 cm. long, 2-2.5 cm. wide.

Type collected in Bear Valley, San Bernadino Mountains, 1886, *S. B. & W. F. Parish 1407 D* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Mountains of southern California.

30. *Phaca topoensis* Rydberg, sp. nov.

Perennial, low, perhaps 3 dm. high; stem striate, glabrous, flexuose; leaves 8-10 cm. long, ascending; stipules deltoid, 2-3 cm. long; leaflets 17-21, linear-oblong, acute, 10-20 mm. long, 2-4 mm. wide, glabrous above, sparingly strigose beneath; racemes 8-12 cm. long, laxly flowered above the middle; bracts subulate, 2 mm. long; calyx strigose, the tube 3-3.5 mm. long, the teeth deltoid, about 1 mm. long; corolla ochroleucous, 7-8 mm. long; banner obovate, strongly reflexed; wings and keel-petals shorter, like those of *P. oocarpa*; pod semi-ellipsoid, about 4 cm. long, less than 2 cm. wide, sparingly pubescent, the upper suture nearly straight.

Type collected at Topo, Lower California, October, 1882, *Orcutt 621* (Gray Herb.).

31. *Phaca Parishii* (A. Gray) Rydberg.

Astragalus Parishii A. Gray, Proc. Am. Acad. 19: 75. 1883.

Astragalus Douglasii Parishii M. E. Jones, Contr. W. Bot. 8: 6. 1898.

Perennial; stem 5–10 dm. high, sparingly strigose when young, glabrate in age, or glabrous from the beginning, striate; leaves 8–15, ascending; stipules broadly deltoid, 4–5 mm. long; leaflets 11–25, oblong to elliptic-obovate, 1–2.5 cm. long, 2–8 mm. wide, obtuse to retuse, somewhat strigose-canescens when young, in age greener; peduncles 5–10 cm. long; racemes rather lax, 5–10 cm. long; bracts lanceolate, 1–2 mm. long; calyx canescent-strigose, the tube 4 mm. long, the lobes deltoid or lanceolate, 1–2 mm. long; corolla ochroleucous, about 1 cm. long; banner obovate, strongly reflexed; wings decidedly shorter, the blade lunate, with a reflexed basal auricle, about equaling the claw; keel-petals similar but broader and more curved; pod strigose, somewhat canescent when young, membranous, ellipsoid, sessile, 4–5 cm. long, 2–2.5 cm. wide; seeds obliquely reniform, 2–2.5 mm. long.

TYPE LOCALITY: San Bernardino County, California.

DISTRIBUTION: Southern California, north to Kern County, and northern Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 16.

32. *Phaca perstricta* Rydberg, sp. nov.

Perennial; stem strict, 4–6 dm. high, erect, striate, sparingly strigose when young, soon glabrate; leaves 10–15 cm. long; stipules deltoid, 3 mm. long, deciduous; leaflets 13–19, oblong or oblong-obovate, 1–2.5 cm. long, 3–6 mm. wide, mostly obtuse, strigose on both sides; racemes including the peduncles 10–13 cm. long, bearing the flowers above the middle; bracts lanceolate, 2 mm. long; calyx strigose-canescens, the tube scarcely 3 mm. long, the teeth deltoid, 1 mm. long; corolla ochroleucous, about 1 cm. long, resembling that of *P. oocarpa*; pod elongate-ellipsoid, 5–6 cm. long, 2–2.5 cm. wide, sparingly strigulose.

Type collected in a hill valley between Campo and Jucumba, San Diego County, California, May 28, 1903, *Abrams 3636* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Southern California and Lower California.

10. **Douglasianae.** Tall perennials, with oblong to elliptic, glabrous or strigose leaflets. Calyx-lobes subulate, fully half as long as the tube. Corolla yellowish or purplish, 1 cm. long or more; banner moderately arched. Pod sessile, large, elliptic, much inflated, round in cross-section.

33. *Phaca Douglasii* T. & G. Fl. N. Am. 1: 346. 1838.

Astragalus Douglasii A. Gray, Proc. Am. Acad. 6: 215. 1864.

Tragacantha Douglasii Kuntze, Rev. Gen. 944. 1891.

Astragalus tejonensis M. E. Jones, Proc. Calif. Acad. II. 5: 644. 1895.

Phaca tejonensis A. Heller, Muhlenbergia 2: 85. 1905.

Perennial, with a caespitose caudex; stem erect, 2–4 dm. high, striate, glabrate or strigose; leaves ascending, 7–12 cm. long; stipules deltoid, distinct, 4 mm. long; rachis sparingly strigose or glabrate; leaflets 15–23, rather firm, elliptic or oblong, 8–20 mm. long, 3–8 mm. wide, more or less strigose or in age glabrate; peduncles 3–4 cm. long; racemes 5–15-flowered, 2–4 cm. long; calyx rather densely but finely white-strigose, the tube 3 mm. long, the lobes subulate, 2 mm. long; corolla yellowish or straw-colored, 10 mm. long; banner obovate, reflexed; wings slightly shorter, the blade obliquely oblong, with an acute basal auricle; wing-petals still shorter, strongly arcuate, rounded at the apex; pod rather elongate-ellipsoid, 3–4 cm. long and 1.5 cm. wide, strigulose.

TYPE LOCALITY: California [probably Monterey].

DISTRIBUTION: San Benito and Monterey counties, California, and southward, to northern Lower California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 15; pl. 16, f. 62 (including var. *tejonensis*).

34. *Phaca megalophysa* Rydberg, sp. nov.

Perennial, with a caespitose caudex; stems 4–6 dm. high, striate and angled, glabrous or sparingly strigose; leaves ascending, 10–15 cm. long; stipules lance-deltoid, 4–5 mm. long;

leaflets 19-29, oblong or elliptic, 1.5-3 cm. long, 5-8 mm. wide, often truncate or retuse at the apex, glabrate or somewhat strigose when young; peduncles 5-10 cm. long, arcuate; racemes 5-8 cm. long, 15-20-flowered; bracts lanceolate, 3 mm. long; calyx sparingly black-hairy, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous, about 1 cm. long, the banner obovate, somewhat reflexed; wings somewhat shorter, the blades oblong, with a rounded basal auricle; keel-petals broadly lunate, acutish; pod ellipsoid, sparingly short-pubescent, 4-6 cm. long, 2.5-3 cm. wide.

Type collected in Swarthout Canyon, San Antonio Mountains, California, *H. M. Hall 1531* (Gray Herb.).

DISTRIBUTION: Southern California.

35. *Phaca glaberrima* (M. E. Jones) Rydberg, sp. nov.

Astragalus Douglasii glaberrimus M. E. Jones, Proc. Calif. Acad. II. 5: 645. 1895.

Perennial, branched at the base; stems 2-4 dm. high, striate and glabrous; leaves 7-10 cm. long, ascending; stipules deltoid, 3 mm. long; leaflets 11-17, lance-linear, 1.5-2 cm. long, 2-3 mm. wide, tapering at each end, glabrous on both sides, or slightly strigose beneath, the apex almost cuspidate; peduncles about 5 cm. long; bracts lanceolate, 2 mm. long; calyx sparingly white-strigose, the tube 2 mm. long, the teeth lance-subulate, 1.5-2 mm. long; corolla about 8 mm. long, ochroleucous, similar to that of *P. Douglasii*; pod semi-ovoid, almost straight on the upper suture, 3 cm. long, 1.5 cm. wide, glabrous.

TYPE LOCALITY: Los Huevelos, Lower California.

DISTRIBUTION: Southern California and Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 15.

36. *Phaca allochroa* (A. Gray) Rydb. Fl. Rocky Mts. 487, 1063.

1917.

Astragalus allochrous A. Gray, Proc. Am. Acad. 13: 366. 1878.

Perennial, with a caudex; stems erect, 3-5 dm. high, sparingly strigose; leaves strongly ascending, about 1 dm. long; stipules deltoid, acuminate, pubescent, scarious, 4-5 mm. long; rachis strigose; leaflets 11-19, oblong to obovate, rounded to retuse at the apex, strigose on both sides; peduncles 5-7 cm. long; racemes 3-10 cm. long, 8-15-flowered; bracts lance-subulate, 2-3 mm. long; calyx strigose, the tube campanulate, 3 mm. long, the teeth subulate, 1.5 mm. long; wings shorter than the banner, the blade longer than the claw, oblong; keel-petals strongly incurved, the blade obliquely obovate, rounded at the apex; pod sessile, strigulose, about 3 cm. long and 1.5 cm. wide, acute, the upper suture nearly straight; seeds obliquely reniform, brown, 2 mm. long.

TYPE LOCALITY: Near Wickenburg, Arizona.

DISTRIBUTION: Arizona and southern New Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 17, f. 63.

37. *Phaca piscina* (M. E. Jones) Rydberg.

Astragalus piscinus M. E. Jones, Proc. Calif. Acad. II. 5: 645. 1895.

Astragalus Douglasii piscinus M. E. Jones, Contr. W. Bot. 10: 61. 1902.

Perennial; stem erect, 5 dm. high or more, striate, sparingly strigose; leaves 10-15 cm. long, ascending; stipules lanceolate, 4-5 mm. long; leaflets 25-29, narrowly oblanceolate, 1-2 cm. long, 2-4 mm. wide sparingly strigose; peduncles about 1 dm. long, strict; racemes nearly as long; bracts lanceolate, 2-3 mm. long; pedicels very short; calyx canescent-strigose, the tube 3 mm. long, the teeth subulate, nearly 2 mm. long; corolla purplish; banner obovate, spreading; keel-petals broadly lunate; pod oval-ellipsoid, about 2.5 cm. long and 1.5 cm. wide, sparingly short-strigose.

TYPE LOCALITY: Lagoon Head, Lower California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 72.

11. *Densifoliae*. Tall perennials, with oblong or elliptic leaflets. Flowers very numerous in long racemes, mostly reflexed. Calyx-teeth lanceolate, at least half as long as the tube. Corolla ochroleucous, the wings nearly as long as the banner, the latter moderately arched. Pod sessile, large, strongly inflated, round in cross-section.

38. *Phaca unde* Rydberg, sp. nov.

Perennial, with underground woody stems; branches decumbent or ascending, about 2 dm. high; leaves numerous, more or less arcuate, 3–6 cm. long, the rachis villous; stipules scarious, 5–6 mm. long, lance-deltoid; leaflets 13–31, crowded, obovate, usually retuse at the apex, 5–12 mm. long, white-villous with curved short hairs; peduncles 3–6 dm. long; racemes 3–5 cm. long; bracts subulate, 2–3 mm. long, about equaling the pedicels; flowers drooping; calyx white-villous, the tube campanulate, 3–3.5 mm. long, the teeth deltoid, 1 mm. long; corolla ochroleucous, 10–12 mm. long; banner obovate, arched above the middle; wings nearly as long, the blade slightly falcate, oblong, with a large auricle; keel-petals as long, similar but broader, rounded at the apex; pod obliquely ovoid, about 3 cm. long and 1.5 cm. wide, more ventricose on the lower suture, sparingly villous, at least when young.

Type collected at "Walla Walla, Washington" [but more likely southern California], C. L. Shear 5625 (U. S. Nat. Herb. No. 835452).

DISTRIBUTION: Southern California and [?] Washington.

39. *Phaca densifolia* Smith, in Rees' Cycl. 27: Phaca no. 9. 1814.

Phaca Nuttallii T. & G. Fl. N. Am. 1: 343. 1838.

Phaca inflata Nutt.; T. & G. Fl. N. Am. 1: 343, as a synonym. 1838.

Astragalus densifolius Torr. Pacif. R. R. Rep. 7: 10. 1857. Not *A. densifolius* Lam. 1783.

Astragalus Menziesii A. Gray, Proc. Am. Acad. 6: 217. 1864.

Tragacantha Nuttallii Kuntze, Rev. Gen. 941. 1891.

Astragalus Crotonariae Menziesii M. E. Jones, Contr. W. Bot. 10: 59. 1902.

Astragalus vestitus Menziesii M. E. Jones, Rev. Astrag. 110. 1923.

Perennial; stem erect or decumbent at the base, 5–10 dm. high, sulcate, sparingly villous or glabrate; leaves ascending, 6–15 cm. long; stipules membranous, 5–7 mm. long, deltoid; leaflets 19–41, obovate, 1–2 cm. long, 4–8 mm. wide, rather densely villous beneath, glabrate above, retuse at the apex, acute at the base; peduncles 10–15 cm. long, sparingly villous; racemes dense, 2–5 cm. long; bracts subulate, 2–3 mm. long; flowers reflexed in age; calyx-tube 4–5 mm. long, somewhat gibbous, villous, the lobes subulate, 1–1.5 mm. long; corolla ochroleucous (originally described as reddish, but evidently erroneously so), about 1 cm. long; banner obovate; wings almost as long, the blade oblong-lunate, rounded at the apex, with a reflexed basal auricle, shorter than the claw; keel-petals similar, slightly broader, tipped with purple; pod sparingly strigose, in age glabrate, obliquely ovoid, about 3 cm. long and 2 cm. wide.

TYPE LOCALITY: California [probably Monterey].

DISTRIBUTION: California, from San Francisco to Santa Barbara along the coast.

ILLUSTRATIONS: Hook. Ic. pl. 282; M. E. Jones, Rev. Astrag. pl. 12.

40. *Phaca pomonensis* (M. E. Jones) Rydberg.

Phaca densifolia Torr. Pacif. R. R. Rep. 4: 80. 1856. Not *P. densifolia* Smith, 1814.

Astragalus Crotonariae A. Gray, Proc. Am. Acad. 6: 216, in part. 1864.

Astragalus pomonensis M. E. Jones, Contr. W. Bot. 10: 59. 1902.

Perennial; stem 3–8 dm. high, striate and angled, glabrous; leaves 10–18 cm. long, ascending; stipules deltoid, about 5 mm. long, membranous; leaflets 11–35, oblong to oval, 1–2 cm. long, 3–8 mm. wide, acute at the base, rounded or rarely retuse at the apex, sparingly strigose beneath, glabrous above; peduncles 8–15 cm. long; racemes dense, 3–5 cm. long; bracts lance-subulate, 1–2 mm. long; flowers reflexed in age; calyx-tube 4 mm. long, appressed-pubescent, sometimes slightly black-hairy, the lobes subulate, with a deltoid base, 1.5–2 mm. long; corolla ochroleucous, 10–12 mm. long, similar to that of *P. densifolia*; pod obliquely ovoid, 3 cm. long, 1.5–2 cm. wide, minutely strigose.

TYPE LOCALITY: Fallbrook, California.

DISTRIBUTION: Southern California.

ILLUSTRATIONS: M. E. Jones, Contr. W. Bot. 10: pl. 9; Rev. Astrag. pl. 13, f. 56; pl. 15, f. 56.

41. *Phaca virgata* (A. Gray) Rydberg, sp. nov.

Astragalus Crotalariae virgatus A. Gray, Bot. Calif. 1: 149. 1876.
Astragalus franciscanus longulus Sheldon, Minn. Bot. Stud. 1: 135. 1894.
Astragalus franciscanus virgatus Cockerell, Bot. Gaz. 26: 437. 1898.
Astragalus vestitus franciscanus M. E. Jones, Rev. Astrag. 110, in part, as to description. 1923.

Perennial; stem 5 dm. high or more, sparingly pubescent or glabrate, angled, striate; leaves ascending, 5–10 cm. long; stipules lance-deltoid, 5–6 mm. long; leaflets 25–35, oblong, 1.5–2 cm. long, 2–5 mm. wide, glabrous above, sparingly pubescent beneath, acute to truncate at the apex; peduncles 1–1.5 dm. long; racemes elongate, about 1 dm. long; bracts subulate, 3–5 mm. long; flowers reflexed in age, but pod ascending; calyx-tube pilose, 4 mm. long, the lobes lance-subulate, 3–4 mm. long; corolla ochroleucous, 10–12 mm. long; banner obovate, gradually tapering below; wings nearly as long, the blade lunate, with a reflexed basal auricle, scarcely as long as the claw; wing-petals similar but broader and more rounded at the apex; pod more or less strigose, ovoid, sessile, about 3 cm. long and 1.5 cm. wide.

TYPE LOCALITY: About San Francisco Bay, California.

DISTRIBUTION: San Francisco Bay region.

42. *Phaca franciscana* (Sheldon) A. Heller, Muhlenbergia
2: 217. 1906.

Astragalus Crotalariae A. Gray, Proc. Am. Acad. 6: 216, in part. 1864.
Astragalus franciscanus Sheldon, Minn. Bot. Stud. 135. 1894.
Astragalus vestitus franciscanus M. E. Jones, Rev. Astrag. 110. 1923.

Perennial; stem angled and striate, 3–8 dm. high, stout, sparingly appressed-pubescent; leaves ascending, 8–14 cm. long; stipules deltoid, about 5 mm. long; rachis sparingly villous; leaflets 25–45, oblong to oval, acute at the base, mostly rounded at the apex, sparingly villous beneath, at least on the veins and the margins, 1–2 cm. long, 3–8 mm. wide; peduncles 5–12 cm. long; racemes dense, 5–8 cm. long; bracts lance-subulate, 4–6 mm. long; flowers reflexed; calyx-tube 4 mm. long, sparingly villous or glabrate, the lobes lance-subulate, 2–2.5 mm. long; corolla ochroleucous, 10–12 mm. long, like that of *P. densifolia*; pod glabrous from the beginning, obliquely oval-ovoid, 3 cm. long, 1.5 cm. wide, sessile.

TYPE LOCALITY: San Francisco, California.

DISTRIBUTION: Around San Francisco Bay and north to Mendocino County, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 13 (var. *franciscanus* and *f. 57 Crotalariae*).

12. *Candidissimae*. Tall perennials, with densely white-pubescent foliage, often decumbent at the base. Racemes short and densely flowered. Calyx-teeth deltoid to subulate. Corolla purple or ochroleucous, the banner strongly bent at the middle. Pod sessile, much inflated, round-ellipsoid, round in cross-section.

43. *Phaca candidissima* Benth. Bot. Voy. Sulph. 13. 1844.

Astragalus candidissimus S. Wats. Bibl. Ind. 191. 1878. Not *A. candidissimus* Ledeb. 1829.
Astragalus Magdaleneae Greene, Pittonia 1: 162. 1888.
Tragacantha californica Kuntze, Rev. Gen. 940. 1891.
Astragalus Crotalariae Magdaleneae M. E. Jones, Contr. W. Bot. 10: 59. 1902.

Perennial, somewhat shrubby below; stem decumbent, 5–8 dm. long, white-silky with appressed hairs; leaves 4–6 cm. long; stipules broadly deltoid, 1–5 mm. long, sericeous; leaflets 13–19, obovate or cuneate, rounded to retuse at the apex, 5–10 mm. long, 3–8 mm. wide, silvery silky-strigose on both sides; peduncles 5–10 cm. long; racemes rather lax, 3–4 cm. long; bracts subulate, 1–2 mm. long; calyx silvery, 3–4 mm. long, the lobes subulate, about 1 mm. long; corolla purple, about 1 cm. long; banner obovate, gradually tapering below; wings somewhat shorter, the blade lunate, fully as long as the claw, with an acutish basal auricle; keel-petals more curved and broader, rounded at the apex; pod sessile, canescent-strigose, ovoid-elliptic, 2–2.5 cm. long, about 12 mm. wide.

TYPE LOCALITY: Bay of Magdalena, Lower California.

DISTRIBUTION: Type locality and vicinity.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 13, f. 59.

44. *Phaca nivea* Rydberg, sp. nov.

Perennial, somewhat woody at the base, but apparently blooming the first season; stems 3 dm. high or more, branched, white-silky with appressed short pubescence; leaves 5–10 cm. long, ascending; stipules broadly deltoid, 3 mm. long; leaflets 11–19, oblong or elliptic, 6–10 mm. long, silvery-white, obtuse; peduncles 5–8 cm. long; racemes at first short, more elongate in age; bracts subulate, 1–2 mm. long; calyx-tube silvery-canescens, 3 mm. long, the lobes lance-subulate, 1 mm. long; corolla purple, 12–14 mm. long; banner obovate, gradually tapering below; wings somewhat shorter, the blade lunate, equaling the claw, with a large spreading auricle; keel-petals similar, broader, and rounded at the apex; pod sessile, canescent-strigose, when full-grown probably 2 cm. long or longer.

Type collected 15 miles north of San Felipe Bay, Lower California, February, 1904, *MacDougal* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Lower California and Sonora.

45. *Phaca macrodon* H. & A. Bot. Beech. Voy. 333. 1838.

Astragalus macrodon A. Gray, Proc. Am. Acad. 6: 216. 1864.

Tragacantha macrodon Kuntze, Rev. Gen. 943. 1891.

Astragalus holosericeus M. E. Jones, Proc. Calif. Acad. II. 5: 638. 1895.

Perennial, with a caudex; stems flexuose, 3–5 dm. high, villous throughout; leaves ascending, 1–1.5 dm. long, the rachis villous; leaflets 11–21, linear to elliptic, acute, 1–2 cm. long, villous on both sides; peduncles 5–10 cm. long, villous; bracts lanceolate, 2 mm. long; calyx 5–6 mm. long, villous, the lobes lance-subulate, equaling the tube; corolla yellowish, 8–9 mm. long; banner obovate, rather strongly reflexed; wings nearly as long, the blade oblong, with a large basal auricle; keel-petals lunate, rounded at the apex; pod sessile, obliquely ovoid, 2–3 cm. long, villous-canescens.

TYPE LOCALITY: California [somewhere between Monterey and San Francisco].

DISTRIBUTION: Monterey, San Luis Obispo, and Fresno counties, California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 14; pl. 15, f. 61.

46. *Phaca miguelensis* (Greene) Rydberg.

Astragalus miguelensis Greene, Pittonia 1: 33. 1887.

Perennial, somewhat woody at the base; stems branched, 3–6 dm. high, densely white-woolly; leaves 5–10 cm. long, ascending or spreading; stipules broadly deltoid, 3–4 mm. long; leaflets 17–25, obovate to elliptic, obtuse to retuse, 8–18 mm. long, 3–7 cm. wide, whitish- or grayish-villous on both sides; peduncles 5–9 cm. long; bracts lance-subulate, 2 mm. long; calyx-tube white-villous, 4–5 mm. long, the lobes subulate, 2–3 mm. long; corolla ochroleucous, 13–14 mm. long; banner obovate, gradually tapering below; wings somewhat shorter, the blade oblong-lunate, fully as long as the claw, with a large basal auricle; keel-petals similar, shorter and broader; pod sessile, finely villous-canescens, ellipsoid, about 2 cm. long and 12 mm. wide.

TYPE LOCALITY: Island of San Miguel, California.

DISTRIBUTION: Islands of San Miguel and San Clemente.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 13, f. 53; pl. 14.

47. *Phaca vestita* Benth. Bot. Voy. Sulph. 13. 1844.

Astragalus vestitus S. Wats. Bibl. Ind. 202. 1878. Not *A. vestitus* Boiss. 1842.

Astragalus anomophilus Greene, Bull. Calif. Acad. 1: 186. 1886.

Tragacantha vestita Kuntze, Rev. Gen. 949. 1891.

Astragalus Crotalariae anomophilus M. E. Jones, Contr. W. Bot. 10: 59. 1909.

Perennial; stems decumbent, 3–5 dm. long, white-villous with short hairs, branched; leaves 5–10 cm. long, spreading; stipules broadly deltoid, 3–5 mm. long; leaflets 19–25 (25–39 according to Bentham), obovate to oblong, 6–15 mm. long, densely white-villous, at least when young; peduncles 7–10 cm. long; racemes short and dense; bracts subulate, 2–3 mm. long; calyx-tube about 5 mm. long, villous, the lobes deltoid, 1 mm. long; corolla ochroleucous or greenish-yellow, 10–12 mm. long; banner obovate, gradually tapering below; wings somewhat shorter,

the blade lunate, obtuse, with a reflexed basal auricle; keel-petals similar, but broader; pod sessile, ovoid, villous-pubescent, 3.5-4 cm. long, 1.5 cm. broad.

TYPE LOCALITY: Bay of Magdalena.

DISTRIBUTION: Lower California; apparently also San Miguel Island, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 12, *f.* 55.

13. **Lutosae.** Low caespitose perennials, with a thick woody root, short stems, and crowded white-strigose leaflets. Calyx-lobes short, lanceolate. Corolla small, white, with a purple-tipped keel. Pod ellipsoid, inflated, acute, rounded-oval in cross-section.

48. *Phaca lutosa* (M. E. Jones) Rydberg.

Astragalus lutosus M. E. Jones, Contr. W. Bot. 13: 8. 1910.

Perennial, with a thick woody taproot; stems many, less than 1 dm. high, glabrous; leaves spreading, 4-7 cm. long, the rachis strigose; stipules oval to reniform, membranous; leaflets 21-27, crowded, at first conduplicate, oval, 5-7 mm. long, rounded at the apex, densely and coarsely strigose; peduncles short, 1-2.5 cm. long; racemes 1-4-flowered; bracts ovate; pedicels 1-2 mm. long; calyx strigose, tinged with red, the tube 5 mm. long, the teeth deltoid, 1.5 mm. long; corolla white, the keel tipped with purple; banner 8 mm. long, obovate, abruptly and strongly arched above the middle, retuse; wings nearly as long, the blade oblong-obovate, with a rounded auricle; keel-petals shorter, the blade lunate; pod 2.5-3 cm. long, 1.5 cm. wide and thick, elliptic, acute at each end, finely strigose, orbicular in cross-section; seed obliquely round-reniform, 4 mm. long.

TYPE LOCALITY: White River, near Dragon, Utah, near the Colorado line.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 20.

14. **Serpentes.** Low perennials, with a thick woody root and prostrate or ascending stems. Calyx-lobes subulate. Corolla purplish. Pod sessile, broadly ellipsoid, mottled, orbicular in cross-section.

49. *Phaca serpens* (M. E. Jones) Rydb. Bull. Torrey Club 40: 47. 1913.

Astragalus serpens M. E. Jones, Proc. Calif. Acad. II. 5: 641. 1895.

Perennial, with a thick woody root and a caespitose caudex; stems many, prostrate or ascending, 5-20 cm. long, much branched, strigose; leaves 1-3 cm. long, ascending; stipules broadly deltoid, 3 mm. long; leaflets 11-15, elliptic, conduplicate, 4-6 mm. long, strigose with rather long hairs; peduncles 3 cm. long or less; racemes 2-5-flowered; calyx strigose, the tube 2 mm. long, the lobes subulate, 1 mm. long; corolla 6 mm. long, purplish; banner broadly obovate; wings shorter, the blade obliquely obovate, with a basal auricle; keel-petals shorter and broader, strongly arcuate, obtuse; pod sessile, broadly ellipsoid, mottled, about 1.5 cm. long, 1 cm. wide; seeds brown, obliquely round-reniform, 2.5 mm. long.

TYPE LOCALITY: Loa Pass, Utah.

DISTRIBUTION: Central and southern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 11, *f.* 52.

15. **Polares.** Low caespitose perennials, with decumbent or creeping slender stems and thin glabrous leaflets. Calyx-teeth lance-subulate. Flowers 1-5. Corolla purple. Pod elongate-ellipsoid, black-strigose, sessile, rounded in cross-section.

50. *Phaca polaris* (Seem.) Rydberg.

Oxytropis polaris Seem. Narr. Voy. Herald 2: 24. 1852.

Astragalus polaris Benth.; Hook. Trans. Linn. Soc. 23: 323. 1861.

Tragacantha polaris Kuntze, Rev. Gen. 947. 1891.

Perennial, with a caespitose rootstock; stems 1-2 dm. long, decumbent or creeping among the moss; leaves 3-5 cm. long; stipules deltoid, membranous, connate, 4-7 mm. long; leaflets

11-14, oval, notched at the apex, 6-10 mm. long, 3-5 mm. wide, thin, glabrous; peduncles 5-10 cm. long; racemes 1-5-flowered; bracts lanceolate, 2 cm. long; calyx black-hairy, the tube 4 mm. long, slightly funnelliform, the teeth lance-subulate, 3 mm. long; corolla purple, "3-4 times as long as the calyx"; pod minutely black-strigulose, membranous, sessile, narrowly ellipsoid, 4-5 cm. long, 15-18 mm. thick and wide.

TYPE LOCALITY: Eschscholtz Bay, Alaska.

DISTRIBUTION: Western Alaska.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 7, f. 26.

16. *Candolleanae*. Perennial or annual low herbs, more or less strigose and branched. Calyx-teeth subulate or lanceolate. Corolla small, mostly ochroleucous or tipped with purple. Pod sessile, round-ellipsoid, rounded in cross-section.

51. *Phaca Wardii* (A. Gray) Rydb. Bull. Torrey Club 40: 47. 1913.

Astragalus Wardii A. Gray, Proc. Am. Acad. 12: 55. 1877.

Perennial, with a short woody caudex; stems erect or decumbent at the base, glabrous, 2-4 dm. high, straw-colored; leaves ascending, 6-10 cm. long; stipules deltoid, distinct or nearly so, about 2 mm. long, glabrous; leaflets 13-21, oblong or linear-oblong, 6-10 mm. long, 1-3 mm. wide, obtuse, truncate, or slightly retuse, glabrous; peduncles 2-5 cm. long; racemes 5-15-flowered, 2-5 cm. long; calyx slightly pubescent, the tube campanulate, 5 mm. long, the teeth subulate, fully 1 mm. long; corolla white or straw-colored, 6-7 mm. long; banner with an obovate retuse blade, reflexed; wings nearly as long as the banner, the blade oblong, twice as long as the claw, with an acute basal auricle; keel-petals much shorter, rounded at the apex; pod sessile, mottled, glabrous, 2-2.5 cm. long, 12-15 mm. wide; seeds brown, obliquely reniform, fully 2 mm. long and more than 1.5 mm. wide.

TYPE LOCALITY: Sevier County, Utah, on the edge of Aquarius Plateau.

DISTRIBUTION: Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 11, f. 51.

52. *Phaca Candolleana* H.B.K. Nov. Gen. & Sp. 6: 495. 1824.

Astragalus triflorus A. Gray, Pl. Wright. 2: 45, in part. 1853. Not *Phaca triflora* DC. 1802.

Astragalus Candolleanus Sheldon, Minn. Bot. Stud. 1: 140. 1894. Not *A. Candolleanus* Royle, 1835.

Astragalus triflorus Candolleanus M. E. Jones, Proc. Calif. Acad. II: 5: 637. 1895.

Perennial, with a caespitose caudex; stem pubescent, erect or decumbent below, angled; leaves ascending, 5-10 cm. long; stipules lanceolate-deltoid, acuminate, pubescent, 3-4 mm. long, deciduous; leaflets 17-25, linear-oblong, obtuse or emarginate, sparingly hirsute, 7-10 mm. long, 2-3 mm. wide; peduncles 2-5 cm. long; racemes 4-10-flowered; calyx pubescent, the tube campanulate, 2-2.5 mm. long, the lobes subulate, 1-1.5 mm. long, acuminate; corolla white, about 7 mm. long; banner obovate, retuse, strongly reflexed; blade of the wings oblong, with an acute basal auricle, longer than the claw; keel-petals shorter, the blade obliquely obovate, obtuse, with a rounded basal auricle; pod ellipsoid, sessile, glabrous, straw-colored, 14-18 mm. long; seeds obliquely reniform.

TYPE LOCALITY: Vulcano Jorullo, Mexico.

DISTRIBUTION: Southern Mexico.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. pl. 586.

53. *Phaca Wootoni* (Sheldon) Rydberg.

Astragalus triflorus A. Gray, Pl. Wright. 2: 45. 1853. Not *Phaca triflora* DC. 1802.

Astragalus Wootoni Sheldon, Minn. Bot. Stud. 1: 138. 1894.

Astragalus Candolleanus Sheldon, Minn. Bot. Stud. 1: 140, in part. 1894.

Astragalus playanus M. E. Jones, Contr. W. Bot. 8: 6. 1898.

Astragalus triflorus playanus M. E. Jones, Rev. Astrag. 106. 1923.

Annual or perennial; stems several from the woody root, 1-3 dm. high, erect or decumbent below, finely striate; leaves ascending, 5-10 cm. long; stipules deltoid, 3-4 mm. long, acuminate; leaflets 9-19, oblong, mostly obtuse, 1-2 cm. long, strigose beneath, glabrous above; peduncles 2-5 cm. long; racemes 6-10-flowered; calyx strigose, the tube campanulate, 2-2.5 mm. long, the

lobes subulate, nearly as long; corolla pink, purplish, or white, 7-8 mm. long; petals as in the preceding species; pod sessile, 2-2.5 cm. long, 1-1.5 cm. broad, strigulose; seeds brown, as in the preceding.

TYPE LOCALITY: Las Cruces, New Mexico.

DISTRIBUTION: Western Texas to Arizona and northern Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl. 10, f. 48; pl. 11 (var. playanus).*

54. *Phaca Tracyi* Rydberg, sp. nov.

Annual, with a deep root; stems several, strigose, decumbent or ascending, branched, 1 dm. high or less; leaves 5 dm. long or less; lower stipules connate and scarious, the upper distinct, deltoid, acuminate, 4-5 mm. long; leaflets 11-15, oblong, hirsute-strigose on both sides, 6-10 mm. long, 2-3 mm. wide; peduncles less than 2 cm. long; racemes few-flowered, short; calyx strigose, the tube 2 mm. long, the lobes subulate, 2 mm. long; corolla apparently white, 5-6 mm. long, similar to that of *P. Wootoni*; legumes sessile, strigose ovoid, 1-1.5 cm. long, 12-14 mm. wide; seeds like those of *P. Wootoni*.

Type collected on Toyah Creek, western Texas, April 21, 1902, *Tracy & Earle 78* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Western Texas and Chihuahua.

55. *Phaca Pondii* (Greene) Rydberg.

Astragalus Pondii Greene, *Pittonia* 1: 288. 1889.

Astragalus insularis quentinus M. E. Jones, *Contr. W. Bot.* 8: 6. 1898.

Astragalus insularis Pondii M. E. Jones, *Rev. Astrag.* 104. 1923.

Annual or probably sometimes perennial; stems several, decumbent at the base, branched 1-3 dm. long, sparingly strigose; leaves ascending, 4-11 cm. long; stipules distinct, deltoid, about 3 mm. long, acuminate; rachis strigose; leaflets 9-21, linear or linear-oblong, 5-20 mm. long, 1-4 mm. wide, strigose beneath, glabrate above, acute at each end; peduncles 2-3 cm. long, strigose; racemes 5-10-flowered, 2-3 cm. long; calyx strigose, the tube 2 mm. long, the teeth subulate, fully 2 mm. long; corolla purple, 5-6 mm. long; petals as in *P. Wootoni*; legume strigulose, sessile, 2-2.5 cm. long, 1.5 cm. wide, straw-colored, obliquely ellipsoid, more convex on the lower than on the upper surface; seeds obliquely reniform.

TYPE LOCALITY: San Bartolomé Bay (that of var. *quentinus*, San Quentin), Lower California.

DISTRIBUTION: Lower California.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl. 10.*

56. *Phaca subcinerea* (A. Gray) Rydb. *Bull. Torrey Club*

40: 47. 1913.

Astragalus subcinereus A. Gray, *Proc. Am. Acad.* 13: 366. 1878.

Apparently perennial; stems decumbent at the base, cinereous often with curved hairs, 2-4 dm. high; leaves ascending, 5-8 cm. long; stipules free, broadly deltoid, about 2 mm. long; leaflets 9-21, oblong, 5-10 mm. long, 1-3 mm. wide, short-villous, obtuse to retuse; peduncles 2-3 cm. long; racemes rather dense, 7-10-flowered; calyx canescent, the tube about 4 mm. long, the lobes deltoid, about 1 mm. long; corolla about 8 mm. long, according to the original publication "greenish with a purple tip, the banner violet-striate"; legume sessile, villosulous, spotted with purple, 1.5-2 cm. long, 8-15 mm. wide; seeds brown, obliquely round-reniform, 2.5 mm. broad.

TYPE LOCALITY: Mokia Pass, northwestern Arizona.

DISTRIBUTION: Arizona and southern Utah.

ILLUSTRATIONS: M. E. Jones, *Rev. Astrag. pl. 11, f. 49; pl. 17, f. 49.*

57. *Phaca Silerana* (M. E. Jones) Rydb. *Bull. Torrey Club*

40: 47. 1913.

Astragalus Sileranus M. E. Jones, *Zoe* 2: 242. 1891.

Astragalus Sileranus cariacus M. E. Jones, *Proc. Calif. Acad.* II. 7: 642. 1895.

Perennial; stems several, decumbent, about 5 dm. high, slender, short-villous; leaves 5-10 cm. long, ascending, the rachis short-villous; stipules deltoid, 5 mm. long, nearly distinct;

leaflets 15-19, oblong to cuneate-obovate, 8-15 mm. long, 4-5 mm. wide, truncate to obovate at the apex, short-villous; peduncles 3-5 cm. long; racemes short, few-flowered; calyx short-villous, the tube 2 mm. long, the lobes subulate, 2 mm. long; corolla 8 mm. long, ochroleucous, with purple-tipped keel; banner obovate; wings nearly as long, the blade obliquely oblanceolate, somewhat falcate; keel-petals shorter and broader, the blade semi-orbicular, shorter than the claw; pod nearly globose, 1-1.5 cm. long, purple-spotted, sessile, short-villous, the lower suture deeply inflexed.

TYPE LOCALITY: Sink Valley, southern Utah.
DISTRIBUTION: Southern Utah and northern Arizona.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 44, f. 160.

58. *Phaca cerussata* (Sheldon) Rydb. Bull. Torrey Club
32: 665. 1906.

Astragalus triflorus Porter & Coult. Syn. Fl. Colo. 27, in part. 1874. Not *A. triflorus* A. Gray, 1853.
Astragalus cerussatus Sheldon, Minn. Bot. Stud. 1: 139. 1894.
Astragalus triflorus cerussatus M. E. Jones, Rev. Astrag. pl. 11. 1923.

Perennial, stems erect to spreading, 2-3 dm. high, striate, sparingly pilose; leaves 4-8 cm. long, spreading; stipules deltoid, acuminate, 3-5 mm. long; leaflets 11-17, oblong to obovate, emarginate, 5-12 mm. long, villous-pilose on both sides or glabrate above; peduncles 4-6 cm. long; racemes 3-10-flowered, 2-4 cm. long; calyx pilose, the tube 2 mm. long, the lobes subulate, 2 mm. long; corolla tipped and veined with purple, 7-8 mm. long; banner obovate, retuse and reflexed; wings slightly shorter, the blade oblong, with an acute basal auricle; keel-petals strongly arcuate, obtuse, with a rounded auricle; legume sessile, pilosulous, slightly tinged with purple, but not mottled, 1.5-2 cm. long, about 1 cm. wide; seeds obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Canon City, Colorado.
DISTRIBUTION: Central and southern Colorado and northwestern New Mexico.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 11.

59. *Phaca pardalina* Rydberg, sp. nov.

Perennial, with a taproot; stems spreading or ascending, grayish-villous, terete, 1-2 dm. long; leaves 3-6 cm. long, spreading; stipules lanceolate or deltoid, acuminate, 2-4 mm. long; leaflets 9-13, oblong or those of the lower leaves obovate, rounded or rarely retuse at the apex, 4-10 mm. long, grayish-villous on both sides; peduncles 3-5 cm. long, erect; racemes 5-10-flowered, 2-5 cm. long; bracts subulate, 2-3 mm. long; pedicels 2-3 mm. long; calyx villous, the tube 3 mm. long, the lobes subulate, 2 mm. long; corolla purple or white, 7-8 mm. long; banner broad, strongly arcuate at the middle; wings nearly as long, the blade oblanceolate-falcate, with a large basal auricle; keel-petals shorter, the blade broadly lunate; legume sessile, villous, ellipsoid, 2 cm. long and fully 1 cm. wide, yellowish, with purplish-brown blotches.

Type collected on Cedar Mountain, Green River, Utah, May 20, 1915, M. E. Jones (herb. N. Y. Bot. Garden).
DISTRIBUTION: Utah and northwestern New Mexico.

60. *Phaca zacatecana* Rydberg, sp. nov.

Annual or short-lived perennial; stem about 3 dm. high, branched near the base, decumbent at the base, strigose-canescens when young; leaves ascending, 4-6 cm. long; stipules deltoid, 3-4 mm. long; leaflets 11-17, obovate or elliptic, 8-12 mm. long, glabrous above, villous-pilose beneath, rounded at the apex; peduncles 2-3 cm. long; racemes about 2 cm. long, 3-5-flowered; bracts lanceolate, 1 mm. long; calyx pilose, the tube 2.5 mm. long, the teeth subulate, 2 mm. long; corolla yellow, 6 mm. long; banner broadly obovate, strongly arched at the middle; wings almost as long, the blade obliquely obovate, with a large basal auricle; keel-petals shorter, the blade broadly lunate, acutish; pod ellipsoid, acute at each end, about 2.5 cm. long and 12 mm. wide, strigose.

Type collected at Casuality, Zacatecas, April 26, 1892, M. E. Jones (herb. N. Y. Bot. Gard.).

17. **Annuae.** Annuals or short-lived perennials. Calyx-teeth lanceolate or subulate, half as long as the tube or longer. Corolla ochroleucous or purple, less than 1 cm. long. Pod sessile, rather small, ovate in cross-section, the upper suture acute, straight or slightly concavely arcuate, the lower rounded and strongly convex.

61. *Phaca diurna* (S. Wats.) Rydberg.

Astragalus diurnus S. Wats. Proc. Am. Acad. 21: 450. 1886.
Astragalus Craigi M. E. Jones, Contr. W. Bot. 9: 42. 1900.

Perennial, branched at the base; stems several, ascending, branched, 1-2 dm. high, strigose; leaves ascending, 3-5 cm. long; stipules broadly deltoid, purplish, strigose, 2 mm. long; leaflets 9-13, obovate, obtuse or retuse, 5-10 mm. long, 3-5 mm. wide, sparingly strigose beneath, glabrous above; peduncles about 2 cm. long; calyx strigose, the tube 2 mm. long, the lobes nearly 2 mm. long, subulate; corolla white or purplish(?); banner obovate, 6 mm. long; wings slightly shorter, the blade oblong, with an acute basal auricle; keel-petals shorter, the blade strongly arcuate, rounded at the apex; legume sessile, strigose, 1.5-2 cm. long, fully 1 cm. wide, nearly straight on the upper suture; seeds obliquely round-reniform, 2.5 mm. long, the lower suture sometimes inflexed-sulcate and forming a narrow partial septum (*A. Craigi*).

TYPE LOCALITY: John Day River, Oregon.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 8, f. 34; pl. 22, f. 79.

62. *Phaca annua* Geyer; Hook. Lond. Jour. Bot. 6: 213. 1847.

Astragalus Geyeri A. Gray, Proc. Am. Acad. 6: 214. 1864. Not *A. annuus* DC. 1802.
Tragacantha Geyeri Kuntze, Rev. Gen. 945. 1891.

Annual; stem erect or ascending, much branched, strigose-canescens, less than 1 dm. high; leaves 3-7 cm. long; stipules distinct, deltoid, strigose, 2 mm. long; leaflets 7-11, linear, 8-15 mm. long, 1-2 mm. wide, strigose-canescens; peduncles 1 cm. long or less; racemes 3-6-flowered; calyx grayish-strigose, the tube 1.5 mm. long, the lobes subulate, 1 mm. long; corolla ochroleucous, 5-7 mm. long; banner obovate; wings somewhat shorter, the blade obliquely oblong, with an acute basal auricle; keel-petals strongly arcuate, rounded at the apex; pod strigose, sessile, about 2 cm. long and 1 cm. wide, obliquely ovate-lunate, strongly gibbous on the lower suture, acute on the concavely arcuate upper suture; seeds brown, obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Plains of Upper Platte.

DISTRIBUTION: Sandy soil, Wyoming and Utah to California and Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 9, f. 38.

63. *Phaca triquetra* (A. Gray) Rydberg.

Astragalus triquetrus A. Gray, Proc. Am. Acad. 13: 367. 1878.
Astragalus Geyeri triquetrus M. E. Jones, Contr. W. Bot. 8: 7. 1898.

Annual; stem erect, much branched, strigose-canescens, less than 2 dm. high; leaves 4-6 cm. long, ascending; stipules deltoid, 3 mm. long, strigose; leaflets 7-9, elliptic or oblong, usually retuse at the apex, 6-10 mm. long, 3-4 mm. wide; racemes few-flowered, shorter than the leaves; calyx strigose, the tube scarcely 2 mm. long, the teeth subulate, about equaling the tube; corolla ochroleucous, 4-5 mm. long, like that of *P. annua*; pod strigose, about 1.5 cm. long, 6 mm. broad, the upper suture acute, somewhat curved upwards, the lower convex, more or less sulcate; seeds obliquely reniform, 3 mm. long.

TYPE LOCALITY: Confluence of the Muddy River with the Virgin, Nevada.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 22, f. 78.

64. *Phaca insularis* (Kellogg) Rydberg.

Astragalus insularis Kellogg, Bull. Calif. Acad. 1: 6. 1884.
Astragalus triflorus insularis M. E. Jones, Proc. Calif. Acad. II, 5: 637. 1895.

Annual; stem branched, ascending or spreading, rarely more than 1 dm. long, sparingly strigose; leaves 4-7 cm. long; stipules deltoid, acuminate, strigose, 2-3 mm. long; leaflets 11-17,

lance-oblong to elliptic, acute, 6–10 mm. long, 2–3 mm. wide, sparingly strigose beneath, glabrate above; peduncles 1–4 cm. long; racemes 5–8-flowered; calyx strigose with black hairs, the tube 2 mm. long, the lobes 1 mm. long; corolla purple, 6–7 mm. long; banner obovate; wing-petals slightly shorter, the blade obliquely oblanceolate, with a large acute basal auricle; keel-petals similar but more arcuate; pod strigose, sessile, 1–1.5 cm. long, 7–9 mm. wide, obliquely ovoid, acute on the nearly straight upper suture.

TYPE LOCALITY: Cedros Island, Lower California.

DISTRIBUTION: Cedros Island, Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 10, f. 47.*

65. *Phaca arida* (A. Gray) Rydberg.

Astragalus aridus A. Gray, Proc. Am. Acad. 6: 223. 1864.

Tragacantha arida Kuntze, Rev. Gen. 943. 1891.

Astragalus albatrus Sheldon, Minn. Bot. Stud. 1: 128. 1894.

Annual; stem 1–2 dm. high, erect, branched, densely white-strigose; leaves 4–6 cm. long, the rachis strigose; stipules deltoid, acuminate, distinct, 2–3 mm. long; leaflets 9–13, oblong, 8–15 mm. long, obtuse, white-silky-strigose; peduncles 2–5 cm. long; racemes 5–8-flowered; calyx white-silky, the tube 2 mm. long, the lobes subulate, 1 mm. long; corolla ochroleucous, 5–6 mm. long, like that of *P. annua*; pod 10–12 cm. long, 5–6 mm. wide, white-silky, sessile, obliquely ovate, the lower suture gibbous, the upper acute and nearly straight; seeds like those of *P. annua*.

TYPE LOCALITY: Between the mouth of the Gila River and San Diego, California.

DISTRIBUTION: Southern California and Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 9, f. 37.*

66. *Phaca Vaseyi* (S. Wats.) Rydberg.

Astragalus Vaseyi S. Wats. Proc. Am. Acad. 17: 370. 1882.

Annual or biennial; stem 2–4, rarely 5–6 dm. high, striate, strigose-canescens, branched; leaves 5–10 cm. long, the rachis strigose; stipules distinct, triangular, 3 mm. long; leaflets 13–21, oblong to elliptic, 5–15 mm. long, 2–6 mm. wide, silky-strigose on both sides, often silvery-white; peduncles 6–10 cm. long, silky-strigose; racemes including the peduncle 5–20 cm. long, many-flowered; calyx silvery-strigose, the tube fully 3 mm. long, the lobes subulate, 2 mm. long; corolla purplish, 10–12 mm. long; banner obovate, retuse; wings shorter, the blade oblong, longer than the claw, with a large basal auricle; keel-petals rounded at the apex; legume sessile, strigose, 15–18 mm. long, 6–7 mm. wide, gibbous on the lower suture, acute and nearly straight on the upper.

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

DISTRIBUTION: Southern California, northwestern Sonora, and Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 9, f. 42.*

67. *Phaca metana* (M. E. Jones) Rydberg.

Astragalus melanus M. E. Jones, Proc. Calif. Acad. II. 5: 666. 1895.

Perennial; stem decumbent at the base, 3–6 dm. high, more or less canescens-strigose, striate; leaves 10–15 cm. long, ascending; stipules deltoid, 4–5 mm. long, canescens; leaflets 15–21, oblong to oval, 1–4 cm. long, 4–8 mm. wide, densely canescens-strigose when young, greener in age, mostly rounded at the apex; peduncles 1 dm. long or more; racemes elongate, about as long, many-flowered; bracts lanceolate, 3–4 cm. long, more or less black-hairy; pedicels short; calyx black-hairy, the tube 3 mm. long, the teeth subulate, nearly 2 mm. long, corolla dark-purplish-blue, 8–10 mm. long; banner obovate, porrect; wings somewhat shorter; the blade oblong, with a large basal auricle; blade of the keel-petals broadly lunate, obtuse; pod obliquely ovoid, turgid, finely strigose, 1–1.5 cm. long and 8–10 cm. wide, the upper suture straight and acute.

TYPE LOCALITY: Hanson's Ranch, Lower California, near the border.

DISTRIBUTION: Southern California and northern Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 9, f. 41.*

68. *Phaca Deanei* Rydberg, sp. nov.

Annual or biennial; stem erect, about 3 dm. high, glabrous and reddish, striate, branched; leaves ascending, about 1 dm. long; stipules deltoid, 3 mm. long; leaflets 21-29, oblong or elliptic, obtuse, glabrous or nearly so, 8-15 mm. long; peduncles 7-8 cm. long; racemes lax, 3-7 cm. long; bracts lanceolate, 1-2 mm. long; pedicels short; calyx sparingly strigose, the tube scarcely 3 mm. long, the teeth subulate, 1.5 mm. long; corolla white; banner nearly 1 cm. long, obovate, porrect; wings a little shorter, the blade oblong, with a large basal auricle; blade of the keel-petals broadly lunate; pod about 1.5 cm. long and 12 mm. wide, strigose, obliquely ovate, straight on the upper suture.

Type collected in Sweetwater Valley, San Diego County, California, May 13, 1883, *G. C. Deane* (Gray Herb.).

69. *Phaca Palmeri* (A. Gray) Rydberg.

Astragalus Palmeri A. Gray, Proc. Am. Acad. 7: 398. 1868.

Stem about 5 dm. high, sparingly strigose; leaves ascending, about 1 dm. long; stipules deltoid, 2-3 mm. long; leaflets 17-27, oblong, 1-2 cm. long, 4-6 mm. wide, sparingly strigose when young, glabrate at least above in age, obtus.; peduncles about 1 dm. long, striate; racemes lax, about as long; bracts lanceolate, 1-1.5 mm. long; calyx strigose, the tube 2.5 mm. long, the teeth subulate, nearly 2 mm. long; corolla bluish-purple, resembling that of *P. Vaseyi*; pod erect, strigose, obliquely ovate in outline, 1.5 cm. long, 8 mm. wide, somewhat compressed, acute and straight on the upper suture.

TYPE LOCALITY: Camp Grant, southern Arizona.

DISTRIBUTION: Southern Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 10, f. 44.

70. *Phaca prorifera* (M. E. Jones) Rydberg.

Astragalus proriferus M. E. Jones, Zoe 4: 275. 1893.

Probably perennial; stem shrubby at the base, 3-6 dm. high, short-villous, canescent; leaves 5-10 cm. long, ascending, the rachis short-villous; stipules triangular, 2-3 mm. long; leaflets 17-23, oblong or oblong-lanceolate to obovate, obtus., 6-20 mm. long, 2-6 mm. wide; peduncles stout, 4-6 cm. long; racemes 4-8 cm. long, many-flowered; calyx white-villous, the tube 3 mm. long, the lobes subulate, 1.5 mm. long; corolla dark-purple, fading yellowish, 8 mm. long; banner obovate, emarginate; wings shorter, the blade oblanceolate; keel-petals strongly falcate, obtuse; legume obliquely ovoid, about 12 mm. long, 6-7 mm. wide, densely short-villous, gibbous on the lower suture, nearly straight on the upper.

TYPE LOCALITY: San Pedro Martir, Lower California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 9, f. 40.

71. *Phaca juliana* (M. E. Jones) Rydberg.

Astragalus julianus M. E. Jones, Proc. Calif. Acad. II. 5: 667. 1895.

Annual or short-lived perennial, branched at the base; stem 1-3 dm. high, hirsute; leaves 5-10 cm. long, ascending; stipules lance-deltoid, 2-3 mm. long; leaflets 13-19, lance-elliptic to lance-linear, acute, 8-12 mm. long, 2-3 mm. wide, hirsute; peduncles 3-5 cm. long; racemes lax, 3-8 cm. long, overtopping the leaves; bracts subulate, 2 mm. long; calyx hirsute, the tube 2 mm. long, the teeth subulate, 2 mm. long; corolla white or nearly so, about 7 mm. long, similar to that of *P. sabulonum*; pod obliquely ovoid, 12-15 mm. long, 7-8 mm. wide, short-hirsute, the upper suture nearly straight and acute.

TYPE LOCALITY: San Julio, Lower California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 9, f. 39.

72. *Phaca sabulorum* (A. Gray) Rydb. Bull. Torrey Club
40: 47. 1913.

Astragalus sabulorum A. Gray, Proc. Am. Acad. 13: 368. 1878.

Astragalus sabulorum S. Wats. [err.] Bibl. Ind. 463. 1878.

Astragalus virgineus Sheldon; Coville, Contr. U. S. Nat. Herb. 4: 88. 1893.

Annual; stem 5-15 cm. high, with spreading branches, canescent with ascending hairs; leaves 3-5 cm. long, the rachis canescent; stipules deltoid, acuminate, 3-4 mm. long; leaflets 9-13, oblong or oblong-oblongeolate, 8-12 mm. long, 2-4 mm. wide, canescent on both sides; peduncles 1-4 cm. long; raceme short, 3-6-flowered; calyx silky-strigose, the tube 2-2.5 mm. long, the lobes subulate, 2 mm. long; corolla described as purple or violet, but apparently white, with striate banner; petals as in *P. annua*; pod hirsute, sessile, about 1.5 cm. long and 8 mm. wide, obliquely ovoid, the lower suture gibbous, the upper acute and nearly straight.

TYPE LOCALITY: Southeastern Nevada, near the confluence of Muddy River with Rio Virgin.

DISTRIBUTION: Southern Nevada to northwestern Sonora.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 9, f. 36.

73. *Phaca arenicola* Rydberg, sp. nov.

Perennial; stem somewhat woody at the base, silky-canescenscent, the branches decumbent below; leaves 5-8 cm. long, the rachis canescent; stipules deltoid, acuminate, distinct, 3-5 mm. long; leaflets 9-13, obovate, rounded to retuse at the apex, 5-10 mm. long, 3-5 mm. wide, appressed silky-canescenscent; peduncles 3-5 cm. long; racemes 2-3 cm. long, 3-10-flowered; calyx silky-canescenscent, the tube 2-2.5 mm. long, the lobes lance-subulate, 2.5-3 mm. long; corolla about 6 mm. long, apparently white, streaked with purple; banner broadly obovate; wings somewhat shorter, the blade broadly obliquely obovate, with a large basal auricle; keel-petals similar, strongly arcuate, obtuse at the apex; pod (not mature) sessile, hirsute, more than 1 cm. long, the lower suture gibbous, the upper acute and somewhat upcurved.

Type collected in sand at Mecca, Salton Basin, Southern California, Feb. 28, 1913, *Parish 8467* (herb. N. Y. Bot. Gard.).

74. *Phaca lerdoensis* Rydberg, sp. nov.

Annual; stem with decumbent or spreading branches, less than 1 dm. long, hirsutulous-canescenscent; leaves 2-3 cm. long; stipules distinct, deltoid, 2 mm. long; leaflets 7-11, obovate to oblong, about 5 mm. long, hirsute-canescenscent; peduncles 1-2 cm. long; racemes 3-5-flowered; calyx hirsute, the tube 2 mm. long, the lobes 2 mm. long; corolla purple-tinged with darker veins, 6 mm. long; banner broadly obovate; wings somewhat shorter, the blade oblong-lunate, obtuse, with a long basal auricle; keel-petals broader, strongly gibbous-arcuate, obtuse; pod sessile, hirsute, 12-15 mm. long, gibbous on the lower suture, nearly straight on the upper.

Type collected at Colonia Lerdo, northern Sonora, February, 1904, *MacDougal* (herb. N. Y. Bot. Gard.).

18. *Pubentissimae*. Low caespitose perennials with a woody caudex; the stems slender and decumbent. Flower-clusters small, few-flowered, shorter than the leaves. Calyx-teeth subulate, almost equaling the tube. Corolla yellowish-white, small. Pod small, less than 1 cm. long, obliquely ovoid, acuminate, the upper suture straight or upcurved.

75. *Phaca pubentissima* (T. & G.) Rydb. Bull. Torrey Club
40: 48. 1913.

Astragalus multicaulis Nutt.; T. & G. Fl. N. Am. 1: 335. 1838. Not *A. multicaulis* Ledeb. 1831.

Astragalus pubentissimus T. & G. Fl. N. Am. 1: 693. 1840.

Tragacantha pubentissima Kuntze, Rev. Gen. 947. 1891.

Astragalus Peabodyanus M. E. Jones, Zoe 3: 295. 1893.

Perennial, with a deep root; stems several, branched, about 1 dm. high or less, canescenscent-strigose; leaves 3-5 cm. long, ascending; stipules deltoid, membranous, 3 mm. long; leaflets 7-13, obovate, 3-6 mm. long, obtuse, canescenscent with long ascending hairs; peduncles 1-3 cm. long; racemes 3-5-flowered; calyx pilose-canescenscent, the tube 3 mm. long, the lobes subulate,

2-2.5 mm. long; corolla 8 mm. long, white or tinged with purple, the keel purple-tipped; banner broadly obovate; wings nearly as long, the blade obliquely oblanceolate-arcuate, with a large basal auricle; keel-petals broader, strongly arcuate, rounded at the apex; pod sessile, villous with long hairs, obliquely ovoid, 12-14 mm. long, the lower suture strongly arched and gibbous, the upper more or less recurved.

TYPE LOCALITY: Ham's Fork of the Colorado, Wyoming.

DISTRIBUTION: Western Wyoming and northern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 8, f. 35.

76. *Phaca Pulsiferae* (A. Gray) Rydberg.

Astragalus Pulsiferae ["*Pulsiferi*"] A. Gray, Proc. Am. Acad. 10: 69. 1874.

Tragacantha Pulsiferae Kuntze, Rev. Gen. 947. 1891.

Perennial, with a thick woody root and caespitose caudex; stems rather slender, villous, branched, 1-2 dm. long; leaves 2-4 cm. long, the rachis villous; stipules broadly deltoid, acuminate, distinct, 2 mm. long; leaflets 5-11, obovate-cuneate, often emarginate, 5-10 mm. long, villous; peduncles 1-2 cm. long; racemes 3-5-flowered; calyx villous, the tube 1.5-2 mm. long, the lobes subulate, 2 mm. long; corolla white, purple-tinged, 6 mm. long; banner obovate, emarginate; wings much shorter, the blade oblanceolate; keel-petals short and broad, strongly incurved, the apex purple and obtuse; pod sessile, long-villous, 1.5 cm. long, obliquely ovoid, strongly arched, gibbous on the lower suture, the upper straight or slightly upcurved.

TYPE LOCALITY: Sierra and Plumas counties, California.

DISTRIBUTION: Northern Sierra Nevada, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 8, f. 33.

19. *Pychnostachyae*. Stout erect perennials, with leafy stems. Racemes dense, spike-like or head-like. Calyx somewhat gibbous, the teeth subulate. Corolla ochroleucous or white. Pod ovoid in outline, sessile, rather small, compressed, acute on the upper or both margins, few-seeded.

77. *Phaca pychnostachya* (A. Gray) Rydberg.

Astragalus pychnostachyus A. Gray, Proc. Am. Acad. 6: 527. 1865.

Tragacantha pychnostachya Kuntze, Rev. Gen. 947. 1891.

Perennial; stem sometimes woody below, 5-10 dm. high, often tinged with brown or purple, more or less short-villous, canescent; leaves 5-15 cm. long, spreading, the rachis villous-canescens; stipules scarious, distinct, deltoid, acuminate, 4-5 mm. long; leaflets 15-33, rather crowded, elliptic or oblong, 1-2 cm. long, 2-7 mm. wide, densely villous-canescens, obtuse or mucronate; peduncles 3-5 cm. long, stiff, nearly erect; racemes dense, 3-5 cm. long, the flowers and fruit densely crowded; calyx villous, the tube somewhat gibbous above, 4 mm. long, the lobes subulate, 2 mm. long; corolla ochroleucous; banner obovate, only slightly exceeding the other petals; blade of the wing-petals obliquely obovate, with a large basal auricle, about equaling the claw; keel-petals similar, but more arcuate and with a smaller auricle; pod ovoid (originally described as turgid-lenticular), beaked, 1 cm. long, 5-6 mm. broad, glabrous, somewhat reticulate; seeds brown, obliquely round-reniform, 2.5 mm. long.

TYPE LOCALITY: Baulinas [Bolinas] Bay, California.

DISTRIBUTION: Central and southern California, near the coast.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 10, f. 45.

78. *Phaca lanosissima* Rydberg, sp. nov.

Perennial; stem stout, 4-6 dm. high, grayish-canescens, strict; leaves spreading, 5-10 cm. long; stipules deltoid, reflexed, 4-5 mm. long; leaflets 25-31, crowded, oblong, silvery-silky, 1-2 cm. long, 4-6 mm. wide, rounded at the apex; peduncles 2-3 cm. long; racemes dense, spike-like, 2-3 cm. long; bracts lanceolate, 1-2 mm. long; calyx white-pilose, the tube 4 mm. long, the teeth lanceolate, 1-1.5 mm. long; corolla ochroleucous, about 1 cm. long; banner only slightly upcurved, obovate; wings slightly shorter, the blade obovate, equaling the claw, with a large basal auricle; keel-petals similar, broader and more rounded;

pod reflexed, sessile, long-beaked, the body about 1 cm. long, glabrous, compressed, 2-4 seeded, the sutures acute; seeds obliquely reniform, 2.5 mm. long, brown.

Type collected at La Bolsa, Los Angeles County, California, in October, 1882, *S. B. & W. F. Parish 1117* (Morong Herbarium).

DISTRIBUTION: Southern California.

79. *Phaca Hornii* (A. Gray) Rydberg.

Astragalus Hornii A. Gray, Proc. Am. Acad. 7: 398. 1868.

Perennial; stem 3-5 dm. high, erect, striate, sparingly strigose or glabrate; leaves about 1 dm. long, spreading; stipules deltoid, distinct, 3 mm. long, reflexed; leaflets 21-29, oblong, 1-2 cm. long, 3-5 mm. wide, sparingly strigose; peduncles 7-10 cm. long; racemes short and dense, 2-4 cm. long, the flowers and fruits crowded; calyx more or less black-hairy, the tube 3 mm. long, the lobes subulate, 2 mm. long; corolla ochroleucous, nearly 1 cm. long; banner obovate; wing-petals nearly as long, the blade obliquely obovate, about equaling the claw, with a large basal auricle; keel-petals similar to the wings, slightly more curved; pod sessile, short-villous, ovoid, tapering into a beak, 12 mm. long, 8-9 mm. wide; seeds similar to those of the preceding.

TYPE LOCALITY: Near Fort Tejon, California.

DISTRIBUTION: Southern California and Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 10, f. 46.

80. *Phaca bajaensis* (Sheldon) Rydberg.

Astragalus bajaensis Sheldon, Minn. Bot. Stud. 1: 169. 1894.

Astragalus miserandus Greene, Erythra 3: 76. 1895.

Astragalus Hornii minutiflorus M. E. Jones, Proc. Calif. Acad. II. 5: 677. 1895.

Astragalus Hornii bahaeensis M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Perennial; stem decumbent, 2-4 dm. long, striate, glabrate, or slightly hairy when young; leaves ascending, 7-10 cm. long; stipules deltoid, 3 mm. long, reflexed; leaflets 21-33, obovate to oblong, retuse at the apex, 8-15 mm. long, 3-6 mm. wide, sparingly appressed-hairy when young, soon glabrate; peduncles 5-7 cm. long; racemes dense and short, sub-capitate, 1-2 cm. long; bracts ovate, 2 mm. long; calyx appressed-pubescent, the tube about 3 mm. long, the teeth about 1 mm. long, the upper two deltoid, the lower three lance-subulate; corolla white, 6-7 mm. long, similar to that of *P. Hornii*; pod 10-12 mm. long, 7-8 mm. wide, ovoid, rather sparingly short-hairy.

TYPE LOCALITY: San Gregorio, Lower California.

DISTRIBUTION: Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 10.

81. *Phaca tularensis* Rydberg, sp. nov.

Apparently perennial; stem at least 3 dm. high, strongly sulcate, sparingly pilose; leaves spreading, 2-4 cm. long; stipules deltoid, 4 mm. long, reflexed; leaflets 13-17, crowded, oblanceolate, 8-12 mm. long, 3-4 mm. wide, rather copiously long-pilose, especially when young; peduncles 1-4 cm. long, pilose; racemes dense, 1-2 cm. long; calyx pilose, the tube 2.5 mm. long, the teeth subulate, 1.5 mm. long; corolla apparently white or ochroleucous, 8 mm. long; banner obovate; wings much shorter, the blade obliquely oblong, with a larger auricle; keel-petals nearly as long, the blade broadly lunate; pod long-pilose, obliquely ovoid, long-beaked, the upper suture slightly curved upward, the body about 1 cm. long, few-seeded.

Type collected near Tulare Lake, southern California, *Lemmon* (Gray Herb.).

DISTRIBUTION: Type locality and Pyramid Lake, Nevada.

20. *Jejunae*. Low perennials with a caespitose woody caudex, subcaulescent, and the leaves with a stiff rachis and numerous minute leaflets. Racemes few-flowered. Pod sessile, round-ellipsoid, less than 1 cm. long, apiculate.

82. *Phaca jejuna* (S. Wats.) Rydb. Bull. Torrey Club 40: 48. 1913.

Astragalus jejunus S. Wats. Bot. King's Expl. 73. 1871.
Tragacantha jejuna Kuntze, Rev. Gen. 945. 1891.

Perennial, with a thick root and caespitose caudex; stems numerous, 3-5 cm. high, below covered with imbricate, membranous, connate, ciliate stipules; leaves about 2 cm. long; leaflets 7-15, linear, 2-5 mm. long; peduncles shorter than the leaves; racemes 1-3-flowered; calyx strigose, the tube nearly 2 mm. long, the lobes subulate, 1 mm. long; corolla ochroleucous, tinged with violet, 4 mm. long; banner obovate, retuse; wings slightly shorter, the blade obovate, with an acute basal auricle; keel-petals much shorter and broader, obtuse; pod sessile, slightly puberulent or glabrate, about 1 cm. long, sub-globose, usually somewhat mottled.

TYPE LOCALITY: Bear River Valley, near Evanston, Utah [now Wyoming].

DISTRIBUTION: Western Wyoming and northern Utah.

ILLUSTRATIONS: Bot. King's Expl. *pl. 13, f. 1-6*; M. E. Jones, Rev. Astrag. *pl. 17, f. 65*.

83. *Phaca humillima* (A. Gray) Rydb. Bull. Torrey Club 32: 665. 1906.

Astragalus humillimus A. Gray; Brand. Bull. U. S. Geol. Surv. Terr. 2: 235. 1876.
Tragacantha humillima Kuntze, Rev. Gen. 945. 1891.

Perennial, with a woody root and caespitose tufted caudex; stems 3 cm. high or less, covered by imbricate, connate, scarios stipules; leaves 1-2 cm. long, ascending, the rachis persistent and spinescent; leaflets 7-11, oblong, canescent, 2 mm. long, deciduous; peduncles short; racemes 1-3-flowered; calyx-tube shorter than the subulate calyx-lobes; corolla pale; pod obovate, sessile, white-pubescent, 4-5 mm. long.

TYPE LOCALITY: Mesa Verde, near edge of Mancos Cañon, southwestern Colorado.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 6, f. 19* [poor].

21. *Microcystes*. Perennials, usually with elongate slender stems and small leaflets. Calyx-teeth subulate. Corolla small, ochroleucous, white, or purple. Pods small, inflated, from ellipsoid to subglobose, less than 1 cm. long, rounded in cross-section.

84. *Phaca Thurberi* (A. Gray) Kearney, Trans. N. Y. Acad. 14: 34. 1894.

Astragalus Thurberi A. Gray, Mem. Am. Acad. II. 5: 312. 1854.
Tragacantha Thurberi Kuntze, Rev. Gen. 948. 1891.

Perennial; stems 2-3 dm. high, more or less grayish-strigose or glabrate, striate, branched; leaves ascending, 6-10 cm. long; stipules triangular, distinct; leaflets 13-17, oblong or linear-oblong, retuse or obtuse, 8-15 mm. long, sparingly strigose, or glabrate above; peduncles 2-5 cm. long; racemes about as long, 10-20-flowered; calyx strigose, the tube 2 mm. long, the lobes 1.5 mm. long, subulate; corolla ochroleucous or tinged with purple, 6 mm. long; pod subglobose-sessile, sparingly strigose, 6-10 mm. long; seeds obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Near Fronteras, Sonora.

DISTRIBUTION: Arizona, Sonora, and western New Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 10, f. 43*.

85. *Phaca Bodini* (Sheldon) Rydb. Bull. Torrey Club 32: 665. 1906.

Astragalus Bodini Sheldon, Minn. Bot. Stud. 1: 122. 1894.
Astragalus debilis M. E. Jones, Rev. Astrag. 88, in part. 1923. Not *A. debilis* A. Gray, 1863.

Perennial; stem slender, 3-6 dm. high, sparingly pubescent or glabrate, erect or decumbent; leaves 3-10 cm. long, ascending; stipules deltoid, acuminate, distinct, 3-5 mm. long; leaflets acute at each end, 7-20 mm. long, sparingly strigose beneath, glabrous above; peduncles 5-10 cm. long; racemes 5-10-flowered, 2-4 cm. long; calyx strigose with short black hairs, the tube 3 mm. long, the lobes subulate, 2 mm. long; corolla purple, 8-10 mm. long; banner obo-

vate, retuse; wing-petals shorter, the blade oblong, somewhat arcuate, longer than the claw; keel-petals much shorter and broader, rounded at the apex; pod sessile, ellipsoid, short-strigose with black hairs, about 1 cm. long, 6 mm. wide; seeds obliquely round-reniform, dark-brown, 2 mm. long.

TYPE LOCALITY: Cheyenne, Wyoming.

DISTRIBUTION: Western Nebraska, Wyoming, Utah, and Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 7, f. 27.

86. *Phaca leptalea* (A. Gray) Rydb. Bull. Torrey Club 40: 48. 1913.

?*Phaca pauciflora* Nutt.; T. & G. Fl. N. Am. 1: 348. 1838.
Astragalus pauciflorus A. Gray, Proc. Acad. Phila. II. 7: 60. 1863. Not *A. pauciflorus* Pall. 1800;
nor *A. pauciflorus* Hook. 1831.
Astragalus leptaleus A. Gray, Proc. Am. Acad. 6: 220. 1864.
Tragacantha leptalea Kuntze, Rev. Gen. 946. 1891.

Perennial, with a slender caespitose rootstock; stems slender, decumbent or spreading, 1-2 dm. long, sparingly strigose; leaves 4-7 cm. long; lower stipules connate, deltoid, 3 mm. long, the upper lance-subulate; leaflets 15-25, lance-linear to oblong, often acute, 5-12 mm. long; peduncles 2-5 cm. long, slender; racemes 2-5-flowered; calyx more or less black-hairy, the tube 3 mm. long; the lobes subulate, 2 mm. long; corolla white; banner obovate, emarginate, nearly 1 cm. long; wings 8 mm. long, the blade oblong, with an acute basal auricle; keel-petals 6 mm. long, the blade broadly lunate, rounded at the apex, purple-tipped; pod sessile, strigose with black hairs, ellipsoid, 1 cm. long, 5 mm. wide; seeds obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Valleys of the Rocky Mountains, in South Park, Colorado.

DISTRIBUTION: Mountains of Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 8, f. 30.

87. *Phaca stragala* (Fernald) Rydberg.

Astragalus stragalus Fernald, Rhodora 28: 214. 1926.

Perennial; stems many, slender, creeping, forming mats 3-4 dm. in diameter, glabrous or sparsely strigose; stipules lance-oblong, 2-4 mm. long; leaves spreading, 2-6 cm. long, strigose; leaflets 9-19, oval or elliptic, retuse, 2-10 mm. long, 1-5 mm. wide, glabrous on both sides or strigose beneath; peduncles 1-5 cm. long; racemes short, 1-10-flowered; bracts scarious, lanceolate; calyx black-strigose, the tube 2.5-3 mm. long, the teeth lanceolate, 1-1.5 mm. long; corolla purple, 8-12 mm. long; banner rounded-obovate, retuse; wings much shorter, the blade narrowly obovate, with an oblong basal auricle; keel-petals as long, the blade lunate, equaling the claw; pod oblong-ellipsoid, 6-8 mm. long, 2.5-4 mm. wide, black-hairy; seeds 5-8, olive-brown, about 1.5 mm. long.

TYPE LOCALITY: Cook Point, Pistolet Bay, Newfoundland.

DISTRIBUTION: Known only from the type locality.

88. *Phaca Yukonis* (M. E. Jones) Rydberg.

Astragalus Yukonis M. E. Jones, Rev. Astrag. 89. 1923.

Perennial, with a slender, caespitose rootstock; stems filiform, decumbent at the base, 1-2 dm. high, sparingly pubescent; leaves 2-5 cm. long; stipules deltoid, 1-3 mm. long; leaflets 5-13, elliptic, 4-7 mm. long, obtuse or retuse at the apex, glabrous above, sparingly strigose beneath; peduncles about 1 dm. long; racemes at first short, elongate in age, 2-6 cm. long; bracts deltoid, scarious, 2 mm. long; pedicels 1-1.5 mm. long; calyx black-hairy, the tube 2.5 mm. long, the teeth deltoid-subulate, fully 1 mm. long; corolla purple, 7-8 mm. long; banner obovate, moderately arched; wings shorter, the blades oblong, rather strongly falcate; keel-petals still shorter, the blade strongly lunate, rounded at the apex; pod ellipsoid, about 7 mm. long, 4 mm. broad, black-hairy with short hairs.

TYPE LOCALITY: Ranch Valley, Fort Selkirk on the Yukon.

DISTRIBUTION: Yukon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 7, f. 28.

89. *Phaca Prebblei* Rydberg, sp. nov.

Perennial, with a rootstock; stems slender, 2-3 dm. long, prostrate or decumbent, sparingly hairy; leaves 3-5 cm. long, spreading; stipules ovate, 3 mm. long; leaflets 13-17, elliptic or oblong, 4-15 mm. long, acute at the base, obtuse or more often slightly emarginate at the apex, glabrous above, sparingly strigose beneath; peduncles 7-12 cm. long; racemes 3-5 cm. long, rather lax; bracts lanceolate, 2 mm. long; pedicels 1 mm. long; calyx black-hairy with short hairs, the tube 3 mm. long, the teeth subulate, 1 mm. long; corolla purplish, about 10 mm. long; banner broadly obovate, retuse, rather strongly arcuate; wings shorter, the blade obliquely oblanceolate, falcate, with a reflexed auricle; keel-petals still shorter, the blade broadly lunate; pod obliquely elliptic-ovoid, 1 cm. long, 3-4 mm. wide, white-strigose, the upper suture nearly straight.

TYPE COLLECTED ON THE Athabasca River, Alberta, August 14, 1903, *Prebble & Cary 123* (U. S. Nat. Herb. 421630).

DISTRIBUTION: Alberta and Mackenzie.

90. *Phaca quinquiflora* (S. Wats.) Rydberg.

Astragalus quinquiflorus S. Wats. Proc. Am. Acad. 21: 450. 1886.

Apparently annual; stems several, 1.5 dm. long or less, slender, prostrate or ascending; strigose; leaves 3-8 cm. long; stipules deltoid or lance-deltoid, 2 mm. long; leaflets 7-11, linear or linear-oblong, obtuse, 4-12 mm. long, strigose on both sides; peduncles 3-8 cm. long; racemes 2-5-flowered; calyx strigose, the tube 1.5 mm. long, the lobes subulate, 1 mm. long; corolla white or purplish, 5 mm. long; pod ellipsoid, sessile, strigose, about 8 mm. long and 4 mm. wide; seed nearly black, obliquely round-reniform, 1 mm. long.

TYPE LOCALITY: Hills and Plains near city of Chihuahua.

DISTRIBUTION: Chihuahua and Durango.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 7, f. 23.

91. *Phaca microcystis* (A. Gray) Rydb. Mem. N. Y. Bot. Gard.

1: 245. 1900.

Astragalus microcystis A. Gray, Proc. Am. Acad. 6: 220. 1864.

Tragacantha microcystis Kuntze, Rev. Gen. 946. 1891.

Astragalus miser M. E. Jones, Rev. Astrag. 98. 1923. Not *A. miser* Dougl. 1834.

Perennial, with a woody root and caespitose caudex; stems decumbent or procumbent, branched, 2-3 dm. long, strigose with curved hairs; leaves 4-6 cm. long; lower stipules connate, the upper distinct, 3 mm. long; leaflets 9-13, oblong or lance-elliptic, obtuse or acute, 6-12 mm. long, pilose with ascending curved hairs below, glabrous or nearly so above; peduncles 1-3 cm. long; racemes about as long, 5-15-flowered; calyx appressed-hairy often with black hairs, the tube 1.5 mm. long, the lobes subulate, 1 mm. long; corolla pink or white, 5 mm. long; banner obovate, deeply notched, abruptly arched, purple-striate; wings much shorter, the blade obliquely oval, rounded; wings still shorter, the blade broadly lunate, rounded at the apex; pod rounded-obovoid, 8-10 mm. long, 5-6 mm. wide, sessile, usually white-pilose with spreading hairs, seeds obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Interior of Washington, Fort Colville.

DISTRIBUTION: Montana to Washington and British Columbia.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 8, f. 32.

92. *Phaca scalaris* (S. Wats.) Rydberg.

Astragalus scalaris S. Wats. Proc. Am. Acad. 23: 270. 1888.

Astragalus scalaris quercetinus M. E. Jones, Rev. Astrag. 107. 1923.

Biennial according to the original description, more likely perennial; stem sparingly and finely strigose, slender, 3-6 dm. high, erect; leaves spreading, 5-7 cm. long; stipules deltoid-subulate, 2 mm. long; leaflets 13-25, linear or oblong, 5-12 mm. long, 1.5-3 mm. wide, obtuse or retuse at the apex, sparingly strigose beneath, glabrous above; peduncles 3-7 cm. long; racemes lax, 5-10 cm. long, 10-16-flowered; calyx-tube 1.5 mm. long, sparingly black-strigose, the lobes deltoid, 0.5 mm. long; corolla purplish, 5-6 mm. long; banner obovate, spreading;

wings about 4 mm. long, the blade obliquely obovate, with a large basal auricle; keel-petals still shorter, similar but the blade broader, more arcuate, rounded at the apex; pod ellipsoid, 7-9 mm. long, about 4 mm. wide, glabrous, tapering below into a minute stipe; seeds obliquely round-reniform.

TYPE LOCALITY: Sierra Madre, Chihuahua.

DISTRIBUTION: Chihuahua.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 11, f. 50.*

22. **Preussianae.** Stout perennials, only slightly hairy. Calyx-tube cilindro-campanulate, longer than the short teeth. Corolla purplish, rather large, the banner elongate and slightly arcuate. Pod stipitate, but the stipe often short, the body inflated, rather firm, ellipsoid, 2-valved at the apex, rounded in cross-section.

93. *Phaca ampullaria* (S. Wats.) Rydb. Bull. Torrey Club

40: 47. 1913.

Astragalus ampullarius S. Wats. Am. Nat. 7: 300. 1873.

Tragacantha ampullaria Kuntze, Rev. Gen. 943. 1891.

Perennial; stem 1-2 dm. high, sparingly strigose; leaves about 5 cm. long, spreading; stipules lanceolate or ovate, 5-7 mm. long, membranous; leaflets 7-11, obovate, rounded or retuse at the apex, 6-10 mm. long, 4-7 mm. wide, cuneate at the base, glabrous above, sparingly strigulose beneath; peduncles 2-5 cm. long; racemes headlike, 8-12-flowered; bracts lanceolate, 2-3 mm. long; pedicels 1-2 mm. long; calyx strigulose with black hairs, the tube 5-6 mm. long, 2-3 mm. wide, the teeth deltoid, 1 mm. long; corolla purple, 17-18 mm. long; banner obovate, notched at the apex; wings 15-16 mm. long, the blade lanceolate, with a large reflexed auricle; keel-petals much shorter, the blade broadly lunate; pod glabrous, long-stipitate, the stipe 1.5-2 cm. long, the body ovoid, 1.5-2 cm. long, 10-12 mm. wide.

TYPE LOCALITY: Kanab, Utah.

DISTRIBUTION: Southern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 33, f. 114.*

94. *Phaca Preussii* (A. Gray) Rydb. Bull. Torrey Club

40: 47. 1913.

Astragalus Preussii A. Gray, Proc. Am. Acad. 6: 222. 1864.

Tragacantha Preussii Kuntze, Rev. Gen. 947. 1891.

Rydbergiella Preussii Rydb. Fl. Rocky Mts. 501. 1917.

Perennial, with a woody taproot and a short cespitose caudex; stems several, 2-5 dm. high, sulcate, glabrous, stout; leaves 7-11 cm. long, spreading; stipules large, free, broadly deltoid, 5-7 cm. long; leaflets 11-15, oblong to broadly obovate, 8-18 mm. long, glabrous, obtuse to emarginate at the apex, somewhat fleshy; peduncles ascending, 5-10 cm. long, sulcate, glabrous; racemes 4-6 cm. long; bracts lanceolate, about 2 mm. long, equaling the pedicels; flowers spreading; calyx glabrous, cylindric, the tube about 7-8 mm. long, the teeth subulate, 2-2.5 mm. long; corolla purple, about 2 cm. long; banner obovate, slightly arched, emarginate at the apex; wings much shorter, the blade oblong, shorter than the claw, with a large reflexed auricle; keel-petals about as long and similar, slightly broader and more lunate; pod glabrous, stipitate, the stipe 5-8 mm. long, the body oblong-ellipsoid, 2-3 cm. long, about 1 cm. wide and thick; seeds obliquely reniform, 4 mm. long, 2.5 mm. broad.

TYPE LOCALITY: Banks of Rio Virgin [Nevada].

DISTRIBUTION: Central Utah to southeastern California and central Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 32, f. 113.*

95. *Phaca Davidsonii* Rydberg, sp. nov.

Perennial; stems several from a woody root and short caudex, sulcate, glabrous, 2-4 dm. high; leaves 5-10 cm. long, ascending; stipules broadly deltoid, 3-5 mm. long, scarious, the lower very broad; leaflets 11-15, broadly obovate, 6-20 mm. long, 4-10 mm. wide, glabrous, usually retuse or obovate at the apex; peduncles 6-12 cm. long; racemes rather lax, 4-8 cm.

long; bracts lanceolate, about 2 mm. long; calyx slightly strigulose with scattered black hairs, the tube 5 mm. long, 2-2.5 mm. wide, the lower 3 teeth subulate, 2 mm. long, the upper 2 broader and shorter; corolla light-purple, about 15 mm. long; banner obovate, slightly arcuate; wings slightly shorter, the blade broadly oblong; keel-petals still shorter, the blade broadly lunate, obtuse; pod nearly sessile, acute at each end, glabrous and somewhat reticulate, about 2 cm. long, 7-8 mm. wide, obliquely elliptic, nearly straight on the upper suture.

Type collected at Lancaster, California, May 12, 1893, *A. Davidson* + (Gray Herb.).
DISTRIBUTION: Los Angeles County, California.

96. *Phaca laxiflora* (A. Gray) Rydberg, sp. nov.

Astragalus Preussii laxiflorus A. Gray, Proc. Am. Acad. 13: 369. 1878.
Astragalus Preussii laxispicatus Sheldon, Minn. Bot. Stud. 1: 130. 1894.

Perennial; stem erect, 5 dm. high or more, glabrous, sulcate; leaves 1-1.5 dm. long, strongly ascending; stipules deltoid, free, 4-5 mm. long; leaflets 11-15, broadly obovate, 5-15 mm. long, usually retuse at the apex, glabrous; peduncles 10-15 cm. long, erect; racemes 10-15 cm. long, lax; bracts lanceolate, 2-3 mm. long; pedicels 1 mm. long; flowers ascending; calyx cylindrical, glabrous, the tube 6 mm. long, the teeth subulate, 2-2.5 mm. long; corolla pale-purple, 17 mm. long; banner obovate, narrow and retuse at the tip; wings shorter, the blade oblong, falcate, nearly equaling the claw, with a reflexed basal auricle; keel-petals about as long, the blade broadly lunate, obtuse; pod short-stipitate, the stipe obconic, 3 mm. long, the body glabrous, obliquely ellipsoid, about 2 cm. long, 1 cm. wide and thick.

TYPE LOCALITY: Beaverdam, on the Rio Virgin, Arizona.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 74, f. 112.

97. *Phaca Crotalariae* Benth. Pl. Hartw. 307. 1848.

Astragalus Crotalariae A. Gray, Proc. Am. Acad. 6: 216. 1864.
Tragacantha Crotalariae Kuntze, Rev. Gen. 243. 1891.
Astragalus limatus Sheldon, Minn. Bot. Stud. 1: 126. 1894.
Astragalus Preussii limatus Jepson, Man. Fl. Pl. Calif. 566. 1925.

Perennial, with a taproot, but evidently blooming the first year; stems several, 3-6 dm. high, strongly sulcate, pubescent, at least when young, with ascending hairs; leaves 10-15 cm. long, ascending; stipules ovate-deltoid, reflexed, free, 5-6 mm. long; leaflets 11-19, rounded-obovate, rounded or retuse at the apex, 1-3.5 cm. long, pubescent beneath with ascending hairs; peduncles 1-1.5 dm. long, ascending; racemes 6-10 cm. long; bracts ovate or ovate-lanceolate, 3 mm. long; pedicels 2 mm. long; calyx strigose, the tube cylindrical, about 7 mm. long, the teeth lanceolate, 2 mm. long; corolla purple, about 2 cm. long; banner obovate, retuse, slightly arched; wings shorter, the blade oblong, slightly falcate, longer than the claw, with a large basal auricle; keel-petals similar but broader and more arched; pod short-stipitate, strigulose and cross-veined, the stipe 2 mm. long, obconic, the body rounded-ellipsoid or ovoid, 2.5-3 cm. long, 15-18 mm. wide and thick; seeds obliquely reniform, 4 mm. long, 2.5 mm. broad, brown.

TYPE LOCALITY: Monterey, California (that of *A. limatus*: Indian Wells, Colorado Desert, California).

DISTRIBUTION: Southern California and northern Lower California.
ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 33, 34, f. 115; pl. 74.

98. *Phaca Eastwoodiae* (M. E. Jones) Rydb. Bull. Torrey Club
32: 664. 1906.

Astragalus Preussii sulcatus M. E. Jones, Zoe 4: 37. 1893.
Astragalus Eastwoodiae M. E. Jones, Zoe 4: 368. 1894.
Astragalus Preussii Eastwoodiae M. E. Jones, Rev. Astrag. 154. 1923.

Perennial, with a woody taproot and short cespitose caudex; stems several, decumbent at the base, 2-3 dm. high, glabrous, sulcate; leaves 8-15 cm. long, ascending; stipules membranous, broadly deltoid, 4-5 mm. long; leaflets 17-21, linear or lance-linear, 7-20 mm. long, glabrous, acute; peduncles 4-5 cm. long; racemes 3-4 mm. long, ascending; bracts ovate, 2 mm. long; calyx minutely black-hairy, the tube cylindrical, 6-7 mm. long, the teeth subulate, 2 mm. long;

corolla unknown; pod short-stipitate, the stipe 2 mm. long, obconic, the body round-ellipsoid, sulcate on both sutures, glabrous, 1.5 cm. long, 8 mm. wide and 12 mm. thick; seeds obliquely reniform.

TYPE LOCALITY: Westwater, "Colorado" [Utah].

DISTRIBUTION: Eastern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 33.

23. *Neglectae*. Tall leafy perennials, nearly glabrous. Calyx-tube campanulate, the teeth subulate. Corolla white, the banner moderately arched at the middle. Pod sessile, obliquely ovoid, strongly inflated, parchment-like in texture, 2-valved at the apex, suborbicular in cross-section, but both sutures especially the lower somewhat sulcate.

99. *Phaca neglecta* T. & G. Fl. N. Am. 1: 344. 1838.

Astragalus Cooperi A. Gray, Man. Bot. ed. 2. 98. 1856.

Tragacantha neglecta Kuntze, Rev. Gen. 741. 1891.

Astragalus neglectus Sheldon, Minn. Bot. Stud. 1: 59. 1894. Not *A. neglectus* Freyn, 1893.

Perennial; stem erect, branching, striate, 3-7 dm. high; leaves ascending, 5-10 cm. long; stipules 3-4 mm. long, lance-deltoid; leaflets 11-17, oblong or elliptic, 1-2.5 cm. long, 3-10 mm. wide, strigose beneath, glabrous above, obtuse to emarginate; peduncles 4-8 cm. long; racemes 3-5 cm. long; calyx black-hairy, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla white, 12-14 mm. long; banner obovate, not reflexed; wings slightly shorter, the blade comparatively narrow, obliquely oblong, falcate, obtuse, with a small auricle; blade of keel-petals lunate, rounded, at the apex, with a large auricle; pod comparatively firm, ovoid, about 2 cm. long and 1 cm. broad, glabrous, the sutures somewhat sulcate; seeds obliquely round-reniform, 3 mm. long, brown.

TYPE LOCALITY: Western part of New York, from Onondaga Lake to the falls of Niagara.

DISTRIBUTION: Quebec and western New York to Minnesota.

ILLUSTRATIONS: Torr. Fl. N. Y. pl. 24; M. E. Jones, Rev. Astrag. pl. 40, f. 129; Britt. & Brown, Ill. Fl. f. 2149; ed. 2. f. 2554.

46. *ATELOPHRAGMA* Rydb. Bull. Torrey Club 32: 660. 1905.

Cauliscent leafy perennials with rootstocks. Leaves odd-pinnate, usually with many entire leaflets; stipules nearly free both from each other and the petiole. Flowers in spike-like axillary racemes. Calyx-tube campanulate, the lobes 5, slender. Corolla purple or white, middle-sized. Banner obovate, almost clawless. Wings and keel-petals clawed, the blades of the former obliquely obovate or oblong, somewhat falcate, with a rather small basal auricle, those of the latter more or less lunate. Stamens diadelphous (9 and 1), the sheath straight, the free part of the filaments curved upwards. Ovary stipitate, straight, the style glabrous, curved upwards, the stigma minute, terminal. Pod stipitate, or rarely sessile, membranous or papery, the body elongate, laterally flattened or terete, more or less inflated, rounded, oval or somewhat cordate in cross-section, abruptly acute, the lower suture inflexed, the lower edge of the valves folded and forming a partial partition or septum. Seeds obliquely rounded-reniform.

Type species, *Astragalus aboriginum* Richards.

Pod not sulcate on the lower suture, both sutures usually prominent.

Pod distinctly stipitate.

Pod compressed, glabrous or minutely grayish-strigillose.

Pod more turgid, more or less black-hairy or in one species densely gray-pubescent.

Pod subsessile, turgid, the stipe less than 2 mm. long.

Pod sulcate on the lower suture.

Pod erect or ascending on short pedicels, sessile.

Pod pendul on slender pedicels, stipitate.

Upper suture of the pod acute, straight or nearly so.

Upper suture blunt or rounded; both sutures nearly equally convexly curved.

Flowers more than 6 mm. long; racemes elongate at least in fruit; pod more than 1 cm. long.

Flowers less than 5 mm. long; racemes dense and short; pod less than 1 cm. long.

1. GLABRUSCULA.

2. ROBBINSIANA.

3. OROBOIDEA.

5. WILLIAMSIANA.

4. ALPINA.

6. STRIGULOSA.

7. SEATONIANA.

1. GLABRIUSCULA

Leaves loosely and densely villous on both sides.

Body of the pod obliquely oblanceolate, the stipe exceeding the calyx; racemes in anthesis dense, shorter than the peduncle; corolla white or ochroleucous, only the keel purplish.

Body of the pod elliptic, the stipe about equaling the calyx; racemes lax, about as long as the peduncle; corolla greenish-white, tinged with purple.

Leaves strigose or glabrate or with scattered hairs.

Leaflets elliptic or lance-elliptic.

Leaves glabrous or with a few scattered hairs; corolla with purple-tipped keel.

Leaves rather densely strigose beneath, glabrous above; corolla purple.

Leaflets linear or lance-linear.

Leaves glabrous or nearly so.

Leaves rather densely strigose, at least beneath.

Pod glabrous.

Pod strigose.

2. ROBBINSIANA

Corolla white; body of the pod abruptly contracted at each end, minutely and sparingly black-hairy.

Corolla purplish; pod gradually tapering at each end, or at least at the base; pod densely hairy.

Leaflets glabrous or nearly so on both sides.

Leaflets distinctly strigose or pilose beneath.

Corolla about 1 cm. long; leaflets strigose or strigulose beneath.

Stipe decidedly longer than the calyx-tube.

Stipe about as long as the calyx-tube or slightly shorter.

Calyx and pod black-hairy; calyx-teeth about 1 mm. long;

leaflets glabrous above, sparingly strigose beneath.

Calyx and pod with white hairs; calyx-teeth 1.5-2 mm. long;

leaflets sparingly pubescent above, densely so beneath.

Corolla about 12-15 mm. long.

Stipe slightly if at all exceeding the calyx-tube; leaves canescent-pilose beneath, at least when young.

Stipe equaling or exceeding the calyx-teeth; leaves sparingly pilose beneath.

3. OROBOIDEA

Pod hairy; leaflets not retuse.

Leaflets thin, oblong, to oval; plant erect; raceme many-flowered.

Pod about 1.5 cm. long, gradually acute.

Pod about 12 mm. long or less, rather abruptly acute.

Pod 6-7 mm. long; racemes short and dense even in fruit.

Pod 10-12 mm. long; racemes lax in fruit.

Leaflets elliptic or oblong, hairy at least above.

Leaflets rounded-oval to orbicular, glabrous.

Leaflets linear; plant decumbent; raceme few-flowered.

Pod glabrous, reticulate; leaflets thick, retuse.

4. ALPINA

Pod densely long-pubescent, straight or nearly so; calyx densely black-hairy.

Pod sparingly short-strigulose, more or less arcuate, *i.e.* even the upper suture curved upwards; calyx-tube nearly glabrous.

5. WILLIAMSIANA

One species.

6. STRIGULOSA

Pod glabrous.

Calyx-lobes deltoid, one fourth as long as the tube; corolla usually tinged with purple.

Calyx-lobes subulate, half as long as the tube or longer.

Corolla bluish-purple, strongly striate; bracts ovate or lanceolate.

Corolla white or tinged with purple; bracts subulate.

Body of the pod 3-4 cm. long.

Leaflets oblong; stipe of the pod longer than the calyx-tube.

Calyx short-hairy, its teeth shorter than the tube.

Calyx long-hairy, its teeth fully as long as the tube.

Leaflets obovate, retuse; stipe of the pod shorter than the calyx-tube.

Body of the pod 1-2 cm. long; leaflets elliptic.

Stipe of the pod longer than the calyx-tube; calyx-teeth nearly as long as the tube; corolla 10 mm. long.

Stipe shorter than the calyx-tube.

Calyx not densely black-hairy, the teeth less than half as long as the tube; raceme lax, few-flowered; corolla 7 mm. long.

Calyx densely black-hairy, the teeth three fifths as long as the tube; raceme dense; corolla 10 mm. long.

1. *A. aboriginum*.

2. *A. Coltoni*.

3. *A. Forwoodii*.

4. *A. wallowense*.

5. *A. glabriusculum*.

6. *A. lineare*.

7. *A. Herriolii*.

8. *A. Robbinsii*.

9. *A. Jesupi*.

10. *A. Blakei*.

11. *A. Macounii*.

12. *A. Fernaldi*.

13. *A. Harringtonii*.

14. *A. Collieri*.

15. *A. occidentale*.

18. *A. atratum*.

16. *A. elegans*.

17. *A. alpiniforme*.

19. *A. Brandegei*.

20. *A. Shearii*.

21. *A. alpinum*.

22. *A. labradoricum*.

23. *A. Williamsii*.

24. *A. Painteri*.

25. *A. tolucanum*.

26. *A. jaliscense*.

27. *A. zacatecanum*.

28. *A. tioides*.

29. *A. strigulosum*.

30. *A. hidalgense*.

31. *A. guatemalense*.

- Pod more or less pubescent.
 Corolla 9–15 mm. long.
 Corolla white.
 Stems creeping; stipe shorter than the calyx-tube.
 Leaflets 25–31, 1–2 cm. long; peduncles 1–4 cm. long; pod 1.5 cm. long or more, rather gradually acute. 32. *A. reptans*.
 Leaflets 15–21, less than 1 cm. long; body of the fruit 12 mm. long, abruptly contracted at each end. 33. *A. Harshbergeri*.
 Stems merely decumbent to erect.
 Stipe of the pod barely equaling the calyx-tube; body 5–6 mm. wide. 34. *A. oaxacanum*.
 Stipe much exceeding the calyx-tube; body 3–4 mm. wide.
 Calyx-teeth subulate, 1.5 mm. long. 35. *A. potosinum*.
 Calyx-teeth deltoid less than 1 mm. long. 36. *A. altum*.
 Corolla purple.
 Bracts longer than the calyx-tube; leaflets minutely strigulose beneath. 37. *A. bracteatum*.
 Bracts shorter than the calyx-tube; leaflets sparingly long-pilose beneath. 38. *A. Lozani*.
 Corolla 7–8 mm. long.
 Corolla purplish.
 Stems low, decumbent; leaflets obovate, often retuse. 39. *A. cobrense*.
 Stems tall, erect; leaflets linear to oblong. 40. *A. straturense*.
 Corolla white or straw-colored.
 Stipe equaling or exceeding the calyx-tube.
 Pod white-hairy, the stipe much exceeding the calyx-teeth. 41. *A. longissimum*.
 Pod black-hairy, the stipe slightly exceeding the calyx-tube.
 Leaves and calyx sparingly short-hairy. 42. *A. Rusbyi*.
 Leaves and calyx copiously long-hairy. 43. *A. Townsendii*.
 Stipe shorter than the calyx-tube. 44. *A. Rosei*.

7. SEATONIANA

- Stems elongate, 3–4 dm. long; leaflets linear; raceme subcapitate, pods subsessile. 45. *A. Pueblae*.
 Stems shorter, 1–3 dm. long; leaflets oblong to obovate; raceme oblong at least in fruit.
 Pod subsessile, often black-hairy. 46. *A. Seatonii*.
 Pod short-stipitate, white-hairy, the stipe nearly as long as the calyx-tube. 47. *A. Purpusi*.

1. *Glabriuscula*. Pod distinctly flat, grayish-strigulose, stipitate, the stipe longer than the calyx; both sutures prominent, the upper more curved than the lower. Corolla middle sized, ochroleucous or greenish white, only purple-tinged in one species, the keel tipped with purple.

1. *Atelophragma aboriginum* (Richards.) Rydb. Bull. Torrey Club
 32: 660. 1906.

- Astragalus aboriginorum* Richards. in Frankl. Journey 756. 1823.
Astragalus vaginatus (Richards. in Frankl. Journey 756, hyponym. 1823) Hook. Fl. Bor. Am. 1: 149. 1831. Not *A. vaginatus* Pall. 1800.
Astragalus aboriginum Spreng. Syst. 4: Post. Cur. 288. 1827.
Phaca aboriginorum Hook. Fl. Bor. Am. 1: 143. 1831.
Tragacantha aboriginum Kuntze, Rev. Gen. 942. 1891.
Astragalus Richardsonii Sheldon, Minn. Bot. Stud. 1: 126. 1894.
Homalobus aboriginorum Rydb. Mem. N. Y. Bot. Gard. 1: 246. 1900.
Homalobus aboriginum Rydb.; Britton, Man. 554. 1901.

A perennial, with a caespitose rootstock; stems erect, or decumbent at the base, 1–3 dm. high, villous-canescens, angled; leaves ascending, 3–7 cm. long, the rachis sulcate, villous; stipules ovate, 4–5 mm. long; leaflets 9–13, oblong or lance-oblong, or rarely linear, mostly acute at each end, 8–20 mm. long, 2–7 mm. wide, grayish-villous on both sides; peduncles erect, 4–8 cm. long; racemes 2–5 cm. long, at first dense, in age lax; bracts subulate, 2–4 mm. long; pedicels about 1 mm. long; calyx villous, the tube 3.5–4 mm. long, 2.5–3 mm. broad, the teeth 3 mm. long, subulate; corolla ochroleucous, with a purple-tipped keel; banner 8–10 mm. long, obovate, strongly arched at the middle, retuse; wings shorter, the blade oblong, rather strongly falcate, with a long reflexed basal auricle; keel-petals still shorter, the blade broadly lunate, acutish and purple-tipped; pod distinctly stipitate, glabrous, or strigose when young, the stipe 7–8 mm. long, the body lunate, 1.5–3 cm. long, about 5 mm. wide and 2.5 mm. thick, the lower suture acutish, straight or slightly concave, the cross-section oval, the septum less than 0.5 mm. wide; seed obliquely reniform, 2.5 mm. long, 2 mm. wide, grayish-brown.

TYPE LOCALITY: "Wooded country from lat. 54° to 64°N" [between Lake Winnipeg and Bear Lake], Canada.

DISTRIBUTION: Manitoba to Black Hills, South Dakota, Colorado, Nevada, and Yukon; also Gaspé Peninsula, Quebec.

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl.* 56; M. E. Jones, *Rev. Astrag.* *pl.* 27, *f.* 87; Britt. & Brown, *Ill. Fl. f.* 2145; ed. 2. *f.* 2550; Clements, *Rocky Mt. Fl.* *pl.* 29, *f.* 17.

2. *Atelophragma Cottoni* (M. E. Jones) Rydb. *Bull. Torrey Club*
55: 121. 1928.

Astragalus olympicus Cotton, *Bull. Torrey Club* 29: 573. 1902. Not *A. olympicus* Pall. 1800.

Astragalus Cottoni M. E. Jones, *Rev. Astrag.* 135. 1923.

A perennial, with a deep root and caespitose caudex; stems many, spreading or decumbent, 1-2 dm. long, villous with short ashy hairs; leaves 2-3 cm. long, spreading; stipules deltoid, 4 mm. long, membranous; leaflets 13-17, oblong, 8-12 mm. long, 2-3 mm. wide, subacute, villous; peduncles 3-5 cm. long; racemes more lax than in the related species, 8-15-flowered; bracts narrowly subulate, 2-3 mm. long; calyx-tube 4-5 mm. long, pubescent with mixed black and white hairs, the teeth subulate, 2-3 mm. long; corolla greenish-white, about 1 cm. long, the keel tipped with purple; banner obovate, tapering gradually below; wings shorter, the blade oblong-lunate, acutish, with a long reflexed basal auricle, fully as long as the claws; keel-petals similar but much broader, rounded at the apex; pod glabrous, apparently not mottled, the stipe 3 mm. long, the body ellipsoid, 2-2.5 cm. long, 8-12 mm. broad, the septum about 0.6 mm. wide; seeds obliquely round-reniform, 3 mm. long, nearly as broad.

TYPE LOCALITY: Olympic Mountains, Chatham County, Washington.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, *Rev. Astrag.* *pl.* 27, *f.* 88.

3. *Atelophragma Forwoodii* (S. Wats.) Rydb. *Bull. Torrey Club*
40: 51. 1913.

Astragalus glabriusculus major A. Gray, *Proc. Acad. Phila.* 1863: 60. 1863.

Astragalus Forwoodii S. Wats. *Proc. Am. Acad.* 25: 129. 1890.

Astragalus glabriusculus spatiosus Sheldon, *Minn. Bot. Stud.* 1: 156. 1894.

Homalobus spatiosus A. Heller, *Cat. N. Am. Pl.* ed. 2. 7. 1900.

Astragalus aboriginum fastigiorum M. E. Jones, *Rev. Astrag.* 135 (depauperate form). 1923.

A perennial, with a caespitose rootstock; stems ascending, or decumbent at the base, angled, strigose, 1.5-3 dm. high; leaves ascending, 3-7 cm. long; stipules herbaceous, ovate, 4-5 mm. long, strigose; leaflets 9-15, from lance-oblong to elliptic, 8-15 mm. long, 2-5 mm. wide, strigose beneath, glabrate above; peduncles 4-6 cm. long; racemes 2-8 cm. long, dense at first; bracts subulate, 3-5 mm. long; pedicels 1 mm. long; calyx strigose, the tube 3-3.5 mm. long, the teeth 2 mm. long, subulate; corolla ochroleucous, with purple-tipped keel; banner about 8 mm. long, obovate, retuse, strongly arched at the middle; wings shorter, the blade oblong, strongly falcate, with a long reflexed auricle; keel-petals still shorter, the blade broadly lunate, more strongly arched towards the tip; pod stipitate, glabrous, the stipe about 8 mm. long, the body lunate, 1.5-2 cm. long, 4-5 mm. wide, the septum scarcely 0.5 mm. wide.

TYPE LOCALITY: Black Hills, South Dakota.

DISTRIBUTION: South Dakota to Colorado, New Mexico [?], and Montana.

ILLUSTRATION: M. E. Jones, *Rev. Astrag.* *pl.* 27 (as var. *glabriusculus* and var. *fastigiorum*).

4. *Atelophragma wallowense* Rydb. *Bull. Torrey Club*
55: 122. 1928.

A perennial, with a woody root and caespitose caudex; stems decumbent, terete, sparingly strigose, 1-2 dm. high; leaves 2-4 cm. long; stipules ovate or oblong, 4-5 mm. long, leaflets 9-13, lance-oblong, acute at each end, strigose beneath, sparingly so or glabrate above, 8-15 mm. long, 2-3 mm. wide; peduncles 3-7 cm. long; racemes short and dense at first, in age elongate; bracts oblong, 2-3 mm. long; pedicels short; calyx black-villous, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla tinged with blue-purple, the keel tipped with dark-purple; banner obovate, slightly shorter, the blade oblong, decidedly falcate; keel-petals broad, the blade

broadly lunate, rounded at the apex; pod glabrous, the stipe 5 mm. long, the body semi-oblanccolate or slightly falcate, about 15 mm. long, 4-5 mm. wide, arched on the upper, nearly straight on the lower suture.

TYPE LOCALITY: Wallawa Mountains, Oregon.

DISTRIBUTION: Known only from the type locality.

5. *Atelophragma glabriusculum* (Hook.) Rydb. Bull. Torrey Club

32: 660. 1906.

Phaca glabriuscula Hook. Fl. Bor. Am. 1: 144. 1831.

Astragalus glabriusculus A. Gray, Proc. Am. Acad. 6: 204. 1864.

Tragacantha glabriuscula Kuntze, Rev. Gen. 945. 1891.

Astragalus aboriginum glabriusculus Rydb. Contr. U. S. Nat. Herb. 3: 492. 1896.

Homalobus glabriusculus Rydb. Mem. N. Y. Bot. Gard. 1: 246. 1900.

A perennial, with a caespitose rootstock; stems erect, 2-3 dm. high, strigose, often tinged with purple; leaves ascending, 4-7 cm. long; stipules ovate to lanceolate, 4-6 mm. long; leaflets 7-11, linear, 1-2.5 cm. long, 1-2 mm. wide, glabrous above, sparingly strigose beneath; peduncles 3-7 cm. long; racemes 2-7 cm. long; bracts subulate, 3-4 mm. long; calyx strigose with mostly dark hairs, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous, with purple-tipped keel; banner about 8 mm. long, retuse, strongly arched at the middle; wings shorter, the blade oblong, falcate, with a large auricle; keel-petals still shorter, the blade broadly lunate; pod stipitate, glabrous, the stipe about 6 mm. long, the body lunate, 1.5-2 cm. long, 5 mm. wide, 3 mm. thick, the lower suture nearly straight, the septum 0.3 mm. wide.

TYPE LOCALITY: Valleys of the Rocky Mountains [Canada].

DISTRIBUTION: South Dakota to Wyoming and Alberta.

6. *Atelophragma lineare* Rydb. Bull. Torrey Club 40: 50. 1913.

Homalobus aboriginum Rydb. Bull. N. Y. Bot. Gard. 2: 176, in part. 1901.

A perennial, with a woody taproot and a short caespitose caudex; stem grayish-strigose, often tinged with purple, 2-4 dm. high; leaves 5-6 cm. long, ascending; stipules ovate or lanceolate, acute, 2.4 mm. long; leaflets 9-15, linear, 1-2 cm. long, 1-2 mm. wide, grayish strigose; peduncles 5-10 cm. long; racemes 2-3 cm. long, in fruit 6 cm. long; bracts subulate, 2-3 mm. long; calyx densely black-hairy, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla about 8 mm. long, ochroleucous or tinged with purple, the keel purple-tipped; banner obovate, retuse, strongly arched; wings shorter, broadly oblong, falcate, with a long basal auricle; keel-petals still shorter, the blade broadly lunate, strongly arched towards the rounded apex; pod glabrous, stipitate, the stipe 4-5 mm. long, the body 2.5-28 mm. long, convexly curved on both sutures, but less so on the lower.

TYPE LOCALITY: Foot of Lake Lebarge, Yukon Territory.

DISTRIBUTION: Mackenzie and Yukon territories.

7. *Atelophragma Herriotii* Rydb. Bull. Torrey Club 55: 123. 1928.

A perennial, with a caespitose caudex; stems 2-3 dm. high, erect or decumbent at the base, finely strigose; leaves ascending, 5-7 cm. long; stipules deltoid or lanceolate, 3-4 mm. long; leaflets 7-11, linear, 1.5-2.5 cm. long, 1.5-3 mm. wide, densely strigose beneath, sparingly so or glabrous above; peduncles 5-10 cm. long, erect; racemes at first short, elongate in age, 8-15-flowered; bracts subulate, 4-5 mm. long; pedicels about 2 mm. long; calyx black-hairy, the tube 2.5-3 mm. long, the teeth subulate, 1.5 mm. long; corolla cream-colored, 8-9 mm. long, the keel tipped with purple; banner obovate, strongly arched; wings shorter, the blade oblong, falcate, with a rounded basal auricle; keel-petals still shorter, the blade broadly semi-obovate, strongly falcate, rounded at the apex; pod strigulose at least when young, the stipe 4 mm. long, the body broadly semi-oblanccolate, about 15 mm. long, 2 mm. wide, the upper suture arched, the lower nearly straight.

TYPE LOCALITY: Qu'Appelle River, Manitoba.

DISTRIBUTION: Manitoba to Alberta.

2. *Robbinsiana*. Pod distinctly stipitate, rather turgid, more or less black-hairy, the sutures not prominent, neither sulcate, the upper more curved than the lower. Corolla purplish, rarely white, muddledized.

8. *Atelophragma Robbinsii* (Oakes) Rydb. Bull. Torrey Club
55: 124. 1928.

Phaca Robbinsii Oakes, Mag. Hort. Hovey 7: 181. 1841.
Astragalus Robbinsii A. Gray, Man. ed. 2. 98. 1856.
Tragacantha Robbinsii Kuntze, Rev. Gen. 947. 1891.
Astragalus labradoricus Robbinsii M. E. Jones, Rev. Astrag. 134. 1923.

A perennial, with a caespitose rootstock; stems 2-4 dm. long, slender, decumbent at the base, sulcate, glabrous or nearly so; leaves ascending, 5-8 cm. long; stipules ovate or lanceolate, 4-5 mm. long; leaflets 9-13, elliptic or oblong, rounded or slightly retuse at the apex, glabrous above, sparingly strigose beneath; peduncles 10-15 cm. long; racemes 2-3 cm. long, in fruit 5-10 cm. long; bracts scarious, lanceolate; pedicels 1 mm. long; calyx sparingly black-hairy; corolla white, 8 mm. long; banner obovate, slightly notched, moderately arched; wings nearly as long, the blade oblong, falcate, with a long basal auricle; keel-petals shorter, the blade broadly lunate, more strongly arched towards the obtuse apex; pod stipitate, sparingly and minutely black-hairy, the stipe 4 mm. long, the body lunate, 12-15 mm. long, 4 mm. wide, abruptly acute at each end, the lower suture straight or slightly concave, the septum about 0.25 mm. wide, the cross-section obovate; seeds obliquely reniform, 2.5 mm. long.

TYPE LOCALITY: On the banks of Onion [Winooski] River, near Burlington, Vermont.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 27; Britt. & Brown, Ill. Fl. f. 2146; ed. 2. f. 2542.

9. *Atelophragma Jesupi* (Eggleston & Sheldon) Rydb. Bull.
Torrey Club 55: 125. 1928.

Astragalus Robbinsii Jesupi Eggleston & Sheldon, Minn. Bot. Stud. 1: 155. 1894.
Astragalus Jesupi Britton, Man. 1048. 1901.
Astragalus labradoricus M. E. Jones, Rev. Astrag. 133, in part. 1923. Not *A. labradoricus* DC. 1825.

A perennial, with a caespitose rootstock; stems erect, or decumbent at the base, sulcate, glabrous; leaves 4-8 cm. long, ascending; stipules deflexed, lanceolate, 4-5 mm. long; leaflets 11-17, oblong or elliptic, rounded at the apex, 8-22 mm. long, 3-6 mm. wide, glabrous or nearly so on each side; peduncles 8-15 cm. long, erect; racemes 2-3 cm. long, in fruit 3-8 cm. long; bracts lance-subulate, 3 mm. long, scarious; pedicels 1-2 mm. long; calyx black-hairy, the tube 3-3.5 mm. long, the teeth subulate, 2 mm. long; corolla bluish-purple; banner about 1 cm. long, obovate, moderately arched; wings slightly shorter, the blade oblong, slightly falcate, with a long basal auricle; keel-petals much shorter, the blade obliquely obovate, rounded at the apex, with a large auricle; pod black-strigose, the stipe 4-5 mm. long, the body gradually acute at each end, about 15 mm. long, 5 mm. wide, 2.5 mm. thick, both sutures convexly curved, but the lower less so, the septum very narrow, the cross-section elliptic; seeds obliquely reniform, suborbicular, 2 mm. long, black.

TYPE LOCALITY: Hartland, Vermont.

DISTRIBUTION: Eastern Vermont and western New Hampshire.

10. *Atelophragma Blakei* (Eggleston) Rydb. Bull. Torrey Club
55: 125. 1928.

Astragalus Blakei Eggleston, Bot. Gaz. 20: 271. 1895.
Astragalus Robbinsii borealis Eggleston, Bot. Gaz. 20: 271, as a synonym. 1895.
Astragalus labradoricus M. E. Jones, Rev. Astrag. 133, in part. 1923. Not *A. labradoricus* DC. 1825.

A perennial, with a caespitose rootstock; stem 3-5 dm. high, erect, or decumbent at the base, sparingly strigose, angled and sulcate; leaves 3-10 cm. long, ascending; stipules ovate, 4-6 mm. long, acute, the upper reflexed; leaflets 11-17, oblong or elliptic, obtuse, rounded, or emarginate at the apex, glabrous above, paler and strigose beneath; peduncles 8-15 cm. long,

black-hairy; racemes 5-15-flowered, 2-3 cm. long, in age 3-6 cm. long; bracts linear or subulate; pedicels 2-4 mm. long; calyx black-hairy, the tube 3 mm. long, 2 mm. broad, the teeth subulate, 1-1.5 mm. long, the upper slightly shorter; corolla light-violet, nearly 10 mm. long; banner obovate, rather abruptly arched at the middle; wings shorter, the blade oblong, falcate, with a large basal auricle; keel-petals still shorter, the blade obliquely obovate with a large auricle; pod densely black-hairy, the stipe about 4 mm. long, the body 15-20 mm. long, 5 mm. wide, 2.5 mm. thick, tapering at each end, the lower suture less curved than the upper, the septum 0.3 wide; mm. seeds 4-8, obliquely round-reniform, 2 mm. long, nearly black.

TYPE LOCALITY: Willoughby Mountain, Vermont.
 DISTRIBUTION: Labrador, Maine, and Vermont.
 ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 26 (as *A. labradoricus*).

11. *Atelophragma Macounii* Rydb. Bull. Torrey Club
 55: 660. 1906.

Astragalus Robbinsii occidentalis S. Wats. Bot. King's Expl. 70, in part. 1871; Brand. Bull. U. S. Geol. Surv. Terr. 2: 235. 1876.
Astragalus Macounii Rydb. Mem. N. Y. Bot. Gard. 1: 243. 1900.
Astragalus labradoricus occidentalis M. E. Jones, Rev. Astrag. 134, in part. 1923.

A perennial, with a caespitose rootstock; stems 3-6 cm. high, erect, striate and strigose; leaves 5-10 cm. long, the rachis strigose; stipules ovate-lanceolate, free; leaflets 9-17, oblong, oval, or elliptic, obtuse or rounded, 1.5-2.5 cm. long, 4-10 mm. wide, thin, glabrous above, paler and strigose beneath; peduncles 7-15 cm. long; racemes 2-5 cm., in age 4-15 cm. long; bracts linear, 2-3 mm. long; pedicels 3-4 mm. long; calyx black-hairy, the tube 4 mm. long, the teeth subulate, about 1 mm. long; corolla bluish-purple, about 1 cm. long; banner obovate, rather abruptly arched at the middle; wings shorter, the blade elliptic, slightly falcate, with a large basal auricle; keel-petals much shorter, the blade obliquely obovate, with a large auricle; pod black-hairy, the stipe 3 mm. long, the body gradually acute at each end, nearly equally convex on both sutures, 16-18 mm. long, about 5 mm. wide and 3 mm. thick, the septum 0-7 mm. wide; seeds 4-6, round-reniform, dark-brown.

TYPE LOCALITY: Deer Park, Lower Arrow Lake, British Columbia.
 DISTRIBUTION: Alberta to Colorado, Idaho, British Columbia, and Alaska (?).
 ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 27, f. 86a (as *A. labradoricus*) and f. d (as *v. occidentalis*).

12. *Atelophragma Fernaldi* Rydb. Bull. Torrey Club
 55: 126. 1928.

A perennial, with a stout root and caespitose subterranean caudex; stems about 3 dm. high, angled, sparingly strigose, more or less purplish; leaves 4-6 cm. long; stipules deltoid, about 5 mm. long; leaflets 9-13, oblong or elliptic, 1.5-2 cm. long, 4-6 mm. wide, sparingly hairy above, grayish-strigose beneath, rounded at each end; peduncles 5-7 cm. long; racemes 3-6 cm. long; bracts linear-lanceolate, 3 mm. long; calyx white-strigose, the tube 3 mm. long, the teeth lance-subulate, 1.5-2 mm. long; corolla purple, about 1 cm. long; banner broadly obovate, moderately arcuate; wings shorter, the blade oblong, falcate; keel-petals still shorter, the blade rounded at the apex; pod whitish or grayish-strigose, the stipe slightly shorter than the calyx-tube, the body oblanceolate in outline, acute at each end, about 1.5 cm. long.

TYPE LOCALITY: Blanc Sablon, Labrador.
 DISTRIBUTION: Known only from the type locality.

13. *Atelophragma Harringtonii* (Coville & Standley) Rydb. Bull.
 Torrey Club 55: 126. 1928.

Astragalus Harringtonii Coville & Standley, Rydb. Bull. Torrey Club 55: 127, as synonym. 1928.

A perennial, with a rootstock; stems decumbent at the base, 2-3 dm. high, angled, sparingly pubescent with black ascending hairs; leaves 6-10 cm. long; stipules broadly ovate, 5-8 mm. long; leaflets 11-15, elliptic or oval, 1-2 cm. long, 5-10 mm. wide, sparingly pilose but soon glabrate above, rather densely white-pilose beneath, at least when young; peduncles 6-10 cm.

long, black-hairy; bracts linear-subulate, 4-5 mm. long; calyx black-hairy, the tube 5 mm. long, 2.5-3 mm. broad, the teeth 3-4 mm. long, subulate; corolla purplish, 12-15 mm. long; banner obovate, strongly arched at the middle, deeply retuse at the apex; wings nearly as long, the blade oblanceolate with a large reflexed auricle; keel-petals much shorter, the blade obliquely obovate, rounded at the apex; pod black-hairy, the stipe about equaling the calyx-tube, the body lance-elliptic, acute at each end, 10-12 mm. long, 4-5 mm. broad, the sutures nearly equally curved, the lower sulcate, the partial septum about 1 mm. wide; seeds dark-brown, orbicular-reniform, fully 2 mm. broad.

TYPE LOCALITY: Goodnews Bay, Alaska.

DISTRIBUTION: Alaska, near the coast.

14. *Atelophragma Collieri* Rydb. Bull. Torrey Club

55: 127. 1928.

A perennial; stems 3-6 dm. high, somewhat angled, glabrous or nearly so, branched; leaves nearly sessile, about 1 dm. long, the rachis glabrous; stipules lanceolate, 5 mm. long, green; leaflets 11-15, elliptic, 1.5-3 cm. long, 5-10 mm. wide, glabrous and dark-green above, paler and sparingly pilose beneath, rounded or retuse at the apex; peduncles 10-15 cm. long, angled; racemes 5-15 cm. long, the rachis sparingly black-hairy; bracts subulate, 3 mm. long; pedicels about 3 mm. long; calyx black-hairy, the tube 3 mm. long, oblique above, the teeth subulate, 1.5 mm. long; corolla apparently white, 12 mm. long or more; banner obovate, retuse at the apex, strongly arcuate; wings slightly shorter, the blade oblanceolate; keel-petals shorter, the blade broadly lunate, rounded at the apex; pod membranous, black-hairy, the stipe 5 mm. long or more, the body fully 2 cm. long, 6-7 mm. wide, acute at each end, the cross-section elliptic, the partial septum fully 1 mm. wide.

TYPE LOCALITY: Eagle, Alaska.

DISTRIBUTION: Alaska.

3. *Oroboidea*. Pod subsessile or sessile, turgid, black-hairy, the sutures not prominent, nearly equally curved, not sulcate. Corolla rather small or middlesized, purple or rarely white.

15. *Atelophragma occidentale* (S. Wats.) Rydb. Bull. Torrey Club

55: 128.

Astragalus Robbinsii occidentalis S. Wats. Bot. King's Expl. 70. 1871.

Astragalus occidentalis M. E. Jones, Contr. W. Bot. 8: 17. 1898.

Astragalus labradoricus occidentalis M. E. Jones, Rev. Astrag. 134. 1923.

A perennial, with a caespitose rootstock; stem 2-5 dm. high, striate, glabrous or nearly so; leaves 5-10 cm. long, ascending; stipules ovate, 6-7 mm. long, green; leaflets 9-13, elliptic or oval, rounded at the apex, 1-3 cm. long, 3-12 mm. wide, thin, glabrous above, sparingly strigose beneath; peduncles 8-15 dm. long; racemes lax, 5-15 cm. long; bracts lance-subulate, 3 mm. long; pedicels 4-5 mm. long; calyx black-hairy, the tube about 3 mm. long, 2 mm. wide, the teeth subulate, 1 mm. long; corolla purple, similar to that of *A. Mecouinii*; wings emarginate; pod subsessile, black-strigose, ellipsoid, 15-18 mm. long, tapering at each end, sometimes slightly sulcate on the lower suture, the septum nearly 1 mm. wide, the cross-section elliptic.

TYPE LOCALITY: East Humboldt Mountains, Nevada.

DISTRIBUTION: Type locality and vicinity.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 27.

16. *Atelophragma elegans* (Hook.) Rydb. Bull. Torrey Club

32: 660. 1906.

Phaca elegans Hook. Fl. Bor. Am. 1: 144. 1831.

Phaca elegans minor Hook. Fl. Bor. Am. 1: 144. 1831.

Phaca parviflora Nutt.; T. & G. Fl. N. Am. 1: 348. 1838.

Astragalus oroboides A. Gray, Am. Jour. Sci. II. 33: 410. 1862. Not *A. oroboides* Hornem. 1810.

Astragalus oroboides americanus A. Gray, Proc. Am. Acad. 6: 205. 1864.

Astragalus elegans Sheldon, Minn. Bot. Stud. 9: 154. 1894. Not *A. elegans* Bunge, 1868-9.

Astragalus elegans curtiflorus Rydb. Mem. N. Y. Bot. Gard. 1: 242. 1900.

Astragalus minor M. E. Jones, Contr. W. Bot. 10: 64. 1902.

Astragalus curtiflorus "Rydberg" (erroneously); M. E. Jones, Contr. W. Bot. 10: 64. 1902.

Astragalus eucoismus B. L. Robinson, Rhodora 10: 33. 1908.

A perennial, with a caespitose rootstock or caudex; stems 3-6 dm. high, striate, glabrous or sparingly hairy; leaves 5-10 cm. long, ascending; stipules green, spreading, sparingly pubescent, 3-5 mm. long; leaflets 13-15, oblong or elliptic, 1-2.5 cm. long, 3-7 mm. wide, obtuse or rounded at the apex, glabrous above, strigose and often paler beneath; peduncles 7-15 cm. long; racemes 4-10 cm. long, in fruit even 15 cm. long and often secund; bracts subulate, 2-3 mm. long; pedicels 2-3 mm. long; calyx strigose with black, or with mixed white and black hairs, the tube oblique, 2.5-3 mm. long, 2 mm. broad, the teeth lance-subulate, 1 mm. long; corolla usually dark-purple; banner 8 mm. long, obovate, emarginate, moderately arched at the middle; wings shorter, the blade elliptic-oblong, slightly falcate, with a long reflexed auricle; keel-petals still shorter, the blade obliquely obovate, with a smaller auricle; pod sessile, reflexed, obliquely elliptic, less curved on the lower suture, black-hairy or rarely white-hairy, 10-12 mm. long, 4-5 mm. wide, the cross-section elliptic; seeds olive-brown, obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Prairies of the Rocky Mountains, Canada.

DISTRIBUTION: Labrador to Maine, British Columbia, and Alaska, and in the Rockies south to Colorado.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 26, f. 85; Britt. & Brown, Ill. Fl. f. 2144; ed. 2. f. 2549; Clements, Rocky Mt. Fl. pl. 29, f. 18.

17. *Atelophragma alpiniforme* Rydb. Bull. Torrey Club

55: 129. 1928.

A perennial, with a caespitose rootstock; stems several, slender, erect, 2-3 dm. high, glabrous; leaves 5-7 cm. long, ascending or spreading; stipules ovate or suborbicular, more or less clasping, 3-4 mm. long, the lower scarious; leaflets 11-15, rounded-oval or suborbicular, 5-10 mm. long, 3-8 mm. wide, glabrous on both sides; peduncles 6-10 mm. long, erect; racemes 2-3 cm. long, in fruit 5-7 cm. long; bracts ovate, 1-2 mm. long; calyx sparingly black-hairy, the tube 3 mm. long, the teeth lanceolate, 1 mm. long; corolla bluish-purple, 8 mm. long; banner broadly obovate, retuse at the apex; wings somewhat shorter, the blade oblong, slightly falcate; keel-petals still shorter, the blade obovate-lunate, rounded at the strongly arched summit; pod black-hairy with short hairs, obovoid, inflated, 10-12 mm. long, 6-7 mm. wide, the stipe about 15 mm. long.

TYPE LOCALITY: Hurricane Creek, Wallawa Mountains, Oregon.

DISTRIBUTION: Known only from the type locality.

18. *Atelophragma atratum* Rydberg, sp. nov.

A caespitose perennial; stems about 2 dm. high, striate, glabrous; leaves 3-4 cm. long, ascending; stipules deltoid, 5 mm. long; leaflets 9-13, oval or obovate, 1-1.5 cm. long, 4-8 mm. wide, glabrous above, sparingly villous beneath; peduncles 10-12 cm. long; racemes short and dense, 2-3 cm. long; bracts subulate, 5 mm. long, black-hairy; calyx densely black-hairy, the tube campanulate, 3 mm. long, the teeth obtuse, 1 mm. long, the lowest one a little longer; corolla dark-purple, about 8 mm. long; banner obovate, moderately arched; wings slightly shorter, the blade obliquely oblanceolate, with a large basal auricle; keel-petals broadly lunate, rounded at the apex; pod sessile, 6-7 mm. long, rounded-ellipsoid, abruptly acute, densely villous with short black hairs, 4-5-seeded, the septum about 0.5 mm. wide, the cross-section nearly round; seeds brown, obliquely reniform, 2 mm. long.

Type collected August 22, 1896, on Herchel Island, Yukon, *Alvin Seale* (herb. Stanford University):

DISTRIBUTION: Yukon and Alaska.

19. *Atelophragma Brandegei* (Porter) Rydb. Bull. Torrey Club

32: 660. 1905.

Astragalus Brandegei Porter; Porter & Coult. Syn. Fl. Colo. 24. 1874.
Tragacantha Brandegei Kuntze, Rev. Gen. 943. 1891.

A perennial, with a caespitose caudex; stems decumbent, strigose, 1-2 dm. (rarely 3 dm.) long; leaves ascending, 4-10 cm. long, the rachis strigose; stipules lanceolate, spreading, 3-4 mm. long; leaflets 7-15, linear, usually conduplicate, 1-2 cm. long, 1-2 mm. wide, glabrous above, strigose beneath; peduncles 5-10 cm. long; racemes 1-5-flowered; bracts lanceolate, 2 mm. long; pedicels 2-3 mm. long; calyx strigose, the tube 2 mm. long, turbinate, the teeth lanceolate, 1 mm. long; corolla white, tinged with purple; banner broadly obovate, rather strongly arched below the middle; wings shorter, the blade obliquely obovate, strongly falcate; keel-petals still shorter, the blade broadly lunate; pod sessile, white-strigose, oblanceolate-ellipsoid, broadest above the middle, about 15 mm. long, 5 mm. wide and thick, nearly round in cross-section, the septum nearly 2 mm. wide; seeds obliquely round-reniform, brown, 2.5 mm. long.

TYPE LOCALITY: Banks of the Arkansas, near Canon City [Colorado].

DISTRIBUTION: Colorado, New Mexico, Utah, and Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42, f. 144.

20. *Atelophragma Shearii* Rydb. Bull. Torrey Club

32: 660. 1906.

Astragalus Shearii Rydb. Bull. Torrey Club 31: 562. 1904.

A perennial, with a horizontal caespitose rootstock; stem slender, strigose, striate, about 2 dm. high; leaves 3-5 cm. long, spreading; stipules deltoid, strigose, 2-3 mm. long; leaflets 13-19, oblong, obtuse or retuse, 5-8 mm. long, glabrate above, grayish-strigose beneath; peduncles 4-5 cm. long; racemes shorter, 5-10-flowered; bracts subulate, 2-3 mm. long; pedicels 2 mm. long; calyx strigose, partly with black hairs, the tube 4 mm. long, the teeth deltoid, 1 mm. long; corolla reddish-purple, nearly 1 cm. long; banner broadly obovate, strongly arched at the middle; wings slightly shorter, the blade broadly oblong, with a large reflexed auricle; keel-petals much shorter, the blade obliquely obovate, rounded at the apex; pod oblong, 12-14 mm. long, 5 mm. wide, glabrous, reticulate, slightly falcate, subterete, the septum 0.5 mm. wide.

TYPE LOCALITY: Twin Lakes, Colorado.

DISTRIBUTION: Known only from the type locality.

4. *Alpina*. Pod distinctly stipitate, turgid, black-hairy, the lower suture sulcate and more curved than the upper, the upper suture acute. Corolla midsized, purple.

21. *Atelophragma alpinum* (L.) Rydb. Bull. Torrey Club

55: 130. 1928.

Astragalus alpinus L. Sp. Pl. 760. 1753.

Phaca astragalina DC. Astrag. 52. 1802.

Colutea astragalina Poir. in Lam. Encyc. Suppl. 1: 561. 1810.

Phaca andina Nutt.; T. & G. Fl. N. Am. 1: 345, as synonym. 1838.

Astragalus pauciflorus Hook. Lond. Jour. Bot. 6: 210. 1847.

Tragacantha alpina Kuntze, Rev. Gen. 942. 1891.

Astragalus astragalinus Sheldon, Minn. Bot. Stud. 1: 65. 1894.

Astragalus giganteus Sheldon, Minn. Bot. Stud. 1: 65, in part. 1894. Not *A. giganteus* S. Wats.

1882.

Tium alpinum Rydb. Bull. Torrey Club 32: 659. 1906.

Phaca alpina Piper, Contr. U. S. Nat. Herb. 11: 371. 1906. Not *P. alpina* L. 1753.

Astragalus andinus M. E. Jones, Rev. Astrag. 137. 1923.

A perennial, with a slender, creeping, caespitose rootstock; stems slender, decumbent, 1-3 dm. high, branched at the base; leaves spreading, 3-10 cm. long; stipules ovate or lanceolate, 4-6 mm. long, or the lower deltoid and scarious; leaflets 11-23, oval or elliptic, 5-10 mm. long, 3-6 mm. wide, thin, rounded or retuse at the apex, pilose on both sides or glabrate above; peduncles 5-10 cm. long; racemes short and dense, 1-3 cm. long, or in fruit 3-5 cm. long; bracts subulate, black-hairy, 1-2 mm. long; pedicels 1 mm. long; calyx black-hairy, the tube 2-2.5

mm. long, the teeth lanceolate, 1 mm. long; corolla purple or lilac, with purple keel; banner 7-10 mm. long, broadly obovate, retuse; wings shorter, the blade oblong, falcate, with a long reflexed auricle; keel-petals fully as long, the blade obliquely lunate, more curved towards the blunt dark tip; pod black-hairy, stipitate, the stipe about 2 mm. long, the body about 1 cm. long, 4 mm. wide, sulcate on the lower suture, the septum 0.5 mm. wide; seeds 4, obliquely reniform, 2.5 mm. long, brown.

TYPE LOCALITY: Lapland.

DISTRIBUTION: Boreal, subarctic, and alpine America, Europe, and Asia, extending south in the Rockies to Colorado.

ILLUSTRATIONS: Bot. Cab. *pl.* 429; M. E. Jones, *Rev. Astrag. pl.* 28, *f.* 91; L. Fl. Lapp. *f.* 9; Wahlenb. Fl. Lapp. *f.* 19; Fl. Dan. *pl.* 51; Engl. Bot. *pl.* 2717; Sv. Bot. *pl.* 679; Pall. Sp. Astrag. *pl.* 32, 33; Reichenb. Ic. Fl. Germ. 22: *pl.* 2197, *f.* 12-21; Fl. Deuts. ed. 5. *pl.* 2428; Coste, Fl. Fr. *f.* 976; Britt. & Brown, Ill. Fl. *f.* 2147; ed. 2, *f.* 2543.

22. *Atelophragma labradoricum* (DC.) Rydb. Bull. Torrey Club 55: 131. 1928.

Astragalus secundus Michx. Fl. Bor. Am. 2: 66. 1803. Not *A. secundus* DC. 1802.

Astragalus labradoricus DC. Prodr. 2: 287. 1825.

Astragalus alpinus Brunetianus Fernald, Rhodora 10: 51. 1908.

A perennial, with a creeping caespitose rootstock; stems 2-5 dm. high, decumbent at the base, striate, glabrous or nearly so; leaves 7-15 cm. long; stipules deltoid or lanceolate, green, 4-6 cm. long; leaflets 15-29, oblong, obtuse or acute, 8-20 mm. long, 2-10 mm. wide, sparingly appressed-pilose, or glabrate above; peduncles about 1 dm. long; racemes dense, 1-4 cm. long; bracts lanceolate, 2 mm. long; pedicels about 1 mm. long; calyx black-hairy, the tube 2 mm. long, the teeth lanceolate, fully 1 mm. long; corolla lilac, 10-12 mm. long; banner broadly obovate, retuse, strongly arched at the middle; wings shorter, the blade oblong, slightly falcate, with a long reflexed auricle; keel-petals longer than the wings, the blade obliquely lunate, broader and more curved towards the obtuse purple apex; pods sparingly strigulose with black hairs or black and white hairs mixed, otherwise greenish, the stipe 4 mm. long, the body lance-oblong, straight or slightly concave on the upper suture, acute at each end, 12-15 mm. long, sulcate on the lower suture, the septum fully 0.5 mm. wide; seeds 4, obliquely reniform, 2.5 mm. long, light-brown.

TYPE LOCALITY: Labrador.

DISTRIBUTION: Labrador to Newfoundland, New Hampshire, and Quebec.

5. *Williamsiana*. Pod sessile, turgid, glabrous, ascending, the sutures equally curved, the lower slightly sulcate. Corolla rather large, ochroleucous.

23. *Atelophragma Williamsii* Rydb. Bull. Torrey Club 55: 132. 1928.

Astragalus Williamsii Rydb. Bull. N. Y. Bot. Gard. 2: 175. 1901.

Astragalus Gormanii Wight; M. E. Jones, *Rev. Astrag.* 132. 1923.

A perennial, with a caespitose caudex; stems ascending or erect, 2-4 dm. high, more or less 4-angled, glabrous, light-green, in age straw-colored; leaves 5-10 cm. long, ascending; stipules ovate or lanceolate, 3-6 mm. long, free; leaflets 9-11, oval to linear, 1.5-3.5 cm. long, 4-12 mm. wide, obtuse, or the broader ones retuse, perfectly glabrous; peduncles 1-1.5 dm. long; racemes at first short, in fruit about 1 dm. long; bracts oblong, obtuse, straw-colored, 3 mm. long; pedicels 1-2 mm. long; calyx black-hairy, the tube about 3 mm. long, the teeth less than 1 mm. long, deltoid, obtuse; corolla ochroleucous, with a purplish-tipped keel; banner about 1 cm. long, narrowly obovate, slightly arched, retuse at the apex; wings shorter, the blade longer than the claw, with a long reflexed auricle; keel-petals still shorter, the blade obliquely obovate, strongly arched and rounded at the apex; pod erect, sessile, the body 10-14 mm. long, 4 mm. wide, nearly terete, strigulose with black and white hairs or in age glabrate, deeply sulcate on the lower suture, the septum about 1 mm. wide, becoming narrower upwards and extending only half the length of the pod; seeds obliquely reniform, brownish-black.

TYPE LOCALITY: Big Salmon, Yukon.

DISTRIBUTION: Yukon and Alaska.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl.* 26, *f.* 84.

6. *Strigulosa*. Pod distinctly stipitate, turgid, more or less pubescent or glabrous, acute at each end, the sutures equally curved, the lower one or both somewhat sulcate. Corolla small, purple or white; flowers in a long dense raceme.

24. *Atelophragma Painteri* (Rose) Rydb. Bull. Torrey Club
55: 156. 1928.

Astragalus strigosus brevidentatus Hemsl. Biol. Centr. Am. Bot. 1: 266. 1880.

Astragalus Painteri Rose; M. E. Jones, Rev. Astrag. 189. 1923.

A perennial; stem branched, 10–15 mm. long, prostrate or ascending, sparingly strigose, striate; leaves 5–10 dm. long, short-petioled, the rachis strigose and sulcate; stipules 3 mm. long, deltoid, hyaline; leaflets 19–25, elliptic or oval, mostly rounded at each end, 6–12 mm. long, 2–5 mm. wide, glabrous above, pilose-strigose beneath; peduncles 1–1.5 dm. long, slender; raceme short, 2–4 cm. long; bracts lanceolate or subulate, 3 mm. long, black-hairy; pedicels 1 mm. long; calyx black-hairy, the tube 3 mm. long, 2.5 mm. broad, the teeth deltoid, less than 1 mm. long; corolla pale-purple or white, about 1 cm. long; banner obovate, moderately arched; wings shorter, the blade obliquely oblanceolate, with a large basal auricle; keel-petals shorter, the blade obliquely obovate, rounded at the apex; pod glabrous, the stipe 2–3 mm. long, the body oblong, acute at each end, terete, 15–18 mm. long, 5 mm. wide; septum 1 mm. wide; seeds 12–16, dark-brown, 2.5 mm. long.

TYPE LOCALITY: Sierra de Ajusco, "Morales" [Morelos].

DISTRIBUTION: Morelos.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 43, f. 148.

25. *Atelophragma tolucanum* (Rob. & Seaton) Rydb. Bull.
Torrey Club 55: 156. 1928.

Astragalus tolucanus Rob. & Seaton, Proc. Am. Acad. 28: 104. 1893.

A perennial, with a thick woody root; stems 1–2 dm. long, branched, ascending, strigose, slender; leaves 4–6 cm. long, spreading, short-petioled, the rachis sulcate, nearly glabrous; stipules hyaline, ovate or deltoid, 5–7 mm. long; leaflets 17–25, elliptic to obovate, 4–7 mm. long, 2–3 mm. wide, cuneate at the base, rounded, truncate, or retuse at the apex; peduncles 3–5 cm. long; racemes many-flowered, 3–5 cm. long; bracts oblanceolate, 5–6 mm. long, hyaline, pubescent; calyx black-hairy, the tube 3 mm. long, 2.5 mm. broad, the teeth narrowly lanceolate, 3.5 mm. long; corolla variegated with bluish-purple and yellow; banner about 12 mm. long, broadly obovate, moderately arched, striped with bluish-purple and yellow; wings 10 mm. long, the blade purple, oblanceolate, arcuate, with a large reflexed auricle, the claw yellow; keel-petals 7–8 mm. long, the blade broadly lunate, nearly semiorbicular, reddish-purple and rounded at the apex; pod glabrous, the stipe 2–3 mm. long, the body ellipsoid, acutish at each end, 12–15 mm. long, 6 mm. broad.

TYPE LOCALITY: Nevado de Toluca, State of Mexico.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 43, f. 149.

26. *Atelophragma jaliscense* Rydb. Bull. Torrey Club
55: 157. 1928.

A perennial, with a caespitose caudex; stems branched, angled, sparingly and finely pubescent with ascending hairs; leaves 5–8 cm. long, ascending; stipules deltoid, about 5 mm. long; leaflets 19–25, oblong or elliptic, 5–10 mm. long, 2–4 mm. wide, obtuse, strigose beneath, glabrate or sparingly pubescent above; peduncles 5–15 cm. long; racemes 3–6 cm. long; bracts subulate, 2–3 mm. long; pedicels very short; calyx more or less black-hairy, the tube 3 mm. long, the teeth subulate, nearly 2 mm. long; corolla white or cream-colored, about 1 cm. long; banner narrowly obovate, moderately arched; wings slightly shorter, the blade linear-oblong, falcate, with a large basal auricle; wing-petals still shorter, the blade lunate, obtuse; pod glabrous, the

stipe 4 mm. long, the body lance-linear, tapering at each end, 3-3.5 cm. long, 6-7 mm. wide, a little sulcate on the lower suture, the partial septum 1 mm. wide; seeds 10-11.

TYPE LOCALITY: Sierra Tequila, Jalisco.

DISTRIBUTION: Jalisco to Nuevo León.

27. *Atelophragma zacatecanum* Rydb. Bull. Torrey Club

55: 157. 1928.

A perennial; stems rather stout, about 5 dm. high, sparingly short-pubescent with ascending hairs, terete; leaves ascending; stipules deltoid, acuminate, 5-6 mm. long; leaflets 9-15, oblong, 6-15 mm. long, 3-5 mm. wide, strigose beneath, glabrate above, rounded at the apex; peduncles 6-10 cm. long; racemes 5-15 cm. long; bracts subulate, 3 mm. long; calyx long-pilose, the tube 3 mm. long, the teeth fully 3 mm. long, attenuate; corolla cream-colored, 8-10 mm. long, similar to that of the preceding species, but usually smaller; pod glabrous, the stipe about 4 mm. long, the body oblong, acute at each end, 2-2.5 cm. long, 5 mm. wide, sulcate on the lower suture, the septum narrow, nearly 1 mm. broad; seeds 6-8.

TYPE LOCALITY: Zacatecas.

DISTRIBUTION: Known only from the type locality.

28. *Atelophragma tioides* Rydb. Bull. Torrey Club

55: 157. 1928.

A caespitose perennial; stems decumbent, much branched, 3-5 dm. high, slender, terete, strigose; leaves ascending, 5-7 cm. long; stipules deltoid, 3-4 mm. long; leaflets 13-21, obovate, usually retuse at the apex, 5-10 mm. long, 4-7 mm. wide, pilose beneath, glabrate above; peduncles 4-10 cm. long; racemes 3-5 cm. long, rather few-flowered; bracts subulate, 3 mm. long; calyx minutely black-hairy, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla cream-colored, about 1 cm. long; banner obovate, moderately arched; wings shorter, the blade oblong, slightly falcate; pod glabrous, the stipe very short, shorter than the calyx-tube, the body linear, about 3 cm. long, 5 mm. wide, acute at each end, rather deeply sulcate on the lower suture, the septum narrow; seeds 16-18, dark-brown, 3 mm. long.

TYPE LOCALITY: Valley of San Luis Potosí.

DISTRIBUTION: San Luis Potosí.

29. *Atelophragma strigosum* (H.B.K.) Rydb. Bull. Torrey Club

55: 158. 1928.

Astragalus strigosus H.B.K. Nov. Gen. & Sp. 6: 494. 1824.

Tragacantha strigulosa Kuntze, Rev. Gen. 948. 1891.

A perennial; stem ascending or erect, sulcate or striate, 3-6 dm. high, more or less strigose or pilose; leaves 5-8 cm. long, the rachis strigose; stipules lanceolate, 4-5 mm. long, the lower connate; leaflets 17-25, oblong to oval, 8-20 mm. long, rounded, truncate, or retuse at the apex; peduncles 6-10 cm. long; racemes 3-8 cm. long; bracts lance-subulate, 3 mm. long, black-hairy; pedicels 1 mm. long; calyx black-hairy, the tube 3 mm. long, 2 mm. broad, the teeth subulate, 3.5 mm. long; corolla cream-colored, about 8 mm. long; banner obovate, moderately arched; wings nearly as long, the blade oblanceolate-falcate, with a reflexed auricle; keel-petals 6-7 mm. long, the blade broadly lunate, rounded at the apex; pod glabrous, papery, the stipe 4 mm. long, the body ellipsoid, acutish at each end, about 15 mm. long, 6 mm. wide, the septum less than 1 mm. wide; seeds 12-16, nearly 3 mm. long, dark-brown.

TYPE LOCALITY: Moran, Mexico.

DISTRIBUTION: San Luis Potosí to Oaxaca.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42, f. 143; H.B.K. Nov. Gen. & Sp. pl. 586.

30. *Atelophragma hidalgense* Rydb. Bull. Torrey Club

55: 159. 1928.

A perennial; stem 3-5 dm. high, terete, minutely strigose, branched; leaves 5-7 cm. long; stipules broadly deltoid, 3-4 mm. long, leaflets 19-27, oblong or elliptic, 3-8 mm. long, 1-4

mm. wide, rounded or slightly retuse, minutely strigose beneath, glabrous above; peduncles 3-6 cm. long; racemes short, 6-10-flowered; bracts subulate, 1-2 mm. long; calyx sparingly strigose, the tube 2 mm. long, the teeth linear, scarcely 1 mm. long; corolla 7-8 mm. long, purple-tinged; banner obovate, moderately arched; wings nearly as long, the blade oblong; keel-petals shorter, broadly lunate; pod glabrous, the stipe 1 mm. long, the body elliptic, 12-14 mm. long, about 6 mm. wide, abruptly acute at each end, deeply sulcate on the lower suture, the septum more than 1 mm. wide; seeds about 10.

TYPE LOCALITY: Sierra de la Mesa, Hidalgo.
DISTRIBUTION: Hidalgo, Mexico, and Morelos.

31. *Atelophragma guatemalense* (Hemsl.) Rydb. Bull. Torrey Club 55: 159. 1928.

Astragalus guatemalensis Hemsl. Biol. Centr. Am. Bot. 1: 264. 1880.

A perennial; stems 3-5 dm. long, decumbent, sulcate, sparingly strigose; leaves 8-10 cm. long, spreading; stipules scariosus, deltoid, 6-9 mm. long, connate; leaflets 25-33, elliptic, 8-15 mm. long, 2-4 mm. wide, glabrous above, pilose beneath, rounded, truncate, or retuse at the apex; peduncles 4-10 cm. long; racemes dense, 2-4 cm. long; bracts 3-4 mm. long, subulate, black-hairy; calyx black-hairy, the tube 3 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous, 9-10 mm. long, resembling that of *A. strigosum*; pod glabrous, comparatively firm, the stipe 2 mm. long, the body oblong, 15 mm. long, 5 mm. wide, acute at each end; septum less than 1 mm. wide; seeds 6-8, brown, 2.5 mm. long.

TYPE LOCALITY: Vulcan de Fuego, Guatemala.
DISTRIBUTION: Guatemala and Chiapas.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 43, f. 147.

32. *Atelophragma reptans* (Willd.) Rydb. Bull. Torrey Club 55: 159. 1928.

Astragalus reptans Willd. Hort. Berol. pl. 88. 1809.
Tragacantha reptans Kuntze, Rev. Gen. 947. 1891.

A perennial; stems 6-12 dm. long, creeping, rooting at the nodes, strigose; leaves erect, 1-3 dm. long, the petiole and rachis strigose, sulcate; stipules connate, ovate, often 1 cm. long or more; leaflets 25-33, elliptic or oblong, 1-3.5 cm. long, acute at the base, rounded at the apex, glabrous above, strigose beneath; peduncles 1-2 dm. long; racemes 4-7 cm. long, dense; bracts lanceolate, 4-6 mm. long, scariosus, pubescent; pedicels scarcely 1 mm. long; calyx black-hairy, the tube 4 mm. long, 3 mm. broad, the teeth 3 mm. long, lanceolate; corolla cream-colored, about 15 mm. long; banner narrowly obovate, moderately arched; wings nearly as long, the blade lance-oblong, longer than the claw, with a very large basal auricle; keel-petals 11 mm. long, the blade broadly obliquely obovate, rounded at the apex, with a small auricle; pod pubescent with short black hairs, the stipe less than 2 mm. long, the body ellipsoid, acute at each end, about 18 mm. long, 6 mm. wide, transversely oval in cross-section, the septum fully 1 mm. wide; seeds 14-16.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Mexico (state and federal district).
ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 43 and pl. 77, f. 151; Willd. Hort. Berol. pl. 88.

33. *Atelophragma Harshbergeri* Rydb. Bull. Torrey Club 55: 160. 1928.

A perennial; stems decumbent or creeping, 2-3 dm. long, slender, glabrous or nearly so; leaves 4-6 cm. long; stipules ovate or rounded, more or less connate, 2-3 mm. long; leaflets 15-21, linear-lanceolate to oblong, acute, 5-10 mm. long, 1-3 mm. wide, strigulose beneath, glabrous above; peduncles 3-5 cm. long, strigulose; racemes about 3 cm. long; bracts subulate, 3 mm. long; calyx black-hairy, the tube 4-5 mm. long, the teeth lance-subulate, 3 mm. long; corolla cream-colored, 12-14 mm. long; banner obovate, slightly retuse, moderately arcuate;

wings a little shorter, the blade oblong; fruit minutely black-strigulose, the stipe about 1 mm. long, the body ellipsoid, abruptly contracted at each end, about 15 mm. long, 7 mm. wide.

TYPE LOCALITY: Salazar, Sierra de las Cruces [State of Mexico?].

DISTRIBUTION: Known only from the type locality.

34. *Atelophragma oaxacanum* (Rose) Rydb. Bull. Torrey Club

55: 160. 1928.

Astragalus guatemalensis oaxacanus M. E. Jones, Rev. Astrag. 189. 1923.

Astragalus oaxacanus Rose; M. E. Jones, Rev. Astrag. 189, as synonym. 1923.

A perennial; stems 5 dm. tall or more, sparingly strigose, striate; leaves spreading, about 1 dm. long, the rachis sparingly strigose; stipules lance-deltoid, 3-4 mm. long; leaflets 21-27, elliptic, rounded, truncate or retuse at the apex, 8-15 mm. long, 3-16 mm. wide, glabrous above, sparingly pilose beneath with ascending hairs; peduncles 10-15 cm. long; racemes 3-5 mm. long; bracts lanceolate, 3 mm. long, black-hairy; pedicels very short; calyx black-hairy, the tube 3 mm. long, nearly as broad, the teeth subulate, 2.5 mm. long; corolla cream-colored, 11-12 mm. long; banner obovate, moderately arched; wings nearly as long, the blade obliquely oblanceolate, slightly falcate, with a reflexed auricle; keel-petals shorter, the blade broadly obliquely obovate, rounded at the apex; pod minutely strigulose with black hairs, the stipe equaling the calyx-tube, the body oblong, 18-20 mm. long, 6 mm. broad, the septum fully 1 mm. broad.

TYPE LOCALITY: [Sierra San Felipe] Oaxaca.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 43.

35. *Atelophragma potosinum* Rydb. Bull. Torrey Club

55: 160. 1928.

Astragalus strigosus gracilis Hemsl. Biol. Centr. Am. Bot. 1: 266. 1880.

A caespitose perennial; stems several, decumbent, 3-4 dm. high, sparingly strigulose; leaves ascending, 3-7 cm. long, the rachis strigose and sulcate; stipules lance-deltoid, acuminate, 3 mm. long; leaflets 15-25, elliptic or oval, 3-8 mm. long, 1.5-3 mm. wide, rounded at the apex, glabrous above, strigose beneath; peduncles 5-10 cm. long; racemes 2-3 cm. long; bracts subulate, 2-3 mm. long; pedicels very short; calyx rather loosely hairy, usually with mixed black and white hairs, the tube 2.5 mm. long, the teeth subulate, 1.5 mm. long; corolla cream-colored, about 1 cm. long; banner obovate, moderately arched; wings nearly as long, the blade obliquely oblanceolate, falcate, with a reflexed auricle; keel-petals much shorter, the blade obliquely obovate, rounded at the apex; pod strigulose, mostly with black hairs, the stipe 4 mm. long, the body oblong, acute at each end, about 2 cm. long and 5 mm. wide; septum 0.5 mm. wide; seeds 14-16, about 2.5 mm. long.

TYPE LOCALITY: Zimapan [Hidalgo].

DISTRIBUTION: San Luis Potosi and Hidalgo.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42.

36. *Atelophragma altum* (Wootton & Standley) Rydb. Bull. Torrey

Club 55: 161. 1928.

Astragalus altus Wootton & Standley, Contr. U. S. Nat. Herb. 16: 136. 1913.

A perennial; stems several, slender, erect, sparingly strigose, branched, 4-6 dm. high; leaves 8-10 cm. long, ascending; stipules deltoid-lanceolate, acuminate; leaflets 21-29, elliptic to oblong, 8-10 mm. long, obtuse or acute, glabrous above, strigose beneath; peduncles 5-8 cm. long; racemes 2-6 cm. long; bracts lanceolate, 1-2 mm. long; pedicels 1 mm. long; calyx yellowish, sparsely black-strigulose, 4 mm. long, the teeth deltoid, 1 mm. long; corolla ochroleucous or yellow, 9-10 mm. long; banner obovate, moderately arched; wings nearly as long, the blade oblanceolate, with a reflexed auricle; keel-petals much shorter, the blade broadly obovate, rounded at the apex; pod black-strigulose, the stipe 6 mm. long, the body lance-oblong or ob-

COMPLETED VOLUME

9: i-iv, 1-542. (Agaricales:) Polyporaceae (pars), Boletaceae, Agaricaceae (pars). Complete in 7 parts.

PARTS OF VOLUMES PREVIOUSLY PUBLISHED

- 3¹: 1-88. Hypocreales: Nectriaceae, Hypocreaceae. Fimetariales: Chaetomiaceae, Fimetiariaceae.
- 6¹: 1-84. Phyllostictales: Phyllostictaceae (pars).
- 7¹: 1-82. Ustilaginales: Ustilaginaceae, Tilletiaceae. 7²: 83-160. 7³: 161-268. 7⁴: 269-336. 7⁵: 337-404. 7⁶: 405-480. 7⁷: 481-540. 7⁸: 541-604. 7⁹: 605-668. 7¹⁰: 669-732. 7¹¹: 733-796. 7¹²: 797-848. Uredinales: Coleosporiaceae, Uredinaceae, Aecidiaceae.
- 10¹: 1-76. 10²: 77-144. 10³: 145-226. 10⁴: 227-276. (Agaricales:) Agaricaceae (pars).
- 14¹: 1-66. Sphaerocarpaceae: Sphaerocarpaceae, Riellaceae. Marchantiales: Ricciaceae, Corsiniaceae, Targioniaceae, Sauteriaceae, Rebouliaceae, Marchantiaceae.
- 15¹: 1-75. Sphagnales: Sphagnaceae. Andreaeales: Andreaeaceae. Bryales: Archidiaceae, Bruchiaceae, Ditrichaceae, Bryoxyphiaceae, Seligeriaceae. 15²: 77-166. Dicranaceae, Leucobryaceae.
- 16¹: 1-88. Ophioglossales: Ophioglossaceae. Marattiales: Marattiaceae. Filicales: Osmundaceae, Ceratopteridaceae, Schizaeaceae, Gleicheniaceae, Cyatheaceae (pars).
- 17¹: 1-98. Pandanales: Typhaceae, Sparganiaceae. Naiadales: Zannichelliaceae, Zosteraceae, Cymodoceaceae, Naiadaceae, Lilaeaceae. Alismales: Scheuchzeriaceae, Alismaceae, Butomaceae. Hydrocharitales: Elodeaceae, Hydrocharitaceae. Poales: Poaceae (pars). 17²: 99-196. 17³: 197-288. Poaceae (pars).
- 21¹: 1-93. Chenopodiales: Chenopodiaceae. 21²: 95-169. Amaranthaceae. 21³: 171-254. Allioniaceae.
- 22¹: 1-80. Rosales: Podostemonaceae, Crassulaceae, Penthoraceae, Parnassiaceae. 22²: 81-191. Saxifragaceae, Hydrangeaceae, Cunoniaceae, Iteaceae, Pterostemonaceae, Hamamelidaceae, Altingiaceae, Phyllonomaceae. 22³: 193-292. Grossulariaceae, Platanaceae, Crossosomataceae, Connaraceae, Calycanthaceae, Rosaceae (pars). 22⁴: 293-388. 22⁵: 389-480. 22⁶: 481-560. Rosaceae (pars).
- 23¹: 1-76. 23²: 77-136. 23³: 137-194. (Rosales:) Mimosaceae.
- 24¹: 1-64. 24²: 65-136. 24³: 137-200. 24⁴: 201-250. 24⁵: 251-314. (Rosales:) Fabaceae (pars).
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PART 7

NORTH AMERICAN FLORA

(ROSALES)

FABACEAE

GALEGEAE (pars)

^v
PER AXEL RYDBERG



PUBLISHED BY
THE NEW YORK BOTANICAL GARDEN

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ANNOUNCEMENT

NORTH AMERICAN FLORA is designed to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

The work will be published in parts at irregular intervals, by the New York Botanical Garden, through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

- Volume 1. Myxomycetes, Schizophyta.
- Volumes 2 to 10. Fungi.
- Volumes 11 to 13. Algae.
- Volumes 14 and 15. Bryophyta.
- Volume 16. Pteridophyta and Gymnospermae.
- Volumes 17 to 19. Monocotyledones
- Volumes 20 to 34. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Dr. N. L. Britton, Dr. M. A. Howe, and Dr. J. H. Barnhart.

Dr. Frederick V. Coville, of the United States Department of Agriculture; and Professor William Trelease, of the University of Illinois, have consented to act as an advisory committee.

Each author will be wholly responsible for his own contributions, being restricted only by the general style adopted for the work, which must vary somewhat in the treatment of diverse groups.

The subscription price is fixed at \$1.50 for each part; it is expected that four or more parts will be required for each volume. A limited number of separate parts will be sold at \$2.00 each. Address:

**THE NEW YORK BOTANICAL GARDEN
BRONX PARK
NEW YORK CITY**

lanceolate, 1-5 cm. long, 4 mm. wide and high, slightly sulcate on the lower suture, the septum almost obsolete.

TYPE LOCALITY: Toboggan, in the Sacramento Mountains, New Mexico.
DISTRIBUTION: New Mexico.

37. *Atelophragma bracteatum* Rydb. Bull. Torrey Club

55: 161. 1928.

A perennial; stems 5 dm. high or more, decumbent at the base, sparingly short-pubescent; leaves 5-7 cm. long; stipules lanceolate, acuminate, 5 mm. long; leaflets 13-25, linear-oblong to elliptic, 5-12 mm. long, 2-4 mm. wide, strigose beneath, glabrous above, obtuse to retuse at the apex; peduncles 5-10 cm. long; racemes many-flowered, 3-7 cm. long; bracts lanceolate or lance-linear, 6-8 mm. long, black-hairy and purple-tinged; calyx black-hairy, the tube 4 mm. long, the teeth lance-subulate, 3-5 mm. long; corolla purple, about 1 cm. long; banner obovate, moderately arched; wings shorter, the blade semi-ovate, lunate, with a large auricle; keel-petals broadly lunate, rounded at the apex; pod minutely black-strigose, the stipe about equaling the calyx-tube, the body ellipsoid, 1-1.5 cm. long, 6-8 mm. wide, abruptly contracted at each end; septum less than 1 mm. broad; seeds about 12.

TYPE LOCALITY: Sierra de Toluca, State of Mexico.
DISTRIBUTION: Known only from the type locality.

38. *Atelophragma Lozani* (Rose) Rydb. Bull. Torrey Club

55: 161. 1928.

Astragalus guatemalensis Lozani M. E. Jones, Rev. Astrag. 189. 1923.
Astragalus Lozani Rose; M. E. Jones, Rev. Astrag. 189, as a synonym. 1923.

A caespitose perennial; stems several, slender, decumbent, 2-4 dm. long, sparingly strigose; leaves 5-7 dm. long; stipules lanceolate, attenuate, 3-4 mm. long; leaflets 13-21, oval or obovate, 5-12 mm. long, rounded or more often retuse at the apex, thin, glabrous above, long-pilose beneath; peduncles 6-8 cm. long; racemes short, 2-3 cm. long; bracts lanceolate, 3 mm. long; pedicels 1 mm. long; calyx black-hairy, the tube 3 mm. long, nearly as broad, the teeth subulate, 2.5 mm. long; corolla purple, 10-11 mm. long; banner obovate, moderately arcuate; wings nearly as long, the blade oblanceolate-falcate; keel-petals much shorter, the blade obliquely obovate, rounded at the apex; pod strigulose with black hairs, the stipe 4-5 mm. long, the body broadly ellipsoid, about 15 mm. long, 7 mm. wide; septum 1 mm. broad; seeds 12-14.

TYPE LOCALITY: Sierra de Pachuca, Hidalgo.
DISTRIBUTION: Hidalgo.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 43, f. 6.

39. *Atelophragma cobrense* (A. Gray) Rydb. Bull. Torrey Club

55: 162. 1928.

Astragalus cobrensis A. Gray, Pl. Wright. 2: 43. 1853.
Tragacantha cobrensis Kuntze, Rev. Gen. 944. 1891.

A caespitose perennial; stems several, decumbent at the base, 1-2 dm. high, sparingly strigose; leaves spreading, 2-4 cm. long, the rachis strigose; stipules ovate, 3 mm. long, at least the lower connate; leaflets 11-18, obovate, cuneate at the base, usually retuse at the apex, 3-8 mm. long, 1.5-4 mm. wide, glabrous above, pilose beneath; peduncles 2-5 cm. long; racemes 1-3 cm. long; bracts lanceolate, 2 mm. long; pedicels about 2 mm. long; calyx strigose with mixed white and black hairs, the tube 1.5 mm. long, 1 mm. wide, the teeth nearly 1.5 mm. long, subulate; corolla purplish, 7 mm. long; banner obovate, strongly arched at the middle, retuse at the apex; wings much shorter, the blade oblanceolate, falcate; keel-petals still shorter, the blade obliquely obovate; pod grayish-strigose, almost sessile, the body elliptic, 12-15 mm. long, about 6 mm. wide and 4 mm. high, slightly sulcate on the lower suture, the septum fully 1 mm. wide.

TYPE LOCALITY: Santa Rita del Cobre, New Mexico.
DISTRIBUTION: Mountains of southwestern New Mexico.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42, f. 146.

40. *Atelophragma straturense* (M. E. Jones) Rydb. Bull. Torrey Club 55: 162. 1928.

Astragalus straturensis M. E. Jones, Contr. W. Bot. 8: 19. 1898.

A perennial, with a woody root; stem branched, 4-9 dm. high, striate, sparingly strigose, straw-colored, flexuose; leaves ascending, 7-10 cm. long, the rachis strigose; stipules deltoid or lanceolate, acuminate, 3 mm. long, reflexed, green; leaflets 13-19, oblong or oblanceolate, 1-2 cm. long, 2-6 mm. wide, cuneate at the base, obtuse, truncate, or retuse at the apex, glabrous above, strigose beneath; peduncles slender, 6-10 cm. long; racemes lax, 5-10 cm. long; bracts lanceolate, 1-2 mm. long; pedicels 1 mm. long; calyx black-hairy, the tube acute at the base, 2.5 mm. long, the teeth lance-subulate, 1 mm. long; corolla purplish, about 8 mm. long; banner obovate, rather strongly arcuate at the middle; wings slightly shorter, the blade oblanceolate, falcate; keel-petals much shorter, the blade broadly obliquely obovate, rounded at the apex; pod strigose, the stipe 2 mm. long, the body oblanceolate in outline, somewhat falcate, 15-20 mm. long, 3 mm. wide, sulcate on the lower suture; septum about 1 mm. wide.

TYPE LOCALITY: Silver Reef, Utah.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42, f. 145 [142].

41. *Atelophragma longissimum* (M. E. Jones) Rydb. Bull. Torrey Club 55: 162. 1928.

Astragalus Rusbyi longissimus M. E. Jones, Proc. Calif. Acad. II. 5: 662. 1895.

A caespitose perennial, with a woody root; stems several, about 3 dm. high, branched, angled, sparingly strigose; leaves ascending, about 1 cm. long, the rachis sulcate, sparingly hairy; stipules lanceolate, 2-3 mm. long; leaflets 25-37, oblong-oblanceolate, 8-20 mm. long, 3-4 mm. wide, light-green, glabrous above, sparingly strigose beneath, retuse or rounded at the apex; peduncles 1-2 dm. long; racemes lax, about 1 dm. long; bracts lance-subulate, 2 mm. long; pedicels 2 mm. long; calyx strigose often with black hairs, the tube 2 mm. long, the teeth subulate, 1 mm. long; corolla straw-colored, 3-4 mm. long; banner obovate, strongly arched at the middle, even slightly reflexed; wings about as long, the blade oblanceolate, falcate; keel-petals shorter, the blade obliquely obovate, rounded at the apex; pod white-strigose, the stipe 5-6 mm. long, the body lance-oblong, acute at each end, 15-18 mm. long, 4 mm. wide, sulcate on the lower suture, the septum 1.5 mm. wide; seeds 12-16.

TYPE LOCALITY: Chihuahua.

DISTRIBUTION: Chihuahua.

42. *Atelophragma Rusbyi* (Greene) Rydb. Bull. Torrey Club 55: 162. 1928.

Astragalus Rusbyi Greene, Bull. Calif. Acad. 1: 8. 1884.

Astragalus strigosus brevidentatus M. E. Jones, Rev. Astrag. 137. 1923.

A perennial, with woody root; stems 3-6 dm. high, striate, nearly glabrous, often purple-tinted, branched; leaves spreading, 6-10 cm. long; stipules deltoid, 3-4 mm. long; leaflets 13-23, oblong, elliptic or oval, 5-10 mm. long, 2-6 mm. wide, glabrous above, sparingly strigose beneath, rounded or retuse at the apex; peduncles 8-10 cm. long; racemes lax, 10-15 cm. long; bracts lanceolate, 2 mm. long, black-ciliate; pedicels 1 mm. long, calyx black-hairy, the tube 2.5 mm. long, 2 mm. broad, the teeth subulate, 1 mm. long; corolla cream-colored, 7 mm. long, banner obovate, strongly arched, even slightly reflexed; wings about as long, the blade oblanceolate, arcuate, with a reflexed auricle; keel-petals shorter, the blade broadly and obliquely obovate, strongly arched near the rounded tip; pod black-hairy, the stipe 5 mm. long, the body lance-oblong, about 2 cm. long, 4 mm. broad and high, somewhat sulcate on the lower suture, the septum 1 mm. wide; seeds 12-16.

TYPE LOCALITY: Mount Humphreys, Arizona.

DISTRIBUTION: New Mexico and Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42 (as var. *brevidentatus*).

43. *Atelophragma Townsendii* Rydb. Bull. Torrey Club

55: 163. 1928.

A perennial; stems 3-5 dm. high, angled; strigose, somewhat flexuose; leaves 5-8 cm. long; stipules deltoid, 4-5 mm. long; leaflets 15-27, oblong or elliptic to nearly linear, long-pilose on both sides, glabrate in age above, 5-12 mm. long, 1.5-4 mm. wide; peduncles about 1 dm. long, strict; racemes elongate, dense, 5-15 cm. long; bracts subulate, 2-4 mm. long; calyx densely black-hairy, the tube 3 mm. long, the teeth subulate, 1.5 mm. long; corolla cream-colored, about 7 mm. long; banner obovate, strongly arched; wings about as long, the blade broadly lunate; pod black-strigose, the stipe 4-5 mm. long, the body oblong, tapering at each end, about 2 cm. long, 5 mm. wide, deeply sulcate on the lower suture, the septum fully 1 mm. broad; seeds about 16.

TYPE LOCALITY: Sierra Madre, Chihuahua.

DISTRIBUTION: Chihuahua.

44. *Atelophragma Rosei* (M. E. Jones) Rydb. Bull. Torrey Club

55: 163. 1928.

Astragalus Rosei M. E. Jones, Rev. Astrag. 190. 1923.

A perennial; stems 3-5 dm. long, decumbent below, striate and sparingly strigose, flexuose; leaves 6-10 cm. long, ascending, the rachis strigose; stipules deltoid, about 3 mm. long; leaflets 19-25, oblong, 8-20 mm. long, 2-4 mm. wide, glabrous above, strigose beneath, cuneate at the base, obtuse or rounded at the apex; peduncles 6-10 cm. long; racemes dense, 3-10 cm. long; bracts lance-subulate, 3-5 mm. long; flowers reflexed; pedicels 1 mm. long or less; calyx black-hairy, the tube 2.5 mm. long, nearly 2 mm. broad, the teeth subulate, 1 mm. long; corolla cream-colored, 7-8 mm. long; banner obovate, strongly arched, slightly reflexed; wings fully as long, the blade obliquely obovate, falcate, with a large auricle; keel-petals shorter, the blade broadly obovate, rounded at the apex; pod subsessile, ellipsoid, minutely black-strigose, 10-12 mm. long, 4-5 mm. thick, 3-4 mm. wide, rounded at the base, obtuse or rounded at the apex, the septum fully 1 mm. wide; seeds 8-10.

TYPE LOCALITY: Above Dos Rios, State of Mexico.

DISTRIBUTION: Mexico (state and federal district).

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 43, f. 150.

7. *Seatoniana*. Pod sessile or subsessile, rounded at both ends, turgid, sulcate on the lower suture. Flowers purple, very small, in short dense headlike racemes.

45. *Atelophragma Pueblae* (M. E. Jones) Rydb. Bull. Torrey Club

55: 164. 1928.

Astragalus Pueblae M. E. Jones, Contr. W. Bot. 14: 35. 1912.

A caespitose perennial; stems many, filiform, branched, prostrate or spreading, glabrous; leaves 3-4 cm. long, ascending, the rachis nearly glabrous; leaflets linear, 4-7 mm. long, conduplicate, strigose beneath; peduncles 4-5 cm. long; racemes subcapitate, 1 cm. long; bracts lanceolate, 1-1.5 mm. long; pedicels 1.5 mm. long; calyx black-hairy, the tube 1.5 mm. long, the teeth subulate, less than 1 mm. long; corolla purple, 6 mm. long; banner obovate, notched at the apex, strongly arched; wings shorter, the blade obliquely obovate; keel-petals 1 mm. shorter, the blade semi-orbicular; pod oblong, sessile, 7 mm. long, 2 mm. high and broad, sparingly strigulose, sulcate on the lower suture; seeds 8-10, obliquely suborbicular, 2 mm. long.

TYPE LOCALITY: Esperanza, Puebla.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 69.

46. *Atelophragma Seatonii* (M. E. Jones) Rydb. Bull. Torrey Club
55: 164. 1928.

Astragalus Seatonii M. E. Jones, Proc. Calif. Acad. II, 5: 676. 1895.

A caespitose perennial, with a woody root; stems several, branched, decumbent or spreading, 2-4 dm. long, more or less strigose; leaves spreading, 2-5 cm. long; stipules deltoid, 2 mm. long; leaflets 21-25, linear, 3-10 mm. long, glabrous above, strigose beneath; peduncles 3-8 cm. long; racemes dense, 2-4 cm. long; bracts lanceolate, 3-4 mm. long; pedicels 1 mm. long; calyx black-hairy, the tube 1.5-2 mm. long, the teeth deltoid-subulate, 1 mm. long; corolla purple or white, 5-6 mm. long; banner obovate, strongly arched; wings of about the same length, the blade oblanceolate; keel-petals slightly shorter, the blade nearly semi-orbicular; pod oblong, strigulose, sessile, 6 mm. long, 2 mm. wide, blunt at each end, cordate in cross-section, the septum narrow; seeds about 8, suborbicular, brown.

TYPE LOCALITY: Mt. Orizaba, Veracruz.

DISTRIBUTION: Veracruz, Puebla, and State of Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 70, f. 262.

47. *Atelophragma Purpusi* (M. E. Jones) Rydb. Bull. Torrey Club
55: 164. 1928.

Astragalus Purpusi M. E. Jones, Contr. W. Bot. 14: 34. 1912.

A caespitose perennial; stems many, branched, prostrate, 1-2 dm. long, flexuose; leaves 2-3 cm. long, spreading; stipules hyaline, connate, deltoid, 3-5 mm. long; leaflets 19-23, mostly obovate, often retuse, 4-5 mm. long, 1.5-2 mm. wide, glabrous above, strigose beneath; peduncles 2-3 cm. long; racemes dense, about 1 cm. long; bracts lanceolate, 2 mm. long; calyx black-hairy, the tube less than 2 mm. long, the teeth deltoid, less than 1 mm. long; corolla purple, 4 mm. long; banner obovate, strongly arched; wings slightly shorter, the blade oblong, blunt; keel-petals shorter, the blade nearly semi-orbicular; pod ovoid, 4-5 mm. long, 2 mm. wide, short-stipitate, the cross-section cordate.

TYPE LOCALITY: Sierra de Parras, Coahuila.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 71, f. 265.

47. PHACOMENE Rydb. Am. Jour. Bot. 16: 204. 1929.

Cespitose perennial herbs, with ascending leafy stems. Leaves odd-pinnate, with glabrous broad leaflets and large deltoid stipules. Flowers in axillary racemes. Calyx-tube deeply campanulate, the teeth long and narrow. Corolla large, ochroleucous or purple. Banner obovate, clawless, retuse at the apex. Wings clawed, the blade oblanceolate, slightly falcate, with a reflexed auricle. Keel-petals with a winged claw and broadly lunate blade. Stamens diadelphous (9 and 1), the sheath broad at the base, straight, the free portion of the filaments upcurved. Ovary short-stipitate, glabrous, the style straight below, incurved near the apex, the stigma small, terminal. Pod short-stipitate, membranous, inflated, acute at each end, the upper suture acute, straight or somewhat concavely curved, the lower flat or slightly sulcate, strongly convexly curved, the septum usually narrow and not extending to the apex. Seeds many, obliquely round-reniform.

Type species, *Astragalus Beckwithii* T. & G.

Pod gradually tapering at each end.

Pod rather thin, usually distinctly mottled; partial septum less than 1 mm. wide.

Corolla purplish; calyx-teeth about half as long as the calyx-tube.

Corolla ochroleucous; calyx-teeth nearly equaling the tube.

Pod firmer and broader, usually unmottled; septum broader.

Pod abruptly contracted at least at the base.

Body of the fruit broadly ovoid; stipe straight.

Body of the fruit ovoid; stipe curved.

1. *P. artemisiarum*.

2. *P. Beckwithii*.

3. *A. weiserensis*.

4. *P. pontina*.

5. *P. Cimaes*.

1. *Phacomene artemisiarum* (M. E. Jones) Rydberg.

Astragalus Beckwithii purpureus M. E. Jones, Zoe 3: 288. 1893.

Astragalus artemisiarum M. E. Jones, Zoe 5: 46. 1900.

Phaca artemisiarum Rydb. Bull. Torrey Club 40: 48. 1913.

A caespitose perennial, with a deep, thick, woody root; stems ascending, 1-3 dm. high, glabrous, striate, often purplish-dotted; leaves ascending, 5-10 cm. long; stipules broadly deltoid, 3-5 mm. long; leaflets 11-21, oval, 5-10 mm. long, 4-8 mm. wide, rounded or retuse at the apex, glabrous; peduncles 5-7 cm. long, glabrous; bracts lanceolate, about 3 mm. long, glabrous; pedicels about 2 mm. long; calyx sparingly black-hairy, the tube 4-5 mm. long, the teeth subulate, 2-2.5 mm. long; corolla purple, with a white spot on the banner, about 2 cm. long; banner strongly curved, obovate, retuse at the apex; wings shorter, the blade obliquely oblong-obovate; keel-petals much shorter, the blade strongly lunate, rounded at the apex; pod lunate in sideview, acuminate at both ends, the stipe 4-5 mm. long, the body 2.5-3 cm. long, mottled, glabrous, the upper suture sharp, with a narrow wing-margin, the lower more or less sulcate, the imperfect septum less than 1 mm. broad.

TYPE LOCALITY: Deep Creek Mountains, western Utah.

DISTRIBUTION: Western Utah and eastern Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 22.

2. *Phacomene Beckwithii* (T. & G.) Rydb. Am. Jour. Bot.

16: 205. 1929.

Astragalus Beckwithii T. & G. Pacif. R. R. Rep. 2: 120. 1855.

Tragacantha Beckwithii Kuntze, Rev. Gen. 943. 1891.

Phaca Beckwithii Piper, Contr. U. S. Nat. Herb. 11: 371. 1906.

A caespitose perennial, from a woody root; stems ascending, 1-5 dm. high, glabrous, sulcate; leaves ascending, 8-15 cm. long; stipules broadly deltoid, 4-6 mm. long; leaflets 17-27, oval or ovate, rounded or retuse at the apex, 5-15 mm. long, 3-10 mm. wide, glabrous; peduncles 7-15 cm. long; racemes 4-5 cm. long, many-flowered; calyx glabrous or sparingly black-hairy, the tube 5 mm. long and nearly as wide, the teeth subulate, 4-5 mm. long; corolla ochroleucous, 15-18 mm. long; banner broadly obovate, emarginate at the apex; wings slightly shorter, the blade elliptic-lanceolate, with a large basal auricle; keel-petals much shorter, broadly lunate, with a rounded apex; pod glabrous, lunate in outline, mottled, the body about 2 cm. long, tapering at each end, the upper suture wing-margined, the lower often sulcate, with a very narrow partial septum.

TYPE LOCALITY: Cedar Mountains east of Lone Rock, Utah.

DISTRIBUTION: Western Wyoming, Utah, and eastern Nevada.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 22, f. 77; Am. Jour. Bot. 16: pl. 17K.

3. *Phacomene weiserensis* (M. E. Jones) Rydberg, sp. nov.

Astragalus Beckwithii weiserensis M. E. Jones, Zoe 5: 47. 1900.

A caespitose perennial, with a woody root; stems ascending or decumbent, 2-3 dm. high, glabrous, often purple-tinged; leaves ascending, 1-1.5 dm. long; stipules deltoid, 5-10 mm. long; leaflets 13-17, oval or broadly obovate, rounded or retuse at the apex, 1-2 cm. long; peduncles 4-7 cm. long; racemes 4-5 cm. long; bracts broadly lanceolate, 8-10 mm. long, twice or thrice as long as the pedicels; calyx glabrous, the tube 5-6 mm. long, the teeth subulate, 5-6 mm. long; corolla ochroleucous, about 18 mm. long; petals like those of the preceding species; pod leathery, unmottled or with small and faint blotches, the stipe about 8 mm. long, the body 2.5-3 cm. long, glabrous, the upper suture wing-margined and acute, the lower only slightly sulcate, but the partial septum rather wide.

TYPE LOCALITY: Weiser, Idaho.

DISTRIBUTION: Columbia Basin of Idaho, Oregon, and Washington.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 23; pl. 72, f. 77.

4. *Phacomene pontina* Rydberg, sp. nov.

A caespitose perennial; stems ascending, 2-3 dm. high, sulcate, glabrous; leaves ascending, 1-1.5 dm. long; stipules deltoid, 5-8 cm. long, green; leaflets 11-15, oval, about 15 mm. long,

5-8 mm. wide, rounded at the apex; peduncles 7-10 cm. long; racemes 3-6 cm. long; bracts lanceolate; calyx glabrous, the tube 6 mm. long, the teeth subulate, 6 mm. long; corolla ochroleucous, like that of *A. Beckwithii*; pod leathery, mottled, glabrous, the stipe about 6 mm. long, the body half-ovoid in outline, abruptly contracted into the stipe below and into the short beak above, 1.5-2 cm. long, the upper suture slightly wing-margined, the lower deeply sulcate.

Type collected at Spence's Bridge, British Columbia, May 18, 1875, *Macoun 450* (Gray Herbarium); also in 1889.

5. *Phacomene Cimae* (M. E. Jones) Rydberg.

Astragalus Cimae M. E. Jones, Rev. Astrag. 163. 1923.

Astragalus cimensis M. E. Jones, Rev. Astrag. Index. 1923.

A low caespitose perennial, with a woody root and caudex; stems about 1 dm. long, decumbent, glabrous; leaves about 1 dm. long, spreading; stipules deltoid, about 5 mm. long, hyaline; leaflets 17-21, oval or obovate, about 1 cm. long, rounded or retuse at the apex, glabrous and somewhat glaucous; peduncles about 5 cm. long; racemes 3-4 cm. long; bracts lanceolate, about 3 mm. long; calyx sparingly black-hairy, the tube 4 mm. long, the teeth lance-subulate, 2 mm. long; corolla unknown; pod leathery, glabrous, the stipe strongly curved, about 8 mm. long, the body about 2 cm. long, obliquely oblong in side view, ovate seen from above, the upper suture acute, with only a trace of a wing-margin, the lower suture sulcate, the partial septum about 1.5 mm. broad.

TYPE LOCALITY: Cima, San Bernadino Mountains, California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 38.

48. *TIUM* Medic. Vorles. Churph. Phys. Ges. 2: 373. 1787.

Leafy-stemmed perennials. Leaves odd-pinnate, with mostly distinct stipules. Flowers in axillary racemes on rather long peduncles. Calyx-tube campanulate, the teeth mostly subulate. Corolla ochroleucous or rarely purplish. Banner obovate, clawless. Wings clawed, the blade obliquely oblanceolate, with a small basal auricle. Keel-petals with the claw longer than the blade, which is broadly lunate. Stamens diadelphous (9 and 1), the sheath straight, the free portion of the filaments upcurved; ovary stipitate or sessile, many-ovuled, the style upcurved, the stigma minute. Pod leathery, stipitate or sessile, elongate, terete or compressed, the lower suture sometimes sulcate, the valves incurved and adnate forming a partial septum, extending to near the tip. Seeds obliquely round-reniform.

Type species, *Astragalus sulcatus* L.

Pod pendulous, the body linear or lance-linear in outline.

Pod distinctly stipitate, the stipe mostly longer than the calyx; upper suture acute, the lower decidedly sulcate.

Corolla 15-20 mm. long; banner moderately arched; lower edge of the keel-petals abruptly arched upward near the apex; plant stout.

1. *RACEMOSA*.

Corolla 7-12 mm. long; banner more strongly arched; lower edge of the keel-petals more uniformly arched throughout the blade; plant slender, less than 5 dm. high; pod usually falcately curved upward.

2. *MISELLA*.

Pod very short-stipitate or subsessile; upper suture more rounded.

Corolla less than 1 cm. long; plant slender, less than 4 dm. high; pod straight or curved downward.

4. *ATRATA*.

Corolla 1.5-2 cm. long; plant stout, 3-5 dm. high; pod more or less curved upward, rarely straight.

6. *PALANTIA*.

Pod erect or ascending, or rarely spreading.

Leaflets linear, oblong, or elliptic; pod oblong or linear, straight or slightly curved.

3. *ARRECTA*.

Leaflets obovate or orbiculate; pod linear-oblanceolate, falcate.

5. *ORCUTIANA*.

1. *RACEMOSA*

Plant villous; pod orbiculate in cross-section.

1. *T. Drummondii*.

Plant strigose or glabrous, not villous; pod triangular in cross-section.

Calyx not black-hairy; pod straight; partial septum very narrow; stem canescent-strigose.

Pod about 5 mm. broad; leaflets oblong.

Calyx-teeth 1.5-2 mm. long; leaflets comparatively thick.

Calyx-teeth 2.5-4 mm. long; leaflets rather thin.

Pod 6-7 broad; leaflets elliptic.

2. *T. brevisetum*.

3. *T. racemosum*.

4. *T. platycarpum*.

Calyx black-hairy; pod curved; partial septum broad, almost meeting the upper sutures.

Calyx-teeth about 3 mm. long; leaflets rounded at the apex.

Calyx-teeth 5-6 mm. long; leaflets mostly acute.

5. *T. scopulorum*.

6. *T. stenolobum*.

2. MISELLA

Pod 4-6 cm. long, 3 mm. broad, nearly straight.

Pod 2-3.5 cm. long, about 4 mm. broad, distinctly arched on the lower suture.

Plant sparingly short-villous or glabrous; leaflets oblong.

Corolla white or yellowish; pod 3-4 mm. wide.

Leaflets short-villous on both sides; corolla 10-12 mm. long; stem 3 dm. long or more, erect.

Leaflets glabrous above; corolla 8 mm. long; stem ascending or decumbent at the base, 1-2 dm. high.

Corolla purple; pod 6 mm. wide.

Plant densely villous with longer hairs, or subtomentose; leaflets obovate or broadly oblanceolate.

Pod glabrous.

Pod short-villous.

7. *T. Arthuri*.

8. *T. Howellii*.

9. *T. misellum*.

10. *T. inyoense*.

11. *T. Nevinii*.

12. *T. Traskiae*.

3. ARRECTA

Pod distinctly stipitate.

Stipe much exceeding the calyx; pod glabrous.

Leaflets oval to oblong.

Leaflets linear.

Stipe about equaling the calyx-tube.

Septum of the pod nearly obsolete; pod grayish-strigose.

Septum of the pod at least 1 mm. broad.

Stems with more or less elongate internodes, leafy; peduncles not much surpassing the leaves; pod glabrous.

Plant suffruticose at the base; racemes lax; flowers strongly ascending.

Plant with a short woody caudex; raceme in anthesis short; flowers spreading.

Stems very short, with short internodes; peduncles much exceeding the leaves, which are collected near the base of the stem; pod black-striose.

Pod almost sessile, the stipe much shorter than the calyx.

Plant tall, 5 dm. high or more; pod arcuate, glabrous.

Plant low, less than 3 dm. high; pod straight.

Leaves silvery-canescens on both sides; pod glabrous.

Leaves merely grayish-pilose or strigose beneath, usually glabrate above; pod strigose, except in *T. conjunctum*.

Calyx 5 mm. long; corolla 1 cm. long; leaves erect; leaflets linear oblong or linear.

Pod pubescent; leaflets and calyx rather loosely hairy, not conspicuously black-hairy.

Leaflets acute, narrowly linear, pubescent on both sides; pod white-hairy, straight.

Leaflets obtuse to retuse, oblong or linear-oblong; pod black-hairy, slightly arcuate.

Pod glabrous; leaflets and calyx appressed-hairy, the latter conspicuously black-hairy.

Calyx 3-4 mm. long; corolla less than 1 cm. long; lower leaves at least ascending or spreading.

Leaflets elliptic or those of the upper leaves oblong; calyx not black-hairy.

Leaflets linear or those of the lower leaves oblong; calyx partly black-hairy.

13. *T. eremiticum*.

14. *T. malheurense*.

15. *T. arrectum*.

16. *T. remotum*.

17. *T. atropubescens*.

18. *T. Leibergii*.

19. *T. Michauxii*.

20. *T. terminale*.

21. *T. oxytropoides*.

22. *T. Sheldoni*.

23. *T. conjunctum*.

24. *T. obscurum*.

25. *T. miserum*.

4. ATRATA

Pod strigose.

Stems elongate, usually more than 1 dm. long; inflorescence lax, exceeding the leaves; pod not mottled.

Septum of the pod very broad.

Corolla 10-12 mm. long.

Leaflets linear; corolla white; pod nearly terete, abruptly contracted at the base.

Leaflets oblong or elliptic; corolla purple at the tip; pod somewhat flattened, attenuate at the base.

Corolla about 7 mm. long; leaflets short, oblong.

Septum of the pod narrow, sometimes nearly obsolete.

Pod and leaflets linear.

Pod and leaflets oblong.

Stems very short; inflorescence scarcely exceeding the leaves, 1-4 flowered; pod mottled.

Pod glabrous.

Pod straight.

Pod recurved.

26. *T. atratum*.

27. *T. mensarum*.

28. *T. atratiforme*.

29. *T. ovyheense*.

30. *T. Salmonis*.

31. *T. panamintense*.

32. *T. Egglestonii*.

33. *T. recurvum*.

One species.

5. ORCUTTIANA

34. *T. Orcuttianum*.

6. PALANTIA

Pod arched upwards, on recurved pedicels; calyx more or less black-hairy; corolla purplish.

Pod glabrous; corolla 13 mm. long; calyx-tube 5 mm. long.

35. *T. palans*.

Pod pubescent; corolla 16 mm. long; calyx-tube 6 mm. long.

36. *T. amplexum*.

Pod nearly straight, ascending on ascending pedicels.

Pod glabrous; stem glabrate or sparingly strigose; calyx mostly white-hairy.

Corolla white, 15-16 mm. long; pod 2-2.5 cm. long, mottled, rather thin-walled; calyx-tube 6 mm. long.

37. *T. Wilsoni*.

Corolla purplish, 13-14 mm. long; pod about 1.5 cm. long, not mottled, rather firm; calyx-tube 4 mm. long.

38. *T. ursinum*.

Pod strigose; stem canescent; calyx black-hairy; corolla 16-17 mm. long.

39. *T. mokiacense*.

1. *Racemosa*. Pod leathery, distinctly stipitate, pedulous, the stipe longer than the calyx, the body linear, often falcate, the upper suture acute, the lower decidedly sulcate; cross-section cordate or triangular. Tall leafy-stemmed plants, with large ochroleucous or white flowers, the banner moderately arched.

1. *Tium Drummondii* (Dougl.) Rydb. Bull. Torrey Club 32: 659. 1906.

Astragalus Drummondii Dougl.; Hook. Fl. Bor. Am. 1: 153. 1831.
Tragacantha Drummondii Kuntze, Rev. Gen. 744. 1891.

A caespitose perennial; stems 4-10 dm. high, sulcate, villous; leaves spreading or ascending, 7-15 cm. long, the rachis sulcate, villous; stipules lanceolate or ovate, distinct, green, attenuate; leaflets 15-31, oblong or elliptic, 1-2.5 cm. long, 3-10 mm. wide, glabrous above, villous beneath, obtuse, rounded, or slightly retuse at the apex; peduncles 5-15 cm. long; racemes at first rather dense, elongate in fruit, 5-10 cm. long; bracts lanceolate, 2-3 mm. long; flowers nodding; pedicels 2-4 mm. long; calyx black-villous, the tube 5 mm. long, 3 mm. broad, gibbous on the upper side at the base, the teeth subulate, 2 mm. long; corolla white or cream-colored, about 2 cm. long; banner oblanceolate, deeply notched, moderately arched at the middle; wings about 16 mm. long, the blade obliquely oblanceolate, nearly straight, equaling the claw, with a large reflexed auricle; keel-petals about 14 mm. long, the blades obliquely obovate, strongly arched towards the blunt apex, with a rounded basal auricle; pod drooping, glabrous, stipitate, the stipe nearly 1 cm. long, the body linear, 2-4 cm. long, 4 mm. wide and thick, tapering at the base, abruptly short-beaked at the apex, the upper suture acute, the lower deeply sulcate, the cross-section cordate, the septum fully 1 mm. wide; seeds brown, obliquely reniform, 3 mm. long.

TYPE LOCALITY: Eagle and Red-Deer Hills of the Saskatchewan.

DISTRIBUTION: Plains from Saskatchewan and Alberta to northern New Mexico and Utah.

ILLUSTRATIONS: Hook. Fl. Bor. Am. pl. 57; M. E. Jones, Rev. Astrag. pl. 63, f. 210; Fl. Neb. 22: pl. 9, f. 16-21; Britt. & Brown, Ill. Fl. f. 2133; ed. 2. f. 2541; Clements, Rocky Mt. Fl. pl. 29, f. 15.

2. *Tium brevisetum* (M. E. Jones) Rydberg, sp. nov.

Astragalus racemosus brevisetus M. E. Jones, Proc. Calif. Acad. II. 5: 662. 1895.

A tall perennial; stem stout, 5 dm. high or more, striate, strigulose, flexuose above; leaves ascending, 1-1.5 dm. long, the rachis strigose, sulcate; stipules broadly deltoid, 4 mm. long; leaflets 31-41, oblong, 1-2.5 cm. long, thick, 3-5 mm. wide, glabrate above, rather densely strigulose beneath, obtuse to slightly retuse at the base; peduncles 5-8 cm. long, erect, sulcate; bracts subulate, 4-5 mm. long; pedicels 2 mm. long; calyx strigose, the tube oblique, gibbous on the upper side, about 5 mm. long, the upper two teeth lance-subulate, 1.5 mm. long, the lower three subulate, the lowest one 2 mm. long; corolla white, tinged and veined with purple, about 18 mm. long; banner obovate, slightly notched; wings shorter, the blade falcate, oblanceolate; keel-petals still shorter, the blade broadly lunate, rounded and purplish at the apex; pod glabrous; stipe about 5 mm. long, the body linear, acute at each end, 2-2.5 cm. long,

3 mm. wide and thick, cross-reticulate; upper suture sharp, the lower deeply sulcate; cross-section triangular, inversely V-shaped, many-seeded.

TYPE LOCALITY: Ramos, Zacatecas.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 63.

3. *Tium racemosum* (Pursh) Rydb. Bull. Torrey Club

32: 659. 1906.

Astragalus racemosus Pursh, Fl. Am. Sept. 740. 1814.

Astragalus galeoides Nutt. Gen. 2: 100. 1818.

Tragacantha racemosa Kuntze, Rev. Gen. 947. 1891.

Astragalus racemosus brevisetus M. E. Jones, Proc. Calif. Acad. II. 5: 662, in part. 1895.

Astragalus racemosus longisetus M. E. Jones, Proc. Calif. Acad. II. 5: 663. 1895.

A perennial, with a stout root and caespitose caudex; stems 4-10 dm. high, sulcate, flexuose, more or less strigose; leaves 7-15 cm. long, ascending, the rachis strigose; stipules lanceolate or deltoid, acuminate, connate, 5-8 mm. long; leaflets 17-33, oblong or linear-oblong, 1-2.5 cm. long, 3-8 mm. wide, glabrous above, strigose-canescens beneath, obtuse to rounded at the apex; peduncles 5-10 cm. long, sulcate, strigose; racemes 4-10 cm. long; bracts subulate, 3-7 mm. long; flowers nodding; pedicels 4-5 mm. long; calyx white-strigose, the tube 4-5 mm. long, 3 mm. broad, the teeth subulate, 2-4 mm. long; corolla white or pinkish, the keel purplish; banner 15-16 mm. long, oblanceolate, slightly arched at the middle; wings slightly shorter, the blade oblanceolate, as long as the claw, slightly falcate, with a large basal auricle; keel-petals a little shorter, the blades obliquely oblanceolate, abruptly arched near the obtuse apex, with a long reflexed auricle; pod glabrous, stipitate, the stipe 4-5 mm. long, the body linear, tapering at each end, 2-2.5 cm. long, 4-5 mm. wide and 4 mm. thick, the upper suture acute, the lower deeply sulcate, the cross-section triangular, the septum very narrow; seeds brown, obliquely reniform, 3 mm. long.

TYPE LOCALITY: "Upper Louisiana" [now South Dakota].

DISTRIBUTION: North Dakota to Oklahoma, Colorado, and Wyoming.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 63, f. 208; Fl. Neb. 22: pl. 9, f. 22-27; Britt. & Brown, Ill. Fl. f. 2134; ed. 2. f. 2540.

4. *Tium platycarpum* Rydberg, sp. nov.

A perennial; stem 3-5 dm. high, flexuose, striate, strigose; leaves 8-10 cm. long; leaflets 17-19, elliptic, mucronate, 1.5-2.5 cm. long, 6-9 mm. wide, strigose beneath, glabrous above, firm; peduncles 5-7 cm. long; racemes 5-8 cm. long; bracts subulate, 3 mm. long; calyx white-strigose, the tube 6 mm. long, 3 mm. broad, gibbous on the upper side at the base, the upper two teeth lance-deltoid, acuminate, the lower three subulate, 3 mm. long; corolla apparently cream-colored, 17 mm. long; banner obovate, moderately arcuate; wings nearly as long, the blade oblong, falcate, with large auricles; keel-petals similar, of the same length, but broader; pod glabrous, cross-reticulate, the stipe about 7 mm. long, the body lunate, 3.5 cm. long, 6-7 mm. broad, tapering at each end, sulcate on the lower suture, triangular in cross-section, the septum very narrow, almost obsolete.

Type collected along Oak Creek, Colorado, in 1873, *Brandegee* (herb. Columbia Univ.).

5. *Tium scopulorum* (Porter) Rydb. Bull. Torrey Club

32: 659. 1906.

Astragalus scopulorum Porter; Porter & Coult. Syn. Fl. Colo. 24. 1874.

Astragalus subcompressus A. Gray; Brand. Bull. U. S. Geol. Surv. Terr. 2: 234. 1876.

Tragacantha scopulorum Kuntze, Rev. Gen. 948. 1891.

Tragacantha subcompressa Kuntze, Rev. Gen. 948. 1891.

Astragalus rarus Sheldon, Minn. Bot. Stud. 1: 158. 1894.

A perennial, with a woody root and caespitose caudex; stems decumbent at the base, 3-6 dm. high, glabrous or sparingly strigose, angled; leaves ascending, 5-7 cm. long, the rachis sparingly strigose or glabrate; stipules deltoid, green, 5-7 mm. long; leaflets 11-27, oblong or elliptic, 8-15 mm. long, 3-7 mm. wide, obtuse or rounded at the apex, glabrous above, sparingly

strigose or glabrate beneath; peduncles 5-10 cm. long; racemes 3-5 cm. long; bracts subulate, 3-5 mm. long; flowers drooping; pedicels about 5 mm. long; calyx more or less black-hairy, the tube 6-7 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla white, about 2 cm. long; banner lanceolate, notched at the apex, moderately arched at the middle; wings about 18 mm. long, the blade narrowly oblanceolate, falcate, with a large reflexed auricle; keel-petals about 15 mm. long, the blade shorter than the claw, obliquely obovate, abruptly arched near the blunt apex; pod glabrous, stipitate, the stipe 6-7 mm. long, the body linear, falcate, 2-2.5 cm. long, 5 mm. wide, and 4 mm. thick, abruptly acute at each end, the upper suture acute, the lower deeply sulcate, the cross-section cordate, the septum 2-2.5 mm. wide, nearly meeting the upper suture.

TYPE LOCALITY: Wet Mountain Valley, Colorado.

DISTRIBUTION: Colorado, New Mexico and southeastern Utah.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl.* 63, *f.* 209; Am. Jour. Bot. 16: *pl.* 16 O.

6. *Tium stenolobum* Rydberg, sp. nov.

A caespitose perennial, with a thick woody root; stems numerous, erect, 2-3 dm. high, strigose with mixed white and black hairs; leaves ascending, 4-7 cm. long, the rachis sulcate, strigose, lower stipules ovate or deltoid, cunate, scarious, the upper ones herbaceous, lanceolate, attenuate, 5-8 mm. long, black-ciliate; leaflets 15-21, lanceolate or oblong-lanceolate, acute, 5-15 mm. long, 2-4 mm. wide, glabrous above, strigose beneath; peduncles erect, 5-12 cm. long, black-hairy; racemes 3-7 cm. long; bracts subulate, 4-8 mm. long, less than 1 mm. wide, attenuate; pedicels 2 mm. long; calyx rather densely black-hairy, the tube gibbous at the base on the upper side, 7-8 mm. long, the teeth narrowly subulate, almost filiform, dilated only at the base, 5-6 mm. long; corolla ochroleucous, about 2 cm. long; banner oblanceolate, notched at the end; wings shorter, the blade obliquely oblanceolate, shorter than the claw, with a small auricle; keel-petals much shorter, the blade broadly lunate, broader and more arched at the upper end, rounded at the apex; pod glabrous, the stipe about equaling the calyx-tube, the body linear, acute at each end, 2.5-3 cm. long, inverted V-shaped in cross-section.

Type collected in the Sandia Mountains, on the eastern slope of Palomas, New Mexico, *Charlotte C. Ellis 326* (U. S. Nat. Herb.).

DISTRIBUTION: Known only from the type locality.

2. *Misella*. Pod leathery, stipitate, pendulous, the stipe longer than the calyx, the body more or less narrowly lunate in outline, the upper suture acute, the lower sulcate. Low slender plants with rather small, ochroleucous, or white, or (in *T. inyoense*) purple flowers in small racemes.

7. *Tium Arthuri* (M. E. Jones) Rydberg.

Astragalus Arthuri M. E. Jones, Contr. W. Bot. 8: 20. 1898.

~ *Atelophragma Arthuri* Rydb. Bull. Torrey Club 40: 51. 1913.

A perennial, with a caespitose caudex; stems 2-4 dm. high, slender, erect, sulcate and strigose; leaves 5-10 cm. long, erect; stipules deltoid, 2-3 mm. long; leaflets 21-29, oblong or elliptic, 6-10 mm. long, 2-3 mm. wide, glabrous above, sparingly pubescent beneath, obtuse; peduncles 1-1.5 dm. long, strict; racemes about 1 dm. long; bracts subulate, 2-3 mm. long; pedicels 3 mm. long, reflexed; calyx strigose with white and black hairs, the tube 4 mm. long, 2 mm. broad, the teeth lance-subulate, 3 mm. long; corolla white, about 12 mm. long; banner obovate, moderately arched; wings shorter, the blade oblong-oblanceolate, falcate; keel-petals shorter, the blade broadly lunate-obovate, more arched towards the apex; pod strigose, stipitate, the stipe 7-8 mm. long, the body linear, gradually tapering at each end, 4-5 cm. long, 3-3.5 mm. wide and nearly as thick, the upper suture acute, the lower sulcate, the cross-section cordate, the septum nearly meeting the upper suture.

TYPE LOCALITY: Lake Waha, Idaho.

DISTRIBUTION: Northern Idaho and eastern Washington and Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 67, *f.* 233.

8. *Tium Howellii* (A. Gray) Rydberg.

Astragalus Howellii A. Gray, Proc. Am. Acad. 15: 46. 1879.

A perennial, with a woody root and caespitose caudex; stems ascending, branched, finely pubescent with kinky hairs; leaves 5-10 cm. long, ascending; stipules deltoid, thick, 5-7 mm. long; leaflets 15-19, oblong, short-villous on both sides, 6-10 mm. long, 2-3 mm. wide, obtuse; peduncles 5-10 cm. long, sulcate, villous; racemes 2-10 cm. long; bracts lanceolate, 1-2 mm. long; pedicels reflexed, 1-2 mm. long; calyx short-villous, the tube 4 mm. long, 2.5 mm. broad, the teeth subulate, 2 mm. long; corolla dirty-white or yellowish, 12 mm. long; banner obovate, retuse, rather strongly arched; wings shorter, the blade oblong-oblancoolate, falcate, obtuse, with a large auricle; keel-petals still shorter, the blade broadly obovate-lunate, more strongly curved towards the rounded apex; pod villous-puberulent, stipitate, the stipe nearly 1 cm. long, the body lance-linear, tapering at each end, slightly falcate, about 2 cm. long, 4 mm. wide, and 3 mm. thick, the upper suture acute, the lower sulcate, the cross-section cordate, the septum 2 mm. wide, nearly meeting the upper suture.

TYPE LOCALITY: Wasco County, southeastern Oregon.

DISTRIBUTION: Southern Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 66, f. 228.

9. *Tium misellum* (S. Wats.) Rydberg.

Astragalus misellus S. Wats. Proc. Am. Acad. 21: 449. 1886.

Astragalus drepanolobus aberrans M. E. Jones, Contr. W. Bot. 10: 64. 1902.

Phaca misella Piper, Contr. U. S. Nat. Herb. 11: 371. 1906.

Astragalus Howellii misellus M. E. Jones, Rev. Astrag. 262. 1923.

A perennial, with caespitose caudex; stems 1-3 dm. high, decumbent at the base, short-pubescent; leaves 3-6 cm. long, ascending; stipules deltoid, 2 mm. long; leaflets 13-17, oblong or elliptic, 5-10 mm. long, 1-3 mm. wide, glabrous above, sparingly pubescent beneath, obtuse; peduncles 2-5 cm. long; racemes 2-3 cm. long; bracts lanceolate, about 1 mm. long; pedicels 1-2 mm. long, recurved; calyx short-villous, the tube 2.5-3 mm. long, the teeth lance-subulate, 1 mm. long; corolla yellowish, 7-8 mm. long; banner obovate; wings shorter, the blade obliquely oblancoolate, falcate, with a large auricle, as long as the claw; keel-petals much shorter, the blade almost semiorbicular; pod short-villous, stipitate, the stipe 3-5 mm. long, the body lance-linear, tapering at each end, falcate, 15-18 mm. long, 3 mm. wide and about as thick, the upper suture acute, the lower sulcate, the cross-section cordate, the septum 1.5 mm. wide, nearly meeting the upper suture.

TYPE LOCALITY: Mitchell, Wasco County, Oregon.

DISTRIBUTION: Oregon and southeastern Washington.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 66; pl. 67.

10. *Tium inyoense* (Sheldon) Rydberg.

Astragalus inyoensis Sheldon, Contr. U. S. Nat. Herb. 4: 86. 1893.

A perennial, with a caespitose caudex; stems erect or decumbent at the base, glabrate or sparingly strigulose, 3-6 dm. high, loosely branched; leaves 2-4 cm. long, spreading; stipules deltoid, acute, reflexed, 2 mm. long; leaflets 17-21, oval or obovate, rounded or retuse at the apex, cuneate at the base, 4-6 mm. long, glabrous above, white-strigose beneath; peduncles 5-10 cm. long, strigulose; racemes 2-8 cm. long; bracts lanceolate, 2 mm. long; pedicels 2 mm. long; calyx strigose-canescens, the tube 3 mm. long, 2 mm. broad, the teeth lance-subulate, acute, 1.5 mm. long; corolla purple, about 10 mm. long; banner obovate, rather strongly arched; wings nearly as long, the blade obliquely obovate, the claw orange; keel-petals nearly as long, orange, with dark-purple tip, the blade broadly obovate, rounded at the apex; pod rather thin-walled, somewhat inflated, canescens-strigulose, the stipe 3-4 mm. long, the body slightly falcate, lanceolate, tapering at each end, 12-15 mm. long, 4-5 mm. wide, 6 mm. thick, the lower suture deeply sulcate, the cross-section cordate, with a narrow partial septum.

TYPE LOCALITY: Darwin Mesa, near Mill Creek Divide, Inyo County, California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 67, f. 230.

11. *Tium Nevinii* (A. Gray) Rydberg.

Astragalus Nevinii A. Gray, Proc. Am. Acad. 21: 412. 1886.

A perennial, with a taproot; stems ascending or decumbent, white-tomentulose, 2-4 cm. high; leaves numerous, crowded, 4-10 cm. long, the rachis tomentulose; stipules lance-subulate, 3-5 mm. long; leaflets 11-21, obovate, 5-10 mm. long, white-villous on both sides, cuneate at the base, rounded to retuse at the apex; peduncles 5-10 cm. long; racemes 2-4 cm. long; bracts lanceolate, 2-3 mm. long; pedicels very short; calyx villous with dark-brown hairs, the tube 3 mm. long, 2 mm. broad, the teeth subulate, 1.5 mm. long; corolla yellowish, 8-10 mm. long; banner obovate, strongly arched at the middle; wings shorter, the blade oblong, falcate; keel-petals still shorter, the blade broadly lunate; pod glabrous, stipitate, the stipe 7 mm. long, the body lance-linear, tapering at each end, strongly cross-reticulate, falcate, about 1.5 cm. long, 4 mm. wide, and 3 mm. thick, acute on the upper suture, deeply sulcate on the lower, the cross-section cordate, the septum 1 mm. wide, nearly reaching the upper suture.

TYPE LOCALITY: Island of San Clemente, California.

DISTRIBUTION: San Clemente and Santa Barbara islands, off California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 67, f. 231.

12. *Tium Traskiae* (Eastw.) Rydberg.

Astragalus Traskiae Eastw. Proc. Calif. Acad. III. 1: 102. 1898.

A perennial; stem decumbent and woody at the base, 2-4 dm. high, densely white-tomentose; leaves numerous, ascending, 5-9 cm. long; the rachis white-tomentose; stipules deltoid, acuminate, 3 mm. long; leaflets 17-25, elliptic to broadly oval, 5-12 mm. long, thick, white-tomentose on both sides; peduncles 5-10 cm. long, white-tomentose; racemes 3-7 cm. long; bracts lance-subulate, 3 mm. long; pedicels 2 mm. long; calyx yellowish-brown, tomentose, the tube 5 mm. long, the teeth lanceolate, about 1 mm. long; corolla ochroleucous; banner obovate, about 15 mm. long; wings 12 mm. long, the blade broadly oblanceolate, with a large reflexed auricle, longer than the claw; keel-petals shorter, the blade broadly lunate, obtuse at the apex; pod white-tomentose, reticulate, the stipe 6-7 mm. long, the body semioval in outline, about 1.5 cm. long, 4 mm. high, 6 mm. broad, abruptly acute at each end, the upper suture straight or nearly so, the lower strongly arched, deeply sulcate, the cross-section inverted V-shaped, the sulcus extending nearly halfway to and the septum nearly to the upper suture.

TYPE LOCALITY: San Nicholas Island, California.

DISTRIBUTION: Islands of San Nicholas and Santa Barbara, off California.

ILLUSTRATIONS: Proc. Calif. Acad. III. 1: pl. 8, f. 6; M. E. Jones, Rev. Astrag. pl. 67, f. 232.

3. **Arrecta.** Pod leathery, stipitate or sessile, erect or ascending, the body linear-oblong, straight or slightly curved, terete in cross-section, slightly sulcate on the lower suture. Stout, usually low plants, with rather large white or ochroleucous flowers.

13. *Tium eremiticum* (Sheldon) Rydb. Bull. Torrey Club

40: 49. 1913.

Astragalus eremiticus Sheldon, Minn. Bot. Stud. 1: 161. 1894.

Astragalus arrectus eremiticus M. E. Jones, Proc. Calif. Acad. II. 5: 665. 1895.

Astragalus eremiticus spencianus M. E. Jones, Contr. W. Bot. 10: 60. 1902.

Astragalus boiseanus A. Nelson, Bot. Gaz. 53: 223. 1912.

Cystium boiseanum Rydb. Bull. Torrey Club 40: 50. 1913.

Astragalus arrectus Kelseyi M. E. Jones, Rev. Astrag. 161, in part. 1923.

A caespitose perennial, with a woody root; stems several, 3-5 dm. high, sulcate, usually straw-colored or purplish, glabrous or nearly so; leaves 7-10 cm. long, ascending; stipules deltoid, 4-6 mm. long; leaflets 21-35, oblong to oval, 8-18 mm. long, 3-8 mm. wide, glabrous above, sparingly strigose beneath; peduncles 5-15 dm. long; racemes 5-10 cm. long, rather lax; bracts lanceolate, 2 mm. long; pedicels 1-2 mm. long; calyx sparingly black-hairy, the tube 5 mm. long, the teeth subulate, scarcely 2 mm. long; corolla white, ochroleucous, or purple, about 15 mm. long; banner obovate, notched at the apex; wings about 12 mm. long, the blade oblanceolate; keel-petals 10 mm. long, the blade broadly lunate, rounded at the apex; pod

glabrous, the stipe about 1 cm. long, bent upward in fruit, the body oblong, rather abruptly contracted at each end, 1.5–2 cm. long, 5 mm. wide and 6 mm. thick, reniform in cross-section, the septum fully 1 mm. broad.

TYPE LOCALITY: Beaverdam Mountains, Utah.

DISTRIBUTION: Arizona and southern Nevada to Idaho and Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 37; pl. 38 (as var. *spencianus*).

14. *Tium malheureense* (A. Heller) Rydberg.

Astragalus Cusickii Rydb. Bull. Torrey Club 26: 541. 1899. Not *A. Cusickii* A. Gray. 1878.
Astragalus malheurensis A. Heller, Cat. N. An. Pl. ed. 2. 7. 1900.

A perennial; stems several, erect, 3–5 dm. high, strigose; leaves ascending, 6–10 cm. long, the rachis strigose; stipules lanceolate, 3 mm. long; leaflets 13–21, linear, 2–3 cm. long, about 2 mm. wide, acute, glabrous above, strigose beneath; peduncles 5–10 cm. long; racemes 5–10 cm. long, lax; bracts subulate, 2 mm. long; pedicels 1 mm. long; calyx black-hairy, 1.5 mm. long; corolla ochroleucous, with purple-tipped keel; banner 15–18 mm. long, obovate; wings 12–14 mm. long, the blade oblanceolate; keel-petals 10 mm. long, the blade broadly lunate, rounded at the apex; pod glabrous, the stipe about 1 cm. long, curved upward, the body upright, oblong, 2 cm. long, the cross-section obcordate, the septum about 1 mm. wide.

TYPE LOCALITY: Malheur, Oregon.

DISTRIBUTION: Malheur County, Oregon.

15. *Tium arrectum* (A. Gray) Rydb. Bull. Torrey Club 40: 49. 1913.

Astragalus leucophyllus Hook. Lond. Jour. Bot. 6: 211. 1847. Not *A. leucophyllus* Willd. 1803.
Astragalus arrectus A. Gray, Proc. Am. Acad. 8: 289. 1870.
Astragalus palousensis Piper, Bot. Gaz. 22: 489. 1896.
Astragalus arrectus palousensis M. E. Jones, Contr. W. Bot. 10: 68. 1902.
Phaca arrecta Piper, Contr. U. S. Nat. Herb. 11: 371. 1906.

A caespitose perennial, with woody root and short caudex; stems several, 3–6 dm. high, sulcate or angled, sparingly strigose; leaves ascending, 7–15 cm. long, the rachis strigose; stipules deltoid, acuminate, spreading or reflexed; leaflets 13–31, linear or oblong, or those of the lower leaves obovate, 8–20 mm. long, 2–5 mm. wide, obtuse, rounded, or rarely retuse at the apex, glabrous above, strigose beneath; peduncles 1–2 dm. long; racemes 4–10 cm. long; bracts lanceolate, 3–5 mm. long, black-hairy; pedicels 1–2 mm. long; calyx black-hairy, the tube 4–5 mm. long, 3–4 mm. broad; corolla white or ochroleucous, 14–15 mm. long; banner obovate, moderately arched at the middle; wings slightly longer, the blade oblanceolate, slightly falcate, with a very large reflexed auricle; keel-petals shorter, broadly obliquely lunate, abruptly arched above the middle, with a small auricle; pod strigose, or in age glabrate, the stipe 4–5 mm. long; body oblong, abruptly acute at each end, obtuse on the upper suture, sulcate on the lower, about 15 mm. long, 4 mm. wide and thick, the cross-section broadly cordate, the septum less than 1 mm. wide.

TYPE LOCALITY: Kooskooski River, Idaho.

DISTRIBUTION: Idaho, and western Washington and Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 37 (var. *palousensis*).

16. *Tium remotum* (M. E. Jones) Rydberg, sp. nov.

Astragalus arrectus remotus M. E. Jones, Rev. Astrag. 162. 1923.

A branched perennial, suffruticose at the base; stems branched, 3–4 dm. high, the perennial part about 1 dm. high, striate and strigose, flexuose; leaves ascending, 5–10 cm. long; stipules broadly deltoid, 3 mm. long; leaflets 15–25, linear or oblong, 4–8 mm. long, 1–2 mm. wide, glabrous above, strigose beneath, obtuse or truncate at the apex; peduncles 7–10 cm. long; racemes lax, 5–10 cm. long; bracts subulate, 2 mm. long; pedicels 1 mm. long; flowers strongly ascending; calyx strigose, the tube 3 mm. long; corolla white, with purple-tipped keel; banner about 13 mm. long, obovate, moderately arched at the middle; wings much shorter, the blade oblanceolate, with a large auricle; keel-petals shorter, the blade broadly obliquely lunate, nearly semiorbicular, but more strongly arched towards the apex; pod glabrous, the stipe 3

mm. long, the body about 12 mm. long, 3-4 mm. wide and thick, more gradually acute than in the related species, cordate in cross-section.

TYPE LOCALITY: Good Springs, western Nevada.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 38 (var. *remotus*).

17. *Tium atropubescens* (Coul. & Fisher) Rydb. Bull. Torrey Club
40: 49. 1913.

Astragalus atropubescens Coul. & Fisher, Bot. Gaz. 18: 300. 1893.

Astragalus Kelseyi Rydb. Mem. N. Y. Bot. Gard. 1: 241. 1900.

Astragalus arrectus Kelseyi M. E. Jones, Rev. Astrag. 161. 1923.

A perennial, with a woody root and short caudex; stems several, 3-4 dm. high, sulcate, strigose; leaves ascending, 7-10 cm. long; stipules deltoid, 3-4 mm. long, spreading; leaflets 15-21, linear or oblong, 8-15 mm. long, 1.5-3 mm. wide, glabrous above, strigose-canescens beneath; peduncles 5-10 cm. long; racemes 3-5 cm. long; bracts lanceolate-subulate, 2-3 mm. long; pedicels 1-2 mm. long; calyx black-hairy, the tube 4 mm. long, 2.5 mm. broad, the teeth subulate, scarcely 2 mm. long; corolla ochroleucous, 13-14 mm. long; banner obovate, moderately arched; wings nearly as long, the blade oblanceolate, falcate, with a large auricle; keel-petals shorter, the blade broadly lunate, more strongly arched towards the obtuse apex; pod glabrous, the stipe about 4 mm. long, the body oblong, 15-20 mm. long, 4 mm. wide and thick, abruptly acute at each end, the upper suture obtuse, the lower sulcate, the cross-section broadly cordate, the septum 1.5 mm. wide.

TYPE LOCALITY: Deer Lodge, Montana.

DISTRIBUTION: Western Montana.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 37.

18. *Tium Leibergi* (M. E. Jones) Rydberg.

Astragalus Leibergi M. E. Jones, Proc. Calif. Acad. II, 5: 663. 1895.

Astragalus arrectus Leibergi M. E. Jones, Contr. W. Bot. 10: 68. 1902.

Phaca arrecta Leibergi Piper, Contr. U. S. Nat. Herb. 11: 372. 1906.

A caespitose perennial, with a woody root; stems proper very short, usually less than 1 dm. long, striate, sparingly strigose; leaves ascending, about 1 dm. long; stipules connate, scarious, 3 mm. long; leaflets 9-17, linear, about 1 cm. long and 1 mm. wide, strigose; peduncles 1-2 dm. long, strigose; racemes 5 cm. long, in fruit 10 cm. long; bracts lanceolate, 3 mm. long; pedicels 2-3 mm. long; calyx black-hairy, the tube about 4 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous, similar to that of *T. arrectum*; pod black-strigose, the stipe scarcely equaling the calyx-tube, the body oblong, 1.5-2 cm. long, 4 mm. wide and thick, the cross-section cordate, the septum about 1 mm. wide.

TYPE LOCALITY: Egbert Spring, Douglas County, Washington.

DISTRIBUTION: Washington and Idaho.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 37 (as *A. arrectus* var., and var. *Leibergi*)

19. *Tium Michauxii* (Kuntze) Rydberg.

Astragalus glaber Michx. Fl. Bor. Am. 2: 66. 1803. Not *A. glaber* Lam. 1783.

Tragacantha Michauxii Kuntze, Rev. Gen. 941. 1891.

Astragalus apilosus Sheldon, Minn. Bot. Stud. 1: 22. 1894.

Tium apilosum Rydb.; Small, Fl. SE. U. S. 619, 1332. 1903.

A perennial, with a woody root; stem glabrous, simple, 5-10 dm. high, flexuose, sulcate; leaves 10-15 cm. long, spreading; stipules deltoid, 1 mm. long, spreading; leaflets 15-35, oblong or elliptic, firm, 5-15 mm. long, obtuse to retuse at the apex, glabrous or sparingly pilose on both sides; peduncles 5-10 cm. long; racemes lax, 4-10 cm. long; bracts lanceolate, 1-2 mm. long; pedicels 2 mm. long; flowers drooping; calyx minutely strigose, the tube 5 mm. long, 3 mm. wide; corolla white, 12-15 mm. long; banner obovate, notched, moderately arched at the middle; wings shorter, the blade obliquely oblanceolate, somewhat falcate, with a large reflexed auricle; keel-petals nearly as long, the blade lunate, obtuse; pod nearly sessile, linear-falcate, acute at each end, cross-reticulate, glabrous, 2-3 cm. long, 4-5 mm. wide and thick, coriaceous,

rounded-cordate in cross-section, the septum 1 mm. wide and thick; seeds obliquely reniform, 3 mm. long.

TYPE LOCALITY: Georgia.

DISTRIBUTION: North Carolina to Florida.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl. 65, f. 216*.

20. *Tium terminale* (S. Wats.) Rydberg.

Astragalus terminalis S. Wats. *Proc. Am. Acad.* 10: 370. 1882.

Astragalus revertoides M. E. Jones, *Proc. Calif. Acad. II.* 5: 661. 1895.

Astragalus terminalis revertoides M. E. Jones, *Rev. Astrag.* 167. 1923.

A perennial, with a woody root and caespitose caudex; stems many, 2-3 dm. high, silky-canescenscent, somewhat flexuose; leaves ascending, 5-8 cm. long; stipules deltoid, 3-4 mm. long, silvery; leaflets 13-19, elliptic or oblong, 5-10 mm. long, 2-4 mm. wide, obtuse or rounded at the apex, silvery-silky on both sides; peduncles 7-10 cm. long; racemes short and dense, 2-4 cm. long; bracts lanceolate, 1-2 mm. long; pedicels less than 1 mm. long; calyx black-hairy, the tube 4 mm. long, the teeth deltoid, 1 mm. long; corolla cream-colored, with purple-tipped keel (originally described as purple); wings shorter, the blade oblanceolate, falcate, with a large reflexed auricle; keel-petals 9-10 mm. long, the blade broadly lunate, rounded at the apex; pod glabrous, subsessile, erect, 15-19 mm. long, 4 mm. wide, and 6 mm. thick, rounded-cordate in cross-section, the septum fully 1 mm. wide.

TYPE LOCALITY: Red Rock Creek, southern Montana.

DISTRIBUTION: Southwestern Montana and northern Idaho.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl. 39, f. 126*.

21. *Tium oxytropoides* (M. E. Jones) Rydberg, sp. nov.

Astragalus conjunctus oxytropoides M. E. Jones, *Proc. Calif. Acad. II.* 5: 665. 1895.

A caespitose perennial, with a woody root; stems proper short, 1-2 dm. high, numerous, striate, sparingly strigose, erect; leaves borne close to the base, erect, 1-1.5 dm. long, the rachis strigose; stipules deltoid, reflexed, 3-4 mm. long; leaflets 13-23, linear, 1-1.5 cm. long, acute, strigose on both sides; peduncles 1.5-2 dm. long, striate or sulcate, erect; racemes 8-15 cm. long; bracts lanceolate, 2-3 mm. long; calyx loosely white-hairy, the tube 6-7 mm. long, the teeth subulate, 3 mm. long; corolla ochroleucous, nearly 2 cm. long; banner oblanceolate, moderately arched at the middle; wings about 1.5 cm. long, the blade oblanceolate, with a reflexed auricle; keel-petals still shorter, the blade broadly lunate, rounded at the apex; pod nearly erect, subsessile, straight, 1.5-2 cm. long, 3-4 mm. wide, and 5-6 mm. thick, coarsely strigose with white-hairs, the cross-section rounded-cordate, the septum 0.5 mm. wide.

TYPE LOCALITY: Near the Dalles, Oregon.

DISTRIBUTION: Type locality and vicinity.

22. *Tium Sheldoni* Rydberg, sp. nov.

A perennial, with a caespitose caudex; stems proper less than 1 dm. high, erect; leaves erect, 1-1.5 dm. long; stipules lance-deltoid, 3 mm. long; leaflets 19-25, linear or oblong, 5-10 mm. long, 2-3 mm. wide, pilose on both sides or glabrate above; peduncles 1-2 (rarely 3) dm. long, sulcate; bracts subulate, 3 mm. long; calyx sparingly pilose, with some black hairs, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous, about 12 mm. long; banner obovate, slightly arched; pod nearly sessile, slightly arcuate, 2 cm. long, 4 mm. wide, finely strigose with hairs black, sulcate on the lower suture, the partial septum nearly 1 mm. broad.

Type collected in Horse Creek Canyon, Wallowa County, Oregon, May 14, 1897, *Sheldon 8032* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Oregon.

23. *Tium conjunctum* (S. Wats.) Rydberg.

Astragalus conjunctus S. Wats. *Proc. Am. Acad.* 17: 371. 1882.

Astragalus revertus conjunctus M. E. Jones, *Contr. W. Bot.* 10: 61. 1902.

Phaca conjuncta Piper, *Contr. U. S. Nat. Herb.* 11: 373. 1906.

A perennial, with a woody caudex; stems (including the peduncles) 3-5 dm. high, glabrous or sparingly strigose; leaves 8-20 cm. long, erect; stipules deltoid, 3-5 mm. long; leaflets 15-25,

linear, 1-2 cm. long, 1-2 mm. wide, glabrous above, strigose beneath, obtuse or acute; peduncles 1-2 dm. long; racemes 2-5 cm. long; bracts subulate, 3-4 mm. long; pedicels 1-2 mm. long; calyx black-hairy, the tube 5-6 mm. long, 3 mm. wide, the teeth lanceolate or subulate, 2-3 mm. long; corolla white, 15-18 mm. long; banner obovate, retuse; wings shorter, the blade oblanceolate, somewhat falcate, with a large basal auricle; keel-petals much shorter, the blade broadly lunate, obtuse, with a large auricle; pod subsessile, the body oblong, rounded at the base, abruptly acute at the apex, cross-reticulate, glabrous, 15-22 mm. long, 4-5 mm. wide, 5-6 mm. thick, slightly sulcate on the lower suture, the septum 1-1.5 mm. wide, not extending to the apex; seeds brown, obliquely reniform, 2.5 mm. long.

TYPE LOCALITY: John Day Valley, Oregon.

DISTRIBUTION: Oregon and Washington.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 36.

24. *Tium obscurum* (S. Wats.) Rydberg.

Astragalus obscurus S. Wats. Bot. King's Expl. 69. 1871.

Tragacantha obscura Kuntze, Rev. Gen. 946. 1891.

A perennial, with a woody root and short caespitose caudex; stems decumbent or ascending, 1-3 dm. long; leaves 5-10 cm. long; stipules deltoid, 3-4 mm. long; leaflets 9-13, oblong to oval or obovate, rounded or retuse at the apex, 5-10 mm. long, 2-4 mm. wide, strigose on both sides; peduncles 5-10 cm. long; racemes 1-5 cm. long; bracts lanceolate, 2 mm. long; pedicels 1 mm. long; calyx strigose, the tube 3-3.5 mm. long, the teeth lanceolate, 1.5 mm. long; corolla white, about 8 mm. long; banner obovate, notched at the apex, rather strongly arcuate at the middle; wings shorter, the blade obliquely lanceolate, falcate, with a large auricle; keel-petals still shorter, the blade broadly lunate, strongly arched at the middle, acutish; pod subsessile, the body linear-oblong, acute at each end, strigose, 2-2.5 cm. long, 3 mm. wide and thick, sulcate on the lower suture, the septum 1.5 mm. wide, nearly meeting the upper suture.

TYPE LOCALITY: Truckee Pass, Nevada.

DISTRIBUTION: Nevada and eastern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 41, *f.* 137.

25. *Tium miserum* (Dougl.) Rydberg.

Astragalus miser Dougl.; Hook. Fl. Bor. Am. 1: 153. 1838.

A perennial, with a caespitose caudex; stems 0.5-1.5 dm. high, ascending, strigose; leaves ascending, 3-7 cm. long; stipules deltoid, 2-3 mm. long; leaflets 9-15, linear or oblong, 3-10 mm. long; 1-2 mm. wide, strigose on both sides; peduncles 6-10 cm. long, slender, strigose; racemes 2-5 cm. long; calyx strigose, partly with black hairs, the tube 3 mm. long; corolla ochroleucous, with purple-tipped keel, 8-10 mm. long; banner obovate, moderately arched; wings shorter, the blade oblong-falcate, with a large basal auricle; keel-petals as long as the wings, the blade broader; pod nearly sessile, the body linear, 1.5-2 cm. long, acute at each end, strigose, sulcate on the lower suture, the septum about 1 mm. broad.

TYPE LOCALITY: Low hills of Spokane River, Washington.

DISTRIBUTION: Washington to Idaho and Nevada.

4. *Atrata*. Pod leathery, short-stipitate or subsessile, reflexed, the body linear, straight or curved downward, subterete in cross-section. Slender plants with very small white or purple-tinted flowers, in slender racemes.

26. *Tium atratum* (S. Wats.) Rydberg.

Astragalus atratus S. Wats. Bot. King's Expl. 69. 1871.

Tragacantha atrata Kuntze, Rev. Gen. 943. 1891.

Astragalus atratus stenophyllus M. E. Jones, Zoc 3: 297. 1893.

Astragalus atratus arctus Sheldon, Minn. Bot. Stud. 1: 160. 1894.

Astragalus atratus phyllophorus M. E. Jones, Contr. W. Bot. 10: 62. 1902.

Hamosa atrata Rydb. Bull. Torrey Club 34: 48. 1907.

A perennial, with a woody root and short caudex; stems ascending, slender, 1-3 dm. high, strigose or glabrate; leaves ascending, 4-10 cm. long; stipules deltoid, 2 mm. long; leaflets 9-15, linear or oblong, 4-15 mm. long, 1-2 mm. wide, obtuse, strigose on both sides or glabrate

above; peduncles 5–15 cm. long; racemes 3–5 cm. long, rather lax; bracts lanceolate, 2 mm. long; pedicels 2–4 mm. long, recurved; calyx black-hairy, the tube 4 mm. long, 2 mm. wide, the teeth lance-subulate, 1.5–2 mm. long; corolla white, 8–10 mm. long; banner ovate, strongly arched, notched, purple-striate; wings fully as long, the blade oblong, usually 2-lobed at the apex; keel-petals shorter, the blade broadly lunate, nearly semiorbicular, more strongly arched at the middle; pod pendulous, short-stipitate, linear, 1.5–2 mm. long, 2–2.5 mm. wide and thick, strigose, slightly sulcate on the upper suture, the septum nearly meeting the upper suture.

TYPE LOCALITY: Pah-Ute Range, Nevada.

DISTRIBUTION: Nevada.

ILLUSTRATIONS: S. Wats. Bot. King's Expl. *pl. 11*; M. E. Jones, Rev. Astrag. *pl. 41, f. 138* and var. *phyllophorus*.

27. *Tium mensarum* (M. E. Jones) Rydberg, sp. nov.

Astragalus atratus mensarum M. E. Jones, Proc. Calif. Acad. II, 5: 665. 1895.

A perennial, with a woody root and short caudex; stems several, slender, erect or decumbent at the base, about 3 dm. high, tinged with purple, grayish-strigose-caescent; leaves spreading, 7–10 cm. long; stipules deltoid, 4 mm. long, acute; leaflets 11–15, elliptic or oblong or those of the uppermost leaves linear, 8–10 mm. long, 2–4 mm. wide, strigose-caescent on both sides; peduncles 5–8 cm. long; racemes 4–5 cm. long, secund; bracts lanceolate, 1–2 mm. long; pedicels 2 mm. long; calyx grayish-strigose, the tube 4 mm. long, the teeth 1–1.5 mm. long, the lower subulate, the upper lance-deltoid; corolla about 1 cm. long; the banner dark-purple, especially towards the apex, strongly arched at the middle; wings somewhat shorter, the blade oblong-falcate; keel-petals still shorter, the blade broadly lunate, obtuse; pod narrowly oblong, somewhat flattened, about 15 mm. long, 3 mm. wide, strigose-caescent, obliquely acute at the apex, attenuate at the base, the septum extending half way to the upper suture.

TYPE LOCALITY: Mill Canon Divide, Darwin Mesa, Inyo County, California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 41*.

28. *Tium atratiforme* Rydberg.

Hamosa atratiformis Rydb. Bull. Torrey Club 34: 48. 1907.

Astragalus straturensis Tidestrom, Contr. U. S. Nat. Herb. 25: 326. 1925. Not *A. straturensis* M. E. Jones. 1898.

A perennial, with a caespitose caudex; stems erect, 2–3 dm. high, slender, strigose; leaves 3–5 cm. long, ascending, the rachis strigose; stipules deltoid, strigose, 1–2 mm. long; leaflets 13–19, oblong, strigose beneath, glabrous above, 4–6 mm. long, obtuse to slightly retuse at the apex; peduncles 5–7 cm. long; racemes lax, 2–3 cm. long; bracts lanceolate, 1–1.5 mm. long; pedicels 1 mm. long; calyx black-strigose, the tube about 2 mm. long, the teeth subulate, 1 mm. long; corolla ochroleucous or white, with purple-tipped keel; banner about 7 mm. long, obovate, strongly arched at the middle, retuse at the apex; wings a little shorter, the blade oblanceolate; keel-petals much shorter, the blade broadly lunate, strongly curved above the middle, obtuse at the apex; pod subsessile, straight, minutely strigulose, about 1.5 cm. long.

TYPE LOCALITY: Southern Utah.

DISTRIBUTION: Southwestern Utah and northwestern Arizona.

29. *Tium owyheense* (Nelson & Macbr.) Rydberg.

Astragalus owyheensis Nels. & Macbr. Bot. Gaz. 55: 375. 1913.

Astragalus atratus owyheensis M. E. Jones, Rev. Astrag. 182. 1923.

A perennial, with a woody root and short caudex; stems slender, ascending or decumbent at the base, 1–3 dm. high, strigose; leaves 5–10 cm. long, ascending; stipules lanceolate, 3–4 mm. long; leaflets 9–13, narrowly linear, strigose, 5–10 mm. long, less than 1 mm. wide; peduncles 5–10 cm. long; racemes lax, 5–8 cm. long, 5–10-flowered; bracts subulate, 1–2 mm. long; pedicels 3–6 mm. long, recurved; calyx white-hairy, strigose, the tube 3 mm. long, the teeth subulate, 1 mm. long; corolla white, 8–10 mm. long; banner broadly obovate, retuse, purple-striate; wings of about the same length, the blade obliquely obovate, slightly falcate,

with a large auricle; keel-petals much shorter, the blade broadly lunate, purple-tipped; pod drooping, short-stipitate, the body 1.5–2 cm. long, less than 3 mm. wide, and about 4 mm. thick, sulcate on the lower suture, strigose, purple-blotched.

TYPE LOCALITY: Hot Hole, East Fork of Bruneau, Owyhee County, Idaho.

DISTRIBUTION: Idaho, northern Nevada, and eastern Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 41.

30. *Tium Salmonis* (M. E. Jones) Rydberg.

Astragalus Salmonis M. E. Jones, Contr. W. Bot. 8: 9. 1898.

A perennial, with a woody taproot and short caespitose caudex; stems many, 1–2.5 dm. high, ascending, strigose, 5–10 cm. long; stipules deltoid, scarious, 3–4 mm. long; leaflets 11–15, oblong to elliptic, 3–5 mm. long, obtuse, strigose beneath, glabrate above; peduncles 5–10 cm. long, erect or ascending; racemes 3–5-flowered, 1–3 cm. long; bracts ovate or lanceolate, 1–2 mm. long; pedicels 2–4 mm. long; calyx strigose, the tube 3 mm. long, 2 mm. wide, the teeth subulate, 2 mm. long; corolla purple-tinged or white, 8–10 mm. long; banner obovate, strongly arched at the middle; wings slightly shorter, the blade oblong-falcate with a reflexed auricle; keel-petals much shorter, the blade broadly lunate, obtuse; pod subsessile, pendent, the body inverted boat-shaped, purple-blotched, strigose, about 2 cm. long, 4 mm. wide, and 6 mm. thick, broadly sulcate on the lower suture, the septum very narrow.

TYPE LOCALITY: Trout Creek, Blue Mountains, Oregon.

DISTRIBUTION: Eastern Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 41, f. 136.

31. *Tium panamintense* (Sheldon) Rydb.

Astragalus panamintensis Sheldon, Contr. U. S. Nat. Herb. 4: 87. 1893.

Astragalus atratus panamintensis Jepson, Man. Fl. Pl. Calif. 575. 1925.

A perennial, much branched from a woody base; stems numerous, 5–15 cm. high, slender, ashy-strigose; leaves ascending, 5–12 cm. long, the rachis filiform; stipules deltoid, 1 mm. long; leaflets 7–11, linear or narrowly lance-linear, acute, 5–10 mm. long, 0.5–2 mm. wide, cinereous-strigose, often falcate; peduncles 4–5 cm. long, slender; bracts subulate, 1 mm. long; racemes 1–4-flowered; pedicels 1 mm. long; calyx strigose, with mixed black and white hairs, the tube 4 mm. long, 2.5 mm. broad, the teeth subulate, 3 mm. long; corolla white, tipped with purple, 12–15 mm. long; banner oval-obovate, abruptly arched; wings slightly shorter, the blades oblong with a large basal-auricle; keel-petals much shorter, the blade broad, abruptly arched near the apex, with a truncate tip; pod oblong, acutish at each end, nearly straight, about 15 mm. long, 4 mm. wide, and 3 mm. thick, strigulose, mottled, the upper suture acute, the lower sulcate except towards the apex, with a partial septum towards the base, the cross-section inverted Y-shaped.

TYPE LOCALITY: Surprise Canyon, Panamint Mountains, California.

DISTRIBUTION: Panamint Mountains, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42.

32. *Tium Egglestonii* Rydberg, sp. nov.

A caespitose perennial; stems woody at the base, usually erect, 2–3 dm. high, branched, striate, sparingly strigose; leaves ascending, 3–6 cm. long; stipules broadly deltoid, 2–3 mm. long; leaflets 15–25, oblong, 4–7 mm. long, 1–2 mm. wide, bright-green, obtuse, glabrate above, strigose beneath; peduncles 5–12 cm. long, erect, striate; racemes 5–8 cm. long; bracts ovate, 1 mm. long; calyx sparingly black-strigose, the tube 2 mm. long, the teeth 1 mm. long, subulate; corolla ochroleucous; banner broadly obovate, retuse, 7–8 mm. long, strongly arched; wings 6–7 mm. long, the blade elliptic; keel-petals 5–6 mm. long, the blade broadly lunate, strongly arched, rounded at the apex; pod about 2 cm. long, nearly 3 mm. wide and thick, membranous, reticulate, glabrous, tapering at each end, substipitate at the base, triangular-cordate in cross-section.

Type collected in Datil Forest, Socorro County, New Mexico, September 7, 1920, *Eggleston 17216* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: New Mexico and Arizona.

33. *Tium recurvum* (Greene) Rydberg.

Astragalus recurvus Greene, Bull. Calif. Acad. 1: 155. 1885.

A perennial, with a woody taproot and short, caespitose caudex; stems sparingly strigose, 2-3 dm. high, often purplish; leaves 3-6 cm. long, spreading; leaflets 17-19, linear-oblong to obovate, 4-10 mm. long, 1-4 mm. wide, obtuse to retuse at the apex, glabrous above, sparingly strigose beneath; peduncles 4-8 cm. long; bracts lanceolate, 1-2 mm. long; pedicels 1-2 mm. long, recurved; calyx strigose, the tube 2 mm. long and broad, the teeth lance-subulate, 1 mm. long; corolla 5-6 mm. long, purple-tinged; banner obovate, strongly arched at the middle; wings of about the same length, the blade obovate, slightly falcate; keel-petals shorter, the blade broadly lunate; pod lunate, about 2 cm. long, 2.5-3 mm. wide, and 2 mm. thick, purple-tinged, glabrous, the upper suture convex and acute, the lower concave and sulcate, the cross-section cordate, the septum 1 mm. wide.

TYPE LOCALITY: Mountains of northern Arizona.

DISTRIBUTION: Arizona.

ILLUSTRATION: M. E. Jones, *Astragalus* pl. 42, f. 141.

5. *Orcuttiana*. Pod rather membranous, short-stipitate, not pendulous, the body linear, compressed, falcate, curved upwards. Slender plants with small pink corollas.

34. *Tium Orcuttianum* (S. Wats.) Rydberg.

Astragalus Orcuttianus S. Wats. Proc. Am. Acad. 20: 361. 1885.

Astragalus Orcuttianus Gregorianus M. E. Jones, Contr. W. Bot. 10: 63. 1902.

A caespitose perennial, with a short woody caudex; stems several, branched, decumbent at the base, about 3 dm. long; leaves ascending, 5-12 cm. long; stipules deltoid, recurved, about 2 mm. long; leaflets 17-25, suborbicular or broadly obovate, rounded to retuse at the apex, 3-7 mm. long, thin, sparingly strigose or in age glabrate; peduncles 2-5 cm. long; bracts subulate, 1 mm. long; pedicels 2-4 mm. long; calyx glabrate, the tube 2 mm. long, oblique, the teeth 1 mm. long, deltoid; corolla about 7 mm. long, pink; banner obovate, strongly arcuate; wings much shorter, the blade oblong, falcate; keel-petals short, abruptly arched above, acute; pod oblong, equally arched, acute at each end, short-stipitate, 15-18 mm. long, 4 mm. wide, and 3 mm. thick, glabrous, widely sulcate on the lower suture, nearly 2-celled, except at the tip, the upper suture sharp.

TYPE LOCALITY: Cantillas Cañon, Lower California.

DISTRIBUTION: Lower California and southern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 65, 66; Contr. W. Bot. 10: pl. 12.

6. *Palantia*. Pod thin-leathery, sessile or nearly so, subterete in cross-section, elongate, oblong-cylindric, acute, more or less curved upwards, or straight with or without a shallow sulcus on the upper or both sutures. Plants stout, rather tall, with middle-sized, white, pink, or purplish corollas.

35. *Tium palans* (M. E. Jones) Rydberg.

Astragalus palans M. E. Jones, Zoe 4: 37. 1893.

Astragalus lentiginosus palans M. E. Jones, Rev. Astrag. 125. 1923.

A perennial, with a taproot; stem usually more than one from the base, glabrous or sparingly strigose, slightly sulcate, often tinged with purplish below, decumbent at the base; leaves ascending or spreading, about 1 dm. long; stipules deltoid, distinct, 5-7 mm. long; leaflets 15-21, oval, obovate, or elliptic, 1-1.5 cm. long, acutish at the base, rounded or retuse at the apex, glabrous on both sides; peduncles 5-8 cm. long, ascending or spreading; racemes few-flowered, 3-5 cm. long; bracts lanceolate or subulate, 3-5 mm. long; pedicels 2-3 mm. long, in fruit recurved; calyx strigose with black hairs, the tube 5 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla purple, about 2 cm. long; banner broadly obovate; wings shorter, obliquely and broadly oblanceolate; keel-petals about as long, the blade broadly lunate, with a large basal auricle; pod oblong, arcuate, subterete, acute at each end, glabrous, blotched with purple, 2-3 cm. long, 5 mm. wide.

TYPE LOCALITY: Montezuma Canon, southeastern Utah.

DISTRIBUTION: Southern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 25.

36. *Tium amplexum* (Payson) Rydberg.

Astragalus amplexus Payson, Bot. Gaz. 60: 378. 1915.
Hamosa amplexa Rydb. Fl. Rocky Mts. 496. 1917.

A perennial or biennial; stems several from the taproot, 3-4 dm. high, sparingly strigose, striate or somewhat sulcate, flexuose, more or less tinged with purple; leaves 8-12 cm. long, spreading; stipules deltoid, nearly distinct, 3-4 mm. long; leaflets 17-21, obovate or oblanceolate, rounded, truncate, or retuse at the apex, 9-12 mm. long, 4-6 mm. wide, glabrous above, sparingly strigose beneath; peduncles 4-5 cm. long; racemes 3-6 cm. long, 12-15-flowered; bracts lanceolate, 3 mm. long; pedicels in fruit reflexed; calyx strigose, more or less black, the tube 6 mm. long, 3 mm. broad, the teeth subulate, 2-3 mm. long; corolla pale-violet, 2 cm. long; banner obovate, slightly arcuate; wings nearly as long, the blade broadly oblong; keel-petals shorter, the blade broadly lunate; pod sessile, sparingly pubescent, coriaceous, 2-2.5 cm. long, 6 mm. wide, subterete, more or less arcuate, mottled with purple.

TYPE LOCALITY: Long Park, near Naturita, Colorado.
 DISTRIBUTION: Known only from the type locality.

37. *Tium Wilsoni* (Greene) Rydberg.

Astragalus Wilsoni Greene, Pittonia 3: 196. 1897.

A perennial, with a woody root; stems several, striate, glabrous, 3-5 dm. high, often purplish with small white dots; leaves 8-10 cm. long, ascending or spreading; stipules deltoid, 5-7 mm. long; leaflets 19-25, oval or obovate, acute at the base, rounded at the apex, rather firm, 10-18 mm. long, 5-8 mm. wide, glabrous or nearly so on both sides; peduncles 5-8 cm. long; racemes rather dense, 3-6 cm. long; bracts lanceolate, 3 mm. long, sparingly hairy; pedicels ascending, about 2 mm. long; calyx sparingly white-hairy, the tube 6 mm. long, the teeth subulate, 3 mm. long; corolla white, 15-16 mm. long; banner obovate, moderately arcuate; wings nearly as long, the blade oblong, falcate; keel-petals shorter, the blade broadly lunate, rounded at the apex; pod oblong, acute at each end, glabrous, 2-2.5 cm. long, 6 mm. thick, and 5 mm. wide, mottled, somewhat sulcate on the upper suture.

TYPE LOCALITY: Northern Arizona.
 DISTRIBUTION: Arizona.

38. *Tium ursinum* (A. Gray) Rydberg.

Astragalus ursinus A. Gray, Proc. Am. Acad. 13: 367. 1878.

A perennial; stems 3-4 dm. high, flexuose, slightly grooved, strigose; leaves 6-10 cm. long, spreading; stipules deltoid, 5 mm. long, distinct, herbaceous; leaflets 13-19, obovate, acute at the base, rounded to slightly retuse at the apex, 5-10 mm. long, glabrous on both sides or slightly strigose beneath, especially on the midrib; peduncles 4-6 cm. long; racemes lax, 4-6 cm. long; bracts lanceolate, 1.5-2 mm. long; calyx sparingly strigose, with black and white hairs mixed, the tube 4 mm. long, the teeth subulate, 1 mm. long; banner narrowly obovate, moderately arcuate; wings shorter, the blade oblong; keel-petals much shorter, the blade broadly lunate; pod ascending on an ascending pedicel, leathery, subterete, gradually acute, 1-1.5 cm. long, 4 mm. wide, glabrous.

TYPE LOCALITY: Bear Valley, Utah.
 DISTRIBUTION: Known only from the type locality.

39. *Tium mokiace* (A. Gray) Rydberg.

Astragalus mokiace A. Gray, Proc. Am. Acad. 13: 367. 1878.
Astragalus lentiginosus mokiace M. E. Jones, Rev. Astrag. 126. 1923.

A biennial or perennial (?); stem erect, fleshy, striate, more or less strigose, sometimes canescent when young; leaves about 1 dm. long; stipules deltoid, 4-5 mm. long, reflexed, membranous; leaflets 11-17, obovate, retuse, sparingly strigose, or in age glabrate, 1-2 dm. long; racemes rather lax, 7-16 cm. long; bracts lanceolate, 2-3 mm. long; calyx strigose with blackish hairs, the tube about 5 mm. long, the teeth subulate, 2-2.5 mm. long; corolla pink-

purple, nearly 2 cm. long; banner elongate-obovate; wings nearly as long, the blade oblong with a basal auricle; keel-petals shorter, the blade broadly lunate; pod glabrous, lance-ovoid, 2 cm. long, 7-8 mm. wide, rather firm, both sutures intruding, but the pod not quite 2-celled.

TYPE LOCALITY: Mokiatic Pass, on the border of Utah and Arizona.

DISTRIBUTION: Southwestern Utah, northeastern Arizona and southern Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 25.

49. BRACHYPHRAGMA Rydb. Am. Jour. Bot. 16: 204. 1929.

Perennial herbs, with more or less pubescent foliage. Leaves odd-pinnate, with several or many leaflets and more or less adnate stipules. Flowers in axillary racemes, with small persistent bracts. Calyx-tube campanulate, the lobes mostly equal, subulate. Corolla purple or white. Banner obovate, slightly arched, subsessile. Wings clawed, the blades lanceolate or oblong, with a basal auricle on the upper side. Keel-petals shorter, clawed, the blade broadly lunate, obtuse or rounded at the apex. Stamens diadelphous (9 and 1), the sheath almost straight, the free portion of the filaments short, upturned. Ovary sessile or short-stipitate, the style lightly curved, the stigma terminal, minute. Pod coriaceous, terete or nearly so, oblong or elliptic, lance-ovoid, splitting at the apex, with a partial septum, which does not reach the apex, nor the upper suture. Seeds several.

Type species, *Astragalus nudus* S. Wats.

Tall erect plants, with comparatively simple stems; corolla 1-1.5 cm. long.

Pod lance-ovoid, villous; flowers pink, reflexed.

Pod oblong, appressed-pubescent; flowers purple, spreading.

Pod subsessile or sessile.

Pod distinctly stipitate.

Low caespitose depressed plant, with spreading branches; pod elliptic, compressed; corolla 6 mm. long.

1. BRAUNTONIANA.

2. NUDA.

3. PACHYPODA.

4. CIRCUMDATA.

One species.

1. BRAUNTONIANA

1. *B. Brauntonii*.

2. NUDA

Leaflets linear, glabrate above.

Pod spreading, about 3 cm. long; septum nearly meeting the upper suture, stem scarcely flexuose.

Pod erect, 1-1.5 cm. long; septum not extending halfway to the center; stem strongly flexuose.

Leaflets elliptic or oval, silvery on both sides.

2. *B. Serenoi*.

3. *B. Shockleyi*.

4. *B. mohavense*.

3. PACHYPODA

One species.

5. *B. pachypus*.

4. CIRCUMDATA

One species.

6. *B. circumdatum*.

1. *Brachyphragma Brauntonii* (Parish) Rydberg.

Astragalus Brauntonii Parish, Bull. So. Calif. Acad. 2: 26. 1903.

A perennial; stem erect, 1-1.5 mm. high, densely white-woolly; leaves 1-2 dm. long, spreading; stipules scarios, yellowish, lance-subulate, long-attenuate, about 1 cm. long; leaflets 25-35, oblong or elliptic, 1-2.5 cm. long, 3-10 mm. wide, white-villous on both sides, rounded and apiculate at the apex; peduncles 2-6 cm. long; racemes at first short and dense, in age elongate, 3-12 cm. long; bracts subulate, about 1 cm. long; pedicels very short; flowers reflexed; calyx white-villous, the tube 3-4 mm. long, gibbous at the base, 3 mm. broad, the teeth subulate, 3 mm. long; corolla pink, 1 cm. long; banner broadly obovate, moderately arcuate, the margins reflexed; wings shorter, the blade broadly oblong, with a very large reflexed basal auricle; keel-petals still shorter, the blade broad, almost cuneate, rounded at the apex, with a small auricle; pod reflexed, leathery, oblong-ovoid, 1 cm. long, 3 mm. wide and as thick, white-villous, the upper suture slightly arcuate upwards, the lower deeply sulcate and strongly arcuate, the base rounded-cordate, the apex abruptly acute.

TYPE LOCALITY: Santa Monica, California.

DISTRIBUTION: Southern California.

ILLUSTRATIONS: Bull. So. Calif. Acad. 2: *pl.* 1; M. E. Jones, Rev. Astrag. *pl.* 41; *f.* 134.

2. *Brachyphragma Serenoi* (Kuntze) Rydb. Am. Jour. Bot. 16: 205. 1929.

Astragalus nudus S. Wats. Bot. King's Expl. 74. 1871. Not *A. nudus* Clos. 1846.
Tragacantha Serenoi Kuntze, Rev. Gen. 941. 1891.
Astragalus oblatulus Sheldon, Minn. Bot. Stud. 1: 19. 1894.
Astragalus Serenoi Sheldon, Minn. Bot. Stud. 1: 130. 1894.
Astragalus canonis M. E. Jones, Contr. W. Bot. 8: 15. 1898.

A perennial, growing in clumps; stems tall, 4-7 dm. high, glabrous, striate, branched below; leaves 1-1.5 dm. long, spreading; stipules 2-5 mm. long, deltoid, the upper green, reflexed, the lower ones scarious; leaflets 3-7, those of the upper leaves linear or narrowly oblong, acute at each end, 2-3 cm. long, 1-4 mm. wide, sparingly strigose but soon glabrate above, permanently silvery-strigose beneath, those of the lower leaves oval, 12-15 mm. long; peduncles 1-2 dm. long, erect; racemes often 1 dm. long, lax; bracts subulate, 2 mm. long; pedicels about 1 mm. long; calyx black-strigose, tapering at the base, the tube 7 mm. long, 3 mm. wide, the teeth subulate, 3 mm. long; corolla purple with a white base, with darker veins; banner about 20 mm. long, obovate, moderately arched, notched at the apex; wings 18 mm. long, the blade oblong-falcate, with a large reflexed auricle; keel-petals slightly shorter, the blade lunate, rounded at the apex; pods woody, oblong, about 3 cm. long, 1 cm. thick, abruptly acuminate at each end, subterete, the septum 3-4 mm. wide, disappearing in the upper one-fourth of the pod.

TYPE LOCALITY: West Humboldt Mountains, Nevada.

DISTRIBUTION: Nevada and eastern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 32, f. 110, 111; pl. 74, f. 111; Am. Jour. Bot. 16: pl. 17 S.

3. *Brachyphragma Shockleyi* (M. E. Jones) Rydberg.

Astragalus Shockleyi M. E. Jones, Proc. Calif. Acad. II. 5: 659. 1895.
Astragalus Serenoi M. E. Jones, Rev. Astrag. 150, in part. 1923.

A perennial; stem 5 dm. high or more, branched, flexuose, striate or angled, sparingly strigose; leaves spreading, 6-10 cm. long, the rachis stiff and striate; stipules broadly deltoid, about 1 mm. long; leaflets 3-7, rather deciduous, linear, 1-2 cm. long, 1-2 mm. wide, strigose, acute; peduncles strict, 1-1.5 dm. long; bracts lanceolate, 1-2 mm. long; flowers unknown; pod oblong, 12-15 mm. long, 6 mm. wide and thick, coriaceous, somewhat fleshy when young, cross-reticulate in age, abruptly contracted at each end, the sutures prominent, the cross-section round, the septum 2 mm. wide, not extending to the apex.

TYPE LOCALITY: Fish Lake Valley, Nevada.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 32; pl. 74, f. 110.

4. *Brachyphragma mohavense* (S. Wats.) Rydberg.

Astragalus mohavensis S. Wats. Proc. Am. Acad. 20: 361. 1885.

A shortlived perennial, with a taproot, beginning blooming the second season; stem branched from the base, 2-4 dm. high, striate, densely white-strigose; leaves spreading, 3-8 cm. long; stipules deltoid, 3-4 mm. long, densely hairy; leaflets 5-9, obovate, cuncate at the base, rounded or truncate at the apex, 7-15 mm. long, 5-10 mm. wide, densely white-strigose, silvery; peduncles 4-7 cm. long; racemes 3-4 cm. long; bracts lanceolate, 2 mm. long; calyx strigose, the tube 3-4 mm. long, the teeth subulate, 3 mm. long; corolla purplish, 8-10 mm. long; banner rather moderately arcuate, obovate; wings shorter, the blade oblanceolate or oblong, nearly straight; keel-petals nearly as long, the blade broadly lunate, deeply purple-tipped; pod oblong, slightly falcate, abruptly acute at each end, 2 cm. long, 3 mm. thick and 5 mm. wide, cross-reticulate, strigose, the upper suture acute, the lower somewhat flat, or, sulcate the cross-section obovate.

TYPE LOCALITY: Newberry Spring, Mohave Valley, California.

DISTRIBUTION: Mohave Desert, California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 28 (illustration of the pod poor); pl. 72 (better).

5. *Brachyphragma pachypus* (Greene) Rydberg.

Astragalus pachypus Greene, Bull. Calif. Acad. 1: 157. 1885.

A perennial; stem stout, 5-12 dm. high, cinerous-strigulose, flexuose, terete; leaves spreading, 8-12 cm. long; stipules broadly deltoid, 3 mm. long; leaflets 13-17, linear, 1-2 cm. long, 2-3 mm. wide, canescent-strigose on both sides, obtuse; peduncles 1-2 dm. long, strict; racemes 3-10 cm. long, in fruit lax; bracts lanceolate, 3 mm. long; calyx strigose with mixed white and black hairs, the tube 4 mm. long and about as broad, the teeth subulate, 3 mm. long; corolla white or cream-colored, about 15 mm. long; banner broadly obovate, notched, strongly arcuate; wings about 12 mm. long, the blade obliquely oblanceolate, with a large basal auricle; keel-petals fully 1 cm. long, the blade broadly lunate, strongly arcuate, obtuse; pod stipitate, the stipe stout, about 7 mm. long, the body about 2 cm. long, 5 mm. wide and about as thick, falcate, at first fleshy, in age coriaceous, nearly 2-celled, the septum almost reaching the upper suture.

TYPE LOCALITY: Mountains, Kern County, California.

DISTRIBUTION: California, from Kern County south.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 32; Jepson, Man. Fl. Pl. Calif. f. 559.

6. *Brachyphragma circumdatum* (Greene) Rydberg.

Astragalus circumdatus Greene, Pittonia 1: 173. 1888.

A low caespitose perennial; stems numerous, diffuse, about 1 dm. long, with short internodes, glabrous or sparingly strigose; leaves 1-3 cm. long, spreading; stipules broadly deltoid, connate, 2 mm. long; leaflets 13-25, fleshy, crowded, obovate or oblong, strigose, especially along the margin beneath, glabrate above, 3-6 mm. long; peduncles 0.5-1.5 cm. long; racemes short and dense, about 1 cm. long; bracts deltoid, 1 mm. long; calyx white-strigose, the tube 2-2.5 mm. long, the teeth subulate, 2 mm. long; corolla white, about 8 mm. long; banner broadly obovate, rather strongly arcuate; wings somewhat shorter, the blade oblong-falcate; keel-petals about as long, the blade rather narrowly falcate, obtuse at the apex; pod somewhat fleshy, about 14 mm. long, 6 mm. wide, abruptly acute, the upper suture nearly straight.

TYPE LOCALITY: Hanson's Ranch, San Rafael Mountains, Lower California.

DISTRIBUTION: Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 28, f. 92.

50. *JONESIELLA* Rydb. Bull. Torrey Club
32: 661. 1906.

Phacopsis Rydb. Bull. Torrey Club 32: 661. 1906. Not *Phacopsis* Tul. 1853.
Rydbergiella Fedde & Sydow, Bot. Jahresb. 33: 534. 1906.

Stout erect perennials, with a woody base. Leaves odd-pinnate, usually with many leaflets (in the type unifoliolate) and broad free stipules. Flowers in long-peduncled axillary racemes, nearly sessile. Calyx-tube campanulate, with rather long calyx-teeth. Corolla ochroleucous or with purple-tipped keel. Banner obovate, clawless, moderately arcuate. Wings with an oblanceolate blade and a large basal auricle. Keel-petals with a short claw and a lunate blade. Stamens diadelphous (9 and 1), the sheath straight. Ovary many-ovuled, the style glabrous, curved upwards, the stigma minute. Pod leathery, inflated, sessile, terete in cross-section, the lower suture with a narrow partial septum.

Type species, *Astragalus asclepiadoides* M. E. Jones.

Leaflets several or many.

Plant low; leaves canescent with broad flat hairs.

1. *J. sabulosa*.

Plant tall; leaves glabrous or merely strigose beneath.

Pod oblong or lance-oblong in outline, less than 1 cm. in diameter.

Leaflets strigose beneath; pod abruptly contracted at the base, gradually acute at the apex, short-stipitate; calyx-lobes spreading in age; pod erect.

2. *J. Pattersoni*.

Leaflets glabrous or nearly so beneath; pod equally tapering at each end; calyx-lobes erect; pod spreading.

Stipe equaling or surpassing the calyx-tube, the body straight.

3. *J. arcta*.

Stipe of the pod shorter than the calyx-tube, the body somewhat arcuate.

4. *J. Ellisiae*.

Pod broadly ellipsoid, 1 cm. or more in diameter.

Calyx-lobes lance-subulate or subulate, 3 mm. long or more.

Calyx with scattered black short hairs; pod puberulent when young.

Calyx with white hairs; pod glabrous.

Pod ellipsoid, 2.5–3 cm. long.

Pod rounded ellipsoid, about 2 cm. long.

Calyx-lobes deltoid, 2 mm. long or less.

Leaflets single.

5. *J. recedens*.

6. *J. Mearnsii*.

7. *J. Rothrockii*.

8. *J. praelonga*.

9. *J. asclepiadoides*.

1. *Jonesiella sabulosa* (M. E. Jones) Rydberg.

Astragalus sabulosus M. E. Jones, *Zoe* 2: 239. 1891.

A caespitose perennial, with a woody rootstock; stems several, 1–3 dm. long, ascending or decumbent, stout, puberulent or strigose; leaves 5–10 cm. long, the rachis densely strigose; stipules deltoid, green, 5–10 mm. long, recurved; leaflets 3–9, elliptic or oblanceolate, or the terminal one rhombic, 1–3 cm. long, acute at each end, ashy-strigose with flat lanceolate hairs; peduncles 2–5 cm. long; racemes 4–8-flowered; bracts lanceolate, 3–4 mm. long; pedicels 2–3 mm. long; calyx black-strigose, the tube oblique, about 1 cm. long, the teeth deltoid, about 2 mm. long; corolla white, nearly 2 cm. long; banner elliptic-obovate, abruptly arched; wings much shorter; keel-petals a little shorter, nearly straight, with a triangular obtuse purple tip; pod oblong, short-stipitate, 3–3.5 cm. long, fully 1 cm. wide, cross-reticulate, ashy-strigose, scarcely sulcate, the dorsal suture with a very narrow hyaline partial septum.

TYPE LOCALITY: Cisco, Utah.

DISTRIBUTION: Eastern Utah.

ILLUSTRATIONS: M. E. Jones, *Rev. Astrag. pl.* 36, f. 118; pl. 75.

2. *Jonesiella Pattersoni* (A. Gray) Rydberg.

Astragalus Pattersoni Brand.; A. Gray, *Bull. U. S. Geol. Surv. Terr.* 2: 235. 1876.

Tragacantha Pattersoni Kuntze, *Rev. Gen.* 947. 1891.

Phacopsis Pattersoni Rydb. *Bull. Torrey Club* 32: 661. 1906.

Rydbergiella Pattersoni Fedde & Sydow, *Bot. Jahresb.* 33¹: 534. 1906.

A perennial, with a woody root; stems several, striate, often streaked with purple, strigulose when young, in age glabrate; leaves 8–12 cm. long, the rachis strigulose when young; stipules deltoid, spreading, 4 mm. long; leaflets 13–19, oblong or elliptic, rounded at the tip, cuneate at the base, 1–2.5 cm. long, 3–7 mm. wide, glabrous above, strigose beneath, at least when young; peduncles 5–10 cm. long, erect; racemes 4–8 cm. long, rather lax, 8–15-flowered; bracts subulate, 5–7 mm. long; calyx finely strigose, the tube 8 mm. long and 4 mm. broad, the teeth subulate, 3 mm. long, in age spreading or recurved; corolla white, 15–18 mm. long; banner obovate, moderately arcuate; wings shorter, the blade oblanceolate, with a large auricle, about equaling the claw; keel-petals shorter, the blade broadly lunate, shorter than the claw; pod obliquely lance-ellipsoid, 2–2.5 cm. long, tapering gradually at the apex, more abruptly at the base, cross-reticulate, with strong sutures, the upper nearly straight, the septum a mere vestige.

TYPE LOCALITY: Gore Mountains, Middle Park, Colorado.

DISTRIBUTION: Colorado.

ILLUSTRATION: M. E. Jones, *Rev. Astrag. pl.* 35, f. 117.

3. *Jonesiella arcta* (Sheldon) Rydberg.

Astragalus Preussii latus M. E. Jones, *Zoe* 4: 36. 1893.

Astragalus Preussii arctus Sheldon, *Minn. Bot. Stud.* 1: 130. 1894.

Rydbergiella arcta Rydb. *Fl. Rocky Mts.* 501, 1063. 1917.

A perennial, with a woody root; stems several, 3–5 dm. high, branched, striate or sulcate, glabrous; leaves ascending, 5–15 cm. long, the rachis glabrous; stipules deltoid, 4 mm. long; leaflets 15–25, elliptic, oblong, or oblanceolate, 8–20 mm. long, 3–5 mm. wide, glabrous; peduncles 8–15 cm. long, erect; racemes 2–4 cm. long; bracts lanceolate, 2–3 mm. long; pedicels 2–4 mm. long; calyx sparingly strigose, the tube 5 mm. long, the teeth subulate, 2–3 mm. long; corolla white, similar to that of *J. Pattersoni*; pod distinctly stipitate, the stipe 5–6

mm. long, exceeding the calyx-tube, the body oblong-ellipsoid, acute at each end, 1.5-2 cm. long, 6 mm. wide, cross-reticulate, glabrous, the septum about 2 mm. wide.

TYPE LOCALITY: Green River, Utah.

DISTRIBUTION: Western Colorado, southeastern Utah, and northeastern Arizona.

4. *Jonesiella Ellisiae* Rydberg, sp. nov.

A perennial; stem 3-5 dm. high, sulcate, more or less flexuose; leaves about 1 dm. long, the rachis glabrous; stipules deltoid, 3-5 cm. long, reflexed; leaflets 15-19, oblong or oblanceolate, about 1 cm. long, glabrous; peduncles about 1 dm. high, sulcate; racemes about 3 cm. long; bracts lanceolate, 2 mm. long; pedicels 2 mm. long; calyx nearly glabrous, the tube 5 mm. long, the teeth subulate, 3 mm. long; corolla apparently white, with a purple-tipped keel; banner obovate, slightly arcuate, about 18 mm. long; wings somewhat shorter, the blade oblanceolate, with a large basal auricle; keel-petals about 15 mm. long, the blade broadly lunate, with a dark-purple tip; pod somewhat arcuate, about 3 cm. long, 6 mm. wide and 8 mm. thick, tapering at each end, almost sessile, glabrous, the septum 1.5 mm. broad, at least the lower suture sulcate.

Type collected in the Sandia Mountains, New Mexico, April 30, 1914, *Charlotte C. Ellis 421* (U. S. Nat. Herb.).

DISTRIBUTION: Known only from the type locality.

5. *Jonesiella recedens* (Greene) Rydberg, sp. nov.

Rydbergiella praelonga Rydb. Fl. Rocky Mts. 501, in part. 1917.

Astragalus recedens Greene, Mss.

A perennial, with a woody root; stems several, sometimes purple-tinged, striate, glabrous, 3-5 dm. high; leaves ascending, 7-12 cm. long, the rachis glabrous; stipules deltoid, 4 mm. long, reflexed; leaflets 15-19, broadly oval or obovate, more or less retuse at the apex or those of the upper leaves elliptic and rounded at the apex, 1-3 cm. long, 5-12 mm. wide, glabrous or nearly so; peduncles 10-15 cm. long, striate; racemes dense, 2-6 cm. long; bracts lanceolate, 2-3 mm. long; pedicels 2 mm. long; flowers many, drooping; calyx usually with scattered short black hairs, rarely glabrate, the tube 5 mm. long, the teeth subulate, 3 mm. long; corolla ochroleucous or white, about 2 cm. long, the keel purple-tipped; banner obovate, moderately arcuate; wings slightly shorter, the blade oblanceolate, longer than the claw, with a rather large auricle; keel-petals shorter, the blade broader, semi-orbicular; pod ellipsoid, acute at each end, cross-reticulate, puberulent when young, 2.5-3 cm. long, 8 mm. wide, 12 mm. thick, slightly sulcate on both sutures, the partial septum fully 2 mm. broad.

Type collected at Arboles, Colorado, June 1899, *Baker 432* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Colorado, New Mexico, and Utah.

6. *Jonesiella Mearnsii* Rydberg, sp. nov.

A perennial; stem stout, 5 dm. high or more, erect, more or less sulcate, glabrous; leaves spreading, 7-15 cm. long, the rachis glabrous; stipules broadly deltoid, 5-10 mm. long, thin; leaflets 15-19, oval or elliptic, often retuse at the apex, glabrous, rather thick, 1-2 cm. long, 5-12 mm. wide; peduncles 7-15 cm. long, erect; racemes 4-7 cm. long, many-flowered; bracts lanceolate to deltoid, 5-7 mm. long, acuminate; pedicels 2 mm. long; flowers drooping; calyx sparingly pilose, the tube 5 mm. long, the teeth subulate, 3 mm. long; corolla white, the keel barely tipped with purple; banner about 18 mm. long, obovate; wings shorter, the blade oblanceolate, longer than the claw, with a large reflexed auricle; keel-petals still shorter, the blade semi-orbicular, with a very large basal auricle; pod (not mature) ellipsoid, nearly 3 cm. long and fully 1 cm. wide, glabrous.

Type collected at Fort Verde, Arizona, in May 1887, *Edgar A. Mearns 163* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Arizona, Utah, and New Mexico.

7. *Jonesiella Rothrockii* (Sheldon) Rydberg.

Astragalus Rothrockii Sheldon, Minn. Bot. Stud. 1: 174. 1894.

A perennial; stem 5 dm. high or more, striate, glabrous or nearly so, sometimes tinged with brown; leaves ascending, 1–1.5 dm. long, the rachis glabrous; stipules broadly deltoid, about 4 mm. long, reflexed; leaflets 13–21, oval to oblong, 1–2.5 cm. long, 5–8 mm. wide, glabrous, rather thick; peduncles about 1 dm. long, strict, striate or sulcate; racemes dense, many-flowered, 2–4 cm. long; bracts lanceolate, 3 mm. long; pedicels 2 mm. long; flowers drooping; calyx sparingly white-pilose, the tube 5 mm. long, 3 mm. broad, the teeth lance-subulate, 3 mm. long; corolla ochroleucous; banner obovate, moderately arched, 18–20 mm. long; wings somewhat shorter, the blade oblanceolate, with a rather large auricle; keel-petals much shorter, the blade broadly lunate, almost semicircular, rounded and slightly purple-tipped at the apex; pod rounded-ovoid, about 2 cm. long, 1 cm. wide, 1.5 cm. thick, cross-reticulate, puberulent when young, the partial septum about 2 mm. broad; seeds brown, obliquely reniform, 3.5 mm. long.

TYPE LOCALITY: New Mexico.

DISTRIBUTION: New Mexico and Arizona.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 35 (as *A. Pattersoni* var.).

8. *Jonesiella praelonga* (Sheldon) Rydberg.

Astragalus procerus A. Gray Proc. Am. Acad. 13: 369. 1878. Not *A. procerus* Boiss. & Haussk. 1872.

Astragalus praelongus Sheldon, Minn. Bot. Stud. 1: 23. 1894.

Astragalus Pattersoni procerus M. E. Jones, Proc. Calif. Acad. II. 5: 636. 1895.

Astragalus Pattersoni praelongus M. E. Jones, Contr. W. Bot. 10: 65. 1902.

Phacopsis praelonga Rydb. Bull. Torrey Club 32: 661. 1906.

Rydbergiella praelonga Fedde & Sydow, Bot. Jahresb. 33: 534. 1906.

A perennial; stems 5–10 dm. high, striate, glabrous; leaves 1–15 cm. long, the rachis glabrous; stipules broadly deltoid, 4–5 mm. long; leaflets 13–17, oval or obovate, 1–3 cm. long, 5–18 mm. wide, glabrous on both sides, rounded to cuneate at the base, rounded or retuse at the apex; peduncles about 1 dm. long; racemes rather dense, 5–8 cm. long; bracts lanceolate, 2–3 mm. long, about equaling the pedicels; calyx puberulent with fine white hairs, the tube about 6 mm. long and 3 mm. broad, the teeth deltoid or lance-deltoid, 1.2–2 mm. long; corolla ochroleucous, 18–20 mm. long; banner obovate, moderately arcuate; wings slightly shorter, the blade oblanceolate, falcate, longer than the claw, with a large basal auricle; keel-petals shorter and broader, the blade lunate, almost semiorbicular, rounded at the apex; pod according to original description about 2.5 cm. long, short-stipitate, oval in outline, obtuse, glabrous; mature pod not seen.

TYPE LOCALITY: Near St. Thomas, Nevada, at the confluence of Muddy River with the Virgin.

DISTRIBUTION: Southern Nevada and southwestern Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 57.

9. *Jonesiella asclepiadoides* (M. E. Jones) Rydb. Bull. Torrey Club 32: 661. 1906.

Astragalus asclepiadoides M. E. Jones, Zoe 2: 238. 1891.

A perennial, with a woody root; stems several, 3–5 dm. high, striate or sulcate, glabrous, stout; leaves unifoliate, almost sessile; stipules large, deltoid, membranous, 5–8 mm. long; leaflet suborbicular, cordate at the base, 2–4 cm. long and as wide, 5–9-ribbed, thin, glabrous; peduncles 2–5 cm. long, sulcate; bracts lanceolate; flowers 5–10, ascending; calyx sparingly black-hairy or glabrate, the tube cylindric, 10–12 mm. long, the teeth subulate, 3 mm. long; corolla white, about 2 cm. long; banner narrowly obovate, moderately arched; wings shorter, the blade lunate, acutish, with a long reflexed auricle; keel-petals still shorter, the blade broadly lunate, rounded at the apex, with a smaller auricle; pod long-stipitate, the stipe 1.5–2 cm. long, erect, the body broadly lance-ellipsoid, 3–4 cm. long, more than 1 cm. wide and fully 1.5 cm. thick, more gradually tapering at the upper end than at the lower end, slightly sulcate on both sutures, the septum about 1 mm. wide.

TYPE LOCALITY: Price River, eastern Utah.

DISTRIBUTION: Utah.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 34, f. 116; pl. 75; Am. Jour. Bot. 16: pl. 17 Q.

51. **CYSTIUM** Steven, Bull. Soc. Nat. Mosc. 29²: 147. 1856.

Glaux Medic. Vorl. Churph. Phys. Ges. 2: 374. 1787. Not *Glaux* L. 1753.

Leafy-stemmed annual or perennial herbs. Leaves odd-pinnate, with broad leaflets and nearly free stipules. Flowers usually in long-peduncled axillary racemes. Calyx-tube campanulate, the teeth subulate. Corollas white or purplish, middle-sized. Banner obovate, subsessile, often retuse, slightly arcuate. Wings clawed, the blade oblanceolate, with a large basal auricle. Keel-petals clawed, the blade broadly lunate, with a small auricle. Stamens diadelphous (9 and 1), the sheath nearly straight, broad at the base, the free portion of the stamens curved upward. Ovary sessile or nearly so, many-ovuled, straight, the style curved upwards above the middle, glabrous, the stigma minute. Pod sessile or subsessile, papery or parchment-like, much inflated, from orbicular to ovoid, the tip usually upcurved, perfectly 2-celled, the septum from the lower suture reaching the upper. Seeds obliquely round-reniform.

Type species, *Astragalus Cicer* L.

Stem and usually the leaves more or less canescent.

Cespitose perennials with a branched caudex, the stems less than 1 dm. high;

racemes short, few flowered; banner only slightly longer than the wings.

Annuals, or if perennials the stem erect, more than 3 dm. high and mostly

simple below [in *C. nigricalyce* distinctly cespitose]; racemes elongate;

banner decidedly longer than the wings.

Stem and leaves glabrous or sparingly strigose; cespitose perennials; racemes

short and dense.

Corolla white.

Corolla purplish.

1. **PLATYTROPIA**

Pod strigose; banner only slightly longer than the wings.

Pod glabrous; banner decidedly longer than the wings.

2. **COULTERIANA**

Pod glabrous.

Corolla purple; calyx-teeth not more than half as long as the tube.

Calyx-teeth about one fourth as long as the tube; corolla about 1 cm.

long; pubescence of long straight appressed hairs; pod 2 cm. long

or less, short-acuminate.

Calyx-teeth nearly half as long as the tube; corolla about 1.5 cm.

long; pubescence of short curved hairs; pod 2-3 cm. long, long-acu-

minate.

Corolla white.

Calyx-teeth half as long as the tube.

Calyx-teeth nearly as long as the tube.

Pod more or less strigose.

Calyx densely black-hairy.

Corolla ochroleucous; calyx villous.

Corolla purple; calyx strigose.

Calyx white-hairy, rarely with a few black hairs.

Pod densely white-silky, rather firm; whole plant usually white-

silky; corolla blue-purple, rarely white.

Pod broadly ovoid; corolla 15 mm. long.

Pod lanceolate in outline, strongly falcate; corolla 10-12 mm.

long.

Pod with short, mostly curved hairs, membranous; corolla about

12 mm. long.

Leaflets pubescent on both sides.

Pubescence of straight appressed hairs; corolla purplish.

Calyx-teeth about half as long as the tube; stem mostly

simple.

Calyx-teeth about one fourth as long as the tube; stem

branched below.

Pubescence of more or less spreading curled short hairs;

corolla white.

Leaflets glabrous above; corolla white.

3. **LENTIGINOSA**

Pod glabrous.

Pod leathery, arcuate, 2.5-3 cm. long; corolla 1-1.5 cm. long.

Leaflets glabrous on both sides; calyx-teeth more than half as long

as the tube; pod not mottled.

Calyx-tube 7-8 mm. long, 3-4 mm. wide; corolla about 1.5 cm.

long; pod obliquely ovoid, slightly arcuate.

Calyx-tube 4-5 mm. long, 3 mm. wide or less; corolla 10-12 mm.

long.

1. **PLATYTROPIA.**2. **COULTERIANA.**3. **LENTIGINOSA.**4. **DIPHYSA.**1. *C. platytrope.*19. *C. griseolum.*2. *C. Fremontii.*2. *C. Kennedyi.*3. *C. Kennedyi.*4. *C. yuccanum.*5. *C. macrolobium.*6. *C. nigricalyce.*29. *C. tehatchapiense.*7. *C. Coultteri.*8. *C. agninum.*9. *C. Arthu-Schottii.*10. *C. eremicum.*11. *C. vulpinum.*12. *C. stramineum.*13. *C. Merrillii.*

- Pod lanceolate-ovoid, strongly arcuate; calyx sparingly black-hairy.
- Pod ovoid, only the tip upturned; calyx white-hairy.
- Leaflets pubescent on the lower side; calyx-teeth less than one third as long as the tube; pod mottled, lanceolate-ovoid, strongly arcuate.
- Pod papery, less than 2.5 cm. long, rarely more than 2 cm. long; corolla less than 1 cm. long.
- Leaves glabrous or nearly so; corolla pure-white.
- Pod mottled, round-ellipsoid, merely mucronate.
- Pod not mottled, with a distinct beak.
- Pod short-acuminate, with a laterally flattened upturned apex; raceme rather lax on peduncles longer than the internodes of the stem.
- Pod long-acuminate, the apex scarcely flattened.
- Racemes very dense, on stout peduncles, usually shorter than the internodes.
- Racemes and peduncles elongate, the latter longer than the internodes.
- Leaves canescent with loose kinky hairs; corolla tinged with pink; plant 1-2 dm. high.
- Pod pubescent.
- Pod 1.5-3 dm. long, acute or acuminate.
- Leaflets glabrous or with a few scattered hairs on the margins and ribs beneath.
- Pod about 3 cm. long, leathery; corolla about 15 mm. long; calyx with scattered black hairs.
- Pod about 2 cm. long; corolla about 10 mm. long.
- Pod strongly incurved-arcuate, comparatively firm; calyx often more or less black-hairy.
- Pod ovoid, not strongly arcuate, papery; calyx white-hairy.
- Pod straw-colored, unspotted; calyx-teeth lance-subulate; leaflets oblong or oblanceolate.
- Pod mottled; calyx-teeth deltoid; leaflets obovate.
- Leaflets pubescent on both sides.
- Pubescence spreading.
- Pubescence appressed.
- Pod 6-7 mm. long, subglobose, sulcate on both sutures, round-ellipsoid to lance-ovoid, more than 1.5 cm. long.
4. DIPHYSA
- Pod round-ellipsoid to lance-ovoid, more than 1.5 cm. long.
- Stem prostrate; leaflets oblong; pod pubescent, mottled.
- Stem elongate, about 15 dm. long; calyx-lobes at least half as long as the tube.
- Stem 2-3 dm. long; calyx-lobes less than one fourth as long as the calyx-tube.
- Stem erect or ascending; leaflets obovate.
- Pod ovoid with a distinct beak.
- Pod pubescent; calyx black-hairy, the teeth deltoid, less than one fourth as long as the tube.
- Pod usually glabrous; calyx white-hairy.
- Pod not mottled; calyx-teeth about one third as long as the tube; plant 3-4 dm. high.
- Pod mottled; calyx-teeth less than one fourth as long as the tube; plant less than 2 dm. high.
- Pod rounded-ellipsoid, spotted, mucronate; stem 1-2 dm. high; calyx with scattered black hairs, the teeth subulate, half as long as the tube.
- Pod subglobose, about 1 cm. long, deeply sulcate on both sutures, glabrous.
14. *C. platyphyllidium*.
30. *C. diphysum*
(*v. albiflorum*).
15. *C. araneosum*.
32. *C. latum*.
16. *C. salinum*.
17. *C. floribundum*.
18. *C. scorpionis*.
19. *C. griseolum*.
20. *C. cornutum*.
21. *C. lentiginosum*.
22. *C. ormsbyense*.
23. *C. Sierrae*.
24. *C. ineptum*.
25. *C. albifolium*.
26. *C. kernense*.
27. *C. sesquimetreale*.
28. *C. idriense*.
29. *C. tehatchapiense*.
30. *C. diphysum*.
31. *C. pardalotum*.
32. *C. latum*.
33. *C. MacDougalii*.

1. *Cystium platytrope* (A. Gray) Rydb. Bull. Torrey Club

40: 50. 1913.

Astragalus platytropis A. Gray, Proc. Am. Acad. 6: 526. 1865.
Tragacantha platytropis Kuntze, Rev. Gen. 947. 1891.
Phaca platytropis Rydb. Mem. N. Y. Bot. Gard. 1: 246. 1900.

A caespitose perennial, with a branched woody rootstock; stems very short, less than 1 dm. high, decumbent, leafy; leaves 2-8 cm. long, spreading; stipules ovate, acuminate, membranous; leaflets 7-13, obovate or oval, acute to retuse, silvery-silky; peduncles scapiform, 3-8 cm. long; flowers in headlike racemes, few; calyx silky, the tube campanulate, about 2 mm. long, the teeth subulate, nearly as long; corolla dirty-white, with purple-tipped keel, 7-8 mm. long; banner rounded-obovate, emarginate, only slightly longer than the wings and keel; wings

falcate, the blade obliquely oblanceolate, obtuse; blades of the keel-petals broadly lunate, rounded and purple at the apex; pod broadly ovoid, pubescent, usually somewhat mottled, 2-2.5 cm. long, 12-15 mm. thick, acuminate.

TYPE LOCALITY: Mountains near Sonora Pass, California.

DISTRIBUTION: Ridges at an altitude of 1500-2000 m., from southwestern Montana and Idaho to southern Nevada and eastern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 42, f. 145.

2. *Cystium Fremontii* (A. Gray) Rydberg.

Astragalus Fremontii A. Gray, in Torr. Pacif. R. R. Rep. 4: 80. 1857.

Astragalus lentiginosus Fremontii S. Wats. Bot. King's Expl. 66. 1871.

Astragalus Coulteri Fremontii M. E. Jones, Proc. Calif. Acad. II. 5: 669. 1895.

An annual, or a perennial according to the original description; stem 3-5 dm. high, finely strigose, thick; leaves 3-7 cm. long, ascending; stipules deltoid, 3-4 mm. long, deciduous; leaflets 9-13, obovate or oval, retuse, silky-strigose with rather long hairs, 10-15 mm. long, 6-8 mm. wide; peduncles erect, 5-7 cm. long; racemes about 5 cm. long, lax; bracts lance-subulate, 1-2 mm. long; pedicels very short; calyx dark-hairy, the tube 3 mm. long, the teeth deltoid, less than 1 mm. long; corolla about 1 cm. long, purple; banner obovate, bent at an angle of 60° or more; wings slightly shorter, the blades oblong, slightly curved, with a large rounded basal auricle; keel-petals shorter, the blade obovate-lunate, rounded at the apex; pod rounded-ovoid, about 2 cm. long and 1.5 cm. thick, glabrous, papery, many-seeded.

TYPE LOCALITY: Banks of Rio Virgin, Arizona or southern Utah.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 25.

3. *Cystium Kennedyi* Rydberg, sp. nov.

A perennial, with a taproot; stems 3-5 dm. high, decumbent at the base, canescent with short kinky hairs; leaves ascending, 8-12 cm. long; stipules triangular-deltoid, spreading, deciduous; leaflets 11-21, elliptic to obovate, 1-2 cm. long, 5-10 mm. wide, obtuse to retuse, short-pubescent on both sides with kinky hairs; peduncles 5-10 cm. long, erect; racemes elongate, lax, 5-15 cm. long; pedicels short; bracts subulate, 3-4 mm. long; calyx dark-hairy, the tube 5 mm. long, the teeth subulate, 2-3 mm. long; corolla purple, about 15 mm. long; banner elongate-obovate, bent at an angle of about 45°; wings slightly arcuate, shorter, the blade oblong, with a large basal auricle; keel-petals more arcuate and rounded at the apex; pod papery, glabrous, ovoid, long-acuminate, 2.5-3 cm. long, 1.5 cm. thick.

Type collected in the Carson Sink Region, October, 1907, *Kennedy 1691* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Nevada.

4. *Cystium yuccanum* (M. E. Jones) Rydberg, sp. nov.

Astragalus lentiginosus yuccanus M. E. Jones, Contr. W. Bot. 8: 3. 1898.

Probably a winter annual; stem 6-10 dm. high, rather sparingly strigose or glabrate below; leaves 1-1.5 dm. long; stipules deltoid, about 5 mm. long; leaflets 13-25, short-petioled, oval or obovate, 1-2 cm. long, 8-12 mm. wide, obtuse to retuse at the apex, sparingly strigose beneath, at least on the midrib, or glabrate in age, glabrous above; peduncles about 1 dm. long, strict; racemes lax, of about the same length; bracts lanceolate; pedicels about 2 mm. long; calyx sparingly pubescent, the tube 4 mm. long, the teeth subulate, slightly more than 1 mm. long; corolla white, 12-13 mm. long; banner obovate; blade of the wings obliquely oblong-oblanceolate, with a rounded auricle; keel-petals broader, with a rounded apex; pod glabrous, ovoid, 2-2.5 cm. long, 15 mm. thick, papery, short-acuminate, slightly upturned at the apex.

TYPE LOCALITY: Yucca, Arizona.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 26.

5. *Cystium macrolobum* Rydberg, sp. nov.

Astragalus diphyssus S. Wats. Bot. King's Espl. 65, in part. 1871.

Probably a winter annual; stem about 3 dm. high, strigose-canescens; leaves about 1 dm. long or less; stipules deltoid, 3-4 mm. long; leaflets 11-15, obovate or orbiculate, about 1 cm. long, 6-8 mm. wide, usually retuse, canescens on both sides with kinky short hairs; peduncles 4-6 cm. long, ascending; racemes rather lax, about 5 cm. long; bracts subulate, 2-3 mm. long; calyx pubescent, with mixed white and black hairs, the tube 3-4 mm. long, the teeth subulate, 3 mm. long; corolla white, 11-12 mm. long; banner rather narrowly obovate; wings shorter, the blades oblong, with a large basal auricle; keel-petals broader, obliquely obovate, obtuse; pod glabrous, ovoid, about 2.5 cm. long, nearly 1.5 cm. thick, long-acuminate, papery, not mottled.

Type collected at West Humboldt Mountains, Nevada, June, 1868, *Watson 254*, in part (Torrey Herbarium).

DISTRIBUTION: Nevada.

6. *Cystium nigricalyce* (M. E. Jones) Rydberg, sp. nov.

Astragalus lentiginosus nigricalycis M. E. Jones, Proc. Calif. Acad. 5: 674. 1895.

A perennial, branched at the base; stems 3-4 dm. high, often flexuose, white-woolly with short hairs; leaves 8-10 dm. long, spreading; stipules deltoid, about 4 mm. long; leaflets 11-19, obovate, 7-15 mm. long, 4-8 mm. broad, rounded, truncate, or emarginate at the apex, short-villous on both sides, rather firm; peduncles 6-8 mm. long; racemes 5-7 cm. long, rather dense; bracts lanceolate, 3 mm. long; calyx black-hairy, the tube fully 4 mm. long, the teeth lanceolate, nearly 2 mm. long; corolla white, about 12 mm. long; banner elongate-obovate; wings shorter, slightly arcuate, the blade oblong, with a large auricle; keel-petals broader, with a rounded apex; pod rather firm, densely short-villous, ovoid, long-acuminate, about 2.5 cm. long, 1 cm. thick, somewhat mottled.

TYPE LOCALITY: Bakersfield, Kern County, California.

DISTRIBUTION: Santa Barbara and Kern counties, California. ♀

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 23; pl. 24.

7. *Cystium Coulteri* (Benth.) Rydb. Bull. Torrey Club

40: 50. 1913.

Astragalus Coulteri Benth. Pl. Hartw. 307. 1848.

Tragacantha Coulteri Kuntze, Rev. Gen. 944. 1891.

Astragalus lentiginosus Coulteri M. E. Jones, Contr. W. Bot. 8: 4. 1898.

A biennial or perennial, with a taproot; stem 3-5 dm. high, somewhat flexuose, densely white-silky; leaves 7-15 cm. long, spreading; stipules lance-deltoid, 5 mm. long, silky; leaflets 11-21, obovate, 1-2 cm. long, 5-10 mm. wide, white-silky on both sides, rounded to retuse at the apex; peduncles 5-10 cm. long, ascending; racemes nearly as long; bracts lanceolate, 3 mm. long; pedicels about 1 mm. long; calyx silky-villous, some of the hairs, especially on the teeth, often blackish, the tube 5 mm. long, the teeth lance-subulate, 3 mm. long; corolla mostly rose-purple, about 15 mm. long; banner obovate, only slightly upturned; wings shorter, almost straight, the blade obtuse, oblong-obovate, with a large basal auricle; keel-petals slightly shorter, broader, rounded at the apex; pod obliquely ovoid, about 2 cm. long and 1 cm. or more wide, rather firm, mottled, densely white-silky, somewhat sulcate on both sutures; seeds dark-brown, obliquely reniform, 3 mm. long, fully 2 mm. thick.

TYPE LOCALITY: Near Monterey, California.

DISTRIBUTION: Southern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 25.

8. *Cystium agninum* (Jepson) Rydberg.

Astragalus lentiginosus borreganus Jones, Rev. Astrag. 126. 1923.

Astragalus agninum Jepson, Man. Fl. Pl. Calif. 577. 1925.

An annual or perhaps perennial; stems several, 2-5 dm. high, flexuose, densely white-silky, leaves 5-7 cm. long, spreading; stipules deltoid, 5 mm. long, silky; leaflets 7-17, obovate

or oval, obtuse or retuse, white-silky on both sides, 6-10 mm. long; peduncles 4-7 cm. long, ascending; racemes lax, 4-8 cm. long; bracts lanceolate, 2-3 mm. long; pedicels very short; calyx silky-strigose, the tube about 5 mm. long, the teeth lance-subulate, 2 mm. long; corolla purple, 10-12 mm. long; banner obovate, slightly arched; wings shorter, almost straight, the blade oblong-obovate, with a large auricle; keel-petals slightly shorter, broader, rounded at the apex; pod 15-18 mm. long, lanceolate in outline, slightly inflated, strongly falcate, thicker than wide, gradually acute; seeds brown, obliquely reniform, 2.5 mm. long.

TYPE LOCALITY: Borrego Springs, Colorado Desert, California.

DISTRIBUTION: Type locality and vicinity.

9. *Cystium Arthu-Schottii* (A. Gray) Rydberg.

Astragalus Arthu-Schottii A. Gray, Proc. Am. Acad. 6: 209. 1864.

A biennial or perennial; stem 2-4 dm. high, white-silky; leaves 6-10 dm. long; stipules deltoid, 3-4 mm. long; leaflets 11-17, elliptic to obovate, 8-15 mm. long, 4-8 mm. wide, silky on both sides, more densely so on the lower surface, obtuse to retuse at the apex; peduncles 3-7 cm. long; racemes of about the same length; calyx silky, the tube 3 mm. long, the teeth subulate, about 1.5 mm. long; corolla 10-12 mm. long, purple, the petals like those of the preceding species but narrower; pod obliquely ovoid, nearly 2 cm. long and 1 cm. thick, rather thin, slightly incurved, mottled, rather sparingly short-hairy.

TYPE LOCALITY: Diluvial banks of the Colorado, near its mouth. [Probably in Sonora.]

DISTRIBUTION: Southern California to western Arizona and Sonora.

10. *Cystium eremicum* (Sheldon) Rydberg.

Astragalus eremicus Sheldon, Contr. U. S. Nat. Herb. 4: 86. 1893.

An annual or perhaps perennial; stem often branched at the base, 1-3 dm. high, flexuose, white-silky; leaves 5-8 cm. long, spreading; stipules deltoid, 3 mm. long; leaflets 15-21, elliptic or obovate, rounded or obtuse at the apex, 5-10 mm. long, white-silky with loose hairs; peduncles 4-6 cm. long, ascending; racemes 3-6 cm. long; bracts lanceolate, 1-2 mm. long; calyx silky-villous, the tube 3 mm. long, the teeth subulate, 1 mm. long; corolla purple, about 1 cm. long; petals as in *C. Coulteri*; pod 1.5-2 cm. long, oblique-ovoid, somewhat falcate, mottled, rather thin, sparingly short-hairy.

TYPE LOCALITY: Lone Pine, Inyo County, California.

DISTRIBUTION: Southern California.

11. *Cystium vulpinum* Rydberg, sp. nov.

Apparently a perennial; stems 3-5 dm. high, more or less pubescent with white hairs; leaves 7-10 cm. long, ascending; stipules deltoid, reflexed, 3 mm. long; leaflets 13-19, obovate, usually retuse, 6-15 mm. long, silky-villous with white hairs; peduncles 4-5 cm. long; racemes 5-6 cm. long; bracts lance-subulate, 2 mm. long; calyx silky-villous with white hairs, the tube 4 mm. long, the teeth 2 mm. long, subulate; corolla white, 10-12 mm. long; banner narrowly obovate, retuse; wings shorter than the banner, the blade oblong, nearly straight, with a large basal auricle; keel-petals still shorter, the blade broadly lunate, rounded at the apex; pod papery, sparingly pilose, ovoid, acuminate, fully 2 cm. long, 1 cm. thick, the tip slightly incurved.

Type collected in Grass Valley, Nevada, June 1868, *Watson 254*, in part (Torrey Herbarium).

DISTRIBUTION: Nevada and southern California.

12. *Cystium stramineum* Rydberg, sp. nov.

An annual; stem 5 dm. high or more, densely silvery-silky, flexuose; leaves about 7 cm. long, ascending; stipules deltoid, 4 mm. long; leaflets 9-13, obovate, rounded or slightly retuse at the apex, 1-2 cm. long, 6-10 mm. wide, white-silky beneath, glabrous above; peduncles 5-7 cm. long; racemes 5-10 cm. long; bracts subulate, 2 mm. long; calyx silky, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla white, about 12 mm. long, similar to that of the pre-

ceding; pod mottled, sparingly short-pubescent, papery, rounded-ovoid, about 2 cm. long, nearly 1.5 cm. thick, somewhat sulcate on both sutures, short-acuminate, the tip upturned.

Type collected in southeastern Utah in 1870, *E. Palmer* (Torrey Herbarium).

13. *Cystium Merrillii* Rydberg, sp. nov.

A perennial, with a caespitose rootstock; stems 2-3 dm. long, striate or sulcate, glabrous, stout; leaves ascending, 4-7 cm. long; stipules deltoid, 3-5 mm. long, the lower scarious and broad, the upper greener and narrower; leaflets 11-15, broadly obovate, rounded or retuse at the apex, 10-15 mm. long, 5-8 mm. wide, glabrous or nearly so and somewhat glaucous; peduncles 2-3 dm. long; racemes 5-10-flowered, 2-4 cm. long; bracts lanceolate, 3-4 mm. long, yellowish; calyx glabrous or with a few black hairs, the tube 7-8 mm. long, the teeth lance-subulate, 3-4 mm. long; corolla white, fully 1.5 mm. long; banner broadly obovate; wings somewhat shorter, with slender claws, the blade obliquely oblanceolate, with a large basal auricle; keel-petals similar and about as long, but broader, rounded at the apex; pod glabrous, leathery, obliquely ovoid, about 3 cm. long, 2 cm. thick, short-acuminate, the tip flattened laterally and upturned.

Type collected on Leucite Hills, Wyoming, June 18, 1901, *Merrill & Wilcox 680* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Wyoming.

14. *Cystium platyphyllidium* Rydberg, sp. nov.

Astragalus diphysus S. Wats. Bot. King's Expl. 5: 65, in part. 1871.

Astragalus lentiginosus cuspidocarpus M. E. Jones, Proc. Calif. Acad. II. 5: 673. 1895. Not *A. cuspidocarpus* Sheldon, 1894.

A perennial, with a caespitose caudex; stems decumbent at the base, 3-4 dm. high, sulcate, glabrous; leaves ascending, 5-10 cm. long; stipules deltoid, 4-5 mm. long; leaflets obovate, 1-2 cm. long, 8-12 mm. wide, glabrous, cuneate at the base, rounded or retuse at the apex; peduncles 3-4 cm. long; racemes short, subcapitate, 5-10-flowered; bracts lanceolate, 2-3 mm. long; calyx sparingly black-hairy, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla white, about 1 cm. long; pod glabrous, leathery, obliquely lance-ovoid, strongly arcuate, slightly sulcate on the sutures; seeds obliquely reniform, 3 mm. long, 2.5 mm. thick.

Type collected on Pine Creek, Gilliam County, Oregon, June 7, 1891, *J. B. Leiber 171* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Idaho, Washington, Oregon, and northern Nevada and California.

15. *Cystium araneosum* (Sheldon) Rydb. Bull. Torrey Club 40: 50. 1913.

Astragalus araneosus Sheldon, Minn. Bot. Stud. 1: 171. 1894.

A perennial, with a caespitose caudex; stems several, erect or decumbent at the base, sparingly strigose, 1.5-4 dm. high, striate, often tinged with red; leaves 5-7 cm. long, the rachis strigose; stipules deltoid, acuminate, 3-5 mm. long, often reflexed; leaflets 13-19, oval or elliptic, obtuse to emarginate at the apex, glabrate above, strigose beneath, 7-10 mm. long; peduncles 5-8 cm. long, striate and strigose; racemes dense, subcapitate, 10-12-flowered; calyx sparingly strigose with white and black hairs, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla 12-15 mm. long, white, tipped with purple; banner obovate, slightly arched; wings shorter, the blade obliquely oblong, with a large basal auricle; keel-petals broader and shorter, the blade falcate, obtuse; pod 2-2.5 cm. long, 1 cm. thick, strongly incurved at the middle; seeds obliquely suborbicular-reniform.

TYPE LOCALITY: Frisco, Utah.

DISTRIBUTION: Western Utah.

16. *Cystium salinum* (Howell) Rydb. Fl. Rocky Mts. 492,
1063. 1917.

Astragalus salinus Howell, Erythraea 1: 111. 1893.

Astragalus lentiginosus chartaceus M. E. Jones, Proc. Calif. Acad. II. 5: 673. 1895.

Phaca inepta Rydb. Mem. N. Y. Bot. Gard. 1: 246. 1900.

Cystium ineptum Rydb. Bull. Torrey Club 32: 659, mainly. 1906.

Astragalus ineptus Coult. & Nels. Man. 285, mainly. 1909. Not *A. ineptus* A. Gray. 1865.

Cystium heliophilum Rydb. Fl. Rocky Mts. 491, 1063. 1917.

A perennial, with a caespitose caudex; stems decumbent at the base, 2-4 dm. high, glabrate or sparingly strigose, often tinged with red; leaves ascending, 6-10 cm. long; stipules deltoid, 3.5 cm. long; leaflets 9-15, obovate, 7-10 mm. long, rounded to retuse at the apex, glabrous above, sparingly strigose beneath; peduncles 2-4 cm. long; racemes dense, 3-5 cm. long; bracts lanceolate, 2-3 mm. long; pedicels 1 mm. long; calyx strigose, the tube 3.5-4 mm. long, the teeth about 2 mm. long; corolla ochroleucous, about 1 cm. long; banner obovate, slightly up-curved; wings slightly shorter, the blade oblong, with a large basal auricle; keel-petals much broader and shorter, obtuse, falcate; pod broadly ovoid, glabrous, nearly 2 cm. long, 1 cm. thick, short-acuminate, with upturned apex.

TYPE LOCALITY: Southeastern [Harney County] Oregon.

DISTRIBUTION: Oregon and Montana to Utah.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 24, f. aa (as var. *diphysus*).

17. *Cystium floribundum* (A. Gray) Rydberg, sp. nov.

Astragalus lentiginosus floribundus A. Gray, Proc. Am. Acad. 6: 524. 1865.

A densely caespitose perennial, with a woody caudex; stems decumbent, 2-5 dm. long, glabrous, straw-colored; leaves short, 5-7 cm. long, spreading; stipules deltoid, scarious, 3 mm. long; leaflets 13-19, rather thick, obovate to oblong, 8-12 mm. long, rounded to retuse at the apex, glabrous, or sparingly strigose on the midrib beneath; peduncles 1-3 cm. long; racemes short, densely flowered; bracts lanceolate, 3 mm. long; calyx white-strigose, the tube 3-3.5 mm. long, the teeth subulate, 1 mm. long; corolla white or ochroleucous; pod papery, glabrous, ovoid, acuminate, nearly straight, about 2 cm. long and 1 cm. thick.

TYPE LOCALITY: Carson City, Nevada.

DISTRIBUTION: Eastern California and western Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 23, f. c (as var. *ineptus*).

18. *Cystium scorpionis* (M. E. Jones) Rydberg, sp. nov.

Astragalus lentiginosus scorpionis M. E. Jones, Rev. Astrag. 124. 1923.

A perennial; stem decumbent, slender, much branched, about 2 dm. long, sparingly strigose; leaves ascending, 5-10 cm. long; stipules deltoid, 3-4 mm. long, rather densely strigose; leaflets 15-19, elliptic or obovate, 5-10 mm. long, glabrous above, sparingly strigose beneath, obtuse; peduncles 4-6 cm. long; racemes elongate, 4-6 cm. long; bracts lanceolate, 2-3 mm. long; calyx white-hairy, the tube 3 mm. long, the teeth subulate, 1.5 mm. long; corolla white, about 8 mm. long, the banner and wings rather narrow, otherwise as in *C. lentiginosum*; pod glabrous, ovate, 1-1.2 cm. long, slightly mottled, the tip acuminate and strongly incurved.

TYPE LOCALITY: Morey Peak, Nevada.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 24.

19. *Cystium griseolum* Rydberg, sp. nov.

A caespitose perennial, with a woody caudex; stems ascending, 1-2 dm. high, strigose with kinky hairs, striate; leaves ascending, 3-5 cm. long; stipules deltoid, 4 mm. long, erect; leaflets 11-15, obovate, 5-7 mm. long, rounded to retuse at the apex, pubescent on both sides with kinky hairs; peduncles 1-4 cm. long; bracts lanceolate, 2 mm. long; calyx hirsutubous, the tube 3 mm. long, the teeth subulate, 1 mm. long; corolla white, tinged with rose, about 8 mm. long; banner obovate, bent at an angle of about 80°; wings shorter, the blade obliquely ovate,

obtusely; keel-petals similar but broader; pod glabrous, obliquely ovoid, 15–18 mm. long, 10 mm. thick, slightly arcuate.

Type collected at Candelaria, Nevada, May 1882, *Shockley 220*; also 271 (both in Gray Herbarium).

20. *Cystium cornutum* Rydberg, sp. nov.

Astragalus araneosus Sheldon, Minn. Bot. Stud. 1: 170, in part. 1894.

A caespitose perennial; stem 2–4 dm. high, striate, glabrous, leaves ascending, 5–10 cm. long; stipules deltoid, 3–5 mm. long, glabrous; leaflets 13–17, broadly obovate, 10–18 mm. long, rounded to retuse at the apex, glabrous or rarely with a few hairs on the margins and midribs; peduncles 3–5 cm. long; racemes dense; bracts lanceolate or ovate, 2–3 mm. long, with a few black hairs; pedicels 1 mm. long; calyx strigose with mixed white and black hairs, the tube about 4 mm. long, the teeth subulate, 2 mm. long; corolla about 15 mm. long, white or ochroleucous, the keel tipped with purple; banner obovate; wings slightly shorter, the blade oblong, with a large auricle; keel-petals still shorter, broader, somewhat lunate, with a broad auricle and rounded tip; pod fully 2.5 cm. long, 12–14 mm. thick, decidedly arcuate, leathery, sparingly strigulose, long-acuminate.

Type collected at Muddy Station, John Day Valley, May 13, 1885, *T. Howell* (herb. Columbia Univ.).

DISTRIBUTION: Oregon and northern California.

21. *Cystium lentiginosum* (Dougl.) Rydb. Bull. Torrey Club 40: 50. 1913.

Astragalus lentiginosus Dougl.; Hook. Fl. Bor. Am. 1: 151. 1831.

Tragacantha lentiginosa Kuntze, Rev. Gen. 946. 1891.

Cystium salinum Rydb. Fl. Rocky Mts. 492. 1917. Not *Astragalus salinus* Howell. 1893.

Astragalus lentiginosus scorpionis M. E. Jones, Rev. Astrag., in part, 124. 1923.

Astragalus lentiginosus carinatus M. E. Jones, Rev. Astrag. 125. 1923.

A caespitose perennial; stem decumbent or ascending, 1–3 dm. high, slender, glabrous or sparingly strigose; leaves ascending, 4–7 cm. long; stipules lanceolate, 2–3 mm. long; leaflets 13–17, obovate or oval, 6–10 mm. long, glabrous or with scattered hairs on the margins and midribs, obtuse at the apex; peduncles 2–4 cm. long; racemes dense, 1–2 cm. long; bracts lanceolate, 1–2 mm. long; calyx strigose, sometimes more or less black-hairy, the tube 2.5–3 mm. long, the teeth subulate, 1–2 mm. long; corolla white, 8–10 mm. long; banner oblanceolate, moderately arched; wings shorter, obliquely oblong-oblancheolate, with a rather long auricle; keel-petals shorter, lunate; pod thin, about 1.5 cm. long, 6–9 mm. thick, strongly arcuate-inflexed, strigulose.

TYPE LOCALITY: Blue Mountains, Oregon.

DISTRIBUTION: Oregon and Idaho.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 23, f. 80.

22. *Cystium ormsbyense* Rydberg, sp. nov.

A perennial; stems diffuse and much branched, 3–5 dm. long or more, terete, straw-colored, glabrous or with a few scattered hairs; leaves ascending, 5–6 cm. long; stipules lance-deltoid, 2–3 mm. long; leaflets 15–19, elliptic, rounded at the apex, acute at the base, 8–12 mm. long, glabrous above, sparingly strigose beneath; peduncles 1–3 cm. long; racemes dense, 1–2 cm. long; bracts lanceolate, 2 mm. long; calyx white-strigose, the tube 3 mm. long, the teeth subulate, 1 mm. long; corolla white, 8–9 mm. long; pod ovoid, acuminate, 12–15 mm. long, 8–9 mm. thick, strigulose, papery, unmottled, scarcely incurved at the tip.

Type collected in Eagle Valley, Ormsby County, Nevada, 1902, *Baker 1275* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Western Nevada.

23. *Cystium Sierrae* (M. E. Jones) Rydberg, sp. nov.

Astragalus lentiginosus Sierrae M. E. Jones, Rev. Astrag. 124. 1923.

A perennial, from a woody taproot and caudex; stems several, decumbent, 2–3 dm. long, sparingly strigose; leaves numerous, ascending; stipules lanceolate, 2–3 mm. long, stri-

gose; leaflets 17-23, crowded, obovate, usually conduplicate, 5-8 mm. long, sparingly strigose beneath when young, glabrate in age, glabrous above; peduncles 2-3 cm. long; racemes dense, 1-2 cm. long; bracts lanceolate, 2 mm. long; calyx white-strigose, the tube nearly 4 mm. long, the teeth deltoid, 1 mm. long; corolla white, about 12 mm. long; banner obovate, only slightly arched; wings about 10 mm. long, the blade oblong; keel-petals 8 mm. long, the blade lunate, with a large auricle; pod mottled, papery, strigose, ovoid, about 2 cm. long, and 12 mm. thick.

TYPE LOCALITY: Bear Valley, California.

DISTRIBUTION: Mountains of southern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 23.

24. *Cystium ineptum* (A. Gray) Rydb. Bull. Torrey Club

32: 659. 1906.

Astragalus ineptus A. Gray, Proc. Am. Acad. 6: 525. 1865.

Phaca inepta Rydb. Mem. N. Y. Bot. Gard. 1: 246. 1900.

Astragalus lentiginosus ineptus M. E. Jones, Rev. Astrag. 124. 1923.

A caespitose perennial; stems diffuse, 1-2 dm. high, cinereous with loose kinky hairs; leaves ascending, 4-5 cm. long; stipules deltoid, 3 mm. long; leaflets 13-19, oblong-oblancoate, 1 cm. long or less, obtuse to emarginate, pubescent with kinky hairs beneath, less pubescent above; peduncles 1-2 cm. long; racemes dense, 1-2 cm. long; bracts lanceolate, 2 mm. long; pedicels about 1 mm. long; calyx pubescent, the tube about 4 mm. long, the teeth subulate, 2 mm. long; corolla described as white or ochroleucous, but seems to have been pinkish when fresh; banner obovate, 12 mm. long; wings 10 mm. long, the blades oblong; keel-petals 8 mm. long, the blade broadly lunate, obtuse, with a large basal auricle; young pod strigose, the mature one unknown.

TYPE LOCALITY: Near Sonora Pass, California.

DISTRIBUTION: Known only from the type locality.

25. *Cystium albifolium* (M. E. Jones) Rydberg, sp. nov.

Astragalus lentiginosus albifolium M. E. Jones, Rev. Astrag. 124. 1923.

A perennial, with a woody root; stems several, erect, branched, terete, strigose, 3-4 dm. high; leaves ascending, 4-6 cm. long; stipules deltoid or lanceolate, 2-3 mm. long, strigulose; leaflets 13-25, oblong, obtuse, strigose on both sides, 8-15 mm. long; peduncles 2-4 cm. long; racemes dense, 2-4 cm. long; bracts lanceolate, 2 mm. long; pedicels less than 1 mm. long; calyx strigose, the tube 4 mm. long, the teeth subulate, 1.5 mm. long; corolla white; banner obovate, fully 1 cm. long; wings somewhat shorter, the blade oblong, with a large auricle; pod ovoid, papery, short-acuminate, 12-15 mm. long and almost as wide, sparingly strigulose; seeds brown, obliquely reniform, 2.5 mm. long, 2 mm. thick.

TYPE LOCALITY: Lone Pine, Owens Valley, California.

DISTRIBUTION: Southern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 23.

26. *Cystium kernense* (Jepson) Rydberg.

Astragalus kernensis Jepson, Man. Fl. Pl. Calif. 569. 1925.

A perennial, with thick root and short caudex; stems many, less than 1 dm. long, ascending, strigose; leaves 2-5 cm. long, ascending; stipules deltoid, scariosus; leaflets 11-15, obovate, obtuse or retuse, 3-5 mm. long, glabrous above, strigose beneath; peduncles about 1 cm. long; racemes short, 4-6-flowered; calyx strigose, the tube 3 mm. long, the teeth subulate-deltoid, 1 mm. long; corolla white, 8-9 mm. long; banner obovate, notched, with recurved sides; wings shorter, the blade oblong; keel-petals much shorter, the blade broadly lunate, rounded at the apex; pod subglobose, 6-7 mm. long, grooved on both sutures, strigose, about 4-seeded.

TYPE LOCALITY: Volcano Creek, Sierra Nevada, Tulare County, California.

DISTRIBUTION: Known only from the type locality.

27. *Cystium sesquimetræ* Rydberg, sp. nov.

A perennial; stems procumbent, spreading, making mats 1.5 m. in diameter, glabrous or nearly so, the internodes much longer than the leaves; leaves spreading, 4-5 cm. long, the petioles very short; stipules deltoid, reflexed, 4-5 mm. long, green; leaflets 9-13, oblong-ob-lanceolate, 1-2 cm. long, 4-8 mm. wide, glabrous above, strigose beneath; peduncles 3-4 cm. long; racemes 2-3 cm. long, dense; bracts lanceolate, 2 mm. long; calyx strigose, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla purple; banner obovate, only slightly recurved, 12-14 mm. long; wings 11-12 mm. long, the blade oblong; keel-petals about 1 cm. long, the blade strongly lunate, rounded at the apex; pod leathery, mottled, strigose, ovoid, 2-2.5 cm. long, fully 1 cm. thick, slightly arcuate, sulcate on both sutures.

Type collected at Soda Springs, Nevada, June 11, 1882, *Shockey 278* (Gray Herbarium).

DISTRIBUTION: Known only from the type locality.

28. *Cystium idriense* (M. E. Jones) Rydberg, sp. nov.

Astragalus lentiginosus idriensis M. E. Jones, Contr. W. Bot. 10: 63. 1902.

Perennial, with a caespitose woody caudex; stems several, decumbent below, about 2 dm. long, striate, sparingly strigose; leaves 2-4 cm. long, spreading; stipules lanceolate, 2-3 mm. long, scarious; leaflets 13-19, obovate, 5-8 mm. long, obtuse or truncate at the apex, strigose beneath, glabrate above; peduncles 3-5 cm. long, erect; racemes short, dense, about 2 cm. long; bracts ovate, 2 mm. long; calyx sparingly strigose, the tube 4 mm. long, the teeth subulate, 1 mm. long; corolla purple, 10-12 mm. long; banner obovate, with a whitish spot, striate with purple; wings shorter, the blade oblong; keel-petals still shorter, the blade broadly lunate, rounded at the apex; pod lance-ovoid in outline, strongly incurved, acute on the upper suture, 15-20 mm. long, 4-5 mm. wide, 7 mm. thick, mottled, strigose.

TYPE LOCALITY: [Not given in the original but supplied later] New Idria, San Benito County, California.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 24.

29. *Cystium tehachapiense* Rydberg, sp. nov.

A caespitose perennial; stems ascending, 2-4 dm. high, glabrate or sparingly strigose, often tinged with red; leaves ascending, 5-9 cm. long; stipules deltoid, 4 mm. long, ciliate; leaflets obovate or orbiculate, 1-1.5 cm. long, 5-10 mm. wide, glabrous, or ciliate on the margins; peduncles 3-5 cm. long; racemes dense, 2-3 cm. long; bracts ovate, 3 mm. long, black-hairy; calyx black-hairy, the tube 5 mm. long, the teeth deltoid, scarcely 1 mm. long; corolla purple; banner 15 mm. long, obovate; wings 12 mm. long, the blade oblong, with a large basal auricle; keel-petals shorter, the blade broadly lunate, rounded at the apex, with a large basal auricle; pod leathery, ovoid, arcuate, mottled, strigose, 2-2.5 cm. long, fully 1 cm. wide.

Type collected at Tehachapi, Kern County, California, May 5, 1905, *Heller 7833* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Type locality and vicinity.

30. *Cystium diphysum* (A. Gray) Rydb. Bull. Torrey Club

32: 659. 1906.

Astragalus diphysum A. Gray, Mem. Am. Acad. II. 4: 34. 1849.

Astragalus diphysum albiflorus A. Gray, Mem. Am. Acad. II. 4: 34, in part. 1849.

Tragacantha diphyssa Kuntze, Rev. Gen. 944. 1891.

Astragalus lentiginosus diphysum M. E. Jones, Proc. Calif. Acad. II. 5: 673. 1895.

A caespitose perennial; stem 2-4 dm. high, striate, glabrous; leaves ascending, 5-10 cm. long; stipules deltoid, 4-5 mm. long; leaflets elliptic or obovate, rounded or retuse at the apex, glabrous or nearly so, 1-1.5 cm. long; peduncles 3-5 cm. long; racemes dense, 2-4 cm. long; bracts ovate, 1-2 mm. long, ciliate; calyx strigose, the tube 5 mm. long, the teeth 2 mm. long, subulate; corolla purple, rarely white, about 15 mm. long; petals as in the preceding; pod rather firm, obliquely ovoid, acuminate, somewhat arcuate, 2-2.5 cm. long, about 12 mm. thick, glabrous.

TYPE LOCALITY: Plains around Santa Fé, New Mexico.

DISTRIBUTION: New Mexico, Arizona, and Utah.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 24, pl. 25.

31. *Cystium pardalotum* Rydberg, sp. nov.

A perennial; stem 1-2 dm. high, flexuose, branched, sparingly strigulose; leaves ascending, 3-6 cm. long; stipules lanceolate to deltoid, 3 mm. long; leaflets 11-15, obovate, 5-7 mm. long, rounded or retuse at the apex, glabrous on both sides; peduncles 3-6 cm. long; racemes 2-4 cm. long; bracts lanceolate, 1-2 mm. long; calyx white-hairy, the tube 4 mm. long, the teeth subulate, scarcely 1 mm. long; corolla purplish, 12 mm. long; banner narrowly obovate, retuse; wings shorter, the blade lanceolate, acutish; keel-petals still shorter, the blade broadly lunate; pod obliquely ovoid, about 18 mm. long, 9 mm. wide and somewhat thicker, glabrous, brown-spotted, tapering and upturned at the apex.

Type collected in the Mohave Desert, California, in May 1893, *Dr. A. Davidson* (herb. Univ. Minn.).

32. *Cystium latum* (M. E. Jones) Rydberg.

Astragalus diphysus latus M. E. Jones, *Zoe* 3: 287. 1893.

Astragalus latus M. E. Jones, *Zoe* 4: 272. 1893.

Astragalus lentiginosus latus M. E. Jones, *Rev. Astrag.* 125. 1923.

A perennial, with a caespitose caudex; stems ascending, 1-2 dm. high, with short internodes; leaves about 1 dm. long, stipules deltoid, 4-5 mm. long; leaflets 13-17, obovate or oval or orbiculate, rounded to retuse at the apex, 5-10 mm. long, glabrous, or sparingly hairy beneath on the midrib; peduncles 1-4 cm. long; racemes short; bracts lanceolate, 2-3 mm. long; calyx glabrous or with a few scattered black hairs, the tube cylindrical, 7 m. long, the teeth subulate, 2 mm. long; corolla light-purple, 16-20 mm. long; banner retuse, narrowly obovate; wings nearly as long, the blade lance-obovate; keel-petals shorter, the blade broadly lunate, rounded and dark at the apex; pod round-ovoid, mottled, abruptly contracted into a short tip; seeds brown, obliquely reniform, 2 mm. long.

TYPE LOCALITY: Shell Creek Range [Aurum?], Nevada.

DISTRIBUTION: Nevada.

ILLUSTRATION: M. E. Jones, *Rev. Astrag.* pl. 24.

33. *Cystium MacDougali* (Sheldon) Rydberg.

Astragalus MacDougali Sheldon, *Minn. Bot. Stud.* 1: 169. 1894.

Astragalus lentiginosus MacDougali M. E. Jones, *Proc. Calif. Acad.* II. 5: 673. 1895.

A caespitose perennial; stems glabrous or slightly pubescent when young, 2-2.5 dm. high, decumbent at the base, striate; leaves ascending, 6-9 cm. long; stipules deltoid, acuminate, reflexed, 2-3 cm. long; leaflets 13-19, narrowly obovate, obtuse to retuse, glabrous on both sides, or sparingly hairy beneath; peduncles 4-5 cm. long; racemes dense, of about the same length; bracts ovate, 2 mm. long; calyx strigose, the tube 3-4 mm. long, the teeth subulate, 1-1.5 mm. long; corolla 13-16 mm. long; pod glabrous, broadly ovate or subglobose, 10-15 mm. long, about as wide, obcompressed, sulcate on both sutures.

TYPE LOCALITY: Flagstaff, Arizona.

DISTRIBUTION: Type locality and vicinity.

ILLUSTRATION: M. E. Jones, *Rev. Astrag.* pl. 23.

52. ONIX Medic. *Vorl. Churph. Phys. Ges.* 2: 374. 1787.

Leafy-stemmed perennials. Leaves odd-pinnate, with many leaflets and distinct stipules. Flowers in peduncled axillary racemes. Calyx-tube campanulate. Corolla white or yellowish. Banner obovate, subsessile, retuse. Wings clawed, the blades lunate-oblancheolate, with a large basal auricle. Keel-petals shorter and broader, the blades almost semicircular. Stamens diadelphous (9 and 1), the sheath straight, the free portion of the filaments abruptly bent upwards. Ovary stipitate, rather few-ovuled, the style bent upwards, the stigma minute. Pod membranous, inflated, triangular or cordate in cross-section, completely 2-celled, in age splitting through the septum. Seeds obliquely reniform.

Type species, *Astragalus galegiformis* L.

1. **Onix Mulfordae** (M. E. Jones) Rydb. Bull. Torrey Club
40: 51. 1913.

Astragalus Mulfordae M. E. Jones, Contr. W. Bot. 8: 18, 1898.

Perennial, with a taproot and short caespitose caudex; stems slender, erect, green, 1-4 dm. high, strigose-puberulent; leaves ascending, 5-10 cm. long; stipules hyaline, with green tips, deltoid or lanceolate, 3-5 mm. long; leaflets 13-25, linear or oblong, 4-8 mm. long, glabrous above, sparingly strigose or glabrate beneath; peduncles 5-10 cm. long; racemes lax, 3-8 cm. long; bracts lanceolate or subulate, 1-2 mm. long; pedicels about 1-2 mm. long; calyx black-strigose, the tube campanulate, 2.5 mm. long, the teeth lance-subulate, 1 mm. long; corolla yellowish or dirty-white, about 7 mm. long; banner obovate, abruptly arched at the middle; wings somewhat shorter, the blade obliquely obovate, somewhat arcuate, with a small auricle; keel-petals much shorter, the blade broadly lunate, nearly semiorbicular; pod strigose, stipitate, the stipe 5-6 mm. long, straight, the body membranous, semioval, 10-12 mm. long, 3-4 mm. wide, and 5-6 mm. thick, the upper suture straight or nearly so, the lower strongly convex and broadly sulcate, the cross-section broadly cordate or triangular; seeds brown, reniform, 2.5 mm. long, 1.5 mm. broad.

TYPE LOCALITY: Boise, Idaho.

DISTRIBUTION: Southern Idaho.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 67, f. 229.

53. **CONTORTUPLICATA** Medic. Vorl. Churph. Phys. Ges.
2: 378. 1787.

Annual herbs. Leaves odd-pinnate. Flowers perfect, in head-like racemes on axillary peduncles. Calyx short, turbinate, the teeth subulate. Corolla small, scarcely exceeding the calyx-lobes. Banner obovate, tapering into a broad base. Wings and keel-petals clawed, similar, the latter slightly longer, the blades obovate-lunate, with rather large deltoid auricles. Stamens diadelphous (9 and 1), the tube almost straight, the free portion of the filaments arched upwards. Ovary pubescent; style incurved, glabrous; stigma minute. Pod strongly falcate, incurved, 2-celled, membranous, almost papery, sulcate on the lower suture, forming a complete circle, at maturity splitting into two halves through the septum. Seeds numerous, reniform.

Type species, *Astragalus contortuplicatus* L.

1. **Contortuplicata contortuplicata** (L.) Rydberg.

Astragalus contortuplicatus L. Sp. Pl. 758. 1873.

Contortuplicata astragaloides Med. Vorl. Churph. Phys. Ges. 2: 378. 1787.

Annual; stem branched from the root; branches erect, ascending or decumbent, 1-3 dm. long, pilose; leaves 7-12 cm. long, spreading; stipules ovate, 3-4 mm. long; leaflets 15-21, cuneate, ovate or oval in outline, usually deeply notched at the apex, 7-20 mm. long, pilose on both sides; peduncles 1-2 cm. long; racemes very short and head-like, 1-2 cm. long; calyx long-pilose, the tube 2 mm. long, the teeth subulate, 2-2.5 mm. long; corolla white or yellowish, 5 mm. long; banner obovate, retuse; wings a little shorter, the blade broadly lunate, rounded at the apex, with a deltoid retrorse auricle; keel-petals similar but longer and broader; pod membranous, pilose, sessile, strongly falcate, forming a complete circle less than 1 cm. in diameter, the body 2-2.5 mm. wide.

TYPE LOCALITY: Siberia.

DISTRIBUTION: Native of the Old World from Southeastern Europe to Siberia, western India, and Egypt; adventive at Westport, Massachusetts.

ILLUSTRATIONS: Pall. Astrag. pl. 79; Sibth. Fl. Graeca pl. 729; Reichenb. Ic. Fl. Germ. 22: pl. 149 (pl. 2200).

54. **HAMOSA** Medic. Vorl. Churph. Phys. Ges. 2: 373. 1787.

Hamaria Fourr. Ann. Soc. Linn. Lyon II. 16: 364. 1868.

Annual or perennial herbs. Leaves alternate, odd-pinnate, with several or many leaflets. Flowers perfect, in axillary racemes. Calyx-tube campanulate, the teeth subulate. Corolla

purple or white, rarely ochroleucous. Banner broadly obovate, subsessile; wings clawed, the blade obliquely oblanceolate or lunate, with a reflexed auricle, free. Keel-petals adnate, clawed, the blade broadly lunate, in two American species with a small beak. Stamens diadelphous (9 and 1), the sheath straight, the free upper part of the filaments curved upwards. Ovary many-ovuled, the style curved, the stigma minute, terminal. Pod elongate, sessile, linear or oblong, or rarely lance-oblong in outline, usually somewhat compressed, rarely terete, coriaceous or rarely membranous, not inflated, completely (or in one or two species incompletely) 2-celled, the septum meeting the upper suture. Seeds obliquely reniform.

Type species, *Astragalus hamosus* L.

Keel not beaked.

Perennials, with a caespitose rootstock or caudex.

Corolla 1-2 cm. long (rarely 7-10 mm. long); pod linear or narrowly oblong, rather abruptly acute at each end, spreading.

Plant villous or pilose; calyx cylindrical-campanulate, the tube longer than the teeth.

Pod glabrous, strongly flattened

Pod pubescent, less strongly flattened

Plant strigose or glabrate; calyx campanulate.

Low, pulvinate-caespitose, acaulescent, silvery plants; wings 2-lobed.

Taller, leafy-stemmed, usually canescent or glabrous plants; wings entire.

Corolla 5-7 mm. long; flowers in dense racemes; pod broadly oblong or lance-oblong, gradually acute, reflexed.

Annuals, with few-flowered or headlike racemes.

Pods linear, more or less spreading; corolla exceeding the calyx-lobes.

Pods lance-oblong, almost erect in dense head-like clusters; corolla not exceeding the calyx-lobes.

Keel produced into a porrect beak.

One species.

1. SUCCUMBENTES

2. MALACAE

Calyx black-hairy; pod 2-4 cm. long; corolla purple or tipped with purple.

Pubescence spreading; pod moderately arcuate, acute or short-acuminate.

Pubescence appressed or ascending.

Pod strongly arcuate, long-acuminate, 3-4 cm. long.

Pod straight or slightly arcuate, abruptly acute, 2-2.5 cm. long.

Calyx white-hairy; pod less than 2 cm. long; corolla white or ochroleucous; pubescence villous.

Pod villous, thin-leathery, not reticulate, abruptly acute; plant more than 1 dm. high.

Pod strigose, thick-leathery, almost woody, long-tapering, strongly reticulate; plant less than 1 dm. high.

3. SCAPOSAE

Leaflets solitary.

Leaflets 3-11.

Calyx-teeth subulate-lanceolate, more than half as long as the tube.

Calyx-teeth deltoid-lanceolate, about one third as long as the tube.

Leaflets 3-9, oval or obovate, 5-12 mm. long; inflorescence several-flowered.

Leaflets 7-11, oblong-oblanceolate, 3-4 mm. long; inflorescence 1-3-flowered, rarely 4-flowered.

4. TRICARINATAE

Calyx more or less black-hairy.

Pod glabrous.

Stem and leaves glabrous or nearly so.

Stem and leaves pubescent.

Pubescence appressed; leaflets oblong.

Stem slender; leaflets strigose on both sides; corolla about 8 mm. long.

Stem stout; leaflets white-silvery above; corolla 15-16 cm. long.

Pubescence spreading; leaflets obovate, retuse.

Pod strigose; plant distinctly pubescent.

Leaves and stem villous; pod acuminate, 15-16 mm. long.

Corolla white or pale; pod reflexed-spreading; stems tall, erect.

Corolla dark-purple; pod erect; stem low, decumbent.

Leaves strigose beneath, glabrate above.

Stem 1-2 dm. high; stipules large, broadly ovate, scarious; pod firm.

1. SUCCUMBENTES.

2. MALACAE.

3. SCAPOSAE.

4. TRICARINATAE.

7. HARTWEGIANAE.

5. LEPTOCARPAE.

8. WRIGHTIANAE.

6. ACUTIROSTRES.

1. *H. succumbens*.

2. *H. malaca*.

3. *H. Layneae*.

4. *H. Minthorniae*.

5. *H. Andersonii*.

6. *H. feensis*.

7. *H. monophyllidia*.

8. *H. calycosa*.

9. *H. scaposa*.

10. *H. manca*.

11. *H. umbratica*.

12. *H. bernardina*.

13. *H. tricarinata*.

14. *H. Greggii*.

15. *H. Congdoni*.

16. *H. Goodingii*.

17. *H. ensiformis*.

Stem 3-5 dm. high; stipules small, subulate to deltoid; pod thin-walled.

Corolla 8-10 mm. long, purple-veined; leaflets obovate, scarcely notched.

Corolla 7-8 mm. long, white; leaflets ovate or oval, deeply notched.

Calyx white-hairy.

Leaves silky-canescens on both sides; keel not acuminate.

Leaflets 7-11, oval-obovate, rounded at the apex; corolla purple.

Leaflets 9-19, linear or oblong, acute or obtuse; corolla white or merely margined with purple.

Leaflets 9-15, linear, more than 1 cm. long.

Leaflets 15-19, oblong, 5-8 mm. long.

Leaflets glabrate above.

18. *H. drepanoloba*.

19. *H. Paysonii*.

20. *H. albens*.

21. *H. arizonica*.

22. *H. Coahuilae*.

23. *H. madrensis*.

5. LEPTOCARPAE

Calyx black-hairy; pod little or not at all compressed; calyx-teeth shorter than the tube.

Pod glabrous, less than 2 cm. long.

Leaflets cuneate or oblong-cuneate, truncate or retuse at the apex, less than 8 mm. long.

Leaflets linear, acute, 1-1.5 cm. long.

Pod finely strigose.

Leaflets usually cuneate or oblong and retuse at the apex.

Pod 1-1.5 cm. long, slightly arcuate.

Pod about 3 cm. long or more.

Pod tapering below into a stipe-like base, strongly arcuate, about 3 cm. long.

Pod slightly tapering below, the base not stipe-like, nearly straight, 5-6 cm. long.

Leaflets linear, acute; pod about 2.5 cm. long, moderately arcuate.

Calyx white-hairy.

Pod glabrous.

Leaflets retuse or truncate at the apex.

Pod about 5 mm. wide, arcuate at the base; corolla about 12 mm. long.

Pod about 3 mm. wide or less; corolla 10 mm. long or less.

Pod straight; corolla 10 mm. long.

Pod 2.5-3 cm. long; corolla about 1 cm. long.

Pod 1-1.5 cm. long; corolla about 8 mm. long.

Pod more or less arcuate; corolla 5-8 mm. long.

Pod abruptly acute; plant green; stipules lanceolate or lance-subulate.

Calyx-teeth longer than the tube; pod 3 mm. broad, strongly arched at the base; plant erect or ascending.

Calyx-teeth shorter than the tube; pod 1.5-2 mm. wide, equally arched throughout; plant decumbent or prostrate.

Pod gradually acute, equally arched throughout; plant canescens, decumbent; stipules ovate.

Leaflets linear to oblong, acute or obtuse.

Corolla about 1 cm. long; plant green; pod 2.5-3 cm. long.

Corolla 5-8 mm. long; plant canescens; pod 2 cm. long or less.

Pod completely 2-celled.

Leaflets 7-11, those of the lower leaves oval to oblong.

Pubescence appressed.

Pubescence spreading.

Leaflets 3-7, all linear or linear-oblongate.

Pod with only partial partition.

Pod strigose; inflorescence sub-capitate, 1-5-flowered.

Leaflets oval to linear, acute to rounded at the apex.

Leaflets of the lower leaves very short, cuneate, often retuse at the apex.

30. *H. Lindheimeri*.

31. *H. leptocarpa*.

32. *H. francisquitensis*.

33. *H. Nuttalliana*.

34. *H. leptocarpoides*.

35. *H. montereyensis*.

36. *H. macilenta*.

37. *H. Emoryana*.

38. *H. davisiana*.

39. *H. subuniflora*.

40. *H. imperfecta*.

41. *H. austrina*.

42. *H. pertenuis*.

6. ACUTIROSTRES

Calyx-lobes much shorter than the tube; leaflets not retuse.

Calyx-lobes equaling or longer than the tube; leaflets retuse.

43. *H. nothoxys*.

44. *H. acutirostris*.

7. HARTWEGIANAE

Plants about 3 dm. high, erect; raceme elongate.

Corolla purple, 7-8 mm. long.

Corolla white or ochroleucous.

Pod pubescent.

Calyx black-hairy.

Pod 7-9 mm. long, strigose.

Pod black-hairy; leaflets linear.

Pod white-hairy; leaflets oblong.

Pod about 1 cm. long, strigulose.

45. *H. militaris*.

46. *H. Saltonis*.

47. *H. Goldmani*.

48. *H. hidalgensis*.

- Calyx white-hairy; pod 10-12 mm. long.
 Corolla 7-8 mm. long. 49. *H. Hartwegii*.
 Corolla 4-5 mm. long. 50. *H. vaccarum*.
- Pod glabrous.
 Corolla pink-purple. 54. *H. Esperanzae*.
 Corolla white.
 Raceme very many-flowered, 1 dm. long or more; pod about
 8 mm. long. 51. *H. Clevelandii*.
 Racemes 10-12-flowered, lax, 4-5 cm. long; pod nearly 2 cm.
 long. 52. *H. Hookeriana*.
- Plant 1-2 dm. high, decumbent at the base.
 Plant silvery-canescens; raceme elongate. 53. *H. hypoleuca*.
 Plant merely strigose, the leaves glabrate above; raceme short.
 Corolla less than 1 cm. long; pod lance-oblong.
 Pod glabrous; corolla 8 mm. long, pink-purple. 54. *H. Esperanzae*.
 Pod strigose.
 Leaflets linear.
 Calyx white-hairy, the teeth shorter than the tube. 55. *H. parva*.
 Calyx black-hairy, the teeth fully equaling the tube. 56. *H. asperula*.
 Leaflets obovate. 57. *H. hypoxyla*.
- Corolla more than 1 cm. long, white; plant densely cespitose,
 prostrate; pod broadly oblong. 58. *H. Pringlei*.
8. WRIGHTIANAE
- One species. 59. *H. Wrightii*.

1. **Succumbentes.** Rather low stout perennials; stem and leaves pilose; racemes short and dense; flowers large, fully 2 cm. long; calyx cylindro-campanulate, with short teeth; pod glabrous, broad, linear-oblong, only slightly falcate, deeply sulcate on the lower suture.

1. *Hamosa succumbens* (Dougl.) Rydb. Bull. Torrey Club

54: 14. 1927.

- Astragalus succumbens* Dougl.; Hook. Fl. Bor. Am. 1: 151. 1831.
Astragalus dorychnioides Dougl.; G. Don, Gen. Hist. 2: 258. 1833.
Tragacantha succumbens Kuntze, Rev. Gen. 948. 1891.
Phaca succumbens Piper, Contr. U. S. Nat. Herb. 11: 370. 1906.

A perennial, branched below; stems rather stout, flexuose, 2-4 dm. long, hirsute with spreading or retrorse hairs, decumbent or ascending; leaves spreading, 5-10 cm. long; stipules lanceolate to ovate-lanceolate, 1 cm. long; leaflets 13-17, obovate to elliptic, 1-2 cm. long, 5-8 mm. wide, obtuse, hirsute on both sides; peduncles stout, spreading, 3-5 cm. long; racemes dense, head-like; bracts linear-subulate, falcate, about 1 cm. long, pubescent; calyx hirsute, the tube about 8 mm. long, 3 mm. wide, the teeth subulate, 3-4 mm. long; corolla white or tinged with rose, about 2 cm. long; banner oblong-obovate, retuse; wings fully as long, the blade oblong, with a rounded basal auricle; keel-petals much shorter, the blade broadly lunate, nearly semicircular, with a large basal auricle; pod oblong, slightly arcuate, glabrous, 3-4 cm. long, 5-6 mm. wide and 3 mm. thick, deeply sulcate on the lower suture, abruptly acuminate, inversely Y-shaped in cross-section.

TYPE LOCALITY: Barren grounds of the Columbia, Washington.

DISTRIBUTION: Columbia Valley of Washington and Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 57; pl. 58, f. 187.

2. **Malacae.** Cespitose stout perennials; stem leafy, as well as the leaves villous or silky with long hairs; racemes elongate; flowers middle-sized, about 1.5 cm. long; calyx deeply campanulate; pod broad, oblong or linear, somewhat compressed, sulcate on the lower suture, narrowly cordate in cross-section.

2. *Hamosa malaca* (A. Gray) Rydb. Fl. Rocky Mts. 496,

1063. 1917.

- Astragalus malacus* A. Gray, Proc. Am. Acad. 7: 336. 1868.
Tragacantha malaca Kuntze, Rev. Gen. 946. 1891.
Astragalus obfalcatus A. Nelson, Bot. Gaz. 54: 411. 1912.
Astragalus malacus obfalcatus M. E. Jones, Rev. Astrag. 227. 1923.

A cespitose perennial; stems stout, decumbent at the base, 1-3 dm. high, hirsute; leaves 5-20 cm. long, ascending or spreading; stipules thin, deltoid, acuminate, 1-1.5 mm. long,

partly adnate to the petiole; leaflets 15-21, elliptic to obovate, 1-2 cm. long, 5-10 mm. wide, hirsute on both sides, rounded at the apex; peduncles stout, 5-10 cm. long; racemes many-flowered, 5-7 cm. long; bracts subulate, 5-8 mm. long; pedicels short; calyx hirsute-pilose, purple-tinged, the tube 7 mm. long, 2.5 mm. broad, the teeth subulate, 2-4 mm. long; corolla rose-purple, sometimes darkly so, about 2 cm. long; banner narrowly obovate, abruptly arched; wings shorter, the blade obliquely oblong, with a large basal auricle; keel-petals still shorter, the blade broadly lunate; pod 2.5-3.5 cm. long, 5-7 mm. wide and 3 mm. thick, sulcate on the ventral suture, densely long-pilose, narrowly cordate in cross-section.

TYPE LOCALITY: Near Carson City, Nevada.

DISTRIBUTION: Oregon, western Idaho, Nevada, and California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 57, f. 185 and var. *obfalcatus*.

3. *Hamosa Layneae* (Greene) Rydb. Bull. Torrey Club 54: 15. 1927.

Astragalus Fremontii var. Torr. Pac.R.R. Rep. 4: 80. 1857.

Astragalus Layneae Greene, Bull. Calif. Acad. 1: 156. 1885.

Astragalus malacus Layneae M. E. Jones, Zoc 4: 29. 1893.

A perennial, with a deep root and short cespitose caudex; stems 0.5-3 dm. long, with short internodes, strigose-canescens; leaves spreading, 7-12 cm. long; stipules deltoid, 7-10 mm. long, membranous, ciliate; leaflets 13-17, oval or broadly obovate, rounded or retuse at the apex, 1-1.5 cm. (rarely 2 cm.) long, 6-12 mm. wide, long-strigose on both sides, sometimes strongly canescens; peduncles 5-10 cm. long; racemes 5-15 cm. long, rather lax; bracts linear, 6-9 mm. long, scarious on the margins; calyx strigose, more or less black-hairy, the tube 6-7 mm. long, 3-4 mm. broad, the teeth subulate-lanceolate, about 2 mm. long; corolla white or pinkish, the tip deep-purple; banner 15-17 mm. (rarely 2 cm.) long, narrowly obovate, abruptly arcuate, retuse at the apex; wings shorter, the blade obliquely oblong, slightly falcate, with a large basal auricle; keel-petals nearly as long, the blade broadly lunate, semi-orbicular, obtuse with a large basal auricle; pod 3-5 cm. long and 6-7 mm. wide, pilose-canescens with somewhat kinked hairs, strongly arcuate, sometimes almost forming a complete circle, acuminate at each end, slightly sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Mohave Desert.

DISTRIBUTION: Southern Nevada and southeastern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 57, f. 186; Jepson, Man. Fl. Pl. Calif. f. 565.

4. *Hamosa Minthorniae* Rydb. Bull. Torrey Club 54: 15. 1927.

A perennial, probably cespitose; stems low, strigose and striate; leaves erect, 5-10 cm. long; stipules ovate, 7-8 mm. long; leaflets 11-17, obovate, 8-15 mm. long, 4-6 mm. wide, silky-canescens, rounded at the apex; peduncles 8-12 cm. long; racemes 6-10 cm. long; bracts lanceolate or lance-linear, 5-6 mm. long; calyx black-hairy, the tube 5-6 mm. long, the teeth subulate, 2 mm. long; corolla white, with a purple-tipped keel; banner obovate, 15 mm. long; wings much shorter, the blade oblong-falcate, with a large rounded auricle; keel-petals still shorter, broadly lunate, rounded at the apex; pod oblong, straight or slightly arcuate, 2-2.5 cm. long, 4 mm. thick and wide, shaggy-pilose, abruptly acute, orbicordate in cross-section.

TYPE LOCALITY: Vicinity of Pioche, Nevada.

DISTRIBUTION: Southern Nevada.

5. *Hamosa Andersonii* (A. Gray) Rydb. Bull. Torrey Club 54: 16. 1927.

Astragalus Andersonii A. Gray, Proc. Am. Acad. 6: 524. 1865.

Tragacantha Andersonii Kuntze, Rev. Gen. 943. 1891.

A perennial, with a cespitose woody caudex; stems many, 1-3 dm. high, villous-canescens; leaves ascending, 6-10 cm. long, rather long-petioled; stipules deltoid, 5-8 mm. long, acuminate, villous, the lower connate; leaflets 13-17, obovate, 8-10 mm. long, 4-6 mm. wide, villous-canescens; peduncles 3-5 cm. long; racemes dense at first, in age laxer, 3-5 cm. long; bracts subulate, 4 mm. long; calyx villous-canescens, the tube about 4 mm. long and 3 mm. wide, the teeth subulate, 3 mm. long; corolla white, or tinged with pink, about 1.5 cm. long; banner

obovate; wings shorter, the blade obliquely oblanceolate, with a large basal auricle; keel-petals much shorter, the blade broadly lunate, rounded at the apex, with a large auricle; pod oblong-lunate, arcuate, 1.5-2 cm. long, 3-4 mm. wide, and 2 mm. thick, villous-canescens, slightly sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Carson City, Nevada.
DISTRIBUTION: Western Nevada and eastern California.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 66, f. 225.

6. *Hamosa feensis* (M. E. Jones) Rydberg.

Astragalus feensis M. E. Jones, Contr. W. Bot. 8: 20. 1898.

A nearly acaulescent perennial; stems several, 1-2 cm. long; leaves crowded, 2-4 cm. long, ascending; stipules adnate to the petioles, deltoid, 3-4 mm. long; leaflets 13-17, crowded, obovate, densely canescent with rather long appressed hairs, 4-6 mm. long, rounded or emarginate at the apex; peduncles slender, 4-5 cm. long, erect; racemes short and few-flowered; bracts subulate, 1-2 mm. long; calyx canescent, the tube 4 mm. long, the teeth triangular, 1 mm. long; corolla unknown; pod sessile, narrowly lunate in outline, rounded at the base, gradually tapering at the apex, 2 cm. long, 3 mm. wide and thick, strigulose, rather firm, reticulate, deeply sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Santa Fé, New Mexico.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 56, f. 183.

3. *Scaposae*. Low, caespitose, pulvinate, acaulescent perennials; leaves silvery, silky; racemes few-flowered; flowers small, the banner broadly obovate and strongly arched, the wings broad and usually 2-lobed; pod short, oblong, compressed, silky, narrowly cordate in cross-section.

7. *Hamosa monophyllidia* Rydberg, sp. nov.

A subacaulescent, densely caespitose perennial, with a woody caudex; leaves numerous, 2-5 cm. long; leaflet solitary, obovate, rounded at the apex, cuneate at the base, 1-2 cm. long, 5-10 mm. wide, silvery-silky on both sides; peduncles 4-6 cm. long; racemes 2-6-flowered; bracts lance-ovate, 1 mm. long; pedicels 1 mm. long; calyx silvery-silky, the tube about 4 mm. long, the teeth subulate with a deltoid base, 2 mm. long; corolla white, cream-colored, or purple-tinged, about 12 mm. long; banner broadly obovate, abruptly arched; wings slightly 2-lobed, with a large auricle; keel-petals much shorter, the blade strongly lunate, broad at apex; pod (not mature) oblong, falcate, 12 mm. long, 4 mm. wide, strigose-canescens, slightly sulcate on the lower suture, narrowly cordate in cross-section.

Type collected in the vicinity of Currant, Nye County, Nevada, May 1916, *Georgia H. Bentley* (herb. N. Y. Bot. Gard.).

8. *Hamosa calycosa* (Torr.) Rydb. Bull. Torrey Club 40: 50. 1913.

Astragalus calycosus Torr.; S. Wats. Bot. King's Expl. 66. 1871.
Tragacantha calycosa Kuntze, Rev. Gen. 943. 1891.
Astragalus brevicaulis A. Nelson, Bull. Torrey Club 26: 9. 1899.

A subacaulescent, densely caespitose perennial, with woody caudex; leaves numerous, 2-6 cm. long; stipules deltoid, 3-5 mm. long; leaflets 3-7, oblong, oblanceolate, or obovate, 2-10 mm. long, silvery-silky on both sides, obtuse or acute; peduncles 2-5 cm. long; racemes 2-6-flowered; bracts ovate, 1-2 mm. long; pedicels 1-3 mm. long; calyx silvery-silky, the tube 4 mm. long, the teeth subulate-lanceolate, 2-3 mm. long; corolla white or purple, about 15 mm. long; banner broadly obovate, abruptly arched, deeply notched; wings slightly shorter, the blade obovate, deeply 2-lobed at the apex, with a large rounded auricle; keel-petals much shorter, the blade strongly arched above, with a rather indistinct auricle; pod oblong, acute, slightly arcuate, about 15 mm. long, 4 mm. wide and 3 mm. thick, strigose-canescens, slightly sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: West Humboldt Mountains, Nevada.
DISTRIBUTION: Western Wyoming and Idaho to eastern California.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 65, f. 219.

9. *Hamosa scaposus* (A. Gray) Rydb. Bull. Torrey Club
32: 659. 1906.

Astragalus scaposus A. Gray, Proc. Am. Acad. 13: 366. 1878.
Astragalus candicans Greene, Bull. Calif. Acad. 1: 156. 1885. Not *A. candicans* Pall. 1800.
Astragalus calycosus scaposus M. E. Jones, Zoe 4: 26. 1893.

A subcaulescent, densely cespitose perennial; stems numerous, very short, silvery-canescens; leaves 3-7 cm. long; stipules deltoid, 3-5 mm. long, canescent; leaflets elliptic to broadly obovate, 5-12 mm. long, 3-7 mm. wide, silvery-silky, rounded at the apex; peduncles 3-10 cm. long; bracts ovate, 1-2 mm. long; racemes 3-12-flowered; calyx silvery, the tube 5 mm. long, 2.5 mm. broad, the teeth deltoid, 1.5 mm. long; corolla purplish or white, 10-12 mm. long, similar to that of *H. calycosa*; pod oblong, strigose, acute, 15 mm. long, 3 mm. wide, and 2 mm. thick, sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Mokiah Pass, northwestern Arizona.

DISTRIBUTION: Southwestern Colorado, New Mexico, Arizona, and Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 65.

10. *Hamosa manca* Rydb. Bull. Torrey Club 54: 17. 1927.

An acaulescent tufted cespitose perennial, with a short woody caudex; stems less than 1 cm. long; leaves 1.5-2 cm. long; stipules deltoid, 2 mm. long; leaflets 6-11, elliptic-oblancoate, 2-4 mm. long, 1-2 mm. wide, acute or obtusish, silvery-canescens; peduncles slender, 2-5 cm. long; racemes 1- or 2- (rarely 3-) flowered; bracts lanceolate, 1 mm. long; calyx campanulate, silvery-strigose, the tube 3-4 mm. long, the teeth deltoid, 1 mm. long; corolla about 1 cm. long, ochroleucous, the keel tipped with purple; banner broadly obovate, deeply notched; wings of about the same length, broad, 2-lobed at the apex; keel-petals broadly lunate, rounded at the apex; pod oblong-ovate, about 1 cm. long and 4 mm. wide, sericeous.

TYPE LOCALITY: Clover Mountains, Nevada, near Death.

DISTRIBUTION: Northeastern Nevada.

4. *Tricarinatae*. Perennial herbs, with a woody caudex and leafy stems; leaves glabrous or short-strigose; calyx-tube short-campanulate; flowers usually middle-sized, 7-15 mm. long; pod linear or nearly oblong, glabrous or strigose, more or less arcuate; somewhat compressed, sulcate but not deeply so on the lower suture, cordate in cross-section.

11. *Hamosa umbratica* (Sheldon) Rydb. Bull. Torrey Club
54: 19. 1927.

Astragalus sylvaticus S. Wats. Proc. Am. Acad. 23: 262. 1888. Not *A. sylvaticus* Willd. 1803.
Astragalus umbraticus Sheldon, Minn. Bot. Stud. 9: 23. 1894.

A perennial; stems several from a short crown, 3-6 dm. high, erect, striate, glabrous, straw-colored; leaves ascending, 7-12 cm. long; stipules lanceolate, acuminate, about 8 mm. long; leaflets 17-21, oval to elliptic-oblong, usually retuse at the apex, thin, glabrous; peduncles 6-10 cm. long; racemes 2-5 cm. long, rather many-flowered; bracts lance-subulate, about 3 mm. long; pedicels 2-3 mm. long; calyx sparingly black-hairy, the teeth lance-subulate, 2 mm. long; corolla white or ochroleucous, about 1 cm. long; banner obovate, abruptly arcuate, notched; wings a little shorter, the blade oblong-oblancoate, falcate, obtuse or rounded at the apex; keel-petals slightly shorter, the blade strongly curved, broadly lunate, rounded at the apex; pod glabrous and shining, reflexed, strongly and regularly arched, tapering at each end, 2 cm. long, 3 mm. wide, and 2 mm. thick, deeply sulcate on the lower suture, narrowly cordate in cross-section.

TYPE LOCALITY: Glendale, southern Oregon.

DISTRIBUTION: Oregon and northern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 66, f. 226.

12. *Hamosa bernardina* (M. E. Jones) Rydb. Bull. Torrey Club
54: 19. 1927.

Astragalus bernardinus M. E. Jones, Proc. Calif. Acad. II, 5: 661. 1895.

A perennial, with a deep root and short caudex; stems several from the base, about 2 dm. high, ascending, slender, strigose, terete; leaves spreading, arcuate, 5-8 cm. long; stipules

lanceolate, 2-3 mm. long; leaflets 9-15, oblong, 8-12 mm. long, 2-3 mm. wide, mostly rounded at the apex, strigose-canescens on both sides; peduncles 2.5-6 cm. long; racemes 4-6 cm. long; bracts lanceolate, 1 mm. long; calyx more or less black-hairy, the tube about 3 mm. long, the teeth about 2 mm. long, subulate; corolla purple-tinged, 7-8 mm. long; banner obovate, slightly notched, strongly arched; wings shorter, the blade oblong, rather strongly falcate, with a reflexed auricle; keel-petals nearly as long, the blade broadly lunate, acute, purple-tipped; pod 2.5-3 cm. long, 3-3.5 mm. wide and 2 mm. thick, glabrous, slightly arcuate or nearly straight, except at the base, triangular-cordate in cross-section.

TYPE LOCALITY: Moronyo King Mine, east side of Bernardino Mountains, California.

DISTRIBUTION: San Bernardino and Charleston mountains, southern California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 65, f. 220.

13. *Hamosa tricarinata* (A. Gray) Rydb. Bull. Torrey Club

54: 20. 1927.

Astragalus tricarinatus A. Gray, Proc. Am. Acad. 12: 56. 1876.

A perennial, from a woody base; stems erect, 3-5 dm. high, stout, strigose; leaves 10-15 cm. long, ascending; stipules ovate, 2 mm. long; leaflets 25-35, oval, 7-15 mm. long, rounded or retuse at the apex, silvery above, strigose beneath with short lanceolate hairs; peduncles 1-2 dm. long; racemes lax, 5-10 cm. long; bracts lanceolate, 2 mm. long; calyx black-hairy, the tube 4 mm. long and nearly as broad, the teeth lance-subulate, 2 mm. long; corolla white; banner broadly obovate, abruptly arcuate, about 15 mm. long; wings 12 mm. long, the blade lanceolate, falcate, with a large reflexed auricle; keel-petals 10 mm. long, the blade broadly lunate, strongly arched, obtuse; pod glabrous, slightly arcuate, 3-3.5 cm. long, 4-5 mm. wide and 4 mm. thick, broadly sulcate on the lower suture, deeply cordate in cross-section.

TYPE LOCALITY: White Water, San Bernardino County, California.

DISTRIBUTION: San Bernardino County, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 65, f. 221.

14. *Hamosa Greggii* (S. Wats.) Rydb. Bull. Torrey Club

54: 20. 1927.

Astragalus Greggii S. Wats. Proc. Am. Acad. 17: 343. 1882.

A perennial, with a caespitose caudex; stems decumbent, 2-3 dm. long, densely short-villous with white hairs; leaves spreading, 2-4 cm. long; stipules deltoid, connate at the apex, 2-5 mm. long, villous; peduncles 4-8 cm. long; bracts deltoid, 2 mm. long; calyx villous; corolla 8-10 mm. long, white or red (?); banner broadly obovate; wings slightly shorter, the blade elliptic, falcate; keel-petals much shorter, the blade strongly lunate, rounded at the apex; pod linear, somewhat falcate, compressed, about 2 cm. long, 3 mm. wide, 2 mm. thick, glabrous, deeply sulcate on the lower suture; seeds nearly black, obliquely reniform, 2 mm. long.

TYPE LOCALITY: Saltillo, Coahuila.

DISTRIBUTION: Coahuila.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 69, f. 246.

15. *Hamosa Congdoni* (S. Wats.) Rydb. Bull. Torrey Club

54: 20. 1927.

Astragalus Congdoni S. Wats. Proc. Am. Acad. 20: 360. 1885.

A perennial, with a caespitose caudex; stems several, decumbent, 1-4 dm. long, white-villous when young, flexuous; leaves ascending, 5-10 cm. long; stipules deltoid, acuminate, 3-4 mm. long; leaflets 13-25, oval or elliptic, 8-15 mm. long, rounded or truncate at the apex, at first densely white-villous, especially beneath; peduncles 6-10 cm. long; racemes 5-12 cm. long; bracts lance-subulate, 2 mm. long; calyx black-villous, the tube 4 mm. long and 2-2.5 mm. broad, the teeth subulate, 2 mm. long; corolla white; banner narrowly obovate, strongly arched, about 16 mm. long; wings about 12 mm. long, the blade oblong, falcate, obtuse, with a

reflexed auricle; keel-petals about 10 mm. long, the blade broadly lunate, obtuse, with a broad auricle; pod densely strigulose, canescent when young, fully 2 cm. long, 2-3 mm. wide and thick, moderately arcuate, acute at each end, cordate in cross-section.

TYPE LOCALITY: Hite's Cove on the Merced River, Mariposa County, California.

DISTRIBUTION: Mariposa County, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 66, *f.* 224.

16. *Hamosa Gooddingii* Rydb. Bull. Torrey Club 54: 20. 1927.

A perennial, with a caespitose caudex; stems decumbent, about 1 dm. high, strigose; leaves spreading, 2-3 cm. long; stipules ovate, 2-3 mm. long; leaflets 9-13, obovate to elliptic, rounded or obtuse at the apex, 3-5 mm. long, 2-3 mm. wide, glabrous above, strigose beneath; peduncles 7-10 cm. long, strigose, arcuate; racemes 2-4 cm. long; bracts 2 mm. long, lanceolate; calyx strigose with mixed black and white hairs, the tube 4 mm. long, the teeth subulate, 2 mm. long; corolla dark, bluish-purple, about 1 cm. long; banner obovate, retuse; wings shorter, the blade oblong-falcate, with a broad basal auricle; keel-petals much shorter, the blade broadly lunate, strongly arched, rounded at the apex; pod lance-linear, 1.5-2 cm. long, 3 mm. wide and thick, somewhat falcate, minutely strigose or in age glabrate, deeply cordate in cross-section, membranous.

TYPE LOCALITY: Rocky slope in the Huachuca Mountains, Arizona.

DISTRIBUTION: Known only from the type locality.

17. *Hamosa ensiformis* (M. E. Jones) Rydb. Bull. Torrey Club 54: 21. 1927.

Astragalus ensiformis M. E. Jones, Proc. Calif. Acad. II. 5: 658. 1895.

A perennial, with a scaly rootstock; stem about 1 dm. high, purplish, sparingly strigose; leaves 5-8 cm. long, ascending; stipules large, broadly ovate, 1 cm. long, scarious, veiny; leaflets 13-17, green, oval or elliptic, rounded at the apex, 1-1.5 cm. long, glabrous above, sparingly strigose-canescens beneath; peduncles 5-8 cm. long, erect; bracts lanceolate, brownish-purple, 3 mm. long; pedicels short; calyx pubescent with dark and light hairs intermixed, the tube 5 mm. long, the teeth lanceolate, 1 mm. long; corolla unknown; pod linear-oblong, falcate, 2-2.5 cm. long, 5-6 mm. wide and 3 mm. thick, strigose, elliptic in cross-section, with prominent sutures.

TYPE LOCALITY: Above Pagumpa, Arizona.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 56.

18. *Hamosa drepanoloba* (A. Gray) Rydb. Bull. Torrey Club 54: 21. 1927.

? *Astragalus diaphanus* Dougl.; Hook. Fl. Bor. Am. 1: 151. 1831.

Astragalus drepanolobus A. Gray, Proc. Am. Acad. 19: 75. 1883.

? *Astragalus lentiginosus diaphanus* M. E. Jones, Proc. Calif. Acad. II. 5: 675. 1895.

A perennial, with a deep taproot; stems several, sometimes purplish, 1-3 dm. long, more or less hirsutulous-strigose; leaves spreading, 3-6 cm. long; stipules ovate, 3 mm. long, acuminate; leaflets 9-13, obovate, often retuse at the apex, cuneate at the base, glabrous above, sparingly strigose beneath; peduncles 2-5 cm. long; racemes 2-5 cm. long; bracts lanceolate, 1-2 mm. long; calyx more or less black-hairy, the tube 2.5 mm. long, the teeth lance-subulate, 1-5 mm. long; corolla light-purple, fading white; banner about 1 cm. long, distinctly purple-veined, narrowly obovate, deeply notched; wings much shorter, the blade oblanceolate, falcate, with a reflexed auricle; keel-petals much shorter, the blade broadly lunate; pod about 2 cm. long, 4-5 mm. wide and 3 mm. thick, thin-walled, sometimes purplish, minutely strigose, strongly arcuate, deeply sulcate on the lower suture, deeply cordate in cross-section.

TYPE LOCALITY: On John Day River at Scott's Bridge, Oregon.

DISTRIBUTION: Washington, Oregon, and Nevada.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 66, *f.* 223.

19. *Hamosa Paysonii* Rydb. Bull. Torrey Club 54: 22. 1927.

A perennial, with a woody caudex; stems many, about 5 dm. high, glabrous or nearly so, striate, light-green; leaves ascending, 7-10 cm. long; stipules deltoid, 3-4 mm. long; leaflets ovate or oval, deeply notched at the apex, 10-17 mm. long, 4-10 mm. wide, glabrous above, strigose beneath; peduncles 5-10 cm. long, erect; racemes 4-5 cm. long; bracts lance-subulate, 2 mm. long or less; calyx black-hairy, the tube 2.5-3 mm. long, the teeth subulate, 2 mm. long; corolla white, 6-8 mm. long; banner obovate, rather abruptly arched; wings shorter, the blade rather broad, elliptic; keel-petals shorter, broadly lunate, rounded at the apex; pod (immature) oblong, tapering at each end, 2 cm. long, 3 mm. wide and thick, strigose, the cross-section somewhat cordate.

TYPE LOCALITY: Horse Creek, seven miles west of Merna, Sublette County, Wyoming.
DISTRIBUTION: Known only from the type locality.

20. *Hamosa albens* (Greene) Rydb. Bull. Torrey Club 54: 22. 1927.

Astragalus albens Greene, Bull. Calif. Acad. 1: 156. 1885.

A perennial, with a deep root and short caudex; stems many, decumbent or spreading, 2-5 dm. long, strigose with white hairs, flexuose; leaves 3-6 cm. long, spreading; stipules deltoid, 3-4 mm. long, sparingly strigose; leaflets 7-11, broadly obovate, 5-10 mm. long, silvery on both sides, mostly rounded at the apex; peduncles 3-5 cm. long; racemes elongate, about as long; bracts subulate, 1 mm. long; pedicels 1-1.5 mm. long; calyx silvery, the tube 2 mm. long, the teeth subulate, 1 mm. long; corolla purple, about 8 mm. long; banner broadly obovate, abruptly arcuate; wings shorter, the blade obliquely oblanceolate; keel-petals nearly as long as the banner, the blade very broad, strongly arcuate at the rounded apex; pod arcuate, silvery, acute at each end, 1.5-2 cm. long, about 3.5 mm. wide, and 2 mm. thick, white-strigose, deeply sulcate on the lower suture, narrowly cordate in cross-section.

TYPE LOCALITY: Mohave Desert.
DISTRIBUTION: Mohave and Colorado deserts.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 66, f. 227.

21. *Hamosa arizonica* (A. Gray) Rydb. Bull. Torrey Club 54: 22. 1927.

Astragalus arizonicus A. Gray, Proc. Am. Acad. 7: 398. 1868.
Tragacantha arizonica Kuntze, Rev. Gen. 943. 1891.

A perennial; stems white-strigose, procumbent or prostrate, flexuose, 2-5 dm. long; leaves ascending, 6-10 cm. long; stipules deltoid, about 3 mm. long; leaflets 9-17, linear or oblong, mostly acute, 1-3 cm. long, 2-3 mm. wide, silky-canescens on both sides; peduncles 5-15 cm. long; racemes elongate, 3-8 cm. long; calyx white-strigose, rarely with some black hairs, the tube 4 mm. long, the teeth subulate, with a deltoid base, 2 mm. long; corolla white, about 1 cm. long; banner obovate; wings slightly shorter, the blade oblong, falcate, obtuse, with a reflexed auricle; keel-petals slightly longer, broadly lunate, strongly arcuate near the slightly produced but blunt tip; pod linear, 2-4 cm. long, slightly arcuate, strigose, slightly sulcate on the lower suture, cuneately cordate in cross-section.

TYPE LOCALITY: Near Camp Grant, Arizona.
DISTRIBUTION: New Mexico, Arizona, and Sonora.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 65, f. 218.

22. *Hamosa Coahuilae* (M. E. Jones) Rydb. Bull. Torrey Club 54: 23. 1927.

Astragalus Coahuilae M. E. Jones, Rev. Astrag. 256. 1923.

A perennial, somewhat woody at the base; stem much branched, especially at the base, 3-6 dm. high, canescent with short kinked hairs; leaves 4-8 cm. long, ascending; stipules deltoid, 3-5 mm. long; leaflets 9-23, elliptic or oblong, obtuse, 6-12 mm. long, canescent with short

kinked hairs on both sides; peduncles 5-7 cm. long, slender, erect; racemes 3-6 cm. long; bracts lanceolate, 2 mm. long; calyx canescent with kinked hairs, the tube 3 mm. long, the teeth subulate, nearly 2 mm. long; corolla purplish or white, 8-10 mm. long; banner obovate, abruptly arched; wings shorter than the banner, the blade oblanceolate, falcate; keel-petals slightly shorter, strongly arcuate at the obtuse apex; pod ascending, arcuate, 1.5 cm. long, 3 mm. wide and thick, sulcate on the lower suture, deeply cordate in cross-section.

TYPE LOCALITY: Parras, Coahuila.

DISTRIBUTION: Coahuila.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 65, f. 217.*

23. *Hamosa madrensis* (M. E. Jones) Rydberg.

Astragalus madrensis M. E. Jones, Rev. Astrag. 274. 1923.

A perennial, with a taproot and woody caespitose caudex; stems decumbent at the base, 3-5 dm. high, striate, sparingly strigose; leaves 6-10 cm. long, ascending; stipules lanceolate, 3 mm. long; leaflets 15-21, oblong, 5-15 mm. long, cuneate at the base, usually retuse at the apex, sparingly strigose beneath, glabrous above; peduncles about 5 cm. long; racemes 4-6 cm. long, few-flowered; bracts lanceolate, 3 mm. long; calyx canescent, silky-strigose, the tube 5 mm. long, the teeth subulate, 2 mm. long; corolla about 1 cm. long, pale; banner obovate, striped with purple, strongly arched at the middle; wings about as long, the blade obliquely obovate, nearly straight; keel-petals much shorter, the blade lunate, obtuse; pod linear, slightly falcate, 1-1.5 cm. long, 2 mm. wide and 1.5 mm. thick, strongly reflexed, sulcate on the lower suture.

TYPE LOCALITY: Sierra Madre, Chihuahua.

DISTRIBUTION: Chihuahua and western Texas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 69.*

5. **Leptocarpace.** Weak annuals; stems usually branched below; racemes few-flowered; flowers small or middle-sized; calyx-tube short, campanulate, often not longer than the teeth; keel-petals of the corolla acute or obtuse but not beaked; pod strongly flattened, linear, narrowly cordate in cross-section.

24. *Hamosa Bruceae* (M. E. Jones) Rydb. Bull. Torrey Club 54: 323. 1927.

Astragalus tener Bruceae M. E. Jones, Rev. Astrag. 268. 1923.

A slender annual; stems less than 1 dm. high, sparingly strigose or glabrate, branched at the base, often reddish or purplish; leaves 3-5 cm. long, ascending; stipules broadly ovate, 2-3 mm. long; leaflets 6-9, mostly cuneate-obovate, deeply notched, 5-10 mm. long, strigose beneath, glabrate above; peduncles 3-5 cm. long, very slender; racemes short, 2-4-flowered; bracts lanceolate, 1 mm. long; calyx black-hairy, the tube about 2 mm. long, the teeth subulate, 1 mm. long; corolla bluish-purple, 8 mm. long; pod falcate, lunate, 1.5-2 cm. long, 4 mm. wide and 3 mm. thick, glabrous, reticulate, purplish-mottled, sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Butte County, California.

DISTRIBUTION: Butte County, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 68.*

25. *Hamosa Kelloggiana* Rydb. Bull. Torrey Club 54: 323. 1927.

Astragalus hypoglottis strigosus Kellogg, Proc. Calif. Acad. 2: 115. 1861.

A slender annual; stem glabrous or sparingly strigose, 1-2 dm. high, branched at the base; leaves 5-6 cm. long, ascending; stipules lance-deltoid, about 3 mm. long; leaflets 5-13, those of the lower leaves oblong or cuneate, 1 cm. long or less, those of the other leaves linear, 1-2 cm. long, acute or obtuse, 1-2 mm. wide, strigose beneath; peduncles 4-6 cm. long; racemes very short, 4-7-flowered; bracts lanceolate, 1 mm. long; calyx black-hairy, the tube 2 mm. long, the teeth lance-subulate, 1.5 mm. long; corolla bluish-purple, striate, 8 mm. long, similar to

that of *H. tenera*; pod about 1.5 cm. long, arcuate, lunate, glabrous, 3 mm. wide and 2.5 mm. thick, cordate in cross-section.

TYPE LOCALITY: Vallejo, California.

DISTRIBUTION: Central California.

ILLUSTRATION: Jepson, Man. Fl. Pl. Calif. f. 569 (as *Astragalus tener*); Proc. Calif. Acad. 2: f. 37.

26. *Hamosa tenera* (A. Gray) Rydb. Bull. Torrey Club

54: 322. 1927.

Phaca astragalina β Hook. & Arn. Bot. Beech. Voy. 334. 1838.

Astragalus hypoglottis strigosus Kellogg, Proc. Calif. Acad. 2: 115, in part. 1861.

Astragalus tener A. Gray, Proc. Am. Acad. 6: 206. 1864.

Tragacantha tenera Kuntze, Rev. Gen. 948. 1891.

Astragalus strigosus Sheldon, Minn. Bot. Stud. 9: 24. 1894.

Astragalus pauperculus Greene, Pittonia 3: 224. 1897.

Astragalus Titi Eastw. Bull. Torrey Club 32: 195. 1905.

A slender annual; stem at first erect, later branched at the base and spreading, 0.5–2 dm. long, sparingly strigose or glabrate; leaves 3–5 cm. long, ascending; stipules ovate-deltoid, acuminate, 2 mm. long, adnate to the petioles; leaflets 5–13, strigose beneath, glabrous above, 5–12 mm. long, those of the lower leaves cuneate or obcordate, retuse, those of the upper leaves mostly oblong or linear, retuse or truncate, rarely obtuse at the apex, cuneate at the base; peduncles 3–5 cm. long, slender; racemes very short, head-like, 2–7-flowered; bracts lanceolate, 1 mm. long; pedicels about 1 mm. long; calyx black-hairy, the tube less than 2 mm. long, the teeth lance-subulate, 1 mm. long; corolla 6–8 mm. long, bluish-purple, with the claws yellowish; banner obovate, broadly emarginate; wings 1–2 mm. shorter, the blade oblong, strongly arcuate, very obtuse at the apex, with a long reflexed basal auricle; keel-petals much shorter, the blade broadly lunate, strongly arcuate and acute at the apex; pod 1–1.5 cm. long, 2 mm. wide, and 2.5 mm. thick, canescent, nearly straight, sulcate on the lower suture, broadly cordate in cross-section.

TYPE LOCALITY: California.

DISTRIBUTION: California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 68, f. 237.

27. *Hamosa Clariana* (Jepson) Rydberg.

Astragalus Clarianus Jepson, Man. Fl. Pl. Calif. 578. 1925.

An annual; stem branching from the base, 7–20 cm. high, glabrous; leaves 2–4 cm. long, spreading; stipules ovate, 2 mm. long; leaflets 7–11, oblong-cuneate or cuneate, emarginate, 4–8 mm. long, glabrous above, strigose beneath; peduncles 3–4 cm. long; racemes 2–6-flowered, subcapitate; bracts ovate, 1 mm. long; calyx black-hairy, the tube 2 mm. long, the teeth subulate, 1 mm. long; corolla white, tipped with purple, or more or less purple throughout, 9–11 mm. long; banner broadly obovate, strongly arched, slightly emarginate; wings shorter, the blade obliquely oblanceolate; keel-petals still shorter, the blade broadly lunate; pod subterete, attenuate below into a stipe-like base, minutely strigose, 3–4 cm. long, strongly curved.

TYPE LOCALITY: Rocky slopes, Napa Range, near St. Helena, California.

DISTRIBUTION: Northern California.

28. *Hamosa Rattani* (A. Gray) Rydb. Bull. Torrey Club

54: 324. 1927.

Astragalus Rattani A. Gray, Proc. Am. Acad. 19: 75. 1883.

An annual; stem soon branched at the base, about 3 dm. high, striate, glabrous or nearly so; leaves ascending, 2–5 cm. long; stipules deltoid, 2–3 mm. long; leaflets 9–15, cuneate to obovate-oblong, retuse, glabrous above, sparingly strigulose or glabrate beneath, 5–10 mm. long; peduncles 4–6 cm. long; racemes subcapitate, 5–10-flowered; bracts lanceolate, 1 mm. long; calyx black-hairy, the tube 2 mm. long, the teeth subulate, fully 1 mm. long; corolla bluish-purple, about 1 cm. long, similar to that of *H. tenera*; pod nearly straight, 4–6 cm. long, 2 mm.

thick and wide, tapering at each end, strigulose, slightly sulcate on the lower sutures, triangular-cordate in cross-section.

TYPE LOCALITY: Mendocino County, California, north of Mad River.

DISTRIBUTION: Mendocino to Butte County, California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl. 68, f. 238*; Jepson, Man. Fl. Pl. Calif. *f. 571*.

29. *Hamosa rattanoides* (M. E. Jones) Rydb. Bull. Torrey Club
54: 324. 1927.

Astragalus tener rattanoides M. E. Jones, Rev. Astrag. 268. 1923.

A slender annual; stem glabrous or sparingly strigose, 2-3 dm. high, striate; leaves ascending, 5-8 cm. long; stipules lanceolate, acuminate, 4-5 mm. long; leaflets 7-17, linear, 8-15 mm. long, 1-2 mm. wide, glabrous above, sparingly strigose beneath, acute or those of the lower leaves obtuse; peduncles 4-7 cm. long, slender; racemes subcapitate, 5-10-flowered; bracts ovate, 1 mm. long; calyx black-hairy, the tube 2 mm. long, the teeth subulate, fully 1 mm. long; corolla 8-10 mm. long, bluish-purple, striate with darker veins, similar to that of *H. tenera*; pod arcuate, linear, tapering at each end, strigulose, not mottled, 1.5-2 cm. long, 2-2.5 mm. wide and thick, sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Mount Eden, California.

DISTRIBUTION: Central California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 68*.

30. *Hamosa Lindheimeri* (A. Gray) Rydb.; Small, Fl. SE. U. S.
617, 1332. 1903.

Astragalus Lindheimeri A. Gray, Pl. Wright. 1: 52. 1852.

Tragacantha Lindheimeri Kuntze, Rev. Gen. 946. 1891.

A branched annual; stems diffuse, 2-4 cm. long, striate, sparingly strigose or glabrate; leaves 5-7 cm. long, spreading; stipules lanceolate, 4-5 mm. long; leaflets 13-17, oblong-cuneate to suborbicular, usually emarginate, sometimes truncate at the apex, cuneate at the base, 5-10 mm. long, glabrous above, sparingly strigose beneath, especially on the veins and margins; peduncles 3-5 cm. long, ascending; racemes short, 5-10-flowered; bracts subulate, 5 mm. long; pedicels 1-2 mm. long, the teeth subulate, 3-4 mm. long; corolla rose-purple; banner obovate, 12-13 mm. long, emarginate; wings 10-11 mm. long, the blade oblanceolate, somewhat emarginate, 3-4 times as long as the claw, the basal auricle small, reflexed; keel-petals 9-10 mm. long, the blade nearly semicircular, acutish, with a reflexed auricle; pod about 3 cm. long, 5-6 mm. wide, glabrous, strongly flattened, abruptly arched near the base.

TYPE LOCALITY: Along the Santa Clara, 10 miles south of New Braunfels, Texas.

DISTRIBUTION: Texas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 67, f. 235*.

31. *Hamosa leptocarpa* (T. & G.) Rydb.; Small, Fl. SE. U.S.
617, 1332. 1903.

Astragalus leptocarpus T. & G. Fl. N. Am. 1: 334. 1838.

Tragacantha leptocarpa Kuntze, Rev. Gen. 946. 1891.

Slender annual; stem at first simple, later branched at the base, 1-3 dm. high, sparingly strigose; leaves ascending, 3-6 cm. long; stipules lance-subulate, 4 mm. long; leaflets 11-19, cuneate-elliptic to cuneate-obovate, retuse at the apex, glabrous above, sparingly strigose on the midrib and margins beneath, 5-10 mm. long; peduncles 5-10 cm. long; racemes 2-4 cm. long, 5-12-flowered; bracts subulate, 2 mm. long; calyx strigose, the tube about 2 mm. long, the teeth subulate, of the same length; corolla purple; banner obovate, retuse, 9-11 mm. long; wings 6-8 mm. long, the blade obliquely oblanceolate, somewhat arcuate, rounded at the apex, the auricle reflexed; keel-petals 5-6 mm. long, the blade broadly lunate, the tip slightly porrect, acutish or obtuse; pod linear, glabrous, straight or nearly so, compressed, 2.5-3 cm. long, 2 mm. wide, the lower suture slightly sulcate.

TYPE LOCALITY: Near the Sabine River, Texas.

DISTRIBUTION: Texas and southwestern Arkansas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 68, f. 236*.

32. *Hamosa francisquitensis* (M. E. Jones) Rydberg.*Astragalus francisquitensis* M. E. Jones, Proc. Calif. Acad. II. 5: 666. 1895.*Astragalus lagunensis* M. E. Jones, Contr. W. Bot. 8: 11. 1898.*Astragalus francisquitensis lagunensis* M. E. Jones, Contr. W. Bot. 10: 61. 1902.

A slender annual, or according to the original description perennial; stems decumbent at the base, slightly strigose, 1-2 dm. long; leaves 5-10 cm. long; stipules subulate or lanceolate, 4 mm. long; leaflets 15-23, obovate-oblong, emarginate, 5-15 mm. long, strigose beneath; peduncles 5-10 cm. long; racemes short, 2-5 cm. long, 10-15-flowered; bracts deltoid, 1-2 mm. long; calyx strigose, the tube 3 mm. long, the teeth about 1.5 mm. long, subulate; corolla about 8 mm. long; banner oblong-obovate, arched above the middle; wings nearly as long, the blade oblong, slightly falcate; keel-petals shorter, the blade lunate, rounded at the apex; pod linear-oblong, glabrous, straight, about 12 mm. long, 2-3 mm. wide.

TYPE LOCALITY: San Francisco, Lower California.

DISTRIBUTION: Lower California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 61, f. 234 and var. *lagunensis*.33. *Hamosa Nuttalliana* (DC.) Rydb.; Small, Fl. SE. U.S.

617, 1332. 1903.

Astragalus micranthus Nutt. Jour. Acad. Phila. 2: 122. 1821. Not *A. micranthus* Desv. 1814.*Astragalus Nuttallianus* DC. Prodr. 2: 289. 1825.*Tragacantha micrantha* Kuntze, Rev. Gen. 941. 1891.*Astragalus Nuttallianus enneajugus* M. E. Jones, Contr. W. Bot. 8: 22. 1898.*Astragalus Nuttallianus quadrilateralis* M. E. Jones, Contr. W. Bot. 8: 22. 1898.

An annual; stem erect or ascending, 1-5 dm. high, branched at the base, sparingly strigulose or glabrate, striate; leaves ascending, 5-7 cm. long; stipules lanceolate, acuminate, 4-6 mm. long; leaflets cuneate to elliptic, 5-15 mm. long, 2-6 mm. wide, usually emarginate at the apex, cuneate at the base, glabrous above, sparingly strigulose on the veins and margins beneath; peduncles 4-8 mm. long; racemes very short, 3-10-flowered; bracts subulate, 3-4 mm. long; calyx sparingly strigulose, the tube 4 mm. long, the teeth subulate, distinctly longer; corolla purple-tipped; banner obovate, retuse, 5-6 mm. long; wings slightly shorter, the blade obliquely oblanceolate, obtuse, with a reflexed auricle; keel-petals shorter, the blade broadly lunate, acutish, with a reflexed auricle; pod linear, 2-3.5 cm. long, 3 mm. wide and thick, glabrous, arcuate below the middle, sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Red River, Arkansas.

DISTRIBUTION: Texas, Oklahoma, and western Arkansas; also at Palisades, Delta County, Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 68, f. 240.

34. *Hamosa leptocarpoides* (M. E. Jones) Rydb. Bull. Torrey Club

54: 326. 1927.

Astragalus Nuttallianus leptocarpoides M. E. Jones, Contr. W. Bot. 8: 22. 1898.

An annual; stem spreading, decumbent or prostrate, 1-1.5 dm. long, sparingly strigose, striate; leaves ascending or spreading, 2-4 cm. long; stipules lance-subulate, 3 mm. long; leaflets 11-21, oblong or oblong-cuneate, 3-5 mm. long, retuse, truncate or rounded at the apex, glabrous above, sparingly strigose beneath; peduncles 4-6 cm. long; racemes very short, 1-4-flowered; bracts lance-subulate, 1-2 mm. long; calyx sparingly strigulose, the tube about 2 mm. long, the teeth lance-subulate, 1.5 mm. long; corolla 6-7 mm. long, similar to that of *H. Nuttalliana*; pod glabrous, linear, 2-3 cm. long, 1.5-2 mm. wide, slightly and evenly arched, 12-20-seeded.

TYPE LOCALITY: Galveston Island, Texas.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 68.

35. *Hamosa montereyensis* Rydb. Bull. Torrey Club

54: 326. 1927.

An annual; stem branched at the base, decumbent, strigose, 1-2 cm. long; leaves 2-3 cm. long, spreading; stipules ovate, about 4 mm. long, ciliate; leaflets 13-19, oblong, 4-7 mm. long,

about 2 mm. wide, emarginate or truncate at the apex, cuneate at the base, glabrous above, grayish-strigose beneath, rather thick; peduncles 3-5 cm. long; racemes very short, 4-8-flowered; bracts lanceolate, 1-2 mm. long; calyx strigose, the tube 2 mm. long, the teeth lance-subulate, 2 mm. long; corolla purplish, 7-8 mm. long; banner broadly obovate, notched at the apex; wings about as long, the blade broadly oblanceolate, obtuse, with a reflexed auricle; keel-petals shorter, broadly lunate, abruptly incurved at the obtuse apex; pod glabrous, slightly and evenly arcuate, acute at each end, 1-1.5 cm. long, 3 mm. wide.

TYPE LOCALITY: Monterey, Nuevo León.

DISTRIBUTION: Known only from the type locality.

36. *Hamosa macilenta* Small, Fl. SE. U.S. 618, 1332. 1903.

A slender annual; stem sparingly strigose, often branched at the base, 1-2 dm. high; leaves ascending, 5-7 cm. long; stipules lanceolate, 3-4 mm. long; leaflets 11-19, linear or oblong, acute or obtuse, 4-12 mm. long, 1-3.5 mm. wide, sparingly pilose-strigose on both sides or glabrate above; peduncles 3-7 cm. long; racemes 2-3 mm. long; bracts lance-subulate, 2 mm. long; calyx strigose, the tube about 2 mm. long, the teeth subulate, 2 mm. long; corolla about 1 cm. long; banner purplish, obovate, retuse at the apex; wings apparently white or yellowish, the blade broadly oblanceolate, obtuse; keel-petals purple-tipped, the blade broadly lunate, rounded at the apex; pod glabrous, decidedly arcuate at the base, 2.5 cm. long, 2 mm. wide and thick, sulcate on the lower suture.

TYPE LOCALITY: Río Blanco, Texas.

DISTRIBUTION: Texas.

37. *Hamosa Emoryana* Rydb. Bull. Torrey Club 54: 327. 1927.

Astragalus Nuttallianus var. A. Gray, Pl. Wright. 1: 52. 1852.

Astragalus Nuttallianus var. [no. 1 and no. 2, in part] A. Gray, Pl. Wright 2: 43. 1853.

Astragalus Nuttallianus Jepson, Man. Fl. Pl. Calif. 579, mainly. 1925.

An annual; stem 1-3 dm. high, erect or decumbent below, branched at the base; leaves 3-5 cm. long, ascending; stipules lanceolate, 2-4 mm. long; leaflets 9-17, elliptic or oblong, obtuse or those of the upper leaves lance-oblong and acute, 2-10 mm., rarely up to 12 mm. long, strigose on both sides; peduncles 2-8 cm. long; racemes short, 3-10-flowered; bracts subulate, 2 mm. long; calyx strigose, the tube 2 mm. long, the teeth subulate, about as long; corolla purple-tipped; banner obovate, retuse, 6-7 mm. long; wings 5-6 mm. long, the blade oblanceolate, with a reflexed auricle; keel-petals shorter, broadly lunate, acutish; pod glabrous, linear, 2 cm. long, 3 mm. wide and thick, arcuate throughout, but more strongly so towards the base, cordate in cross-section.

TYPE LOCALITY: El Paso, Texas.

DISTRIBUTION: Western Texas to southeastern California, Chihuahua, and Coahuila.

38. *Hamosa davisiana* (Greene) Rydb. Bull. Torrey Club 54: 328. 1927.

Astragalus davisiana Greene; Rydb. Bull. Torrey Club 54: 328, as synonym. 1927.

An annual or perhaps perennial; stem branched at the base, decumbent, 1-1.5 dm. long, terete, hoary-canescens; leaves 2-3 cm. long, spreading; stipules ovate, acuminate, 4 mm. long; leaflets 11-15, oval or elliptic, 2-5 mm. long, hoary-canescens with ascending or spreading hairs; peduncles 1-3 cm. long; bracts lance-subulate, about 2 mm. long; calyx hirsute, the tube 2 mm. long, the teeth subulate, nearly as long; corolla apparently white, 7-8 mm. long, similar to that of *H. Nuttalliana*; pod uniformly arcuate, 12-18 mm. long, 2.5 mm. wide and thick, glabrous, strongly reticulate, cordate in cross-section.

TYPE LOCALITY: Davis Mountains, Texas.

DISTRIBUTION: Known only from the type locality.

39. *Hamosa subuniflora* (Greene) Rydb. Bull. Torrey Club

54: 328. 1927.

Astragalus subuniflorus Greene, Leaflets 2: 42. 1910.

An annual; stem branched at the base, 1-1.5 dm. high, strigose; leaves ascending, 4-6 cm. long; stipules lance-subulate, 4-5 mm. long; leaflets 5-9, linear-oblanccolate or lance-linear, 5-13 mm. long, sparingly long-strigose on both sides, acute at each end; peduncles 4-7 cm. long; racemes 1-2-flowered; bracts subulate, 1-2 mm. long; calyx strigose, the tube about 2 mm. long, the teeth subulate, 2 mm. long; corolla apparently white, 6 mm. long, similar to that of *H. Emoryana*; pod arcuate, about 1.5 cm. long, 2 mm. wide and thick, glabrous, slightly sulcate on the lower suture.

TYPE LOCALITY: Near Tehuacán, Puebla.

DISTRIBUTION: KNOWN only from the type locality.

40. *Hamosa imperfecta* Rydb. Bull. Torrey Club 54: 329. 1927.

An annual; stem branched at the base, decumbent, 2-3 dm. long, very sparingly strigose straw-colored, terete; leaves 2-4 cm. long; stipules lanceolate, 2 mm. long; leaflets lance-oblong or lance-linear, acute at each end, strigose beneath, glabrate above, 5-10 mm. long; peduncles 3-8 cm. long; racemes usually 2-flowered; bract subulate, 1 mm. long; calyx strigose, often partly with black hairs, the tube less than 2 mm. long, the teeth subulate, of about the same length; corolla apparently white, 5 mm. long; pod arcuate especially at the base, glabrous, 15-18 mm. long, 2 mm. broad, and 3 mm. deep, slightly sulcate on the lower suture, only partially 2-celled, the partition very narrow; seeds 2.5 mm. long.

TYPE LOCALITY: Rhyolite, Nye County, Nevada.

DISTRIBUTION: Nevada, Arizona, and Lower California.

41. *Hamosa austrina* Small, Fl. SE. U.S. 618, 1332. 1903.*Astragalus Nuttallianus trichocarpus* T. & G. Fl. N. Am. 1: 334. 1838.*Astragalus trichocarpus* M. J. Young, Fl. Tex. 228, in part. 1873. Not *A. trichocarpus* Wall. 1868.

An annual; stem branched at the base, terete, strigose, 1-4 dm. long, often decumbent in age; leaves 2-5 cm. long; stipules lanceolate, acuminate, 4-5 mm. long; leaflets of the lower leaves mostly oval and obtuse, those of the upper elliptic or oblong or even linear and often acute, strigose on both sides, 5-12 mm. long; peduncles 3-8 cm. long; racemes very short, 3-8-flowered; bracts lanceolate, 1 mm. long; calyx strigose, the tube about 2 mm. long, the teeth 2-3 mm. long; corolla white or tinged with purple, 4-5 mm. long; banner obovate, retuse; wings nearly as long, the blade obovate or oblanceolate, somewhat falcate, with a reflexed auricle; keel-petals slightly shorter, the blade broadly lunate, acute or obtuse; pod strigose, 1.5-2 cm. long, 2 mm. wide and thick, arcuate towards the base, the cross-section cordate.

TYPE LOCALITY: "Rio Fronteras, Texas" [in reality Sonora].*

DISTRIBUTION: Texas to Colorado, Utah, Lower California, and Durango.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 63.

42. *Hamosa pertenuis* (Greene) Rydb. Bull. Torrey Club

54: 329. 1927.

Astragalus sp. Vasey & Rose, Contr. U. S. Nat. Herb. 1: 15. 1893.*Astragalus cedrosensis* Vasey & Rose, Contr. U. S. Nat. Herb. 1: 15, as synonym. 1893.*Astragalus pertenuis* Greene, Leaflets 2: 42. 1910.*Astragalus Nuttallianus cedrosensis* M. E. Jones, Rev. Astrag. 270. 1923.

A slender annual; stem very slender, decumbent, 2-3 dm. long, branched at the base, sparingly strigose, terete; leaves 2-5 cm. long, ascending; stipules lanceolate or subulate, 1-2 mm. long; leaflets of the lower leaves 2-7, cuneate or obovate, retuse at the apex, 3-5 mm. long, those of the upper leaves oblong or linear, 5-10 mm. long, strigose beneath and usually glabrate above; peduncles 3-6 cm. long; racemes 1-3-flowered; bracts lanceolate, 1 mm. long;

* At the time of the Mexican Boundary Survey, there was a Frontera, Texas, near El Paso, and also a Fronteras, Sonora. On the type sheet the state is not given, but it is on a duplicate sheet as Sonora.

calyx strigose, the tube about 1.5 mm. long, the teeth 1 mm. long; corolla tipped with purple, 4-5 mm long; pod arcuate, 10-12 mm. long, 2 mm. wide and thick, strigose, slightly sulcate on the lower suture.

TYPE LOCALITY: Cedros Island, Lower California.
DISTRIBUTION: Lower California.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 68.

6. *Acutirostres*. Annuals or sometimes short-lived perennials; stem branched below; racemes with rather small flowers; calyx-tube short, campanulate, at least equaling the teeth; keel-petals with a distinct beak; pod flattened, erect or strongly ascending, slightly falcate.

43. *Hamosa nothoxys* (A. Gray) Rydb. Bull. Torrey Club
54: 330. 1927.

Astragalus nothoxys A. Gray, Proc. Am. Acad. 6: 232. 1864.
Tragacantha nothoxys Kuntze, Rev. Gen. 946. 1891.
Oxytropis nothoxys M. E. Jones, Proc. Calif. Acad. II. 5: 677. 1895.
Spiesia nothoxys M. E. Jones, Proc. Calif. Acad. II. 5: 677. 1895.
Aragallus nothoxys A. Heller, Cat. N. Am. Pl. 4. 1898.

An annual or perennial, branched at the base; stems several, decumbent at the base, 1-4 dm. high, sparingly strigose or glabrate; leaves ascending, 3-8 cm. long; stipules lanceolate, 2-4 mm. long; leaflets 13-19, obovate or oval, rounded or retuse at the apex, 4-10 mm. long, glabrous above, strigulose beneath; peduncles 5-15 cm. long; racemes 2-8 cm. long, short in flowers, elongate in fruit; bracts lanceolate, 2 mm. long; calyx canescent-strigose, often with a few black hairs, the tube 4-5 mm. long, the teeth subulate, about 2 mm. long; corolla white or tipped with purple, about 1 cm. long; banner broadly obovate, slightly retuse, abruptly arcuate; wings nearly as long, the blade oblong below, spatulate above, with a basal auricle; wing-petals much shorter, the blade semiorbicular, acuminate, the beak erect, the basal auricle rounded; pod erect or ascending, 1.5-2 cm. long, 3 mm. wide, and 2.5 mm. thick, acuminate, minutely strigose, deeply cordate in cross-section.

TYPE LOCALITY: San Luis Mountains, Sonora.
DISTRIBUTION: Arizona, Sonora, and Chihuahua.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 69, f. 242.

44. *Hamosa acutirostris* (S. Wats) Rydb. Bull. Torrey Club
54: 331. 1927.

Astragalus acutirostris S. Wats. Proc. Am. Acad. 20: 360. 1885.
Astragalus streptopus Greene, Bull. Calif. Acad. 1: 155. 1885.
Oxytropis acutirostris M. E. Jones, Proc. Calif. Acad. II. 5: 677. 1895.
Aragallus acutirostris A. Heller, Cat. N. Am. Pl. 4. 1898.

An annual; stem 0.5-3 dm. long, branched at the base, terete, decumbent, strigose; leaves 2-3 cm. long, ascending; stipules ovate or lanceolate, 1-2 mm. long; leaflets 9-15, oblong to obovate, retuse at the apex, cuneate at the base, pubescent beneath with somewhat kinked hairs, 5-8 mm. long, thickish; peduncles 4-8 cm. long; racemes 2-4 cm. long, 3-5-flowered; bracts lanceolate, 1 mm. long; pedicels very short; calyx more or less black-hairy, the tube 1.5 mm. long, the teeth subulate, of about the same length; corolla whitish or purple-tipped, 4-5 mm. long; banner obovate; wings slightly shorter, the blades obovate; keel-petals about as long, broadly lunate, acuminate, the tip erect; pod slightly arcuate, 1.5-2 cm. long, 3 mm. wide, minutely strigose, reticulate, acute at each end, sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Brown's Ranch, Mohave Desert.
DISTRIBUTION: Mohave Desert, California.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 69, f. 241.

7. *Hartwegianae*. Leafy-stemmed perennials; stem simple; racemes elongate, many-flowered; flowers small, reflexed, 5-7 mm. long; calyx-tube short, campanulate, the teeth subulate; banner strongly arched; pod reflexed, oblong or lance-oblong, deeply triangular-cordate in cross-section.

45. *Hamosa militaris* (M. E. Jones) Rydberg, Bull. Torrey Club

54: 332. 1927.

Astragalus militaris M. E. Jones, Rev. Astrag. 278. 1923.

A perennial; stems several, decumbent at the base, slender, 2-4 dm. long, glabrous or nearly so, striate; leaves 4-8 cm. long, spreading or ascending; stipules lanceolate, 2-3 mm. long, green, strigose; leaflets 11-17, elliptic to narrowly oblong, 5-15 mm. long, 2-5 mm. wide, obtuse or rounded at the apex, strigose beneath, glabrous above; peduncles erect, 7-10 cm. long; bracts lanceolate, 1-2 mm. long, ciliolate; calyx sparingly strigose, the tube 2.5 mm. long, the teeth subulate, 1 mm. long; corolla dark-purple, 7-8 mm. long; banner obovate, deeply notched, strongly arched; wings nearly as long, the blade lanceolate, acutish, strongly falcate; keel-petals much shorter, broadly lunate, rounded at the apex; pod reflexed, lance-oblong, falcate, acute at each end, 12-15 mm. long, 2 mm. wide and 3 mm. thick, finely strigose with white hairs, acutely sulcate on the lower suture, deeply cordate in cross-section.

TYPE LOCALITY: Soldier Cañon, Sierra Madre, Chihuahua.

DISTRIBUTION: Chihuahua and San Luis Potosí.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 70, f. 257.

46. *Hamosa Saltonis* (M. E. Jones) Rydb. Bull. Torrey Club

54: 332. 1927.

Astragalus Saltonis M. E. Jones, Rev. Astrag. 279. 1923.

A perennial, with creeping rootstock; stems decumbent, flexuose, often branched below, 3-4 dm. high, sparingly strigose, sulcate; leaves spreading, 6-10 cm. long, the rachis strigose; stipules deltoid, 3-4 mm. long; leaflets 17-29, linear or oblong, obtuse, glabrous above, strigose beneath, 10-18 mm. long, 1-3 mm. wide; peduncles about 1 dm. long; racemes elongate, many-flowered, 5-10 cm. long; bracts lanceolate, 3-5 mm. long; pedicels 1 mm. long, reflexed; calyx black-hairy, the tube 2 mm. long and nearly as broad, gibbous at the base on the upper side, the teeth subulate, 1 mm. long; corolla white, only the keel sometimes tipped with purple; banner broadly obovate, 5-7 mm. long, strongly arched at the middle; wings nearly as long, the blade obliquely obovate, falcate, with a large auricle; keel-petals slightly shorter, the blade broadly obliquely obovate, with a large auricle; pod 1-1.5 cm. long, 3 mm. wide and thick, black-hairy with short hairs, oblong, slightly falcate, obliquely acute at the apex, the lower suture sulcate.

TYPE LOCALITY: Salto de Agua, State of Mexico.

DISTRIBUTION: Puebla to Hidalgo.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 70, f. 258.

47. *Hamosa Goldmani* (M. E. Jones) Rydb. Bull. Torrey Club

54: 332. 1927.

Astragalus Goldmani M. E. Jones, Rev. Astrag. 281. 1923.

A perennial, from a caespitose caudex; stems striate, erect, 2-3 dm. high, minutely strigose; leaves ascending, 4-7 cm. long; stipules lanceolate, 4-6 mm. long, herbaceous, distinct; leaflets 13-19, oblong to obovate, 5-12 cm. long, 2-4 mm. wide, strigose beneath, glabrate above, light-green; peduncles 6-10 cm. long, lax in fruit; calyx black-hairy, the tube barely 2 mm. long, the teeth subulate, 1 mm. long; corolla ochroleucous or white, 5-6 mm. long; banner broadly obovate, retuse, strongly arched; wings fully as long, the blade broadly elliptic, with a basal auricle; keel-petals shorter, the blade broadly lunate, rounded at the apex; pod 7-9 mm. long, 2 mm. wide and 3-4 mm. thick, white-silky-strigose, half-ovate, slightly arched, sulcate on the lower suture, broadly cordate in cross-section.

TYPE LOCALITY: Parral, Chihuahua.

DISTRIBUTION: Chihuahua and Durango.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 70, f. 263.

48. *Hamosa hidalgensis* Rydb. Bull. Torrey Club 54: 333. 1927.

A perennial; stem 4-6 dm. high, striate, glabrous or minutely strigulose; leaves 6-10 cm. long, spreading; stipules deltoid, 3-4 mm. long, distinct; leaflets 21-29, oblong, 10-20 mm

long, 2-4 mm. wide, glabrous above, strigulose beneath, truncate, rounded, or retuse at the apex; racemes 10-15 cm. long; rachis black-hairy; bracts lanceolate, 2 mm. long; flowers reflexed; calyx black-hairy, the tube 2 mm. long, the teeth lanceolate, 1 mm. long; corolla white, about 6 mm. long; banner obovate, strongly arcuate, retuse at the apex; wings somewhat shorter, the blade broadly elliptic; wing-petals still shorter, the blade broadly lunate, rounded at the apex; pod linear-oblong, arcuate, about 12 mm. long, 4 mm. wide, and 2.5 mm. thick, acute at each end, minutely strigulose, broadly cordate in cross-section.

TYPE LOCALITY: Dublin, Hidalgo.

DISTRIBUTION: Hidalgo and Zacatecas.

49. *Hamosa Hartwegii* (Benth.) Rydb. Bull. Torrey Club

54: 333. 1927.

Astragalus Hartwegii Benth. Pl. Hartw. 10. 1839.

Tragacantha Hartwegii Kuntze, Rev. Gen. 945. 1891.

A perennial; stem 3-6 dm. high, sparingly strigose, striate, flexuose; leaves spreading, 6-8 cm. long, acuminate; leaflets 15-21, oblong or oblanceolate to nearly linear, 6-15 mm. long, acute at the base, obtuse at the apex, glabrate above, strigose beneath; peduncles 5-10 cm. long; racemes 4-8 cm. long, rather dense; bracts lanceolate, 2 mm. long; flowers nearly sessile, reflexed; calyx white-strigose, the tube 2 mm. long, the teeth deltoid, less than 1 mm. long; corolla white or ochroleucous, 5-7 mm. long; banner broadly obovate, strongly arched at the middle; wings as long, the blade broadly obovate; keel-petals shorter, the blade semiorbicular; pod obliquely lance-oblong, slightly arcuate, 12-15 mm. long, 3 mm. wide and as thick, white-strigulose, the cross-section inversely V-shaped.

TYPE LOCALITY: Aguascalientes.

DISTRIBUTION: Coahuila to Sonora and Mexico.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 70, f. 256.

50. *Hamosa vaccarum* (A. Gray) Rydb. Bull. Torrey Club

54: 334. 1927.

Astragalus vaccarum A. Gray, Pl. Wright. 2: 43. 1853.

Astragalus Daleae Greene, Pittonia 1: 153. 1888.

Tragacantha vaccarum Kuntze, Rev. Gen. 949. 1891.

A perennial; stems slender, 2-5 dm. high, sparingly strigose; leaves ascending, 4-10 cm. long, the rachis strigose; stipules lanceolate, 4-5 mm. long; leaflets 9-19, linear or oblong, 5-20 mm. long, 1.5-3 mm. wide, glabrous above, strigose beneath, mostly obtuse at the apex; peduncles 5-9 cm. long; racemes elongate, many-flowered, 4-8 cm. long; bracts subulate, 1-2 mm. long; pedicels less than 1 mm. long; flowers drooping; calyx white-hairy, the tube campanulate, 1.5 mm. long, the teeth subulate, less than 1 mm. long; corolla ochroleucous, similar to that of the preceding, but smaller, only 4-5 mm. long, and the banner more strongly arched; pod strongly falcate, minutely white-hairy, scarcely 1 cm. long, 1.5 mm. wide, and 2 mm. thick, cordate in cross-section. Scarcely distinct from *H. Hartwegii*.

TYPE LOCALITY: Ojo de Vaca, west of the Copper mines, New Mexico.

DISTRIBUTION: New Mexico to Sonora and Durango.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 70, f. 259.

51. *Hamosa Clevelandi* (Greene) Rydb. Bull. Torrey Club

54: 334. 1927.

Astragalus Clevelandi Greene, Bull. Torrey Club 9: 121. 1882.

A perennial; stem 4-10 dm. high, striate, glabrous, straw-colored; leaves spreading, 6-10 cm. long; stipules 4-5 mm. long, lanceolate, acuminate; leaflets 15-21, oblong, 1-2.5 cm. long, 2-5 mm. wide, glabrous above, strigose beneath, obtuse or acute; peduncles about 1 dm. long; racemes elongate, lax, 1-1.5 dm. long; bracts lanceolate, 1-2 mm. long; calyx sparingly white-strigose, the tube 1.5 mm. long, the teeth lanceolate, 1 mm. long; corolla 4-5 mm. long, ochroleucous; banner broadly obovate, strongly arcuate; wings slightly shorter, the blade strongly

falcate; keel-petals shorter, the blade broadly lunate, strongly arched; pod about 8 mm. long, 2 mm. wide, lanceolate in outline, rather strongly falcate, glabrous, deeply cordate in cross-section.

TYPE LOCALITY: Indian Valley, Lake County, California.

DISTRIBUTION: Northern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl. 71, f. 264*; Jepson, Man. Fl. Pl. Calif. *f. 566*.

52. *Hamosa Hookeriana* (D. Dietr.) Rydberg.

Astragalus ervoides H. & A. Bot. Beech. Voy. 417. 1841. Not *A. ervoides* Turcz. 1838.

Astragalus Hookerianus D. Dietr. Syn. Pl. 4: 1086. 1850.

Tragacantha ervoides Kuntze, Rev. Gen. 944. 1891.

Astragalus apertus Sheldon, Minn. Bot. Stud. 1: 166. 1894.

Astragalus tepicus Sheldon, Minn. Bot. Stud. 1: 172. 1894.

A perennial; stem 3-5 dm. long, puberulent, slender, apparently decumbent below; leaves spreading, 4-6 cm. long; stipules lanceolate; leaflets 15-19, remote, linear-oblong, obtuse, 6-12 mm. long, 2-3 mm. wide; peduncles 4-8 cm. long, slender; racemes 10-12-flowered, about 4 cm. long; bracts subulate, minute; calyx with scattered black hairs, the tube 2 mm. long, the teeth subulate, 1 mm. long or less, black-hairy; corolla ochroleucous; pod reflexed, lance-linear, slightly falcate, tapering at each end, glabrous, nearly 2 cm. long, 3 mm. wide.

TYPE LOCALITY: San Blas to Tepic.

DISTRIBUTION: Known only from the type locality.

53. *Hamosa hypoleuca* (Schauer) Rydb. Bull. Torrey Club

54: 334. 1927.

Astragalus hypoleucus Schauer, Linnaea 20: 747. 1847.

Tragacantha hypoleuca Kuntze, Rev. Gen. 945. 1891.

Astragalus luisanus M. E. Jones, Rev. Astrag. 275. 1923.

A caespitose perennial; stems several from a woody root and caudex, 1-1.5, rarely 2 dm. high, silvery-canescens; leaves 4-7 cm. long, ascending, the rachis silvery; stipules lance-deltoid, 3 mm. long; leaflets 15-21, oblong or oblanceolate, acutish at each end, 5-12 mm. long, 1-2 mm. wide, silvery-canescens; peduncles 5-8 cm. long; racemes elongate, 3-5 cm. long, many-flowered; bracts lance-subulate, membranous, 2-3 mm. long; pedicels 0.5 mm. long; calyx more or less black-hairy, the tube 2.5 mm. long, the teeth subulate, 1 mm. long; corolla ochroleucous; banner obovate, moderately arched; wings nearly as long, the blade obovate; keel-petals much shorter, the blade semi-orbicular, purple-tipped; pod oblong-lanceolate in outline, falcate, about 1 cm. long, 3 mm. wide and thick, obtuse at the base, tapering at the apex, canescens with kinky hairs, the cross-section broadly cordate.

TYPE LOCALITY: Mexico, the exact locality not indicated.

DISTRIBUTION: Coahuila to Hidalgo and Puebla.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl. 69, f. 247*; *pl. 70, f. 260*.

54. *Hamosa Esperanzae* (M. E. Jones) Rydb. Bull. Torrey Club

54: 335. 1927.

Astragalus Esperanzae M. E. Jones, Rev. Astrag. 277. 1923.

Astragalus chapalanus M. E. Jones, Rev. Astrag. 277. 1923.

A perennial, with caespitose root-stock; stems several, decumbent, 1-2 dm. high, terete, strigose, branched; leaves spreading, 3-6 cm. long, the rachis strigose; stipules lanceolate to ovate, 3-4 mm. long; leaflets 15-25, oblong or oblanceolate, 5-12 mm. long, 1-2 mm. wide, acute at the base, obtuse, truncate, or retuse at the apex, glabrous above, strigose beneath; peduncles 3-7 cm. long, strict; racemes short and dense, 2-3 cm. long; bracts lanceolate, membranous, 2-3 mm. long; pedicels about 1 mm. long; calyx black-hairy, the tube 2.5 mm. long, the teeth lanceolate, 2 mm. long; corolla white or greenish-white, tinged with purple; banner 7-8 mm. long, obovate, strongly arched; wings nearly as long, the blade broadly obliquely obovate, with a large rounded auricle; keel-petals shorter, the blade broadly lunate, almost

semiorbicular, rounded and purple at the tip; pod glabrous, lanceolate in outline, falcate, 12-16 mm. long, 3 mm. wide and thick, cordate in cross-section.

TYPE LOCALITY: Esperanza, Puebla.

DISTRIBUTION: San Luis Potosí to Jalisco and Hidalgo.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 70, f. 253, 254.*

55. *Hamosa parva* (Hemsl.) Rydb. Bull. Torrey Club

54: 335. 1927.

Astragalus parvus Hemsl., Biol. Centr. Am. Bot. 1: 266. 1880.

Tragacantha parva Kuntze, Rev. Gen. 947. 1891.

Astragalus Schaffneri M. E. Jones, Rev. Astrag. 276. 1923.

A caespitose perennial, with a taproot; stems numerous, slender, terete, sparingly strigose, 1-2 dm. long; leaves ascending, 4-6 cm. long, the rachis strigose; stipules lanceolate, 3-4 mm. long, green; leaflets 11-17, linear, 5-10 mm. long, 1-2 mm. wide, glabrous above, strigose beneath, obtuse at the apex; peduncles 5-8 cm. long; racemes 1-2 mm. long; bracts subulate, 2 mm. long; pedicels 1 mm. long; calyx white-strigose, the tube 2 mm. long, the teeth subulate, 1.5 mm. long; corolla purplish, about 8 mm. long; banner narrowly obovate, strongly arched at the middle; wings about as long, the blade oblanceolate, falcate; keel-petals much shorter, the blade nearly semiorbicular; pod lanceolate in outline, about 12 mm. long, 3 mm. thick and nearly as wide, slightly arcuate, white-strigose.

TYPE LOCALITY: San Luis Potosí.

DISTRIBUTION: San Luis Potosí.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl. 69, f. 250, 251; pl. 70, f. 251.*

56. *Hamosa asperula* Rydb. Bull. Torrey Club 54: 335. 1927.

A caespitose perennial, with a woody root and caudex; stems decumbent or spreading, 1-2 dm. long, purplish, appressed-pubescent with short stiff hairs; leaves 3-5 cm. long, spreading, the rachis pubescent, sulcate on the upper side; stipules connate, deltoid, acuminate, membranous; leaflets 13-23, linear, 6-12 mm. long, glabrous above, strigose beneath, more or less involute; peduncles 3-6 cm. long; racemes dense, 1-3 cm. long; bracts lanceolate, membranous, 2-3 mm. long; pedicels 1 mm. long; calyx black-hairy, the tube 2.5 mm. long, campanulate, the teeth subulate, 2.5 mm. long; corolla purplish, 8 mm. long; banner obovate, strongly arcuate; wings nearly as long, the blade broadly obovate; keel-petals shorter, broadly lunate, the blade nearly semiorbicular, obtuse; pod falcate, strigose, 14-16 mm. long, 2-6 mm. broad and high, tapering at the apex.

TYPE LOCALITY: Between Pachuca and Real del Monte, Hidalgo.

DISTRIBUTION: KNOWN only from the type locality.

57. *Hamosa hypoxyla* (S. Wats.) Rydb. Bull. Torrey Club

54: 336. 1927.

Astragalus hypoxylus S. Wats. Proc. Am. Acad. 18: 192. 1883.

A perennial, with a prostrate branching woody base, and short herbaceous branches of the season, these less than 5 cm. long, minutely strigose; leaves 2-4 cm. long, spreading; stipules distinct, deltoid, strigose, 1-1.5 mm. long; leaflets 9-13, obovate or elliptic, 3-6 mm. long, rounded at the apex, strigose beneath, glabrous above; peduncles 5-7 cm. long; racemes short, spike-like, 1-2.5 cm. long; bracts lanceolate, 1-2 mm. long; calyx strigose, the tube about 2 mm. long, and nearly as broad, the teeth subulate, 2 mm. long; corolla about 6 mm. long; banner obovate, abruptly arcuate; wings nearly as long, the blade oblong; keel-petals much shorter, acute; pod ascending, sessile, about 1 cm. long, 3 mm. wide and as thick, strigose, slightly arcuate, acute on the upper suture, sulcate on the lower, 2-celled, cordate in cross-section.

TYPE LOCALITY: Maloney's Range, Huachuca Mountains, Arizona.

DISTRIBUTION: KNOWN only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 70, f. 255.*

58. *Hamosa Pringlei* (S. Wats.) Rydb. Bull. Torrey Club

54: 336. 1927.

Astragalus Pringlei S. Wats. Proc. Am. Acad. 21: 449. 1886.

A tufted caespitose perennial, with a thick woody root; stems very numerous, short and leafy, sparingly strigose, 5–15 cm. long, decumbent or ascending; leaves 1–3 cm. long, spreading; stipules deltoid, 1–2 mm. long; leaflets 9–15, obovate, 2–4 mm. long, glabrous above, strigose-caescent beneath; peduncles 1–2 cm. long; racemes dense, 1–2 cm. long; bracts lanceolate, 1 mm. long, shorter than the pedicels; calyx white-strigose, the tube 4–5 mm. long, 2.5 mm. broad, the teeth 2 mm. long, subulate; corolla apparently white, 12 mm. long; banner obovate, moderately arched; wings as long, the blade oblanceolate-oblong, with a reflexed auricle; keel-petals much shorter, the blade broadly lunate; pod oblong, about 1 cm. long, 3.5 mm. thick, nearly as wide, strigose, abruptly contracted at each end, the cross-section cordate, with a broad sulcus.

TYPE LOCALITY: Plains of Chihuahua.

DISTRIBUTION: Chihuahua and Durango.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 69, f. 249.

8. *Wrightianae*. Annual herbs, branched at the base; racemes dense, oblong, with rather small subsessile flowers; calyx-tube turbinate, the teeth subulate and much longer, but exceeding the corolla in length; corolla dark-purple; pod lance-oblong, strongly ascending, tapering at the apex, cordate in cross-section.

59. *Hamosa Wrightii* (A. Gray) Rydberg.*Astragalus Wrightii* A. Gray, Bost. Jour. Nat. Hist. 6: 176. 1850.*Tragacantha Wrightii* Kuntze, Rev. Gen. 949. 1891.

An annual; stem branched at the base, 1–2 dm. high, sulcate, villous, the branches erect or ascending; leaves 2–4 cm. long, ascending; stipules deltoid or lanceolate, green, acuminate, 3–5 mm. long; leaflets 7–11, oblong or elliptic, acute, light-green, 1–2 cm. long, pilose on both sides; peduncles 2–6 cm. long; racemes dense, headlike; bracts lance-subulate, 4–5 mm. long; flowers subsessile; calyx silky-villous, the tube turbinate, 2 mm. long, the teeth subulate, 4 mm. long; corolla dark-bluish-purple, shorter than the calyx; petals subequal, 5 mm. long; banner obovate, distinctly clawed; blade of the wings lunate, longer than the claw, with a lanceolate, retrorse auricle; keel-petals similar, but the blade broader and shorter; pod lance-oblong, about 1 cm. long, 3–4 mm. wide and about as thick, villous, tapering at the apex, the cross-section cordate; seeds brown-spotted, obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Near Austin, Texas.

DISTRIBUTION: Texas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 68.

55. *HEDYPHYLLA* Steven, Bull. Soc. Nat. Mosc.29²: 142. 1856.*Astragalus* § *Glycyphylla* Steven, Bull. Soc. Nat. Mosc. 4: 266. 1832. Not *Glycyphylla* Raf. 1819.

Perennial herbs. Leaves alternate, odd-pinnate. Flowers perfect, several or many in axillary racemes. Calyx campanulate, rather short, oblique, with subulate teeth. Corolla yellowish, or white. Banner free, obovate, retuse, moderately arched at the middle. Wings free, clawed, the blade oblanceolate, with a large reflexed auricle. Keel-petals with united blades, similar to the wings but the blades broader and shorter, broadly lunate. Stamens diadelphous (9 and 1), the sheath nearly straight, the free portion of the filaments curved upwards. Ovary elongate, the style curved upwards, glabrous, the stigma minute. Pod elongate, subterete, slightly inflated, linear or lance-linear, more or less sulcate on the lower suture, leathery or membranous, 2-celled by a double partition, formed by intrusion of the lower suture, many-seeded, filled between the seed by a pulpy tissue becoming fibrous in age.

Type species, *Astragalus glycyphyllus* L.

1. *Hedyphylla glycyphylla* (L.) Rydberg.

Astragalus glycyphylus L. Sp. Pl. 758. 1753.

Astragalus lunatus Gilib. Fl. Lithuan. 110. 1781.

Hedyphylla vulgaris Steven. Bull. Soc. Nat. Mosc. 29: 142. 1856.

A perennial; stem reclining, flexuose, 3-12 dm. long, angled; leaves 1-1.5 dm. long, spreading; stipules lanceolate, foliaceous, acuminate, about 1 cm. long; leaflets 9-15, oval or elliptic, rounded at both ends or retuse or mucronate at the apex, 2-4 cm. long, 1-1.5 cm. wide, glabrous or nearly so, paler beneath; peduncle 2-8 cm. long; racemes dense, 2-5 cm. long; bracts lanceolate, acuminate, 2 mm. long; pedicels 1 mm. long; calyx glabrous, the tube 3 mm. long, oblique, the teeth subulate, unequal, 2-3 mm. long, the upper two the shortest; corolla greenish-yellow, rarely bright-yellow, turning brownish; banner obovate, retuse, 10-12 mm. long; wing-petals about as long, the blade oblanceolate, as long as the claw, with a large reflexed auricle; keel-petals shorter, the blade broadly lunate, rounded at the apex, with a short and broad auricle; pod linear, tapering at each end, short-stipitate, 3-5 cm. long, 5 mm. wide and thick, glabrous, reticulate, sulcate on the lower suture, at length slightly falcate; seeds dark-brown, reniform, 2.5 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Adventive around eastern seaports; native of Eurasia.

ILLUSTRATIONS: Fl. Dan. pl. 1108; Engl. Bot. pl. 203; ed. 3. pl. 377; Sv. Bot. pl. 237; Schrank, Fl. Monac. pl. 22; Reichenb. Ic. Fl. Germ. 22: pl. 153 [pl. 2204]; Fl. Deuts. ed. 5. pl. 2441; Thomé, Fl. Deuts. pl. 441; ed. 2. pl. 369; Coste, Fl. Fr. f. 952.

56. *HESPERONIX* Rydberg, gen. nov.

Leafy-stemmed perennials. Leaves odd-pinnate, with many leaflets and distinct stipules. Flowers in peduncled axillary racemes. Calyx-tube campanulate, the teeth subulate. Corolla mostly white or ochroleucous. Banner obovate, subsessile, mostly retuse. Wings clawed, the blades obliquely oblanceolate with a basal auricle. Keel-petals with shorter and broader, lunate blades. Stamens diadelphous (9 and 1), the sheath straight, the free portion of the filaments curved upward. Ovary stipitate, many-ovuled, the style glabrous, curved upwards, the stigma minute, terminal. Pod leathery or coriaceous, inflated, stipitate, completely 2-celled, the septum formed by the lower suture extending to the upper. Seeds obliquely reniform.

Type species, *Astragalus Bolanderi* A. Gray.

Stipe and body of the pod straight or nearly so.

Pubescence villous; pod somewhat fleshy or coriaceous.

Pod pubescent, its body 1.5 cm. long or less; leaflets glabrous above.

Pod glabrous, its body 1.8 cm. long; leaflets villous on both sides.

Pubescence strigose, the leaflets glabrous above; pod not fleshy, leathery.

Body of fruit 3-4 cm. long; leaflets pubescent only on the ribs and around the margins.

Body of fruit 2-2.5 cm. long; leaflets strigose throughout beneath.

Stipe and body of the pod distinctly curved.

1. *H. accidens*.

2. *H. Watsoni*.

3. *H. vallis*.

4. *H. scaphoides*.

5. *H. Bolanderi*.

1. *Hesperonix accidens* (S. Wats.) Rydberg.

Astragalus accidens S. Wats. Proc. Am. Acad. 22: 471. 1887.

A perennial; stems 3-5 dm. high, striate, sparingly villous; leaves ascending, 8-10 cm. long, the rachis sparingly villous; stipules lanceolate, free, 4-5 mm. long; leaflets 21-33, oblong or elliptic, 8-20 mm. long, cuneate at the base, truncate or retuse at the apex, glabrous above, pilose beneath; peduncles about 1 dm. long; racemes 2-5 cm. long; bracts subulate, 3 mm. long; pedicels 1 mm. long; flowers reflexed; calyx black-hairy, the tube 4 mm. long, 3 mm. broad, the teeth lance-subulate, 1.5 mm. long; corolla white or cream-colored, 15-18 mm. long; banner narrowly ovate, moderately arched at the middle; wings oblong-falcate, obtuse, the blade nearly twice as long as the claw, with a large reflexed auricle; keel-petals about 10 mm. long, the blade broadly lunate, with a large auricle; pod strigose, stipitate, coriaceous, the stipe about 6 mm. long, straight, the body oval-obovoid, abruptly contracted at each end, reticulate, 15 mm. long, 6 mm. wide and thick, terete, the sutures somewhat prominent.

TYPE LOCALITY: Southern Oregon.

DISTRIBUTION: Oregon.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 39, f. 125, pl. 76.

2. *Hesperonix Watsoni* (Sheldon) Rydberg.

- Astragalus Hendersoni* S. Wats. Proc. Am. Acad. 22: 471. 1887. Not *A. Hendersoni* Baker. 1879.
Astragalus Watsoni Sheldon, Minn. Bot. Stud. 1: 23. 1894.
Astragalus pacificus Sheldon, Minn. Bot. Stud. 1: 174. 1894.
Astragalus pruniformis M. E. Jones, Proc. Calif. Acad. II. 5: 660. 1895.
Astragalus cymatodes Greene, Pittonia 3: 196. 1897.
Astragalus accidens Hendersoni M. E. Jones, Rev. Astrag. 164. 1923.
Astragalus accidens pacificus M. E. Jones, Rev. Astrag. Index. 1923.

A perennial; stems 2-4 dm. high, decumbent at the base, more or less villous; leaves 5-10 cm. long, spreading, the rachis sparingly villous; stipules lanceolate, herbaceous, 4 mm. long; leaflets 13-25, obovate, oval, or elliptic, 8-20 mm. long, cuneate at the base, retuse or truncate at the apex, villous on both sides; peduncles 5-8 cm. long; racemes 2-4 cm. long, rather dense; bracts lance-subulate, 2-3 mm. long; pedicels 1 mm. long; calyx black-hairy, the tube 7 mm. long, 3 mm. broad, the teeth lanceolate or deltoid-lanceolate, 1.5-2 mm. long; corolla cream-colored, 15 mm. long, similar to that of the preceding, but the wings slightly broader; pod glabrous, stipitate, the stipe 6 mm. long, the body ellipsoid, about 18 mm. long, 8 mm. thick, and 10 mm. wide, somewhat fleshy when young, in age reticulate.

TYPE LOCALITY: Foot hills of Siskiyou Mountains, Oregon.

DISTRIBUTION: Washington to northern California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 39; pl. 76.

3. *Hesperonix vallis* (M. E. Jones) Rydberg.

Astragalus vallis M. E. Jones, Contr. W. Bot. 10: 59. 1902.

A perennial; stems glabrous, 2-4 dm. high, sulcate; leaves about 1 cm. long, ascending; stipules lanceolate, 3 mm. long; leaflets 15-19, obovate or elliptic, glabrous, cuneate at the base, truncate or retuse at the apex, 10-16 mm. long; peduncles 5-10 cm. long; racemes 3-5 cm. long; bracts lanceolate, ovate, 2 mm. long; calyx sparingly black-hairy, the tube about 5 mm. long, the teeth subulate, 3-4 mm. long; corolla white, 18 mm. long; banner ovate-lanceolate, moderately arcuate; wings shorter, the blade linear; keel-petals much shorter, broadly lunate, purple-tipped; pod coriaceous, glabrous, stipitate, the stipe 8 mm. long, the body ellipsoid, about 3 cm. long, 12 mm. thick and 8 mm. wide, cross-reticulate, acute at each end.

TYPE LOCALITY: Snake River Canon, near Ballard's Landing, Oregon.

DISTRIBUTION: Eastern Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 38, f. 123.

4. *Hesperonix scaphoides* (M. E. Jones) Rydberg.

- Astragalus arrectus scaphoides* M. E. Jones, Proc. Calif. Acad. II. 5: 664. 1895.
Astragalus scaphoides [err.] Rydb. Mem. N. Y. Bot. Gard. 1: 241. 1900.
Astragalus scaphoides M. E. Jones, Contr. W. Bot. 10: 69. 1902.
Phacopsis scaphoides Rydb. Bull. Torrey Club 40: 52. 1913.

A perennial, with a thick woody root and caespitose caudex; stems many, 3-5 dm. high, erect, angled and slightly sulcate, sparingly strigose; leaves ascending, 8-10 cm. long, the rachis sulcate, strigose; stipules deltoid, acuminate, strigose, 3-5 mm. long; leaflets elliptic to obovate, 1-1.5 cm. long, 4-7 mm. wide, rounded at the apex, glabrous above, strigose beneath; peduncles 5-10 cm. long, sulcate; racemes 4-8 cm. long; bracts subulate, 3 mm. long, black-hairy; calyx black-hairy, the tube 6-7 mm. long, the teeth subulate, 2 mm. long; corolla unknown; pod leathery, stipitate; stipe 1-1.5 cm. long, slightly curved upwards, the body erect, glabrous, slightly reticulate, oblong, about 2 cm. long, 7 mm. thick and 5 mm. wide, truncate or subcordate at the base, acute at the apex, slightly sulcate on both sutures, somewhat broadly ∞ -shaped in cross-section.

TYPE LOCALITY: West of Clark's Cañon, Beaverhead County, Montana.

DISTRIBUTION: Montana and Idaho.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 38.

5. *Hesperonix Bolanderi* (A. Gray) Rydberg.

Astragalus Bolanderi A. Gray, Proc. Am. Acad. 7: 337. 1868.

Tragacantha Bolanderi Kuntze, Rev. Gen. 943. 1891.

Astragalus supervacaneus Greene, Erythea 1: 221. 1893.

A perennial, with a woody root and cespitose caudex; stems erect, 3-5 dm. high, angled and somewhat sulcate, sparingly hairy; leaves ascending, 8-12 cm. long; stipules deltoid, 5 mm. long; leaflets 17-25, oblong to oval, 8-20 mm. long, 3-7 mm. wide, appressed-pilose on both sides, obtuse at the apex; peduncles 5-10 cm. long, erect, sulcate; bracts subulate, 3-4 mm. long; pedicels 1 mm. long; calyx pilose with mixed black and light hairs, the tube 6 mm. long, the teeth subulate, 3-4 mm. long, unequal; corolla white or cream-colored; banner oblanceolate, slightly emarginate, 14-15 mm. long; wings shorter, the blade equaling the claw, obliquely oblanceolate, with a rather large auricle; keel-petals still shorter, the blade broadly lunate; pod chartaceous, stipitate, the stipe about 8 mm. long, the body strongly incurved, obliquely ovate, about 2 cm. long, 1-1.5 cm. thick, 8-10 mm. wide, sulcate on both sutures.

TYPE LOCALITY: Ostrander's Ranch, Yosemite Valley, California.

DISTRIBUTION: Sierra Nevada region, California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 38, f. 124; Jepson, Man. Fl. Pl. Calif. f. 557.

57. *ASTRAGALUS* L. Sp. Pl. 1753.

Glandula Medic. Vorl. Churpf. Phys. Ges. 2: 374. 1787.

Glottis Medic. Vorl. Churpf. Phys. Ges. 2: 376. 1787.

Stella Medic. Vorl. Churpf. Phys. Ges. 2: 377. 1787.

Aragallus Neck. Elem. 3: 12, in part. 1790.

Alopecias Steven, Bull. Soc. Nat. Mosc. 29²: 143. 1856.

Solenotus Steven, Bull. Soc. Nat. Mosc. 29²: 143, in part. 1856.

Macrosema Steven, Bull. Soc. Nat. Mosc. 29²: 145. 1856.

Ailuraschia Steven, Bull. Soc. Nat. Mosc. 29²: 150. 1856.

Kirchnera Opiz, Lotos 8: 65. 1858.

Medyphylla Opiz, Lotos 8: 65. 1858.

Hypoglottis Fourr. Ann. Sci. Linn. Lyon II. 16: 364. 1868.

Perennial herb, usually with a woody cespitose caudex or rootstock, or rarely annuals with a taproot. Leaves odd-pinnate, with entire leaflets. Flowers mostly in dense axillary peduncled racemes. Calyx cylindrical or campanulate, the lobes mostly subulate. Corolla of various colors. Banner obovate, often retuse, tapering below but scarcely clawed. Wings usually long-clawed, the claw about equaling the obliquely oblanceolate or more or less lunate blade, which is auricled at the base on the upper side. Keel-petals with longer claw and shorter blade, the latter usually broadly lunate. Stamens monadelphous (9 and 1), the sheath nearly straight, and the free portion of the filaments arching upwards. Ovary usually sessile, the style glabrous and straight to near the end, the stigma minute. Pod sessile or rarely subsessile, coriaceous or woody, somewhat turgid, short, from ovoid to oblong, erect or ascending, rarely reflexed, 2-celled, the septum formed by the inflexion of the lower suture complete. Seeds several, rarely few, obliquely round-reniform, with a depressed hilum.

Type species, *Astragalus Onobrychis* L.

Perennials; beak of the pod short.

Pod several- to many-seeded, ascending or rarely spreading.

Leaves villous or silky; pod more or less sulcate on both sutures; plant usually low and short-stemmed (except No. 1, 2, 4 and 5).

1. MOLLISSIMI.

Leaves strigose or glabrate; pod not sulcate on the upper suture; plant leafy-stemmed.

Pod ellipsoid, not sulcate on the lower suture or only slightly so, nearly round in cross-section.

2. ULIGINOSI.

Pod ovoid, deeply sulcate on the lower suture, cordate in cross-section.

3. HYPOGLOTTIDES.

Pod few-seeded, ovoid in outline.

Pod ascending, coriaceous, cordate in cross-section; racemes dense, headlike.

4. CHAETODONTES.

Pod reflexed, thin-leathery or membranous, lenticular in outline; racemes lax.

5. LENTIFORMES.

Annuals; beak of the pod as long as the ovoid, deeply sulcate body.

6. BREWERIANI.

1. MOLLISSIMI

Pod glabrous.

Corolla yellowish; stem elongate; pod 8-10 mm. broad.

- Corolla about 2 cm. long.
 Corolla 3-3.5 cm. long.
 Corolla purple; stems very short; pod 6-7 mm. broad.
 Pod pubescent.
 Pubescence of the pod spreading, loose.
 Corolla 3 cm. long, crimson, rarely white; banner straight.
 Plant velutinous; pod ovoid-ellipsoid, 2.5-3 cm. long, 1.5-2 cm. broad.
 Plant strigulose; pod broadly ellipsoid, 3-4 cm. long, 2-2.5 cm. broad.
 Corolla 2 cm. long or less, bluish-purple to yellowish; banner more or less arched.
 Pod short-pubescent.
 Pubescence of the leaves silky with long straight hairs.
 Pod broadly ovoid, 8-9 mm. broad, more than half as broad as long; leaflets oblong or lance-elliptic, rarely oval.
 Pod ellipsoid, 5-6 mm. broad, not more than half as broad as long, arcuate.
 Leaflets obtuse or rounded at the apex; corolla about 1.5 cm. long.
 Leaflets acute at the apex; corolla about 2 cm. long.
 Pubescence of the leaves of rather short densely tangled hairs.
 Pod long-pubescent.
 Pod distinctly arcuate, 12-20 mm. long; corolla fully 2 cm. long.
 Calyx-lobes more than one third as long as the tube; leaflets yellowish- or brownish-hairy, 1-2 cm. long.
 Calyx-lobes less than one third as long as the tube; leaflets white-pubescent, usually less than 1 cm. long.
 Pod straight or nearly so on the upper suture.
 Leaves white-pubescent with appressed hairs; pod about 2 cm. long, obliquely ovate, gradually tapering at the apex.
 Leaves brownish-pubescent with loose hairs; pod less than 1 cm. long, elliptic-ovoid, abruptly contracted at the apex.
 Raceme short and dense; corolla 18-20 mm. long; leaflets suborbicular.
 Raceme more elongate and laxer; corolla about 12 mm. long; leaflets oval.
 Pubescence of the rounded-ellipsoid mucronate pod appressed; corolla 1.5 cm. long, apparently white.

1. *A. giganteus*.
2. *A. Hartmanii*.
3. *A. mollissimus*.

4. *A. orthanthus*.
5. *A. sanguineus*.

6. *A. Humboldtii*.

7. *A. Earlei*.
8. *A. irolanus*.
9. *A. pervelutinus*.

10. *A. Bigelovii*.

11. *A. Thompsonae*.

12. *A. Matthewsii*.

13. *A. mogollonicus*.

14. *A. marcidus*.

15. *A. anisus*.

2. ULIGINOSI

- Pod glabrous, scarcely sulcate; calyx-teeth all subulate, the upper two scarcely broader than the lower three.
 Bracts linear-lanceolate or subulate, long-attenuate, the lower almost as long as the calyx-tube.
 Calyx-teeth about three fourths as long as the tube; stem terete, scarcely striate; leaflets sparingly strigulose beneath.
 Calyx-teeth half as long as the tube or less.
 Pod ascending at maturity; calyx-teeth about half as long as the tube.
 Pod spreading or reflexed at maturity; calyx-teeth about one third as long as the tube.
 Bracts ovate or lanceolate, scarcely half as long as the calyx-tube.
 Pod pubescent, distinctly sulcate on the lower suture; upper two calyx-teeth deltoid or lance-deltoid, much broader than the lower three.
 Leaflets oblong to oval, green.
 Calyx and bracts more or less black-hairy; body of the fruit 15-20 mm. long, the beak nearly straight, 7-10 mm. long.
 Calyx and bracts white-hairy; body of the fruit 10-15 mm. long, the beak curved downward.
 Leaves glabrous or glabrate above.
 Leaves equally strigose on both sides, at least when young.
 Leaflets broadly obovate or obcordate, canescent.

16. *A. carolinianus*.

17. *A. canadensis*.

18. *A. Halei*.

19. *A. oreophilus*.

20. *A. Mortoni*.

21. *A. pachystachys*.

22. *A. Torreyi*.

23. *A. oreaganus*.

3. HYPOGLOTTIDES

- Pod with appressed gray or black hairs; leaflets acute or obtuse.
 Corolla purple or pink, rarely white; calyx-lobes much shorter than the tube.
 Corolla ochroleucous, only the keel tipped with purple.
 Calyx strigose, the teeth three fourths to fully as long as the tube.
 Leaflets silvery-silky on both sides; pod white-hairy.
 Leaflets glabrate above; pod more or less black-hairy.
 Calyx short-villous, the teeth one third as long as the tube.
 Pod villous with long spreading hairs; leaflets often retuse.
 Corolla ochroleucous; bracts broadly spatulate to linear.

24. *A. striatus*.

25. *A. Chandonnetii*.

26. *A. sulphurescens*.

27. *A. brevidens*.

28. *A. virgutulatus*.

Corolla purple; bracts ovate-lanceolate or lanceolate.

Calyx more or less black-hairy.

Calyx-lobes half as long as the tube or less.

Calyx-lobes nearly as long as the tube.

Calyx not black-hairy; calyx-lobes nearly as long as the tube.

29. *A. goniatius*.
30. *A. Tarletonis*.
31. *A. agrestis*.

4. CHAETODONTES

Stems 2-5 dm. high; corolla white; stipules lanceolate.

Stems less than 2 dm. high, with short internodes; corolla purple; stipules broadly deltoid.

32. *A. Spaldingii*.
33. *A. Austinae*.

5. LENTIFORMES

Racemes elongate, many-flowered, usually longer than the leaves.

Racemes short, rather few-flowered usually shorter than the leaves.

Terminal leaflet well developed as large as or larger than the rest.

Leaves and branches villous; pod abruptly acute.

Leaves and branches strigose; pod more gradually acute.

Terminal leaflet not developed, represented by the somewhat produced rachis.

34. *A. Lyallii*.
35. *A. lentiformis*.
36. *A. Lemmoni*.
37. *A. Peckii*.

6. BREWERIANI

One species.

38. *A. Breweri*.

1. **Mollissimi**. Plant perennial, with a woody root, usually short-stemmed, almost subcaulescent (except in *A. giganteus*, *A. Hartmanii*, *A. orthanthus*, *A. sanguineus* and *A. Humboldtii*); leaves densely pubescent, villous or velutinous, spreading; pod ovoid to oblong, coriaceous, in some species incurved, thicker than wide, more or less sulcate, at least on the upper suture; calyx cylindric, the teeth from half as long as the tube to nearly as long; corolla purple, white, or yellowish, in one species crimson, the banner moderately arched to nearly straight.

1. *Astragalus giganteus* S. Wats. Proc. Am. Acad. 17: 370. 1882.

Astragalus yaquianus S. Wats. Proc. Am. Acad. 23: 270. 1888.

Astragalus lexanus Sheldon, Minn. Bot. Stud. 1: 65. 1894.

Astragalus giganteus yaquianus M. E. Jones, Rev. Astrag. 234 (as to type). 1923.

A perennial, with a rootstock; stem 3-15 dm. high, flexuose, silky, in age with brownish, tangled, appressed hairs; leaves short-petioled, 1.5-2 dm. long, ascending; stipules deltoid, herbaceous, 5-8 mm. long; leaflets 21-31, oval or elliptic, acute or obtuse, 1.5-3.5 cm. long, silky-tomentose with loosely appressed, tangled hairs; peduncles 1-2 dm. long, strict; racemes dense, 5-15 cm. long; bracts lance-subulate, 5 mm. long; calyx silky-tomentose, the tube 7-8 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla ochroleucous, about 2 cm. long; banner narrowly obovate, nearly straight, slightly retuse at the apex; wings shorter, narrow, the blade linear-oblong, with a large reflexed basal auricle; keel-petals much shorter, about 1.5 cm. long, the blade strongly lunate, rounded at the apex, with a large broad auricle; pod oblong-ovoid, abruptly acuminate, glabrous, 15-20 mm. long, 8 mm. thick, and 6 mm. wide, somewhat reticulate, slightly sulcate on both sutures.

TYPE LOCALITY: Fort Davis, Western Texas.

DISTRIBUTION: New Mexico, Chihuahua, and western Texas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 59, f. 192.

2. *Astragalus Hartmanii* Rydberg, sp. nov.

Astragalus giganteus yaquianus M. E. Jones, Rev. Astrag. 234, in part (as to description and specimen). 1923.

A perennial; stem 1 m. high or more, finely short-villous; leaves 2-3 dm. long, ascending; stipules herbaceous, deltoid, acuminate, 1-1.5 cm. long; leaflets about 25, oval, 2.5-5 cm. long, obtuse, silky on both sides, but glabrate in age; peduncles 1.5 dm. long or more; racemes about 1 dm. long; bracts subulate, about 1 cm. long; pedicels about 5 mm. long; calyx sparingly silky, the tube about 1.5 cm. long, the teeth about 1 cm. long, subulate; corolla ochroleucous, 3.5-4 cm. long; banner narrowly obovate, only slightly arcuate, the margins reflexed; wings shorter, the claw much exceeding the calyx-tube, the blade linear-oblong, nearly straight, with

a large basal auricle; keel-petals rather narrow, oblong-lunate, only slightly arcuate towards the apex, obtuse; ovary glabrous; pod unknown.

Type collected near San Diego Ranch, Chihuahua, *Hartman 678* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 59* (as var. *yaquianus*).

3. *Astragalus mollissimus* Torr. Ann. Lyc. N. Y. 2: 178. 1827.

Phaca villosa James, Trans. Am. Phil. Soc. II 2: 186. 1825. Not *P. villosa* Nutt. 1818.

Tragacantha mollissima Kuntze, Rev. Gen. 946. 1891.

Astragalus simulans Cockerell, Torreya 2: 154. 1902.

A caespitose perennial, much branched at the base; stems decumbent, usually less than 1 dm. long; leaves ascending, 1-2 dm. long; stipules herbaceous, lance-deltoid, about 5 mm. long; leaflets 21-31, oval or obovate, acutish, obtuse or rounded at the apex, 1-2.5 cm. long, densely silky with long, loosely appressed, yellowish or brownish hairs; peduncles 1-3 cm. long, stout; racemes dense, 5-10 cm. long; bracts subulate, about 5 mm. long; calyx densely silky, the tube 7-10 mm. long, the teeth subulate, 3-4 mm. long; corolla purple, 18-20 mm. long; banner narrowly obovate, moderately arcuate, with the margins reflexed; wings shorter, the blade linear-oblong, falcate, with a large basal auricle; keel-petals 12-15 mm. long, the blade lunate, obtuse, with a large basal auricle; pod glabrous, lance-oblong, acuminate, 15-20 mm. long, 5 mm. thick and 3 mm. wide, decidedly arcuate, slightly sulcate on both sutures.

TYPE LOCALITY: On the Platte [Nebraska or Colorado].

DISTRIBUTION: Nebraska and Wyoming to Texas and New Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl. 59, f. 191*; Britt. & Brown, Ill. Fl. f. 2129; ed. 2. f. 2534; Fl. Neb. 21: *pl. 9, f. 37-41*.

4. *Astragalus orthanthus* A. Gray, Proc. Am. Acad. 6: 195. 1864.

Tragacantha orthantha Kuntze, Rev. Gen. 947. 1891.

A perennial; stem short, 1-3 dm. long, short-woolly, almost velutinous; stipules herbaceous, deltoid, acuminate, 6-8 mm. long; leaves about 2 dm. long, ascending; leaflets 25-35, oval, 1-2 cm. long, densely silky on both sides with yellowish or brownish, loosely appressed hairs; peduncles about 2 dm. long; racemes dense, about 5 cm. long; bracts lanceolate, 4-5 mm. long; calyx densely silky, the tube about 1 cm. long, 3 mm. broad, the teeth subulate, 4-5 mm. long; corolla purplish-red or rose-colored, rarely white, 3-3.5 cm. long; banner narrowly obovate, straight; wings shorter, the blade oblong-lanceolate, with a large basal auricle; keel-petals 2.5-3 cm. long, the blade slightly lunate, acute, with a rounded, reflexed auricle; pod ovoid-ellipsoid, 2.5-3 cm. long, 1.5-2 cm. thick, densely velutinous, at least when young, sulcate on both sutures.

TYPE LOCALITY: Perote, Veracruz.

DISTRIBUTION: Veracruz to Nuevo León.

5. *Astragalus sanguineus* Rydberg, sp. nov.

A perennial; stem 3-5 dm. high or more, sulcate, strigulose; leaves ascending, 8-15 cm. long, the rachis strigulose; stipules lanceolate, green, strigose, 6-9 mm. long; leaflets 17-29, oblong or elliptic, obtuse or rounded at the apex, 5-10 mm. long, glabrous above, strigulose beneath; peduncles 10-18 cm. long, strigulose; racemes 5-7 cm. long, 10-15-flowered; bracts lance-subulate, scarious, 5-6 mm. long; calyx strigulose, the tube 9-10 mm. long, the teeth subulate, 3-4 mm. long; corolla purplish, red, or dark-rose, fully 2.5 cm. long; banner nearly straight, narrowly ovate; wings about 3 mm. shorter, the blade oblong-lanceolate; keel-petals about as long, the blade lunate but only slightly arched; pod broadly round-ellipsoid, strigose, 3-4 cm. long, 2-2.5 cm. wide.

Type collected near Saltillo, Nuevo León, in 1880, *E. Palmer 243* (U. S. Nat. Herb. 43559).

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl. 60, f. 195* (as *A. orthanthus*).

6. *Astragalus Humboldtii* A. Gray, Proc. Am. Acad. 6: 195. 1864.

Phaca mollis H.B.K. Nov. Gen. & Sp. 6: 496. 1824.

Tragacantha mollis Kuntze, Rev. Gen. 941. 1891.

Astragalus Orizabae Seaton, Proc. Am. Acad. 28: 117. 1893.

A caespitose perennial, with a short woody caudex; stems decumbent, 2-4 dm. long, densely tomentose with a mixture of short straight hairs and a fine tomentum; leaves 1-2 dm. long, ascending; stipules deltoid, acuminate, herbaceous, 5-8 mm. long; rachis pubescent as the stem; leaflets 25-35, oblong or lance-oblong, obtuse or acute, 1-2.5 cm. long, densely and closely silky-pubescent; peduncles 1-1.5 dm. long; racemes 3-6 cm. long; bracts linear-lanceolate, 3-5 mm. long; calyx silky, the tube about 8 mm. long, 3 mm. broad, the teeth 5 mm. long, subulate; corolla purple, or yellowish, tipped with purple, 15-20 mm. long; banner obovate; wings shorter, the blade oblong, with a large basal auricle; keel-petals still shorter, the blade broadly acuminate, rounded at the apex; pod ovoid, only slightly curved, 15-18 mm. long, fully 10 mm. thick and 5 mm. wide, densely short-pubescent, deeply sulcate on both sutures, cordate at the base.

TYPE LOCALITY: Gasave, Valley of Mexico.

DISTRIBUTION: Southern Mexico.

ILLUSTRATIONS: H.B.K. Nov. Gen. & Sp. pl. 585; M. E. Jones, Rev. Astrag. pl. 59, pl. 60, f. 193 (as *A. Orizabae*).

7. *Astragalus Earlei* Greene, sp. nov.

Astragalus Humboldtii M. E. Jones, Rev. Astrag. 232. 1923. Not *A. Humboldtii* A. Gray. 1864.

A caespitose perennial, with a woody root; stems several, very short or sometimes 1-2 dm. long and decumbent, densely villous-tomentose, usually yellowish; leaves 1-3 dm. long, ascending; stipules deltoid, 5-8 mm. long; leaflets 25-35, oval or obovate, 0.5-2 cm. long, densely silky-villous with mostly appressed yellowish hairs; peduncles 1-3 dm. high; racemes dense, 5-1.5 cm. long; bracts lance-subulate, 5-7 mm. long; calyx densely silky, the tube 5-6 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla white or purplish, about 15 mm. long; banner obovate, moderately arched; wings shorter, the blade oblong, with a large auricle; keel-petals 12 mm. long, the blade broadly lunate, rounded at the apex; pod lance-oblong, abruptly acuminate, 12-15 cm. long, 5 mm. thick and 3 mm. wide, rather densely short-pubescent, sulcate on both sutures.

Type collected in Limpia Cañon, Texas, April 5-May 3 [Apr. 25], 1902, *Earle & Tracy 226* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Western Texas, New Mexico, and Chihuahua.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 59, f. 190 (as *A. Humboldtii*).

8. *Astragalus irolanus* (M. E. Jones) Rydberg, sp. nov.

Astragalus Orizabae irolanus M. E. Jones, Rev. Astrag. 234. 1923.

A perennial; stems 2-4 dm. high, velutinous; leaves ascending, 1-3 dm. long, the rachis velutinous; stipules lance-deltoid, attenuate, 5-10 mm. long; leaflets 23-35, lance-elliptic, acute at each end, 1-2 cm. long, silvery; peduncles 1-3 dm. long; racemes 5-6 cm. long, rather dense; bracts lanceolate, 3-4 mm. long; pedicels very short; calyx velutinous, the tube 7-8 mm. long, the teeth subulate, 3 mm. long; corolla purple, 2-2.5 cm. long; wings 15-20 mm. long, the blade lanceolate, acute, with a rather large auricle; keel-petals 12 mm. long, the blade lunate, much shorter than the claw; pod obliquely ovoid, short-pubescent, slightly arcuate, acute, fully 2 cm. long, 6 mm. thick, slightly sulcate on both sides.

TYPE LOCALITY: Irola, Mexico.

DISTRIBUTION: Mexico and Hidalgo.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 60.

9. *Astragalus pervelutinus* Rydberg, sp. nov.

A caespitose perennial; stems short, usually less than 2 dm. high, densely pubescent with brownish short densely tangled hairs, decumbent below; leaves 1-2 dm. long, ascending; stipules deltoid, acuminate, 8-10 mm. long, densely pubescent; leaflets 17-23, broadly obovate, 1-2

cm. long; calyx velutinous, the tube 5-6 mm. long, 2-3 mm. thick, the teeth subulate, 3-4 mm. long; corolla white or purplish, 15-17 mm. long; banner obovate, slightly arched; wings shorter, the blade oblong, with a large basal auricle; keel-petals 11-12 mm. long, the blade lunate, rounded at the apex; pod ovoid (not mature), 12 mm. long, 6 mm. thick and 4 mm. wide, slightly curved, sulcate on the upper suture, densely short-pubescent.

Type collected near the City of Chihuahua, April 1, 1885, *Pringle 189* (herb. N. Y. Bot. Gard.).
DISTRIBUTION: Chihuahua and Durango.

10. *Astragalus Bigelovii* A. Gray, Pl. Wright. 2: 42. 1853.

Tragacantha Bigelovii Kuntze, Rev. Gen. 943. 1891.

Astragalus Bigelovii MacDougalii Gand. Bull. Soc. Bot. Fr. 48: xiv. 1902.

A caespitose subacaulescent perennial, with a short caudex; stems several, very short, rarely 1 dm. long, densely silky-villous; leaves 1-2 dm. long, the rachis and petioles shaggy-hairy; stipules herbaceous, lanceolate to deltoid, 8-10 mm. long; leaflets 21-31, broadly oval, 1-2 cm. long, densely silky-villous with long yellowish hairs; peduncles erect or decumbent, 1-3 dm. long; racemes dense, 5-15 cm. long; bracts 4-10 mm. long, lance-subulate; calyx loosely silky-villous, the tube 7-8 mm. long; corolla purple, about 2 cm. long; banner obovate, gradually arcuate; wings shorter, the blade oblong, arcuate, with a large basal auricle; keel-petals similar but broader and more falcate; pods obliquely ovoid, arcuate, 12-15 mm. long, 7-8 mm. thick, and 5 mm. wide, densely villous, slightly sulcate on both sutures.

TYPE LOCALITY: Organ Mountains, New Mexico.

DISTRIBUTION: Texas to Arizona and Durango.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 58, f. 188; Clements, Rocky Mt. Fl. pl. 29, f. 27.

11. *Astragalus Thompsonae* S. Wats. Proc. Am. Acad.

10: 345. 1875.

Tragacantha Thompsonae Kuntze, Rev. Gen. 948. 1891.

Astragalus syrticolus Sheldon, Minn. Bot. Stud. 1: 22. 1894.

Astragalus Bigelovii Thompsonae M. E. Jones, Contr. W. Bot. 8: 23. 1898.

A subacaulescent caespitose perennial; stems numerous from the base, very short and covered by the broad stipules; leaves 5-15 cm. long; stipules deltoid, densely white-pubescent, about 5 mm. long; rachis white-villous, with rather short spreading hairs; leaflets 25-35, broadly ovate, 5-10 mm. long, rounded or truncate at the apex, densely white-villous; peduncles 5-10 cm. long; bracts lanceolate or lance-subulate, membranous, villous; calyx white-villous, the tube about 1 cm. long, 4 mm. broad, the teeth subulate, 3 mm. long; corolla light-purple, about 2 cm. long; banner obovate, moderately arcuate; wings slightly shorter, the blade oblong, with a very large reflexed auricle; keel-petals about 16 mm. long, the blade broadly lunate, obtuse, with a smaller spreading auricle; pod densely silky-villous with long spreading hairs, about 2 cm. long, 8 mm. thick, and 5 mm. wide, strongly arcuate, deeply sulcate on both sutures, 1-celled at the apex.

TYPE LOCALITY: Southern Utah.

DISTRIBUTION: Utah, Arizona, and western Colorado.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 58.

12. *Astragalus Matthewsii* S. Wats. Proc. Am. Acad.

18: 192. 1883.

Astragalus Bigelovii Matthewsii M. E. Jones, Rev. Astrag. 231. 1923.

A subacaulescent caespitose perennial, with a woody root; stems very short, almost none; leaves spreading, about 1 cm. long; stipules deltoid, 8-10 mm. long, densely white-silky on both sides; peduncles about 1 cm. long; racemes 4-5 cm. long, rather lax; bracts lanceolate, 5-7 mm. long; calyx loosely silky, the tube 6-7 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla purplish, about 18 mm. long, like that of *A. Bigelovii*; pod obliquely ovoid, about 2 cm. long, 12 mm. thick, and 10 mm. wide, deeply sulcate on the lower suture, densely villous with white hairs.

TYPE LOCALITY: Fort Wingate, New Mexico.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 58.

13. *Astragalus mogollonicus* Greene, Bull. Torrey Club

8: 97. 1881.

A subcaulescent caespitose perennial; leaves 6–12 cm. long, ascending; stipules lanceolate, about 1 cm. long; petioles and rachis densely shaggy-pubescent with spreading brown hairs; leaflets 17–23, suborbicular or broadly obovate, 5–10 mm. long, densely brown-silky-villous; peduncles about 7 cm. long, shaggy-pubescent; racemes head-like, 3–4 cm. long; bracts lanceolate, 5 mm. long; calyx silky-villous, the teeth subulate, 4 mm. long; corolla purple, about 2 cm. long, resembling that of *A. Bigelovii*; pod obliquely ovoid-ellipsoid, about 1 cm. long, 5 mm. thick and wide, straight on the upper suture, not sulcate, densely villous.

TYPE LOCALITY: Mogollon Mountains, New Mexico.

DISTRIBUTION: Known only from the type locality.

14. *Astragalus marcidus* Greene, sp. nov.

A subcaulescent caespitose perennial; stems several, very short; leaves about 1 dm. long, spreading; stipules deltoid, about 5 mm. long, silky-villous with long loose hairs; peduncles 7–12 cm. long, long-villous; racemes very dense, 5–8 cm. long; bracts lance-subulate, about 5 mm. long; calyx loosely silky-villous, the tube 6 mm. long, the teeth 2 mm. long, subulate; corolla apparently white, 12 mm. long, nearly as in *A. Bigelovii*, but the keel-petals broader and shorter; pod densely villous, 1 cm. long or less, rounded-ovoid, slightly arched, sulcate on the upper suture, 4 mm. wide, 6 mm. thick.

Type collected in the Davis Mountains, Texas, April 28, 1902, *Tracy & Earle 319* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Western Texas and Chihuahua.

15. *Astragalus anisus* M. E. Jones, Zoe 4: 34. 1893.

A perennial, with a taproot and caespitose caudex; stems decumbent, less than 1 dm. high; leaves crowded, 3–7 cm. long; stipules deltoid, strigose, about 5 mm. long; leaflets 11–15, obovate or oval, 4–7 mm. long, appressed-silky-canescenscent; peduncles 2–3 cm. long; bracts lanceolate or lance-linear, 4–6 mm. long; calyx silky-canescenscent, the tube cylindrical, 6–7 mm. long, 3 mm. broad, the teeth subulate, 2 mm. long; corolla apparently white, 15 mm. long; banner obovate, only slightly arched; wings nearly as long, the blade oblong, slightly falcate, with a large basal auricle; keel-petals shorter, the blade broadly lunate, with a large basal auricle, shorter than the claw; pod strigose, rounded-ellipsoid, 15–18 mm. long, nearly 1 cm. wide and 12–15 mm. thick, leathery, slightly sulcate on both sutures.

TYPE LOCALITY: Pueblo, Colorado.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 60.

2. *Uliginosi*. Plants perennial, with a short rootstock; stems elongate, leafy; leaves more or less strigose, but green; racemes dense, elongate, spike-like; calyx-tube cylindro-campulate, the teeth usually shorter than the tube; corolla mostly ochroleucous; banner moderately arched; pod ellipsoid or oblong, nearly terete in cross-section, ascending (except in no. 18).

16. *Astragalus carolinianus* L. Sp. Pl. 757. 1753.

Astragalus canadensis carolinianus M. E. Jones, Proc. Calif. Acad. II. 5: 647. 1895.

A perennial; stem 3–6 dm. high, terete, barely striate, glabrous or sparingly strigose, flexuose; leaves spreading, 10–17 cm. long; stipules deltoid, acuminate, 3–4 mm. long; leaflets 13–27, oblong or elliptic, 1–3 cm. long, 3–10 mm. wide, thin, glabrous above, minutely strigulose beneath, rounded or slightly retuse at the apex; peduncles about 1 dm. long, strict; racemes 8–12 cm. long, many-flowered; bracts subulate, 3 mm. long; flowers reflexed; calyx sparingly strigulose, the tube 4 mm. long, 2 mm. broad, the teeth subulate, nearly 3 mm. long; corolla white, about 12 mm. long; banner oblanceolate, slightly arched at the middle; wings shorter, the blade oblong, slightly falcate, about as long as the claw, with a long reflexed basal auricle one third as long as the blade itself; keel-petals shorter, the blade broadly lunate, abruptly

arched at the middle, rounded at the apex; pod thick, leathery, oblong, 1 cm. long, 5 mm. thick and about as wide, glabrous, cross-reticulate, abruptly contracted at both ends; seeds brown, obliquely round-reniform, 1.5 mm. long.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Maryland to West Virginia and Georgia.

ILLUSTRATIONS: Hill, Veg. Syst. 22: *pl. 14, f. 3*; M. E. Jones, Rev. Astrag. *pl. 39*; Dill, Hort. Eth. *pl. 39*.

17. *Astragalus canadensis* L. Sp. Pl. 757. 1753.

Tragacantha canadensis Kuntze, Rev. Gen. 943. 1891.

Phaca canadensis MacMill. Metasp. Minn. Valley 325, as synonym. 1892.

Astragalus canadensis monticola Gand. Bull. Soc. Bot. Fr. 48: xv. 1902.

A perennial; stem 1-1.5 m. high, striate and slightly angled, strigose or in age glabrate; leaves ascending, 8-20 cm. long; stipules deltoid, 4-6 mm. long, acuminate; leaflets 15-31, elliptic or oblong, 1-3.5 cm. long, 5-15 mm. wide, glabrous above, decidedly strigose beneath, rounded at each end; peduncles 5-15 cm. long, strict, sulcate; racemes 5-10 cm. long; bracts subulate, 5-8 mm. long; flowers spreading or reflexed; pedicels about 1 mm. long; calyx finely strigose, the tube 5-6 mm. long, 2.5 mm. broad, the teeth subulate 1.5-2 mm. long; corolla greenish-white or ochroleucous, 12-15 mm. long; banner obovate, slightly arcuate; wings shorter, the blade lance-oblong, shorter than the claw, with a large reflexed basal auricle; keel-petals still shorter, the blade broadly lunate, abruptly arched above the middle, rounded at the apex; pod thick-leathery, oblong, abruptly acute, cross-reticulate, 15-18 mm. long, 6 mm. thick and wide; seeds dark-brown, obliquely reniform 2, mm. long.

TYPE LOCALITY: Canada.

DISTRIBUTION: Among bushes, from Quebec to Hudson Bay, British Columbia, Utah, north Texas, and Virginia.

ILLUSTRATIONS: Hill, Veg. Syst. 22: *pl. 15, f. 1*; Lodd, Bot. Cab. *pl. 372*; Torr. Fl. N. Y. *pl. 25*; M. E. Jones, Rev. Astrag. *pl. 39*; Britt. & Brown, Ill. Fl. f. 2130; ed. 2. f. 2535 (both as *A. carolinianus*); Fl. Neb. 21: *pl. 9, f. 16-21*; Clements, Rocky Mt. Fl. *pl. 29, f. 28*.

18. *Astragalus Halei* Rydberg, sp. nov.

A perennial; stem probably 5 dm. high or more, terete, scarcely even striate, glabrous or sparingly strigulose; leaves ascending, about 1.5 dm. long; stipules deltoid, distinct, about 5 mm. long; leaflets 15-21, thin, 1-3 cm. long, elliptic, rounded at the apex, obtuse at the base, glabrous above, strigulose beneath; peduncles 5-8 cm. long; racemes 3-5 cm. long, not dense; bracts subulate, 4-6 mm. long; pedicels very short, in fruit 3 mm. long; calyx sparingly strigose, the tube 5 mm. long, 2 mm. broad, gibbous at the base on the upper side, the teeth subulate, a little more than 1 mm. long; corolla cream-colored, 14-15 mm. long; banner narrowly obovate, slightly arched; wings a little shorter, the blade oblong, with a large reflexed basal auricle; keel-petals nearly as long, the blade broadly lunate, rounded at the apex, with a round auricle; pod spreading or slightly reflexed, sessile, subterete, glabrous, transversely reticulate, slightly arched, abruptly acute at each end, the beak short, recurved.

Type collected in Louisiana, *Dr. Hale 313* (Torrey Herbarium, flowers); also at Shreveport, *Cocks 3624* (fruit).

DISTRIBUTION: Louisiana to Alabama.

19. *Astragalus oreophilus* Rydb. Bull. Torrey Club 31: 561. 1904.

A perennial; stem erect, 3-6 dm. high, sparingly strigose, branched; leaves about 15 cm. long; stipules deltoid to lanceolate, strigose, acuminate, 4-5 mm. long; leaflets 7-23, oblong or elliptic, about 3 cm. long, strigose on both sides, glabrate above; peduncles 5-15 dm. long; racemes 5-10 cm. long; bracts lanceolate, acuminate, 3-5 mm. long; pedicels very short; calyx white-pubescent with short hairs, the tube about 5 mm. long; lower calyx-teeth subulate, 1.5 mm. long, the upper lanceolate, shorter and broader; corolla like that of *A. canadensis*; pod oblong, about 1.5 cm. long, 5 mm. thick, glabrous, leathery, almost terete; seeds brown, obliquely reniform, 2 mm. long.

TYPE LOCALITY: Pagosa Springs, Colorado.

DISTRIBUTION: Colorado and northern New Mexico.

20. *Astragalus Mortonii* Nutt. Jour. Acad. Phila. 7: 19. 1834.

Astragalus tristis Nutt.; T. & G. Fl. N. Am. 1: 336. 1838.

Astragalus canadensis Mortonii S. Wats. Bot. King's Expl. 68. 1871.

Tragacantha Mortonii Kuntze, Rev. Gen. 946. 1891.

Phaca Mortonii Piper, Contr. U. S. Nat. Herb. 11: 372. 1906.

A perennial; stem 3-5 dm. high, strigose, slightly sulcate, flexuose; leaves 1-1.5 dm. long, ascending or spreading; stipules deltoid, 6-10 mm. long, acuminate, united around the stem, strigose; leaflets 13-19, oval or elliptic, rounded at the apex, 1-2 cm. long, 4-10 mm. wide, glabrous above, strigose beneath; peduncles 6-16 cm. long; racemes very dense, 3-12 cm. long; bracts lanceolate, 4-5 mm. long; calyx pubescent with mixed white and black hairs, the tube about 4 mm. long, the teeth subulate, the upper 1.5, the lower 2.5 mm. long; corolla ochroleucous, 12-13 mm. long; banner obovate, slightly arched at the middle; wings shorter, the blade obliquely oblanceolate, with a large basal auricle; keel-petals shorter, the blade broadly lunate, with a large auricle; pod oblong, pubescent, 15-20 mm. long, contracted above into a straight beak, sulcate on the lower suture.

TYPE LOCALITY: Sources of the Missouri [Montana].

DISTRIBUTION: Mountains, from Montana to Washington, northern California, and western Wyoming.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 40.

21. *Astragalus pachystachys* Rydberg, non. nov.

Astragalus spicatus Nutt.; T. & G. Fl. N. Am. 1: 336. 1838. Not *A. spicatus* Pall. 1773.

Astragalus canadensis Mortonii S. Wats. Bot. King's Expl. 68, in part. 1871.

A perennial, with a creeping rootstock; stem 2-6 dm. high, striate and strigose, rather strict; leaves 6-15 cm. long, ascending; stipules deltoid, acuminate, 5-7 mm. long; leaflets 11-15, elliptic, 1-2.5 cm. long, rounded at the apex, glabrous above, strigose beneath; peduncles 5-10 cm. long; racemes dense, 3-7 cm. long; bracts lanceolate, 4-6 mm. long; pedicels very short; flowers reflexed; calyx white-hairy, the tube 6 mm. long, 3 mm. broad, the upper two teeth deltoid, 1.5 mm. long, twice as broad as the lower ones, which are subulate, 2 mm. long; corolla ochroleucous; banner 12-14 mm. long, moderately arched; wings only slightly shorter, the blade falcate-oblanceolate, with a long reflexed auricle; keel-petals nearly as long, the blade broadly obliquely lunate, rounded at the apex; pod densely strigose, oblong, abruptly contracted at the apex, with the beak curved downward, about 4 mm. thick and wide; seeds brown, obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: "Rocky Mountains." [Probably Wyoming].

DISTRIBUTION: Hills, from Black Hills of South Dakota to British Columbia, Washington, Nevada, and Colorado.

22. *Astragalus Torreyi* Rydberg, sp. nov.

A perennial; stem 3-5 dm. high, somewhat angled, glabrous or sparingly strigose, flexuose; leaves 8-12 cm. long, spreading; stipules scarious, lance-deltoid or lanceolate, 8-10 cm. long; leaflets 17-21, oblong or lance-oblong, acutish at each end, or obtuse at the apex, 1-2.5 cm. long, 3-8 mm. wide, strigose on both sides, in age glabrate above; peduncles 7-10 cm. long; racemes dense, 3-6 cm. long; bracts lanceolate, about 5 mm. long; calyx short-pubescent, the tube 1.5-2 mm. long, the upper two teeth deltoid, the lower three subulate; corolla ochroleucous, 12-15 mm. long; banner narrowly obovate, slightly arched; wings nearly as long, the blade oblong-oblanceolate, with a large basal auricle; keel-petals shorter, the blade broadly lunate, rounded at the apex; pod oblong, subterete, abruptly acute at each end, short-pubescent, sulcate on the lower suture, slightly curved, the beak slightly recurved.

Type collected near Empire City, Nevada, in 1865, *Torrey* (herb. Columbia University and N. Y. Bot. Gard.).

DISTRIBUTION: Nevada, eastern California, and southern Idaho.

23. *Astragalus oreganus* Nutt.; T. & G. Fl. N. Am.

1: 335. 1838.

Astragalus ventorum A. Gray; Parry, Am. Nat. 8: 212. 1874.*Tragacantha ventorum* Kuntze, Rev. Gen. 949. 1894.

A perennial, with an underground rootstock; stems branched, flexuose, canescent-strigose, 1-1.5 dm. high; leaves 7-15 cm. long, ascending; stipules large, deltoid, 5-8 mm. long, free from the petiole, connate around the stem, somewhat scariosus, strigose; leaflets 9-21, obovate or broadly oval, often truncate or retuse at the apex, 8-20 mm. long, 5-12 mm. wide, canescent; peduncles 3-8 cm. long; racemes 3-9 cm. long; bracts lanceolate, scariosus, 5-7 mm. long; calyx short-villous; the tube 6-7 mm. long, 4 mm. broad, the teeth subulate, 2 mm. long; corolla ochroleucous or sulphur-yellow, 15-18 mm. long; banner broadly obovate, rather strongly arcuate; wings nearly as long, the blade oblong, with a rounded basal auricle; keel-petals much shorter, the blade broadly lunate, strongly arched towards the rounded apex; pod slightly strigose, oblong, 12-18 mm. long, slightly curved, the upper suture prominent, the lower slightly sulcate.

TYPE LOCALITY: "Plains of the Rocky Mountain Range, towards the Oregon."

DISTRIBUTION: Wyoming and eastern Idaho.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 37, f. 127.

3. *Hypoglottides*. Plants perennial, with a caespitose caudex; stems elongate, leafy; leaves green, strigose, ascending or spreading; racemes dense, spike-like; calyx subcylindric, the teeth one third to two thirds as long as the tube; corolla purple or ochroleucous, the banner moderately arched at the middle; pod ovoid, short and coriaceous, several- to many-seeded, deeply sulcate on the lower suture, strongly ascending, cordate in cross-section.

24. *Astragalus striatus* Nutt.; T. & G. Fl. N. Am. 1: 330. 1538.*Astragalus Laxmanni* Nutt. Gen. 2: 99. 1818. Not *A. Laxmanni* Jacq. 1776.*Astragalus adsurgens* Hook. Fl. Bor. Am. 1: 149. 1831. Not *A. adsurgens* Pall. 1800.*Astragalus adsurgens robustior* Hook. Fl. Bor. Am. 1: 149. 1831.*Astragalus hypoglottis robustior* Hook. Lond. Jour. Bot. 6: 210. 1847.*Astragalus nitidus* Dougl.; (Hook. Fl. Bor. Am. 1: 149, as synonym. 1831) M. E. Jones, Proc. Calif. Acad. II. 5: 646. 1895.*Phaca adsurgens* Piper, Contr. U. S. Nat. Herb. 11: 372. 1906.*Astragalus adsurgens pauperculus* Blankinship, Mont. Agr. Coll. Stud. 1: 72 [depauperate form]. 1895.*Astragalus nitidus robustior* M. E. Jones, Rev. Astrag. 170, in part. 1923.

A perennial, with a caespitose caudex; stems several, decumbent at the base, 2-4 dm. high, sparingly strigose; leaves 7-12 cm. long, ascending; stipules deltoid, distinct, scariosus, about 5 mm. long; leaflets 13-25, oblong or elliptic, 5-20 cm. long, 4-7 mm. wide, acute or obtuse, silky-strigose beneath, less so or glabrate above; peduncles 6-10 cm. long; racemes dense, 3-6 cm. long; bracts lanceolate, 3-5 mm. long; calyx strigose with short black and white hairs mixed, the tube 4-6 mm. long, the teeth 3-4 mm. long, subulate; corolla light-purple, sometimes white, 15-18 mm. long; banner oblong-obovate, moderately arched; wings shorter, the blade oblong-oblancoleate, with a large basal auricle; keel-petals much shorter, the blade broadly lunate, rounded at the apex; pod oblong, 7-10 mm. long, 3-4 mm. wide and as thick, strigose, nearly straight, deeply sulcate on the lower suture.

TYPE LOCALITY: Plains and hills of the Platte and Missouri.

DISTRIBUTION: Manitoba and Minnesota to Nebraska, New Mexico, and Washington.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 40; Britt. & Brown, Ill. Fl. f. 2131; ed. 2. f. 2536 (both as *A. adsurgens*); Fl. Neb. 21: pl. 10, f. 42-46; Clements, Rocky Mt. Fl. pl. 28, f. 6 (as *A. hypoglottis*).25. *Astragalus Chandonnetii* Lunell, Am. Midl. Nat.

2: 127. 1911.

Astragalus adsurgens albiflorus Blankinship, Mont. Agr. Coll. Stud. 1: 71. 1905. Not *A. albiflorus* Gand. 1902.

A perennial, with a caespitose caudex; stems 2-4 dm. high, strigose, flexuose; leaves ascending, 5-10 cm. long; stipules scariosus, deltoid, acuminate, 5-10 mm. long; leaflets 11-19, oblong

or elliptic, 1-2.5 cm. long, 4-7 mm. wide, silvery-strigose on both sides, mostly obtuse; peduncles 7-15 cm. long, strict; racemes dense, 3-8 cm. long; bracts lance-subulate, 3-5 mm. long; flowers subsessile, ascending; calyx strigose with white hairs, the tube 4 mm. long, 2 mm. broad, the teeth subulate, 3-4 mm. long; corolla white or ochroleucous, about 15 mm. long; banner oblanceolate, retuse at the apex, moderately arched, with spreading margins; wings much shorter, the blade oblanceolate, somewhat falcate, as long as the narrow claw, with a large reflexed auricle; keel-petals still shorter, the blade obliquely lunate, more arched towards the obtuse tip; pod silvery-strigose, obliquely ovoid, 1 cm. long, 3 mm. wide and thick, deeply sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: McHugh, near Detroit, Minnesota.

DISTRIBUTION: Minnesota to Wyoming and Montana.

26. *Astragalus sulphureus* Rydb. Bull. Torrey Club
28: 36. 1901.

Astragalus Crandallii Gand. Bull. Soc. Bot. Fr. 48: xiv. 1902.

A perennial, with a caespitose caudex; stems ascending, 3-4 dm. high, angled and striate, glabrous or slightly strigose; leaves ascending, 6-12 cm. long; stipules ovate to lanceolate, somewhat scarious; leaflets 13-19, elliptic, obtuse or acute, 12-30 mm. long, glabrous above, sparingly strigose beneath; peduncles 5-15 cm. long; racemes 3-8 cm. long, dense; bracts lanceolate-subulate, about 8 mm. long; flowers ascending, subsessile; calyx strigose with mixed white and black hairs, the tube 4-5 mm. long, the teeth subulate-filiform, fully as long; corolla light-yellow, 15-18 mm. long; banner oblanceolate, moderately arched; wings much shorter, the blade almost linear, falcate, as long as the claw, with a large basal auricle; keel-petals shorter, the blade broadly lunate, obtuse; pod about 1 cm. long, 3-4 mm. wide and thick, strigose with black hairs, deeply sulcate on the lower suture, cordate in cross-section.

TYPE LOCALITY: Georgetown, Colorado.

DISTRIBUTION: Colorado.

27. *Astragalus brevidens* Rydberg, sp. nov.

A perennial, with a caespitose caudex; stems decumbent at the base, about 3 dm. high, more or less strigose; leaves ascending, about 1 dm. long; stipules lanceolate, acuminate, free, 5-7 mm. long; leaflets 17-21, elliptic or oval, 1-1.5 cm. long, 5-6 mm. wide, glabrous above, silky-strigose beneath, rounded at the apex; peduncles 5-10 cm. long; racemes dense, 4-6 cm. long; bracts lanceolate, 3-5 mm. long; flowers ascending, subsessile; calyx short-villous with white hairs, the tube 4 mm. long, nearly 3 mm. broad, the teeth subulate, 1-1.5 mm. long; corolla ochroleucous, 12 mm. long; banner oblanceolate, moderately arched; wings much shorter, the blade oblong, slightly falcate, equaling the claw, with a large basal auricle; keel-petals shorter, the blade broadly lunate, obtuse; young pod densely white-pubescent with short crisp hairs, deeply sulcate on the lower suture, the mature pod not seen.

Type collected 3 miles north of Whitney, Baker County, Oregon, Febr. 22, 1921, *M. Peck 10360* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Known only from the type locality.

28. *Astragalus virgultulus* Sheldon, Minn. Bot. Stud.
1: 165. 1894.

Astragalus hypoglottis bracteatus Osterhout, Bull. Torrey Club 26: 256. 1899.

Astragalus agrestis bracteatus M. E. Jones, Contr. W. Bot. 10: 87. 1902.

A perennial, with a caespitose creeping rootstock; stems several, branching, glabrous or sparingly strigose, 1-2 dm. high, flexuous; leaves 4-7 cm. long, spreading; stipules oblong or lanceolate, 4-8 mm. long, green; leaflets 15-19, linear or oblong, obtuse or slightly emarginate, 1-2 cm. long, 2-5 mm. wide, glabrous above, sparingly strigose beneath; peduncles 5-6 cm. long, sulcate; racemes dense, 1.5-3 cm. long; bracts oblong or oblanceolate, 5-6 mm. long, obtuse or acute; flowers ascending, subsessile; calyx appressed-pilose, mostly with white hairs, the tube 6 mm. long, 2 mm. broad, the teeth subulate, 3-4 mm. long; corolla ochroleucous,

12-20 mm. long; banner oblanceolate or narrowly obovate, slightly retuse; wings shorter, the blade oblong, equaling the claw, with a large auricle; keel-petals still shorter, the blade broadly lunate, with a rather large auricle; pod obliquely ovoid, nearly 1 cm. long, 4 mm. wide and thick, densely long-hairy, deeply sulcate on the lower suture, deeply cordate in cross-section.

TYPE LOCALITY: Plains near Boulder, Colorado.

DISTRIBUTION: Northern Colorado and southern Wyoming.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 41.

29. *Astragalus goniatus* Nutt.; T. & G. Fl. N. Am. 1: 330. 1838.

Astragalus hypoglottis Hook. Fl. Bor. Am. 1: 148. 1831. Not *A. hypoglottis* L. 1753.

Astragalus hypoglottis polyspermus T. & G. Fl. N. Am. 1: 328. 1838.

Astragalus dasylottis Nutt.; T. & G. Fl. N. Am. 1: 329, as synonym. 1838.

Phaca hypoglottis MacMill. Metasp. Minn. Valley 324, in part. 1892.

Astragalus agrestis M. E. Jones, Proc. Calif. Acad. II. 5: 646, in part, excluding synonym. 1895.

Astragalus agrestis polyspermus M. E. Jones, Contr. W. Bot. 10: 65. 1902.

Phaca agrestis Piper, Contr. U. S. Nat. Herb. 11: 372, in part. 1906.

A perennial, with a caespitose rootstock; stems much branched, 1-3 dm. high, glabrous, or sparingly strigose; leaves spreading, 4-10 cm. long; stipules lanceolate, 4-8 mm. long; leaflets 13-19, linear to oblong, 5-20 mm. long, 2-5 mm. wide, sparingly strigose on both sides, or glabrous above, rounded or retuse at the apex, or those of the upper leaves sometimes acute; peduncles 4-12 cm. long; racemes dense, 2-4 cm. long; bracts lanceolate or oblong, 4-5 mm. long; flowers subsessile, ascending; calyx black-hairy, the tube about 6 mm. long, 2 mm. wide, the teeth subulate, 3 mm. long; corolla purple, 15-17 mm. long; banner obovate, retuse; wings shorter, the blade oblong, as long as the claw, with a large basal auricle; keel-petals still shorter, the blade broadly lunate, obtuse at the apex; pod obliquely ovoid, long-pilose, 8-9 mm. long, 4 mm. wide and thick, sulcate on the lower suture, deeply cordate in cross-section; seeds obliquely round-reniform, 2 mm. long.

TYPE LOCALITY: Rocky Mountains near the sources of the Platte, Wyoming.

DISTRIBUTION: Minnesota to Washington, northern California, and New Mexico.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl.* 40, *f.* 131 (as *A. agrestis* and var. *polyspermus*); Britt. & Brown, Ill. Fl. *f.* 2132, ed. 2. *f.* 2537 (both as *A. hypoglottis*); Fl. Neb. 21: *pl.* 10, *f.* 47-51.

30. *Astragalus Tarletonis* Rydb. Bull. N. Y. Bot. Gard. 2: 175. 1901.

A perennial, with a caespitose rootstock; stems ascending, 2-3 dm. high, angled, striate, sparingly strigose; leaves about 1 dm. long, spreading; stipules lanceolate, attenuate, sparingly strigose; leaflets 17-29, elliptic to lanceolate or oblong, 10-15 mm. long, 3-6 mm. wide, sparingly strigose or in age glabrate, obtuse or retuse at the apex; peduncles 9-12 cm. long, sulcate; racemes dense, 3-4 cm. long; bracts oblong, 6-8 mm. long, mostly obtuse, black-hairy; flowers subsessile, ascending; calyx black-hairy, the tube 6 mm. long, the teeth subulate, of almost the same length; corolla purple, about 15 mm. long; banner obovate, retuse; wings shorter, the blade oblong-oblanceolate, equaling the claw, with a large auricle; keel-petals still shorter, the blade broadly lunate, rounded at the apex, with a rounded auricle; fruit unknown.

TYPE LOCALITY: Five-finger Rapids, Yukon.

DISTRIBUTION: Yukon and Mackenzie.

31. *Astragalus agrestis* Dougl.; (Hook. Fl. Bor. Am. 1: 148, as synonym. 1831) M. E. Jones, Proc. Calif. Acad. II. 5: 646. 1895.

Astragalus hypoglottis β Hook. Fl. Bor. Am. 1: 148. 1831.

Phaca agrestis Piper, Contr. U. S. Nat. Herb. 11: 372. 1906.

A perennial, with a caespitose rootstock; stems decumbent at the base or ascending, 2-3 dm. high, flexuose, glabrous or nearly so, sulcate, sometimes tinged with purple; leaves 5-10 cm. long, ascending; stipules lanceolate, attenuate, 4-8 mm. long; leaflets 11-21, oblong, 1-2 dm. long, often emarginate at the apex, sparingly strigose on both sides; peduncles 7-10 cm. long; racemes dense, about 3 cm. long; bracts oblong, 4-5 mm. long; calyx strigose with white hairs, the tube 5-6 mm. long, the teeth subulate, 5-6 mm. long; corolla purple, 18-20 mm.

long, similar to that of *A. goniatius*; mature pod not known, but the ovary long-hairy and the pod probably similar to that of said species.

TYPE LOCALITY: Fertile plains of the Red River, Manitoba.
DISTRIBUTION: Montana and Manitoba.

4. **Chaetodontes.** Plants perennial, with a caespitose caudex; stems leafy; leaves and stem villous; racemes dense, short, spike-like or head-like; calyx-tube campanulate, the teeth more than half as long as the tube; corolla white or purple, the banner rather strongly arched; pod short, few-seeded, almost woody, ovoid, deeply sulcate on the lower suture, cordate in cross-section.

32. *Astragalus Spaldingii* A. Gray, Proc. Am. Acad. 6: 524. 1865.

Astragalus chaetodon Torr.; A. Gray, Proc. Am. Acad. 6: 194. 1864. Not *A. chaetodon* Bunge. 1851.

Tragacantha Spaldingii Kuntze, Rev. Gen. 948. 1891.

Phaca Spaldingii Piper, Contr. U. S. Nat. Herb. 11: 370. 1906.

A perennial, with a caespitose caudex; stems numerous, ascending, slender, 1-3 dm. high, angled, villous; leaves ascending, 5-10 cm. long; stipules linear-lanceolate, attenuate, 5-8 mm. long; leaflets 15-25, oblong to lance-linear, acute, villous on both sides, 5-10 mm. long, 2-3 mm. wide; peduncles 5-10 cm. long; racemes at first dense and short, 2-3 cm. long, in age elongate and lax, up to 7 cm. long; bracts linear-lanceolate, 3-4 mm. long; flowers ascending, subsessile; calyx densely white-villous, the tube 4 mm. long, 3 mm. broad, the teeth subulate, 3 mm. long; corolla white, 12-14 mm. long; banner obovate, deeply retuse; wings shorter, the blade oblong, falcate, equaling the claw, with a reflexed auricle; keel-petals smaller, the blade lunate, shorter than the claw, obtuse and purple-tipped; pod ovoid, villous, 6-7 mm. long, 3.5 mm. wide and thick, suborbicular-cordate in cross-section; seeds 2-4, reniform, 2.5 mm. long.

TYPE LOCALITY: Plains of Kooskooskie River, Washington Territory [now Idaho].
DISTRIBUTION: Washington, Oregon, and western Idaho.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 41, f. 133.

33. *Astragalus Austinae* A. Gray, Bot. Calif. 1: 156. 1876.

Tragacantha Austinae Kuntze, Rev. Gen. 943. 1891.

A perennial, with a caespitose woody caudex; stems numerous, ascending, less than 1 dm. high, densely white-villous; leaves 2-4 cm. long, ascending; stipules canescent, broadly ovate or deltoid, 3-5 mm. long; leaflets 7-11, elliptic or oblanceolate, mostly acute, 4-6 mm. long, 2-3 mm. wide, densely canescent with appressed hairs; peduncles 2-5 cm. long; racemes dense, about 2 cm. long; bracts lanceolate, 3-5 mm. long; flowers subsessile, spreading; calyx villous, the tube 5 mm. long and 3 mm. broad, the teeth subulate, 3 mm. long; corolla purple, about 1 cm. long; banner obovate, villous without; wings slightly shorter, the blade oblanceolate, rather strongly falcate, as long as the claw, with an acute basal auricle; keel-petals shorter, the blade shorter than the claw, broadly lunate, almost semiorbicular; pod densely villous, about 7 mm. long, 3 mm. wide and thick, ovoid, slightly sulcate on the lower suture.

TYPE LOCALITY: Mount Stanford (Castle Peak), Nevada County, California.
DISTRIBUTION: Sierra Nevada, California and western Nevada.
ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 41, f. 132.

5. **Lentiformes.** Plant perennial, with a caespitose caudex; stems elongate, leafy; leaves green, more or less pubescent; racemes lax; calyx-tube campanulate, the teeth subulate; corolla small, white or ochroleucous, the banner strongly arched; pod reflexed, rather thin-walled, ovoid or lance-ovoid in outline, more or less compressed, few-seeded, the sulcus on the lower suture very narrow and inconspicuous.

34. *Astragalus Lyallii* A. Gray, Proc. Am. Acad. 6: 195. 1864.

Tragacantha Lyallii Kuntze, Rev. Gen. 246. 1891.

Phaca Lyallii Piper, Contr. U. S. Nat. Herb. 11: 370. 1906.

Astragalus Lyallii caricinus M. E. Jones, Rev. Astrag. 174. 1923.

A perennial, with a caespitose woody caudex; stems numerous, 2-5 dm. high, villous, terete, flexuose; leaves ascending, 5-10 cm. long; stipules subulate, 3-5 mm. long; leaflets 13-17,

villous, oblong to linear-lanceolate, acute at each end, 1-1.5 cm. long, 2-4 mm. wide; peduncles 4-6 cm. long; racemes elongate, 4-10 cm. long, lax; bracts subulate, 3-4 mm. long; flowers reflexed; pedicels 1 mm. long; calyx villous, the tube 2 mm. long, the teeth subulate, 3 mm. long; corolla white, 6-7 mm. long; banner obovate, striate, strongly arched at the middle; wings shorter, the blade obliquely oblanceolate, falcate, with a prominent auricle; keel-petals shorter, the blade broadly lunate, strongly arched, obtuse; pod villous, lance-oblong, somewhat laterally compressed, 6-7 mm. long, 3 mm. wide and thick, cordate in cross-section; seeds few.

TYPE LOCALITY: Upper Yakima River, Washington.

DISTRIBUTION: Washington and Idaho.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 41, f. 135.

35. *Astragalus lentiformis* A. Gray, Bot. Calif. 1: 156. 1876.

Tragacantha lentiformis Kuntze, Rev. Gen. 946. 1891.

A perennial, with a woody root and caespitose caudex; stems many, prostrate, slender, terete, sparingly pubescent, 1-2 dm. long; leaves 1-4 cm. long, spreading; stipules deltoid, 2-3 mm. long, pilose; leaflets 11-15, rather crowded, obovate, or elliptic, rounded or retuse at the apex, villose-pilose, 3-8 mm. long; peduncles 1-1.5 cm. long; racemes short, few-flowered, reflexed; calyx pilose, the tube 2 mm. long and broad, the teeth subulate, 2 mm. long; corolla white, about 5 mm. long; banner obovate; wings shorter, the blade oblanceolate, falcate; keel-petals still shorter, the blade semi-orbicular, rounded at the apex; pod oblong, thin-walled, villous, somewhat compressed, 1 cm. long, 3 mm. wide and 2 mm. thick, slightly sulcate on the lower suture, oblong in cross-section, 5-6-seeded.

TYPE LOCALITY: Sierra Nevada, in Clover Valley.

DISTRIBUTION: Sierra County, California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 69, f. 243.

36. *Astragalus Lemmoni* A. Gray, Proc. Am. Acad. 8: 626. 1873.

Tragacantha Lemmoni Kuntze, Rev. Gen. 946. 1891.

A perennial, with a woody root and a caespitose caudex; stems slender, prostrate, 2-5 dm. long, glabrous or sparingly strigose; leaves 2-4 cm. long, spreading; stipules deltoid or lanceolate, green, 4 mm. long, distinct; leaflets 9-13, lanceolate to obovate, strigose beneath; peduncles 1-3 cm. long, slender; racemes short, few-flowered; bracts lanceolate, 2 mm. long; pedicels less than 1 mm. long; calyx strigose, the tube 1.5 mm. long, the teeth subulate, scarcely 1 mm. long; corolla white, 4-5 mm. long; banner oval-obovate, abruptly arched; wings shorter, oblong, falcate; keel-petals shorter, the blade broadly lunate, semi-orbicular; pod obliquely lance-oblong, 5-7 mm. long, 1.5 mm. wide and 2 mm. thick, sulcate on the lower suture, cordate in cross-section, 3-4-seeded; seeds obliquely reniform.

TYPE LOCALITY: Sierra Valley, Sierra County, California.

DISTRIBUTION: California and Oregon.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 69, f. 252.

37. *Astragalus Peckii* Piper, Proc. Biol. Soc. Wash. 37: 92. 1924.

A low perennial, with a caespitose caudex; branches ascending, less than 1 dm. high, densely leafy, canescent; leaves 2-3 cm. long, ascending, strigose-canescens; stipules lanceolate- or ovate-deltoid, clasping; leaflets 9-13, lanceolate, 2-6 mm. long, acuminate, canescent on both sides, the terminal one poorly developed, represented by the somewhat produced and flattened tip of the rachis; racemes 2-3 cm. long, lax; bracts lanceolate; calyx strigose, the tube 2 mm. long, the teeth subulate, 1 mm. long; corolla ochroleucous, 5 mm. long; banner broadly obovate, strongly arched; wings about as long, the blade broadly lunate, with a large basal auricle; keel-petals shorter and broader, strongly incurved at the rounded apex; pod reflexed, oblong, acute at each end, flattened, strigose, about 7 mm. long and 2.5 mm. wide.

TYPE LOCALITY: McKenzie Pass, Cook County, Oregon.

DISTRIBUTION: Known only from the type locality.

6. **Breweriani.** Low annuals; stem branched; leaflets few, more or less cuneate; racemes head-like; corolla purplish, with a deeply retuse banner; pod coriaceous, ovoid, erect or nearly so, tapering into a beak as long as the body.

38. **Astragalus Breweri** A. Gray, Proc. Am. Acad. 6: 207. 1864;
Proc. Calif. Acad. 3: 103. 1864.

Tragacantha Breweri Kuntze, Rev. Gen. 943. 1891.

An annual; stem erect, branched, 1-2 dm. high, sparingly hispid-pubescent; leaves ascending or spreading, 3-5 cm. long; stipules deltoid, 2-3 mm. long; leaflets 9-11, cuneate-obovate or cuneate-oblong, sparingly strigose beneath, glabrous above, 4-10 mm. long, truncate or retuse at the apex; peduncles 4-6 cm. long, sparingly black-hispidulous; racemes dense, head-like; bracts ovate, 1 mm. long; calyx black-hairy, the tube campanulate, 3 mm. long, the teeth subulate, 2 mm. long; corolla purplish, or white, about 1 cm. long; banner obovate, deeply retuse, strongly arched at the middle; wings much shorter, the blade oblong, falcate, longer than the claw, with a large reflexed auricle; keel-petals about half as long as the banner, the blade broadly lunate, more strongly arched towards the rounded apex, tipped with dark-purple; pod erect, densely silky, sessile, coriaceous, the body lance-ovoid in outline, 10-12 mm. long, 3-4 mm. wide and thick, tapering into a straight beak, as long as the body, the upper suture acute, the lower deeply sulcate, the cross-section cordate; seeds few.

TYPE LOCALITY: Sonoma Valley, California.

DISTRIBUTION: Central California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 71, f. 268; Jepson, Man. Fl. Pl. Calif. f. 568.

EXCLUDED AND IMPERFECTLY KNOWN SPECIES

ASTRAGALUS BIDENTATUS H.B.K. Nov. Gen. & Sp. 6: 493. 1824. The species was described from a plant of unknown origin, and there is no indication that it came from Mexico. The description is full except as to the pod, which was not known, and accompanied by a good illustration. No similar plant has been collected since in North America. Jones' claim (see Rev. Astrag. 189), that it might be the same as *A. guatemalensis* Hemsley and that the figure might be inaccurate, has no ground whatever.

ASTRAGALUS CARNOSUS Pursh, Fl. Am. Sept. 740. 1814. This is *Sophora sericea*, the fruit excepted.

ASTRAGALUS DEFLEXUS Pall. Acta Acad. Petrop. 2: 268. 1779. This was later transferred by De Candolle to *Oxytropis*.

ASTRAGALUS FRUTESCENS Kunth, Ind. Sem. Hort. Berol. 1845: 12. 1845. This is the same as *Brongniartia podalyrioides* (see N. Am. Flora 24: 189).

ASTRAGALUS LAMBERTII Spreng. Syst. 3: 390. 1826. This was based on *Oxytropis Lambertii* Pursh, Fl. Am. Sept. 740. 1814.

ASTRAGALUS LEPTOPUS Benth.; A. Gray, Pl. Wright. 2: 43. 1853. This is only incidentally mentioned, and *A. cobrensis* is compared with it. There is no diagnosis, but the plant was found in Coulter's Mexican collections.

ASTRAGALUS HELLERI Fenzl, Bonplandia 8: 56. 1861. The description of this species is ample, but the type has not been accessible. The species is compared with *A. mexicanus*, *A. caryocarpus*, *A. plattensis*, and *A. irichocalyx*, and the plant should then belong to *Geoprumnon*. No species of this genus, however, has been collected in later years in southern Mexico. The type came from the neighborhood of Mount Orizaba, Veracruz.

ASTRAGALUS PASQUALENSIS M. E. Jones, Rev. Astrag. 78. 1923. This is the same as *Indigofera acutifolia* Schlecht. (see N. Am. Flora 24: 144. 1923). One specimen cited there belongs, however, to *I. nana* Rydb. (*loc. cit.* 143).

ASTRAGALUS RECTICARPUS Wood, Bot. Gaz. 3: 50. 1878. This is *Indigofera leptosepala* Nutt. (see N. Am. Flora 24: 143. 1923).

OMITTED SYNONYMS

ASTRAGALUS JUNCEUS A. Gray, Proc. Am. Acad. 6: 230. 1864. This synonym was omitted under *Homalobus junceus* Nutt. (see page 267).

ASTRAGALUS ODORATUS Ell.; D. Dietr. Syn. Pl. 4: 1080. 1847. This is given as a synonym under *A. Elliottii*, and is evidently an error for *A. obcordatus* Ell. (see *Batidophaca obcordata*, page 321).

ASTRAGALUS ORTHOCARPUS Dougl.; A. Gray, Proc. Am. Acad. 6: 196. 1864. The name appears only as a synonym of *A. canadensis* L.

ASTRAGALUS PALANS ARANEOSUS M. E. Jones, Proc. Calif. Acad. II. 5: 673. 1895. A synonym omitted under *Cysticum araneosum* (see page 410).

ASTRAGALUS STRIATIFLORUS M. E. Jones, Contr. W. Bot. 7: 643. 1835. The type has not been seen, but according to Jones himself it is a synonym of *Phaca Silerana* (see page 351).

ASTRAGALUS SUKSDORFII Howell, Erythea 1: 117. 1893. A synonym omitted under *Phaca Pulsiferae* (see page 357).

58. HESPERASTRAGALUS A. Heller, Muhlenbergia 2: 86. 1905.

Astragalus § *Microlobium* Nutt. Jour. Acad. Phila. II. 1: 152. 1848.

Slender annuals, or rarely (in the Mexican species) perennials. Leaves alternate, odd-pinnate, the stipules distinct and almost free from the petioles. Flowers perfect, in dense racemes or spikes, with minute bracts and very short pedicels. Calyx-tube hemispheric or short-campanulate; teeth nearly equal, mostly subulate. Corolla small. Banner oblancoolate, often claw-less, usually retuse or notched at the apex. Wings shorter, the blade equaling or exceeding the claw, mostly oblong, more or less falcate, with a large basal auricle. Keel-petals shorter, the blade lunate to semi-orbicular, often shorter than the claw, and with a small auricle. Stamens diadelphous (9 and 1), the sheath nearly straight, the free portion of the filaments abruptly bent upwards. Pistil sessile or nearly so, the ovary short, with 1-4 ovules in each cell, the style glabrous, the stigma capitate, terminal. Pod completely 2-celled, in fruit reflexed, short, coriaceous, almost didymous, usually with 1-3 seeds in each cell and almost filling it, the valves more or less cross-veined or cross-ribbed, indehiscent.

Type species, *Astragalus didymocarpus* H. & A.

Pod decidedly longer than broad, broadest below the middle and tapering at the apex.

Pod about as broad as long or broader, rounded and merely mucronate at the apex.

Body of the pod fully 5 mm. long.

Body of the pod about 3.5 mm. long or less.

1. REFLEXI.

2. DIPHACI.

3. DIDYMOCARPI.

1. REFLEXI

Annual; leaflets obovate, deeply retuse at the apex.

Perennial, with a creeping rootstock; leaflets linear-oblong.

1. *H. reflexus*.

2. *H. oxyrhynchus*.

2. DIPHACI

Pod strigulose, subsessile; leaflets linear, obtuse or acutish.

Plant green; corolla white.

Plant canescent; corolla yellowish.

Pod glabrous, distinctly stipitate, the stipe about equaling the calyx; leaflets obovate, retuse.

3. *H. diphacus*.

4. *H. peonis*.

5. *H. brazoensis*.

3. DIDYMOCARPI

Calyx white-hairy.

Pod short-pubescent, strongly rugose; leaflets more or less cuneate, deeply retuse.

Pod glabrous, not strongly rugose; leaflets oblong, not retuse.

Calyx black-hairy.

Pod pubescent; corolla less than 7 mm. long.

Leaflets oblong or cuneate, not deeply emarginate.

Pod densely pubescent with appressed hairs, not strongly rugose; racemes elongate, linear.

Pod with spreading pubescence; racemes short, rounded to oblong.

Pod rather densely long-hairy; corolla 4-5 mm. long.

Flowers subsessile in a dense head; pod not reflexed.

Flowers short-pedicelled; raceme in fruit slightly elongate; pod reflexed.

Pod short-pubescent; corolla 6-7 mm. long.

Leaflets linear, usually deeply emarginate.

Pod glabrous; corolla about 10 mm. long.

6. *H. dispemus*.

7. *H. obispensis*.

8. *H. Elmeri*.

9. *H. compactus*.

10. *H. Gambellianus*.

11. *H. didymocarpus*.

12. *H. catalinensis*.

13. *H. Milesianus*.

1. *Hesperastragalus reflexus* (T. & G.) Rydb. Bull. Torrey Club 53: 165. 1926.

Astragalus reflexus T. & G. Fl. N. Am. 1: 334. 1838.

Tragacantha reflexa Kuntze, Rev. Gen. 947. 1891.

A slender annual; stem branched at the base, 1-3 dm. high, sparingly pilose or glabrate; leaves ascending, 3-7 cm. long, the rachis slender, sparingly pilose; stipules deltoid, acuminate,

ciliate; leaflets 13–15, obovate or orbiculate, 4–8 mm. long, petiolulate, truncate or notched at the apex, glabrous above, pilose beneath; peduncles 3–6 cm. long; racemes dense, about 1 cm. long; bracts lanceolate, about 0.5 mm. long; pedicels less than 1 mm. long; calyx sparingly pilose, the tube campanulate, 1 mm. long, the teeth subulate, fully 1 mm. long; corolla 5–6 mm. long; banner purplish, with an ochroleucous spot and dark-purple veins; wings shorter, ochroleucous, the blade obliquely oblong, rounded at the apex and with a reflexed auricle; keel-petals dark-purple, fully as long, the blade lunate, with an acute auricle and acutish tip; pod glabrous, coriaceous, cross-veined, 6–7 mm. long, 2 mm. wide, and 4 mm. thick, the lateral view obliquely lanceolate, with the upper suture straight, the dorso-ventral view ovate, the cross-section broadly cordate; seeds mostly 2 in each cell, obliquely reniform.

TYPE LOCALITY: Texas.

DISTRIBUTION: Texas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 71, *f.* 266.

2. *Hesperastragalus oxyrhynchus* (Hemsl.) Rydb. Bull. Torrey Club 53: 165. 1926.

Astragalus oxyrhynchus Hemsl. Biol. Centr. Am. Bot. 1: 265. 1880.

Tragacantha oxyrhyncha Kuntze, Rev. Gen. 947. 1891.

Astragalus angelinus M. E. Jones, Rev. Astrag. 286. 1923.

A perennial, with several slender under-ground stems; stems decumbent, 1–2 dm. long, strigulose, often canescent; leaves 3–6 cm. long, ascending, the rachis strigulose; stipules deltoid, strigose, 3 mm. long; leaflets 15–25, linear, retuse to obtuse at the apex, glabrous above, strigose beneath; peduncles 3–7 cm. long, erect; racemes dense, 2–4 cm. long, many-flowered; bracts lanceolate, 1 mm. long; pedicels reflexed, 2 mm. long; calyx strigose with mixed white and black hairs, the tube campanulate, 1.5 mm. long, the teeth subulate, about as long; corolla 5–6 mm. long; banner broadly obovate, abruptly arched, slightly retuse, purplish with dark veins; wings slightly shorter, the blade obliquely oblong, falcate; keel-petals nearly as long, the blade semi-orbicular, obtuse; pod strigose, cross-reticulate, coriaceous, 7 mm. long, 3 mm. wide, and 4 mm. thick, the lateral view semi-ovate, straight on the upper suture, the dorsi-ventral view ovate, the cross-section broadly cordate, but only slightly sulcate on the lower suture.

TYPE LOCALITY: Tizapan, Valley of Mexico (Federal District).

DISTRIBUTION: Mexico and Hidalgo.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. *pl.* 70, *f.* 261 (poor); *pl.* 71, *f.* 272.

3. *Hesperastragalus diphacus* (S. Wats.) Rydb. Bull. Torrey Club 53: 166. 1926.

Astragalus diphacus S. Wats. Proc. Am. Acad. 17: 342. 1882.

An annual or perennial, with a taproot; stems branched at the base, usually decumbent, 1–3 dm. long, strigose, striate; leaves 5–10 cm. long, ascending, the rachis strigose; stipules lanceolate, 4–6 mm. long, strigose; leaflets 13–25, linear, petioluled, obtuse, glabrous above, strigose beneath; peduncles 5–15 cm. long; racemes dense and short, 2–4 cm. long; bracts lance-subulate, 2–3 mm. long, black-hairy; pedicels about 1 mm. long, reflexed; calyx black-hairy, the tube campanulate, 3 mm. long, the teeth subulate, nearly as long; corolla whitish, about 8 mm. long; banner obovate, retuse, abruptly arched at the middle; wings shorter, the blade obliquely oblong, falcate, with a large basal auricle; keel petals shorter, the blade semi-orbicular, rounded at the apex, subcordate at the base; pod strigose, 7–8 mm. long, 4 mm. wide, and 7 mm. thick, cross-reticulate, rounded and mucronate at the tip, sulcate on both sutures; seeds 2 or 3 in each cell.

TYPE LOCALITY: San Miguelito Mountains, San Luis Potosí.

DISTRIBUTION: San Luis Potosí and Zacatacas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. *pl.* 71, *f.* 271.

4. *Hesperastragalus peonis* (M. E. Jones) Rydberg, sp. nov.

Astragalus diphacus peonis M. E. Jones, Contr. W. Bot. 10: 65. 1902.

Apparently a perennial; stems decumbent or prostrate, silvery-canescens, 1-2 dm. long; leaves ascending, 3-5 cm. long; stipules deltoid, erect, 3 mm. long; leaflets 15-21, oblong or elliptic, 5-7 mm. long, conduplicate, densely white-strigose beneath, glabrate above; peduncles 5-6 cm. long; racemes short, 1.5-2.5 cm. long; bracts lanceolate, 1 mm. long; pedicels very short; calyx strigose with mixed black and white hairs, the tube 2.5-3 mm. long, the teeth lanceolate, 1 mm. long; corolla 6 mm. long, according to the original description white, but a note on the type sheet states "flowers yellow," and they are yellowish in the specimens; banner obovate, strongly arcuate; wings nearly as long, the blade obliquely oblong-oblancoelate, falcate; keel-petals shorter, the blade broadly lunate; pod strigulose, 5-6 mm. long, 4 mm. wide, 6 mm. thick, cross-reticulate, mucronate, rounded, sulcate on both sutures.

TYPE LOCALITY: Zacatecas.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 71.

5. *Hesperastragalus brazoensis* (Buckl.) Rydb. Bull. Torrey Club 53: 166. 1926.

Astragalus brazoensis Buckl. Proc. Acad. Phila. 1861: 452. 1862.
Tragacantha brazoensis Kuntze, Rev. Gen. 943. 1891.

An annual; stem branched at the base, erect, or decumbent at the base, 1-4 dm. high, sparingly strigose, striate; leaves ascending, 3-6 cm. long, the rachis sparingly strigose; stipules deltoid, 3 mm. long; leaflets 13-15, cuneate or oblong-obovate, retuse at the apex, 5-10 mm. long, glabrous above, sparingly strigose beneath, often only on the margins and midribs; peduncles 5-8 cm. long, ascending; racemes 1-4 cm. long; bracts lance-subulate, 1-2 mm. long; calyx sparingly strigose, the tube campanulate, 1.5 mm. long, the teeth subulate, 2 mm. long; corolla purplish or white, with purple-tipped keel; banner broadly obovate, slightly retuse, abruptly arcuate at the middle; wings shorter, the blade obliquely oblong-oblancoelate, falcate; keel-petals slightly shorter, the blade semi-orbicular, obtuse at the tip; pod distinctly stipitate, cross-reticulate, 5-7 mm. long and as thick, 4 mm. wide, deeply sulcate on the lower suture, the dorsi-ventral view suborbicular, subcordate at the base and abruptly beaked at the apex; seeds 2 or 3 in each cavity.

TYPE LOCALITY: Western Texas.

DISTRIBUTION: Texas and Tamaulipas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 71, f. 273.

6. *Hesperastragalus dispermus* (A. Gray) A. Heller, Muhlenbergia 1: 137. 1906.

Astragalus dispermus A. Gray, Proc. Am. Acad. 13: 365. 1878.

An annual; stem branched at the base, 1-2 dm. long, the branches ascending or decumbent, slender, minutely strigose, sometimes purplish; leaves 2-5 cm. long, ascending or spreading; stipules deltoid, acuminate, 3 mm. long; leaflets 7-11, cuneate or oblong-cuneate, 2-7 mm. long, usually deeply notched, white-hairy on both sides; peduncles 3-5 cm. long, ascending; racemes dense and head-like, the flowers sub-sessile; bracts subulate, 2 mm. long; calyx pilose with long white hairs, the tube 2 mm. long, the teeth subulate-filiform, slightly longer; corolla purple or white; banner obovate, 6-7 mm. long, abruptly arched at the middle, retuse; wings slightly shorter, the blade obliquely oblong-oblancoelate; keel-petals still shorter, the blade semi-orbicular, obtuse, often very dark; pod pubescent with rather short white hairs, strongly cross-ribbed, 3-4 mm. long, 1.5-2 mm. wide, 2.5 mm. thick, the lateral view obliquely ovoid, the dorsi-ventral one rounded-ovoid, the cross-section broadly cordate; seeds mostly solitary in each cavity.

TYPE LOCALITY: Wickenburg, Arizona.

DISTRIBUTION: Western Arizona, southern California, and Lower California.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 71, f. 270.

7. *Hesperastragalus obispensis* Rydb. Bull. Torrey Club
53: 167. 1926.

An annual; stem 1 dm. high, branched at the base, the branches ascending or spreading, minutely strigose; leaves 2-3 cm. long, spreading; stipules herbaceous, deltoid, acuminate, 2 mm. long; leaflets 9-11, elliptic or oblong, mostly rounded at the apex, 4-5 mm. long, pilose on both sides; peduncles 2-4 cm. long, slender; racemes dense, head-like, 1.5-2 cm. long, 1.5 cm. in diameter; bracts subulate, 2-3 mm. long; flowers nearly sessile; calyx white-pilose, the tube broadly campanulate, 2 mm. long, the teeth subulate, 2 mm. long; corolla apparently white with purple-tipped keel, 5-6 mm. long; banner with an oval blade, strongly arcuate; wings shorter, the blade obliquely oblanceolate; keel-petals nearly as long, the blade lunate, strongly arched at the middle, attenuate at the apex; pod glabrous, 3 mm. long, about as thick, 2 mm. wide, broadly ovate when seen from above, glabrous, acute.

TYPE LOCALITY: San Luis Obispo, California.
DISTRIBUTION: Known only from the type locality.

8. *Hesperastragalus Elmeri* (Greene) Rydb. Bull. Torrey Club
53: 168. 1926.

Astragalus Elmeri Greene, Erythraea 3: 98. 1895.

An annual; stems branched, 2-3 dm. high, with scattered black-hairs; leaves ascending, 3-5 cm. long; stipules deltoid, 4 mm. long, more or less scarious, slightly hairy; leaflets 1-15, oblong-cuneate, deeply emarginate, 6-10 mm. long, 1.5-3 mm. wide, glabrous above with scattered white hairs beneath; peduncles 3-6 cm. long; racemes comparatively lax, usually elongate, 1-2 cm. long, 6-8 mm. thick; bracts subulate, 2 mm. long, black-hairy; calyx black-hairy, the tube campanulate, 1 mm. long, the teeth subulate, about 1 mm. long; corolla lilac or white, 3 mm. long; banner obovate, acutish; wings shorter, the blade semi-bastate, the main portion obovate with a long, acute, somewhat porrect auricle; keel-petals as long, the blade almost rectangular, round-truncate at the apex and squarely truncate on the upper edge at the base, the claw broad; pod 3 mm. long and thick, about 2 mm. wide, broadly ovate, as seen from above, reticulate, with appressed white hairs, broadly obovate in cross-section.

TYPE LOCALITY: Ross Valley, Marin County, California.
DISTRIBUTION: Central and southern California.

9. *Hesperastragalus compactus* A. Heller, Muhlenbergia 2: 218. 1906:

An annual; stem diffusely branched from the base, 2-3 dm. long, slender, strigose; leaves 2-4 cm. long; stipules deltoid, short-acuminate, 2 mm. long, strigose; leaflets 11-15, oblong or elliptic, 5-7 mm. long, 2-3 mm. wide, emarginate, strigose on both sides; peduncles 5-8 cm. long; racemes head-like, 7-10 mm. long; flowers subsessile; calyx black-strigose, the tube 1.5 mm. long, the teeth subulate; corolla violet-blue; banner obovate, abruptly arched; wings shorter, the blade obliquely oblong; keel-petals still shorter, the blade semi-orbicular, obtuse at the apex, and deeper blue; pods densely strigose with white hairs, cross-ribbed, 4 mm. long, obovoid, the lower suture deeply sulcate, cordate in cross-section, splitting the calyx at maturity.

TYPE LOCALITY: Hills near Pollasky, Fresno County, California.
DISTRIBUTION: Known only from the type locality.

10. *Hesperastragalus Gambellianus* (Sheldon) A. Heller,
Muhlenbergia 2: 87. 1905.

Astragalus nigrescens Nutt. Proc. Acad. Phila. 4: 9. 1848. Not *A. nigrescens* Pall. 1800.
Astragalus Gambellianus Sheldon, Minn. Bot. Stud. 1: 21. 1894.
Hesperastragalus nigrescens A. Heller; M. E. Jones, Rev. Astrag. Index. 1923.

An annual; stems branched at the base, slender, ascending or decumbent, 1-2 dm. high, sparingly pubescent with white hairs, sometimes mixed with black ones; leaves 2-4 cm. long,

ascending, the rachis sparingly pubescent; stipules deltoid, 2-5 mm. long; leaflets 9-13, oblong-cuneate, notched, 3-10 mm. long, pilose on both sides or glabrate above; peduncles 3-5 cm. long; racemes 1-2 cm. long; bracts lanceolate, 1 mm. long, black-ciliate; pedicels very short; calyx black-hairy, the tube less than 1 mm. long, the teeth subulate, of about the same length; corolla purple or white, 4 mm. long; banner broadly obovate, retuse; wings shorter, the blade oblong, with a large spreading auricle; keel-petals shorter, the blade broadly lunate; pod 3-4 mm. long, white-pubescent with rather long crisp hairs, cross-ribbed, sulcate on the lower suture, the dorsi-ventral view suborbicular, the lateral one nearly semi-orbicular, the cross-section deeply cordate.

TYPE LOCALITY: Island of Catalina, California.

DISTRIBUTION: Southern Oregon to Lower California.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag., *pl. 71, f. 267*; Jepson, Man. Fl. Pl. Calif. *f. 567*.

11. *Hesperastragalus didymocarpus* (H. & A.) A. Heller, *Muhlenbergia* 2: 87. 1905.

Astragalus didymocarpus H. & A. Bot. Beech. Voy. 334. 1838.

Tragacantha didymocarpa Kuntze, Rev. Gen. 944. 1891.

An annual; stems branched from the base, ascending, strigose, and striate; leaves 3-6 cm. long, ascending; stipules broadly deltoid, acuminate, scarious, striate; leaflets 9-17, oblong-cuneate, notched at the apex, 5-10 mm. long, glabrate above, pilose beneath; peduncles 3-6 cm. long; racemes dense, head-like, oblong, 1-2 cm. long; flowers subsessile; bracts subulate, 2 mm. long; calyx black-hairy, the tube 1.5-2 mm. long, the teeth subulate, nearly as long; corolla 6-7 mm. long; banner oblanceolate, notched at the apex, strongly arched; wings shorter, the blade oblong, with a large basal auricle; keel-petals still shorter, the blade nearly semi-orbicular, obtuse at the apex; pod nearly spherical, 3 mm. long, 2.5 mm. wide and thick, strongly cross-ribbed, minutely strigulose, deeply sulcate on the lower suture; seed usually solitary in each cavity, obliquely rounded-reniform.

TYPE LOCALITY: California.

DISTRIBUTION: Central and southern California.

ILLUSTRATIONS: H. & A. Bot. Beech. Voy. *pl. 81*; M. E. Jones, Rev. Astrag. *pl. 71, f. 269*.

12. *Hesperastragalus catalinensis* (Nutt.) Rydb. Bull. Torrey Club 53: 169. 1926.

Astragalus catalinensis Nutt. Proc. Acad. Phila. 4: 9. 1848.

An annual; stem branched at the base, 1-3 dm. high, sparingly strigulose; leaves 3-5 cm. long, ascending; stipules deltoid, 2-4 mm. long; leaflets 11-17, narrowly linear, 4-12 mm. long, deeply notched into 2 acute teeth at the apex, glabrous above, pilose or strigose beneath; peduncles 3-5 cm. long; racemes dense, oblong, 1-1.5 cm. long; bracts lanceolate, 1-2 mm. long; calyx black-hairy, the tube 1.5-2 mm. long, the teeth subulate, 1-1.5 mm. long; corolla 5-7 mm. long, purple or white; petals similar to those of *H. didymocarpus*; pod nearly globose, nearly 3 mm. long, pubescent with comparatively short crisp hairs; seeds mostly solitary in each cavity.

TYPE LOCALITY: Island of Catalina, California.

DISTRIBUTION: Southern California and Lower California.

13. *Hesperastragalus Milesianus* Rydb. Bull. Torrey Club 53: 169. 1926.

An annual; stem erect, 2-3 dm. high, glabrous or with a few scattered hairs; leaves 4-6 cm. long, ascending; stipules 2-3 mm. long, deltoid, more or less scarious; leaflets 11-13, oblong-cuneate, about 1 cm. long and 2 mm. wide, emarginate, glabrous above, sparingly hairy beneath; peduncles 4-5 cm. long; racemes head-like, dense, 1-2 cm. long, fully 1 cm. broad; bracts lanceolate, 1-2 mm. long; flowers subsessile; calyx black-hairy, the tube 2-2.5 mm. long, the teeth subulate, fully 1 mm. long; corolla purplish; banner oblanceolate, 1 cm.

long, emarginate; wings about 8 mm. long, the blade oblanceolate, with a large reflexed auricle; keel-petals about as long, the blade strongly arcuate near the rounded apex, with a small auricle; pod rounded-ovoid, strongly cross-ribbed, glabrous, 4 mm. long, nearly as thick and wide, broadly obovate in cross-section.

TYPE LOCALITY: San Luis Obispo, California.

DISTRIBUTION: Known only from the type locality.

59. GEOPRUMNON Rydb.; Small, Fl. SE. U. S. 615, 1332. 1903.

Low perennials, with caespitose rootstocks. Stems mostly decumbent or spreading. Leaves odd-pinnate, with stipules but without stipels, the leaflets petioluled. Flowers in axillary dense racemes. Calyx deeply campanulate, the tube longer than the 5 teeth. Corolla purple or whitish. Banner oblanceolate or narrowly obovate, mostly retuse at the apex, cuneate at the base, without a claw, moderately arched at the middle, with spreading margins. Wings with an oblong blade, about equaling the claw, and a basal reflexed auricle. Keel-petals shorter, the blade broadly lunate, obtuse at the apex. Stamens diadelphous (9 and 1), the sheath almost straight. Ovary sessile, many-ovuled; style bent above, glabrous; stigma capitate. Pod ellipsoid to subglobose, completely 2-celled by intrusion of the lower suture. fleshy, becoming spongy in age, tardily dehiscent. Seeds round-reniform, oblique.

Type species, *Astragalus crassicaarpus* Nutt.

Pod glabrous, at least in age.

Pod subglobose or broadly ellipsoid, abruptly mucronate at the apex.

Calyx strigose.

Pod subglobose, about as broad as long, 2-2.5 cm. long; corolla about 2 cm. long.

Corolla purple; leaflets oblong to linear.

Corolla cream-colored with purple keel; leaflets oval or obovate.

Pod broadly ellipsoid, 2.5-3 cm. long; corolla about 3 cm. long, white or ochroleucous.

Calyx densely woolly; corolla ochroleucous; pod subglobose.

Pod obliquely ovoid, acuminate; corolla ochroleucous; leaflets lance-oblong. Pod pubescent.

Pod somewhat oblique but not curved, less than 2 cm. long, short-acuminate; stems with short ascending hairs.

Pod arcuate, more than 2 cm. long, gradually acuminate; stems with long spreading hairs.

1. *G. crassicaarpus*.

2. *G. succulentum*.

3. *G. mexicanum*.

4. *G. trichocalyx*.

5. *G. pachycarpum*.

6. *G. plattense*.

7. *G. tennesseense*.

1. *Geoprimum crassicaarpus* (Nutt.) Rydb.; Small, Fl. SE. U. S. 616, 1332. 1903.

Astragalus crassicaarpus Nutt.; Fraser, Cat. 1. 1813.

Astragalus crassipes Fraser; Steud. Nom. Bot. ed. 2. 1: 160 (err.). 1841.

Astragalus carnosus Pursh, Fl. Am. Sept. 740, in part. 1814; Nutt. Gen. 2: 100. 1818.

Astragalus caryocarpus Ker, Bot. Reg. 2: 176. 1816.

Tragacantha caryocarpa Kuntze, Rev. Gen. 943. 1891.

Phaca caryocarpa MacMill. Metasp. Minn. Valley 326, as synonym. 1892.

Astragalus succulentus Lindl. Bot. Reg. 16: pl. 1324. 1830. Not *A. succulentus* Richards. 1823.

A perennial, with a caespitose rootstock; stems decumbent, at least below, 1-4 dm. long, sparingly strigose, striate or slightly grooved; leaves spreading, 3-10 cm. long; stipules green or partly hyaline, deltoid, acuminate, 5-7 mm. long; leaflets 15-21, linear to elliptic, cuneate at the base, rounded to acutish at the apex, 5-18 mm. long, 3-7 mm. wide; peduncles 3-7 cm. long; racemes dense, 3-4 cm. long; bracts lanceolate, acuminate, 3-5 mm. long, scarious; pedicels very short; calyx more or less black-hairy, the tube 8-10 mm. long, 3 mm. wide; corolla 2 cm. long, purple; banner oblanceolate, retuse; wings nearly as long, the blade oblong, equaling the claw, with a small reflexed auricle; keel-petals much shorter, the blade broadly lunate, shorter than the claw; pod glabrous, subglobose, about 2 cm. in diameter.

TYPE LOCALITY: Above the river Platte, Nebraska.

DISTRIBUTION: Prairies and plains from Manitoba to Missouri, Tennessee, New Mexico, Montana, and Saskatchewan.

ILLUSTRATIONS: Bot. Reg. 2: pl. 176; 16: pl. 1324 (as *A. succulentus*); M. E. Jones, Rev. Astrag. pl. 60, f. 196; Fl. Neb. 21: pl. 10, f. 52-54; Clements, Rocky Mt. Fl. pl. 29, f. 24; Britt. & Brown, Ill. Fl. f. 2125; ed. 2. f. 2530.

2. *Geoprumnon succulentum* (Richards.) Rydb. Bull. Torrey Club
32: 658. 1906.

Astragalus succulentus Richards. in Frankl. Journey 746. 1823.
Astragalus prunifer Rydb. Mem. N. Y. Bot. Gard. 1: 239. 1900.
Astragalus mexicanus Rydb. Fl. Neb. 21: 52. 1895. Not *A. mexicanus* A. DC. 1833.

A perennial, with a caespitose rootstock; stems several, decumbent, sparingly strigose; leaves spreading, 5-8 cm. long; stipules lanceolate or ovate, acuminate, 5-8 mm. long; leaflets 13-19, elliptic or oval, 5-20 mm. long, 4-10 mm. wide, yellowish-green, glabrate above, strigose beneath, rounded to acutish at the apex; peduncles 4-7 cm. long; racemes dense, 3-4 mm. long; bracts lanceolate or lance-linear, 5-8 mm. long; pedicels very short; calyx more or less black-hairy, 8-10 mm. long, the teeth subulate, 3 mm. long; corolla ochroleucous, with purple-tipped keel, 20-23 mm. long; banner oblanceolate, retuse, slightly arcuate; wings nearly as long, the blade oblong, nearly straight; keel-petals much shorter, the blade broadly lunate; pod subglobose, glabrous, 2-2.5 cm. in diameter.

TYPE LOCALITY: "Neighborhood of Carlton" [House, Saskatchewan].
DISTRIBUTION: Saskatchewan and Alberta to Colorado and Nebraska.
ILLUSTRATION: Fl. Neb. 21: pl. 11, f. 116, 117 (as *A. mexicanus*).

3. *Geoprumnon mexicanum* (A. DC.) Rydb.; Small, Fl. SE. U. S.
616, 1332. 1903.

Astragalus mexicanus A. DC. Mém. Soc. Genève 6: 224. 1833.
Tragacantha mexicana Kuntze, Rev. Gen. 946. 1891.
Astragalus crassicaepus pachycarpus M. E. Jones, Contr. W. Bot. 8: 16, in part. 1898.

A perennial, with a rootstock; stems several, decumbent at the base, about 3 dm. long, striate, sparingly strigose; leaves 8-15 cm. long, ascending or spreading; stipules deltoid or lance-deltoid, 6-8 mm. long, acuminate; leaflets 21-31, obovate, oval or elliptic, pilose on both sides or glabrate above, 6-12 mm. long, 4-5 mm. wide; peduncles 5-7 cm. long; racemes about 3 cm. long; bracts lanceolate, 5-6 mm. long; calyx strigose-pilose, the tube 8-9 mm. long, the teeth subulate, 5 mm. long; corolla 25-28 mm. long; banner narrowly obovate, retuse; wings much shorter, the blade oblong, somewhat falcate; keel-petals broadly lunate; pod broadly ellipsoid, 3-3.5 cm. long, 1.75-2 cm. thick, glabrate.

TYPE LOCALITY: Guadalupe River, Texas.
DISTRIBUTION: Texas.
ILLUSTRATIONS: Mém. Soc. Genève 6: pl. 3; M. E. Jones, Rev. Astrag. pl. 61 (as *A. crassicaepus* var. *pachycarpus*).

4. *Geoprumnon trichocalyx* (Nutt.) Rydb. Bull. Torrey
Club 53: 163. 1926.

Astragalus trichocalyx Nutt.; T. & G. Fl. N. Am. 1: 332. 1838.
Astragalus mexicanus A. Gray, Pl. Wright. 1: 51, in part. 1852. Not *A. mexicanus* DC. 1833.
Geoprumnon mexicanum Rydb.; Small, Fl. SE. U. S. 616, 1332, in part. 1903.

A perennial, with a caespitose woody rootstock; stems several, 3-5 dm. long, decumbent at the base, glabrous below, strigose above; leaves ascending, 8-10 cm. long; stipules deltoid, 6-8 mm. long, thin, acuminate; leaflets 15-23, elliptic, oval or obovate, rounded or slightly retuse at the apex, 5-15 mm. long, glabrous above, appressed-pilose beneath; peduncles 5-8 cm. long; racemes dense, 2-3 cm. long; bracts lanceolate, 3-5 mm. long; pedicels about 1 mm. long; calyx white-villous, the tube 8-9 mm. long, 4 mm. broad, the teeth subulate, 1.5 mm. long; corolla ochroleucous or cream-colored, about 2 cm. long; banner oblanceolate, slightly arched at the middle; wings much shorter, the blade oblong, falcate, with a large auricle; keel-petals still shorter, the blade broadly lunate, rounded at the apex; pod globose or nearly so, 2-2.5 cm. long, 2 cm. thick, glabrous.

TYPE LOCALITY: Plains of Arkansas.
DISTRIBUTION: Illinois to southern Kansas, Texas, and Louisiana.
ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 61, f. 197; Britt. & Brown, Ill. Fl. f. 2126; ed. 2. f. 2531 (all as *A. mexicanus*).

5. *Geoprumnon pachycarpus* (T. & G.) Rydb.; Small, Fl. SE.

U. S. 616, 1332. 1903.

Astragalus pachycarpus T. & G. Fl. N. Am. 1: 332. 1838.*Astragalus crassicaarpus pachycarpus* M. E. Jones, Contr. W. Bot. 8: 16. 1898.

A perennial, with a creeping rootstock; stems decumbent at the base, 1.5-3 dm. high, strigose; leaves 5-10 cm. long, spreading; stipules lance-deltoid, 5 mm. long; leaflet 15-23, lanceolate, acute, 5-10 mm. long, 1-3 mm. wide, strigose beneath, glabrate above; peduncles 3-5 cm. long; racemes 2-3 cm. long; bracts lanceolate, 2-3 mm. long; calyx strigose, the tube 5 mm. long, the teeth subulate, 2 mm. long; corolla pale, apparently ochroleucous, the keel tipped with purple; banner obovate, about 15 mm. long; wings much shorter, the blade lance-elliptic, acutish, with a large basal auricle; keel-petals shorter, the blade broadly lunate, rounded at the apex; pod ovoid-ellipsoid, 18-22 mm. long, 8-10 mm. wide, and 10-12 mm. thick.

TYPE LOCALITY: Prairies of Arkansas.

ILLUSTRATION: M. E. Jones, Rev. Astrag. pl. 61, f. 198 (in part, as to the glabrous fruit).

6. *Geoprumnon plattense* (Nutt.) Rydb.; Small, Fl. SE.

U. S. 616, 1332. 1903.

Astragalus caryocarpus Torr. Ann. Lyc. N. Y. 2: 179. 1827. Not *A. caryocarpus* Ker, 1816.*Astragalus plattensis* Nutt.; T. & G., Fl. N. Am. 1: 332. 1838.*Tragacantha plattensis* Kuntze, Rev. Gen. 947. 1891.*Phaca plattensis* MacMill. Metasp. Minn. Valley 325, as synonym. 1892.

A perennial, with a caespitose rootstock; stems slender, decumbent or ascending, 3-4 dm. long, hirsute; leaves 5-10 cm. long; stipules lanceolate or deltoid, acuminate, 3-5 mm. long; leaflets 15-25, elliptic, oblong or obovate, 4-15 mm. long, 3-5 mm. wide, glabrate above, pilose beneath; peduncles 3-5 cm. long; racemes dense, 1.5-2 cm. long; bracts lance-subulate, 3-5 mm. long; pedicels very short; calyx hirsute-pilose with ascending hairs, the tube 6-7 mm. long, the teeth lance-subulate, 2 mm. long; corolla purplish, 14-16 mm. long; banner narrowly obovate, retuse at the apex, moderately arched at the middle; wings shorter, the blade obliquely oblanceolate, with a large basal auricle; keel-petals shorter, the blade broadly lunate, rounded and much darker at the apex; pod pubescent, obliquely ovoid, abruptly acuminate, 1.5-2 cm. long, 1-1.5 cm. thick, 7-8 mm. wide, slightly sulcate on each suture.

TYPE LOCALITY: Plains of Platte, Nebraska.

DISTRIBUTION: Prairies and plains from Indiana (?) to Minnesota, Black Hills of South Dakota, Texas, and Alabama.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 61, f. 198 (except the glabrous fruit); p. 62; Fl. Neb. 21; pl. 10; f. 55-57; Britt. & Brown, Ill. Fl. f. 2127; ed. 2. f. 2532.

7. *Geoprumnon tennesseense* (A. Gray) Rydb.; Small, Fl. SE.

U. S. 615, 1332. 1903.

Astragalus tennesseense A. Gray; Chapm. Fl. S. U. S. 98. 1860.*Astragalus plattensis tennesseensis* A. Gray, Proc. Am. Acad. 6: 193. 1864.

A perennial, with a caespitose rootstock; stems decumbent at the base, long-pilose; leaves ascending, 5-12 cm. long; stipules deltoid, acuminate, 7-10 mm. long, membranous and yellowish; leaflets 15-25, oblong to elliptic, 8-20 cm. long, glabrate above, pilose beneath, rounded at the apex; peduncles 5-10 cm. long; racemes dense, 2-3 cm. long; bracts lanceolate, acuminate, membranous, 4-5 mm. long; pedicels 1-1.5 mm. long; calyx villous-pilose, the tube 7 mm. long, 3 mm. broad, the teeth subulate, 2 mm. long; corolla ochroleucous, 15-17 mm. long; banner narrowly obovate, retuse, slightly arched; wings shorter, the blade oblong, with a large basal auricle; keel-petals still shorter, the blade obliquely and broadly lunate, rounded at the apex; pod obliquely oblong-ovoid, pubescent in age, reticulate, 2-5-3 cm. long, fully 10-15 mm. thick and 8-10 mm. wide, slightly sulcate on each suture.

TYPE LOCALITY: Nashville, Tennessee.

DISTRIBUTION: Illinois to Tennessee and Alabama.

ILLUSTRATIONS: M. E. Jones, Rev. Astrag. pl. 62, f. 199; Britt. & Brown, Ill. Fl. f. 2128; ed. 2. f. 2533.

COMPLETED VOLUME

9: i-iv, 1-542. (Agaricales:) Polyporaceae (pars), Boletaceae, Agaricaceae (pars). Complete in 7 parts.

PARTS OF VOLUMES PREVIOUSLY PUBLISHED

- 3¹: 1-88. Hypocreales: Nectriaceae, Hypocreaceae. Fimetales: Chaetomiaceae, Fimetiaceae.
- 6¹: 1-84. Phyllostictales: Phyllostictaceae (pars).
- 7¹: 1-82. Ustilaginales: Ustilaginaceae, Tilletiaceae. 7²: 83-160. 7³: 161-268. 7⁴: 269-336. 7⁵: 337-404. 7⁶: 405-480. 7⁷: 481-540. 7⁸: 541-604. 7⁹: 605-668. 7¹⁰: 669-732. 7¹¹: 733-796. 7¹²: 797-848. Uredinales: Coleosporiaceae, Uredinaceae, Aecidiaceae.
- 10¹: 1-76. 10²: 77-144. 10³: 145-226. 10⁴: 227-276. (Agaricales:) Agaricaceae (pars).
- 14¹: 1-66. Sphaerocarpaceae: Sphaerocarpaceae, Riellaceae. Marchantiales: Ricciaceae, Corsiniaceae, Targioniaceae, Sauteriaceae, Rebouliaceae, Marchantiaceae.
- 15¹: 1-75. Sphagnales: Sphagnaceae. Andreaeales: Andreaeaceae. Bryales: Archidiaceae, Bruchiaceae, Ditrichaceae, Bryoxyphiaceae, Seligeriaceae. 15²: 77-166. Dicranaceae, Leucobryaceae.
- 16¹: 1-88. Ophioglossales: Ophioglossaceae. Marattiales: Marattiaceae. Filicales: Osmundaceae, Ceratopteridaceae, Schizaeaceae, Gleicheniaceae, Cyatheaceae (pars).
- 17¹: 1-98. Pandanales: Typhaceae, Sparganiaceae. Naiadales: Zannichelliaceae, Zosteraceae, Cymodoceaceae, Naiadaceae, Lilaaceae. Alismales: Scheuchzeriaceae, Alismaceae, Butomaceae. Hydrocharitales: Elodeaceae, Hydrocharitaceae. Poales: Poaceae (pars). 17²: 99-196. 17³: 197-288. Poaceae (pars).
- 21¹: 1-93. Chenopodiales: Chenopodiaceae. 21²: 95-169. Amaranthaceae. 21³: 171-254. Allioniaceae.
- 22¹: 1-80. Rosales: Podostemonaceae, Crassulaceae, Penthoraceae, Parnassiaceae. 22²: 81-191. Saxifragaceae, Hydrangeaceae, Cunoniaceae, Iteaceae, Pterostemonaceae, Hamamelidaceae, Altingiaceae, Phyllonomaceae. 22³: 193-292. Grossulariaceae, Platanaceae, Crossosomataceae, Connaraceae, Calycanthaceae, Rosaceae (pars). 22⁴: 293-388. 22⁵: 389-480. 22⁶: 481-560. Rosaceae (pars).
- 23¹: 1-76. 23²: 77-136. 23³: 137-194. (Rosales:) Mimosaceae.
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- 25¹: 1-87. Geraniales: Geraniaceae, Oxalidaceae, Erythroxylaceae, Linaceae. 25²: 89-171. Tropaeolaceae, Balsaminaceae, Limnanthaceae, Koerberliniaceae, Zygophyllaceae, Malpighiaceae. 25³: 173-261. Rutaceae, Surianaceae, Simaroubaceae, Bursereaceae. 25⁴: 263-326. Meliaceae, Trigonaceae. Polygalales: Vochyaceae, Polygalaceae (pars). 25⁵: 327-383. Polygalaceae (pars), Dichapetalaceae.
- 29¹: 1-102. Ericales: Clethraceae, Monotropaceae, Lennoaceae, Pyrolaceae, Ericaceae.
- 32¹: 1-86. 32²: 87-158. Rubiales: Rubiaceae (pars).
- 33¹: 1-110. Carduales: Ambrosiaceae, Carduaceae (pars).
- 34¹: 1-80. 34²: 81-180. 34³: 181-288. 34⁴: 289-360. (Carduales): Carduaceae (pars).

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