

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Faculty Publications in the Biological Sciences

Papers in the Biological Sciences

12-30-1895

Flora of Nebraska: Part 21. Rosales

Per Axel Rydberg

University of Nebraska

The Botanical Seminar, University of Nebraska

Follow this and additional works at: <https://digitalcommons.unl.edu/bioscifacpub>



Part of the [Life Sciences Commons](#)

Rydberg, Per Axel and The Botanical Seminar, University of Nebraska, "Flora of Nebraska: Part 21. Rosales" (1895). *Faculty Publications in the Biological Sciences*. 35.

<https://digitalcommons.unl.edu/bioscifacpub/35>

This Article is brought to you for free and open access by the Papers in the Biological Sciences at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Faculty Publications in the Biological Sciences by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

FLORA OF NEBRASKA.

EDITED BY THE

MEMBERS OF THE BOTANICAL SEMINAR

OF THE

UNIVERSITY OF NEBRASKA.



Part 21. Rosales.

LINCOLN, NEBRASKA, U. S. A.

LIFE
QK
172
U548
v. 16

PUBLISHED BY THE SEMINAR.
1895.

UNIVERSITY OF NEBRASKA.
FLORA OF NEBRASKA.

PUBLISHED BY THE BOTANICAL SEMINAR.

XVI.

Part 21. Rosales.

LINCOLN, 1895.

(ISSUED DECEMBER 30, 1895.)

NOTE.

It has been decided to abandon the term *Disciflorae* for reasons which appear in Mr. Rydberg's introduction. This necessitates some change in the plan previously published. Two parts will be given to the *Calyciflorae*, the first, part 21, covering the *Rosales*, the other, part 22, the remainder of the group.

We are able to announce that part 8, *Fungi Imperfecti*, is approaching completion.

CHARLES E. BESSEY,

ROSCOE POUND,

FREDERICK E. CLEMENTS,

Editorial Committee.

October 31, 1895.

UNIVERSITY OF NEBRASKA.

FLORA OF NEBRASKA.

Published by the Botanical Seminar.

PART 21.

ROSALES.

BY

PER AXEL RYDBERG, A.M.

INTRODUCTION.

DeCandolle, the author of *Calyciflorae*, gives the following characters (Prodromus, 2: 1):

Calyx gamosepalous, that is, the sepals more or less united at the base. Torus more or less adnate to the bottom of the calyx. Petals and stamens inserted on a torus which is partly adnate to the calyx, and therefore generally said to be borne on the calyx. Petals free or united with each other. Ovary free, or adnate to the calyx.

What has generally been regarded as the lower portion of the gamosepalous calyx, and is described as such in many recent systematic works, is in reality the hollow upper portion of the receptacle. In this work the term receptacular-cup (receptacular-tube) has been adopted, a term which indicates the true nature of the organ. The foregoing description may, therefore, be modified to read:

Receptacle broadened into a flat or more or less concave or even tubular calyx-like structure, bearing on its margin the sepals, petals, and stamens, which are free or seldom more or less united; ovaries free, united with each other, or even imbedded in the hollow receptacle.

Bentham and Hooker modified the Candollean *Calyciflorae*, taking out the families constituting the sub-orders *Celastrales* and *Sapindales*, and making of these and the orders *Geraniales* and *Olacales*, the series *Disciflorae*. Hooker gives the reason for so doing in his edition of LeMaout and Decaisne, p. 993:

"The great obstacle to the recognition of the thalamifloral and calycifloral series lies in the fact that (putting aside the many cases of hypogynous orders containing perigynous genera) there are many orders of which it is difficult to say to which they belong. Thus Brongniart regards as hypogynous *Anacardiaceae*, *Connaraceae*, *Burseraceae*, and *Celastraceae*, all of which are regarded as perigynous by DeCandolle; and as perigynous, *Caryophyllaceae*, *Elatineae*, and *Olacineae*, which DeCandolle and Lindley regard as hypogynous. To reduce this difficulty, Mr. Bentham and I, observing that a highly developed staminiferous disk prevailed in the orders that intervened between the manifestly perigynous and hypogynous orders, collected them into a division of *Polypetalae* called series *Disciflorae*. In doing this we did not look on the disk as a proof of affinity, but as a guide to that amount of affinity which certainly exists between the orders included under that series."

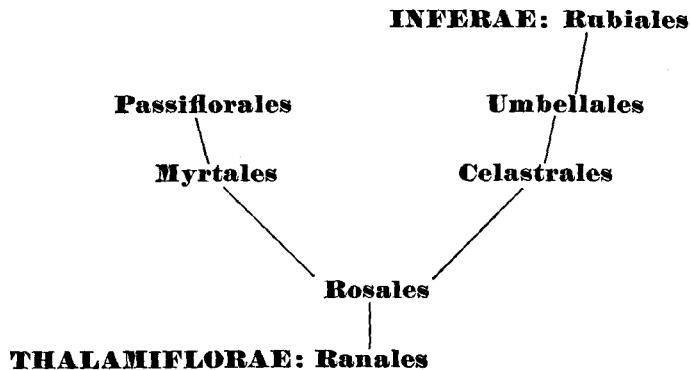
The difficulty seems to have been remedied very little, however. Whatever relationship there may be between the *Geraniales* and *Celastrales*, there is a much nearer one between the former and the *Caryophyllales*. *Linaceae* among the *Geraniales* is in the closest relationship to *Caryophyllaceae*, from which it differs mainly in the position of the ovules. The affinities of the *Celastrales* are nearly all among the calycifloral families. *Rhamnaceae* and *Celastraceae* are nearly related to groups of plants now generally included in *Saxifragaceae*, but formerly placed in either of those families.

The systematic position of the *Umbellales* has been very uncertain. While their close relationship to the *Rubiales* among the *Gamopetalae* has been recognized, indeed, strongly emphasized, their affinities among the other calycifloral orders have been very uncertain. The isostemonous flowers, the few, united, 1-2-ovuled carpels, the copious albumen, and the generally thick, fleshy disk at the margin of which the stamens are fastened

are all characters common to the *Umbellales* and the *Celastrales*. The difference between the two is rather of degree than of kind. In the *Celastrales*, the ovary is generally superior, in the *Umbellales*, inferior, *i. e.*, sunken into the receptacle. But, in some genera of *Rhamnaceae* and *Celastraceae*, the ovary is partly sunken in the receptacle, scarcely less so than in some representatives of *Araliaceae*, as for instance, *Hedera helix*.

If the fleshy disk that gave the name to the *Disciflorae* is used as the characteristic feature of the series, the *Umbellales* should be included in *Disciflorae*, and the *Geraniales* excluded, as the disk, if present, is of a different character. If, however, it is to take in the families on the border line between the *Thalamiflorae* and the *Calyciflorae*, then such families should be included as *Crassulaceae* and *Saxifragaceae* proper, in which the calycifloral character is generally obsolete. This is also the case in many genera in most families of the *Rosales*. It is, therefore, best to leave *Calyciflorae* as originally constituted.

RELATIONSHIP OF THE SUB-ORDERS OF CALYCIFLORAE.



Order 51.—CALYCIFLORAE.

Receptacle broadened into a flat, or more or less concave or even convex, tubular, calyx-like structure, bearing on its margin the sepals, petals, and stamens, which are free, or seldom more or less united; ovaries free, united with each other, or even imbedded in the hollow receptacle.

- A. Pistils 1-many, generally distinct, sometimes more or less united, but in ours with the upper portion and the styles free, generally superior, sometimes partly inferior, in *Grossulariaceae* wholly inferior.

Rosales.—A glandular disk is often present within the receptacle, but when present is scarcely ever fleshy.

- B. Ovaries syncarpic, generally many-ovuled, mostly inferior, and enclosed in the receptacular-tube (in *Lythraceae*, included, but free from the tube); disk, if any, not fleshy.

Myrtales.—Ovaries 1-several-locular; placentae central; style undivided.

Passiflorales.—Ovaries 1-locular; placentae central; style undivided.

- C. Ovaries syncarpic, each locule 1-2-ovuled; stamens inserted on or at the margin of a more or less fleshy disk.

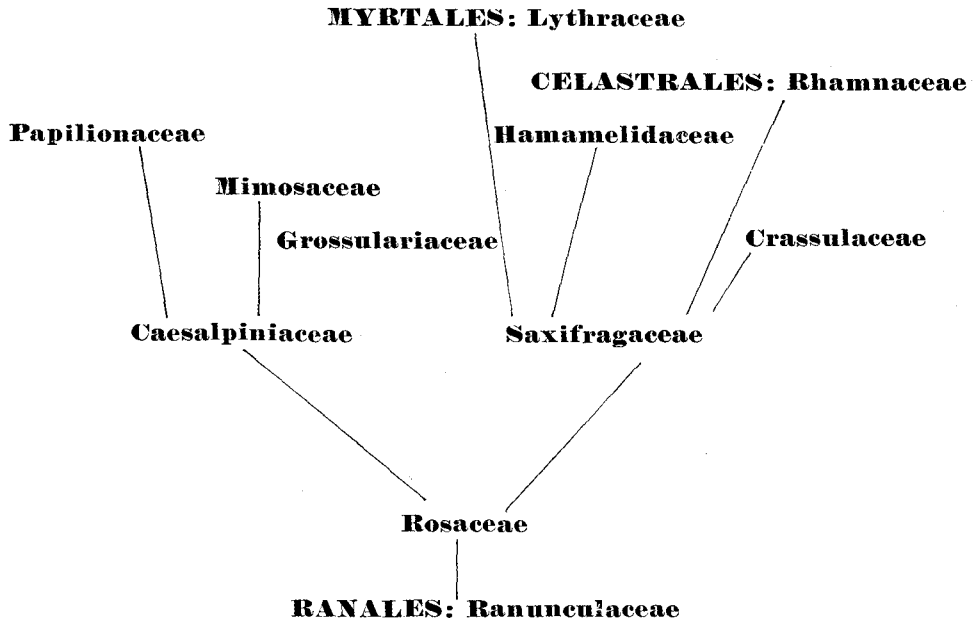
Celastrales (including *Sapindales*).—Ovary mostly superior; style entire (in *Anacardiaceae*, 2-3-cleft); ovules erect, ascending, or horizontal.

Umbellales.—Ovary mostly inferior; styles distinct except in *Cornaceae*, ovules pendulous.

Sub-order.—ROSALES.

Flowers regular or irregular, mostly hermaphroditic; pistils many or few, mostly superior, generally free, sometimes united at the base or even to the apex; in a few cases (*Pomeae*, *Hamamelis*, *Ribes*) partly or wholly imbedded in the receptacle; styles free in ours; stamens as many or twice as many as the petals, or indefinite, generally fastened at the margin of a rarely fleshy, glandular disk.

RELATIONSHIPS OF THE FAMILIES:



SYNOPSIS.

- A. Stamens indefinite, generally many; carpels several, in *Prunus* only 1, generally only 1-2-seeded and indehiscent.
 ROSACEAE.—Flowers regular.
- B. Stamens twice as many as the petals, generally 10; pistils 1, generally becoming a many-seeded legume.
 CAESALPINIACEAE.—Flowers regular or irregular; petals imbricated in the bud, the upper petal innermost.
 MIMOSACEAE.—Flowers regular, petals valvate in the bud.
 PAPILIONACEAE.—Flowers irregular, papilionaceous; petals imbricated in the bud, the lower 2 innermost.
- C. Stamens (in ours) as many or twice as many as the petals; pistils several, dehiscent, several to many-seeded (except in *Hamamelidaceae*), often more or less united below.
 SAXIFRAGACEAE.—Pistils generally superior, more or less united and many-ovuled; not succulent herbs (in ours).
 CRASSULACEAE.—Pistils superior, free; succulent herbs.
 HAMAMELIDACEAE.—Pistils united, partly inferior, 1-2-ovuled, becoming a woody capsule; shrubs or trees.
 GROSSULARIACEAE.—Pistils united, inferior, many-ovuled, becoming a fleshy berry; shrubs.

Family.—ROSACEAE.

Receptacle broadened into a flat, or more or less concave, or even tubular calyx-like organ, bearing on its margin the sepals, petals, and stamens, and, inside the latter, a

more or less distinct annular, glandular disk, which, however, is very rarely fleshy; flowers regular (in ours), petals and sepals normally 5, and stamens many; pistils few or many, free (except in *Pomeae* and in a few of *Spiraeaceae*); seeds with thick cotyledons, generally without albumen; leaves alternate, with stipules.

Many have regarded *Pomeae* and *Pruneae* as distinct families, *Pomaceae* and *Drupaceae*, but nearly all recent systematists include all the different tribes in a single family. Notwithstanding the diversity in the fructification, they are all evidently very nearly related. So are they also to *Caesalpinaceae* and *Saxifragaceae*. It is scarcely possible to draw a line between the former and one tribe of *Rosaceae*, viz, *Chrysobalanaceae*, to which the Cocoa Plum of the South belongs. This tribe stands nearest *Pruneae*, from which it differs in its basal style. Some members of *Spiraeaceae* connect *Rosaceae* with *Saxifragaceae*, and nearly related families. The many-carpelled members of *Rosaceae*, as for instance *Potentilla*, come very near to *Ranunculaceae*. The main difference between the two families is the insertion of the stamens and petals, which, in *Ranunculaceae*, are fastened directly below the pistils, and in *Potentilla* on the margin of the flat receptacular-cup, making them more or less perigynous. (Compare Pl. I., Figs. 1 and 2)

In *Rosaceae*, the form of the receptacular-cup is very variable. In *Potentilleae* (Pl. I., Fig. 2) it is more or less flat, with the central portion, which bears the many pistils, more or less convex, conical, or ovoid, resembling, so far as this part is concerned, the receptacle of most *Ranunculaceae*. In *Fragaria* (Pl. I., Fig. 16), and some species of *Rubus*, it becomes fleshy, constituting the whole of the fruit in the strawberry, and a part of the fruit in the blackberry. In *Spiraeaceae*, *Pruneae* (Pl. I., Fig. 15), and *Pomeae* (Pl. I., Fig. 23), the cup is campanulate. In the latter tribe, its lower portion is united with the carpels. In fruit, it becomes fleshy and constitutes the larger portion of the fruit of the apple, pear, or quince. In *Roseae* (Pl. I., Fig. 22), *Sanguisorbeae* (Pl. I., Fig. 20, 21), and *Cercocarpeae* (Pl. I., Figs. 9, 10), the cup becomes deeply campanulate, urn-shaped, or in the last tribe even tubular, including, in all cases, the achenes. The rose-hip is the receptacle which has become fleshy, and the real fruits are the small, seed-like achenes inclosed therein.

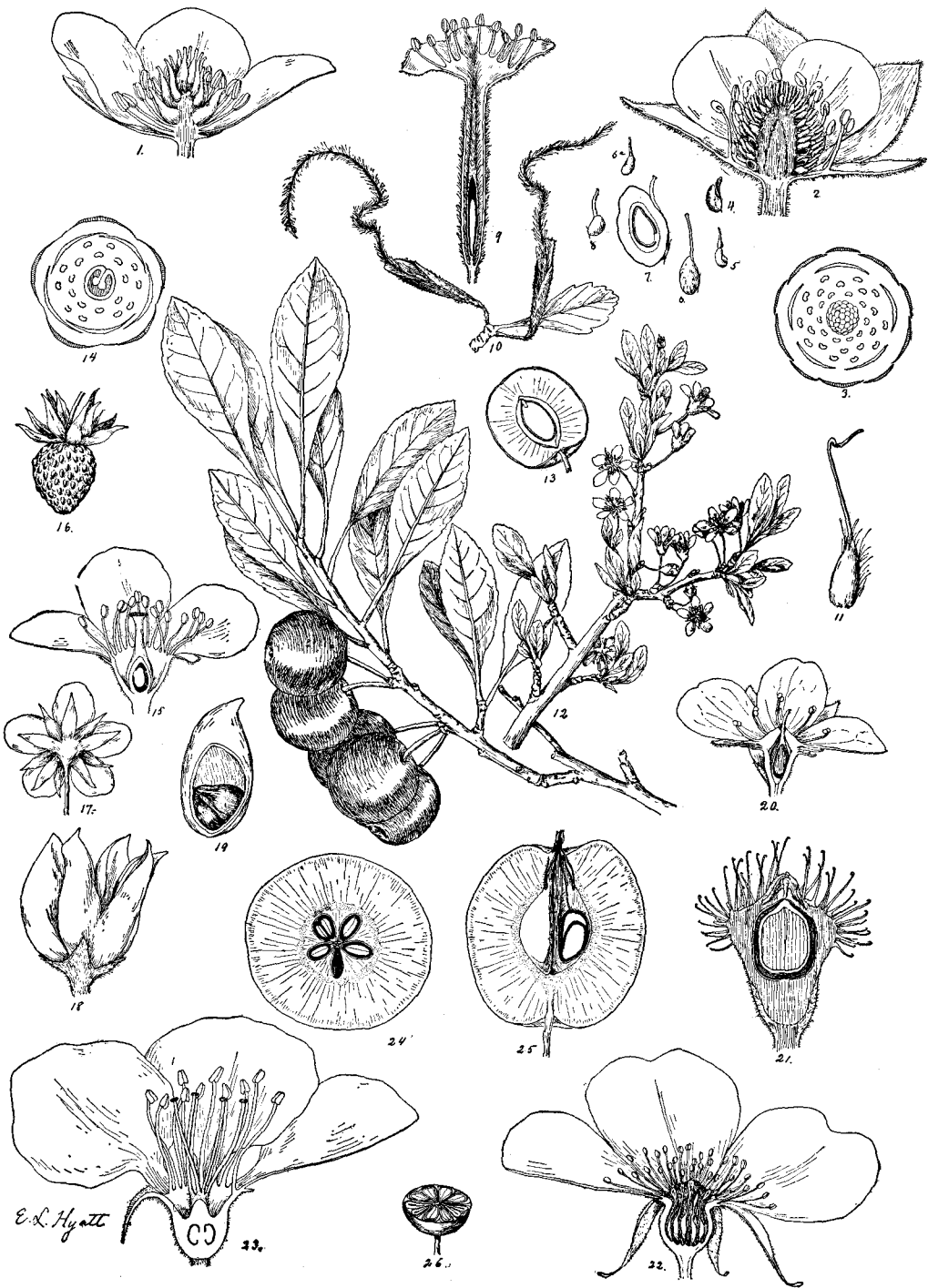
The stamens are indefinite in number, seldom few, in one species of *Potentilla* often only 5.

The fruit is also very variable. Most commonly, it consists of many 1-loculed, 1-2-seeded, indehiscent achenes. In some of the *Spiraeaceae*, and among them *Opulaster* (Pl. I., Fig. 18, 19), they are dehiscent. Sometimes, as in *Geum* (Pl. I., Fig. 11), and *Cercocarpus* (Pl. I., Fig. 10), the style elongates in fruit and becomes a long, bent, or plumose tail. In *Prunus* (Pl. I., Fig. 13), and in *Rubus*, the endocarp becomes stony, while the mesocarp changes into a soft, edible pulp. The mesocarp becomes more or less fleshy in *Pomeae*, and, together with the fleshy receptacle, makes up the pome (Pl. I., Fig. 24-26). In *Amelanchier* (Pl. I., Fig. 26), the locules become 2-septate by a false partition from the back.

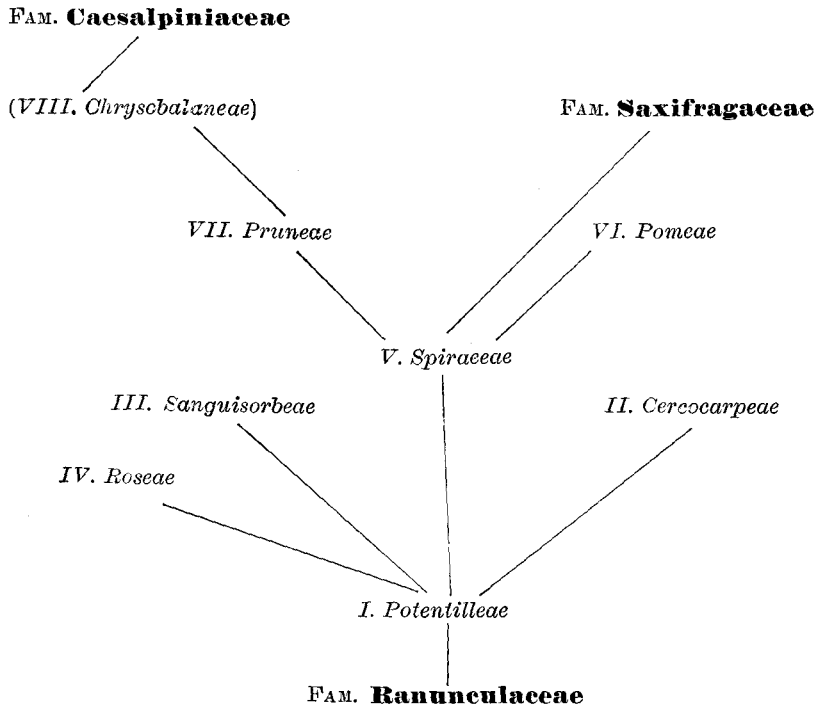
Rosaceae comprises about 1400 species distributed throughout all the zones of the world. Over 250 are found within the United States.

EXPLANATION OF PLATE I.

1, *Ranunculus acris*, section of flower (x3); 2, *Potentilla arguta*, section of flower (x4); 3, diagram of the same; 4, achene of *Potentilla arguta*; 5, of *P. pennsylvanica*; 6, *P. hippiana*, 6a, *P. pulcherrima*; 7, *P. anserina*; 8, *P. monspeliensis*; 9, *Cercocarpus parvifolius*, section of flower (x4); 10, fruit of the same; 11, achene of *Geum strictum* (x4); 12, *Prunus besseyi*, flowering and fruiting branches (x1½); 13, section of the fruit of the same (x1½); 14, diagram of the flower of *Prunus*; 15, *Prunus demissa*, section of the flower (x4); 16, *Fragaria vesca americana*, fruit (nat. size); 17, flower seen from below showing sepals and bractlets; 18, *Opulaster opulifolia*, fruit showing the dehiscence (x3); 19, a carpel cut to show the seeds; 20, *Agrimonia striata*, section of the flower (x4); 21, section of the fruit (x4); 22, *Rosa woodsii fendleri*, section of flower (x1½); 23, *Pirus iowensis*, section of flower (x2), partly from Sargent; 24, 25, section of fruit (nat. size); 26, *Amelanchier canadensis*, cross-section of the fruit (x2).



RELATIONSHIP OF THE TRIBES OF ROSACEAE.



SYNOPSIS.

- A. Pistils, many or few (seldom one), free, 1-2-ovuled, in fruit becoming 1-seeded, indehiscent achenes.
- I. **Potentilleae**.—Receptacular-cup scutellate, or slightly campanulate, the center convex, bearing many indehiscent achenes.
 - a. Calyx with 5 bractlets, imitating an outer set of sepals; achenes dry.
 - 1. *Potentilla*.—Style small, terminal or lateral, not elongated in fruit, neither jointed nor plumose; receptacle dry.
 - 2. *Fragaria*.—Style lateral, otherwise as in *Potentilla*; receptacle fleshy.
 - 3. *Geum*.—Style terminal, elongating in fruit, plumose (in ours) and often jointed.
 - b. Calyx without bractlets; achenes becoming drupelets in fruit.
 - 4. *Rubus*.—Drupelets numerous, the aggregate berry-like.
- II. **Cercocarpeae**.—Achenes 1 (rarely 2); receptacle deeply campanulate, or tubular.
 - 5. *Cercocarpus*.—Style elongated in fruit, plumose; petals none; shrubs.

- III. **Sanguisorbeae**.—Achenes few, 1-4, enclosed in the dry, more or less urn-shaped receptacle.
6. *Sanguisorba*.—Cup 4-angled (in ours), without prickles; sepals petaloid; petals none; flowers in dense spikes or heads.
 7. *Agrimonia*.—Cup margined with a disk, bearing hooked prickles; petals 5, yellow; flowers in long racemes.
- IV. **Roseae**.—Achenes numerous, inclosed in the fleshy, urn-shaped, or spherical receptacle.
8. *Rosa*.—Leaves pinnate, with adnate stipules; prickly shrubs.
- B. Pistils few, becoming dehiscent, several-seeded follicles.
- V. **Spiraceae**.—Follicles 1-2-valved; smooth shrubs.
9. *Opulaster*.—Follicles 2-valved, more or less inflated; leaves palmately lobed; seeds stony, polished.
- C. Pistils 2-5, united with each other and with the lower part of the receptacular-cup; in fruit, inclosed in the fleshy receptacle, forming a pome.
- VI. **Pomeae**.—Pome fleshy or berry-like; trees or shrubs.
10. *Pirus*.—Pome large and fleshy, the inside wall papery, locules 5; seeds 2 in each locule.
 11. *Crataegus*.—Pome small, the inside wall bony, locules 1-5; seeds 1 in each locule at maturity.
 12. *Amelanchier*.—Pome small, berry-like, locules 5; each locule 2-seeded, but divided by a false partition intruded from the back, making the fruit look as if 10-loculed and each locule 1-seeded.
- D. Pistil 1, with terminal style, in fruit becoming a drupe.
- VII. **Prunaceae**.—Mesocarp of the fruit pulpy (in ours); trees or shrubs.
13. *Prunus*.—Petals and sepals 5; flowers perfect; stone bony.

TRIBE **Potentilleae**.—Pistils many, free, 1-2-ovuled, in fruit becoming one-seeded, indehiscent achenes; receptacular-cup saucer-shaped or slightly bell-shaped, the center convex, bearing many indehiscent achenes.

1. POTENTILLA L. Sp. Pl., 496. 1753.

Herbs with pinnately or palmately compound leaves, 5 (seldom 4) rounded, mostly yellow petals, and 5 (4) sepals, supported by as many bractlets, resembling an outer row of sepals; style small, terminal or lateral, not elongating in fruit, neither jointed nor plumose; receptacle and achenes dry. (Five-finger, Cinque-foil.)

About 200 species, herbs (all our species) or seldom shrubs, inhabitants of temperate zones, mostly northern.

Etymology: Latin *potens*, powerful.

I. Inflorescence terminal, cymose.

A. Leaves white, tomentose and silky, especially beneath.

1. Leaves pinnate, achenes glabrous, style terminal; perennial herbs.

Potentilla pennsylvanica L. Mant. 76. 1767.

Stout, generally 3-6 dm., erect or with decumbent base; stipules pectinately cleft, leaflets 5-9, green above, oblong, pinnatifid, lobes not revolute, or only slightly so; bractlets about the length of the sepals and petals; style fusiform.

Rare: Saunders county. (Maine—British Columbia—New Mexico.)

Potentilla pennsylvanica strigosa PURSH Fl. Am. Sept. 356. 1814.

Seldom over 3 dm. high; leaves more silky-tomentose, also tomentose above, deeply pinnatifid, the narrow lobes revolute.

Common throughout the state. (Wis.—Kans.—N. Mex.—British Columbia—Saskatchewan.)

Potentilla hippiana LEHM. Nov. Stirp. Pug. 2: 197. 1830.

Stem ascending, 3-4½ dm. high, more slender than the preceding, and more densely silky throughout; leaflets 5-11, smaller, cuneate-oblong, incised toward the apex, margin not revolute; petals exceeding the calyx, style filiform.

Northwestern Nebraska: Sioux, Dawes, and Box Butte counties. (Ariz.—Neb.—Saskatchewan—British Columbia.)

Potentilla pulcherrima LEHM. Nov. Stirp. Pug. 2: 10. 1830.

Potentilla hippiana pulcherrima WATS. Proc. Am. Acad. A. & S. 8: 555. 1873.*

Stem 3-5 dm. high, ascending; stipules large, subentire; the lower leaves pinnate with 5-9 approximate leaflets, resembling those of *P. pennsylvanica* but less divided, the terminal 3-7 cm. long, the upper leaves ternate; petals exceeding the calyx, style filiform, terminal.

Sheridan county. (British Columbia—Nev.—N. Mex.—Saskatchewan.)

B. Leaves not white-tomentose.

1. Perennial, villose, not glandular; style terminal, filiform; leaves digitate.

Potentilla gracilis chrysantha (LEHM.) RYDB. Bot. Surv. Neb. 3: 34. 1894.

Potentilla chrysantha LEHM., Hook. Fl. Bor. Am. 1: 193. 1833, not TREV.

Potentilla gracilis rigida WATS. Proc. Am. Acad. A. & S. 8: 557. 1873.

Potentilla nuttallii LEHM. Ind. Sem. Hamb. Add. 12. 1852.

Leaflets cuneate to obovate, pinnately toothed; bractlets somewhat shorter than the broad sepals; petals broadly obcordate, larger than the sepals; the whole plant villose; leaves without tomentum.

Potentilla gracilis proper has the leaves white-tomentose beneath.

Reported for Nebraska by Watson in King's report, but no locality is known. (Saskatchewan—Black Hills of S. Dak.—Col.—Cal.—Ore.)

2. Annuals, hirsute, not glandular; style terminal, fusiform.

a. Leaves digitate, generally ternate.

*Dr. Watson makes this a variety of *P. hippiana*, uniting it with some form belonging to that species, but his treatment is far from satisfactory. The original figured by Lehman seems rather to be a stout form of *P. gracilis*. Whether ours belongs to the same species is hard to tell. It evidently belongs to *P. pennsylvanica* var. *pulcherrima* TORR. & GRAY Fl. N. A. 1:438. It seems to be intermediate between *P. pennsylvanica* and *P. gracilis*.

Potentilla monspeliensis L. Sp. Pl. 499. 1753.*Potentilla norvegica* L. Sp. Pl. 499. 1753.

Erect, stout; leaflets obovate, 3-10 cm. long; cyme leafy; sepals longer than the obovate, emarginate petals; bractlets equalling or exceeding the sepals, but narrower; calyx much enlarged in fruit; achenes rugose; stamens 15-20.

Common, probably throughout the state. (Labrador—Alaska—N. Mex., Eu.)

Potentilla pentandra ENGELM., Torr. & Gray Fl. N. A. 1: 447. 1840.*Potentilla rivalis pentandra* WATS. Proc. Am. Acad. A. & S. 8: 553. 1873.

More branched upwards, and the cyme more disposed to become flat-topped; leaves ternate, but the lateral leaflets of the lower leaves 2-cleft, so as to make the leaves seem quinate; calyx scarcely enlarging in fruit; sepals and bractlets subequal, 3-6 mm. long; petals much shorter than the sepals; stamens 10 or more, often only 5; achenes smooth, brown.

Cass, Cedar, Knox, and Grant counties.

Potentilla millegrana ENGELM., Lehm. Ind. Sem. Hamb. Add. 12. 1849.*Potentilla rivalis millegrana* WATS. Proc. Am. Acad. A. & S. 8: 553. 1873.

More slender and simpler, leaves ternate, leaflets 1-3 cm., obovate to oblong; calyx and corolla as in the preceding, but a little smaller; stamens 10-20; achenes smaller, light colored.

Lancaster, Cass, and Cherry counties. (Saskatchewan—N. Mex.)

b. Leaves pinnate.

Potentilla rivalis NUTT., Torr. & Gray Fl. N. A., 1: 244. 1838.

In general habit like the preceding, but more diffusely branched from the base; leaves pinnate, of 5 approximate, ovate, or cuneate-oblong leaflets; flowers as in the preceding, but the achenes larger and darker.

This species has been collected near Omaha by Dr. Vasey, but no specimens are in the herbarium of the Survey. (Wash.—S. Cal.—Missouri river.)

Potentilla paradoxa NUTT., Torr. & Gray Fl. N. A., 1: 437. 1840.*Potentilla supina* MICHX. Fl. Bor. Am. 1: 304. 1803, not L.

Stem ascending or decumbent, leafy, less hairy; leaves pinnate of 5-7 obovate leaflets, 1-2 cm., the upper often confluent; stipules ovate, mostly entire; bractlets, sepals, and the obovate petals equal in length; stamens about 20; achenes gibbous at the base.

Reported from Douglas, Cedar, Keith, and Scott's Bluff counties. (Ontario—Saskatchewan—N. Mex., Mexico, Asia.)

3. Perennial, more or less glandular; style fusiform, attached below the middle of the ovary.

Potentilla arguta PURSH Fl. Am. Sept. 736. 1814.

Stout, erect, densely pubescent and glandular, especially the calyx and the upper part of the stem; cyme close; leaflets 7-11, rounded, doubly serrate, 3-10 cm. long; bractlets much smaller than the sepals; sepals and petals large, 6-8 mm., the latter round, generally white, drying yellowish, rarely yellow.

Hillsides in the eastern and northern parts of the state, but local. (New Brunswick—New Jersey—N. Mex.—British Columbia.)

II. Peduncles axillary, solitary, 1-flowered; creeping or decumbent perennials.

Potentilla anserina L. Sp. Pl. 495. 1753.

White silky-tomentose; leaves radical, pinnate; leaflets 7-21, with smaller ones between; petals elliptical-obcordate, exceeding the calyx; style attached to the middle of the ovary; achenes large; spreading by runners. Western Nebraska: Keith and Scott's Bluff counties. (Pa.—Cal.—N. Mex, Europe, Asia.)

Potentilla canadensis simplex (MICHX.) TORR. & GRAY Fl. N. A. 1: 443. 1838,

Potentilla simplex MICHX. Fl. Bor. Am. 1: 303. 1803.

Somewhat hairy; leaves ternate, with the lateral leaflets parted nearly to the base; leaflets cuneate-obovate; petals obcordate; style nearly terminal; stem ascending, 3-6 dm. long, rarely creeping.

In *P. canadensis* proper, the stem is very slender, nearly prostrate, and villose. Cass and Saunders counties. (Quebec—Ga.—Ark.—Saskatchewan.)

2. FRAGARIA L. Sp. Pl. 494. 1753.

Spreading by runners; leaves ternate, with obovate, serrate leaflets; in our species, petals 5, rounded, white; sepals, bractlets, stamens, and pistils as in *Potentilla*, but the style always lateral.

Differs from *Potentilla* in the pulpy, central portion of the receptacle, known as the strawberry.

Probably 10 species, perennials, inhabitants of the north-temperate zone, one from Chili. (Strawberry.)

Etymology: Latin *fraga*, strawberry.

Fragaria virginiana illinoensis PRINCE, Gray Man. Ed. 5, 158. 1867.

Leaflets thick, serrate, more or less firm in texture; achenes sunk in pits of the receptacle; the villose hairs of the $\frac{1}{2}$ -2 dm. high scape and pedicels widely spreading.

In *Fragaria virginiana* MILL. proper, the silky hairs are appressed.

Low prairies, probably throughout the state, common especially in the eastern part. (Ontario—Kans.—Ariz.—British Columbia.)

Fragaria vesca americana PORTER Bull. Torr. Bot. Club 17: 15. 1890.

Fragaria vesca of American authors, not L.

Fragaria americana Britt. Bull. Torr. Bot. Club 19: 222. 1892.

Leaflets thin, deeply and sharply serrate, becoming glabrate in age; achenes not sunk in pits, superficial on the conical or ovoid receptacle; hairs of the 1-2 dm. high scape spreading, on the pedicels generally appressed.

Fragaria vesca L. of Europe, which is often cultivated, has thicker and more hairy leaves.

Sides of bluffs and canyons, western Nebraska from Custer county westward and northward. It has also been collected in Sarpy county. (Newfoundland—Va.—Ariz.—Wash.)

3. GEUM L. Sp. Pl. 500. 1753.

Leaves pinnate; styles terminal, elongated in fruit (in our species, plumose and jointed), the lower part at least persistent; otherwise as in *Potentilla*. Between 30 and 40 species, herbs, inhabitants of temperate zones, a few arctic. (Avens.)

Etymology: a Latin name used by Pliny.

A. Petals white or ochroleucous, scarcely exceeding the reflexed sepals; style articulated and bent at the middle.

Geum virginicum L. Sp. Pl. 500. 1753.

Petals small, much shorter than the calyx, generally greenish-ochroleucous; stem hirsute; root-leaves pinnate, stem-leaves 3-parted, incised; receptacle generally glabrous; peduncle generally short in fruit.

Woods, Cass county. (Nova Scotia—N. J.—Kans.—Minn.)

Geum canadense JACQ. Hort. Vind. 2: 82. 1772, not MURR. 1790.

Geum album GMELIN Syst. 2: 861. 1791.

Petals generally white, as long as the calyx; stem smooth or soft-hairy; root-leaves with a rounded, terminal leaflet and often with a few small leaflets below; fruiting receptacle bristly; peduncles generally elongated in fruit.

Woods, probably throughout the state. (Ga.—Nova Scotia—Saskatchewan—Tex., Mexico.)

- B. Petals golden-yellow, much exceeding the reflexed calyx; style articulated and bent.

Geum strictum AIT. Hort. Kew. 217. 1789.

Hairy; root-leaves pinnate, with smaller leaflets interposed, the leaflets cuneate and incised, the terminal larger; stem-leaves 3-5-foliate; leaflets rhombic, acute; receptacle hairy.

Meadows in the northwestern part of the state. (Newfoundland—British Columbia—Ariz.—N. J., Europe, Asia, Mexico, South America.)

Geum macrophyllum WILLD. Enum. 1: 557. 1809.

Like the preceding, but more bristly-hairy; terminal leaflet very large and heart-shaped or rounded; the lateral leaflets of the stem-leaves small and few, the terminal rounded and 3-cleft.

Scarcely distinct from the preceding, as intermediate forms are found.

Rare: meadows, Thomas county. (Nova Scotia—N. Y.—Mo.—Cal.—Alaska.)

4. RUBUS L. Sp. Pl. 492. 1753.

Calyx tube short, without bracts; stamens indefinite, inserted on the margin of the calyx; carpels numerous on the convex receptacle; achenes drupaceous, one-seeded.

About 200 species, shrubs or herbs, inhabitants of all zones.

Etymology: Latin *rubus*, bramble.

- A. Blackberries. Fruit not separating from the juicy receptacle; leaves 3-foliate or pedately 5-foliate; stems woody and prickly.

Rubus villosus AIT. Hort. Kew. 210. 1789.

Stem erect or reclining, angled, as well as the petioles beset with stout, curved prickles, the upper part and the peduncles glandular and villose; leaflets ovate, doubly serrate, villose beneath, the terminal long-petioled and often somewhat cordate; petals obovate, spreading, 10 mm. long; fruit large, black.

Borders of woods, rare, Otoe county. (Nova Scotia—Ga.—Minn.)

- B. Raspberries. Fruit thimble-shaped, separating from the dry, elongated receptacle; leaves pinnately 3-5-foliate, whitened beneath; petals small, erect.

Rubus strigosus MICHX. Fl. Bor. Am. 1: 297. 1803.

Stem erect, woody, bristly, or sometimes with a few weak prickles, the younger parts somewhat glandular; petals equalling the sepals; fruit red.

Thickets and hills, Lancaster, Nemaha, Cass, and Sarpy counties. (Lab.—N. C.—N. Mex.—Ore.—Saskatchewan.)

Rubus occidentalis L. Sp. Pl. 493. 1753.

Stem glaucous with a bloom, recurved, often rooting at the base, armed with curved prickles, not bristly; petals shorter than the calyx; fruit black or dark purple.

Thickets and woods, common in eastern and northern Nebraska. (N. B.—Ore.—Tex.—Ga.)

TRIBE **Cercocarpeae**.—Achenes 1-seeded, indehiscent, 1, rarely 2; receptacle deeply campanulate or tubular.

5. CERCOCARPUS HBK. Nov. Gen. Am. 6: 232. 1823.

Calyx-tube persistent, narrowly tubular, terete; lobes 5, small, valvate; petals none; stamens 15-25, inserted on the limb of the calyx; ovary 1, silky; style terminal, filiform, villous; achene linear-oblong, coriaceous, with a long plumose style.

Species 6, shrubs or trees, inhabitants of the mountain regions of North America.

Etymology: Greek *κερκος*, tail, *καρπος*, fruit.

Cercocarpus parvifolius NUTT. Torr. & Gray Fl. N. A. 1: 427. 1840.

Shrub, 1-2 m. high with cuneate-obovate, coriaceous, dark-green leaves toothed toward the apex, silky-pubescent or nearly glabrous above; flowers solitary or few, pedicelled in the axils of the leaves.

Hills in Banner and Scott's Bluff counties. (N. Mex.—Cal., Mex.)

TRIBE **Sanguisorbeae**.—Achenes few, 1-4, inclosed in the dry, more or less urn-shaped receptacle.

6. SANGUISORBA L. Sp. Pl. 116. 1753.

Flowers in dense spikes, leaves unequally pinnate.

The form of the calyx and the number of stamens are very variable. Some have perfect flowers and 4 stamens with short filaments. Our species has polygamous flowers and many stamens with capillary filaments.

About 30 perennials of the north temperate zone.

Etymology: Latin *sanguis*, blood, and *sorbere*, to suck.

Sanguisorba sanguisorba (L.) BRITTON Mem. Torr. Bot. Club. 5: 189. 1894.

Poterium sanguisorba L. Sp. Pl. 994. 1753.

Leaflets of the lower leaves round or elliptic, of the upper narrower, serrate; flowers brownish-green, the upper pistillate, the middle perfect, and the lower staminate.

Escaped from cultivation, Lancaster county. (Eu.)

7. AGRIMONIA L. Sp. Pl. 448. 1753.

Achenes 2, inclosed in the prickly calyx; flowers yellow, in long spikes; leaves interruptedly pinnate.

Ten or twelve species, inhabitants of temperate regions.

Etymology: a false reading of *Argemonia*, a name used by Pliny.

Agrimonia striata MICHX. Fl. Bor. Am. **1**: 287. 1803.*Agrimonia eupatoria* of American authors, not L.

Leaflets 5-7, ovate-oblong, coarsely toothed, nearly smooth but glandular-dotted beneath (scarcely visibly so to the naked eye); petals more than twice as long as the sepals, 2-4 mm. long.

Agrimonia eupatoria of Europe has thicker leaves, 9-13 leaflets, and is grayish-hirsute and not glandular beneath.

In woods, probably throughout the state. (Newfoundland—Fla.—Southern Cal.—Wash.)

Agrimonia parviflora AIT. Hort. Kew. **2**: 130. 1789.

Leaflets 9-19, lanceolate, deeply and sharply serrate, with generally three sets of smaller leaflets between, of which the middle one is larger than the others; flowers about half the size of the preceding.

Reported from Fairbury. (N. Y.—Ga.—La.—Neb., Mex.)

TRIBE **Roseae**.—Achenes numerous, enclosed in the fleshy, urn-shaped or spherical receptacle.

8. ROSA L. Sp. Pl. 491. 1753.

More or less shrubby, some climbing; leaves generally pinnate with adnate stipules; petals 5, large, obcordate, sepals 5, without bractlets, sometimes pinnately lobed.

The number of species may be estimated at about 100. The number admitted by different authors varies considerably. Some acknowledge scarcely half as many, while others estimate the number as much larger. In fact, several hundred species have been described, but most of them of questionable value.

Etymology: the ancient Latin name.

A. Shrubs with distinct styles and persistent sepals.

Rosa arkansana PORTER Syn. Fl. Col. 38. 1874.

Stem 2-15 dm. high, more or less densely prickly and bristly, but infrastipular spines lacking; stipules generally glandular-toothed; leaflets 7-9, broadly elliptic or oblong, somewhat cuneate at the base, more or less pubescent beneath, simply but coarsely serrate; sepals generally glandular on the lower surface and somewhat floccose above; receptacle globose, when ripe often over 2 cm. in diameter.

Prairies, common throughout the state. (Tex.—N. Mex.—Sask.—Minn.—Mo., Mex.)

Rosa engelmannii WATS. Proc. Am. Acad. **20**: 342. 1885.

Stem $\frac{1}{2}$ -1 $\frac{1}{2}$ m. high, generally densely bristly or prickly, slender and straight; leaflets 5-7, somewhat resinous, puberulent beneath, doubly serrate, thin, infrastipular spines seldom present; sepals naked or hispid; receptacle elliptic-oblong, when ripe about 2 cm. long and 1 cm. in diameter.

Rare in Nebraska, collected once in Sioux county, but common in the Black Hills of South Dakota. (Mich.—Idaho—Col.)

Rosa woodsii LINDL. Ros. Monog. 21. 1820.

Stem 5-15 cm., less prickly; infrastipular spines nearly always present, short and stout, straight or slightly curved; leaflets 5-7, obovate or elliptic,

nearly glabrous above, finely soft-pubescent beneath, simply serrate; sepals generally naked beneath;* receptacle globose, when ripe 10-15 mm. in diameter, generally yellowish or light red.

Hillsides in western Nebraska: Sioux, Dawes, Sheridan, Cherry, Scott's Bluff, Banner, Cheyenne, and Deuel counties. (Mo.—Col.—Mont.—Sask.—Minn.)

Rosa woodsii fendleri (CREPIN) n.n.

Rosa fendleri CREPIN Bull. Soc. Bot. Belg. **15**: 91. 1876.

Stem taller, 1-2½ m.; leaflets smaller, greener, and smoother, scarcely pubescent beneath, sometimes somewhat resinous; receptacle smaller, when ripe less than 1 cm. in diameter, bright red.

In specimens from Hooker county the receptacle is elliptic-oblong or pear-shaped. In a few specimens from Frontier and Deuel counties the sepals are glandular and the leaves resinous and doubly glandular-serrate. These specimens can scarcely be distinguished from *Rosa pisocarpa*, which also must be regarded as a variety of *Rosa woodsii*.

Same range as the species, but growing nearer water and extending further east, viz.: to Thomas, Frontier, and Dixon counties. (Tex.—Ariz.—British Columbia—Manitoba.)

- B. Climbing shrubs with styles connate into a smooth, exserted, persistent column, and deciduous sepals.

Rosa setigera MICHX. Fl. Bor. Am. **1**: 295. 1803.

Stem with scattered, stout, recurved spines, upper part glandular-hairy; leaflets 3-5, oblong-ovate, acuminate, coarsely serrate, 3-10 cm. long, smooth above, tomentose beneath; sepals hispid; receptacle ovate to globose, 8-10 mm. in diameter.

Woods, Richardson county. (Ont.—Fla.—Tex.)

TRIBE **Spiraceae**.—Pistils few, becoming dehiscent, several-seeded follicles; mostly shrubs.

9. OPULASTER MED. Beitr. z. Pflanz. **2**: 109. 1799.

Physocarpa RAF. New Fl. N. Am. **3**: 73. 1836.

Physocarpus MAXIM. and *Neillia* Am. auct., not DON.

Shrubs with more or less maple-like leaves and corymbose, white flowers; ovaries 1-5, more or less united, becoming 2-valved follicles; seeds stony; with copious albumen.

Five or six species, inhabitants of North America and northeast Asia.

Etymology: Latin *opulus*, a name used by Varro for some kind of Maple, and *aster*, like.

Opulaster opulifolia (L.) O. KUNTZE Rev. Gen. Pl. 949. 1891.

Spiraea opulifolia L. Sp. Pl. 489. 1753.

Neillia opulifolia BREWER & WATSON Bot. Cal. **1**: 171. 1876.

Shrub 1-3 m. high with recurved branches; leaves round or ovate, 3-lobed, doubly crenate, generally glabrous; mature carpels 3-5, 10 mm. long, connected below, diverging, inflated, 2-seeded, glabrous or pubescent.

Thickets near streams, canyons of Rock, Brown, Holt, and Keya Paha counties. (Canada—Ga.—Col.—Saskatchewan.)

* Dr. Watson describes this species as having lobed sepals, which it sometimes has, but scarcely more often than any of the species of the same group. In the original description Lindley describes them as entire.

TRIBE **Pomeae**.—Trees or shrubs; pistils 2-5, united with each other and the lower part of the receptacular-cup, in fruit enclosed in the fleshy receptacle, with it forming a fleshy or berry-like pome.

10. PIRUS L. Sp. Pl. 479. 1753.

Trees, with simple leaves, flowers in umbels, fruit globular or pear-shaped, fleshy, in ours sunken at the base and the top; locules 5, each containing 2 ovules and 1-2 seeds, endocarp of the locules papery.

Between 20 and 30 species, inhabitants of north-temperate regions.

Etymology: the Latin name for the pear.

Pirus ioensis (WOOD) BAILEY Am. Gard **12**: 473. 1891.

Pirus coronaria ioensis WOOD Classbook 333. 1870.

Tree 7-9 m. high; leaves elliptic-oblong or ovate, lobed and obtusely toothed, the under surface as well as the young shoots covered with a thick, white tomentum; styles united below, fruit 5-6 cm. in diameter.

Pirus coronaria L., the eastern crabapple, differs in the less plainly lobed leaves which are only slightly pubescent when young, at length glabrous, and in the smaller fruit 3-4½ cm.

Woods, Nemaha, Butler, Knox, Holt, Brown, and Johnson counties. (Minn.—La.—Ohio.)

11. CRATAEGUS L. Sp. Pl. 475. 1753.

Low trees or shrubs with entire, or often lobed or incised leaves, and often with thorns; locules of the small pome 1-5, the inside wall bony; seeds at maturity one in each locule.

All of our species have many-flowered corymbs, comparatively large fruit, 12-25 cm. in diameter, and rounded or obovate leaves; branches the first summer greenish, becoming reddish or orange in the winter, and at last grayish. (Hawthorn.)

Between 30-40 species, inhabitants of the north-temperate zone.

Etymology: Greek *κρατος*, strength, referring to the hard wood.

Crataegus coccinea L. Sp. Pl. 476. 1753.

Shrub or tree, 4-6 m. high; spines 2½-4 cm. long, straight, or slightly curved, first chestnut-brown, then grayish; leaves 5-9-lobed or incised, sharply serrate (except at the base) with glandular teeth, generally glabrous when young; fruit globose or slightly pear-shaped, 8-15 mm. in diameter, bright scarlet; sepals glandular-toothed.

Rare; along the Dismal river in Hooker county. (Newfoundland—Saskatchewan—eastern Tex.—Fla.)

Crataegus coccinea macracantha (LODD.) DUDLEY. Bull., Cornell Univ. **2**: 33. 1886.

Crataegus macracantha LODD.; Loudon Arb. Brit. Ed. 2, **2**: 819. 1854.

Differs in having larger spines, 5-12 cm. long, pectinate glandular sepals, broader corymbs, and thick leaves on stout petioles.

Along the Niobrara. (Me.—Wash.—N. Mex.)

Crataegus mollis (T. & GR.) SCHEELE Linnaea **21**: 569. 1847.

Crataegus coccinea mollis T. & GR. Fl. N. Am. **1**: 465. 1838.

Tree 6-10 m. high, branchlets tomentose when young; spines stout, 5-6½ cm.; leaves like those of the last, but more or less tomentose when young;

fruit globose or pear-shaped, pubescent when young, 25-30 mm., orange-scarlet.

Woods, Cass, Sarpy, and Lancaster counties. (Mass.—Neb.—Tex.)

Crataegus tomentosa L. Sp. Pl. 476. 1755.

Tree 4-6 m. high, branchlets tomentose when young; spines when present slender, 3-4 cm. long; leaves like those of the preceding, but narrower and firmer, tapering into a margined petiole; fruit pyriform, 10-12 mm. in diameter, dull red; flowers with an unpleasant odor.

Woods, Douglas and Nemaha counties. (N. Y.—Ga.—Tex.—Neb.)

12. AMELANCHIER MEDIC. Phil. Bot. **1**: 155. 1789.

Shrubs or small trees with entire, oval, obovate, or roundish leaves, and white flowers in drooping racemes; locules of the small, berry-like pome 5, 2-seeded, but each locule divided by a false partition intruded from the back, making the fruit look as if 10-loculed and each locule 1-seeded. (June-berry.)

About half a dozen species (4-12 according to different views), inhabitants of the north-temperate zone.

Etymology: the name of *A. vulgaris* in Savoy.

Amelanchier canadensis (L.) MEDIC. Gesch. Bot. 79. 1793.

Mespilus canadensis L. Sp. Pl. 478. 1753.

Tree 3-15 m. high; leaves ovate, acute, or acuminate, rounded or cordate at the base, finely and sharply serrate; raceme 8-10 cm. long; calyx campanulate, glabrous; petals strap-shaped, 12-20 mm. long.

Along the Missouri and the Platte, Nemaha, Otoe, Cass, Sarpy, and Dodge counties. (Newfoundland—Minn.—Kan.—La.—Fla.)

Amelanchier alnifolia NUTT. Journ. Acad. Phil. **8**: 22. 1834.

With us a low shrub, $\frac{1}{2}$ -1 m. high; leaves round or broadly elliptical, obtuse, bluntly toothed toward the apex; raceme short, 3-5 cm. long; calyx cup-shaped; petals narrowly oblong to obovate, 6-15 mm. long.

Sioux, Dawes, Banner, Scott's Bluff, and Brown counties. (Yukon River—Lake Superior—N. Mex.—S. Cal.)

Amelanchier botryapium (L. f.) DC. Prodr. **2**: 632. 1825, not Gray.

Pyrus botryapium L. f. Suppl. 255. 1781.

Amelanchier canadensis oblongifolia T. & GR. Fl. N. A. **1**: 473. 1840.

A shrub 2-3 m. high; leaves elliptic or oblong, rounded at the base, acute or obtuse at the apex, finely serrate, as well as the racemes densely tomentose when young; raceme short; petals 6-8 mm. long, oblong-spatulate.

Along the Niobrara and the Missouri from Brown to Dixon counties. (New Brunswick—Va.—Mo.—Minn.)

TRIBE **Prunaceae**.—Trees or shrubs; pistil 1, with a terminal style, in fruit becoming a drupe; mesocarp in our species pulpy.

13. PRUNUS L. Sp. Pl. 473. 1753.

Trees and shrubs, leaves entire and serrate, in some species evergreen; petals and sepals 5; flowers perfect; stone bony.

In all of our species the drupe is smooth and pulpy.

About 75 species, inhabitants of the north-temperate zone, a few from the tropics.

Etymology: the Latin name of the plum.

A. Flowers in small umbels, appearing before or with the leaves.

***Prunus americana* MARSH.** Arbust. Am. 111. 1735.

Tree or shrub, $1\frac{1}{2}$ -9 m. high, thorny; leaves oval or obovate, acuminate, doubly serrate, nearly always without glands on the petioles; sepals entire; fruit yellow or red, globose, or a little elongated, 12-20 mm. in diameter, grooved on one side, stone flattened, somewhat rugose.

The other native plums that may be confounded with this, viz.: *P. nigra*, *P. hortulana*, and *P. angustifolia*, have the sepals glandular-dentate or ciliate, and the petioles with a pair (or more) of glands.

Near streams, throughout the state. (N. Y.—Mont.—N. Mex.—N. Fla.)

***Prunus besseyi* BAILEY** Bull. Cornell Agr. Exp. Sta. 70: 261. 1894.

Low (2-6 cm. high), trailing, most of the stems covered by the sand; leaves when mature 2-4 cm. long and $1-1\frac{1}{2}$ cm. wide, rarely $5 \times 2\frac{1}{2}$ cm., spatulate. oblanceolate, or obovate, finely and remotely serrate, subcoriaceous, paler beneath; fruit globose, 10-15 mm. in diameter, nearly black when ripe.

Our western sand-cherry differs, according to Prof. L. H. Bailey, from *Prunus pumila* L. (Mant. 75, 1767), in having much shorter leaves and the fruit on short stems. The dentation of the leaves seems also to be less sharp.

Sandhills and sandy plains throughout western and northern Nebraska. (S. D.—Kans.—N. E. Col.)

B. Flowers in many-flowered racemes at the ends of leafy branches.

***Prunus virginiana* L.** Sp. Pl. 473. 1753.

Tree, or rather tall shrub, 2-10 m. high; generally with erect or ascending branches forming a narrow, irregular crown; leaves oval to obovate, abruptly acuminate, thin, densely serrate with subulate teeth with spreading tips; sepals deciduous; stone ovoid, pointed toward the apex, fruit astringent, 6-8 mm. in diameter. (Choke-cherry.)

River banks, southeastern Nebraska. (Labrador—Ga.—Tex.—Great Slave Lake, Mex.)

***Prunus demissa* (NUTT.) WALP.** Rep. 2: 10. 1843.

Cerasus demissa NUTT. Torr. & Gray Fl. N. A. 1: 411. 1840.

Resembling the last, but lower, 1-4 m. high, more tree-like in appearance, with wide-spreading branches and rounded crown; leaves thick, in texture rather resembling those of the following, but in form those of the preceding, although more often subcordate at the base, paler beneath, the dentation intermediate between the two.

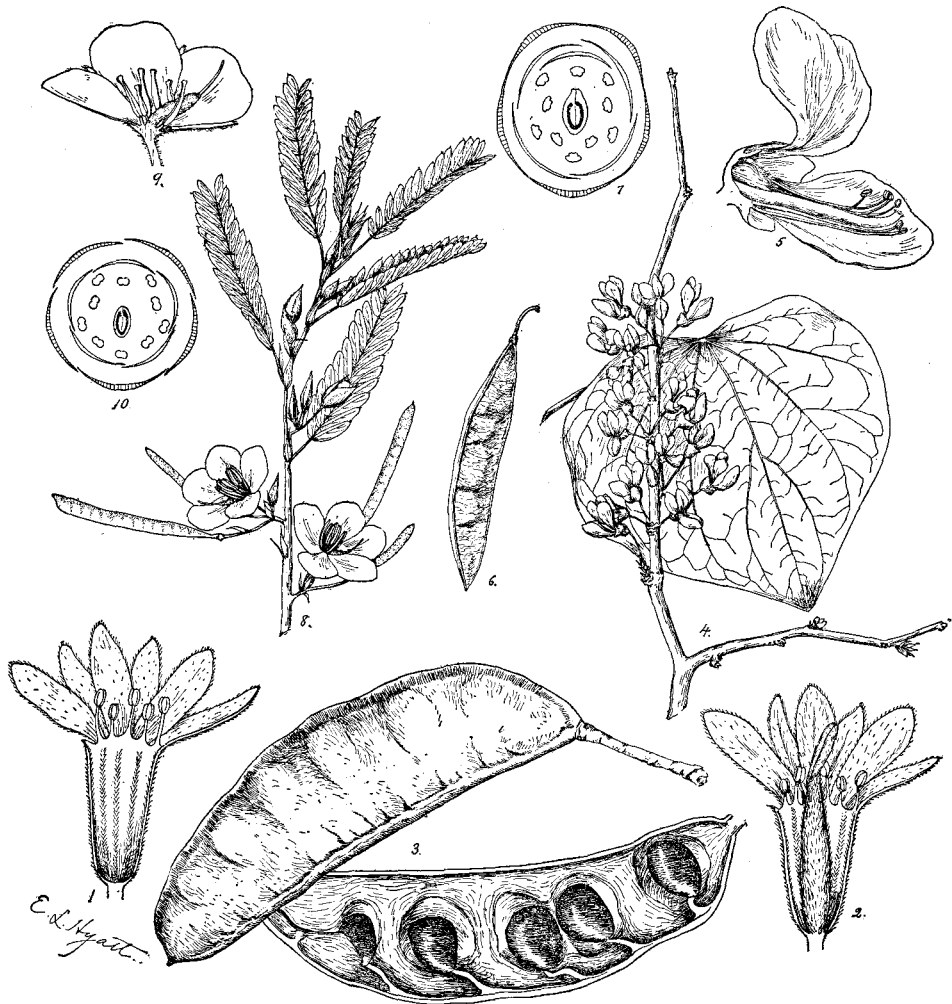
There seem to be two forms, one with smaller and nearly glabrous leaves, and one with larger, broadly oval leaves, which, as well as the branchlets, are tomentose when young. Professor Sargent includes this in the preceding. Professor Macoun suggests the probability of there being three species included in the two. (Western Choke-cherry.)

Throughout the western and northern parts of the state. (Kan.—N. Dak.—British Columbia—Cal.)

***Prunus serotina* EHRH. Beitr. 3: 20. 1788.**

Tall tree, 10-30 m.; leaves oval to broadly lanceolate, gradually acuminate, finely serrate with incurved, callous teeth, subcoriaceous, dark green; sepals remaining on the black, sour, but pleasant fruit, which is 8-12 mm. in diameter. (Wild Black Cherry.)

Rare: Cass and Nemaha counties. (Nova Scotia—Dakota—Ariz.—Fla.)



EXPLANATION OF PLATE II.

1, 2, *Gymnocladus dioica*, sections of sterile and fertile flowers (x2), after Sargent; 3, fruit of the same (nat. size); 4, *Cercis canadensis*, flowering branch and leaf (x $\frac{1}{2}$); 5, section of the flower (x3); 6, Legume (x $\frac{1}{2}$); 7, diagram of the flower; 8, *Cassia chamaecrista*, portion of plant (x $\frac{1}{2}$); 9, section of the flower (x $\frac{1}{2}$); 10, diagram of same.

Family.—CAESALPINIACEAE.

Receptacle nearly as in *Rosaceae*, but the cup sometimes shallow or obsolete, and then the stamens and petals inserted seemingly in the bottom of the calyx; flowers regular or irregular, more or less zygomorphic, only in *Cercis* somewhat papilionaceous; petals and sepals mostly 5, the latter imbricated in the bud with the upper petal inclosed by the lateral ones; stamens 10 or less, in ours free; pistil one, more or less eccentric, generally becoming a many-seeded legume with a parietal placenta; seeds generally with a straight radicle, and sometimes with albumen.

The family *Caesalpinieae*, as previously stated, is nearly related to the *Rosaceae* from which it is distinguished by its nearly always single and many-seeded legume. It stands, however, still nearer to the next two families, *Mimosaceae* and *Papilionaceae*. In fact most authors include the three in one family under the name *Leguminosae*. I prefer, however, to regard them as three distinct families. There is only one character common to them and not found in *Rosaceae*, viz: that the fruit consists of a mostly many-seeded legume. But in many *Papilionaceae* this is 1-2-seeded, indehiscent, and nut-like, and would rather be called an achene than a legume.

In *Caesalpinieae* the receptacle is very variable. In many genera, as for instance, *Gymnocladus*, it is deeply campanulate. In others, as for instance, *Cassia*, the receptacular-cup is nearly obsolete, and the stamens are borne at the base of the pistil.

In all our species, the pistil is only 1, making a many-seeded legume, but there are members of the family that sometimes have more than 1 pistil, and others that have 1-few-seeded pods.

The stamens are normally 10, but often less. *Cassia marilandica* has only 7 fertile stamens, the other three being represented by staminoids. In *Gleditsia* the stamens are sometimes of the same number as the petals, 3-5. In a few foreign members, the stamens are many.

The corolla is generally somewhat irregular, zygomorphic, with 5 sepals and petals. The unpaired sepal is the lowest, and the unpaired petal the uppermost. In *Cercis*, which in many respects, especially in the form of the corolla, resembles the *Papilionaceae*, and must be regarded as a connecting link, this upper petal is inclosed by the lateral ones, as is the case in nearly all the *Caesalpinieae*. In the *Papilionaceae* it always incloses the wings.

The *Caesalpinieae* comprise nearly 1,000 species of mostly woody plants. Only some species of the genera *Cassia* and *Hoffmanseggia* are herbaceous. The family is mostly confined to the tropics and the subtropical regions of the temperate zones. Very few genera have representatives outside of the 40th parallels.

SYNOPSIS.

I. **Eucaesalpinieae.**—Flowers regular or almost regular, sepals distinct, stamens as many as the petals or more often twice as many. Ours, as most of the tribe, are trees with twice-pinnate leaves.

1. *Gymnocladus*.—Receptacular-cup deep, tubular; petals and sepals 5; stamens 10, short, thornless trees.
2. *Gleditsia*.—Cup short, turbinate-campanulate; petals and sepals 3-5; stamens 3-10; thorny trees.

- II. **Cassieae**.—Flowers more or less irregular, but not at all papilionaceous; sepals free; stamens 2-10, generally of different size and some abortive, opening by two small clefts at the apex. Trees, shrubs, or, as in ours, perennial herbs with simply pinnate leaves.

3. *Cassia*.—Leaves abruptly pinnate.

- III. **Bauhinieae**.—Flowers more or less irregular, in our species subpapilionaceous, but with the standard enclosed by the wings; calyx gamosepalous. Trees or woody vines with simple, 2-lobed, or entire leaves.

4. *Cercis*.—Tree, with heart-shaped, simple leaves and subpapilionaceous flowers.

TRIBE **Eucaesalpinieae**.—Flowers regular or almost regular; sepals distinct, stamens as many as the petals, or more often twice as many, polygamo-dioecious (ours) with the stamens in the fertile flowers abortive. Our representatives, as most of the tribe, are trees with twice-pinnate leaves.

1. **GYMNOCLADUS** LAM. Enc. Meth. 1: 733. 1783.

Flowers whitish, in terminal racemes, when young clothed with a thick tomentum, receptacle deep; petals and sepals 5, stamens 10, short; legumes, which remain unopened through the winter, subfalcate, 15-25 cm. long and $2\frac{1}{2}$ - $3\frac{1}{2}$ cm. wide, with thick margins, and thin, tough, dark-brown valves, filled with a pulp between the seeds. There is only one species, a thornless tree, confined to North America.

Etymology: Greek *γυμνος*, naked, and *κλαδος*, branch.

Gymnocladus dioica (L.) KOCH Dendrol. 1: 5. 1869.

Guilandia dioica L. Sp. Pl., 381. 1753.

Gymnocladus canadensis LAM. Enc. Meth. 1: 733. 1783.

Leaflets ovate, acute, 5-7 cm. long, $2\frac{1}{2}$ cm. wide, or those replacing the lower pinnae twice as large, all stalked. A tree 20-30 m. high.

The "Kentucky Coffee-tree" grows on alluvial soil in the southeastern part of the state and along the Missouri River as far as Cedar county. (N. Y. —Ontario—Minn.—Indian Territory—Tenn.)

2. **GLEDITSIA** L. Sp. Pl. 1056. 1753.

Flowers small, greenish or whitish, in axillary racemes; cup short, turbinate-campanulate; petals and sepals 5; stamens 3-10; leaves abruptly once and twice pinnate; pod flat, in ours with many seeds. (Honey Locust.)

About a dozen species, thorny trees, inhabitants of tropical and subtropical regions.

Etymology: dedicated by Linnaeus to a contemporary botanist, J. G. Gleditsch (Gleditsius).

Gleditsia triacanthos L. Sp. Pl. 381. 1753.

Leaves abruptly pinnate, or generally bipinnate, of 4-7 pinnae, the lower pinnae often reduced to simple leaflets; leaflets oblong, 2-3 cm. long and 1 cm. wide, crenate, when unfolding, white-tomentose; legume $2\frac{1}{2}$ - $4\frac{1}{2}$ dm. long and 3 cm. wide, dark brown, slightly falcate, many-seeded with pulp between the seeds, in drying twisting into a screw; tree 20-40 m. high, with terete, simple, or often 3-forked spines, $\frac{1}{2}$ - $1\frac{1}{2}$ dm. long.

The "Honey Locust;" grows wild on rich soil in southeastern Nebraska and along the Missouri river to the South Dakota line, but is planted here and there throughout the state. (Ontario—Neb.—Tex.—Ala.)

TRIBE **Cassieae**.—Flowers more or less irregular, but not at all papilionaceous; sepals free; stamens 2-10, generally of different size and some abortive, opening by two small clefts at the apex. Our species are perennial herbs with simply pinnate leaves.

3. CASSIA L. Sp. Pl. 376. 1753.

Receptacles very narrow, sepals 5, petals 5, unequal, the lower ones the larger; stamens generally 10, but unequal, some often sterile; leaves abruptly pinnate.

Between 300 and 400 species, mostly inhabitants of warm climates, shrubs or trees, but all natives of the United States are herbs.

Etymology: the ancient name.

Cassia marilandica L. Sp. Pl. 376. 1753.

Perennial, about 1 m. high; stamens 10, but the anthers of the upper 3 imperfect and deformed; leaves with club-shaped glands on the petioles; leaflets 6-9 pairs, lanceolate-oblong, obtuse; flowers in axillary racemes or the upper ones panicle; pod linear, slightly curved, 5-10 cm. long. (Wild Senna.)

Rare: reported from Lancaster, Nemaha, Jefferson, and Franklin counties. (Conn.—Fla.—La.—Neb.)

Cassia chamaecrista L. Sp. Pl. 379. 1753.

Annual, about $\frac{1}{2}$ m. high, ascending; stamens 10, all perfect, unequal, 4 of the anthers yellow, the other six purple; petals yellow, some with purplish spots; pod linear, 5 cm. long, 5 mm. wide, flat, pubescent; leaves 8-12-foliate, leaflets oblong-elliptical, acute or mucronate.

Common in eastern Nebraska on the prairies and in sandy soil, extending as far west as Brown and Franklin counties. (Fla.—Me.—Minn.—Tex., Mex.)

TRIBE **Bauhinieae**.—Flowers more or less irregular, in our species subpapilionaceous, but with the standard included by the wings; calyx gamosepalous. Trees or woody vines with simple, 2-lobed or entire leaves.

4. CERCIS L. Sp. Pl. 373. 1753.

Flowers in simple fascicles or short racemes produced on the branches of previous years, or even on the trunk, appearing before the leaves; receptacle broadly turbinate with a thickened disk; calyx gamosepalous with 5 short teeth; corolla rose-color; stamens 10, free, but declined as in the *Papilionaceae*.

Seven species, inhabitants of temperate regions of both hemispheres.

Etymology: the ancient name of the Judas-tree of the eastern hemisphere.

Cercis canadensis L. Sp. Pl. 374. 1753.

Leaves heart-shaped, pointed; flowers in sessile umbels; legume short-stipitate, oblong or broadly linear, acute at both ends, reticulate-veined. A small tree, 12-15 m. high. (Red-bud, Judas-tree.)

Common on wooded banks in the southeastern corner of the state from Douglas to Gage counties. (N. J.—Fla.—Tex.—Neb.—Mexico.)

Family.—MIMOSACEAE.

Receptacle as in the two preceding families, flowers regular, 3-6, but commonly 5-merous, petals and generally also sepals valvate in the bud, often more or less united; stamens as many or twice as many as the petals, or sometimes numerous, free or monadelphous; pistil one, becoming a legume, seeds generally with a straight embryo.

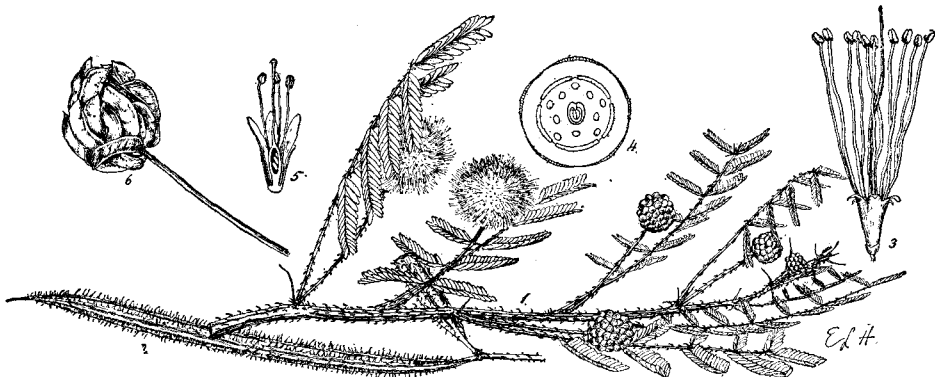
The *Mimosaceae* differ from the more nearly related families, *Rosaceae*, *Caesalpiniaceae*, *Papilionaceae*, etc., in the valvate aestivation of the flowers. The flowers are always regular and radiate, while in *Caesalpiniaceae* they are disposed to be zygomorphic. The flowers are small and generally collected in dense heads or spikes, and the leaves are mostly bipinnate.

The *Mimosaceae* number about 1,300 species, mostly trees or shrubs. The family, which plays such an important part in many tropical regions, constituting the bulk of the woody vegetation, is poorly represented outside of the 40th parallels. Our native species are mere herbs.

Many members of the family are noted for the sensitiveness of their leaflets. The best known is the sensitive plant, *Mimosa pudica*, cultivated in our greenhouses. Even our native species have the same quality, but in less degree.

The only tribe represented in the state is

Eumimoseae.—Petals and sepals 5 (or 4), valvate; stamens as many or twice as many. In ours the pod is many-seeded, the leaves twice-pinnate, and the flowers in heads on axillary peduncles.

**EXPLANATION OF PLATE III.**

1, *Leptoglottis uncinata*, part of branch ($\times \frac{1}{2}$); 2, legume of the same ($\times \frac{1}{2}$); 3, flower of the same ($\times 3$), from Engler and Prantl; 4, diagram of flower; 5, *Acuan illinoensis*, section of flower; 6, legumes of the same ($\times \frac{1}{2}$).

SYNOPSIS.

Leptoglottis.—Legume prickly, 4-angled, 4-valved, i. e., the narrow valves separating from the thick sutures; corolla gamopetalous.

Acuan.—Legume smooth, flat, in ours curved, petals free.

1. LEPTOGLOTTIS DC. Mem. Leg. 451. 1823.*Schrankia* WILLD. Sp. Pl. **4** : 1041., 1806, not MEDIC. 1792.*Morongia* BRITT. Mem. Torr. Bot. Club **5** : 191. 1894.

Stems decumbent and, as well as the petioles, covered with recurved prickles; legumes also prickly, 4-angled, 4-valved; flowers in ours polygamous, corolla gamopetalous, funnel-form, 5-cleft; stamens 8-10, with the filaments in the staminate flowers often flattened.

Ten species of often somewhat shrubby perennials, all American, and most of them tropical or subtropical.

Etymology: Greek λεπτος, narrow, and γλωττις, throat.

Leptoglottis uncinata (WILLD.) RYDBERG.*Mimosa intsia* WALT. Fl. Car. 252. 1788, not L.*Schrankia uncinata* WILLD. Sp. Pl. **4** : 1043. 1806.*Leptoglottis nuttallii* DC. Mem. Leg. 451. 1823.*Morongia uncinata* BRITT. Mem. Torr. Bot. Club **5** : 191. 1894.

Leaves of 4-6 pinnae, these of 18-32 elliptic leaflets, which are mucronate and strongly reticulate beneath; flowers red or sometimes white.

Prairies and hillsides in the southeastern part of the state, extending as far as Gosper and Knox counties. (Va.—Fla.—Tex.—S. Dak., Mexico.)

2. ACUAN MED. Theod. Sp. 62. 1786.*Desmanthus* WILLD. Sp. Pl. **4** : 1044. 1806.

Flowers in ours perfect, petals distinct, stamens generally 10, but in our species only 5; legume not prickly, flat, 2-valved, in ours curved.

Nine species, mostly of sub-tropical America, all perennial.

Etymology: a "barbarous name."

Acuan illinoensis (MICHX.) KUNTZE. Rev. Gen. Pl. 158. 1891.*Mimosa illinoensis* MICHX., Fl. Bor. Am. **2** : 254. 1803.*Desmanthus brachylobus* BENTH. Hook. Journ. Bot. **4** : 358. 1842.

Erect, glabrous; leaves with 6-15 pinnae, these of 40-60 small, oblong leaflets; pods numerous, in a dense head, on a peduncle about $\frac{1}{2}$ dm. long, curved, oblong, 2-6 but most commonly 4-seeded, about 3 cm. long.

Alluvial soil in the eastern part of the state, west to Kearney and Holt counties. (Ind.—Fla.—Tex.—S. Dak.)

Family.—PAPILIONACEAE.

Receptacle a shallow, somewhat oblique cup, constituting the bottom of the more or less gamosepalous calyx, which is 5-lobed or more or less 2-lipped by the union of the lobes; corolla irregular, zygomorphic, papilionaceous; arrangement of the 5 petals as in *Caesalpinaceae*, but the upper petal inclosing the lateral ones; stamens 10 (sometimes 9, in *Kuhnistera* only 5), free, monadelphous, or most commonly diadelphous (9 and 1, seldom 5 and 5); pistil one, generally becoming a many-seeded legume; seeds without albumen; cotyledons thick; embryo generally curved.

The corolla is papilionaceous, i.e., irregularly zygomorphic, consisting of 5 more or less clawed petals of which the upper unpaired one (vexillum, banner, standard, Pl. IV., Figs. 1-3, 20-23) is the largest, and encloses the lateral ones (alae, wings). The wings are symmetrical with reference to each other, have an oblique, more or less up-turned limb and, in their turn, enclose the lower petals. These are also oblique, united along the lower edge, and form one piece (carina, keel). In most members of the family, the standard

and wings are free, but in many they are slightly connected with each other, the keel, or the stamen-tube. In *Amorpha* (Pl. IV., Fig. 15, 23), the wings and keel are lacking, while in *Kuhnistera* they are inserted at the mouth of the stamen-tube, and are alternate with the 5 stamens (Pl. IV., Fig. 14, 21).

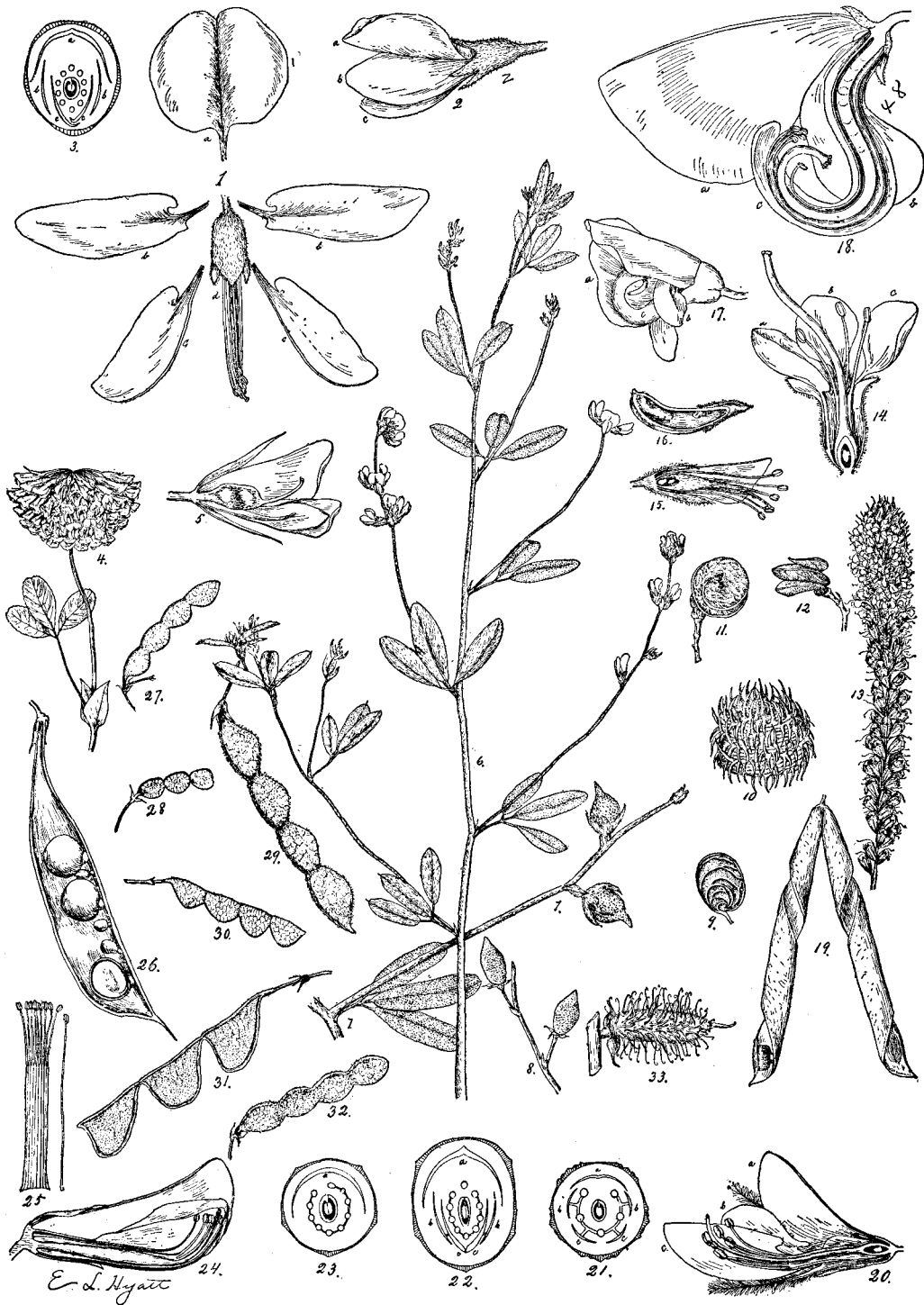
As stated above, the stamens are most commonly diadelphous, 9 and 1, viz., the upper stamen is free, while the nine lower ones are united by their filaments into a tube or sheath, open at the upper side, but otherwise enclosing the pistil (Pl. IV., Fig. 22, 24). The tube is itself enclosed by the keel. The stamen-tube and the pistil are bent down at the base to the lower side of the corolla, but at the apex they curve upwards, or in some cases, as in *Phaseolus*, *Apios*, *Medicago*, etc., turn backwards or coil spirally. In several genera, the upper stamen is united with the rest, and the stamen-tube becomes closed or split on one side. Sometimes the upper stamen is lacking. In the two first tribes the stamens are free (Pl. IV., Fig. 1-3).

The fruit is very variable in the different genera. It consists, generally, of a many-seeded, oblong, or linear legume (Pl. IV., Fig. 26), which opens by two valves, i. e., splits along the margin (the lower, or dorsal suture) as well as along the midrib (the upper or ventral suture). In many species, especially among the *Phaseoleae*, the valves twist when dehiscing (Pl. IV., Fig. 19). In a few, the legume opens only at the end, or along one of the sutures. In some, as for instance in many of the tribes *Trifolieae* and *Psoraleae*, it is 1-few-seeded, and indehiscent (Pl. IV., Fig. 5, 16). In *Medicago* (Pl. IV., Fig. 9-12), it is spirally coiled and in some species armed with prickles (Pl. IV., Fig. 10). In some species of the genus *Astragalus*, the pod becomes 2-loculed by a false partition made by the intrusion of either suture. In some it becomes bladdery-inflated, in others very fleshy. In *Glycyrrhiza* (Pl. IV., Fig. 33), it is covered with hooked prickles. In the tribe *Hedysareae*, the legume, by constriction, becomes divided into several 1-seeded joints (Pl. IV., Fig. 27-32).

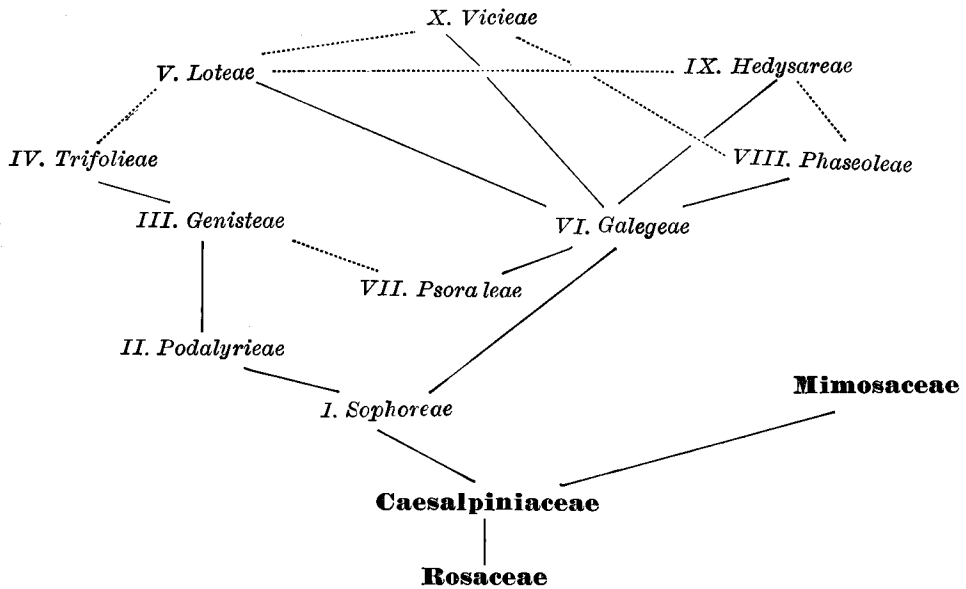
Papilionaceae is, after *Compositae*, the largest and, next *Gramineae*, the most important economically of all the families of plants. It contains over 6000 species, distributed through all parts of the globe, some extending far into the Arctics. The larger number are herbaceous, but trees and shrubs are also found, especially in warmer climates. Among our native species, *Robinia pseudacacia* is the only tree, while the genus *Amorpha* contains a few low shrubs.

EXPLANATION OF PLATE IV.

1, 2, *Baptisia leucophaea*, flower (nat. size), *a*, standard, *bb*, wings, *cc*, keel, *d*, calyx, stamens, and pistil; 3, diagram of the same flower; 4, *Trifolium reflexum*, head of flowers ($\times \frac{1}{2}$); 5, section of the marcescent corolla after flowering ($\times 2$); 6, *Psoralea collina* (nat. size); fruit of the same (nat. size); 8, *Psoralea tenuiflora floribunda*, fruit (nat. size), 9, 12, fruit of *Medicago*; 10, *M. arabica*; 11, 12, *M. sativa* ($\times 2$); 13, *Kuhnistera candida occidentalis*, spike (nat. size); 14, section of the flower of the same ($\times 4$); 15, *Amorpha canescens*, section of flower ($\times 3$); 16, *A. fruticosa*, section of fruit, ($\times 2$); 17, *Apios apios*, flower ($\times 2$); 18, section of the same ($\times 4$); 19, *Phaseolus pauciflorus*, showing dehiscence of legume (nat. size); 20, *Parosela enneandra*, section of flower; 21, *Kuhnistera candida*, diagram of flower; 22, *Lathyrus ornatus*, diagram of flower; 23, *Amorpha fruticosa*, diagram of flower; 24, *Lathyrus ornatus*, section of flower ($\times 1\frac{1}{2}$); 25, stamen—tube of the same; 26, legume of the same in section; 27, legume of *Meibomia paniculata* (nat. size); 28, *M. rigida*; 29, *M. canescens*; 30, *M. canadensis*; 31, *M. acuminata*; 32, *M. illinoensis*; 33, *Glycyrrhiza lepidota*, fruit (nat. size).



RELATIONSHIP OF THE TRIBES.



SYNOPSIS.

A. Stamens distinct, 10.

I. **Sophoreae**.—Leaves pinnate.

1. *Sophora*.—Calyx campanulate; flowers in terminal racemes; pod terete, constricted between the seeds.
(*Amorpha* and *Kuhnistera* may be sought here.)

II.—**Podalyrieae**.—Leaves digitate, in ours trifoliate.

2. *Thermopsis*.—Legume linear, flat, nearly sessile, in ours curved; plants not blackening in drying.
3. *Baptisia*.—Legume stipitate, oblong, ovate, or spherical, inflated; plants blackening in drying.

B. Stamens monadelphous or diadelphous (9 and 1; in *Amorpha* nearly free, in *Kuhnistera* 5, in *Parosela* often 9).

1. Leaves odd-pinnate or palmate; without tendrils.

a. Legume not divided transversely into joints.

(1) Herbs, not twining or trailing; leaflets stipellate.

- a. Herbage not glandular-dotted; stamens monadelphous; anthers of two forms.

III. **Genisteae**.—Leaves simple or digitate; leaflets not denticulate.

4. *Lupinus*.—Leaves digitately 5-11-foliate; calyx 2-lipped; pod flat.

5. *Crotalaria*.—Leaves simple; calyx 5-lobed; pod oblong, inflated.

- β. Herbage not glandular-dotted; stamens diadelphous; anthers uniform.

IV. **Trifoliceae.**—Leaves pinnately, rarely digitately, 3-foliate; leaflets often denticulate.

6. *Trifolium*.—Flowers capitate, or umbellate-capitate; pod membranaceous; 1-6-seeded, included in the calyx.
7. *Melilotus*.—Flowers racemed; pod coriaceous, 1-2-seeded, not curved; leaves pinnately 3-foliate.
8. *Medicago*.—Flowers racemed or spiked; pod few-seeded, curved or coiled.

V. **Loteae.**—Leaves pinnate in ours, 1-3-foliate; leaflets not denticulate; flowers umbellate, or, in ours, solitary on axillary peduncles; pod several-seeded.

9. *Lotus*.—Pod oblong or, in ours, linear, terete, or somewhat compressed.

VI. **Galegeae.**—Leaves pinnate (in a few *Astragali* digitately 3-foliate or simple); leaflets not denticulate; flowers in spikes, racemes, or heads; pod several-seeded.

* Trees; standard very broad.

10. *Robinia*.—Flowers in axillary racemes; pod flat, narrowly winged on the upper margin.

** Herbs; standard broad.

11. *Cracca*.—Leaves pinnately veined; pod flat.

*** Herbs; standard narrow.

12. *Spiesia*.—Keel produced into a point-like appendage; pod not prickly or muricate.

13. *Astragalus*.—Keel not appendaged, otherwise as in the preceding.

14. *Glycyrrhiza*.—Keel not appendaged; pod prickly or muricate; herbage glandular-punctate.

VII. **Psoraleae.**—Leaves digitately 3-many-foliate, rarely pinnately 3-foliate, often pinnate; pod 1-2-seeded, indehiscent.

* Leaves digitately or pinnately 3-foliate; corolla truly papilionaceous.

15. *Psoralea*.—Stamens 10, diadelphous; anthers of two sorts.

** Leaves pinnate; corolla abnormal.

16. *Amorpha*.—Standard only present, wings and keel lacking; stamens 10, monadelphous at the base.

17. *Parosela*.—Wing and keel united by their claws with the filament-tube, at most up to the middle; standard free; stamens 9-10, monadelphous.

18. *Kuhnistera*.—Wings and keel united by their claws with the filament-tube up to the summit; corolla scarcely at all papilionaceous; stamens 5, monadelphous.

(2) Twining or trailing herbs with stipellate leaflets.

VIII. **Phaseoleae.**—Leaves pinnate, mostly 3-foliate; peduncles axillary; pods 2-valved.

* Leaflets 5-7, stipels obsolete.

19. *Apios*.—Keel slender, incurved or coiled.

** Leaflets 3, stipels evident.

- 20. *Phaseolus*.—Keel spirally coiled or strongly incurved; flowers all alike, fertile.
- 21. *Galactea*.—Keel scarcely curved; calyx 4-cleft, the upper lobe somewhat broader; flowers all alike.
- 22. *Falcata*.—Keel nearly straight, calyx tubular, 4-5 toothed; the flowers of two kinds, the upper perfect, in one species seldom producing fruit, the lower rudimentary, fertile, with free stamens, borne on filiform creeping branches.

b. Legumes transversely jointed; joints reticulated, 1-seeded, indehiscent.

IX. **Hedysareac**.—Leaves pinnate, in ours 3-foliate; stamens 9 and 1 in ours.

23. *Meibomia*.—Legume several-jointed; leaflets stipellate.

24. *Lespedeza*.—Legume 1-2-jointed; leaflets not stipellate.

2. Leaves abruptly pinnate with tendrils, which are sometimes reduced to bristles.

X. **Vicieae**.—Pod 2-valved, few-several-seeded; stamens diadelphous.

25. *Lathyrus*.—Style flattish, hairy on the upper side; stamen-tube nearly truncate.

26. *Vicia*.—Style filiform, hairy all around or only on the lower side; stamen-tube oblique at the apex.

TRIBE **Sophoreae**.—Stamens 10, distinct; flowers often indistinctly papilionaceous; leaves pinnate; mostly trees or shrubs, but our species an herb.

1. SOPHORA L. Sp. Pl. 373. 1753.

Flowers in terminal racemes; calyx campanulate, with very short teeth; the corolla white or ochroleucous; pod stipitate, terete, coriaceous, monili-form-constricted between the seeds.

About 25 species, mostly trees or shrubs, inhabitants of the warmer parts of both hemispheres.

Etymology: an ancient Latin name.

Sophora sericea NUTT. Gen. 1: 280. 1818.

Erect or ascending, branching, silky-canescens; leaflets 7-12 pairs, oblong-oval, 8-15 mm. long; flowers in dense racemes; stamens slightly diadelphous; keel ending in two projecting teeth.

Dry prairies, western part of the state; reported from Red Willow, Furnas, Kimball, Cheyenne, and Deuel counties. (Wyo.—Ariz.—Tex.—Mex.)

TRIBE **Podalyricae**.—Stamens 10, distinct; leaves digitate, in ours 3-foliate; ours are coarse herbs.

2. THERMOPSIS R. Br. in Ait. f. Hort. Kew. 3: 3. 1811.

Flowers large, in terminal racemes, yellow in ours; calyx campanulate, 5-toothed or the two upper teeth united; standard orbicular with side reflexed; pod nearly sessile, flat, linear, curved in ours.

About 15 species from North America and Asia: all are herbs arising from a creeping rootstock and with large, foliaceous bracts and stipules.

Etymology: Greek, *θερμος*, lupine, *σψς*, resemblance.

Thermopsis rhombifolia (PURSH) RICHARDS. App. Frank. Journ. 13. 1823.*Cytisus rhombifolius* PURSH Fl. Am. Sept. 741. 1814.

Stout, 3-5 dm. high, silky-puberulent, or nearly smooth; leaflets rhomboid-oblong or obovate-cuneate; stipules broadly oval with somewhat cordate base; racemes short; bracts oval; pod more or less pendulous, 7-10 cm. long, $\frac{1}{2}$ cm. wide, strongly curved, nearly smooth.

In sandy soil in the western part of the state, reported from Banner, Deuel, Lincoln, Cherry, and Dawes counties. (Colo.—Man.)

3. BAPTISIA VENT. Dec. Gen. Nov. 9. 1808.

Resembling *Thermopsis*, but differing in its stipitate, oblong, ovate, or spherical, inflated pod; plants generally blackening in drying.

A genus of sixteen species, herbs, all North American.

Etymology: Greek, βαπτίζω, to dye.

Baptisia leucantha T. & G. Fl. N. A. 1: 385. 1840.

About 1 m. high, erect, glabrous, branched, branches erect; leaflets obovate-oblong or cuneate, about 5 cm. long; stipules and bracts lanceolate, deciduous; flowers white, in an erect raceme, 1-2 dm. long, or in fruit 3 dm. long; pod large, oval-oblong, 5 cm. long, on a stipe twice as long as the calyx.

Rare, reported from Nemaha, Otoe, Cass, Seward, and Lancaster counties. (Ont.—Minn.—La.—Fla.)

Baptisia leucophaea NUTT. Gen. 1: 282. 1818.

About $\frac{1}{2}$ m. high, with horizontal branches, somewhat villose; leaflets oblanceolate; stipules and bracts large, ovate, foliaceous, and persistent; flowers in horizontal racemes, sometimes as much as 3 dm. long, on drooping pedicles, ochroleucous, often 3 cm. long; pod 2-3 cm. long, pointed, hoary.

Common on prairies in the southeastern part of the state, as far west as Jefferson, Saline, and Saunders counties. (Mich.—Minn.—Tex.—Ga.)

TRIBE **Genisteae**.—Stamens monadelphous, anthers of two forms; leaves simple or digitate, without stipels; pod not jointed, nor the herbage glandular-dotted.

4. LUPINUS L. Sp. Pl. 721. 1753.

Leaves digitately 5-11-foliate; calyx 2-lipped, upper lip often bifid and the lower sometimes 3-toothed; standard orbicular with reflexed sides; wings obovate, united at the summit and inclosing the falcate keel; flowers often verticillate, in terminal racemes; pod more or less flattish, leathery, and hairy; stamens united into a closed tube.

About 100 species, a few from the Mediterranean region, the rest American, mostly West-American.

Etymology: Latin, diminutive of *lupus*, a wolf.

A. Perennials, 3-10 dm. high; pubescence silky.

Lupinus plattensis S. WATSON Proc. Am. Acad. 17: 369. 1882.

Usually erect, 3-5 dm. high, silky-villose, somewhat glaucous; leaflets 5-9, oblanceolate to spatulate, glabrous above; stipules narrowly lanceolate;

1-1½ cm. long; racemes loose, short-peduncled; bracts short, deciduous; flowers 12-15 mm. long, pale blue with a conspicuously darker spot on the smooth banner; pod 2-4 cm. long, 1 cm. wide, 1-7-seeded.
Prairies of Sioux, Dawes, Box Butte counties. (Col.—S. Dak.—Mont.)

Lupinus argenteus decumbens (TORR.) S. WATSON. Proc. Am. Acad. **18**: 532 1873.

Lupinus decumbens TORR. Ann. Lyc. N. Y. **2**: 191. 1826.

Ascending or erect, ½-1 m. high, branching, densely and finely appressed silky-canescens; leaflets 6-9, narrowly oblanceolate, nearly smooth above; stipules narrowly lanceolate, about ½ cm. long; racemes many-flowered, dense, short-peduncled; bracts small, deciduous; calyx campanulate, gibbous, but not spurred at the base, upper lip two-toothed, the lower sub-entire; flowers 10-12 mm. long, ochroleucous, tinged with blue, but not spotted; keel often tipped with purple; banner smooth, or slightly hairy; pod 3-4 cm. long, only ½ cm. wide, 2-5-seeded.

Along "draws" in Banner, Scott's Bluff, and Sioux counties. (Mont.—N. Mex.)

Lupinus argenteus argophyllus (GRAY) S. WATS. Proc. Am. Acad. **18**: 532 1873.

Lupinus decumbens argophyllus GRAY Pl. Fendl. 37. 1849.

Like the preceding, but the leaves silky-pubescent on the upper surface also; calyx spurred at the base.

War Bonnet Canyon, Sioux county. (Mont.—N. Mex.)

B. Annuals, 1-3 dm. high; pubescence hirsute.

Lupinus pusillus PURSH Fl. Am. Sept. 468. 1814.

Diffusely branched; leaflets 5, cuneate or oblanceolate, 2-3 cm. long on twice as long petioles; raceme short-peduncled, or nearly sessile, generally shorter than the leaves; flowers nearly 1 cm. long, purple, or rosy, tinged with purple or red; pod 1-2 cm. long, 3-4 mm. wide, generally 2-seeded.

Prairies of the western half of the state, but not common; reported from Frontier, Deuel, Box Butte, and Sioux counties. (Mo.—Minn.—B. C.—Ariz.)

5. **CROTALARIA** L. Sp. Pl. 714. 1753.

Calyx 5-lobed; stamen-tube open on the upper side; standard large, cordate; pod oblong, inflated; flowers in racemes opposite the simple leaves, which are supported by decurrent, united stipules.

About 250 species, nearly all tropical or subtropical.

Etymology: Greek, κροταλος, rattle.

Crotalaria sagittalis L. Sp. Pl. 714. 1753.

Annual, 1-2 dm. high, hirsute, branching; leaves oval or oblong, nearly sessile, 3-5 cm. long; stipules united, inversely sagittate; corolla scarcely longer than the calyx; pod 2-3 cm. long and 1½ cm. wide.

Low bottoms, Lancaster, Saunders, Cass, Sarpy, and Dakota counties. (Maine—S. Dak.—Kan.—Mex.)

TRIBE **Trifolieae**.—Stamens diadelphous, 9 and 1; anthers uniform; leaves digitately or pinnately 3-foliate, without stipules; leaflets usually denticulate; pod not jointed, mostly few-seeded and generally indehiscent.

6. TRIFOLIUM L. Sp. Pl. 772. 1753.

Flowers capitate, or umbellate-capitate; calyx tubular or campanulate, 5-toothed; corolla more or less persistent, and marcescent, the claws of the 4 lower petals somewhat connected with the stamen-tube; pod membranaceous, 1-6-seeded, included in the calyx; leaves palmately 3-, sometimes 5-7-foliate, in a few, pinnately 3-foliate.

Over 250 species, mostly of temperate and subtropical regions of the northern hemisphere, a few growing in the mountainous regions of tropical America.

Etymology: Latin, *tres*, three; *folium*, leaf.

A. Flowers yellow, brown in age, short-pedicelled.

Trifolium procumbens L. Sp. Pl. 772. 1753.

Stem spreading or ascending, 5-20 cm. high, branched, pubescent; stipules ovate, short and broad, shorter than the petioles; leaves pinnately 3-foliate; leaflets obovate or cuneate, truncate or emarginate; standard striate when old.

Much like *Medicago lupulina* L., from which it differs in the globose heads and in the character of the fruit.

Introduced, rare, Lancaster Co. (Naturalized from Europe.)

Trifolium agrarium L. Sp. Pl. 772. 1753.

Branched from the root, branches ascending, 3-5 dm. high, appressed-pubescent; stipules lanceolate, as long or longer than the petioles; leaves palmately 3-foliate, leaflets oval or obovate, truncate or emarginate; standard striate.

Introduced, rare; Lancaster Co. (Naturalized from Europe.)

B. Flowers white or rose-colored, brownish in age, pedicelled, in long-peduncled heads.

a. Annual or biennial; stem and calyx hairy.

Trifolium reflexum L. Sp. Pl. 766. 1753.

Stem ascending or decumbent; leaflets obovate, often emarginate, crenulate-serrate; stipules foliaceous, but thin, ovate; flowers many, long-pedicellate in head-like umbels; calyx parted nearly to the base, with subulate teeth, half as long as the corolla; standard broadly ovate, red; keel and wings white.

Prairies, Cass Co. (N. Y.—Fla.—Tex.—Mex.)

b. Perennial; stem glabrous; calyx nearly so.

Trifolium stoloniferum MUHL. Cat. 70. 1813.

Stem procumbent, with short, erect, axillary flowering branches; leaflets broadly obovate or obcordate, crenulate-dentate; stipules foliaceous, but

very thin, ovate-lanceolate, acuminate; flowers in loose, capitate umbels, $2\frac{1}{2}$ –3 cm. in diam.; calyx deeply parted, teeth twice as long as the tube, half the length of the corolla; corolla white, tinged with purple.
Open woods, rare; Lancaster county. (Ohio—Ky.—Mo.)

Trifolium repens L. Sp. Pl. 767. 1753.

Stem creeping, with long, axillary peduncles; stipules scarious, narrowly lanceolate; leaflets obcordate, denticulate; calyx-teeth lanceolate, shorter than the tube, the two upper distinctly longer than the three lower ones; corolla white, or rose-colored.

Escaped from cultivation, probably throughout the state. (N. A.—Eur.—Asia.)

Trifolium hybridum L. Sp. Pl. 766. 1753.

Stems ascending or upright; stipules scarious, long-acuminate, ovate-lanceolate; leaflets broadly ovate or elliptic, obtuse or retuse, finely and sharply serrate; calyx-teeth subulate, equal in length; peduncles from the upper axils; flowers white, becoming rose-colored.

Escaped from cultivation, Lancaster, Holt, and Cherry counties. (Eur.—Asia.)

C. Flowers red, or purple, sessile in dense heads; corolla elongated-tubular; lower calyx-tooth longer than the other 4.

Trifolium pratense L. Sp. Pl. 768. 1753.

Erect or ascending, hairy; stipules ovate, abruptly pointed; leaflets oval or obovate, often notched and often with a lighter triangular spot in the middle; heads nearly sessile in the axils of the upper leaves; calyx long-hairy.

Escaped from cultivation in the eastern part of the state. (Eur.—Asia.)

7. MELILOTUS Juss. Gen. Pl. 356. 1789.

Flowers in racemes; calyx campanulate, with short, equal teeth; corolla deciduous; pod coriaceous, 1–2-seeded; leaves pinnately 3-foliate.

Our species are tall plants, with narrowly obovate, or cuneate, mucronate, serrate leaflets, setaceous stipules, and small flowers.

About 20 species, of temperate, or subtropical regions of the Old World, but a few introduced into America.

Etymology: Greek, *μελι*, honey, *λωτος*, ancient name for a leguminous plant.

Melilotus alba LAM. Enc. Meth. 4 : 63. 1797.

Upright, branching, $\frac{1}{2}$ –2 m. high; corolla white; standard longer than the other petals; pod stipitate, wrinkled, smooth, at last brown.

Escaped here and there throughout the state. (Eur.—Asia.)

Melilotus officinalis (L.) LAM. Fl. Franc. 2 : 594. 1778.

Trifolium M. officinalis L. Sp. Pl. 765. 1753.

Habit of the preceding; corolla yellow; petals equal in length; pod finely hairy, at length black.

Introduced; Lancaster, Cass, and Saunders counties. (Eur.—Asia.)

8. MEDICAGO L. Sp. Pl. 778. 1753.

Flowers in short spikes or heads; legume few-seeded, curved or spirally coiled, often ridged, reticulated, or spinose; habit of *Melilotus*, but generally lower.

Between 40 and 50 species, of Europe, Eastern Asia, and Northern Africa, but many escaped, or introduced in all parts of the world.

Etymology: Greek, *μηδύκη*, ancient name for lucerne or alfalfa.

Medicago lupulina L. Sp. Pl. 779. 1753.

Low, spreading, or ascending, 1-5 dm., branched, finely pubescent, annual; leaflets obovate or cuneate, dentate above the middle, mucronate; flowers yellow, in oblong spikes on peduncles 2-3 cm. long; calyx-teeth subulate, longer than the tube; legume 1-seeded, indehiscent, reniform, with the apex turned next the stalk, reticulate, at last black.

Introduced; Lancaster and Cherry counties. (Eur., Asia.)

Medicago arabica (L.) ALL. Fl. Ped. 1: 315. 1785.

Medicago polymorpha arabica L. Sp. Pl. Ed. 2. 1098. 1763.

Medicago maculata SIBTH. Fl. Oxon. 232. 1794.

Spreading or ascending, somewhat pubescent, annual; leaflets obcordate, with a purple spot, coarsely dentate; stipules toothed; flowers yellow, in a few-flowered raceme; legume spirally twisted 2-5 times, the edge thick, furnished with two rows of curved prickles (Pl. IV., Fig. 10).

Introduced; Lancaster, Cass, and Saunders counties. (Eur., Asia.)

Medicago sativa L. Sp. Pl. 773. 1753.

Upright, branching, 3-6 dm. high, leaves short-petioled; leaflets obovate to narrowly cuneate, above the middle finely dentate; stipules lanceolate somewhat toothed at the base; flowers many, in an ovate, head-like raceme, of various shades of blue or violet; calyx-teeth subulate, longer than the tube; legume spirally twisted, finely reticulate, appressed-hairy, dehiscent, several-seeded. (Pl. IV., Fig. 9, 11, 12.)

Escaped from cultivation here and there throughout the state. (Eur., Asia.)

TRIBE **Lotene**.—Leaves pinnate, in ours 1-3-foliate; leaflets neither dentate nor stipellate; flowers umbellate, or in ours solitary on axillary peduncles; stamens diadelphous, 9 and 1; anthers uniform; pods several-seeded.

9. LOTUS L. Sp. Pl. 773. 1753.

Calyx-teeth longer than the tube; banner rounded, free; wings obovate, united with the keel but free from the stamen-tube; keel beaked; stipules glandular in ours.

If the 30 species of *Hosackia* are included, the genus comprises over 120 species; most of the true *Loti* grow in Europe and Asia, *Hosackia* in America. Our species, together with two or three more, belongs to *Lotus* proper, however.

Etymology: Greek, *λωτος*, ancient name of some leguminous plant.

Lotus americanus (NUTT.) BISCH. Litt. Ber. Linnaea, **14**: 132. 1840.*Trigonella americana* NUTT. Gen. **2**: 120. 1818.*Hosackia purshiana* BENTH. Bot. Reg. t. 1257. 1829.

Annual, erect, branched, about $\frac{1}{2}$ mm. high, soft-pubescent, or sometimes nearly glabrous; leaves simple or 3-foliate; leaflets elliptic or oblong, 1-2 $\frac{1}{2}$ cm. long and 6-7 mm. wide, the lateral ones nearly sessile; flowers leafy-bracteate, on axillary peduncles 1-2 cm. long; calyx-teeth linear, nearly as long as the corolla; corolla whitish or yellowish, striate and rose-tinted; pod linear, about 3 cm. long.

Probably throughout the state, common westward. (Minn.—B. C.—Tex.—Ark.—Mex.)

TRIBE **Galegeae**.—Stamens diadelphous; anthers uniform; herbage not glandular-dotted; leaves odd-pinnate, or, in some *Astragali*, 3-foliate or simple; leaflets not denticulate; flowers in spikes, racemes, or heads; pod several-seeded, rarely few-seeded.

10. ROBINIA L. Sp. Pl. 772. 1753.

Shrubs, or trees, with stipular prickles and pinnate leaves with entire, stipellate leaflets; flowers in axillary racemes; calyx short, with broad lobes, of which the upper two are somewhat united; standard very broad; wings elongated, free; filament of the upper stamen free at the base, united in the middle with the rest; pod flat, narrowly ridged on the upper margin.

About a dozen species, North American.

Etymology: In honor of John and Vespasian Robin.

Robinia pseudacacia L. Sp. Pl. 722. 1753.

Tree 5-10 m. high, with slender branches; bark dark-brown when old, tinged with red, furrowed and scaly, green when young, turning reddish, at first coated with a fine pubescence, finally smooth; leaflets 7-19, oval-oblong, 3-5 cm. long, mucronulate, dark-green above, paler beneath; flowers white, fragrant, in a loose raceme; legume 7-10 cm. long, 1-1 $\frac{1}{2}$ cm. wide, smooth, bright red-brown, 4-8-seeded.

Escaped from cultivation along streams in the southeastern part of the state, Lancaster and Nemaha counties. (Penn.—Ia.—Ind. Terr.—Ga.)

11. CRACCA L. Sp. Pl. 752. 1753.*Tephrosia* PERS. Syn. **2**: 328. 1807.

Calyx-teeth nearly equal, or the two upper united a little higher than the rest; standard nearly orbicular, generally silky outside and turned back, scarcely longer than the obovate wings; standard, wings, and keel more or less coherent; stamens monadelphous; legume linear, flat, several-seeded; flowers racemose; leaves odd-pinnate, in ours with many leaflets. Over 120 species, herbs, sometimes frutescent, inhabitants of the warmer regions of both hemispheres.

Etymology: a Latin name used by Pliny for some species of wild vetch.

Cracca virginiana L. Sp. Pl. 752. 1753.*Tephrosia virginiana* PERS. Syn. **2**: 329. 1807.

Perennial from a woody base, strict, erect, 3-6 dm. high, whitish silky-villose when young, striate; leaflets 4-14 pairs, linear-oblong, veiny, mucronate,

2-4 cm. long, glabrous above, silky beneath; flowers in terminal sessile or short-peduncled racemes or panicles; calyx silky-villose, teeth acuminate, longer than the tube; corolla cream-colored or streaked with purple or pink, about 2 cm. long; legume 3-5 cm. long, cinereous villose-pubescent. Rare: reported from near Fairbury. (Ontario—Minn.—Tex.—Fla., Mexico.)

12. SPIESIA NECK. Elem. **3** : 13. 1790.

Oxytropis DC. Astr. 19. 1802.

Calyx tubular or deeply campanulate; banner ovate or oblong, wings oblong, keel ending in a sharp point; pod sessile or stipitate, 2-valved, sub-bilocular by the intrusion of the ventral (upper) suture.

Our species are low, acaulescent perennials with scape-like peduncles and tufts of pinnate leaves on a short caudex.

About 150 species, inhabitants of temperate and arctic regions of the northern hemisphere.

Etymology: dedicated to Spies.

Spiesia lambertii (PURSH) KUNTZE Rev. Gen. Pl. 207. 1891.

Oxytropis lambertii PURSH Fl. Am. Sept. 740. 1814.

More or less grayish-pubescent; leaves 5-7 paired, leaflets narrowly oblong to lanceolate-linear, 1-4 cm., acute; scape 2-3 dm. high; spike many-flowered, in the mountain form short and dense, in the prairie form more elongated and lax; flowers $1\frac{1}{2}$ to nearly 2 cm. long, in all Nebraska specimens seen purple or violet, but in Colorado often ochroleucous; calyx-teeth nearly subulate; legume coriaceous, subterete, inflexed on the ventral suture, gradually attenuated into a long beak, including the beak $1\frac{1}{2}$ -2 cm. long, 5-7 mm. in diameter, appressed-hairy, exerted from the split calyx. (Loco-weed.)

Prairies, common in western and central portions of the state. (Manitoba—Saskatchewan—N. Mex.—Tex.—Mexico.)

Spiesia lambertii sericea (NUTT.) RYDBERG Bot. Surv. Neb. **3** : 32. 1894.

Oxytropis sericea NUTT., Torr. & Gray Fl. N. A. **1** : 339. 1838.

Oxytropis lambertii sericea A. GRAY, Coult. Man. Bot. Rocky Mts. 71. 1885.

Larger than the species, longer and more densely hairy, silky-villose, hairs spreading in age; leaflets broadly oblong, $1\frac{1}{2}$ -5 cm. long, $\frac{1}{2}$ -1 cm. wide; flowers fully 2 cm. long, in our form violet; calyx-teeth lanceolate; stipules larger and very broad; pod thicker, with shorter beak, and villose.

As far as Nebraska specimens are concerned, it seems to be a good species, but intermediate forms are found in Colorado.

Prairies, in the western part of the state; Scott's Bluff, Sioux, and Deuel counties. (Manitoba—Saskatchewan—N. Mex.—Tex.)

Spiesia multiceps (NUTT.) KUNTZE Rev. Gen. Pl. 207. 1891.

Oxytropis multiceps NUTT., Torr. & Gray Fl. N. A. **1** : 341. 1838.

Matted, canescent-silky; leaves 1-3 cm. long, with 3-4 pairs of oblong leaflets, 5-10 mm. long; scape 1-3 cm., scarcely exceeding the leaves, 1-3-flowered; flowers purple, about 2 cm. long; calyx-teeth short-lanceolate; pod short-stipitate, included in the bladderly-inflated calyx.

Rare: collected on the upper Lawrence Fork, Banner county, in 1891. (Wyo.—Col.)

Spiesia inflata (HOOK.) BRITT. Mem. Torr. Bot. Club. **5**: 201. 1894.

Oxytropis arctica inflata HOOK. Fl. Bor. Am. **1**: 146. 1833.

Oxytropis podocarpa A. GRAY. Proc. Am. Acad. A. & S. **6**: 234. 1864.

Villose, leaflets 5-11 pairs, linear-lanceolate, 7-10 mm. long; peduncles 2-flowered, not surpassing the leaves; flowers $1\frac{1}{2}$ cm. long, violet; pod large 2-2 $\frac{1}{2}$ cm., bladdery-inflated, puberulent.

Reported from Thomas county, but no specimens are extant, and the occurrence of the species in the state is much to be doubted. (Labrador—Arctic Circle—Rocky Mountains—Col.)

13. ASTRAGALUS L. Sp. Pl. 755. 1753.

Flowers nearly as in *Spiesia*, but the keel without point at the apex.

Between 1200 and 1300 species, mostly herbs, inhabitants of temperate, but some also of arctic and tropical regions.

Etymology: Greek *αστραγαλος*, the name of some leguminous plant.

Astragalus has been regarded as perhaps the most difficult of the leguminous genera, and rightly so. There is no other genus that shows so much variation. Especially is this the case in the structure of the pod. The pods vary from thick-coriaceous and succulent-fleshy to a texture as thin as paper. There are all stages from completely 2-celled pods to perfectly 1-celled ones. Some are straight, some curve upwards, some downwards. The cross-section is as variable: linear, lanceolate, ovate, oval, triangular, round, cordate, obcordate, and even sub-didymous. Some pods are bladdery-inflated, while others are close-fitting around the seeds. The genus *Astragalus* has generally been divided into two, *Astragalus* and *Phaca*, the former with the dorsal suture inflexed, making the pod more or less 2-celled, and the latter having neither suture inflexed or the ventral one somewhat so. As the inflexion of the dorsal suture in many cases is very slight, as for instance in *A. microlobus*, *A. aboriginum*, etc., this division into two genera is simply arbitrary. If the genus is to be divided at all, perhaps not less than a dozen genera should be made of it. In scientific treatment of the group, the structure of the pod has always been made the basis of classification, and perhaps rightly so, as the mature pods give the most constant characters. It is nearly impossible to determine some species without the pods.*

KEY.

I. Leaves pinnate of several pairs, leaflets not bristle-pointed.

A. Leaves scarcely exceeding the joints of the slender, diffuse, or ascending stem-leaflets oblong or linear.

Leaflets 2-4 pairs, linear, racemes very long, flowers white or pale purple,

A. gracilis

Leaflets 5-10 pairs, oblong or ovate, racemes long, flowers white or pale purple.....

A. flexuosus

Leaflets 4-8 pairs, linear to oblong, racemes short on a long peduncle,

flowers purple.....*A. microlobus*

B. Leaves much exceeding the joints of the low, 1-4 dm., ascending stem, leaflets linear, filiform, not jointed to the rhachis.

Stem slender, leaflets few, mostly abortive, flowers small, yellowish...*A. longifolius*

Stem stouter, leafy, leaflets 5-7 pairs, flowers capitate, white.....*A. pectinatus*

* As a rule, a beginner forgets to collect fruits, even if they can be had at the time, which is not always the case. Under such circumstances, it is nearly impossible to use the common manuals. In the key, I have tried to arrange the Nebraska species so that they may be determined even if the fruit is lacking.

- C. Leaves much exceeding the joints of the generally stout stem, leaflets oblong or elliptic.
- a. Spike or raceme elongated.
1. Stem stout, mostly erect, 1-12 dm. high.
- a. Flowers 1-2 cm. long, ochroleucous or white.
- Glabrous or appressed-pubescent, corolla strongly gibbous at the base,
- A. racemosus*
- Soft-villose, striate, scarcely gibbous.....*A. drummondii*
- Grayish pubescent, calyx not gibbous.....*A. carolinianus*
- β. Flowers smaller, 6-8 mm., ochroleucous tinged with purple.
- Stem slender, grayish puberulent, turning black in drying.....*A. tenellus*
- γ. Flowers deep-violet.
- Strigose-pubescent, calyx gibbous at the base.....*A. bisulcatus*
2. Decumbent or acaulescent.
- Stem villose throughout, flowers large, violet.....*A. mollissimus*
- b. Spike or raceme capitate or few-flowered.
1. Stem 1-6 dm., generally ascending or erect, zigzag bent; the dense head generally overtopping the leaves.
- Appressed-pubescent, calyx and pod sparingly silky.....*A. adsurgens*
- More loosely hairy, calyx loosely pubescent, pod villose.....*A. hypoglottis*
2. Stem 1-6 dm., spreading or ascending, or nearly upright; head-like raceme not exceeding the leaves.
- Ascending or upright, smooth or sparingly and loosely hairy; calyx white, silky-villose, corolla cream-colored, tipped with blue.....*A. mexicanus*
- Decumbent or ascending, appressed-pubescent, even the calyx; flowers generally purplish.....*A. crassicaulus*
- Decumbent, loosely villose, calyx villose with spreading hairs, corolla cream-colored tinged with purple.....*A. plattensis*
(See also *A. missouriensis*.)
3. Stem very short, and the plant sub-acaulous (except sometimes in *A. missouriensis*).
- a. Flowers purple, plant silky-canescens.
- Stem short or ascending, peduncle generally exceeding the leaves, calyx with black and white hairs.....*A. missouriensis*
- Acaulescent, peduncles generally not exceeding the leaves, calyx white-hairy
- A. shortianus*
- β. Flowers yellowish, plant appressed-cinereous or hirsute.
- Flowers yellow, scarcely exceeding the calyx, racemose; plant cinereous,
- A. lotiflorus*
- Flowers subsessile in the axils of the leaves, plant cinereous,
- A. lotiflorus brachypus*
- Plant hirsute.....*A. lotiflorus nebraskensis*
- II. Leaves pinnate, leaflets 2-3 pairs, linear, bristle-pointed.
- Flowers 1-3 in the axils of the leaves.....*A. viridis*
- III. Leaves 3-foliate or simple; stipules scarious.
- Cespitose, nearly smooth; leaves generally simple, flowers purple, spike generally exceeding the leaves.....*A. spatulatus*
- Cespitose, silvery-canescens, leaves 3-foliate, flowers in the axils of the leaves, ochroleucous.....*A. gilviflorus*
- Prostrate-spreading, silvery-canescens, flowers in short, few-flowered racemes,
- A. sericoleucus*

- A. Pod one-loculed, with neither suture inflexed, or the ventral (upper) slightly so.
 a. Pod flattened, vetch-shaped, chartaceous, or coriaceous.

1. (**Homolobi.**) Pod straight with a nerve-like suture, several-seeded. Perennials with pinnate or simple leaves, leaflets not bristle-pointed; flowers racemose.

Astragalus tenellus PURSH Fl. Am. Sept. 473. 1814.

Ervum multiflorum PURSH Fl. Am. Sept. 739. 1814.

Astragalus multiflorus A. GRAY Proc. Am. Acad. A. & S. **6**: 226. 1864.

Stem branched from the caudex, slender, ascending, apt to turn black in drying, pubescent or at last glabrous; stipules connate, dark-colored; leaflets 6-10, narrowly oblong, 1-2 cm. long; racemes about the length of the leaves; flowers small, ochroleucous, tinged with purple, 6-8 mm. long; legume 1-1½ cm. long, reflexed, short-stipitate, glabrous, reticulated. Canyons and gulches in the western part of the state: Sheridan, Sioux, Box Butte, and Scott's Bluff counties. (Kan.—Cal.—British Columbia—Minn.)

Astragalus spatulatus SHELDON Bull. Minn. Geol. & Nat. Hist. Surv. **9**: 19. 1894

Astragalus caespitosus A. GRAY Proc. Am. Acad. A. & S. **6**: 230. 1866, not PALLAS Ast. 70. 1800.

Densely caespitose, acaulescent, silky-canescens, scape 5-15 cm. high; stipules scarious, connate; leaves generally simple, oblanceolate or narrowly spatulate, sometimes with 2-5 leaflets; raceme spike-like; flowers purple or rose-colored, about 5 mm. long; pod short, 5-8 mm., sessile, somewhat coriaceous. (Pl. XI. Fig. 98-103.)

On dry hills or cliffs in western part of the state: Sioux, Dawes, Scott's Bluff, Banner, Kimball, Cheyenne, and Deuel counties. (Mont.—Assiniboia—Col.)

2. (**Kentrophytae.**) Pod 3-4-ovuled, but 1- seldom 2-seeded. Perennials with short and bushy stems; flowers subsessile in the axils of the leaves which are pinnate with few, bristle-pointed leaflets.

Astragalus viridis (NUTT.) SHELD. Bull. Minn. Geol. & Nat. Hist. Surv. **9**: 118. 1894.

Kentrophyta viridis NUTT. Torr. & Gray Fl. N. A. **1**: 353. 1838.

Astragalus kentrophyta A. GRAY Proc. Acad. Phil. **1863**: 60. 1863.

Much branched, ½-2 dm. high, silky-pubescent; stipules membranaceous, mostly connate, cuspidate; leaflets 2-3 pairs, about 1 cm. long, linear-subulate, rigid and divergent; flowers 1-3 in each axil, with a very short pedicel, ochroleucous, tinged with purple, 4-5 mm. long; calyx-teeth setaceous; pod ½ cm. long, ovate, a little curved. (Pl. XI., Fig. 82-87.)

Hills and "bad-lands" of the western part of the state: Deuel, Cheyenne, Banner, Scott's Bluff, Box Butte, and Dawes counties. (Mont.—Assiniboia—Neb.—N. Mex.)

- b. Pod terete, inflated, membranaceous.

3. (**Inflat.**) Pods large, globose or ovoid, finely reticulated, glabrous.

Astragalus longifolius (PURSH.)*Psoralea longifolia* PURSH. Fl. Am., Sept. 741. 1814.*Astragalus pictus filifolius* A. GRAY Proc. Am. Acad. A. & S. **6** : 214. 1860.*Astragalus filifolius* A. GRAY Pac. R. R. Rep. **12** : 42. 1860, not Clos. in Say Fl. Chil. **2** : 111. 1846.*Astragalus ceramicus* SHELD. Bull. Minn. Geol. & Nat. Hist. Surv. **9** : 19. 1894.

Slender, 3-6 cm. high, silky-puberulent; stipules lanceolate, connate at the base; leaves simple, filiform, subulate, $1\frac{1}{2}$ dm. long, or with a few subulate leaflets; flowers small, 4 mm. long, ochroleucous, keel tipped with purple; pod large, 3-4 cm. long, beautifully mottled with brown or reddish purple, ovoid. (Pl. XI, Fig. 79-81.)

Common on the sandhills and on other sandy places of the central and western parts of the state, extending as far east as Custer and Holt counties. (Kans.—Neb.—N. Mex.—Utah.)

c. Pod neither laterally flattened nor inflated, mostly coriaceous and terete.

4. (**Triphylli**). Cespitose or acaulescent, perennials with crowded, silvery-silky, 3-(seldom 5-) foliate leaves, large, scarious, connate stipules, and small, ovoid, coriaceous pods.

Astragalus gilviflorus SHELD. Bull. Minn. Geol. & Nat. Hist. Surv. **9** : 19. 1894.*Astragalus triphyllus* PURSH. Fl. Am. Sept. 750. 1814, not PALLAS Ast. 68. 1800.

Cespitose, nearly acaulescent, in dense tufts about $\frac{1}{2}$ dm. high; stipules hyaline, glabrous or slightly hairy near the margin; leaves on more or less recurved petioles, 3- or the earlier 5-foliate, leaflets cuneate or oblanceolate; flowers sessile in the axils of the leaves, ochroleucous, $\frac{1}{2}$ - $2\frac{1}{2}$ cm. long, sometimes a little tinged with purple; calyx silky-villose, teeth shorter than the cylindrical tube; pod villose, inclosed in the calyx. (Pl. XI, Figs. 88-91.)

Hills in the western part of the state: Banner, Cheyenne, Deuel, Scott's Bluff, Dawes, and Sioux counties. (Tex.—western Kan.—Saskatchewan—Mont.)

Astragalus sericolenus A. GRAY Am. Journ. Sci. II., **33** : 410. 1862.

Broadly cespitose with spreading, prostrate, branches, covered with the scarious, villose stipules; leaves 3-foliate, leaflets about $\frac{1}{2}$ cm. long, cuneate-oblanceolate; flowers in few-flowered racemes, equalling the leaves, 6-8 mm., more or less purple; calyx villose, teeth equalling the campanulate tube; pod ovate, hairy, half included in the calyx. (Pl. XI, Figs. 92-97.)

Hills of Deuel, Cheyenne, Banner, Dawes, and Sioux counties. (Col.—S. Dak.—Wyo.)

5. (**Pectinati**). Tall perennials with pinnate leaves with narrow, nearly filiform, rigid leaflets, not jointed to the rhachis. Pod subovate or oblong, with a sub-fleshy epicarp, sessile, both sutures prominent.

Astragalus pectinatus DOUGL. in Don Gen. Syst. Gard. & Bot. **2** : 257. 1832.

Erect or ascending, bushy, ashy-puberulent or glabrate, 2-4 dm. high, branches striate; stipules somewhat connate; leaflets 4-6 cm. long; flowers white, in a short raceme, with a narrow banner; pod 1-2 cm. long, pendulous, cuspidate. (Pl. XI, Figs. 75-73.)

Rare: collected only on the plains of Scott's Bluff county. (Kan.—Saskatchewan.—Mont.)

6. (**Bisulcati.**) Tall perennials with pinnate leaves; pod stipitate, oblong, semi-cylindric, with two deep, rounded grooves on the ventral surface.

Astragalus bisulcatus (HOOK.) A. GRAY Pac. R. R. Rep. **12**: 42. 1860.

Phaca bisulcata HOOK. Fl. Bor. Am. **1**: 145. 1833.

Erect, $\frac{1}{2}$ –1 m. high, strigose-puberulent; stipules distinct, triangular; leaflets 8–14 pairs, oblong, 2–3 cm. long; racemes many-flowered, dense; flowers violet, about 1 cm. long, pendulous or spreading; calyx-teeth shorter than the campanulate tube; pod $1\frac{1}{2}$ cm. long. (Pl. IX., Figs. 28–32.)

Rare: only collected in Dawes county. (Kan.—Col.—Mont.—Saskatchewan.)

7. (**Scytocarpi.**) Pod coriaceous, turgid, ovate or oblong, neither grooved nor sub-fleshy; leaves pinnate; stem in ours flexuose, slender.

Astragalus flexuosus DOUGL. in Don. Gen. Syst. Gard. & Bot. **2**: 256. 1832.

Stem decumbent or ascending, slender, branched, 3–5 dm. long, ashy-puberulent; leaflets oblong or cuneate, 5–10 pairs, obtuse, 10–18 mm. long; stipules connate below, triangular, acuminate; peduncles exceeding the leaves; flowers in a loose raceme, 8–10 mm., white or purplish, pedicelled, at last reflexed; calyx-teeth short-triangular, tube campanulate; pod $1\frac{1}{2}$ –2 cm., slightly pubescent, oblong, acute, a little flattened. (Pl. IX., Figs. 10–12.)

Reported from Llewellyn, Keith county, where it is said to be common. (British Columbia—Saskatchewan—Minn.—Col.)

- B. Pod 1-loculed, the dorsal suture more or less inflexed—in the first group only slightly so, and in *A. missouriensis* not at all.

a. Legume coriaceous, sessile, more or less ovoid.

8. (**Microlobi.**) Perennials with slender, diffuse stem; leaves pinnate with 2–8 pairs, generally shorter than the joints of the stem, peduncles slender, bearing many-flowered racemes; pod 4–6 mm. long, elliptic-ovate, rugose, flattened or concave on the dorsal side.

Astragalus microlobus GRAY Proc. Am. Acad. A. & S. **6**: 203. 1864.

Stem diffuse, spreading, 2–5 dm., ashy-puberulent, joints often zig-zag; leaflets 5–8 pairs, 8–12 mm. long, oblong to linear, cuneate, generally emarginate; raceme shorter than in the next, on a long peduncle which often exceeds the leaves; flowers 8–10 mm., purplish; pod reflexed, ovoid, only flattened on the dorsal side, finely rugose, puberulent. (Pl. IX., Figs. 6–9.)

Sandy soil in the western part of the state: Box Butte, Cheyenne, Kimball, and Deuel counties. (Col.—Mo.—S. Dak.)

Astragalus gracilis NUTT. Gen. N. A. Pl. **2**: 100. 1818.

Stem virgate, ascending or diffuse, 3–6 dm. long, hoary-pubescent or glabrate; leaflets 2–4 pairs, 8–20 mm., linear, obtuse or retuse; flowers small, 4–6 mm., on short pedicels in a lax raceme, pale purple or white; calyx campanulate, teeth triangular; legume 5–7 mm., concave on the back, strongly transversely rugose, slightly pubescent or glabrous. (Pl. IX., Figs. 1–5.)

On the table lands and hills of the western and central parts of the state; Sioux, Banner, Deuel, Dawes, Thomas, Custer, Hitchcock, Dundy, and Red Willow counties. (Col.—Mo.—Minn.—N. Dak.)

9. (**Argophylli**). Low, white-silky, often cespitose; flowers spicate, or in ours subcapitate, violet or purple; calyx-teeth shorter than the cylindric tube; legume thick-coriaceous with the dorsal suture intruded except in *A. missouriensis*.

Astragalus shortianus NUTT., Torr. & Gray Fl. N. A. 1: 331. 1838.

Subacaulescent, appressed silky-canescens, 1 dm. or less high; leaflets broadly obovate, 15-20 mm.; peduncles scape-like, usually shorter than the leaves; calyx 1 cm. or more, cylindric, white-silky; corolla violet or blue; legume elongated-ovate, much curved, pointed, transversely rugose, dorsal suture inflexed. (Pl. X. Figs. 61-63.)

Reported from Cherry county, but no specimens in the Survey Herbarium. (N. Mex.—Tex.—Neb.—Mont.)

Astragalus missouriensis NUTT. Gen. 2: 99. 1818.

Subacaulescent or more seldom with more or less spreading stems, generally greener than the preceding; peduncles generally longer than the leaves; calyx-tube cylindric, pubescent with black and white hairs; corolla violet; legume 2-3 cm. long, oblong-elliptic, straight, transversely rugose, neither suture inflexed. (Pl. X., Figs. 58-59.)

Hills, in the western and central parts of the state: Cherry, Sioux, Scott's Bluff, Banner, Kimball, Deuel, and Frontier counties. (N. Mex.—Tex.—Minn.—Saskatchewan.—Mont.)

10. (**Lotiflori**). Low, subacaulescent, cinereous-pubescent or villose; corolla yellowish, a little exceeding the calyx; pod ovate, thin coriaceous, at the base gibbous and inflexed on the dorsal side.

Astragalus lotiflorus HOOK. Fl. Bor. Am. 1: 152. 1833.

Generally cinereous with appressed hairs, leaves erect, spreading, leaflets 3-10 pairs, oblong-elliptic or oblanceolate, $\frac{1}{2}$ -2 cm. long;* peduncles (in the typical form) 3-8 cm. long, capitately few-flowered; corolla ochroleucous, 8-12 mm.; legume $1\frac{1}{2}$ -2 cm. long, oblong-ovate, in cross-section obovate or near the base obcordate. (Pl. X., Figs. 65-69, 73-74.)

Prairies, rare in the state: Kearney, Gosper, Cherry, Dawes, and Sheridan counties. (Tex.—Minn.—Saskatchewan—British Columbia.)

Astragalus lotiflorus brachypus A. GRAY Proc. Am. Acad. A. & S. 6: 209. 1866.

Flowers smaller, 5-8 mm., subsessile in the axils of the leaves; leaflets generally 3-4 pairs, greener. (Pl. X., Fig. 70.)

Specimens from this state are seemingly biennial rather than perennial.

Mr. E. P. Sheldon has described this as a new species under the name of *Astragalus elatiocarpus* in Bull. Minn. Geol. & Nat. Hist. Surv. 9: 20. 1894, stating that the peduncles elongate after the fruit has matured. I have collected the form in five different localities, during three different seasons, and have not been able to verify this character. All specimens of this form from Nebraska seen had sessile flowers and sessile pods. In the Black Hills of South Dakota I found specimens having on the same plant flowers and also fruit, both in heads on long peduncles and subses-

*A form with very short leaflets has been reported as *A. chamaeluce* GRAY, which is not found in Nebraska.

sile in the axils of the leaves. Dr. Gray's view of the matter, viz.: *A. lotiflorus* forma *brachypus*, may be the most correct one.

More common than the species: Brown, Cherry, Banner, Kimball, Gosper, Frontier, and Hooker counties. (Tex.—Hudson Bay.)

Astragalus lotiflorus nebraskensis BATES Am. Nat. **29**: 670. 1895.

Very hairy with spreading hairs, especially on the pods, more robust, stems rather longer; leaflets 3-6 pairs, larger; legume often $2\frac{1}{2}$ cm. long; flowers and pods generally subsessile in the axils, but sometimes on elongated peduncles. (Pl. X., Fig. 71-72.)

Somewhat resembles *A. villosus* NUTT., but has the legume and flower of *A. lotiflorus*.

First collected by Rev. J. M. Bates at Long Pine, later by Mr. J. A. Warren in Clay county.

11. (**Oroboidei**). Pods coriaceous or nearly membranaceous, scarcely or not at all obcompressed, with the dorsal suture more or less deeply impressed or inflexed; caulescent, slender, glabrous or pubescent; stipules nearly free, distinct except the lowest; flowers in short, often spike-like or capitate racemes, rather small or middle-sized, purple to white.

Astragalus giganteus (PALL.) SHELD. Bull. Minn. Geol. & Nat. Hist. Surv. **9**: 65. 1894.

Astragalus alpinus giganteus PALL. Ast. 42. 1800.

Stems many from a thickish perennial root, ascending, 3-10 dm. high, striate, grayish-pubescent; leaflets 6-12 pairs, ovate to ovate-lanceolate, generally acute, smooth above, grayish-pubescent below; raceme short, $2\frac{1}{2}$ -5 cm. long, 6-15 flowered, on a long, erect peduncle, 10-15 mm. long; flowers violet-purple; calyx black-hairy, with subulate teeth; pod in cross-section obcordate-oblong, straight, sessile in the calyx, blackish or grayish hairy.

This species is most nearly related to *A. alpinus* L., and has been regarded as a variety thereof. It differs in being much taller, in the longer, more strict peduncles, in the more violet flowers, and especially in the pod, which is less inflexed on the dorsal side and sessile. In *A. alpinus* it is decidedly stipitate.

On bottom land, North Platte. (Newfoundland—Alaska—Col.)

- b. Legume oblong to linear, stipitate, cartilaginous, deeply sulcate on the dorsal side.

12. (**Racemosi**). Tall perennials, erect or nearly so, simple or more often branched from the caudex; stipules distinct; legume pendulous, glabrous, more or less triangular, with the dorsal suture intruded to or beyond the middle; flowers white or ochroleucous.

Astragalus drummondii DOUGL., Hook. Fl. Bor. Am. **1**: 153. 1833.

Stout, $\frac{1}{2}$ -1 m. high, softly villose, angularly striate; leaflets 10-18 pairs, oblong-oval, 1-3 cm.; flowers white or very light ochroleucous, keel tipped with purple; calyx scarcely gibbous at the base, black-hairy; pod linear, 3-4 cm. long, on a stipe about 1 cm. long, a little curved, in cross-section deeply obcordate-lobed. (Pl. IX., Fig. 16-21.)

Said to be common on the upper Loup river, but the only authentic localities are Dawes and Sioux counties. (Col.—Neb.—Saskatchewan.)

Astragalus racemosus PURSH Fl. Am. Sept. 740. 1814.

Less strict, ascending or upright, $\frac{1}{2}$ –1 m. high, finely appressed-hairy or glabrate, slightly striate; leaflets 10–16 pairs, oblong; 2–4 cm. long; flowers light ochroleucous or white; calyx gibbous at the base, white-pubescent; legume oblong, acute at both ends, about 3 cm. long, on a stipe scarcely exceeding the calyx, in cross-section nearly equally tri-radiate by the sharply inflexed dorsal suture. (Pl. IX., Figs. 22–27.)

Bluffs, Franklin, Red Willow, Frontier, Cedar, and Boyd counties. (Utah—Mo.—Saskatchewan—Idaho.)

C. Legume perfectly two-loculed.

a. Legume coriaceous, not fleshy.

13. (**Onobrychides**). Caulescent perennials, grayish-pubescent or glabrate, ascending or decumbent, often zigzag, stipules sheathing; legume turgid, oblong, in cross-section obcordate or somewhat triangular-compressed; flowers in dense heads, violet or purple.

Astragalus adsurgens PALL. Ast. 40. 1800.

Astragalus laxmanni PALL. (?), Nutt. and authors, not JACQ.

Ascending, cinereous, 1–4 dm. high, branched, striate; leaflets 5–10 pairs, 1–3 cm. long, narrowly oblong; stipules scarious, triangular-acuminate, connate; calyx cylindrical, subvillose with white or mixed white and black hairs; corolla purple or pale tipped with purple; legume 1–1½ cm., somewhat triangular in cross-section, appressed-hairy. (Pl. X., Figs. 42–46.)

High prairies, common in the western part of the state: Deuel, Cheyenne, Banner, Box Butte, Dawes, and Sioux counties. (Hudson Bay—Kans.—Col.—Ore.—lat. 56°.)

Astragalus hypoglottis L. Mant. 2:274. 1771.

Stem $\frac{1}{2}$ –2½ dm., procumbent or ascending, nearly terete; leaflets 7–10 pairs, 5–15 mm. long, oblong or linear-oblong, obtuse; stipules subfoliaceous, ovate, sheathing; calyx cylindrical, pubescent with dark hairs; corolla violet or pale purple; legume 7–10 mm., silky-villose with white hairs. (Pl. X., Fig. 47–51.)

This species has been reported from several places in the western part of the state, but all specimens so named in the Survey Herbarium belong to the preceding species. *A. hypoglottis* is common among the foot-hills of the Black Hills. (Hudson Bay—Minn.—N. Mex.—Alaska.)

14. (**Mollissimi**). Perennials, subacaulescent or spreading, shining with soft-villose, often yellowish pubescence; peduncles long and scape-like, bearing a dense spike; pod coriaceous, turgid, terete, sulcate on both sutures.

Astragalus mollissimus TORR. Ann. Lyc. N. Y. 2:178. 1826.

Stems short, several from the caudex, decumbent or scarcely any; leaflets 10–20, broadly oval or obovate, 1–2 cm. long; scape 2–3 dm. long; flowers 2 cm. long, light-violet; ovary and pod glabrous, the latter 1–2 cm. long, oblong, somewhat curved. (Loco-weed). (Pl. IX., Figs. 37–41.)

On the plains of the central and western parts of the state: Kearney, Furnas, Red Willow, Cheyenne, Box Butte, Dawes, Sioux, and Sheridan counties. (Tex.—Col.—Neb.—Mexico.)

15. (**Uliginosi**). Tall perennials with grayish, short pubescence, or glabrate, in general habit resembling those of group 11, but differing in the denser, spike-like racemes, and the pods, which are perfectly 2-loculed, erect, sessile, oblong, terete, and scarcely sulcate on the back.

Astragalus carolinianus L. Sp. Pl. 757 (No. 9). 1753.

Astragalus canadensis L. Sp. Pl. 757 (No. 10). 1753.

Erect, slightly puberulent or glabrate, 4-12 dm. high, somewhat striate; leaflets 5-15 pairs, 1-4 cm. long, elliptic-oblong, stipules triangular-acuminate, connate below; flowers ochroleucous, 1-1½ cm.; legume 1-1½ cm., nearly erect, oblong, terete, and slightly sulcate on the dorsal suture, finely reticulated cross-wise. (Pl. IX., Fig. 13-15.)

Common throughout the state. (Fla.—Quebec.—Wash.)

- b. Legume succulent, becoming thick and fleshy, and at last somewhat corky.

16. (**Sarcocarpi**). Perennials with low, prostrate or ascending stems, several from the caudex, racemes short, spike-like or capitate, legume not stipitate.

Astragalus crassicaarpus Nutt. Fraser's Cat. No. 6. 1813.

Astragalus caryocarpus Ker. Bot. Reg. 2: 176. 1816.

Appressed-pubescent, becoming glabrate; leaflets 8-14 pairs, 1-2 cm. long, narrowly oblong or obovate; flowers 1½-2½ cm. long, short-pedicelled; calyx cylindrical, sometimes tinged with purple, silky; corolla violet-purple, or sometimes nearly white, tipped with purple; ovary and pod glabrous, the latter 1½-2 cm. in diameter, globose or ellipsoid, usually pointed, thick and fleshy, at last becoming spongy. (Pl. X., Fig. 52-54.)

Prairies: common throughout the state. (Minn.—Mo.—Tex.—Col.—Saskatchewan.)

Astragalus mexicanus A. DC. Pl. Rar. Gen. 4: 16. 1827.

Like the preceding, but larger and greener; leaflets obovate or oblong; flowers 2-3 cm. long, cream-colored with bluish tips; calyx soft-villose or tomentose; fruit globular, 2½ cm. in diameter.

Reported from Belmont, Dawes county, but no specimens are in the Survey Herbarium. (Ills.—Tex.—N. Mex.—Col., Mexico.)

Astragalus plattensis Nutt. Torr & Gray Fl. N. A. 1: 332. 1838.

Loosely villose; leaflets 6-10 pairs, obovate or oblong-elliptical, about 1 cm.; stipules foliaceous, becoming reflexed; flowers ochroleucous tipped with purple, 12-15 mm. long, short-pedicelled; calyx loosely villose; legume 1½-2 cm. long, 1-1½ cm. in diameter, ovate, acuminate, slightly curved, more sulcate and less fleshy than in the two preceding. (Pl. X., Figs. 55-57.)

Rather local in Nebraska: Lancaster, Adams, Antelope, Sioux, and Dawes counties. (Ind.—Ala.—Tex.—Black Hills of S. Dak.)

14. GLYCYRRHIZA L. Sp. Pl. 741. 1753.

Perennials, glandular-pubescent; upper lobes of the calyx shorter than in the preceding genus, and united; filaments approximate; fruit prickly. (Wild Liquorice.)

About a dozen species, inhabitants of temperate or subtropical regions.

Etymology: Greek, γλυκὺς, sweet, and ριζα, root.

Glycyrrhiza lepidota PURSH. Fl. Am. Sept. 480. 1814.

Tall, 6-10 dm., much resembling *Astragalus carolinianus*; leaflets 7-9 pairs oblong-lanceolate, mucronate, 3-4 cm. long, scaly when young, dotted when old; flowers light ochroleucous; pod oblong, prickles hooked.

Prairies throughout the state. (Hudson Bay—Ontario—Mo.—New Mex.—Wash., Mexico).

TRIBE **Psoraleae**.—Herbage glandular-punctate; pod 1-2 ovuled, mostly 1-seeded, indehiscent; leaves digitate or pinnate.

15. PSORALEA L. Sp. Pl. 762. 1753.

Calyx campanulate, the two upper lobes somewhat united and the lowest one in ours longer than the rest; corolla truly papilionaceous; stamens 10, monodelphous or diadelphous, with anthers of two kinds; leaves digitate or pinnately 3-foliate.

Over 100 species of temperate and tropical regions; about 30 are North American.

Etymology: Greek, *ψωραλεος*, scurfy.

A. Flowers large, 1-1½ cm., sessile in dense heads.

a. Plant low, 1-3 dm. high, hirsute on the stem with spreading hairs; root fusiform.

Psoralea esculenta PURSH. Fl. Am. Sept. 475. 1814.

Stem erect or spreading, 1-3 dm. high; stipules 1-2 cm. long, lanceolate, ciliate; leaves 5-foliate; leaflets 2-6 cm. long, 1-2 cm. wide, oblong to obovate; peduncles equalling or exceeding the leaves; bracts 1-1½ cm. long, ovate-lanceolate; calyx-lobes lanceolate, foliaceous, 1-1½ cm. long, the three lower ones nearly equal; legume enclosed in the calyx, with a beak 15-18 mm. long.

Throughout the state. (Wis.—Ia.—Tex.—Mont.—Sask.)

Psoralea hypogaea NUTT. Torr. & Gr. Fl. N. A. 1: 302. 1838.

Stem erect or obsolescent, generally less than 1 dm. high; leaves 5-7-foliate, on long petioles; leaflets oblong-lanceolate, acute, 3-6 cm. long, 4-8 mm. wide; stipules as in the preceding; peduncles generally shorter than the leaves, sometimes none; bracts ovate; calyx-lobes lanceolate-linear, except the lowest one, which is broadly lanceolate and much larger, about as long as the corolla.

Rare; reported only from Deuel Co. (Nebr.—Tex.—N. Mex.)

b. Plant taller, 3-8 dm. high, appressed-pubescent.

Psoralea cuspidata PURSH. Fl. Am. Sept. 475. 1814.

Erect, branching; leaves mostly 5-foliate, on petioles about as long as the leaflets; leaflets obovate-oblong, mucronate, glabrous above, 2-4 cm. long, 1-1½ cm. wide; stipules narrowly lanceolate, 1-2 cm. long; bracts lanceolate-cuspidate, exceeding the calyx, which is strongly glandular-dotted, and somewhat inflated in fruit; calyx-lobes lanceolate; pod 8 mm. long with a short, curved beak, enclosed in the calyx.

Rare: bluffs of the Niobrara, Holt Co. (Minn.—Mont.—N. Mex.—Tex.)

- B. Flowers small, less than 1 cm., in spikes or racemes; plant from a creeping root-stock.
- a. Flowers 7-10 mm., in interrupted, elongated spikes, 1-3 together, sessile in the axil of each bract; plant more or less silky-pubescent.

Psoralea digitata Nutt. Torr. & Gr. Fl. N. A. 1: 300. 1838.

Psoralea campestris Nutt. l. c. 301. 1838.

Erect, virgately-branched, 3-6 dm. high, with appressed, grayish pubescence; stipules 5-10 mm. long, lanceolate; leaves mostly 5-foliate; leaflets linear-oblong, 2-3½ cm. long, 2-5 mm. wide, mucronate or cuspidate, nearly smooth above; peduncles strict, 1-2½ dm. long; bracts obovate or obcordate, mucronate or cuspidate, 5-7 mm. long and nearly as broad; flowers nearly 1 cm. long; calyx-lobes lanceolate; calyx much enlarged in fruit, enclosing the ovate pod, which has a slender beak.

The original *Psoralea digitata* is a form with broader, obcordate bracts and rigidly cuspidate leaflets: *P. campestris*, on the other hand, has obovate bracts and merely mucronate leaflets, but all grades between the two are found.

Common on prairies in the sand-hill regions, extending eastward to Knox, Antelope, and Kearney counties. (S. Dak.—Ark.—Tex.)

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

Erect, branched, silvery-canescens throughout, 3-5 dm. high; stipules ½-1 cm. long; leaves 3-5-foliate; leaflets oblong, cuneate, or obovate, obtuse, mucronate, 2-4 cm. long, ½-1½ cm. wide; peduncles from 2-12 cm. long; flowers nearly 1 cm. long; bracts ovate-lanceolate, acute, ½-1 cm. long; calyx-lobes acuminate, the lower about 1 cm. long, longer than the ovate pod, which is beaked with a straight beak.

Common on prairies throughout the state. (Sask.—Mont.—N. Mex.—Mo.—Minn.)

Psoralea collina n. sp.

Ascending, or diffuse, somewhat grayish-pubescent, 3-5 dm. high; stipules narrow, ¼-¾ cm. long; leaves mostly 3-foliate, sometimes 5-foliate, nearly smooth above; leaflets obovate to oblanceolate, mucronate; bracts small, pointed, 3-4 mm. long; peduncles slender, 5-10 cm. long; flowers about 5-6 cm. long; calyx-lobes linear-lanceolate, the lower a little longer than the others, but much shorter than the ovate pod, which is 5-7 mm. long and tipped with a flat, straight beak, 3 mm. long.

This species may be identical with *Psoralea argophylla decumbens* (Gray. Pac. R. R. Rep. 12), but the stipules are very small and shorter than the petioles, and the plant is scarcely decumbent. It differs from *P. argophylla* in being less silvery, in the smoothness of the upper surface of the leaves, in the smaller flowers, and in the much less elongated lower calyx-lobe; from *P. digitata* in the broader leaves, narrower and smaller bracts, in the calyx which scarcely enlarges in fruit, and in the shorter, more slender peduncles; and from *P. tenuiflora floribunda*, which it resembles most in general habit, in its sessile flowers and the longer and stouter beak of the pod.

On hill-sides: Fort Robinson, Sioux county, Dr. C. E. Bessey, July 30, 1887; Scott's Bluff county, P. A. Rydberg, No. 50, 1891.

- b. Flowers 7 mm. or less long, pedicelled; plant less hairy or smooth, conspicuously glandular-dotted; bracts small, 2-3 mm., ovate-lanceolate.

Psoralea tenuiflora PURSH. Fl. Am. Sept. 475. 1814.

Erect with diverging branches, 2-5 dm. high, stem minutely canescent or glabrous; leaves 3-foliate, or the lower sometimes 5-foliate; leaflets oblong-elliptical, or oblanceolate, glabrous above and nearly so below, 1-3 cm. long; peduncles 2-8 cm. long; raceme few-flowered; flowers mostly only 1 or 2 to each bract, 4-5 mm. long, blue; calyx nearly glabrous, closely glandular-dotted; pod ovoid, glabrous, dark glandular-dotted, with a stout, short beak; pedicels shorter than the flowers.

Common on hills and table-lands in western Nebraska, extending east to Custer county. (S. Dak.—Mont.—Col.—Ark.)

Psoralea tenuiflora floribunda (NUTT.)

Psoralea floribunda NUTT. Torr. & Gr. Fl. N. A. 1:300. 1838.

Taller, sometimes 1 m. high, more hairy on the stem, lower surface of the leaves and the calyx; branches more upright; leaflets generally 5; peduncles longer, 5-15 cm.; racemes many-flowered, with generally 2 or 3 flowers to each bract; corolla larger, 5-7 mm., with a broader standard.

This variety has been variously treated—by some as a distinct species, by others as a mere form. As a rule, it can be easily distinguished, but sometimes, especially in the central portion of the state, it grades into the true *P. tenuiflora*. The species generally grows on dry hills, the variety in rich valleys.

Cass, Lancaster, Seward, Jefferson, Phelps, Custer, and Cherry counties. (Ill.—Mont.—Miss.—N. Mex.—Mex.)

Psoralea linearifolia TORR. & GRAY Fl. N. A. 1:300. 1838.

Erect, with long, slender branches, 4-7 dm. high; stem distinctly glandular-dotted, sparingly appressed-hairy; leaves 3-foliate, very short-petioled; leaflets linear, 1-5 cm. long, 1-3 mm. wide, often conduplicate; peduncles 5-15 cm. long, lax; flowers 5-6 mm., blue; pod ovoid-oblong, with a straight beak; pedicels longer than the flower.

Rare: prairies, Buffalo and Deuel counties. (Neb.—Tex.—Ark.)

Psoralea lanceolata PURSH, Fl. Am. Sept. 475. 1814.

Psoralea micrantha A. GRAY. Torr. Pac. R. R. Rep. 4: 77. 1856.*

Erect, strict, 2-4½ dm. high, densely glandular throughout, glands becoming scattered and obsolescent on the older branches, heavy-scented; stem coarsely fibrillose-pubescent toward the base; branches numerous, erect, closely appressed, minutely roughened, channeled; stipules subulate or lanceolate, rarely somewhat scarious, 3-8 mm. long, ⅓-¾ mm. wide; petioles 1-2 cm. long; leaves 3-foliate; leaflets 1-4 cm. long, narrowly linear to lanceolate-spatulate, lowermost often broadly spatulate, acute to obtuse or rounded, mucronate, rarely glabrous, generally sparingly beset with long, white hairs, veins prominent; peduncles as long as the leaves, 1½-4 dm.; raceme short, small, 1½-3 cm.; bracts minute, subulate; flowers white with a yellowish tinge, 5 mm. long; calyx clothed with white hairs; lobes equal, obtuse; pod globose, pointed, covered with numerous, flex-

*This must be regarded as merely a narrow-leaved form of *P. lanceolata*, since all grades between the two are found in the same locality.

uous, white hairs, the glands borne on prominent, wart-like protuberances; seed smooth, shining, globose, tan.

Common in sandy places throughout western and central Nebraska, extending as far east as Kearney, Antelope, and Dakota counties. (Ore.—Ariz.—Ind. Terr.—Sask.)

16. AMORPHA L. Sp. Pl. 713. 1753.

Calyx obconical, with 5 nearly equal teeth; standard obovate with a short claw, wrapped around the stamens; wings and keel lacking; stamens monadelphous at the base; flowers in terminal, dense spikes, in ours blue or purple; leaves odd-pinnate, with many mucronate leaflets, which are often stipellate; legume 1-2-seeded, tardily dehiscent.

Species 8-10, shrubs, all natives of North America.

Etymology: Greek, *αμορφος*, deformed.

Amorpha fruticosa L. Sp. Pl. 713. 1753.

Shrub, 2-5 m. high, with greenish-purple stems, finely pubescent or nearly glabrous; leaflets 7-12 pairs, petiolate, elliptic-oblong, $1\frac{1}{2}$ -3 cm. long; spikes clustered; flowers indigo-blue; calyx somewhat hairy, the lowest tooth acuminate and a little longer than the rest; style hairy nearly the whole length; legumes 1-2-seeded, 7-10 mm. long, 3 mm. wide, curved upwards.

Common along streams throughout the state. (Penn.—Fla.—N. Mex.—Sask.)

Amorpha canescens PURSH. Fl. Am. Sept. 467. 1814.

Low, less than 1 m. high, softly grayish-canescenscent, in age glabrate; branches grayish; leaflets crowded, 12-25 pairs, elliptic, about 1 cm. long; spikes generally clustered; flowers bluish-purple; calyx hairy, teeth ovate-lanceolate; pod 4-5 mm. long, 1-seeded, curved, canescenscent.

Common on dry hill-sides throughout the state. (Ind.—Ga.—Tex.—Sask.)

Amorpha nana NUTT. Fraser's Cat. No. 5. 1813.

Amorpha microphylla PURSH. Fl. Am. Sept. 466. 1814.

Low, generally less than $\frac{1}{2}$ m. high, glabrous, with a bright green foliage; stem grayish; leaflets crowded, 5-15 pairs, elliptic-obovate, 5-7 mm. long; spikes generally solitary; flowers bluish-purple; calyx nearly smooth, teeth triangular, setaceously acuminate; pod 3-7 mm. long, 1-seeded, scarcely curved.

Abundant on the bluffs of the Missouri in Cedar county. (Minn.—Ia.—Wy.—Sask.)

17. PAROSELA Cav. Desc. 185. 1803.

Dalea WILLD. Sp. Pl. 3: 1336. 1803; not R. BR., nor GAERTN.

Standard free, heart-shaped; wings and keel mostly longer than the standard, with the claws united with the stamen-tube to the middle or less, stamens 9-10, monadelphous; legume 2-ovuled, but generally 1-seeded; leaves in ours pinnate, not stipellate.

Herbs, but many more or less woody at the base; about 100 species, mostly North and Central American, only a few found in South America.

Etymology: anagram of *Psoralea*.

a. Spike long, lax; flowers distant.

Parosela enneandra (NUTT.) BRITTON MEM. Torr. Bot. Club 5: 196. 1894.

Dalea enneandra NUTT. Fraser's Cat. No. 30. 1813.

Dalea laxiflora PURSH. Fl. Am. Sept. 741. 1813.

About 1 m. high, with slender branches, smooth throughout; leaflets 2-5 pairs, linear or oblanceolate, 5-10 mm. long; stipules minute; bracts nearly orbicular, punctate, margin scarious, slightly cuspidate; calyx enlarged in fruit, lobes beautifully plumose; corolla white; stamens 9. (Pl. IV., Fig. 20.)

Not uncommon in the western part of the state, extending east to Red Willow, Buffalo, and Cedar counties. (S. Dak.—Mo.—Tex.—Wy.—Mex.)

b. Spike more densely cylindrical.

Parosela dalea (L.) BRITTON Mem. Torr. Bot. Club 5: 196. 1894.

Psoralea dalea L. Sp. Pl. 764. 1753.

Dalea alopecuroides WILLD. Sp. Pl. 3: 1336. 1803.

Erect, branching, glabrous; leaflets 10-14 pairs, oblong-elliptical, 5-8 mm. long, bright green, obtuse or retuse, bracts ovate, as long as the calyx, deciduous; calyx silky-villose, teeth lanceolate-acuminate; corolla whitish or light rosy.

Common in eastern and central portions of the state, extending west to Keya Paha, Buffalo, and Kearney counties. (Minn.—Ill.—Ala.—Ariz.—Mex.)

Parosela lanata (SPRENGEL) BRITTON Mem. Torr. Bot. Club 5: 196. 1894.

Dalea lanata SPRENGEL Syst. Veg. 3: 327. 1826.

Decumbent, canescent-tomentose throughout; leaflets 4-7 pairs, crowded, broadly cuneate, emarginate; corolla deep purple.

Said to have been collected in the state (Wats., King's Rep.; Coulter, Man. Rocky Mount. Fl.), but not seen by any member of the Botanical Seminar. (Kan.—Ark.—Tex.—N. Mex.—Utah.)

c. Spike very dense, ovoid-capitate on a long peduncle.

Parosela aurea (NUTT.) BRITTON Mem. Torr. Bot. Club 5: 196. 1894.

Dalea aurea NUTT. Fraser's Cat. No. 29. 1813.

Branches many, erect, $\frac{1}{2}$ m. high, from a ligneous caudex, canescent-pubescent; leaflets 3-4 pairs, obovate to oblong, 7-15 mm. long; the rhombic-ovate bracts, and the calyx villous; teeth subulate from a broad base, plumose; flowers yellow, $1\frac{1}{2}$ cm. long.

Gravelly hills in western Nebraska; Banner, Scott's Bluff, Deuel, Cherry, Holt, and Knox counties. (S. Dak.—Mo.—Tex.)

18. KUHNISTERA LAM. Enc. Meth. 3: 370. 1789.

Petalostemon MICHX. Fl. Bor. Am. 2: 48. 1803.

Petals with long claws, the four lower borne at the summit of the stamens; standard free; leaves pinnate, not stipellate; stipules setaceous; flowers in dense spikes; ovary 2-ovuled, but pod usually 1-seeded, indehiscent; in ours, the stems are generally several from one root.

Over 20 species, perennial herbs, all North American; some of the species are frequently woody at the base.

Etymology: Kuhn, an early botanist, *αστρον*, a star.

a. Calyx villose-pubescent or silky.

Kuhnistera villosa (NUTT.) KUNTZE Rev. Gen. Pl. 192. 1891.*Petalostemon villosus* NUTT. Gen. 2: 85. 1818.*Dalea villosa* SPRENG. Syst. Veg. 3: 326. 1826.

Stems 3-6 dm. high, villose-tomentose, much branched; leaflets 5-7 pairs, lanceolate-oblong, 5-10 mm. long; spike cylindrical, 2-8 cm. long, short-peduncled; bracts lanceolate, a little longer than the silky-villose calyx; corolla rose-colored, or rarely white; root thick, fusiform, red.

Common in the sand-hills, extending east to Kearney, Nance, and Knox counties, also collected in Douglas, and Dodge counties. (Wis.—S. Dak.—Col.)

Kuhnistera purpurea (VENT.) MACM. Met. Minn. Val. 329. 1892.*Dalea purpurea* VENT. Hort. Cels. t. 40. 1800.*Petalostemon violaceus* MICHX. Fl. Bor. Am. 2: 50. 1803.

Stem 3-6 dm. high, smooth, or in one form, pubescent; leaves often fascicled; leaflets mostly only two pairs, linear, mucronate, 1-2 cm. long; spike short, oblong-cylindrical, sometimes nearly capitate, long-peduncled; bracts ovate, pointed, the tip generally glabrous; calyx silky-canescens, or in one form, villose; flowers purple, rarely whitish.

Common throughout the state; in the western part is found a form, often somewhat pubescent, and with a villose calyx and shorter spikes. (Ind.—Tex.—Sask.)

Kuhnistera compacta (SPRENG.) KUNTZE Rev. Gen. Pl. 192. 1891.*Dalea compacta* SPRENG. Syst. Veg. 3: 327. 1826.*Petalostemon macrostachyus* TORR. Ann. Lyc. N. Y. 2: 176. 1828.

Stem $\frac{1}{2}$ -1 m. high, glabrous, somewhat glaucous; leaflets 2-4 pairs, oblong-lanceolate, 1-3 cm. long, green, obovate, somewhat glaucous beneath; spike cylindrical, in age sometimes nearly 2 dm. long, long-peduncled; bracts lanceolate, brownish; calyx silky-villose; corolla ochroleucous, sometimes pink or whitish.

Rare: Scott's Bluff and Keith counties. (Neb.—Col.—Ore.)

b. Calyx smooth, or slightly pubescent on the margin.

Kuhnistera candida (WILLD.) KUNTZE Rev. Gen. Pl. 192. 1891.*Dalea candida* WILLD. Sp. Pl. 3: 1337. 1803.*Petalostemon candidus* MICHX. Fl. Bor. Am. 2: 49. 1803.

Stem 3-8 dm. high, perfectly glabrous; leaflets 3-4 pairs, lanceolate, oblanceolate, or oblong; calyx with 2 glandular dots just below each tooth; corolla white.

A very variable species, in which *K. multiflora* must be included, as the variety *occidentalis* grades into both. The best disposition, I think, is the one adopted here.

In the typical form the stem is stout, erect, and sparingly branched; leaflets comparatively large, generally $\frac{1}{2}$ -2 cm., oblanceolate; bracts lanceolate and longer than the calyx, more persistent than in the varieties.

Common in rich soil in eastern and central portions of the state, extending to Buffalo, Custer, and Cherry counties. (Ill.—Tenn.—Kan.)

Kuhnistera candida occidentalis RYDBERG Contr. U. S. Nat. Herb. 3: 153-4, 1895.

Stem erect or ascending, more slender and more branched; leaflets generally narrower; spike cylindrical and lax, at least in fruit; bracts lanceolate,

cuspidate, generally longer than the calyx, but sometimes nearly as in var. *multiflora*, early deciduous. (Pl. IV., Fig. 13.)

Common in sandy places in the central and western portions of the state (Scott's Bluff county, Rydberg 58b) extending east to Thomas and Antelope counties. (S. Dak.—Ark.—Tex.—Ariz.—Mex.)

This species has been called *Petalostemon candidus* var. *occidentalis*, *P. candidus*, *P. gracilis*, and *P. multiflorus*. All specimens of *P. gracilis* from Texas belong to this or the next variety.

Kuhnistera candida diffusa n. v.

Like the preceding variety, but prostrate, decumbent, or diffuse; bracts generally short; leaflets short, $\frac{1}{2}$ –1 cm. long, obovate or broadly oblong.

Petalostemon gracilis GRAY in Pl. Fendl. may belong here.

Deuel county, Rydberg 58.

Kuhnistera candida multiflora (NUTT.) RYDBERG Contr. U. S. Nat. Herb. **3**: 154. 1891.

Petalostemon multiflorus NUTT. Journ. Phil. Acad. **7**: 92. 1834.

Kuhnistera multiflora HELLER Mem. Torr. Bot. Club **5**: 197. 1894.

Resembling var. *occidentalis* in habit and leaves; heads very short, nearly capitate, and disposed to be corymbose; bracts ovate, shorter than the calyx, deciduous.

Deuel, Scott's Bluff (Rydberg 58c), Dundy, Cherry, and Thomas counties. (Neb.—Tex.—N. Mex.)

TRIBE **Phaseoleae**.—Twining or trailing herbs, mostly with stipels at the axil of each leaflet; peduncles axillary; pods 2-valved, valves often twisted after dehiscence; leaves pinnate, mostly 3-foliate.

19. APIOS MOENCH Meth. 165. 1794.

Leaflets 5–7; stipels obsolete; flowers in dense, often compound racemes; calyx campanulate, the lower tooth lanceolate, the others nearly obsolete; standard very broad; wings recurved; keel slender, incurved, or coiled; legumes (seldom developed with us) linear, slightly curved, many-seeded.

Four species, twining herbs of North America and China.

Etymology: Greek, *απιον*, pear, from the shape of the tuber.

Apios apios (L.) MACM. Bull. Torr. Bot. Club **19**: 15. 1892.

Glycine apios L. Sp. Pl. 753. 1753.

Apios tuberosa MOENCH Meth. 165. 1794.

Tall, climbing over bushes, somewhat scarious and hairy on the petioles, peduncles, and younger parts of the stem; leaflets ovate or ovate-lanceolate thickish; flowers brownish-purple, in dense, compound, ovoid racemes; peduncles shorter than the leaves; propagation mostly by means of the edible tubers.

Common in rich soil in the eastern part of the state, extending along the streams to Kearney, Thomas, and Cherry counties. (N. Bruns.—Fla.—La.—S. Dak.)

20. PHASEOLUS L. Sp. Pl. 723. 1753.

Flowers all alike and fertile; calyx campanulate or tubular, 5-toothed; standard orbicular, upright, or somewhat twisted; keel spirally coiled or strongly incurved; legume sessile, linear or oblong, terete, or somewhat flattened, many-seeded; leaflets 3.

About 150 species, twining or trailing herbs, inhabitants of the warmer regions of both hemispheres.

Etymology: ancient Latin name for the kidney-bean.

- a. Keel and the included stamens and pistil spirally coiled; stipules not produced at the base; flowers in an elongated raceme; perennials.

Phaseolus polystachyus (L.) B. S. P. Prel. Cat. N. Y. 15. 1888.

Dolichos polystachyus L. Sp. Pl. 726. 1753.

Phaseolus perennis WALT. Fl. Car. 182. 1788.

Stem 1-3 m. high, pubescent, climbing or trailing; leaves broadly ovate, the lower oblique, the odd leaflet more or less cordate, all palmately 3-ribbed and acuminate; calyx-teeth very short; flowers purple; pod strongly curved, 4-5-seeded, 4-7 cm. long, and 8-10 mm. wide.

Reported from Weeping Water, Cass county. (Me.—Fla.—La.—Minn.)

- b. Keel, stamens, and style strongly incurved, but not spirally coiled; stipules adnate to the petiole, produced at the free base; flowers capitately clustered on long peduncles; annuals.

Phaseolus helvolus L. Sp. Pl. 724. 1753.

Phaseolus diversifolius PERS. Syst. 2: 296. 1803.

Strophostyles angulosus ELL. Sk. Bot. S. C. & Ga. 2: 229. 1822.

Stem $\frac{1}{2}$ -2 m. long, branched, twining or trailing, retrorsely hairy; leaflets rhombic-ovate, often rounded, lobed at the base, 3-ribbed, 3-6 cm. long; flowers greenish or purplish; peduncles 1-2 dm. long; pod terete, linear, straight, 4-7 cm. long; seeds hairy.

In sandy soil in the eastern part of the state, extending as far west as Rock and Keya Paha counties. (Mass.—Minn.—Tex.—Fla.)

Phaseolus pauciflorus BENTH. Comm. Leg. Gen. 76. 1837.

Strophostyles pauciflorus WATS. Gray Man., Ed. 6, 145. 1890.

Stem $\frac{1}{2}$ -1 m., generally trailing, branched, pubescent; leaflets lanceolate-oblong, 1-ribbed, or indistinctly 3-ribbed at the base, 2-4 cm. long; peduncle 3-10 cm. long; flowers light purplish; pod 3-4 cm. long, about $\frac{1}{2}$ cm. wide, slightly flattened; seeds finely granular, becoming smooth.

Throughout the state on sandy banks. (Ind.—S. Dak.—Tex.—Miss.)

21. GALACTIA P. Br. Civ. & Nat. Hist. Jam. 298. 1755.

Flowers all alike and fertile; calyx-lobes acute; standard ovate or round; wings narrow or adherent to the keel; keel scarcely incurved; pod flat.

About 50 species, mostly inhabitants of the warmer regions of both hemispheres.

Etymology: Greek, γαλα, milk.

Galactia volubilis (L.) BRITTON Mem. Torr. Bot. Club 5: 208. 1894.

Hedysarum volubile L. Sp. Pl. 750. 1753.

Galactia pilosa ELL. Sk. Bot. S. C. & Ga. 2: 238. 1822.

Stem and lower surface of the leaves soft-downy; leaflets ovoid, 1-ribbed; racemes many-flowered; pod very downy.

Reported from Weeping Water, but there are no specimens in the Survey Herbarium. (Penn.—Fla.—Miss.)

22. FALCATA GMEL. Syst. 2 : 1131. 1796.*Amphicarpa* ELL. Journ. Acad. Phil. 1 : 372. 1817.

Flowers of two kinds, the upper perfect, but rarely producing fruit, fertile flowers rudimentary, on filiform, creeping branches; standard in the perfect flowers erect, obovate, with reflexed sides, slightly auriculate at the base; wings narrow with a saccate spur at the base; calyx tubular, 4-5-toothed; legume oblong, compressed, stipitate, 3-4-seeded; in the rudimentary flowers, the petals are generally lacking, the stamens reduced in number, and free, and the pod pear-shaped, 1-2-seeded.

About fifteen species, trailing herbs from tropical and temperate North America, Japan, and Thibet.

Etymology: Latin, *falcatus*, scythe-shaped.

Falcata comosa (L.) KUNTZE Rev. Gen. Pl. 182. 1891.*Glycine comosa* L. Sp. Pl. 754. 1753.*Amphicarpa monoica* ELL. Journ. Acad. Phil. 1 : 373. 1817.

Stem slender, finely retrorsely hairy; leaflets thin, rhombic-ovate, 3-ribbed, 3-5 cm. long; bracts rhombic-oval, shorter than the pedicels; calyx of the perfect flowers 3-4 mm. long, with short and broad teeth; legumes rarely formed, smooth, finely hairy, hirsute on the margin, half-elliptic in outline, 2 cm. long; legume of the rudimentary flower pear-shaped, hairy.

In thickets; Lancaster, Saunders, Thomas, and Franklin counties. (N. Bruns.—Fla.—Tex.—S. Dak.—Mex.)

Falcata pitcheri (TORR. & GRAY) KUNTZE Rev. Gen. Pl. 182. 1891.*Amphicarpaea pitcheri* TORR. & GRAY. Fl. N. A. 1 : 292. 1838.

Stem hirsute, with retrorse, brown hairs; leaflets similar, but with somewhat firmer texture, sometimes 7-8 cm. long; peduncles longer and flowers more numerous; bracts nearly orbicular, large, generally as long as the pedicels, or longer, silky-canescens; calyx of the fertile flowers 5-6 mm.; lobes lanceolate; pod oblong, 3-4 cm. long, hairy, tapering toward both ends.

In this species the perfect flowers often produce fruit, while the rudimentary ones seem to be rare. It may be simply a variety of the preceding. Common in woods and copses in the eastern and central portions of the state, extending as far west as Brown, Thomas, and Jefferson counties. (N. Y.—La.—Tex.)

TRIBE **Hedysareae**.—Pods transversely jointed; joints reticulate, 1-seeded, and indehiscent; leaves pinnate, in ours 3-foliate; stamens diadelphous in ours.

23. MEIBOMIA ADANS. Fam. Pl. 2 : 509. 1763.*Desmodium* DESV. Journ. Bot. 3 : 122. 1813.

Calyx campanulate, the upper lobes more or less united, the three lower acuminate; standard obovate; wings elongated, adhering to the straight, truncate keel by means of small strips; upper stamen free at the base, at the middle united with the tube; leaflets stipellate; pod several-jointed.

Over 150 species, herbs or shrubs, mostly tropical, though several are found in the United States and in extra-tropical South America, Australia, and Africa.

Etymology: a personal name.

- A. Legume long-stipitate, straight on the upper margin, deeply lobed on the lower, making the joints half-obcordate, slightly concave on the back; plant nearly smooth.

Meibomia grandiflora (WALT.) KUNTZE Rev. Gen. Pl. 196. 1891.

Hedysarum grandiflorum WALT. Fl. Car. 185. 1783.

Desmodium acuminatum DC. Prod. 2:329. 1825.

Desmodium grandiflorum DC. Prod. 2:338. 1825.

Stem about $\frac{1}{2}$ m. high, bearing the leaves and the elongated peduncle at the summit; leaflets 8-12 cm. long, ovate to orbicular, acuminate; peduncle often $\frac{1}{2}$ m. long; joints of the legume 2-4, 8-10 mm. long, 6-8 mm. wide.

In rich soil in woods; Jefferson, Lancaster, Saunders, Dodge, and Knox counties. (Ont.—Fla.—Tex.—Minn.)

- B. Legume sessile or short-stipitate, constricted on both sides, but more so on the lower, making the joints unequally rhombic, or nearly orbicular.

- a. Stipules ovate, taper-pointed, striate, persistent; bracts large, ovate-lanceolate, deciduous; petioles about the length of the lower leaflets; stem pubescent; leaves more or less grayish-pubescent and reticulate beneath, scabrous above.

Meibomia canescens (L.) KUNTZE Rev. Gen. Pl. 195. 1891.

Hedysarum canescens L. Sp. Pl. 748. 1753.

Desmodium canescens DC. Prod. 2:328. 1825.

Stem 1-1 $\frac{1}{2}$ m. high, leaflets 3-8 cm. long, ovate-lanceolate, mostly acute, mucronate, of firm texture; racemes panicle; legumes of 4-7 unequal-sided, rhombic joints, which are much longer than broad, 8x5 mm. (Pl. IV., Fig. 29.)

In thickets, in the eastern and northern portions of the state; Douglas, Lancaster, and Holt counties. (Ont.—Minn.—Tex.—Fla.)

Meibomia illinoensis (GRAY) KUNTZE Rev. Gen. Pl. 198. 1891.

Desmodium illinoense GRAY Proc. Am. Acad. 8:289. 1870.

Like the last, but the leaflets more obtuse, mucronate; raceme simple, with the legumes disposed to be in pairs; joints of the legume rounder, 2-5, 5-6 mm. long, 4-5 mm. wide. (Pl. IV., Fig. 32.)

On dry prairies in the eastern part of the state. (Ill.—Nebr.—Kan.)

- b. Stipules lanceolate or subulate, mostly deciduous; petioles much shorter than the lower leaflets.

Meibomia canadensis (L.) KUNTZE Rev. Gen. Pl. 195. 1891.

Hedysarum canadense L. Sp. Pl. 748. 1753.

Desmodium canadense DC. Prod. 2:328. 1825.

Stem 1-2 m. high, hairy, striate; leaflets 5-8 cm. long, ovate-lanceolate, mucronate, when growing in open places, thick, scabrous above, grayish and reticulate beneath, in shade, thin, greener, and the reticulations nearly obsolete; racemes panicle; bracts large, ovate, early deciduous; flowers the largest of all our species; legumes of 3-7 rounded, or slightly rhomboidal joints, which are 5-6 mm. long and 4-5 mm. wide. (Pl. IV., Fig. 30.)

Common in the eastern part of the state, extending along the streams to Cherry, Grant, and Webster counties. (Ont.—N. C.—Kan.—Sask.)

Meibomia dillenii (DARL.) KUNTZE Rev. Gen. Pl. 195. 1891.*Desmodium dillenii* DARL. Fl. Cestr. 414. 1837.

Stem about 1 m. high, hairy, leaflets 5-7 cm. long, oblong-ovate, blunt, smooth above, appressed-hairy beneath; racemes paniced; bracts ovate-lanceolate, deciduous; joints of the legume unequally, but decidedly rhomboidal, 5-6 cm.

The habit and the form of the joints are much as in *M. canescens*. The species is, however, easily distinguished by the characters given for the section.

Reported from Weeping Water, Cass county, but there are no specimens in the Survey Herbarium. (Ont.—Fla.—Tex.—Nebr.)

Meibomia paniculata (L.) KUNTZE Rev. Gen. Pl. 198. 1891.*Hedysarum paniculatum* L. Sp. Pl. 749. 1753.*Desmodium paniculatum* DC. Prod. 2: 329. 1825.

Stem about 1 m. high, striate, smooth or finely pubescent; leaflets 5-8 cm. long, oblong to lanceolate, thin, sometimes minutely pubescent on both sides; racemes paniced; bracts lanceolate, deciduous; legume of 3-5 unequal rhomboidal or ovate joints, which are 5 mm. long, 4 mm. wide. (Pl. IV., Fig. 27.)

Woody bluffs of the Missouri river, Richardson, and Cass counties. (Ont.—Fla.—Tex.—Mex.)

Meibomia rigida (ELL.) KUNTZE Rev. Gen. Pl. 198. 1891.*Hedysarum rigidum* ELL. Sk. Bot. S. C. & Ga. 215. 1824.*Desmodium rigidum* DC. Prod. 2: 330. 1825.

Stem $\frac{1}{2}$ -1 m. high, slender, branched, somewhat scabrous-pubescent; leaflets 3-6 cm. long, oval or ovate-oblong, obtuse, thick, reticulate beneath, pubescent on both sides, somewhat scabrous, the lower much longer than the very short petiole; raceme paniced, but leafless; legume with 1-3 rarely 4, joints, which are rounded-rhomboidal, 4 mm. long and nearly as broad. (Pl. IV., Fig. 28.)

Reported from Lincoln and Weeping Water, but there are no specimens in the Survey Herbarium. (Mass.—Fla.—Tex.—Ark.—Nebr.)

24. LESPEDEZA MICHX. Fl. Bor. Am. 2: 70. 1803.

Calyx with 5 slender, equal lobes, furnished with two bractlets at the base; standard roundish or oblong, with inflexed margin; wings straight, auricled at the base; keel incurved, obtuse; legume 1-seeded, generally 1-sometimes 2-jointed, with the lower joint empty and stipe-like; flowers in ours all perfect and fertile, in a dense head; corolla whitish or cream-colored, with purple spots on the standard, about the length of the deeply cleft calyx; leaflets not stipellate.

Between 20 and 30 species, herbs or shrubs, principally from North America and Asia.

Etymology: dedicated to Lespedez, Governor of Florida.

Lespedeza capitata sericea Hook. Comp. Bot. Mag. 1: 23. 1835.

Stem erect, several from a woody caudex, rigid, strict, villous; petioles very short; leaves crowded; leaflets oval-oblong, thick, coriaceous, about 4 cm. long, densely appressed-silky on both sides; heads dense, nearly spherical, on short peduncles; calyx very hairy, much longer than the oval, villous legume.

Common on the prairies of the eastern and central portions of the state.
(Mass.—Fla.—La.—S. Dak.)

TRIBE **Vicieae**.—Stamens diadelphous, anthers of one kind; leaves abruptly pinnate, with tendrils (which in some are much reduced, however); pod 2-valved, few-many-seeded.

25. LATHYRUS L. Sp. Pl. 729. 1753.

Style flattish, hairy on the upper side; stamen-tube nearly squarely truncate; pod flattish, stipitate; stipules semi-sagittate. Ours are low perennials, with the tendrils reduced to short points.

Over 100 species, inhabitants of the north-temperate zone and of South America.

Etymology: Greek, *λathyrus*, the name of some leguminous plant.

Lathyrus ornatus NUTT. Torr. & Gray Fl. N. A. 1: 277. 1838.

Stems 2-3 dm. high, glabrous or somewhat pubescent when young, 4-angled; leaflets 3-5 pairs, linear-lanceolate, acute, mucronate, strongly-veined, 2-5 cm. long; peduncles 3-6-flowered; flowers large, 2-2½ cm. long, purple; calyx-teeth lanceolate, the upper shorter; seeds with a broad stalk and a long hilum.

Common throughout the state. (Utah.—Kan.—S. Dak.)

Lathyrus ornatus flavescens n. v.

Flowers ochroleucous, sometimes more hairy.

Prairies, Dodge and Kearney counties; a specimen from Cherry county, approaches the following variety in hairiness.

Lathyrus ornatus incanus SMITH & RYDBERG n. v.

Low, about 1 m. high, branched, grayish-pubescent throughout; flowers smaller, less than 2 cm. long.

Sheridan county (Smith & Pound, 49, 1892), Fort Robinson (Dr. Bessey, 1887), collected by Hayden at "Eaglenest Butte, not far from White river," S. D., Engelman Herb., 19177, where it is labeled *Lathyrus polymorphus incanus*.

Lathyrus decaphyllus PURSH. Fl. Am. Sept. 471. 1814.

Lathyrus polymorphus NUTT. Gen. 2: 96. 1818.

Like the last, but with broader leaves; seeds with narrow stalk and short hilum.

Reported for the state, but all specimens so labeled in the Survey Herbarium belong to the preceding. (Mo.—Col.—Ariz.—Tex.—Mex.)

26. VICIA L. Sp. Pl. 734. 1753.

Zig-zag bent, and climbing by means of tendrils; scarcely differs from the preceding except in the style, which is filiform and hairy all around or only on the lower side, and in the stamen-tube, which is oblique at the apex.

About 120 perennial or annual herbs, inhabitants of the north-temperate zone and temperate South America.

Etymology: the ancient Latin name.

Vicia americana MUHL. Willd. Sp. Pl. 3: 1096. 1803.

Stem ½-1 m. high, smooth and short, or appressed-hairy; stipules toothed; leaflets 10-14 pairs, thin, many-veined, elliptical or ovate-oblong, obtuse, mucronate, or sometimes truncate and retuse, in which case it has often been named var. *truncata*, but *Vicia truncata* NUTT. seems to be different

(see description below); peduncles 4-8-flowered; flowers purplish, about $1\frac{1}{2}$ -2 cm. long; legume oblong, glabrous, reticulated; lower teeth of the calyx broadly lanceolate.

Eastern part of the state, in rich soil. (New Brunswick—N. Y.—Ky.—N. Mex.—Alaska.)

***Vicia americana truncata* (NUTT.) BREWER Bot. Cal. 1: 158. 1876.**

Vicia truncata NUTT. Torr. & Gray Fl. N. A. 1: 270. 1838.

As the species, stem generally more pubescent; leaflets linear-oblong or cuneate, of a much firmer texture, often truncate and somewhat toothed at the apex.

On river and creek banks, Lancaster, Cass, and Sheridan counties. (Neb.—Col.—Wash.—N. Dak.)

***Vicia americana linearis* (NUTT.) S. WATS. Proc. Am. Acad. A. & S. 11: 134. 1876.**

Lathyrus linearis NUTT. Torr. & Gray. Fl. N. A. 1: 276. 1838.

Vicia linearis GREENE Fl. Francisc. 3. 1891.

Low, $\frac{1}{2}$ m. or less, leaflets linear, generally acute and mucronate; stipules often narrow and less lobed.

This is often regarded as a good species, but grades into the var. *truncata*, and the latter into *V. americana* proper.

Dry prairies throughout the state. (S. Dak.—Kan.—Cal.—N. W. Territory).

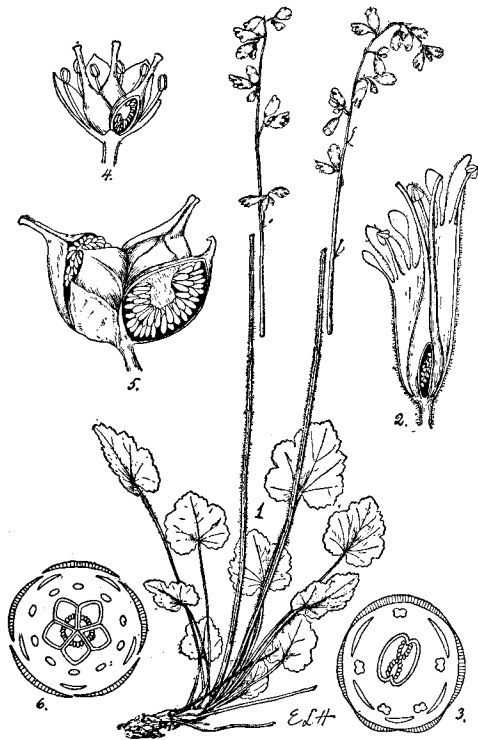
Family.—SAXIFRAGACEAE.

Receptacle as in *Rosaceae*, but more often united with the ovaries below; flowers regular or irregular, but not papilionaceous, petals and sepals normally 5, stamens as many or twice as many as the petals or sepals, in a few genera many; pistils few, 2-5, as a rule more or less united but with free styles, in fruit dehiscent; seeds several, small, generally with copious albumen; leaves not succulent, and generally without stipules. (*Heuchera* has stipules.)

As stated before the *Saxifragaceae* are nearly related to the tribe *Spiraeae* in *Rosaceae*. *Astilbe*, of which a species is found in the southern states, is easily mistaken for the rosaceous genus *Aruncus*, and has been classified with it. Other related families are *Crassulaceae*, *Grossulariaceae*, *Hamamelidaceae*, *Rhamnaceae*, and *Celastraceae*. *Penthorum* has generally been included in *Crassulaceae*, to which family it shows some relationship. But as its vegetative parts have none of the characters peculiar to *Crassulaceae* as in all the members of that family except one the pistils are fully distinct, and as in *Penthorum* the albumen is always present, even when the seeds are ripe, Baillon places it as a tribe of *Saxifragaceae*, which arrangement is followed here. Perhaps it would, have been better to place it in a distinct family by itself.

Saxifragaceae, as generally understood, is a collection of widely differing forms. If the different groups were treated as the corresponding groups of the *Thalamiflorae*, or the *Gamopetalae*, *Saxifragaceae* would be split into several families. One tribe especially is so different from the rest that it very well deserves the rank of a distinct family, and will be treated as such, namely, *Grossulariaceae*.

Even limited to the *Saxifrageae* proper, the family shows much variation in form and arrangement of the parts of the flower, and especially of the pistils. They are always more or less united below and sometimes sunken into the receptacle. The placentae may be said to be parietal, but often fasten into the ventral angle of the united carpels, and are seemingly central. Sometimes, where the partition between the locules



EXPLANATION OF PLATE V.

1, *Heuchera hispida* ($\times \frac{1}{4}$) ; 2, section of flower ($\times 3$) ; 3, diagram of the same; 4, *Penthorum sedoides*, section of flower ($\times 3$) ; 5, section of fruit, one carpel showing the placenta, the other the dehiscence; 6, diagram of flower.

TRIBE **Saxifrageae**.—Herbs, mostly with alternate leaves; carpels 2, or more rarely 3 or 4, more or less united, sometimes making a 1-celled capsule; carpels dehiscent along the sutures.

1. HEUCHERA L. Sp. Pl. 226. 1753.

Perennial herbs with horizontal root-stock, and several long-petioled, roundish or heart-shaped, palmately veined, lobed and toothed radical leaves; flowers in terminal racemes or spikes; receptacle deeply campanulate; sepals 5, often unlike and colored, imbricated in the bud; petals small, spatulate, or none; stamens 5, opposite the sepals; ovary 1-celled with the upper portion of the pistils free; placentae 2, parietal, pendant from the angles at the sutures.

A North American genus of about 25 species.

Etymology: dedicated to J. H. Heucher, a German botanist.

is incomplete or none, the placentae are along the suture between the valves, and hence are truly parietal. In several cases, as in our species, the placentae are pendant, in *Heuchera* from the suture, in *Penthorum* from the inner angle.

Saxifragaceae contains between 500 and 600 species, mostly inhabitants of temperate regions. None are of any economic value. Only two species are native in this state.

SYNOPSIS.

TRIBE **Saxifrageae**.—Herbs, mostly with alternate leaves; carpels 2, or more rarely 3 or 4, more or less united, sometimes making a 1-celled capsule, carpels dehiscent along the sutures.

Heuchera.—Ovary 1-celled with the upper part of the pistils free, placentae 2, parietal, receptacle deeply campanulate; flowers in terminal racemes or spikes.

TRIBE **Penthoreae**.—Herbs with alternate leaves, carpels 5–6, united below, the upper free portion at maturity falling off like a cap.

Penthorum.—Receptacle with a thick, concave, saucer-shaped disk; flowers in cymes with the flowers on the upper side of the naked branches.

***Heuchera hispida* PURSH Fl. Am. Sept. 188. 1814.**

Stem generally leafless, $\frac{1}{2}$ -1 m. high, hirsute with spreading hairs, above somewhat glandular; leaves on long, hirsute petioles, round-cordate, 5-7 cm. long, and as broad; receptacle at flowering time campanulate, very oblique, 6-10 mm. long; sepals unequal; petals small, a little longer than the sepals; stamens soon exerted.

Woods and woody bluffs, Saunders county (Ashland), and from the Niobrara westward. (Ont.—Idaho—Kans.—Va.)

TRIBE **Penthoreae**.—Herbs with alternate leaves, carpels 5-6, united below, the upper free portion falling off at maturity like a cap.

2. PENTHORUM L. Sp. Pl. 432. 1753.

Erect perennial herbs; flowers in cymes on the upper side of the naked branches; receptacle with a thick, concave, saucer-shaped disk; sepals 5, sometimes 6 or 7, valvate; petals as many, small, or often wanting; stamens twice as many; carpels alternate with the sepals, seeds many, with a fleshy albumen.

The genus comprises two species, one found in North America, the other in China and Japan.

Etymology: Greek, *πεντε*, five, *ορον*, arrangement.

***Penthorum sedoides* L. Sp. Pl. 432. 1753.**

Stem $\frac{1}{2}$ -1 m. high, branched and somewhat angled above, leaves lanceolate, tapering at both ends, almost sessile, thin, sharply serrate; flowers greenish-yellow.

Common in eastern Nebraska on creek banks, in ditches, and in other wet places. (New Brunswick—Fla.—Tex.—Minn.)

Family.—CRASSULACEAE.

Receptacle somewhat as in *Rosaceae*, but the broadening in many cases so little that the calycifloral character of the flower becomes obsolete and the stamens, sepals, and petals hypogynous; sepals and petals 3-30, but normally 5, free or somewhat united; stamens as many, or often twice as many, free (in ours) or somewhat united with the petals; carpels of the same number as the sepals, free; seeds when ripe generally without albumen; stem and leaves succulent, the latter without stipules; flowers mostly cymose.

After *Penthorum* is removed from *Crassulaceae*, the family is one of the most natural ones, easily distinguished from the family nearest related, *Saxifragaceae*, by its succulent habit, but also by its free carpels, which are of the same number as the sepals and the petals, and have the seeds borne in two rows on a parietal placenta in the ventral angle. *Crassulaceae* also shows some relationship to *Resedaceae*.

The family consists of about 360 species, inhabitants of temperate and tropical regions. No species, however, are found in Australia or in Polynesia, and only a few in South America. None are of economic value, but many are cultivated as ornamental plants. The only genus found in Nebraska is *Sedum*, represented by only one species.

1. SEDUM L. Sp. Pl. 430. 1753.

Sepals, petals, and pistils commonly 5, sometimes 4, 6, or 7, free; stamens generally twice as many; carpels many-seeded, flowers cymose.

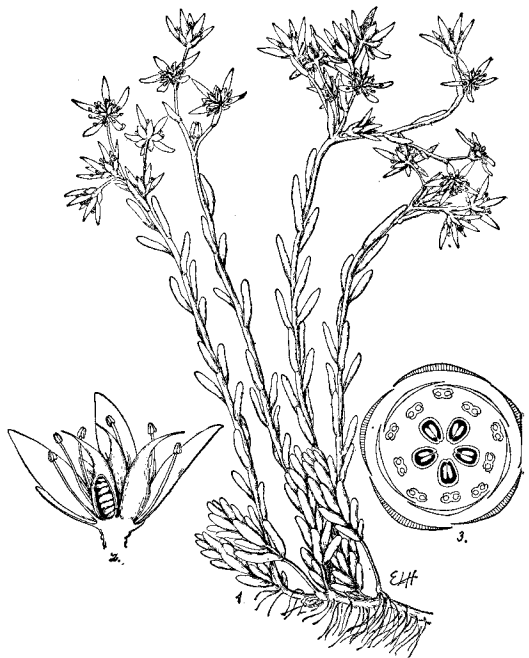
About 140 species, found in the northern hemisphere and one species in Peru.

Etymology: Latin, *sedeo*, to sit.

Sedum stenopetalum PURSH. Fl. Am. Sept. 324. 1814.

Glabrous, 1-1½ dm. high, branching at the base, leaves lanceolate, nearly terete, somewhat crowded, sessile, acute, ½-1 cm. long; flowers yellow, crowded on the short branches, nearly sessile; petals linear, longer than the sepals.

On stony hills in Sioux county. (Col.—S. Dak.—British Columbia.)



EXPLANATION OF PLATE VI.

1, *Sedum stenopetalum* (x¼); 2, section of flower (x3); 3, diagram of flower.

Family.—HAMAMELIDACEAE.

Receptacle concave, often with the ovary partially sunken therein, in fruit becoming woody; flowers mostly regular; sepals 4 or 5, petals of the same number or wanting; fertile stamens 4 or 5, often with an inner set of as many staminoids; pistils 2, styles free, ovary united, in fruit forming a 2-loculed, 2-valved, more or less woody capsule; ovules in ours 1-2; seed 1, bony, pendulous; albumen scanty; leaves alternate, simple, with deciduous stipules.

A small family of less than five species, all trees and shrubs. Only three grow in the United States, and only one is reported from Nebraska. Baillon includes the family in *Saxifragaceae*, to which it is nearly related and from which it differs mainly in the few pendulous seeds, and the woody capsule. It also shows some relationship to *Platanaceae*, to which family the Sweet Gum (*Liquidambar styraciflua*) approaches in many respects.



EXPLANATION OF PLATE VII.

1, *Hamamelis virginiana*, branch in autumn (x½); 2, leaves of the same, 3, flower; 4, section of flower (x2), from Baillon.

1. HAMAMELIS L. Sp. Pl. 124. 1753.

Flowers perfect, or by abortion polygamous, in small axillary heads surrounded by three scale-like bracts; calyx consisting of 4 sepals, 2 outer and 2 inner; petals long, strap-shaped, crisp, spirally coiled in the bud; stamens with spherical anthers which open by lateral valves; woody capsule opening from the top, the exoderm splitting along the back of the valves, the endoderm remaining unsplit and enclosing the bony seed; shrubs or small trees with hazel-like leaves.

A genus of three species, two natives of Japan and one of North America.

Etymology: Greek, *ama*, at the same time with, and *μηλος*, apple.

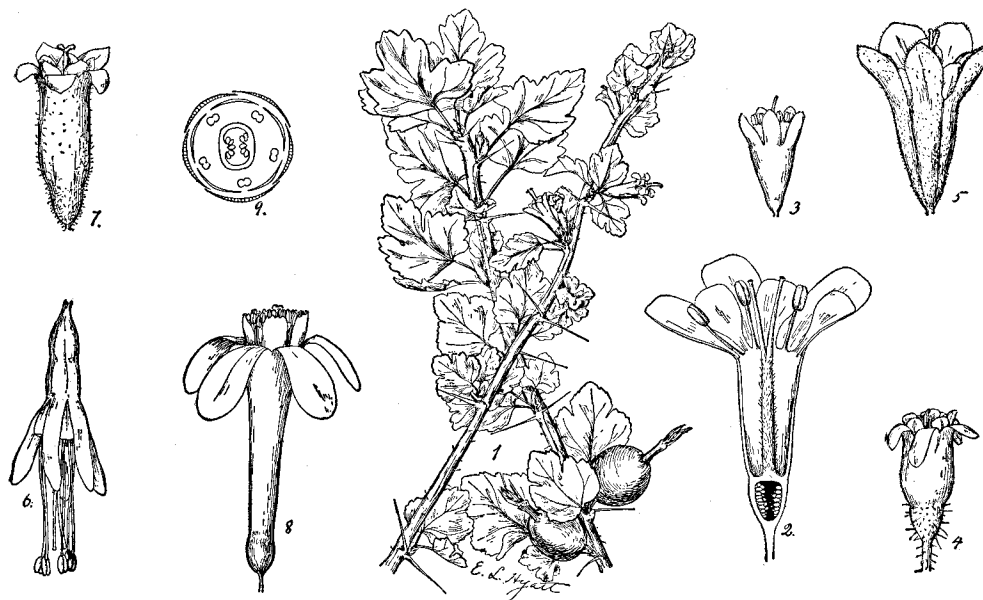
***Hamamelis virginiana* L. Sp. Pl. 124. 1753.**

Shrub, 1-2 m. high; leaves oval or ovate, obliquely heart-shaped at the base, sinuate-crenate toward the apex, glabrate or stellate-pubescent beneath; capsule canescent-hirsute. (Witch Hazel.)

Rare: collected near Weeping Water. (Nova Scotia—Fla.—La.—Minn.)

Family.—GROSSULARIACEAE.

Receptacle from bell-shaped to tubular, wholly inclosing and adnate to the ovary, which in fruit becomes a berry; styles and placentae 2, the latter parietal; sepals, petals and stamens 5, seldom 4, the former more conspicuous than the petals and often petaloid; seeds with small embryo and hard albumen; shrubs mostly with palmately veined and lobed leaves, and flowers in axillary racemes.

**EXPLANATION OF PLATE VIII.**

1, *Ribes setosum*, flowering and fruiting branches (nat. size); 2, section of flower of the same (x4); 3, *Ribes oxycanthoides*, flower (x2); 4, *R. cynosbati*; 5, *R. floridum*; 6, *R. gracile*; 7, *R. cereum*; 8, *R. aureum*; 9, diagram of flower of *Ribes*.

As stated before *Grossulariaceae* has generally been included in *Saxifragaceae*, to which it is related. But the wholly inferior ovary, which in fruit becomes a berry, makes it readily distinguishable from the latter family. It also shows relationship to the tribe *Pomeae* in *Rosaceae*, which also has an ovary which is partly at least inferior.

The family contains only about fifty species, all belonging to the genus *Ribes*, distributed throughout the north-temperate zone and the mountains of Central and South America.

1. RIBES L. Sp. Pl. 200. 1753.

The characters of the family. (Currant, Gooseberry.)

Etymology: Latinized from a German name, *riebs*.

- A. Grossularia.**—Raceme 1-3 flowered; berry large, elliptic; stem with 1-3, seldom 5, subaxillary spines, and often with scattered prickles; leaves rounded in outline, with more or less cordate base, rounded 3-5-lobed and crenate, plicate in veneration. (Gooseberry.)

a. Sepals shorter than the tube; pedicels and peduncle short.

Ribes cynosbati L. Sp. Pl. 202. 1753.

Spines generally solitary, small and weak, $\frac{1}{2}$ - $\frac{3}{4}$ cm. long; stem bristly, prickly or smooth, leaves more or less pubescent; petioles downy or ciliate; the upper part of the receptacle, i.e., the part above the ovary, broadly bell-shaped, greenish-white; sepals much shorter than the receptacle, but longer than the obovate petals (see Pl. VIII, Fig. 4); stamens and the undivided style slightly shorter than the sepals; lower part of the receptacle bristly, in fruit generally prickly, brownish when ripe.

Reported from Antelope county. (New Brunswick—N. C.—Mo.—Wyo.?)

Ribes setosum LINDL. Trans. Hort. Soc. 7: 243. 1830.

Stem generally very setose-prickly, bark more or less scaly; subaxillary spines generally 3, stouter, $\frac{1}{2}$ -1 cm. long; leaves as well as the petioles glandular-pubescent; the free part of the receptacle cylindrical, whitish; sepals linear, recurved, generally shorter than the receptacle,* twice as long as the petals; style bifid, berry blackish-purple, sour, sometimes hispid. (Pl. VIII., Figs. 1-2.)

Gravelly hills: Sioux and Dawes counties, common in the Black Hills of South Dakota. (Western Ontario—Alberta—Idaho—Neb.)

- b.* Sepals longer than the tube; peduncles filiform, generally longer than the leaves.

Ribes gracile MICHX. Fl. Bor. Am. 1: 111. 1803.

Stem generally smooth and shining, subaxillary spines 1-3, stout, about 1 cm. long; leaves pubescent beneath; free portion of the receptacle narrowly campanulate, about half the length of the sepals; stamens (about 1 cm. long) and the hairy style often exserted; flowers whitish, fruit brownish, smooth.

River and creek banks throughout the larger part of the state. (Mich.—Mont.—Tex.—Tenn.)

*Specimens with somewhat shorter receptacle and smooth fruit, from Sioux county, were referred to *R. oxycanthoides* L. by Dr. N. L. Britton, but the latter differs in its campanulate receptacle, greenish-white, purple-tinged flowers, longer narrower sepals, and the generally unarmed stem. (Compare Pl. VIII, Fig. 3.)

- B. **Ribesia**. Racemes several-flowered, berries less than 1 cm. in diameter, generally spherical; stem neither prickly nor spiny; leaves plicate in vernation. Free portion of the receptacle in ours cylindrical or deeply campanulate, and leaves sprinkled with resinous dots.

Ribes cereum DOUGL. Trans. Hort. Soc. 7: 512. 1830.

Stem $\frac{1}{2}$ –1 m. high, branches short; leaves small, 1–2 cm. in diameter, round or kidney-shaped, more or less glutinous, 3–5 lobed, lobes rounded and crenate; racemes short, few-flowered, drooping; pedicels shorter than the bracts; receptacle cylindrical, much longer than the sepals; flowers nearly white, sometimes pinkish; berry bright red, sweet, but not of an agreeable taste.

Dry hills of western Nebraska; Sioux, Dawes, Scott's Bluff, Cheyenne, and Deuel counties. (British Columbia—N. Dak.—N. Mex.)

Ribes floridum L'HER. Stirp. Nov. 1: 4. 1784.

Stem 1–1 $\frac{1}{2}$ m. high; leaves subcordate, 2–5 cm., 3–5 lobed, lobes acute, doubly serrate, when young as well as the petioles and peduncles pubescent or even somewhat floccose; racemes many-flowered, pendulous, bracts linear, longer than the pedicels; flowers yellowish-green; free portion of the receptacular-cup campanulate, glabrous, about the length of the oblong-spatulate sepals; stamens and undivided style included; fruit black, glabrous, with the flavor of the Black Currant of the garden. (Pl. VIII., Fig. 7.)

Probably throughout the state along watercourses. (Nova Scotia—Manitoba—Colo.—Va.)

- C. **Chrysobotrya**.—Racemes several-flowered; bracts foliaceous; berry spherical or ellipsoid; stem unarmed, receptacular-cup tubular, bright yellow, fragrant; leaves convolute in vernation. (Flowering or Buffalo Currant.)

Ribes aureum PURSH. Fl. Am. Sept. 1: 164. 1814.

Stems 1–4 m. high; leaves firm, in texture and form resembling those of a maple, deeply 3-lobed, lobes acute and toothed toward the apex; receptacular-cup tubular, 3–4 times the length of the oval sepals, these twice the length of the erose petals; stamens short, included; fruit when ripe dark-brown or black, of the flavor of the Black Currant.* (Pl. VIII Fig. 8.)

Common on hillsides in western and northern Nebraska, extending as far east as Custer and Antelope counties. (Mo.—Tex.—Cal.—Assiniboia, Mexico).

Ribes aureum chrysococcus n. v.†

Fruit, when ripe, yellow, of a vinous flavor not at all resembling that of the Black Currant.

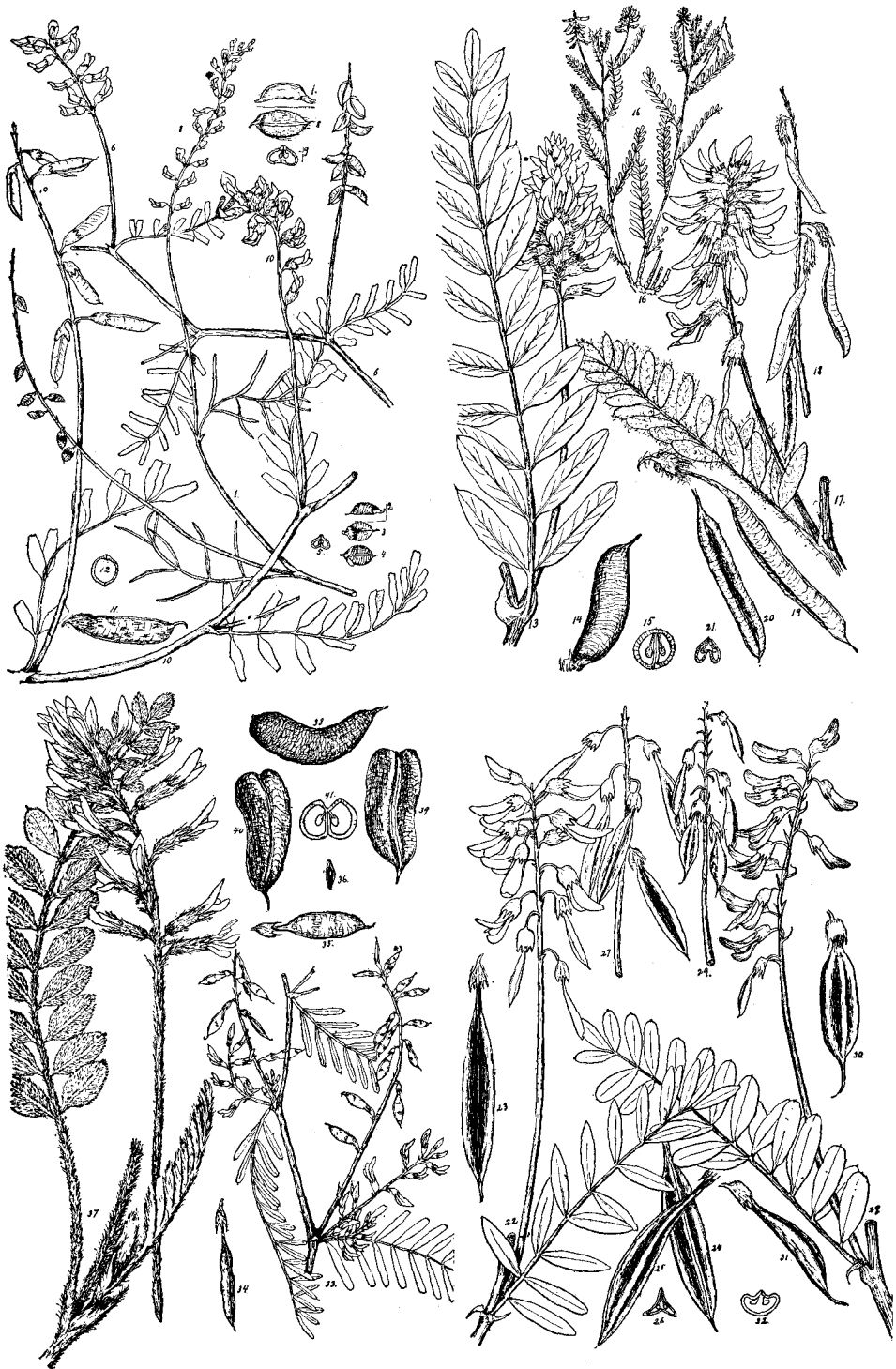
Rare: Scott's Bluff, Banner, and southern Cherry counties. (Rydberg No. 106 b, and 1601.)

* The fruit is sometimes large, elliptic (*R. aureum praecox* LINDL. Trans. Hort. Soc. 7: 240; *Chrysobotrya revoluta* SPACH Ann. Sc. Nat. Bot. IL, 4: 18), or more generally smaller and spherical (*R. aureum serotinum* and *sanguineum* LINDL. l. c., *Chrysobotrya intermedia* SPACH l. c.)

† This may possibly be included in Lindley's *R. tenuiflorum* (*Chrysobotrya lindleyana* SPACH), which is described as having sometimes yellow fruit. But the characters of the flowers do not agree with Lindley's species. In our form the flowers do not seem to differ from the true *R. aureum*.

EXPLANATION OF PLATE IX.

The plants are $\frac{1}{2}$ nat. size, (No. 16 $\frac{1}{4}$), the fruits and sections nat. size, 1-5, *Astragalus gracilis*; 6-9, *A. microlobus*; 10-12, *A. flexuosus*; 13-15, *A. carolinianus*; 16-21, *A. drummondii*; 22-27, *A. racemosus*; 28-32, *A. bisulcatus*; 33-36, *A. tenellus*; 37-41, *A. mollissimus*.



EXPLANATION OF PLATE X.

42-46, *Astragalus adsurgens*; 47-51, *A. hypoglottis*; 52-54, *A. crassicaarpus*; 55-57, *A. plattensis*; 58-59 *A. missouriensis*; 61-63, *A. shortianus*; 65-69 and 73, 74, *A. lotiflorus*; 70, var. *brachypus*; 71, 72, var. *nebraskensis* (small specimen).



EXPLANATION OF PLATE XI.

75-78, *A. pectinatus* ; 79-81, *A. ceramicus*; 82-87, *A. viridis*; 88-91, *A. gilviflorus*; 92-97, *A. sericoleucus*; 98-103, *A. spatulatus*; 104-106, *Spiesia lambertii*; 107-109, *Spiesia lambertii sericea*; 110, flower of *Spiesia*, showing beaked tip of keel; 111, flower of *Astragalus*, showing blunt tip of keel; 112-115, *Spiesia multiceps*; 116-117, *Astragalus mexicanus*.



ERRATA.

Page 47, first two lines.

Through a misapprehension of Mr. Rydberg's instructions, while the work was in press, the editors, in altering these and the following lines, made an error which was not discovered in time to be otherwise corrected:

Read:

Astragalus ceramicus longifolius (PURSH.) RYDBERG Contrib. U. S. Nat. Herb. **3**: 154. 1895.

Psoralea longifolia PURSH. Fl. Am. Sept. 741. 1814, not *Astragalus longifolius* LAM. Ency. Meth. **1**: 322. 1783.

Page 44, second line from the bottom, instead of *A. longifolius*, read *A. ceramicus longifolius*.

Page 74, first line of explanation, instead of *A. ceramicus*, read *A. ceramicus longifolius*.

INDEX.

- Acuan**, 31.
Acuan illinoensis, 31.
Agrimonia, 20.
Agrimonia eupatoria, 21.
Agrimonia parviflora, 21.
Agrimonia striata, 21.
Amelanchier, 24.
Amelanchier alnifolia, 24.
Amelanchier botryapium, 24.
Amelanchier canadensis, 24.
Amelanchier canadensis oblongifolia, 24.
Amorpha, 56.
Amorpha canescens, 56.
Amorpha fruticosa, 56.
Amorpha microphylla, 56.
Amorpha nana, 56.
Amphicarpa, 61.
Amphicarpa monoica, 61.
Amphicarpaea pitcheri, 61.
Apios, 59.
Apios apios, 59.
Apios tuberosa, 59.
Astragalus, 44.
Astragalus adsurgens, 51.
Astragalus alpinus giganteus, 50.
Astragalus bisulcatus, 48.
Astragalus caespitosus, 46.
Astragalus canadensis, 52.
Astragalus carolinianus, 52.
Astragalus caryocarpus, 52.
Astragalus ceramicus longifolius, 47.
Astragalus chamaeluce, 49.
Astragalus crassicaarpus, 52.
Astragalus drummondii, 50.
Astragalus elatiocarpus, 49.
Astragalus filifolius, 47.
Astragalus flexuosus, 48.
Astragalus giganteus, 50.
Astragalus gilviflorus, 47.
Astragalus gracilis, 48.
Astragalus hypoglottis, 51.
Astragalus kentrophyta, 46.
Astragalus laxmanni, 51.
Astragalus lotiflorus, 49.
Astragalus lotiflorus brachypus, 49.
Astragalus lotiflorus nebraskensis, 50.
Astragalus mexicanus, 52.
Astragalus microlobus, 48.
Astragalus missouriensis, 49.
Astragalus mollissimus, 51.
Astragalus multiflorus, 46.
Astragalus pectinatus, 47.
Astragalus pictus filifolius, 47.
Astragalus plattensis, 52.
Astragalus racemosus, 51.
Astragalus sericoleucus, 47.
Astragalus shortianus, 49.
Astragalus spatulatus, 46.
Astragalus tenellus, 46.
Astragalus triphyllus, 47.
Astragalus viridis, 46.
Baptisia, 37.
Baptisia leucantha, 37.
Baptisia leucophaea, 37.
BAUHINIEAE, 29.
Calyciflorae, 9; relationships, 8.
Caesalpinaceae, 27; relationships, 10.
Cassia, 29.
Cassia chamaecrista, 29.
Cassia marilandica, 29.
CASSIEAE, 29.
Celastrales, 9.
Cercis, 29.
Cercis canadensis, 29.
Cerasus demissa, 25.
CERCOCARPEAE, 20.
Cercocarpus, 20.
Cercocarpus parvifolius, 20.
Cracca, 42.
Cracca virginiana, 43.
Crassulaceae, 67; relationships, 10.
Crataegus, 23.
Crataegus coccinea, 23.
Crataegus coccinea macracantha, 23.
Crataegus coccinea mollis, 23.
Crataegus macracantha, 23.
Crataegus mollis, 23.
Crataegus tomentosa, 24.
Crotalaria, 38.
Crotalaria sagittalis, 38.

- Cytisus rhombifolius*, 37.
Dalea, 56.
Dalea alopecuroides, 57.
Dalea aurea, 57.
Dalea candida, 58.
Dalea compacta, 58.
Dalea enneandra, 56.
Dalea lanata, 57.
Dalea laxiflora, 57.
Dalea purpurea, 58.
Dalea villosa, 31.
Desmanthus, 31.
Desmanthus brachylobus, 61.
Desmodium, 62.
Desmodium acuminatum, 62.
Desmodium canadense, 62.
Desmodium canescens, 62.
Desmodium dillenii, 63.
Desmodium grandiflorum, 62.
Desmodium illinoense, 62.
Desmodium paniculatum, 63.
Desmodium rigidum, 63.
Dolichos polystachyus, 60.
Ervum multiflorum, 46.
 EUCAESALPINIEAE, 28.
 EUMIMOSEAE, 30.
Falcata, 61.
Falcata comosa, 61.
Falcata pitcheri, 61.
Fragaria, 18.
Fragaria americana, 38.
Fragaria vesca, 18.
Fragaria vesca americana, 18.
Fragaria virginiana illinoensis, 18.
Galactia, 60.
Galactia pilosa, 60.
Galactia volubilis, 60.
 GALEGEAE, 42.
 GENISTEAE, 37.
Geum, 18.
Geum album, 19.
Geum canadense, 19.
Geum macrophyllum, 19.
Geum strictum, 19.
Geum virginicum, 19.
Gleditsia, 28.
Gleditsia triacanthos, 28.
Glycine apios, 59.
Glycine comosa, 61.
Glycyrrhiza, 52.
Glycyrrhiza lepidota, 53.
Grossulariaceae, 69; relationships, 10.
Guilandia dioica, 28.
Gymnocladus, 28.
Gymnocladus dioicus, 28.
Gymnocladus canadensis, 28.
Hamamelidaceae, 68; relationships, 10.
Hamamelis, 69.
Hamamelis virginiana, 69.
 HEDYSAREAE, 61.
Hedysarum canadense, 62.
Hedysarum canescens, 62.
Hedysarum grandiflorum, 62.
Hedysarum paniculatum, 63.
Hedysarum rigidum, 63.
Hedysarum volubile, 60.
Heuchera, 66.
Heuchera hispida, 67.
Hosackia purshiana, 42.
Kentrophyta viridis, 46.
Kuhnistera, 57.
Kuhnistera candida, 58.
Kuhnistera candida diffusa, 59.
Kuhnistera candida multiflora, 59.
Kuhnistera candida occidentalis, 58.
Kuhnistera compacta, 58.
Kuhnistera multiflora, 59.
Kuhnistera purpurea, 58.
Kuhnistera villosa, 58.
Lathyrus, 64.
Lathyrus decaphyllus, 64.
Lathyrus linearis, 65.
Lathyrus ornatus, 64.
Lathyrus ornatus flavescens, 64.
Lathyrus ornatus incanus, 64.
Lathyrus polymorphus, 64.
Leptoglottis, 31.
Leptoglottis nuttallii, 31.
Leptoglottis uncinata, 31.
 LOTEAE, 41.
Lotus, 41.
Lotus americanus, 42.
Lupinus, 37.
Lupinus argenteus argophyllus, 38.
Lupinus argenteus decumbens, 38.
Lupinus decumbens, 38.
Lupinus decumbens argophyllus, 38.
Lupinus plattensis, 37.
Lupinus pusillus, 38.
Medicago, 41.
Medicago arabica, 41.
Medicago lupulina, 41.

- Medicago maculata*, 41.
Medicago polymorpha arabica, 41.
Medicago sativa, 41.
Meibomia, 61.
Meibomia canadensis, 62.
Meibomia canescens, 62.
Meibomia dillenii, 63.
Meibomia grandiflora, 62.
Meibomia illinoensis, 62.
Meibomia paniculata, 63.
Meibomia rigida, 63.
Melilotus, 40.
Melilotus alba, 40.
Melilotus officinalis, 40.
Mespilus canadensis, 24.
Mimosa illinoensis, 31.
Mimosa intsia, 31.
Mimosaceae, 30; relationships, 10.
Morongia, 31.
Morongia uncinata, 31.
Myrtales, 9.
Neillia, 22.
Neillia opulifolia, 22.
Opulaster, 22.
Opulaster opulifolia, 22.
Oxytropis, 43.
Oxytropis arctica inflata, 44.
Oxytropis lambertii, 43.
Oxytropis lambertii sericea, 43.
Oxytropis multiceps, 43.
Oxytropis podocarpa, 44.
Oxytropis sericea, 43.
Papilionaceae, 31; relationships, 10, 34.
Parosela, 56.
Parosela aurea, 57.
Parosela dalea, 57.
Parosela enneandra, 56.
Parosela lanata, 57.
Passiflorales, 9.
PENTHOREAE, 67.
Penthorum, 67.
Penthorum sedoides, 67.
Petalostemon, 57.
Petalostemon candidus, 58.
Petalostemon macrostachyus, 58.
Petalostemon multiflorus, 59.
Petalostemon villosus, 58.
Petalostemon violaceus, 58.
Phaca bisulcata, 48.
PHASEOLEAE, 59.
Phaseolus, 59.
Phaseolus diversifolius, 60.
Phaseolus helvolus, 60.
Phaseolus pauciflorus, 60.
Phaseolus perennis, 60.
Phaseolus polystachyus, 60.
Physocarpa, 22.
Physocarpus, 22.
Pirus, 23.
Pirus botryapium, 24.
Pirus coronaria ioensis, 23.
Pirus ioensis, 23.
PODALYRIEAE, 36.
POMEAE, 23.
Potentilla, 15.
Potentilla anserina, 18.
Potentilla arguta, 17.
Potentilla canadensis simplex, 18.
Potentilla chrysantha, 16.
Potentilla gracilis chrysantha, 16.
Potentilla gracilis rigida, 16.
Potentilla hippiana, 16.
Potentilla hippiana pulcherrima, 16.
Potentilla millegrana, 17.
Potentilla monspeliensis, 17.
Potentilla norvegica, 17.
Potentilla nuttallii, 16.
Potentilla paradoxa, 17.
Potentilla pennsylvanica, 16.
Potentilla pennsylvanica strigosa, 16.
Potentilla pentandra, 17.
Potentilla pulcherrima, 16.
Potentilla rivalis, 17.
Potentilla rivalis millegrana, 17.
Potentilla rivalis pentandra, 17.
Potentilla simplex, 18.
Potentilla supina, 17.
POTENTILLEAE, 15.
Poterium sanguisorba, 15.
PRUNEAE, 24.
Prunus, 24.
Prunus Americana, 25.
Prunus besseyi, 25.
Prunus demissa, 25.
Prunus serotina, 26.
Prunus virginiana, 25.
Psoralea, 53.
Psoralea argophylla, 54.
Psoralea campestris, 54.
Psoralea collina, 54.
Psoralea cuspidata, 53.
Psoralea dalea, 57.

- Psoralea digitata**, 54.
Psoralea esculenta, 53.
Psoralea floribunda, 55.
Psoralea hypogaea, 53.
Psoralea lanceolata, 55.
Psoralea linearifolia, 55.
Psoralea longifolia, 47.
Psoralea micrantha, 55.
Psoralea tenuiflora, 55.
Psoralea tenuiflora floribunda, 55.
 PSORALEAE, 53.
Ribes, 70.
Ribes aureum, 71.
Ribes aureum chrysococcus, 71.
Ribes cereum, 71.
Ribes cynosbati, 70.
Ribes floridum, 71.
Ribes gracile, 70.
Ribes oxyacanthoides, 70.
Ribes setosum, 70.
Robinia, 42.
Robinia, pseudacacia, 42.
Rosa, 21.
Rosa arkansana, 21.
Rosa engelmannii, 21.
Rosa fendleri, 22.
Rosa setigera, 22.
Rosa woodsii, 21.
Rosa woodsii fendleri, 22.
Rosaceae, 10; relationships, 10, 14.
Rosales, 9.
 ROSEAE, 21.
Rubus, 19.
Rubus occidentalis, 20.
Rubus strigosus, 19.
Rubus villosus, 19.
Sanguisorba, 20.
Sanguisorba sanguisorba, 20.
 SANGUISORBEAE, 20.
Saxifragaceae, 65; relationships, 10.
 SAXIFRAGEAE, 66.
Schrankia, 31.
Schrankia uncinata, 31.
Sedum, 67.
Sedum stenopetalum, 68.
Sophora, 36.
Sophora sericea, 36.
 SOPHOREAE, 36.
Spiesia, 43.
Spiesia inflata, 44.
Spiesia lambertii, 43.
Spiesia lambertii sericea, 43.
Spiesia multiceps, 43.
 SPIRAEAE, 22.
Spiraea opulifolia, 22.
Strophostyles angulosus, 60.
Strophostyles pauciflorus, 60.
Tephrosia, 42.
Tephrosia virginiana, 42.
Thermopsis, 36.
Thermopsis rhombifolia, 37.
 TRIFOLIEAE, 39.
Trifolium, 39.
Trifolium agrarium, 39.
Trifolium hybridum, 40.
Trifolium M. officinalis, 40.
Trifolium pratense, 40.
Trifolium procumbens, 39.
Trifolium reflexum, 39.
Trifolium repens, 40.
Trifolium stoloniferum, 39.
Trigonella americana, 42.
Umbellales, 9.
Vicia, 64.
Vicia americana, 64.
Vicia americana linearis, 65.
Vicia americana truncata, 65.
Vicia linearis, 65.
Vicia truncata, 65.
 VICIEAE, 64.