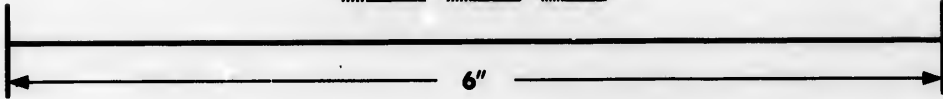
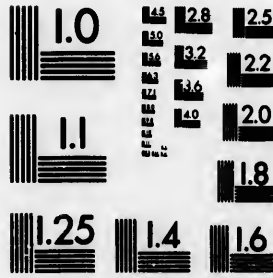


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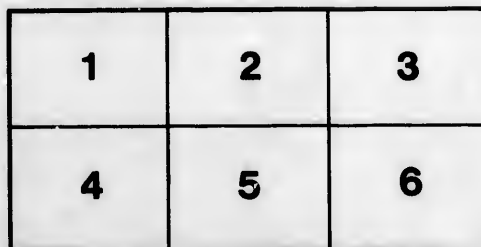
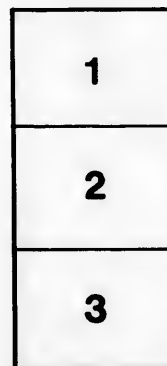
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BY

THOMAS HOWELL

VOL. I.

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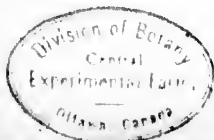
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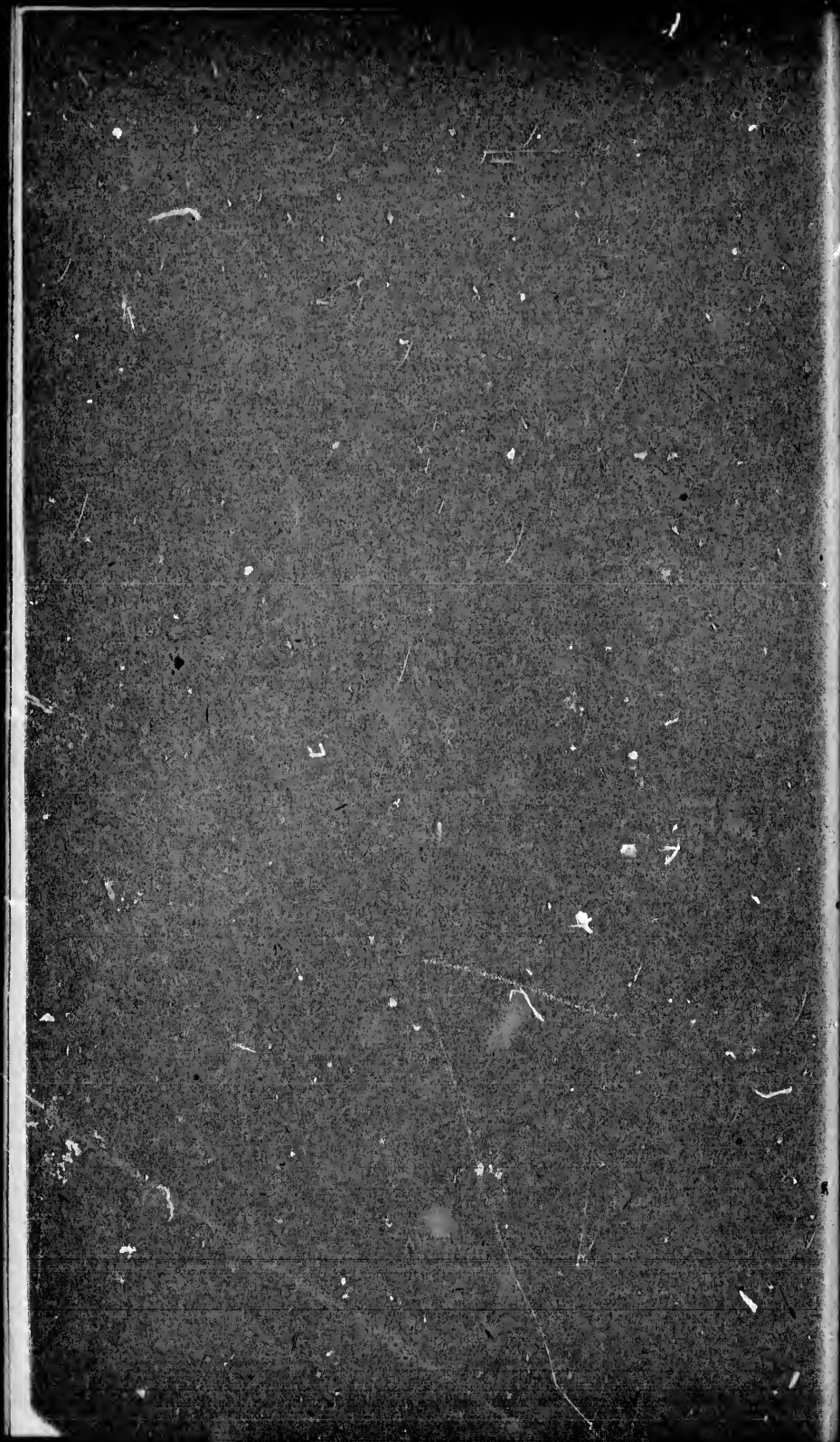
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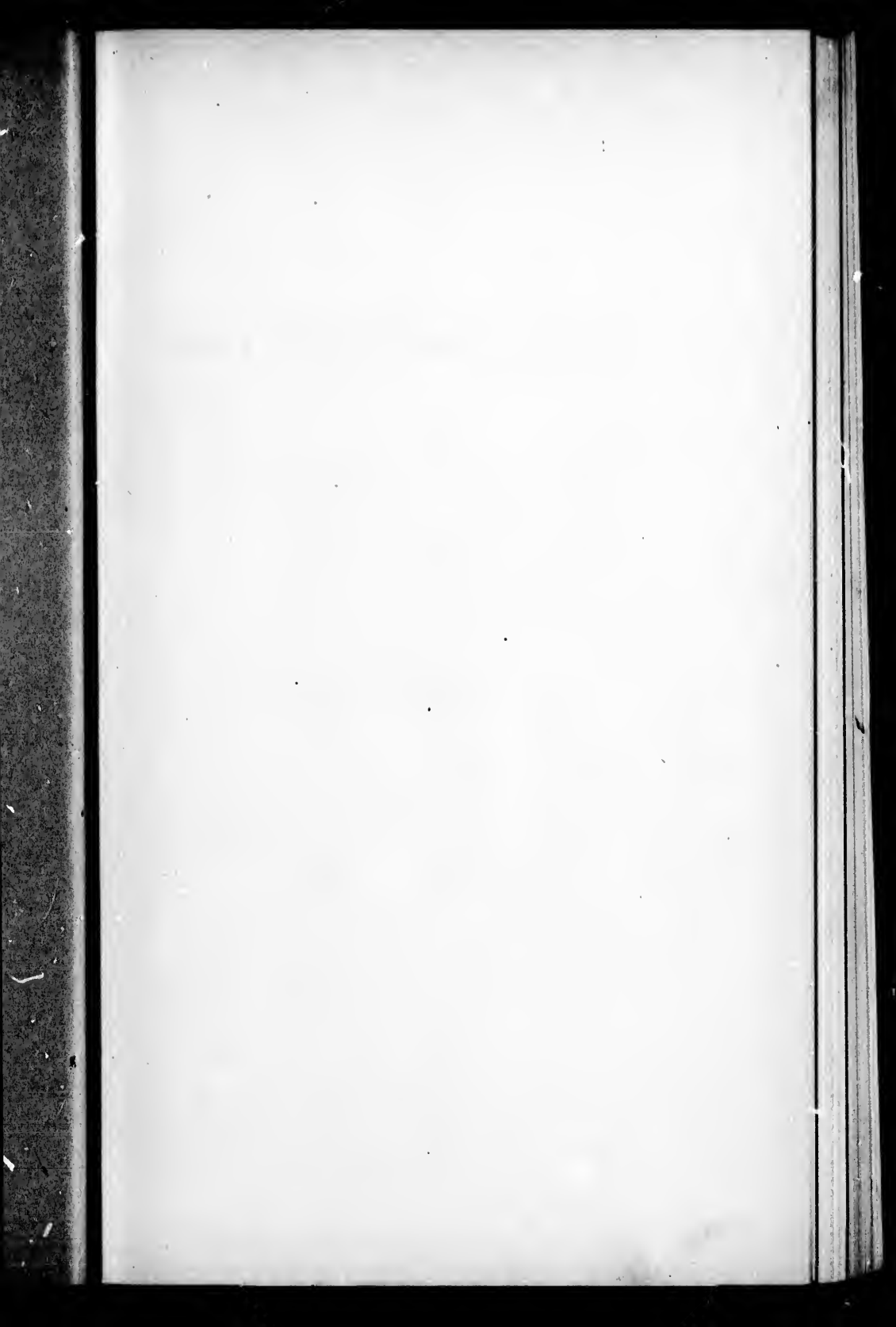
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March 15th, 1897.

	7 <i>Polypetalacæ</i>	2
1	Ranunc.	7
2	Berberid.	27
3	Nymph.	29
4	Sarrac.	30
5	Papav.	31
6	Fumari.	33
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8	Cappar.	66
9	Violac.	68
10	Polygal.	72
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19	Scalid.	109
20	Balsam.	110
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22	Rhamn.	112







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BY  
**THOMAS HOWELL.**

**VOL. I.**

**PHANEROGAMÆ.**

**FASCICLE I, RANUNCULACEÆ TO RHAMNACEÆ.**

*Price Fifty Cents.*

**PORTLAND OREGON,**  
**March 10th, 1897.**



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## Preface.

All the territory of the United States of America south of the British boundary, except Oregon, Washington and Idaho, being supplied with local Floras, this work is intended to fill up the corner left out by other authors.

As the writing of descriptions of plants at this late date is, to a great extent, writing or copying what others have previously done, it is hardly right to claim originality for work done in that field; I, therefore, wish to acknowledge here that I have used the works of Torrey & Gray, Dr. Asa Gray, Sereno Watson, William Trelease, Coulter & Rose, Edward L. Greene and others, and to save repetition (which would otherwise occur on every page) I wish to give full credit here to all authors, any portion of whose works have been copied herein.

Wherever possible, descriptions have been drawn from specimens in hand, but some I have been unable to procure and for these I have had no other alternative than to copy from descriptions already published.

Believing that if a plant has one constant character that is different from any of its congeners it is sufficient for a species; and that if a plant is sufficiently distinct from others to deserve a name it is better to have it described as a distinct species than as a variety of some other species, I have, therefore, raised nearly all published varieties of the region embraced in this work to specific rank.

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POLYPETA  
GAMOPETA  
APETALE.

**A FLORA**  
**OF**  
**NORTHWEST AMERICA.**

**SERIES I. CORMOPHYTA ENDLICHER.**

Plants consisting of root and stem growing in opposite directions, composed of regular cellular tissue traversed (except in the very lowest forms) by woody fibre. Stems increasing in size either at the apex and circumference simultaneously, or at the apex only, producing buds, and usually, distinct leaves at definite points and in regular order. Propagation effected by means of flowers and seeds, or spores.

**PHANEROGAMÆ.** Plants producing flowers and perfect seeds.

**CRYPTOGAMÆ.** Plants producing spores but not flowers.

**SUBSERIES 1. PHANEROGAMÆ.**

Plants bearing flowers with one or more stamens and producing seeds that contain an embryo.

**ANGIOSPERMÆ.** Ovule enclosed in an ovary, and fertilized through a stigma.

**GYMNOSPERMÆ.** Ovule not enclosed in an ovary and fertilized by direct application of pollen.

**CLASS 1. ANGIOSPERMÆ.**

Pistil consisting of a closed ovary which contains the ovule and forms the fruit, and a more or less manifest style and stigma.

**EXOGENÆ.** Stems with pith in the centre and the woody fibre in annual layers or rings: embryo usually with two opposite cotyledons.

**ENDOGENÆ.** Stems without pith, and the woody fibre scattered irregularly: embryo with a single cotyledon.

**SUBCLASS 1. EXOGENÆ.**

Stem consisting of pith in the centre, bark on the outside, and these separated by one or more layers of fibrous or woody tissue which, when the stem lives for more than one year, increases by the addition of new layers outside next to the bark. Embryo usually with two opposite cotyledons.

**POLYPETALÆ.** Petals distinct, rarely united at base or wanting.

**GAMOPETALÆ.** Petals more or less united: very rarely wanting.

**APETALÆ.** Petals always wanting.



## DIVISION 1. POLYPETALÆ.

Floral envelopes consisting usually of both calyx and corolla; the petals distinct or rarely united with each other, sometimes wanting.

## SYNOPTICAL KEY TO THE POLYPETALOUS ORDERS.

§ 1. Stamens hypogynous, free from the calyx and the superior ovary.

\* Carpels solitary, or distinct.

+ Sepals and petals deciduous, rarely persistent in No. 1. Leaves alternate or all radical, rarely opposite or whorled.

1 **Ranunculacæ.** Sepals 4 or more; petals as many and alternate with them or wanting; stamens usually numerous: carpels one to many: fruit achenes or follicles, or in *Actæa* a berry.

2 **Berberidacæ.** Parts of the flower in threes, in opposite ranks, distinct, (sepals and petals wanting in *Achlys*): anthers opening by valves: carpel solitary, (a berry in *Berberis*).

Sepals 3, petals 6, stamens many, carpels several, soon distinct, becoming linear torulose several-seeded pods: *Plutystemon* in *Papaveracæ*.

\* \* Ovary compound with parietal placentæ, or seeds covering the cell-walls.

+ Capsule many-celled, indehiscent: sepals and petals persistent.

3 **Nymphaecæ.** Parts of the flower indefinite, mostly numerous: seeds numerous, covering the walls of the cells. Aquatic herbs with entire plain leaves and solitary flowers.

4 **Sarraceniacæ.** Sepals and petals 5. Acaulescent marsh perennials with odd-shaped leaves and solitary flowers.

+ + Valves of the capsule separating from the persistent placentæ. Sepals and petals persistent.

+ + Seeds albuminous.

5 **Papaveracæ.** Sepals 2 or 3, caducous: petals twice as many, alike: stamens numerous: capsule 2-several-valved, one- (rarely several) celled. Herbs, or shrubs with mostly alternate leaves without stipules, and often colored juice.

6 **Fumariacæ.** Flowers very irregular: sepals 2, small: petals 4, in 2 dissimilar pairs: stamens 6, diadelphous: (capsule 1-celled, 2-valved, several to many-seeded. Herbs with alternate leaves without stipules.

+ + Seeds without albumen; flowers regular.

7 **Crucifera.** Sepals and petals 4: stamens 6, tetradynamous (rarely 4 or 2); capsule 2-celled, 2-valved, 2-many-seeded; rarely 1-celled and indehiscent. Herbs with alternate leaves without stipules.

8 **Capparidacæ.** Sepals and petals 4: stamens 6 or more, nearly equal: capsule 2-valved, 1-2-celled, 1-several-seeded. Mostly herbs with alternate often stipulate leaves.

+ + + Capsule 1-celled, several-carpelled, the valves not separating from the placentæ.

+ + Flowers irregular.

9 **Violacæ.** Sepals and petals 5: anthers 5, coherent: style 1, clavate: capsule 3-valved, many-seeded. Low herbs with alternate or radical stipulate leaves.

Sepals and petals  
Low herb  
Sepals and petals  
herbs with  
\*\*\* Ovary  
ly strictly hypogynous

10 **Polygalacæ.**  
ed: stamens  
upper side

+ + Flower  
embryo curved

11 **Caryophyllacæ.**  
stamens 10  
twice as many  
with opposite

12 **Portulacacæ.**  
few-many  
cumscissile

Sepals and petals  
celled, 5-valved  
pitcher-shaped

13 **Elatinacæ.**  
many-ovuled  
and axillary

14 **Hypericacæ.**  
styles 3: corolla  
leaves with

15 **Malvacæ.**  
ous; anthers  
separating  
shrubs with

16 **Linacæ.**  
ed, 4-10, several

Flowers 5-merous  
Prostrate  
*Mollugo* in  
+ + + Fru

17 **Geraniacæ.**  
cated: stamens  
ating from  
Herbs with

18 **Limnanthacæ.**  
lute in the

↔ ↔ Flowers regular: leaves without stipules.

Sepals and petals 5; styles 3, 3-parted: capsule 3-valved, many seeded.  
Low herbs with the leaves all radical. *Droseraceæ*.

Sepals and petals 5: stamens indefinite: styles 3: capsule 3-valved. Low herbs with opposite leaves. *Hypericum* in *Hypericaceæ*.

\*\*\* Ovary of 2-several carpels and central placentæ: stamens mostly strictly hypogynous: sepals persistent.

← Flowers very irregular.

10 *Polygalaceæ*. Capsule compressed, narrowly winged, 2-celled, 2-seeded: stamens 4-8, monadelphous (united into a tube that is split on the upper side), or distinct: anthers 1-celled, opening at the top.

↔ ↔ Flowers regular: capsule 2-celled with free central placentæ: embryo curved around central albumen.

11 *Caryophyllaceæ*. Flowers mostly 5-merous; petals sometimes none: stamens 10 or fewer: styles 3-5, the capsule opening by as many or twice as many valves: ovules numerous. Herbs, rarely woody at base, with opposite leaves mostly without stipules.

12 *Portulacaceæ*. Sepals 2, 4-8 in *Lewisia*: petals 2-5 or more: stamens few-many: style 2-cleft: ovules few or many; capsule 2-3-valved or circumscissile.

↔ ↔ Flowers regular: ovary 2-several celled.

↔ ↔ Capsule not lobed nor winged.

= Stamens distinct or nearly so, not in fascicles.

Sepals and petals 5, persistent: stamens many: style 5-lobed: capsule 5-celled, 5-valved, many-seeded. Acaulescent marsh perennials with pitcher-shaped leaves and solitary flowers. *Sarraceniaceæ*.

13 *Elatinaceæ*. Sepals and petals 2-5: styles distinct: capsule 2-5-celled, many-ovuled. Low herbs with opposite leaves, membranous stipules, and axillary flowers.

= = Stamens clustered at base into fascicles.

14 *Hypericaceæ*. Sepals and petals 5: stamens numerous, in 3 fascicles: styles 3: capsule 3-celled, many-seeded. Herbs with opposite entire leaves without stipules, and yellow flowers in cymes.

= = = Stamens monadelphous (united into a tube).

15 *Malvaceæ*. Calyx valvate: petals 5, united at base: stamens numerous; anthers 1-celled: carpels either in a ring 1-few-seeded and at length separating, or forming a 5-10-celled many-seeded capsule. Herbs or shrubs with alternate stipulate leaves.

= = = = Stamens 5, not united.

16 *Linaceæ*. Flowers 5-merous: styles 2-5: capsule 2-5-valved, 4-10-celled, 4-10-seeded. Low herbs with entire leaves and paniced flowers.

Flowers 5-merous: petals none: styles 3: capsule 3-celled, several-seeded. Prostrate annual with entire verticillate leaves and axillary flowers. *Mollugo* in *Ficoideæ*.

↔ ↔ Fruit lobed or winged: ovules 1 or 2 in each cell, pendulous.

= Flowers slightly irregular.

17 *Geraniaceæ*. Sepals 5, imbricated in the bud: petals 5, mostly imbricated: stamens mostly 10: styles 5, coherent to an axis at length separating from it: capsule 5-celled, the cells 2-ovuled but only 1 maturing. Herbs with opposite stipulate leaves and long-beaked carpels.

= = Flowers regular.

18 *Limnanthaceæ*. Flowers 5-merous: sepals valvate and petals convolute in the bud: carpels fleshy, indehiscent, 1-ovuled. Tender annuals

- with alternate dissected leaves without stipules.
- 19 Oxallidaceæ.** Flowers 5-merous: sepals imbricated and petals mostly convolute in the bud: carpels combined into a 5-celled and few-many-ovuled capsule. Low herbs with sour juice and alternate or radical trifoliate leaves.
- = = = Flowers very irregular.
- 20 Balsaminaceæ.** Sepals 5, imbricated in the bud: petals 4, united in pairs, rarely 5 and distinct: fruit a 5-celled several-seeded capsule. Coarse succulent herbs with entire leaves without stipules.
- \* \* \* \* Ovary compound with central placentæ: stamens borne upon a more or less perigynous disk: flowers mostly polygamous or dioecious: calyx persistent or the limb deciduous: cells of the ovary 1-few-ovuled: seeds mostly erect or ascending and albuminous.
- 21 Celastraceæ.** Flowers perfect, 4-5-merous: capsule 2-5-celled: seeds arillate. Shrubs with opposite pinnately veined leaves and no stipules.
- 22 Rhamnaceæ.** Calyx valvate, the 4 or 5 lobes alternate with as many stamens, deciduous: petals often none: style often 4- or 5-lobed or cleft: fruit a berry, drupe-like, or dry, 1-4-celled. Shrubs or trees with simple leaves and small stipules.
- 23 Vitaceæ.** Flowers 4-5-merous: calyx minute: petals valvate with a stamen at the base of each: fruit a 2-celled, 2-4-seeded berry. Woody vines climbing by tendrils.
- 24 Aceraceæ.** Flowers dioecious or polygamous, often apetalous: styles 1-3: fruit, in ours, a double samara or a single follicle. Trees or shrubs with opposite, rarely alternate, leaves and mostly no stipules.
- 25 Anacardiaceæ.** Flowers mostly 5-merous: stigmas 3: fruit a drupelet. Shrubs with milky juice and alternate leaves without stipules.
- § 2, Stamens perigynous (upon the calyx) or epigynous (upon the top of the ovary).
- \* Ovary superior or nearly so.  
- Carpels solitary or distinct.
- 26 Leguminosæ.** Flowers mostly irregular: stamens 10, rarely fewer, mostly monadelphous (all united) or diadelphous (9 and 1): carpel solitary, becoming a legume. Herbs shrubs or trees with alternate stipulate leaves.
- 27 Amygdalaceæ.** Carpel solitary or rarely 5, becoming a drupe, entirely free from the calyx; ovules 2, pendulous: seed usually solitary.
- 28 Pomaceæ.** Carpels 2-5, enclosed in the fleshy calyx-tube, with 2 erect ovules in each cell. Trees or shrubs with free stipules.
- 29 Rosaceæ.** Flowers regular, mostly 5-merous, or the stamens usually numerous: carpels 1-many, becoming achenes. Herbs shrubs or trees with alternate, mostly stipulate leaves.
- + + Carpels united or free: seeds mostly albuminous: leaves simple; stipules none, or adnate to the base of the petiole.
- 30 Saxifragaceæ.** Flowers 5-merous; styles or tips of the carpels distinct and soon divergent; fruit a 2-celled capsule. Herbs with mostly alternate simple leaves without distinct stipules.
- 31 Hydrangeaceæ.** Flowers 5-merous: fruit a 3-5-celled capsule. Shrubs with opposite simple leaves without stipules.
- 32 Ribesiacæ.** Flowers 5-merous: fruit a 1-celled berry. Shrubs with alternate simple leaves with adnate stipules or none.
- 33 Crassulaceæ.** Flowers 3 or 5-merous: stamens nearly hypogynous: carpels 3-5, becoming 1-many-seeded follicles.

**34 Droseraceæ.**  
many-seed  
with gland

**35 Ceratophylacaceæ.**  
aquatic her  
flowers.

**36 Lythraceæ.**  
calyx, 2-4  
and axillar

++ Not te

**37 Haloragaceæ.**  
pended see  
leaves and

**38 Onagraceæ.**  
1; fruit a 2

++ Tend

**39 Cucurbitacæ.**  
fruit fleshy

+ + Fruit  
many: stipul

**40 Loasaceæ.**  
ed; leaves m

**41 Ficoldeæ.**

**42 Cactaceæ.**  
1-celled. 1

+ + + Fr

2-celled, with

disk (wanting

**43 Umbelliferæ.**

**44 Arallaceæ.**

**45 Cornaceæ.**  
fruit bacca

**46 Garryaceæ.**  
2: fruit ba

Flowers perfec  
berries con

34 **Droseraceæ.** Sepals and petals 5: styles 3, 2-parted: capsule 3-valved, many-seeded. Low marsh herbs with the leaves all radical and beset with gland-tipped hairs.

35 **Ceratophyllaceæ.** Fruit a crustaceous 1-seeded achene. Submersed aquatic herbs with finely dissected whorled leaves and minute axillary flowers.

36 **Lythraceæ.** Flowers 4- or 6-merous: style 1: capsule enclosed in the calyx, 2-4-celled, many-seeded. Herbs with mostly opposite leaves and axillary flowers.

\* \* Ovary wholly inferior.

+ Fruit with central placentæ: stamens few.

\*\* Not tendril-bearing and flowers not in umbels: stipules none.

37 **Haloragaceæ.** Fruit indehiscent, nut-like, 1-4-celled, with a single suspended seed in each cell. Aquatic herbs with opposite or verticillate leaves and inconspicuous axillary flowers.

38 **Onagraceæ.** Flowers 2- or 4-merous: calyx valvate in the bud; style 1; fruit a 2- or 4-celled capsule or berry-like.

\*\* Tendril-bearing herbs with alternate leaves without stipules.

39 **Cucurbitaceæ.** Flowers monoecious or dioecious, often gamopetalous: fruit fleshy, indehiscent, 1-several-celled.

+ + Fruit with parietal placentæ, several-many-seeded: stamens many: stipules none.

40 **Loasaceæ.** Flowers perfect, conspicuous; style 3-cleft: capsule 1-celled; leaves rough with tenacious hairs.

41 **Ficoideæ.** Sepals mostly 5; petals none; capsule 3-5-celled.

42 **Cactaceæ.** Sepals and petals numerous: stamens many: capsule 1-celled. Leafless, usually prickly, fleshy perennials.

+ + + Fruit indehiscent; dry, berry-like, or drupe-like, mostly 2-celled, with a suspended seed in each cell: ovary with an epigynous disk (wanting in *Garrya*).

\*\* Flowers in umbels.

43 **Umbelliferae.** Carpels and styles 2: fruit dry.

44 **Araliaceæ.** Carpels and styles 4 or 5, becoming a berry-like fruit.

\*\* Flowers in cymes or aments.

45 **Cornaceæ.** Inflorescence cymose: flowers perfect, 4-merous: style 1: fruit baccate, 2-3-celled. Herbs shrubs or trees with opposite leaves.

46 **Garryaceæ.** Flowers in aments, dioecious: sepals 4; petals none: styles 2: fruit baccate, 1-celled. Shrubs with opposite, simple leaves.

Flowers perfect, cymose, 5-merous; petals imbricated, united: fruit baccate berries containing 1-5 seed-like nutlets. *Sambuceæ*.

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Sepals 3-4  
colored and  
Stamens ind  
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TRIBE I. I  
Petals very s

1 *Clematis*. F

TRIBE II. I  
Fruit a head

\* Achene  
spurred at b

2 *Anemone*.  
or whorled

3 *Thalictrum*  
ternately de

\*\* Achene  
spurred at b

4 *Myosurus*.

TRIBE III.  
coming ache

5 *Troutvetter*  
cid, soon

6 *Batrachium*  
petals white  
versely wrin

7 *Ranunculus*  
mostly yello  
claw: achene

TRIBE IV.  
ular or none  
alternate.

8 *Caltha*. Sep

9 *Trollius*. S  
sessile; le

10 *Coptis*. Sep  
summit; c

11 *Aquilegia*.  
5; sessile:

ORDER I. RANUNCULACEÆ Endl. Gen. 843.

Sepals 3-6 or more but usually 5, distinct, hypogynous, often colored and petaloid. Petals 1-several or none, hypogynous. Stamens indefinite in number, hypogynous, distinct. Ovaries usually numerous, sometimes few or solitary, distinct: ovules solitary or several. Fruit achenes or follicles or baccate. Seeds anatropous. Embryo minute, near the base of horny or fleshy albumen. Herbs or rarely shrubs with colorless usually acrid juice, alternate or rarely opposite leaves without stipules, the base of the petiole generally dilated and partly clasping the stem.

TRIBE I. Leaves opposite. Sepals valvate in the bud, petaloid. Petals very small or none. Fruit a head of hairy-tailed achenes.

1 *Clematis*. Half-woody plants climbing by their petioles, or erect herbs.

TRIBE II. Sepals petaloid or greenish, imbricated in the bud. Fruit a head or spike of achenes.

\* Achenes in a more or less globose or oblong head. Sepals not spurred at base, petaloid. Petals none.

2 *Anemone*. Sepals indefinite in number. Leaves on the stem opposite, or whorled on or below 1-flowered peduncles.

3 *Thalictrum*. Flowers mostly dioecious, paniced: leaves alternate, ternately decompound.

\*\* Achenes numerous, in a long and slender, or short spike. Sepals spurred at base. Petals present.

4 *Myosurus*. Petals slender; flowers, solitary on scapes.

TRIBE III. Sepals imbricate in the bud. Pistils numerous, becoming achenes. Ovule solitary, ascending. Leaves alternate.

5 *Trautvetteria*. Flowers perfect, corymbosely paniced; sepals petaloid, soon deciduous; leaves alternate, palmately cleft.

6 *Batrachium*. Flowers perfect: peduncles solitary, opposite the leaves: petals white with a naked nectariferous pit near the base: achenes transversely wrinkled on the sides.

7 *Ranunculus*. Flowers perfect: peduncles axillary or terminal: petals mostly yellow, with a nectariferous spot or pit covered by a scale on the claw: achenes not wrinkled on the sides.

TRIBE IV. Sepals imbricated in the bud. Petals small or irregular or none. Fruit 1-several follicles, or a 1-celled berry. Leaves alternate.

\* Fruit 1-several follicles.

+ Flowers regular; follicles 1-15.

8 *Caltha*. Sepals petaloid; petals none; leaves simple; carpels 5-15.

9 *Trollius*. Sepals 5-15, petaloid: petals 5-20, tubular at base; follicles sessile; leaves palmately parted.

10 *Coptis*. Sepals 5-6, greenish: petals 5-6 enlarged in the middle or at the summit; carpels 5-10, stipitate: leaves compound, persistent.

11 *Aquilegia*. Sepals 6, colored: petals 5, all spurred backwards: carpels 5; sessile: leaves ternately compound.

+ + Flowers irregular: follicles 1-5: leaves lobed or dissected.

12 *Delphinium*. Sepals 5, the upper one produced backwards into a spur: petals 4, the 2 upper ones produced backwards.

13 *Aconitum*. Sepals 5, the upper one arched into a hood: petals 5, the 3 lower ones minute or stamen-like.

+ + + Flowers regular: carpels 1-5: leaves compound.

14 *Isopyrum*. Sepals 5, petaloid: petals 5, sometimes none: low herbs.

15 *Cimicifuga*. Sepals 5, petaloid, caducous: petals 5 or none: tall herbs.

\*\* Fruit a 1-celled berry.

16 *Actæa*. Sepals 3-5, petaloid, caducous: petals 4-10, small, soon deciduous: leaves ternately compound.

TRIBE v. Sepals herbaceous, imbricated in the bud, persistent. Petals conspicuous. Carpels few, many-ovuled, becoming follicles.

17 *Pæonia*. Herbs or shrubs with alternate compound leaves and large fleshy roots.

*Tribe 1. Clematidæ DC. Sepals valvate in the bud. Stamens numerous, with adnate anthers. Carpels numerous, 1-ovuled, becoming indehiscent hairy-tailed achenes. Ovule suspended. Herbs or trailing woody plants with opposite leaves.*

1 CLEMATIS Tourn. Inst. 255. Linn. Gen. n. 696.

Erect herbs or somewhat woody plants that climb by their petioles. Sepals 5, rarely more, colored, valvate or with the edges turned inwards in the bud. Petals shorter than the sepals or wanting. Stamens numerous with extrorse anthers. Style persistent, becoming plumous appendages of the compressed achenes.

§ 1. FLAMMULA DC. partly. Flowers comparatively small and usually cymous-paniculate, white or whitish, in ours diœcious. Sepals petaloid, thin, widely spreading. Petals none. Anthers mostly short, blunt.

*C. ligusticifolia* Nutt. T. & G. Fl. i, 9. Somewhat pubescent: stems. 2-30 feet long: leaves quinate to quinate-ternate: leaflets oblong, acute, mostly somewhat lanceolate-cuneate, incisely lobed and trifid, 2-6 inches long: flowers in paniculate corymbs: sepals thin, silky, white, 4-6 lines long, equaling the stamens: achenes pubescent, tails 1-2 inches long. Along streams, from N. Cal. to Brit. Columbia and the Rocky Mountains.

*C. brevifolia*. *C. ligusticifolia* var. *brevifolia* Nutt. T. & G. Fl. i, 9. Stems woody, climbing over brush and cliffs, 3-18 feet long: leaves nearly smooth, mostly 5-foliolate, somewhat coriaceous: leaflets broadly ovate to lanceolate-ovate, acute or acuminate, usually 3-lobed and coarsely toothed: sepals white, thin, 4-6 lines long, equaling the stamens: achenes densely pubescent: silky-white tails 1-2 inches long. Along streams, from the Blue Mountains in Oregon to Brit. Columbia.

*C. Suksdorfii* Robinson in Gray's Syn. Fl. i 4. Leaves quinate, glabrous: leaflets 1-1½ inches long: sepals widely spreading or reflexed in anthesis, velvety-pubescent on the outside: heads of fruit small and few-carpelled, not over an inch in diameter at full maturity including the curling tails: pubescence of the young achenes woolly or felt-like, the hairs crinkly, not straight nor silky as in *C. ligusticifolia*: mature achenes with broadly ovate nearly orbicular body and filiform sparsely pubescent tails. Klickitat river Washington, collected and first recognized as distinct by W. M. Suksdorf July 15th. 1881.

§ 2 VIORN mostly nodd long and slex herbaceous p

*C. Douglasii* less villous, w lanceolate seg gate in fruit: s the apex, dee gon to Brit. C

*C. Scottii* F hairs; bushy, inches high; le some or all of long or ovate-long; some up axillary and to ovate, with ref ple, thickish, with densely p southern Color

§ 3. ATRAC naked pedun spreading fro pubescent fil enlarging to s by the petiole

*C. verticillata* mostly glabrous; rupty acumin mountains from

*C. Columbiana* nate; leaflets p 1-2 inches broa of the stamens and Brit. Colum

*C. ochotensis* Stems woody, t ceolate acumin -ovate, purplish rudiments of a tails 1½ inches

*Tribe 2. An in the bud. F Herbs with th several-flower*

2 AD

Erect pere all radical ex Sepals 4-20, erous; style



§ 2 VIORNA Spach. Flowers large, hermaphrodite, solitary and mostly nodding on rather long peduncles. Petals none. Anthers long and slender, pointed. Filaments hirsute or pubescent. Ours herbaceous perennials.

*C. Douglasii* Hook. Fl. i, 1. t. 1. Stems simple or branched, more or less villous, woolly at the joints: leaves 2-3-pinnatifid with linear to linear-lanceolate segments: flowers nodding, on erect naked peduncles that elongate in fruit: sepals thick, pubescent, more or less spreading and woolly at the apex, deep purple inside, paler externally. High mountains, E. Oregon to Brit. Columbia and the Rocky Mountains.

*C. Scottii* Porter Fl. Col. 1. More or less villous with soft spreading hairs; bushy, branching from a suffrutescent base; branches erect, 9-18 inches high; leaves opposite, on rather long petioles, large, pinnate, with some or all of the divisions 3-5-parted or 3-5-foliate; lobes or leaflets oblong or ovate-lanceolate, acute or acuminate, 4-5 lines broad by an inch long; some upper leaves with distinctly tortuous partial petioles: flowers axillary and terminal, nodding, on peduncles 3-6 inches long: sepals 4, ovate, with reflexed summits, nearly an inch long, dark- or brownish-purple, thickish, more or less tomentose outside: achenes silky-pubescent, with densely plumose tails 1-1½ inches long. Beaver Canyon Idaho to southern Colorado.

§ 3. ATRAGENE DC. Flowers large, hermaphrodite, solitary on naked peduncles. Sepals much exceeding the stamens and pistils, spreading from the base, thin, petaloid. Anthers short, on long pubescent filaments: usually some of the outermost filaments enlarging to small spatulate petals. Half-woody plants that climb by the petioles.

*C. verticillaris* DC. Syst. i, 166. Stems slender, somewhat woody, almost glabrous; leaves ternate; leaflets petiolulate, ovate or subcordate, abruptly acuminate: flowers solitary, bluish-purple, 2-3 inches across. In mountains from Idaho northward, and eastward to the Atlantic States.

*C. Columbiana* T. & G. Fl. i, 11. Stems somewhat woody: leaves ternate; leaflets petiolulate, ovate, acute, obscurely crenulate: flowers solitary 1-2 inches broad, pale blue; sepals ovate, acuminate, nearly twice the length of the stamens. Wild Horse Plains Washington to the Rocky Mountains and Brit. Columbia.

*C. ochotensis* Poir. Suppl. ii, 298. *C. alpina* var. *occidentalis* Gray. Stems woody, trailing: leaves bitermately divided, with ovate or oblong-lanceolate acuminate, often 3-lobed, irregularly toothed segments: sepals 4, lance-ovate, purplish-blue: spatulate and petaloid staminodes few and usually with rudiments of anthers, or none: carpels glabrous with very finely plumose tails 1½ inches long. Washington to the Rocky Mountains and Dakota.

Tribe 2. *Anemoneæ* DC. *Sepals petaloid or greenish, imbricated in the bud. Pistils numerous, becoming achenes. Ovule suspended. Herbs with the leaves all radical, or alternate, or whorled below 1-several-flowered peduncles.*

2 ANEMONE Tourn. Inst. 275. L Gen. n. 696. ed. 4

Erect perennial herbs with lobed or divided leaves which are all radical except those that form an involucre below the flower. Sepals 4-20, colored and petaloid. Petals none. Ovaries numerous; style short; stigma lateral; ovule suspended. Achenes



compressed, pointed, or ending in long feathery tails.

§ 1. *PREONATHUS*, DC. Prod. i. 17. Involucre of 2 or 3 more or less petiolate and petiolulate leaves. Flowers large, solitary. Sepals thin, widely spreading. Carpels with long filiform styles that become plumose tails to the achenes.

*A. occidentalis* Watson Proc. Am. Acad. xi, 121. More or less silky-villous throughout: stem stout, 6-18 inches high: radical leaves large, long-petioled, biternate and pinnate; involucre leaves similar, nearly sessile: sepals: 6-8, 6-9 lines long, white, or purplish at base. On high mountains near perpetual snow, California to Alaska and the Rocky Mountains.

§ 2. *EUANEMONE* Gray Syn. Fl. i, 8. Carpels with short and not plumose styles. Involucre petioled. peduncle solitary.

\* Style short, nearly naked, not becoming elongated.

† Carpels numerous, in a close head, villous.

*A. Drummondii* Watson Bot. Cal. ii, 424, sparingly pubescent; stems slender, from tufted rootstocks, 3-15 inches high: radical leaves on long petioles, ternate; leaflets deeply 3-5 lobed, the narrow segments 2-3 cleft: involucre leaves similar, nearly sessile, with a slightly narrowed base: sepals 5-7, pale blue, 4-5 lines long, silky-villous outside: style slender, glabrous: achenes densely villous. On the highest mountains near perpetual snow, Washington and Oregon to northern California.

*A. multifida* Poir. Suppl. i, 364. Somewhat silky-villous: stems 3-15 inches high: radical leaves long petioled, nearly semicircular in outline, ternate, the sessile divisions deeply lobed with cleft linear segments: involucre leaves similar, shortly petioled: sepals 5-8, red or bluish or whitish, 4-6 lines long, villous outside: receptacle oblong, the head in fruit globular to oblong; achenes densely woolly, ovate-oblong, with a straight beak. On high mountains, Oregon to Alaska and the Eastern States.

*A. Tetonensis* Porter in Britton An. N. Y. Acad. Sci. vi, 224. Nearly related to the last but lower and more slender: leaf-segments somewhat broader, obtusish, glabrate: flowers deep purple: achenes dorsally glabrate. Idaho Teton Range 10,000 feet *J. M. Coulter*, and Needle Peak of Lost River Mountains, *V. Bailey*. *Robinson in Gray, Syn. Fl. i, 10.*

+ + Carpels fewer, pubescent but not villous.

*A. deltoidea* Hook Fl. i, 6, t. 3. Stem simple, slender, 6-14 inches high, from long running root-stocks: radical leaves trifoliolate; leaflets rhomboid, crenate-serrate; involucre leaves rhomboid or rhombic-ovate, on very short petioles, serrate and sometimes 3-lobed: sepals about 5, white, oval, 4-6 lines long, usually unequal: achenes few globose-ovoid, tipped with the short style. Common in wooded districts, N. California to Brit. Col.

*A. Oregana* Gray Proc. Am. Acad. xxii, 308. Smoothish: stem slender, 5-12 inches high from a fleshy, very brittle, somewhat running root-stock: radical leaves trifoliolate, the leaflets coarsely serrate; involucre leaves long-petioled, trifoliolate, the terminal leaflet 3-lobed, the lateral ones usually 2-lobed, all coarsely toothed and cut: sepals 4-7, oval to obovate, blue: carpels 15-20, oblong, tipped with a hooked beak. Moist shady slopes, western Oregon and Washington.

*A. Lyallii* Britton l. c. 227. *A. quinquefolia* var. *Lyallii* *Robinson l. c. 13.* Stem slender, 2 to 4 inches high: leaves trifoliolate; leaflets ovate to lanceolate, obtuse or acute, obtusely toothed: flowers small, a third to half inch in diameter, pale blue or whitish. From Vancouver Island to the Willamette valley and the Redwoods of California.

ANEMONE.  
THALICTRUM

*A. trifolia* L. ly trifoliolate; developed specimens leaves subsimilarly more than sepals white or Atlantic States

§ 3. *OMAL* enes smooth, lucre sessile,

*A. narcissif* parted; segmental leaves similar sepals white: c Alaska and the

3 T

Tall, usually compound leaves. Sepals 4-8, several; withments. Pistils that are tipped

*T. sparsiflor* 6 feet high, with petioled; leaflets oblong, 3-15 lines or short-acuminate erect or soon nate: sepals obovate filament short-stipitate, each side. From

*T. polycarp* rous: leaves with lines long, 3-lobed; the segments on very slender lines long, on their thin walls 2 lines long.

*T. Fendleri* 3 to 5 cauline leaves deeply cordate lobed, their divisions numerous; anthers in the heads, structure straightish, ribs the median Siskiyou mountains Rocky Mountains

*T. venulos* rous, the stem, or whitened: s

**A. trifolia** L. Sp. i, 540. Involucral leaves with rare exceptions regularly trifoliate; leaflets ovate-lanceolate, rather regularly serrate, large, in well developed specimens 2 to 3 inches long, and more than an inch wide; radical leaves subsimilar, but sometimes 5-foliolate: peduncle long and slender, usually more than 2 inches in length: flowers large, 15 to 16 lines in diameter: sepals white or pinkish: carpels in a globular head. Idaho, Sandberg, to the Atlantic States and Europe.

§ 3. **OMALOCARPUS** DC. Style short, not plumose. Mature achenes smooth, orbicular, much compressed, wing-margined. Involucre sessile, palmately parted or cleft. Peduncles 1-several.

**A. narcissiflora** L. Sp. i, 542. Villous: radical leaves palmately 3-5-parted; segments cuneiform, incisely many-cleft into linear lobes: involucral leaves similar, 3-5-cleft, sessile: peduncles several, umbelled, leafless: sepals white: carpels roundish-oval, much compressed. Alpine: Idaho to Alaska and the Rocky Mountains.

3 **THALICTRUM** Tourn. Inst. 270. L. Gen. n. 597.

Tall, usually smooth perennial herbs with 2- or 3-ternately compound leaves and dioecious or polygamous flowers in panicles. Sepals 4-8, white or greenish, petaloid. Petals none. Stamens several; with linear anthers on rather long almost capillary filaments. Pistils few-several, becoming ribbed or veined achenes that are tipped with the persistent style.

**T. sparsiflorum** Turcz. in E. & M. Ind. Sem. i, 40. Stem firm, erect, 1-6 feet high, with ascending branches: leaves 3-ternate, ample, the lowest petioled; leaflets approximate, short-petioled, thinnish, round- or spatulate-oblong, 3-15 lines long, slightly cordate at base, divided above into 3 obtuse or short-acuminate lobes that are again incised: flowers perfect, not large, erect or soon nodding on slender pedicels in a short, branched, leafy panicle: leaves obovate, whitish, soon reflexed: stamens 10-25, the short exerted filaments widened to the pointless elliptical anthers: achenes 9-15, short-stipitate, obliquely obovate, with 4 or 5 low, often forked nerves on each side. From the mountains of California to Alaska and Colorado.

**T. polycarpum** Watson Bot. Cal. ii, 424. Stout, 3-8 feet high, glabrous: leaves with short petioles or the upper sessile; leaflets variable, 3-12 lines long, 3-lobed with acute or acuminate lobes: panicle narrow: flowers dioecious; the staminate usually crowded, on short pedicels; anthers acute, on very slender filaments: fruit in dense heads; achenes compressed, 3-5 lines long, on a short stipe. obovoid, turgid, tapering into a reflexed beak their thin walls with free, or anastomosing low veins: seed slender, terete, 2 lines long. Along small streams from the Columbia river to California.

**T. Fendleri** Engelm. in Gray Pl. Fendl. 5. Stems 1-3 feet high, with 3 to 5 cauline leaves, the lower ones petioled; the stalked remote leaflets often deeply cordate with three divergent lobes, the central or all of them again lobed, their divisions rounded or mucronate-pointed: flowers dioecious; stamens numerous; anthers linear, 1-2 lines long, mucronate; achenes few to numerous in the heads, substipitate, 2-3 lines long, obliquely oval or with the dorsal suture straightish, thin-walled, flattened, with 8 to 10 prominent nearly parallel ribs the median heaviest, not filled by the oblong or linear seed. From the Siskiyou mountains, in southern Oregon, to Arizona, New Mexico, and the Rocky Mountains.

**T. venulosum** Trelease Proc. Bost. Soc. xxiii, 302. Glabrous and glaucous, the stem, petioles and sepals purple-tinted, the foliage typically pale or whitened: stem simple, erect, 7-20 inches high: stem leaves 2 or 3, long

petioled, 3-4-ternate; leaflets approximate, petiolulate, moderately firm, rounded and lobed at the apex, rugose-veiny beneath: panicle simple, narrow, its short erect branches few-flowered: flowers dioecious, small; sepals ovate: stamens 10-20, on slender filaments; anthers oblong, slender-pointed: achenes about 8, nearly sessile, 2 lines long, ovoid, tapering into a straight beak, thick-walled, 2-edged, with 4 or 5 longitudinal grooves and rounded ridges on each side: seed ovoid, pointed at one end, filling the achene. Klickitat Co, Washington to Brit. Columbia and Wyoming.

**T. occidentale** Gray Proc. Am. Acad. viii, 372. Stem slender, 1-3 feet high; leaves 2-4-ternate, the lowermost petioled; leaflets thin, 3-10 lines long, 3-9-lobed at the summit, sparingly glandular-puberulent beneath: flowers dioecious, rarely polygamous, nodding, on very slender pedicels, in an ample open panicle: filaments purplish, slender; anthers linear, cuspidate: achenes 1-10 in each head, lanceolate or somewhat falcate, 4-7 lines long, tapering below into a short stipe, and above into a long one-sided curved beak, acutely 8-10 ribbed. Along streams, and moist shady places, Brit. Columbia to California, west of the Cascade Mountains.

4 MYOSURUS Dillenius Gies. 106, t. 4. L. Gen. n. 394.

Little annuals with linear or linear-spatulate entire leaves, and solitary flowers on simple scapes. Sepals 5 or 6, spurred at base. Petals as many as sepals, on long claws, with a pit at the summit. Stamens 6-20. Achenes with a prominent costa terminating in an erect or more or less spreading beak, numerous on a slender or conical receptacle. Ovule suspended.

**M. minimus** L. Sp. i, 284. Leaves linear: scapes 1-4 inches high, about equaling the leaves; receptacle in fruit an inch or more high: achenes quadrate with a broad back, truncate at the apex; beak short, appressed: seed oval. In wet places, Willamette valley to California and the Atlantic States and Europe.

**M. apetalus** Gay Hist. Chil. Bot. i, 31, t. 1, fig. 1. Scapes 1-2 inches high, usually spreading, but little surpassing the linear leaves; petals often wanting: spike of achenes 3-10 lines long, ovoid-oblong and more or less squarose, or cylindrical: achenes oblong, thin-walled, with narrow, prominently carinate back prolonged into a spreading or ascending beak: seed oblong. In alkaline places, California to Brit. Columbia east of the Cascade Mountains: also Chili.

**M. lepturus**. *M. apetalus* var. *lepturus*, Gray, Bull. Torr. Club, xiii, 2. Scapes in fruit 3-6 inches high, erect, surpassing the linear-spatulate leaves: receptacle in fruit 3-24 lines high: achenes with broad, distinctly carinate back, and short, appressed beak: seed elongated-oblong. Common in wet places, from California to Brit. Columbia and the Rocky Mountains.

**M. sessilis** Watson Proc. Am. Acad. xvii, 362. Scapes very short or none: fruiting heads several, crowded, much shorter than the leaves: receptacle short and thick, often sessile, 1-6 lines long by 1-2 lines thick at base; achenes oval, scarious-utricular, with narrow salient keel, and subulate, erect beak: seed short-oval. A rare species, the only locality known, being an alkaline flat seven miles south of Arlington Oregon.

*Tribe 3. Ranunculeæ, DC. Sepals imbricated in the bud. Pistils numerous, rarely few, 1-ovuled, becoming achenes. Ovule ascending. Herbs with alternate cauline leaves.*

5 TRAUTVETTERIA Fischer & Meyer Ind. Sem. 1835, 22.

Herbs with palmately lobed alternate leaves, and small flowers in terminal corymbose panicles. Sepals usually 4, concave, petal-

oid. Petals no  
4-angled men

**T. grandis**  
leaves few, thin  
7-lobed with ir  
achenes a little  
suptly beaked by  
Mountains from

6

Aquatic he  
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achenes transv  
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**B. aquatilis**  
*utilis* L., Glabr  
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cles thicker than  
sepals deciduou  
not longer than  
reticulated, sho  
Alaska, Europe

**B. trichophyllum**  
*trichophyllum* Gr  
leaves all subme  
segments which  
long, longer than  
shorter than the  
several, in a clos  
litches: Oregon

**B. Lobbl.** *Robl.*  
long: leaves  
at base, deeply  
al ones usually  
leaves none or r  
than the petiole  
long, obovate-ob  
terminal stigma  
about a line lon  
dry in summer,

7 RA.

Herbs with  
ary or scatt  
and reflexed.  
small pit or s  
usually numer  
nd beaked w  
he sides. Ovu

§ 1 HALODE  
thin-walled an  
r sparingly b  
cale near the

oid. Petals none. Pistils numerous, capitate, becoming inflated, 4-angled membranaceous achenes.

**T. grandis** Nutt. in T. & G. Fl. i, 37. Stem slender, 1-3 feet high: leaves few, thin, radical long-petioled, cauline short-petioled, all deeply 5-7-lobed with irregularly laciniate-toothed, acuminate lobes; flowers white: achenes a little more than a line long, broadly gibbous at base, rather abruptly beaked by the slender revolute style. Along streams in the Cascade Mountains from California to Brit. Columbia.

6 BATRACHIUM S. F. Gray Brit. Pl. ii, 720.

Aquatic herbs with the submersed leaves if any finely dissected into capillary divisions. Sepals 5, plain. Petals white with yellow base, and a naked nectariferous spot on the claw of each. Achenes transversely wrinkled on the sides. Peduncles solitary, opposite the leaves.

**B. aquatile** Du Mortier Bull. Bot. Soc. Belg. ii, 207. *Ranunculus aquatilis* L. Glabrous: stems 6-20 inches long: floating leaves round-reniform, 5-9 lines in diameter, 3-5-lobed, the lobes coarsely crenate-toothed: peduncles thicker than the petioles, 8-10 lines long, spreading or recurved in fruit: sepals deciduous: flowers white, 5-10 lines in diameter: style subulate, not longer than the ovary, introrsely stigmatic: receptacle hairy: achenes reticulated, short-beaked. In ponds and shallow streams, California to Alaska, Europe and Asia,

**B. trichophyllum** Bosc Prodr. Fl. Bat. 5. *Ranunculus aquatilis* var. *trichophyllum* Gray. Annual: stems coarsely filiform, 2-20 inches long: leaves all submersed, round-reniform in outline, cut into numerous capillary segments which are 4-10 lines long, short-petioled: peduncles 1-2 inches long, longer than the petioles: flowers 3-5 lines in diameter: style subulate, shorter than the ovary introrsely stigmatic: receptacle hairy: achenes several, in a close globular head, glabrous obliquely oblong. In ponds and bitches: Oregon and Washington and across the continent.

**B. Lobbii**. *Ranunculus Lobbii* Gray. Glabrous annual: stems 6-12 inches long: leaves commonly all floating, 3-9 lines wide, truncate or cordate at base, deeply 3-lobed, middle lobe usually elliptical and entire, the lateral ones usually oblong and with a broad notch in the apex; submersed leaves none or rudimentary: peduncles opposite the upper leaves, thicker than the petioles 6-8 lines long: sepals a line long, persistent: petals 2 lines long, obovate-oblong: stamens 5-9: style long and filiform, with a small terminal stigma: receptacle glabrous: achenes 4-6, finely rugose, obovate, about a line long, embraced by the persistent calyx. In pools that dry in summer, Oregon and California.

7 RANUNCULUS Tourn. Inst. 285. L. Gen. n. 690.

Herbs with alternate, entire or variously lobed leaves, and solitary or scattered flowers. Sepals 5, plain, commonly colored and reflexed. Petals 1-15, usually broad and conspicuous, with a small pit or spot covered by a scale, on the claw inside. Achenes usually numerous, in a globose to oblong head, usually flattened, and beaked with the persistent style, not transversely rugose on the sides. Ovule ascending.

§ 1 **HALODES** Gray Proc. Am. Acad. xxi, 366. Mature carpels thin-walled and utricular, compressed, striate with several simple or sparingly branched nerves. Petals yellow with a nectariferous scale near the base, deciduous with the sepals.

**R. Cymbalaria** Pursh Fl. ii, 392. Flowering stems 3-6 inches long, 1-7-flowered: leaves broadly ovate or ovate-cordate, coarsely crenate, clustered at the base and joints of the long filiform rooting runners: petals yellow, 2 lines long, longer than the sepals: mature achenes a line long, striate-veined on the sides, apex blunt, with a short oblique beak: heads oblong, 2-6 lines long. In wet saline places; California to Alaska and the Atlantic States.

§ 2 **EURANUNCULUS** Gray l. c. Mature carpels crustaceous or firm-coriaceous, the sides nerveless. Petals usually yellow, with a nectariferous spot or pit and scale near the base.

\* Amphibious, the submersed leaves cut into numerous filiform divisions: petals yellow, with a broad scale at the base: achenes with a broad white caruncle.

**R. delphinifolius** Torr. in Eat. Man. ed. 4, 424. ? Glabrous: annual: stems floating, a foot or two long: submersed leaves dissected into several-times forked capillary divisions; emerged leaves round or reniform, vari-ously lobed or cleft: peduncles stout, 2 inches or more long: petals 5-8, 4-6 lines long, much longer than the sepals; scale  $\frac{1}{2}$  as long as its petal, in-rolled and its edges joined together for half its length: achenes strongly margined, and pointed with a stout curved beak. In ponds that are dry part of each year, Western Oregon and Washington.

**R. himosus** Nutt. T. & G. Fl. i, 20. Subaquatic, soft-villous, procumbent; leaves reniform, palmately 5-cleft, the segments 2-3-toothed or somewhat lobed, the divisions blunt, short and shallow; stems 1-2-flowered: petals 3 lines long, rounded, longer than the sepals: achenes small, scarcely keeled, with a short, nearly straight, subulate beak. Margins of brackish lakes, plains of Idaho and Utah.

\*\* Subaquatic, with entire or merely denticulate or crenulate, petioled leaves; petals 5 or more; achenes in a globular head, subulate-beaked.

**R. reptans** L. Sp. 549. *R. Flammula* var. *reptans* Meyer Pl. Lab. 96. Stems filiform, creeping and rooting at the joints, 4-12 inches long: leaves lanceolate to linear, acute at both ends, glabrous, entire: flowers 2-5 lines wide; petals obovate: achenes barely a line long, roundish-ovate, tipped with a slender curved-beak. Common in wet places, Oregon to Alaska, New York and Canada.

**R. microlonchus** Greene Eyth. iii, 122. Perennial, the rather large cluster of fleshy-fibrous roots supporting a tuft of erect lanceolate leaves and a single slender tortuous, often partly reclining, leafy and few-flowered stem: leaves all entire, acute at both ends, the radical 1-2 inches long, on slender petioles as long, narrowly lanceolate, nearly glabrous above, but rather densely appressed-pubescent beneath; cauline few, relatively somewhat broader, with short petioles or sessile: flowers 1-several, yellow, 4 lines broad: sepals spreading: petals 5-8, obovate, obtuse; achenes few, in a depressed-globose head, obliquely obovoid, slightly narrowed at base, tipped with a short stout blunt style, moderately compressed, marginless, smooth and glabrous. Collected by E. L. Greene in N. Idaho, Aug. 1889.

**R. Unalaschensis** Bess. in Ledeb. Fl. Ross. i, 32. *R. Flammula* var. *intermedius* Hook. Fl. i, 11. Stems decumbent and creeping, 4-12 inches long leaves all lanceolate or linear-lanceolate, entire or nearly so, 1-2 inches long, tapering below into the petiole: petals obovate, 2-3 lines long; achenes roundish-ovate, with a short oblique beak, in small globular heads. In wet places, Idaho to Alaska.

**R. samolifolius** Greene Pitt. iii, 13. Stems several from a perennial root, weak, somewhat flexuous and half reclining, 6-10 inches long, leafy throughout, simple and 1-flowered or branched and several-flowered: her-

bage light green  
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ra Nevada Mou-

**R. Gormanii**  
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at base, rooting  
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glabrous, moder-  
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Springs, Crater

**R. alismellus**  
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**R. Populago** C  
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leafy, the whole  
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ate, sessile: ped-  
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**R. Bolanderi**  
or the peduncles  
leaves lanceolate  
blade 4-6 inches  
and short-petiole  
as long as the ro-  
moderately com-  
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+ Radical le-  
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**R. glaberrimus**  
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of the oval sprea-  
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**R. ellipticus** C  
inches high, from  
leaves elliptical,  
the cauline narrow  
ing, sometimes

bage light green, glabrous or nearly so, leaves all entire, obtuse, radical ones oblanceolate, long-petioled, 2-4 inches long; cauline lanceolate to obovoid or oval, the upper ones with very short dilated and thin sheath-like petioles: sepals roundish, spreading, thin: petals 5-8, broadly obovate, 2-3 lines long, golden yellow: achenes obovate, moderately compressed, obscurely margined, obliquely tipped with a short style. Very common in wet places in the Willamette valley, and from W. Washington to the Sierra Nevada Mountains in California.

**R. Gormanii** Greene Pitt. iii, 91. Stems several, from a fascicle of perennial, thick but slenderly tapering fleshy-fibrous roots, simple, prostrate at base, rooting and bearing leaves at 2-3 nodes, the terminal part naked, ascending and scapiform, bearing a solitary small flower: leaves broadly ovate or deltoid-ovate, acute, coarsely few-toothed, 6-9 lines long, glabrous, on almost filiform somewhat pilose-hairy petioles 1-3 inches long: petals 5, oblong, obtuse, twice the length of the spreading sepals: achenes small, glabrous, moderately compressed, with a slender curved beak as long as the body. Collected by *Mr. M. W. Gorman* on wet banks at Cathedral Springs, Crater Lake, southern Oregon, Aug. 22nd, 1896.

**R. alismellus** Greene Fl. Fr. 297. *R. alismefolius* var. *alismellus* Gray. (Glabrous; stems slender 2-12 inches long; radical leaves ovate or elliptical to oblong or cordate, 6-15 lines long, o. long slender petioles; cauline 1-2 or none, narrower, subsessile: flowers solitary, 4-7 lines broad, on long slender peduncles: achenes few, the mature ones unknown. In wet meadows on the highest mountains, Washington to California.

**R. Populago** Greene Eryth. iii, 19. *R. Cusickii* Jones Proc. Cal. Acad. new series v. 615. Stem solitary, from a fascicle of fibrous roots, erect, leafy, the whole plant flaccid and glabrous, 6-10 inches high: leaves thin-membranaceous, from round-reniform to cordate-ovate, obtuse, entire or obscurely crenate, long petioled; the cauline smaller, ovate and ovate-lanceolate, sessile: peduncles many, slender, longer than the cauline leaves to which they are axillary: flowers yellow, 4 lines broad: petals 5-6, obovate-oblong: heads of rather numerous thick short-pointed achenes small, globose or depressed-globose. Mountains of eastern Oregon and Idaho.

**R. Bolanderi** Greene, Bull. Calif. Acad. ii, 58. Glabrous throughout or the peduncles and calyx pubescent: stem stout, erect, 1-3 feet high: leaves lanceolate, sparingly callous-denticulate, obtuse, the lower ones with blade 4-6 inches long on petioles 5-12 inches long, the cauline ones few and short-petioled or subsessile; petals broadly obovate 3-5 lines long, twice as long as the rounded spreading sepals; scales minute: achenes smooth, moderately compressed, pointed with a slender beak, crowded in a compact ovoid head. In wet places, Willamette valley to northern California.

\* \* \* Terrestrial species with at least some lobed or divided leaves, and no stoloniferous rooting or creeping stems except in *R. repens*.

+ Radical leaves few, only lobed: achenes turgid and dorsally rounded, in a globose head.

**R. glaberrimus** Hook. Fl. i, 12, t. 5, Fig. A. Glabrous: stems weak, 2-6 inches long, erect or decumbent: leaves all petioled, radical broadly oval, rounded and coarsely toothed or lobed at the apex; cauline subcuculate, trifid or entire: petals 5, obovoid, 4-6 lines long, twice the length of the oval spreading sepals: achenes plump, puberulent, slender-beaked, in large globose heads. In wet places, eastern Washington and northward: flowering in very early spring.

**R. ellipticus** Greene Pitt. ii, 110. Very glabrous: stems several, 2-3 inches high, from a large fascicle of perennial fleshy-fibrous roots: radical leaves elliptical, entire, acutish at both ends, the petiole equaling the blade; the cauline narrower, often cleft into 2-3 linear divisions: petals often wanting, sometimes 1 only, or 5, large, broadly obovate or more rounded, bright



yellow: achenes numerous, in a large globose head, plump, smooth, tipped with a short curved beak: peduncles recurving in fruit until the heads rest on the ground. In wet places from the Blue Mountains of Oregon to eastern California and the Rocky Mountains.

**R. digitatus** Hook. Kew Misc. iii, 124, t. 4. Less than a span high from a cluster of short and downwardly tuberous-thickened roots; glabrous: leaves few, petioled, entire and lanceolate, or digitately or somewhat pedately lobed the 3 to 5 segments narrowly lanceolate or oblong-spatulate, obtuse: flowers 3 or 3, terminal, 5 to 10 lines in diameter, with 5 to 11 oblong-spatulate petals: fruit subglobose, achenes beaked with the subulate recurved style. Mountains of southern Idaho Nevada, Utah, and Wyoming,

+ + Leaves all 2-4-ternately parted or divided into numerous narrow divisions: achenes turgid, subulate-beaked, dorsally marginless, smooth or nearly so. Low perennials with fibrous-fascicled roots.

**R. triternatus** Gray Proc. Am. Acad. xxi, 370. Stems ascending, 2-6 inches long: leaves usually triternately divided and parted; primary divisions petiolulate, lobes filiform-linear to linear-spatulate, obtuse: inflorescence secund: peduncles stout, 2 inches long, at length recurved and the heads resting on the ground: petals broadly obovate, 4-6 lines long: achenes very turgid, rounded on the back, slender-beaked, the head globose with a thick globular receptacle. Klickitat Co. Washington, on the highest hills opposite the Dalles; flowering in very early spring.

**R. eximius** Greene Eryth. iii, 19. Radical leaves very few, often only one, on short stout petioles 1-2 inches long, the blade of cuneate-obovate or almost flabelliform outline deeply about 7-lobed at the broad summit, otherwise entire: upper cauline leaves sessile, broadly cuneiform, an inch long, cleft to the middle into about 5 lanceolate or broadly linear lobes: periphery of the expanded large corolla quite circular by the overlapping of the numerous broadly obovate or almost obovate yellow petals. Alpine or subalpine, Idaho and Wyoming to the Rocky Mountains.

+ + + Leaves mostly cleft or more divided, some radical ones undivided but at least crenate or dentate: achenes turgid or lenticular, marginless: high mountain perennials with rather large flowers.

**R. Suksdorfii** Gray Proc. Am. Acad. xxi, 371. Glabrous: stems 4-10 inches high from a fascicle of fleshy-fibrous roots, 1-3-flowered; leaves small, somewhat reniform, 3-5-cleft or parted, divisions of the radical ones 3-5-cleft or incised, of the cauline linear; petals round-obovate, retuse, 4-6 lines long, deep yellow: achenes glabrous, turgid-lenticular, acutish-edged, tipped with an almost filiform long style. In damp ground on Mount Adams, Washington at 6000 to 7800 feet elevation.

**R. Eschscholtzii** Schlecht. Animad. Ranunc. ii, 16, t. 1. Stems ascending, 6-12 inches long, 1-3-flowered: leaves roundish in outline; radical all 3-5-parted or deeply cleft, and their obovate or cuneate divisions mostly lobed or incised; cauline similar or with oblong to spatulate or lanceolate and often entire divisions: petals 3-6 lines long: achenes glabrous, with slender-subulate and mostly straight style of more than half their length; heads oblong. Alpine, in the Cascade Mountains to Alaska and the Rocky Mountains.

**R. cardiophyllus** Hook. Fl. i, 14, t. 5. Hirsutely pubescent: stems robust, 10-12 inches high: radical leaves round-cordate, coarsely crenate to 3-7-cleft; cauline nearly sessile, palmately many-cleft, the linear lobes incisely crenate: petals golden yellow, broadly oval, very obtuse, twice as long as the spreading sepals: achenes small, roundish, tipped with a long hooked style. On high mountains, Oregon to Alaska, Canada and the Rocky Mountains.

+ + + Slender-rooted annual, with small flowers and achenes.

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in Bear Valle

**R. eremogenes** Greene Eryth. iv, 121. *R. scleratus* of authors as to the western plant. Glabrous: stem erect, stout and fistulose, 6-30 inches high, sparingly leafy, simple below, loosely corymbose-paniculate above, herbage light-green; lower leaves round-reniform, deeply 2-5-lobed, the lobes obtusely-toothed above; upper leaves more deeply and narrowly cut: petals light yellow, surpassing the sepals: achenes numerous, smooth, flattened, with very short beak, crowded in a short-oblong head: the oblong-ovoid receptacle much inflated. Wet springy places, northern California to Brit. Columbia and the Rocky Mountains; east of the Cascade Mts.

+ + + + + Leaves variously cleft or divided: achenes compressed, usually flat, surrounded by a firm or indurated margin: none truly alpine.

-- Radical leaves not divided into separate leaflets: petals usually only 5: achenes smooth or barely pubescent, in globose or oblong heads.

= Style long, recurving, wholly persistent in a rigid and uncinatè, elongated beak.

1 Perennials with erect stems from somewhat fleshy-fibrous roots.

**R. occidentalis** Nutt. T. & G. Fl. i, 22. Pilose with spreading hairs: stems rather slender, 10-18 inches high, at length much branched: radical leaves orbicular, subcordate, more or less deeply 3-lobed, or 3-parted, and coarsely toothed, an inch or less in diameter; cauline leaves deeply cut into 3-5 linear lobes: petals obovate-oblong, 3-7 lines long, twice as long as the reflexed sepals: achenes smooth or nearly so, flat, a line in diameter; beak nearly as long as the body; heads globose. Common in dry open places, Oregon to Alaska and the Rocky Mountains,

**R. Elseni** Kellogg Proc. Cal. Acad. vii, 115. Sparingly villous: stems slender, at length widely branched above, 1-2 feet high: leaves rather small, not cordate at base, palmately 3-lobed or 3-parted, the broad cuneiform lobes of the radical ones trifid: petals obovate-oblong, 3-5 lines long, twice as long as the reflexed sepals: achenes broad and rounded, compressed and thin, glabrous, tipped with a short recurved beak. In dry ground, mountains of southern Oregon to middle California.

**R. Rattani.** *R. occidentalis* var. *Rattani* Gray Proc. Am. Acad. xxi, 372. More or less villous with long white hairs: stem slender, 1-2 feet high, widely branching above: leaves palmately 3-parted or 3-lobed, not cordate at base, the broad cuneiform lobes of the radical ones trifid: sepals 2-3 lines long, reflexed; petals obovate-oblong, 4-6 lines long or more: achenes becoming roughish-papillose, and sparsely or thickly beset with short hairs. Dry ground, southern Oregon and northern California.

**R. Howellii** Greene ms. *R. occidentalis* var. *Howellii* Greene Pitt. iii, 14. *R. canus* Howell P. C. Pl. No. 1331. not Benth. Stems slender, smooth, 1-2 feet high, widely branched above: leaves broadly cuneate, palmately 3-5-lobed or -parted, the cuneiform segments 3-toothed or -lobed, canescent with a long appressed-silky pubescence: sepals ovate, acute, pubescent outside, soon reflexed, 2-3 lines long: petals obovate-oblong, 4-6 lines long or more: achenes rather small, smooth, tipped with a subulate, slightly hooked to almost straight, elongated style. Dry hillsides about Ashland Oregon, extending to near the Klamath river in California.

**R. ciliosus.** Soft-pubescent with moderately long, white, at length spreading hairs: stems 1-several from a fascicle of fleshy-fibrous perennial roots, erect or ascending: lower leaves 3-parted, the obovate or oblanceolate segments acutely 2-5-lobed; the cauline 3-parted, the acute lanceolate segments entire or 2-3-lobed; the uppermost lanceolate and entire: sepals ovate, acutish, 2-3 lines long, soon reflexed; petals broadly obovate, 4-6 lines long: young achenes roundish, ciliate on the outer edge, tipped with a long subulate hooked style: mature achenes not seen. Moist banks, in Bear Valley, Blue Mountains, Oregon. Howell. May 23, 1885.





**R. Greenel.** *R. occidentalis* var. *Lyallii* Gray Proc. Am. Acad. xxi, 373. *R. tenellus* var. *Lyallii* Robinson in Gray Syn. Fl. i, 33. Hispidly hirsute with tawny hairs, or the upper parts nearly smooth: stem usually solitary, erect, 1-3 feet high, with few-several slender erect branches: leaves rather few, thin, 1-3 inches in diameter, cordate, deeply 3-cleft, the broadly-obovate divisions acute, 3-5-cleft and acutely toothed: flowers small, on slender pedicels, the pale yellow petals 1-3 lines long, not surpassing the spreading sepals achenes in rather dense globose heads, scarcely a line broad, minutely papillose and hispid, tipped with a long slender-subulate curved and hooked beak. Common in open Fir forest, Oregon to Brit. Columbia and northern Idaho.

2 Winter annuals.

**R. Douglasii.** *R. tenellus* Nutt, T. & G. Fl. i, 23. not *Viviani*. Stem solitary, slender or moderately stout, branching, 1-3 feet high: radical leaves long-petioled, 3-parted or trifoliolate, the divisions deeply 3-lobed and the lobes acutely 3-toothed; cauline similar, or the upper 3-parted with linear lobes, or reduced to a single linear-lanceolate leaf or bract, all sparingly pubescent with small appressed hairs: sepals greenish, pubescent outside, oblong, obtuse, 1-2 lines long: petals broadly spatulate, a third longer than the reflexed sepals, attenuate below to a claw: achenes smooth, tipped with a short stout hooked beak. Common in moist places and river bottoms, California to Brit. Columbia.

**R. PARVIFLORUS** L. Sp. ed. 2, i, 780. Soft-pubescent with spreading hairs: stem erect, slender or stoutish, simple-much branched, 2-12 inches high; lower leaves 3-parted; the broad segment deeply 3-7-lobed; cauline leaves trifoliolate, the broad cuneiform leaflets deeply cut into 3-5 lanceolate acute lobes: sepals about a line long, oblong, obtuse, subsistent: petals obovate, attenuate below to a claw, about as long as the sepals, subsistent: achenes few, in a loose globose head, papillose-hispid with short hooked hairs, tipped with a very short, hooked beak. In the shade of bushes and rocks, from the Columbia river to southern Oregon. Introduced from Eu.

= = Style comparatively short.

**R. Californicus** Benth. Pl. Hartw. 295. More or less pilose or hirsute: stems erect or nearly so, 6-25 inches high, from a cluster of somewhat thickened fibrous perennial roots: radical leaves usually pinnately ternate, the leaflets laciniately cut into 3-7 usually linear lobes or parts: flowers 5-10 lines in diameter; petals 5-15, narrowly obovate, deep glossy yellow, longer than the reflexed sepals: achenes nearly 2 lines long, much flattened and with sharp edges, tipped with the short curved beak: heads compact, ovate or globular. Dry or moist ground, southern Oregon near the coast, and California.

\*\* Stems erect or ascending, not stoloniferous: roots fibrous, of short duration: ovaries with the stout subulate style stigmatose for much of its length, persisting in a straight or merely oblique beak.

**R. Pennsylvanicus** L. f. Suppl. 272. Hirsute with rough spreading hairs: stem stout, erect 1-2 feet high: leaves ternate; the somewhat ovate acute leaflets 3-cleft, the divisions sharply cut and toothed: petals pale yellow, not longer than the spreading sepals: achenes flat, tipped with the short straight beak, crowded in an oblong head. In damp places, eastern Oregon to Brit. Columbia and the Eastern States.

**R. Macounii** Britton Trans. N. Y. Acad. xii, 3. *R. hispidus* Pursh Fl. ii, 395, not Michx. Stems ascending or declined, usually hirsute with spreading hairs, stout, 1-2 feet long: leaves all ternately compound; segments oval, acute, laciniately toothed: flowers few, middle-sized, rather long-peduncled; petals obovate, about 3 lines long, surpassing the spreading or hardly reflexed soon deciduous sepals; achenes mostly 1½ lines long, smooth, tipped with a stout straight flat-subulate beak, in globular or at

most oval head

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most oval heads. Washington to Brit. Columbia and Canada.

**R. Oregonus.** *R. hispidus* var. *Oregonus* Gray Proc. Am. Acad. xxi, 376. Smooth or somewhat pubescent below with scattered hairs: stem stout,  $\frac{1}{2}$ -3 feet high, usually several from the fascicle of annual roots: leaves ample, trifoliate; the broadly-ovate leaflets deeply 3-lobed; lobes mostly lanceolate, serrate above the middle: petals obovate, 3-4 lines long, twice as long as the reflexed sepals: achenes flat with a prominent border, 1- $\frac{1}{2}$  lines long, tipped with a short subulate beak, in a large dense oblong or oval head. Shady, and wet places about the mouth of the Willamette river.

\*\* \*\* \* Stems prostrate and stoloniferous.

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**R. REPENS** L. Sp. i, 554. Pubescent; stems 1-2 feet long, trailing, rooting at the lower joints: leaves ternately parted and often subdivided: sepals spreading: petals 5; achenes  $1\frac{1}{2}$  lines long, rather sharply margined, the nearly straight beak about  $1\frac{1}{2}$  lines long. Naturalized in various places from California to Brit. Columbia.

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**R. septentrionalis** Poir. Dict. vi, 125. Coarsely hirsute to glabrous: stems stout, 1-3 feet high: often stoloniferous: leaves nearly all pedately and pinnately 3-foliolate; leaflets 3-parted and sharply incised: flowers large, often more than an inch broad: achenes strongly compressed, rather gradually contracted into a long flat beak; heads ovoid. Northern Idaho and eastward to New Brunswick.

\*\* \*\* \* Style more or less elongated and attenuate upwards, stigmatose at the tip only: petals 5-15: roots perennial.

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**R. orthorhynchus** Hook. Fl. i, 21, t. 9. Hirsute to nearly glabrous: stems erect or ascending, 1-2 feet long, usually several from the fascicle of thick fibrous roots: leaves mostly oblong in outline, pinnate, with 5-7 usually cleft or incised leaflets; petals narrow obovate purple outside, 4-6 lines long, much surpassing the reflexed sepals: achenes not very numerous, ovate, nearly 2 lines long, strongly margined, tipped with a slender-subulate, rigid and quite straight beak about the same length. In wet places, western Oregon to Brit. Columbia.

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**R. maximus** Greene Bull Torr. Club, xiv, 118. *R. orthorhynchus* var. *platyphyllus* Gray l. c. 377. Pilose or hirsute with spreading hairs: stems stout, 1-4 feet high, ascending or trailing, but not rooting: radical leaves pinnate, 2-8 inches long, on long petioles; leaflets deeply 3-cleft or -parted, the divisions laciniately 3-9-toothed: sepals ovate, acute, 3-4 lines long, hirsute outside, soon reflexed: petals obovate-oblong, rounded at the summit, short clawed, 5-9 lines long, yellow with a dark base: achenes strongly margined, tipped with a rigid, subulate, straight or slightly incurved beak as long as the body. In wet places, Oregon and Washington to California and the Wahsatch Mountains.

+ + + + + Annuals or biennials with muricate-echinate achenes.

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n, eastern

**R. MURICATUS** L. Sp. 1, 555. Glabrous: stems rather stout, 4-8 inches high; leaves roundish or reniform, coarsely toothed: petals pale yellow, longer than the sepals: achenes very large, flat, the sides coarsely muricate-prickly, surrounded by a wide sharp smooth margin; beak stout and straight. In wet places, Umpqua valley Oregon. Introduced from Europe.

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*Tribe 4. Helleboreæ DC. Sepals imbricated in the bud, petaloid. Petals small or irregular or none. Carpels few, becoming several-seeded follicles.*

\* Perennial herbs. Flowers regular. Follicles 5-15.

⊗ **CALTHA** L. Gen. n. 703.

Smooth marsh plants with mostly radical, cordate or reniform

leaves and white or yellow flowers. Sepals 5-15. petaloid. Petals none. Stamens numerous. Pistils 5-15, several ovuled, becoming several-seeded. flattened follicles that are dehiscent their whole length on the inner edge.

**C. leptosepala** DC. Syst. i, 310. Stems erect, 2-8 inches high, 1-2-flowered; the lower flower subtended by a petaloid lanceolate bract: leaves roundish- to oblong-cordate, longer than wide, irregularly crenate-toothed: sepals white tinged with purple outside, lanceolate, acute, 5-8 lines long: follicles obscurely stipitate. Wet meadows, Mount Adams Washington to the Rocky Mountains and Alaska.

**C. biflora** DC. Syst. i, 310. Stems scape-like, 5-12 inches high, 1-2-flowered: leaves round-reniform, with broad overlapping base, broader than long, 1-4 inches broad, obscurely crenate: sepals white, oblong to spatulate, obtuse, 6-10 lines long: follicles distinctly stipitate when mature. In cold bogs and rivulets of high mountains. California to Alaska.

**C. palustris** L. Sp. i, 784. Stems erect or ascending, rather thick and succulent, 6-10 inches long or more, corymbosely or dichotomously branched above: lower leaves 2-4 inches broad, cordate or reniform, on petioles 3-9 inches or more long, crenately or acutely dentate, or quite entire; cauline leaves on shorter petioles: flowers few, pedunculate, yellow; sepals 5-6, broadly oval, 6-9 lines long: follicles oblong, somewhat curved, mucronate with the, at length, nearly straight style. In marshes, Oregon to Alaska and the Atlantic States and Canada.

9 § TROLLIUS L. Gen. n. 700.

Glabrous perennial herbs with palmately lobed or dissected leaves, and few or solitary yellow or lilac flowers. Sepals 5-15, regular, petaloid, deciduous. Petals 5-8, small, 1-lipped, tubular at base. Stamens and ovaries numerous. Follicles sessile, somewhat cylindrical, many-seeded. Seeds oblong with a smooth crustaceous testa.

**T. laxus** Salisb. Trans. Linn. Soc. viii, 303. Stems erect, 1-2 feet high: leaves palmately divided; the segments many-cleft: sepals 5-6, spreading, ochroleucous with a tinge of green beneath: petals 15-25, deep orange-yellow. Headwaters of the Skokomish river, Olympic Mountains Washington, and the eastern States.

10 § COPTIS Salisb. Trans. Linn. Soc. viii, 305.

Low, smooth and shining evergreen herbs with 1-3-flowered scapes and ternate or quinate leaves. Flowering in very early spring. Sepals 5-7, petaloid. Petals as many, thread-like, enlarging and cucullate near the upper end or near the middle. Stamens 10-25. Follicles 3-12, stipitate, several seeded. Seeds with shining crustaceous testa.

§ 1. **CHRYSA** Gray Gen. Ill. i, 38. Sepals oval. Petals shorter than the stamens, clavate, with enlarged and thickened, hollow, nectariferous summit. Leaflets 3, rarely 5, subsessile and undivided. Scapes 1-flowered.

**C. trifolia** Salisb. l. c. Leaves trifoliate; leaflets cuneiform-obovate, mucronately toothed, obscurely 3-lobed, about an inch long: scapes slender, 3-5 inches high, 1-flowered: sepals 5-7, oblong, obtuse, white: petals shorter than the sepals, cucullate-obconic, white with yellow base, soon deciduous: follicles ovate-oblong, longer than the style, equaled by

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§ 2 **CHRYSA**  
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the stipe: seeds black. In marshes and low woods, northwest Wash-  
ington to Alaska and the Atlantic States, Newfoundland and northward.

§ 2 **CHRYSOCOPTIS** Gray l. c. Sepals linear or ligulate, atten-  
uate, greenish- or yellowish-white. Petals filiform or ligulate,  
enlarged and cucullate near the middle. Scapes 1 3-flowered.

**C. occidentalis** T. & G. Fl. i, 28. Leaves simply trifoliolate: leaflets  
long-petiolulate, roundish in outline, 2-3 inches long, 3-lobed to about the  
middle, lobes obtuse, slightly 3-lobed or incised and obtusely dentate: pet-  
als shorter than the sepals and apparently subulate from a sessile ovate  
and concave base; mature follicles longer than the stipe; seeds oblong. In  
the mountains of Idaho. A little known species.

**C. venosa.** Leaves ternate, coriaceous, smooth and shining prominent-  
ly veined; leaflets ovate with cordate base, deeply 3-cleft, the divisions again  
cleft into 3-5 cuspidate dentate lobes, the terminal one long and the lateral  
ones short petiolulate: scapes at length 7-12 inches high, equaling or exceed-  
ing the leaves: sepals petal-like, very narrowly lanceolate, long-acuminate  
3-4 lines long: petals a little shorter, filiform, dilated and gibbous below the  
middle: follicles longer than the stipe: seeds oblong, chestnut-brown. Cas-  
cade mountains near the head of Elk Creek Oregon. So far as known only  
collected by myself, and distributed as *C. occidentalis* in 1881-82.

**C. laciniata** Gray Bot. Gaz. xii, 297. Leaves chartaceous, ternate, triter-  
nate, or ternate-quinate; the ovate leaflets deeply 3-5-cleft, acute and acute-  
ly toothed: sepals linear-lanceolate, 4-5 lines long, spreading or reflexed:  
petals a third shorter, nearly filiform, cucullate in the middle: follicles 4-5  
lines long, exceeding the stipe: seeds oval. Along streams, Coast and Cas-  
cade mountains from Oregon to northern California.

**C. asplenifolia** Salisb. l. c. 303. Leaves pinnately 5-foliolate; leaflets all  
rather long-petiolulate, mostly ovate-oblong in outline and pinnately  
5-parted or divided; lowest pair of pinnae commonly petiolulate and upper  
confluent all 3-5-cleft and incised: sepals filiform, 2-3 lines long: petals  
filiform with a thickened and concave nectary below the middle: mature  
follicles shorter than the stipe. Damp woods and marshes, Alaska to Brit.  
Columbia. To be looked for in northern Washington.

(1) **AQUILEGIA** Tourn. Inst. 428. L. Gen. n. 684.

Perennial herbs with biternate or triternate leaves and showy  
terminal flowers in early summer. Sepals 5, colored and petal-  
oid. Petals 5, alternate with the sepals, with short spreading  
lips, and produced backwards into long tubular spurs. Stamens  
many, the outer ones long-exserted, the inner ones reduced to  
thin scales. Follicles 5, sessile, pointed with the slender style.

**A. formosa** Fischer in DC. Prod. i, 50. Sparingly pubescent with soft  
spreading hairs: stems branching, 2-4 feet high, from a simple or branched  
fleshy fusiform root: lower leaves triternate, on long petioles, the upper sessile  
and ternate or reduced to simple bracts: leaflets broadly cuneate, 3-cleft, the  
divisions variously 3-5-lobed: flowers red, pendulous in anthesis; sepals spread-  
ing or reflexed, 10-14 lines long, lanceolate, abruptly narrowed to a short  
claw: spurs little or not at all longer than the sepals: style not longer than the  
stamens: follicles an inch long by 2 lines wide. Common from California  
to Alaska Nevada and Utah.

**A. truncata** F. & M. Ind. Sem. Petr. Suppl. 8. (1843.) Glabrous: stems  
1-3 feet high, with lax spreading branches: flowers 1-2 inches in diameter,  
red tinged with yellow: sepals widely spreading or reflexed: petals trun-  
cate, the limb very short; the spurs 6-9 lines long, thick and blunt. In

shady ravines, southern Oregon near Crater Lake, *Gorman*, and California.

**A. flavescens** Watson Bot. King, 10. Smooth: stems 1-3 feet high: leaves ternate: leaflets round-cordate, 3-parted, the segments 2-3-cleft and coarsely toothed: flowers yellow, pendulous; sepals reflexed, oblong-ovate, acute, longer than the spurs: style nearly equaling the stamens, much longer than the pubescent ovary. Subalpine, eastern Oregon to Nevada, Utah and Brit. Columbia.

**A. leptosera** Nutt. Journ. Acad. Philad. vii, 9. Stems 1-2 feet high, glabrous, few-flowered: flowers white or slightly tinged with blue, soon becoming erect: sepals ovate, an inch to inch and a half long; spur straight, 2 inches long, very slender: Shaded mountain slopes, Idaho to eastern California and Utah.

\* \* *Flowers irregular. Carpels 1-5. Leaves palmately lobed or dissected.*

(2) DELPHINIUM Tourn. Inst. 426. L. Gen. n. 781.

Erect herbs from grumous or fleshy-fibrous roots, with palmately lobed cleft or divided alternate leaves and showy flowers in simple or paniculate racemes. Sepals 5, very irregular, usually colored and petaloid, the upper one produced backwards at the base into a hollow spur the others plain. Petals 2-4, very irregular, the 2 upper ones developed backwards and enclosed in the spur of the calyx. Stamens many. Pistils 1-5, many-ovuled. Style persistent. Ours all of

§ DELPHINASTRUM DC. Syst. i, 351. Petals 4. distinct, the upper pair usually glabrous: the lateral ones unguiculate, more or less hairy on the face, in ours emarginate or 2-lobed at the apex. Follicles in ours usually 3.

\* Flowers blue or white, never scarlet nor orange.

**D. Menziesii** DC. Syst. i, 355. Glabrous or pubescent with spreading hairs; 5 to 18 inches high, sparingly leafy: lower leaves round-reniform, irregularly cut into oblong lobes: the upper finely dissected into linear lobes: flowers blue, in a few-branched panicle: sepals lanceolate, obtuse, 5-8 lines long by 2-3 lines wide, about as long as the stout spur, pubescent with spreading hairs: petals exserted, white with purple veins: follicles glabrous, 8-10 lines long with acute widely spreading tips: seeds turbinate, with a broad depressed summit. Northern California to Brit. Columbia: usually in open woods.

**D. pauperculum** Greene Pitt. i, 284. Stem solitary, simple, 2-7-leaved, 6-10 inches high; from a small globose or ovate tuber: pubescence sparse and soft: leaves parted into broad-linear, trifid segments: flowers only 3 or 4 on ascending pedicels, deep blue, an inch broad; spur straight, ascending. Near the coast, Washington. *M. A. Knapp*.

**D. Oregonum.** Finely pubescent with short reflexed hairs: stem often slender, 1-3 feet high, from a somewhat branched flattish tuber, sparingly leafy: leaves all dissected into acute linear lobes: flowers blue, in few to many-flowered racemes; sepals broadly lanceolate, half inch or more long, shorter than the slender spur; lower petals blue, very obtuse or truncate, repand and ciliate at the apex, the blade only 2-3 lines long; upper ones light blue bordered with white, lanceolate, obtuse: follicles 3-4 lines long by a line broad, densely tomentose, erect and not at all spreading at the tips: seed triangular, with rounded and rugose back, and truncate summit. Open plains and hillsides of the Willamette valley.

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**D. leucophæum** Greene Eryth. iii, 118. *D. Menziesii* var. *ochroleucum* Nutt. T. & G. Fl. i, 31. Very finely pubescent with retrorsely appressed hairs, usually rather slender, 1-3 feet high from a more or less branching tuber: leaves ternate, the nearly sessile leaflets deeply cut into 3-5 laciniately trifid lobes: racemes virgate, 3-10 inches long: pedicels erect in fruit, the lowest 1-2 inches long, the upper 2-6 lines long, all more or less glandular: sepals whitish or ochroleucous outside, spur slender, 8-10 lines long, longer than the oblong lower petals, blue bordered with white, rounded at the summit, repand-dentate, rather densely bearded: follicles erect, rather densely pubescent, oblong, 5-7 lines long. Open plains, Willamette valley and along the Willamette river near Oswego.

**D. simplex** Dougl. Hook. Fl. i, 25. Tall and strict, 2-3 feet high: pubescent throughout, with short and soft spreading almost velvety down: leaves all dissected into linear divisions and lobes, racemes spiciform and virgate: pedicels shorter than the spur, erect in flower and fruit: calyx pubescent outside. Root and fruit not seen. Western Idaho. (*Gray Syn. Fl. i, 49.*)

**D. distichum** Geyer Lond. Journ. Bot. vi, 68. Stem strict a foot or two to rarely 3 feet high from a fasciculate tuberous root, glaucescent, glabrous or the inflorescence puberulent, rather rigid, several-leaved, simple or the larger plants having one or more lateral racemes: leaves thickish; lower ones of rounded outline, with cuneate or narrow divisions and lobes; upper ones short-petioled, erect, and with approximate or little spreading linear divisions and lobes: raceme spiciform and virgate, many-flowered: pedicels shorter than the spur, erect or appressed both in flower and fruit: flowers blue or violet, approximate and conspicuously distichous in the very spiciform raceme: sepals at first canescent puberulent outside, a third to nearly a half inch long, follicles erect, seldom over a half inch long. Low prairies, etc., Oregon and Washington to Montana.

**D. Columbianum** Greene Eryth. ii, 193. Densely canescent: stems simple, 4-12 inches high or more, from a fascicle of thickened roots: lower leaves reniform, irregularly cut into oblong callous-tipped lobes; upper ones finely dissected into linear lobes: inflorescence tawny pubescent: flowers dark blue, rather small, in a strict secund or virgate spike: pedicels erect, short and stout: sepals oblong, about half as long as the slender spur, appressed canescent; follicles densely tawny-pubescent, 5-8 lines long by a line or more wide, erect: seeds winged. In winter rivulets, eastern Washington to Nevada and California.

**D. Andersoni** Gray l. c. Sparingly pubescent or glabrous, 4-18 inches high, rather stout: leaves thickish, round-reniform in outline, the lower coarsely and the upper finely dissected into obtuse linear lobes; flowers blue, in a condensed spike: sepals broadly spatulate, 6 lines long or more, finely pubescent: petals pale blue veined with dark blue: follicles glabrous, 8-12 lines long by  $1\frac{1}{4}$ -2 lines wide, erect, with acute spreading tips: seeds broadly winged with a broad depressed summit. Southeastern Oregon to Nevada and California.

**D. Nuttallianum** Pritz. in Walp. Rep. ii, 744. Glabrous or barely puberulent: stem slender, a span to a foot high from a fasciculate-tuberous root; leaves small, all pedately parted into narrowly linear divisions of an inch or more in length: racemes 3-15 flowered: pedicels about the length, of the flowers; sepals 3 lines long, oblong, little surpassing the petals much shorter than the slender spur: follicles (so far as known) oval-oblong, erect, about 4 lines long. Eastern borders of Washington to the Rocky Mountains.

**D. bicolor** Nutt. Jour. Acad. Philad. vii, 10. Pubescent, a span to a foot high from fasciated, and mostly deep descending roots, rather stout: leaves thickish, the lower orbicular in outline, all deeply cleft or parted with mostly linear and obtuse segments; racemes few to several-flowered: lower pedicels an inch or two long, ascending: sepals and spur half to



three-fourths inch long; upper petals pale yellow and white and copiously blue-veined: follicles glabrous, or when young puberulent, sometimes quite erect, but usually recurving above. Dry ground, mountains of eastern Oregon and Washington to Utah, Colorado and British Columbia.

**D. depauperatum** Nutt. l. c. Stem very slender, simple, 1-3 leaved: leaves scarcely an inch in diameter, glabrous. the lower one flabelliform or reniform: upper part of the stem and carpels minutely villous; raceme 1-7-flowered; flowers deep blue, upper petals yellowish: follicles 5-6 lines long, erect. Mountains of eastern Oregon and Nevada.

**D. trollifolium** Gray Proc. Am. Acad. viii, 275. Glabrous throughout or the inflorescence sparingly villous, tall and stout, 2-5 feet high: leaves large, long petioled, 5-7 lobed, the lobes laciniately cleft and toothed with acuminate segments: flowers large, in a loose raceme: sepals oblong-lanceolate, acuminate, 8-10 lines long, sparingly villous: follicles glabrous, 6-8 lines long by two lines broad: seeds turbinate with a narrow rim at the top. Common along streams from British Columbia to California. Known as "Poison Larkspur."

**D. occidentale** Watson. Glabrous or densely pubescent above, 4-6 feet high: leaves deeply 3-5 cleft, the divisions broadly cuneate somewhat 3-lobed and sparingly gash-toothed, the teeth narrowing abruptly to a callous point: flowers small in a many-flowered sparingly branched panicle: sepals spatulate acuminate attached by a broad base 6 lines long or more, follicles glabrous or sometimes pubescent: seeds light colored and spongy. Subalpine in damp soil, from the Blue Mountains of Oregon to Nevada.

**D. scopolorum** Gray Pl. Wright, ii, 9. Glabrous below or throughout: stems 1-6 feet high from a fascicle of thick roots; leaves numerous, mostly orbicular in outline, 2-3 inches in diameter, 5-7 parted, the lower into cuneate and the upper into narrower cleft and laciniate divisions: petioles, except the lowest, hardly dilated at base: bracts and bractlets mainly filiform: racemes many flowered; flowers blue varying to white or pink on short erect pedicels; sepals about half an inch long, about equaling the spur: lower petals deeply notched and with the whitish upper ones but little shorter than the oblong sepals: follicles not over half inch long, short-oblong, erect: seeds with a loose cellular coat. Mountains of eastern Washington (*Sandberg No. 921*) to the Rocky Mountains and New Mexico

**D. glaucum** Watson Bot. Cal. ii, 427. Tall and stout, glabrous and more or less glaucous: leaves large, laciniately lobed and toothed, the lobes mostly acuminate, the upper leaves sparingly lobed or entire and narrowly lanceolate: flowers pale blue, numerous in a narrow raceme, upon slender and rather short pedicels, the somewhat minutely tomentose sepals rather narrow, about 6 lines long or less, follicles glabrous. From Yakima county, Washington, to California and north to the Yukon river.

**D. Burkei** Greene Eryth. ii. 183. Stems one or several, a foot high or more, erect, not slender, from a manifestly woody-fibrous root, leafy at or near the base only: foliage and lower part of stem seeming glabrous, though somewhat puberulent under a lens; upper part of stem and the inflorescence clothed with a short villous-hirsute pubescence: leaves 2 inches broad, deeply parted into many linear and oblong-linear obtusish segments, the texture rather fleshy: raceme rather long and narrow, the pedicels being equal and quite erect: sepals deep blue, pubescent exteriorly, spur rather long, usually blunt, nearly straight and horizontal; petals conspicuously white, or perhaps ochroleucous: ovaries densely appressed-villous: follicles unknown. "Snake Country" Idaho. *Burke*.

\* \* Flowers scarlet.

**D. nudicaule** T. & G. l. c. Smooth or slightly villous, stems a foot or two high; leaves mostly near the base, 1-3 inches in diameter, 3-5 lobed,

the lobes more flowers red: se more, much sh ern Oregon an

13 12.  
Tall perenn showy flower very irregular ones plain. I spur-like bla 3 lower ones s

**A. Columb** smooth below, petioles; the up ciniately tooth portion higher narrowed basa obtuse, 6-8 line versely wrinkle bia, east to the

**A. bulbiferu** below, toment per sessile bear lobes: sepals p on the eastern ing in Septemb

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**I. stipitatu** slender, 2-4 in with about 2 te ternate, petiole peduncle thick ments enlarged long, 3-4 seede moist places, s

**I. Hallii** Gr high, 2-leaved, inches long, irr twice forked fo inch or two lon sepals, clavate seeds rugulose. ley. A rare sp

the lobes more or less deeply 3-7 toothed, with broad obtuse segments: flowers red: sepals broadly lanceolate, abruptly acuminate, 6 lines long or more, much shorter than the long stout spur. In the mountains of southern Oregon and California.

12. ACONITUM Tourn. Inst. 424. L. Gen. n. 682.

Tall perennial herbs with palmately lobed alternate leaves and showy flowers in open racemes. Sepals 5, colored and petaloid, very irregular, the upper ones arched into a hood, the lateral ones plain. Petals 2-5, the upper 2 irregular, with long claw and spur-like blade which are concealed in the hood of the sepals; the 3 lower ones small or obsolete. Follicles 3-5, sessile, many-seeded.

**A. Columbianum** Nutt. T. & G. Fl. i. 34. Rather stout, 2-6 feet high, smooth below, somewhat tomentose above: leaves ample, the lower on long petioles; the upper subsessile, all deeply 3-5 cleft into broadly cuneate laciniately toothed acuminate lobes: hood 6-8 lines long with helmet-shaped portion higher than broad, at length much shorter than the downwardly narrowed basal portion, very strongly beaked: follicles usually 3, oblong, obtuse, 6-8 lines long, many-seeded: seeds flat, strongly keeled and transversely wrinkled. Along mountains: steams, California to Brit. Columbia, east to the Rocky Mountains and New Mexico.

**A. bulbiferum.** Stems slender, weak and viney, 2-4 feet long: smooth below, tomentose above: leaves rather small, on short petioles, or the upper sessile bearing bulblets in their axils, all laciniately cut into acute lobes: sepals pale blue; hood 6-8 lines long. Fruit not seen. In marshes on the eastern slope of the Cascade Mountains near Mount Hood, flowering in September.

\* \* \* *Flowers regular. Carpels 1-5. Leaves ternately compound.*

— *Fruit dry. Follicles 1-20.*

13. ISOPYRUM L. Gen. n. ed. 2. 533.

Low perennial herbs with mostly alternate 2-3-ternately decompound leaves and white flowers in lax terminal panicles or solitary. Sepals 5-6, petaloid, regular, deciduous. Petals 5, very small and nectariferous or none. Stamens 10-40. Follicles 2-20, several-ovuled. Seeds with a smooth or rugulose crustaceous testa.

**I. stipitatum** Gray Proc. Am. Acad. xii, 54. Glabrous; stems very slender, 2-4 inches high from a large fascicle of thickened fibrous roots, with about 2 ternate cauline leaves and a single flower; radical leaves biterminate, petiolate, with cuneate often 2-3 lobed leaflets, 3-5 lines long: peduncle thickened at the summit; sepals 4-6, oblong, 3 lines long: filaments enlarged in the middle: follicles 2-6, shortly stipitate, oblong, 3 lines long, 3-4 seeded: seeds globular, transversely rugose. Under trees in open moist places, southern Oregon, near Oakland, to northern California.

**I. Hallii** Gray Proc. Am. Acad. viii, 374. Stems slender, erect, 1-3 feet high, 2-leaved; leaves ample, 2-3-ternate; leaflets obovate-cuneate 1/2-2 inches long, irregularly 3-incised at the apex: flowers in simple or once or twice forked foliaceous-bracted subumbellate corymbs: pedicels slender, an inch or two long: sepals 5, obovate, 4 lines long: filaments as long as the sepals, clavate: follicles 3-5, sessile, ovate-oblong, acuminate, 2-4 seeded: seeds rugulose. Along mountain streams both sides of the Willamette valley. A rare species.



## 14 CIMICIFUGA L, Amcen. Acad. viii, 193 t. 4.

Tall perennial herbs with ample ternately compound leaves and small white flowers in paniculate racemes in summer. Sepals 4-6, falling soon after the flower opens. Petals 1-8, or none, small, with short, claws. Stamens numerous. Follicles 1-8, many-seeded.

**C. elata** Nutt. T. & G. Fl. i, 36. Canescently pubescent or the panicle tomentose and glandular, 4-8 feet high; leaves ample; leaflets thin 2-4 inches in diameter. 5-7 lobed, segments acute, coarsely cuspidate-serrate: petals none: filaments equal: pistils 2-5 in the early flowers, only one in the later ones, glabrous or minutely glandular; follicles sessile, 4 lines long, obtuse, 6-10 seeded: seeds terete transversely rugose. In woodlands Willamette valley to Puget Sound.

**C. laciniata** Watson Proc. Am. Acad. xx, 352. Glabrous or the panicle tomentose: 3-5 feet high: leaves ample, ternate, the divisions 3-parted or deeply 3-lobed, the acuminate segments coarsely laciniate-toothed: petals usually present: filaments unequal: pistils 2-5 pubescent; follicles stipitate 4-5 lines long, 6-8 seeded: seeds flat linear, light brown, scaly. Lost Lake, north side of Mount Hood. Rare.

← → *Fruit a one-celled, many-seeded berry.*

## 15 ACTÆA L. Gen. n. 644.

Tall perennial herbs with alternate, triterately decomposed leaves and small white flowers in short terminal racemes. Sepals 5-6, nearly equal, petaloid, caducous. Petals 4-10, or none, less showy than the numerous white filaments. Carpel solitary, sessile, covered with a broad and obscurely 2-lobed depressed stigma, becoming a berry filled with smooth flattened seeds packed horizontally in two rows.

**A. arguta** Nutt. T. & G. Fl. i. 35. Stems 1-6 feet high from a fascicle of short branching roots, 1-3 leaved; leaves ternately or quaternately decomposed: leaflets ovate to oblong, often obscurely 3-lobed, acuminate, irregularly incised-dentate: racemes oblong, sometimes divided toward the base, loose: pedicels longer than the flowers, filiform, scarcely thickened in fruit: petals oblong, obtuse, shorter than the stamens: berries red or white subglobose. Common in forests from California to Alaska and the Rocky Mountains.

**A. rubra** Wild. Enum. 561. Stems about 2 feet high: leaves ternately decomposed; leaflets ovate, acuminate, 1-2 inches long, unequally and incisely serrate, the terminal one often 3-cleft: racemes broadly ovate or hemispherical: pedicels longer than the flowers, scarcely any thicker in fruit: sepals 4 greenish, ovate petals 3-10, rhombic ovate, acute, shorter than the stamens: berries bright cherry-red, shining, subovate. Craig Mountains, northern Idaho (*Sandberg n. 235*), to the Atlantic States and Canada.

*Tribe 5. Pæoniæ DC. Prod. i. 64. Sepals herbaceous, imbricated in the bud, persistent. Carpels few, many ovuled.*

## 16 PÆONIA Tourn. Inst. 273 t. 146. L. Gen. n. 678.

Herbs or low shrubs with tuberous roots, alternate, triterately compound or divided leaves and large solitary flowers terminating the stems or branches. Sepals 5, strongly imbricated, persistent or falling, the inner ones concave or coming coriaceous. Seeds anathropic, short fleshy arcuate.

cated, persistent or falling, the inner ones concave or coming coriaceous. Seeds anathropic, short fleshy arcuate.

**P. Browni** ascending or terete, leaflets ternately compound, unequal: petals dull red: follicles 5-6 lines in diameter to California.

ORD

Herbs or shrubs with stipules and stamens or more in the bud, single carpels small or mixed.

1 **Berberis**. clustered racemes  
2 **Vancouveria**. yellow in autumn

3. **Achlys**. Herbs with

1 **P.** Smooth stems in clusters dark blue berries bractlets imbricated at base. Fruit a 1-celled berry.

§ **MAHONIA** (none reduced) imbricated at the base, spiny-toothed

**B. pumila** rigid, erect from tuberous roots, terminal ones 3-toothed, the flowers on both faces, pale

cated, persistent. Petals 5-10 or more, situated with the stamens on the fleshy perigynous disk that is adnate to the sepals or concave receptacle. Stamens numerous. Carpels few becoming coriaceous many-seeded follicles. Style short or none. Seeds anatropous, oval or oblong, naked at base or the very short fleshy funiculus cupulate; embryo straight or slightly arcuate.

**P. Brownii** Dougl. in Hook. Fl. i, 27. Glabrous and glaucous, stems ascending or at length decumbent, 1-2 feet long; leaves thick, leaflets ternately dissected into oblong or linear lobes; sepals green, mostly unequal; petals scarcely larger than the sepals; thick and leathery, dark dull red; follicles oblong, an inch or more long; seeds round or oblong 2 lines in diameter, black and shining. Stony hillsides, Brit. Columbia to California.

ORDER II. BERBERIDACEÆ Endl. Gen. 851.

Herbs or shrubs with compound or divided leaves without stipules and perfect, hypogynous flowers. Bracts sepals petals and stamens 6 each (sepals and petals wanting, and stamens 9 or more in *Achlys*): Anthers 2-celled opening by uplifted valves that are hinged at the top. Calyx and corolla imbricated in the bud, deciduous, both usually colored Pistil 1, of a single carpel. Style short or none. Seeds anatropous, with small or minute embryo in firm-fleshy or horny albumen.

\* Flowers complete: stamens 6, mostly short.

1 **Berberis**. Shrubs with rigid oddpinnate leaves; flowers yellow, in clustered racemes: fruit a few-seeded berry.

2 **Vancouveria**. Herbs with ternately compound leaves: flowers white or yellow in a panicle: fruit a follicle.

\*\* Flowers without sepals or petals: stamens 9 or more.

3. **Achlys**. Flowers spicate on a scape, without bracts, sepals or petals. Herbs with 3-parted leaves.

1 BERBERIS, Tourn. Inst. 614, t. 385, L. Gen. n. 442.

Smooth shrubs with yellow wood, pinnate leaves, yellow flowers in clustered bracketed racemes, and oblong or globose, acid, dark blue berries. Sepals 6, petal-like, with 6 closely appressed bractlets in 2 rows. Petals 6, opposite the sepals, usually 2-glandular at base. Stamens 6, opposite the petals. Stigma peltate. Fruit a 1-celled berry, with 1-3 seeds. Ours all of

§ **MAHONIA** T. & G. Fl. i, 50. Leaves evergreen, all evolute, (none reduced to spines) and 3- to several-foliolate; petioles articulated at the insertion of the leaflets: leaflets thick, coriaceous. Spiny-toothed: filaments usually 2-toothed at the summit.

\* Leaflets pinnately veined.

**B. pumila** Greene Pitt. ii, 162. A few inches to a foot high, stout and rigid, erect from the base: leaves very thick-coriaceous: leaflets 1-5, the terminal one round-ovate, the lateral ones obliquely ovate, all coarsely toothed, the teeth rigidly spinescent, conspicuously reticulate-veined on both faces, pale and glaucous beneath, deep but dull green and glaucous

cent above racemes short, terminal and axillary; berries small, very glaucous. Coast mountains of southern Oregon and northern California.

**B. repens** Lindl. Bot. Reg. t. 1176. Stems stoutish erect, branching, 1-4 feet high; leaflets few, coriaceous, light green, coarsely spinose-toothed; racemes short, in terminal and axillary clusters; bud scales triangular, acute; fruit globose to oblong, dark blue. Idaho to the Rocky Mountains.

**B. nana** Greene Pitt. iii, 98. Low, 3-15 inches high, increasing from underground runners; leaflets 3-7, rarely more, ovate to oblong, acute or obtuse, 1-2½ inches long, not shining above; racemes few, terminating the branches, 1-2 inches long; bud-scales triangular, cuspidate 2 lines long. Brit. Columbia to California, Montana and New Mexico.

**B. Aquifolium** Pursh Fl. i, 219 in part. Large, 2-10 feet high; leaflets 5-9, oblong-ovate, acute, spinulose dentate, 1-3 inches long, green and shining above; bud scales triangular, acute, 3 lines long; racemes in terminal and axillary clusters, 2-4 inches long; fruit globose to oblong. Western Washington to California.

\* \* Leaflets palmately veined.

**B. nervosa** Pursh l. c. t. 5. Stems simple, a foot or two high, from long underground shoots; leaves 1-2 feet long, of 11-17 ovate acuminate spinulose-serrate leaflets; bud scales long-acuminate, 10-12 lines long, persistent, becoming dry and rigid; racemes in terminal clusters, 6-12 inches long. In Fir forests from Brit. Columbia to California.

2 VANCOUVERIA Morr. & Decne, Ann. Sci. Nat. ser. 2, ii, 315.

Slender perennial herbs with 2-3-ternately compound leaves and white or yellow flowers in open paniculate racemes upon a naked scape. Sepals 6, obovate reflexed, soon falling with the 6-9 oblong, membranaceous bracts. Petals 6, shorter than the sepals and opposite them, linear-spatulate, nectary-like reflexed. Stigma slightly dilated. Ovules in two rows upon the ventral suture. Capsule dehiscing by a dorsal valve attached by the base, persistent. Seeds oblong, somewhat curved, with a broad attachment and prominent arillus.

**V. hexandra** Morr. & Decne. l. c. More or less villous, with brownish hairs, 1-2 feet high, from long running rootstocks; leaves diffuse, long petioled; leaflets 1-2 inches broad, petiolulate, subcordate, obtusely 3-lobed, the lobes emarginate, the margin thickened and often undulate; scapes exceeding the leaves; pedicels an inch long or more, recurved; sepals 2-3 lines long; carpels 4-6 lines long, gibbous-lanceolate, with a slender beak, smooth or slightly glandular; arillus 2-lobed, more than half covering the seed. In Fir forests, British Columbia to California.

**V. chrysantha** Greene Bull. Cal. Acad. Sci. i, 66. Stems rusty-villous pubescent; leaflets evergreen, thickish, sub-3-lobed, glabrous and reticulated above, whitened and pubescent beneath, margins only slightly crisped, revolute in places; inflorescence sub-racemose, 5-18 flowered, covered with dense dark glandular pubescence; flowers golden yellow; sepals 3-4 lines long; ovules 7-8. Eastern base of the Coast Mountains near Waldo, Josephine county, Oregon.

3 ACHYLS DC. Syst. ii, 35.

Smooth perennial herbs with one radical trifoliate leaf and small white flowers, crowded in a naked spike terminating the scape. Sepals and petals none. Stamens 9 or more in 3 or more

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rows. Filaments slender, the outer ones dilated at the summit. Stigma sessile dilated. Ovule solitary, erect. Fruit at first somewhat fleshy, at length dry and coriaceous lunate-incurved, dorsally carinate, ventrally excavated each side of the fleshy salient suture or ventral appendage. Embryo minute.

A. *triphyllo* DC. Syst. ii. 35. Rootstock creeping, clothed with glumaceous scales: leaves ample, long-petioled, a foot or more high from a scaly base; leaflets broadly cuneate, 3-5 inches long, the outer margin irregularly and coarsely sinuate, very fragrant when drying: scape solitary, equaling or surpassing the leaf. In Fir forests, Brit. Columbia to California.

ORDER III. NYPHÆACEÆ Endl. Gen. 858.

Aquatic perennial herbs with trunk-like horizontal rootstocks or tubers. Leaves peltate or deeply cordate involute from both margins in the bud. Flowers perfect, solitary on long axillary peduncles. Stamens numerous. Ovules on the back or sides of the carpels, embryo small at the base of fleshy albumen, enclosed in a fleshy bag.

1. *Brasenia*. Carpels 4-18, in a cluster, indehiscent, 2-seeded.
2. *Nymphæa*. Carpel only one, many-celled and many-seeded: sepals 5-12, concave.
3. *Castalia*. Carpel only one, many celled and many-ovuled: sepals only 4, plain.

1. BRASENIA Schreb. Gen. 372.

Aquatic perennial herbs with peltate leaves and purple flowers. Sepals and petals nearly alike, nearly oblong, dull dark purple hypogynous persistent, 3-4 of each. Stamens 12-18 hypogynous. Filaments slender. Anthers oblong-linear. Carpels 11-18, distinct, tipped with the linear one-sided stigma. Fruit a 1-2 seeded indehiscent pod.

B. *Schreberi* Gmel. Syst. Veg. i, 854: *B. pellata*, Pursh. Fl. ii, 389. Stems ascending from a tuberous rootstock: leaves floating alternate on long slender petioles, elliptical, centrally peltate, light green above, red and when young covered with a clear jelly-like substance beneath; flowers 6 lines long. In ponds, Brit. Columbia to California, and east to the Atlantic.

2. NYPHÆA Boerh. Hort. Acad. Bat. 281.

Herbs of shallow waters, sending up large and mostly rather leathery cordate leaves, and 1-flowered peduncles from large and creeping rootstocks in the mud beneath. Sepals 5-13; concave and roundish, partly colored. Petals numerous, some of the inner ones resembling sterile stamens persistent. Stamens numerous, short, hypogynous, densely crowded around the ovary, at length recurving, persistent. Anthers truncate at the apex, the two linear cells adnate introrse. Ovary oblong or ovate, 8-20 celled. Stigma sessile, peltate, many-rayed. Fruit ovoid or flask-shaped indehiscent, with a firm rind and fleshy or pulpy interior. Cells many-seeded.

*N. advena* Ait. Hort. Kew. ii. 226; *Nuphar advena*, Ait. f. Leaves floating or emersed and erect, on stout and half cylindrical petioles, deeply cordate 6-8 inches in diameter: flowers two inches in diameter: sepals usually 6, unequal: petals narrowly oblong, thick and fleshy, truncate shorter than the stamens: anthers longer than the filaments: stigmas 12-24-rayed, the margin entire or repand: fruit strongly furrowed, ovoid-oblong. (In subalpine ponds about Mount Hood), Oregon to Alaska thence eastward across the continent.

*N. polysepala* Greene Bull Torr. Club, xv, 84. *Nuphar polysepalum* Engelm. Trans. Acad. St. Louis, ii, 282. Resembling the last but larger: leaves all floating, 8-14 inches in diameter: flowers fragrant, 2-5 inches in diameter: sepals 8-12, unequal: petals 11-18, dilated and unlike the stamens, yellow: fruit globose, 1-2 inches long. In ponds, British Columbia to California.

## CASTALIA Salisb. Parad. Lond. 14.

Perennial acaulescent herbs with thick creeping or tuberous rootstocks, rounded cordate leaves and snow white or pink flowers blooming all summer. Sepals 4, plain, hypogynous, herbaceous on the outer and somewhat colored on the inner face. Petals plain, those of the outermost row often greenish outside, all oblong or lanceolate, imbricated over and their bases adnate to the surface of the 7-35-celled ovary: innermost reduced to staminodes or imperfect stamens with petaloid filaments. True stamens with narrow filaments and linear-oblong anthers, inserted around the broad summit of the ovary. Ovary concave and umbonate, lineate with as many radiate stigmatic lines as there are carpels, the tips of the latter produced into as many incurved short processes. Surface of the spongy-baccate fruit bearing the basis of the decaying stamens or their scars. Seeds enclosed in cellular-membranaceous arillus.

*C. Leiberghi* Morong Bot. Gaz. xiii, 124 t. 7. Leaves oval with rather open sinus and acutish lobes, entire  $1\frac{1}{2}$ -6 inches long, two-thirds as broad: flowers white  $1\frac{1}{2}$ -2 inches in diameter when fully expanded: sepals an inch long, narrow, obtuse: petals in two rows, a little shorter and more obtuse than the sepals: stamens in 3-4 rows running up the ovary more than half way: stigmatic rays 7 or 8, the projecting points very short and blunt. In small ponds, northern Idaho.

## ORDER IV. SARRACENIACEÆ Endl. Gen. 901.

Bog plants with pitcher-shaped or tubular and hooded leaves, and perfect, polyandrous hypogynous flowers. The persistent sepals, petals and cells of the ovary each 5. Fruit a many-seeded capsule. Embryo small, in flesh, albumen.

CHRYSAMPHORA Greene Pitt. ii, 191.

DARLINGTONIA Torr. Smith. contrib. vi, 4. t. 12.

Calyx without bracts, of 5 imbricated narrowly oblong sepals. Petals 5, ovate oblong with a small ovate tip. Stamens 12-15 in a single row. Filaments subulate. Anthers oblong of 2 unequal cells. Ovary top-shaped, with a broad concave dilated summit, longer than the stamens, 5-celled, the cells opposite the pet-

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als. Style short, with 5 short linear or club-shaped lobes. Capsule loculicidally 5-valved. Seeds very numerous, obovate-clavate, thickly beset with soft slender projections.

**C. Californica** Greene l. c. A smooth perennial herb of greenish yellow hue, from long creeping rootstocks, leaves tubular gradually enlarging upwards to a vaulted ventricose hood which terminates in a forked deflexed appendage, under which is the contracted rounded orifice, the ventral edge winged: scapes 2-3 feet high bearing several membranaceous bracts; and a solitary nodding flower; sepals dull yellow 1-2 inches long, much longer than the brown, spotted with yellow petals. In bogs, southwestern Oregon and northern California.

ORDER V. PAPAVERACEÆ Endl. Gen. 854.

Herbaceous or rarely shrubby plants, with milky or colored juice. Leaves mostly alternate, without stipules. Peduncle 1-flowered. Sepals, petals and stamens hypogynous. Sepals 2 or 3. Petals twice as many, in two sets, imbricated and usually crumpled in the bud. Stamens indefinite. Capsule 1-celled with parietal placentæ. Seeds anatropous, with minute embryo in copious albumen. Platystemon is exceptional in having the several capels distinct or at least early separating and forming as many torulose pods, and Eschscholtzia has colorless juice in the herbage.

TRIBE I. Annuals with opposite entire leaves. Sepals usually three, distinct.

1. **Platystemon**. Filaments very broad; carpels many, distinct or soon becoming so.
2. **Platystigma**. Filaments slightly dilated or filiform, ovary 8-ovuled.
3. **Canbya**. Filaments shorter than the anthers, persistent; ovary 3-valved.

TRIBE II. Annual or perennial herbs. Sepals completely united into a narrow cap which falls off entire from a top-shaped receptacle.

4. **Eschscholtzia**. Stigma lobes 4-6, subulate, unequal; style very short: capsule linear, 2-valved.

1 PLATYSTEMON Benth. Trans. Hort. Soc. ser. 2, i, 405.

Low annual with mostly opposite or whorled, entire leaves and long-peduncled yellow flowers that are nodding in the bud.

Sepals 3, distinct. Petals 6, in two series. Stamens many with broad flattened filaments and linear anthers. Carpels 6-18, each several-ovuled, at first all united in a circle into a deeply, plurisulcate, compound ovary by as many parietal placentæ, in fruit separating and closing into as many torulose, narrow follicles which when mature are disposed to break up transversely into a few 1-seeded joints.

**P. Californica** Benth. l. c. Stems slender, branching from the base 6-12 inches high, hispid with long spreading hairs: leaves 1-4 inches long, sessile or clasping, broadly linear, obtuse: peduncles 3-8 inches long:



sepals hispid; petals pale yellow shading to orange in the center, 3-6 lines long, tardily deciduous, at length loosely closing over the forming fruit; carpels aggregated into an oblong head, 5-10 lines long, beaked with the linear persistent stigmas, the one-seeded divisions a line long; seeds smooth. Southern Oregon near the sea to California.

2. *PLATYSTIGMA* Benth. l. c. 406.

Low and slender annuals with verticillate or opposite entire leaves and long-peduncled white or yellow flowers in spring. Sepals 2 or 3, distinct. Petals 4 or 6, in two series, deciduous. Stamens 6-12, rarely 4, with narrow filaments. Carpels 3, rarely 4, wholly combined into a somewhat 3-lobed, or angled, or nearly terete ovary, having as many strictly parietal placentæ. Stigmas ovate to subulate. Seeds smooth and shining.

*P. lineare* Benth. l. c. 407. Somewhat villous with spreading hairs, 6-12 inches high, the stems usually very short and leafy: leaves all linear sessile, 1-2 inches long: petals yellow, 4-6 lines long: stamens numerous, with oblong-linear anthers: capsule half inch long, obovoid or clavate-ovoid, crowned with the 3 broad and obtuse spreading introrsely stigmatose stigmas.—Valleys and low hills, Oregon to central California.

*P. oregonum* Watson, Bibl. Index 43. Smooth, 1-3 inches or more high with spreading branches or peduncles: leaves a quarter to at most an inch long, lower round to spatulate, on long wing-margined petioles; upper leaves spatulate to linear 2-4 lines long, verticillate or opposite; flowers on long filiform peduncles, opening at night only: petals white 1-2 lines long: stamens 4-6, with filiform filaments and oblong anthers: stigma subulate: capsule linear, 8-10 lines long, the thin valves commonly twisted in age.

In open places, Hood River and the Willamette valley to the borders of California.

3. *CANBYA* Parry in Gray Proc. Am. Acad. xii, 51, t. 1.

Little annuals with alternate entire leaves and numerous filiform, one-flowered scapes. Sepals 3. Petals 6, scarious-marcescent and persistent, closing over the capsule till the fruit is grown. Stamens 6 or 9: filaments shorter than the oblong-linear anthers. Capsule ovoid, strictly 1-celled, 3-6-valved from above; valves alternating with as many nerviform placentæ. Style none. Stigmas 3 oblong-linear, opposite the 3 nerviform placentæ and recurved-appressed to them. Seeds neither crested nor carunculate.

*C. aurea* Watson Proc. Am. Acad. xxi, 445. Stems 1-2 inches high: leaves fleshy, linear, 1-3 lines long, glabrous or sparingly pubescent, all clustered at the base of the stem: scape-like peduncles few to several, half to an inch or more long: flowers bright yellow; petals ovate, 1½ lines long, deciduous. On the Sage Plains southwest of Prineville, Oregon.

4. *ESCHSCHOLTZIA*, Cham. in Nees. Horæ. Phys. Berol. 73, t. 15.

Smooth herbs with colorless (or of the root red,) bitter juice, finely dissected alternate petioled leaves, and bright yellow flowers in summer, usually only opening in bright sunshine. Sepals 2, completely united into a conical calyptra and is detached and pushed off by the expansion of the petals. Petals 4. Stamen numerous, with short filaments and linear anthers. Ovary linear, strictly 1-celled, with two nerviform placentæ. Style very short:

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stigma divided into 4-6 linear unequal, divergent lobes. Capsule elongated, strongly 10-nerved, dehiscent the whole length, usually from the bottom, by two valves separating from the placental ribs: many seeded. Seeds globular, reticulated or rough tuberculate.

**E. Douglasii** Benth. Pl. Hartw. 296. Perennial, smooth and glaucous, 1-2 feet high, rather stout and branching: leaves ternate to triternate, finely divided into oblong-linear lobes: flowers bright yellow, 2 inches in diameter, on pedicels 4-6 inches long: torus dilated and broadly rimmed: capsule 2-3 inches long, curved: seeds reticulated. Gravelly hillsides and river banks, Oregon and California.

**E. hypocoides**, Benth. Trans. Hort. Soc. Ser. 2, i, 408. Annual: stems slender, paniculately branched from the base: leaves small, mostly pinnately 5-foliolate; leaflets finely divided into linear lobes: flowers small, not over an inch in diameter, light yellow, on peduncles 1-3 inches long; torus but little dilated, and very narrowly rimmed: capsule 1-2 inches long by a line in diameter, tipped with filiform stigmas: seeds reticulate rugose. On open hillsides near Wolf Creek, Josephine county, Oregon, to California.

ORDER VI. FUMARIACEÆ, DC., Syst. ii, 105.

Tender herbs with watery and bland juice, dissected compound leaves, and perfect hypogynous flowers. Sepals 2, small and hyaline. Petals 4, one or two of them spurred. Stamens 6, diadelphous. Capsule one-celled with two parietal placentæ. Seeds anatropous, with minute embryo in copious albumen.

- 1 **Bicuculla**. Corolla 2-spurred: the two outer and larger petals similar.
- 2 **Corydalis**. Corolla with only one of the outer petals spurred.

1 BICUCULLA Adans. Fam. Pl. ii. 23.

*DICENTRA* Bernh. *Linnæa*, viii, 557, 468.

Smooth perennials with tuberiferous or granuliferous subterranean base, or running rootstocks, ternately or pinnately compound leaves and racemous or paniculate flowers. Sepals 2, small and scale-like. Corolla flattened and cordate, at least at base, of two pairs of petals, the outer pair larger, saccate or spurred at base, the tips spreading; the inner much narrower, spoon-shaped, mostly carinate or crested on the back; the small hollowed tips slightly united at the apex, the two forming a cavity which contains the anthers and stigma. Stamens 6, in two sets; the filaments slightly adhering in the middle: the middle anther 2-celled; the lateral ones 1-celled. Style slender persistent: stigma 2-lobed; each lobe sometimes 2-crested or horned. Capsule narrow, 1-celled, with 2 filiform parietal placentæ, from which the valves at maturity separate.

**B. formosa**. *Dicentra (Dicytra) formosa* DC. Syst. ii, 109. Stems and scapes from the apex of thickish and almost naked creeping rootstock, a span to a foot or more high: leaves twice or thrice ternately compound, the ultimate divisions narrow and incisely pinnatifid: flowers in compound racemes at the summit of the naked scapes: corollas ovate-cordate with rounded somewhat connivent spurs and short spreading tips to the larger



petals: crests of the inner petals little surpassing their tips: all the petals united up to above the middle.

**B. Cucullaria** Millsp. Bull. W. Va. Agr. Exp. Sta. ii, 227. Leaves usually 2 to each stem, long petioled, tritermately decomposed, the primary and secondary divisions petiolate, ultimate divisions laciniately pinnatifid with oblong-linear mucronulate lobes: scapes 6-10 inches high from a kind of scaly, fleshy bulb composed of the triangular bases of former leaves; several flowered; corolla white with yellowish tips, the spurs divergent, short and rounded, not longer than the pedicel: crest of the inner petals small, semi-oval, bladderly. Along the Columbia river from below the Cascades to Idaho, and the Eastern States. Ours differs from the eastern plant in having much shorter and rounded spurs.

**B. uniflora.** *Dicentra uniflora*, Kell. Proc. Cal. Acad. Sci. iv, 141. Leaves ternately or somewhat pinnately divided, the 3-7 divisions pinnatifid into a few spatulate lobes: scapes 3-5 inches high, from a fascicle of narrow-fusiform and perpendicular fleshy tubers, 2-3 bracted, and 1-2 flowered: outer petals merely gibbous-saccate at base, their spatulate-linear recurving tips much longer than the body; inner petals with lamina dilated and hastate at base directly from the oblong-linear claw. On Mount Adams, Washington, to the Sierra Nevada in California, and Wyoming and Utah.

**B. pauciflora.** *Dicentra pauciflora* Watson Bot. Cal. ii, 429. Scapes and leaves very slender, 4-8 inches high, from running tuberiferous rootstocks: leaves small, 2-3-ternate, with narrow segments: flowers 1-3, 8-12 lines long, the short stout straight spurs not diverging: spreading or reflexed tips of the outer petals 3-4 lines long; inner petals with lamina abruptly contracted at apex into a short stalk which abruptly dilates into the elongate-spatulate lamina. In the Siskiyou mountains Southern Oregon, to Tulare County, California, near perpetual snow.

#### CORYDALIS Vent. Cels. t. 19.

Herbs with variously decomposed alternate leaves and white, rose-colored or yellow flowers in racemes opposite the leaves or terminal. Corolla with only one of the petals spurred or gibbous and nectariferous, by tortion becoming posterior, all erect and connivent up to the short tips of the outer ones. Filaments with a nectariferous spur-like process at the base. Style mostly persistent. Capule few-many-seeded. Seeds with a concave ariliform crest. I retain *Corydalis* because no other name has been settled on for this genus.

§ 1. Perennials from thickened roots with ample leaves and many-flowered racemes. Stigma with 6 lobes or processes, one pair terminal, one medial and one basal. Capsule oval or oblong, rather few-seeded.

**C. Scouleri** Hook. Fl. 1, 63 t. 14. Stems simple 2-4 feet high, with 2-4 cauline leaves from a large and thickened running scaly-jointed rootstock: leaves very large, pinnately decomposed; ultimate leaflets, oblong to oblong-lanceolate, entire or the terminal one deeply 3-lobed: flowers rose-colored, peduncles, 1-2 inches long in a loose raceme; spurs stout, 2-3 times as long as the balance of the flower: pedicels strongly curved downwards after flowering, stigma 2-lobed at the base.

**C. Cusickii** Watson in Coult. Man. Rocky Mt. Reg. 14. Stems 2-3 feet high, from strong perennial roots, leafy; leaves bipinnately divided, the oblong oval leaflets acute at each end, half to an inch long: raceme terminal, dense; flowers white or purplish with tips of inner petals violet, an

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ch or less long, the nearly straight spur fully twice as long as the rest of the flower; hood of the outer petals emarginate by the development of broad thin margins which are recurved over the narrow and undulate dorsal crest: capsule oblong, turgid, 6 lines long: seeds nearly smooth, with a conspicuous orbicular carunculate crest. Along alpine streams, Blue and angle creek Mountains, eastern Oregon to western Idaho.

§ 2. Biennials, mostly branched from the base, with finely dissected leaves and siliquiform capsule.

*C. aurea* Willd. Enum. 710. Commonly low and spreading: flowers golden yellow about half an inch long, on rather slender pedicels in a short raceme: spur barely half the length of the body when dry, 10-12-seeded. Seeds turgid obtuse at margin, the shining surface obscurely reticulated. Rocky banks, eastern Oregon to Brit. Columbia, Lower Canada and northern New England (*Gray, Syn. Fl. i, 97*).

*C. montana* Engelm. in Gray, Pl. Fend. 8. Stems decumbent, 6-12 inches long: leaves pinnate, leaflets 5-7 parted, the divisions irregularly ciliate-toothed: flowers yellow, in short-peduncled racemes; spur shorter than the rest of the flower: capsule 4-angled, deflexed in fruit: seeds minutely margined muricate. From the Blue Mountains of Oregon to western Idaho and Mexico.

#### ORDER VII. CRUCIFERÆ Endl. Gen. 861.

Herbs rarely suffrutescent, with pungent watery juice, cruciform corolla tetradynamous stamens and 2-celled pod (silicle or silique) with two parietal placentæ. Flowers perfect hypogynous. Sepals 4, often colored, deciduous. Petals 4, usually with narrow claws and spreading lamina, rarely wanting. Stamens 6, two of them inserted lower down on the receptacle and shorter than the other 4. Ovary 2-celled by a partition which stretches across from the placentæ or the partition, rarely wanting. Style undivided or none: stigma entire or 2-lobed. Ovules few or numerous, campylotropous. Seeds smooth, without albumen. Cotyledons either accumbent *applied edgewise to the radical* or incumbent, *with the radical against the back of one of them* or sometimes conduplicate, *plicately folded and partly enveloping the radical*. Inflorescence racemose or spicate or somewhat corymbose and (with rare exceptions) ebracteate.

SERIES I. Pods 2-valved, dehiscent their whole length (except in *Brassica*), not compressed contrary to the partition.

TRIBE I. Fruit completely or incompletely 2-celled, regularly dehiscent, flattened parallel to a broad partition, terete or prismatic, short or long.

\* Pods more or less strongly compressed parallel to the partition.

*Parrya*. Pods lanceolate, acuminate; valves flat, with a prominent central nerve and reticulated: seeds in 1 row in each cell, large, not winged.

*Cheiranthus*. Pods strongly compressed, 1-4 inches long, broadly linear, with flat 1-nerved valves or narrow and quadrangular with convex and more or less distinctly keeled valves.

\*\* Pods globose terete or prismatic, at least not compressed parallel to the partition.

- 3 **Nasturtium**. Pods short, turgid, little compressed, nerveless.
- 4 **Roripa**. Pods terete or nearly so, with nearly or quite nerveless, the valves.
- 5 **Barbarea**. Pods linear, elongated, somewhat tetragonal: seeds in 1 row in each cell.
- 6 **Arabis**. Pods linear with more or less 1-nerved flat valves and thin partition: seeds in 1 row in each cell, flattened and more or less winged.
- \* \* \* Pods oblong or linear, compressed parallel to the partition, sessile.
- 7 **Streptanthus**. Pods oblong to narrowly linear, compressed parallel to the partition, sessile upon the enlarged receptacle: valves flat, nerveless, seeds flat, more or less winged: cotyledons accumbent.
- 8 **Caulanthus**. Pods narrowly linear, somewhat flattened or subterete: sessile: valves 1-nerved and often reticulate-veined: cotyledons incumbent.
- 9 **Dentaria**. Pods linear, with nerveless flat valves and nerveless partition: seeds in 1 row in each cell wingless.
- 10 **Cardamine**. Pod linear with thin flat nerveless valves, and wingless seeds in 1 row in each cell.

TRIBE II. Pod a silicle, 2-celled, completely dehiscent, strongly compressed parallel to the broad partition or very turgid with broad partition and almost hemispherical valves, or didymous, or strongly obcompressed. Pubescence stellate.

\* Pods strongly compressed parallel to the broad partition.

- 11 **Platyspermum**. Pods suborbicular, very strongly compressed parallel to the broad partition: seeds in 2 rows in each cell, broadly winged.
- \* \* \* Pods turgid with broad partition.
- 12 **Lesquerella**. Pods subglobose: partition suborbicular: seeds flattened.
- \* \* \* Pods didymous with narrow partition.
- 13 **Physaria**. Silicle didymous or obcompressed, partition narrow-elliptical: cells several-seeded.
- \* \* \* \* Fruit orbicular or nearly so, 2-celled, dehiscent, 2-several-seeded: filaments often dilated and toothed or appendaged near the base.
- 14 **Psilonema**. Capsule with valves convex, pubescence stellate.
- \* \* \* \* Fruit oblong elliptic or lanceolate, rarely linear, 2-celled, dehiscent, 2-several-seeded: stamens unappendaged.
- 15 **Erophila**. Flowers white: petals deeply 2-lobed or parted: pods linear to oblong, many-seeded.
- 16 **Draba**. Sepals short and broad, equal at the base: petals entire or emarginate.
- 17 **Cochlearia**. Pods (in ours) very turgid and appearing obcompressed, with distinctly 1-nerved valves.

TRIBE III. Pods longitudinally 2-celled, dehiscent, from linear to lance-oblong or elliptic, always longer than broad.

- 18 **Sophia**. Pods ascending or somewhat spreading, on slender pedicels, oblong-linear, subterete, less than an inch long.
- 19 **Erysimum**. Pods subsessile, erect, appressed to the rachis, subulate.
- 20 **Smelowskia**. Pods lanceolate to lance-oblong, more or less obcompressed with sharply keeled valves.
- 21 **Schœnocrambe**. Pods slender, terete, somewhat torulose.

TRIBE IV. Pod terete or pris-

2 **Thelypodium**. Pod on a short  
3 **Stanleya**. Pod 1-nerved: c-

TRIBE V. Pod compressed.

4 **Braya**. Pod 1-nerved but  
5 **Camelina**. Pod firm strong

6 **Subularia**. Pod dehiscent, subulate le

TRIBE VI. Pod the apex inde-

7 **Brassica**. Pod  
SERIES II. Pod more or less c-

TRIBE VII. Pod turgid. Pube-

8 **Bursa**. Pod  
9 **Hutchinsia**

10 **Coronopus**. Pod valves, fall-trial herbs

11 **Lepidium**. Pod cotyledons

12 **Thlaspi**. Pod seeded: cot-

SERIES III. Pod durated, in-

TRIBE IX.

13 **Heterodra**. Pod ly dehiscent

14 **Athanasus**. Pod cent: ovar-

15 **Thyanoc**. Pod indehiscent

SERIES IV. Pod deeded, or m-

TRIBE X. Pod rose, multi-

16 **Raphanus**. Pod ed pod.

TRIBE IV. Fruit longitudinally 2-celled, dehiscent, elongated, terete or prismatic or compressed parallel to the partition.

2 **Thelypodium**. Pods slender, terete or quadrangular, often torulose, on a short thick stipe: valves 1-nerved: cotyledons incumbent.

3 **Stanleya**. Pods terete or subterete, on a slender elongated stipe: valves 1-nerved: cotyledons incumbent.

TRIBE V. Pods short, scarcely longer than broad, turgid or obcompressed. Cotyledons incumbent.

4 **Braya**. Pods oblong to linear-oblong with flattish or convex faintly-nerved but not keeled valves.

5 **Camelina**. Silicle obovoid, 2-celled and many-seeded, with somewhat firm strongly convex valves, and thin obovate partition.

6 **Subularia**. Silicle turgid, subglobose, pyriform or short fusiform, dehiscent, several-seeded: cotyledons incumbent: aquatic herbs with subulate leaves.

TRIBE VI. Pods long or short, dehiscent their whole length or the apex indehiscent. Cotyledons longitudinally conduplicate.

7 **Brassica**. Pods slender and longitudinally dehiscent to near the apex.

SERIES II. Pods short, dehiscent their whole length. Valves more or less obcompressed, the partition usually narrow.

TRIBE VII. Pod a 2-celled silicle, strongly obcompressed or turgid. Pubescence wholly simple or none.

8 **Bursa**. Pods obcordate, reversed deltoid in outline.

9 **Hutchinsia**. Pods elliptical, entire at the apex.

10 **Coronopus**. Pods more or less distinctly didymous with thickish valves, falling off as closed or nearly closed 1-seeded nutlets: terrestrial herbs but growing in wet places.

11 **Lepidium**. Pods strongly obcompressed; with usually 1-seeded cells: cotyledons incumbent. Terrestrial herbs.

12 **Thlaspi**. Pods strongly obcompressed, dehiscent; cells 2 to several seeded: cotyledons accumbent. Glabrous terrestrial herbs.

SERIES III. Pods short, [rarely long], usually crustaceous and indurated, indehiscent, 1-2-celled, with 1-2 seeds in each cell.

TRIBE IX. Pods orbicular to elliptical. Ovule suspended.

13 **Heterodraba**. Pods short-elliptical, twisted, not margined, very tardily dehiscent, by a very filmy partition 2-celled.

14 **Athysanus**. Pods orbicular, not margined, uncinately hispid, indehiscent: ovary 1-celled, 3-4-ovuled but only one maturing.

15 **Thysanocarpus**. Pods orbicular to obovate, wing-margined, 1-celled indehiscent: ovary 1-ovuled: pubescence simple.

SERIES IV. Pods elongated, indehiscent, 1-celled and many-celled, or many-celled with 1 seed in each cell.

TRIBE X. Pods elongated, terete or somewhat prismatic, often prostrate, multicellular and indehiscent.

16 **Raphanus**. Fruit an indehiscent multicellular or transversely divided pod.

*Tribe 1. Arabideæ DC. Stigma when lobed prolonged over the placenta. Pods 2-celled, sometimes incompletely so, regularly dehiscent, flattened parallel to a broad partition or terete. Cotyledons accumbent (incumbent to convolute in Cheiranthus).*

1 PARRYA R. Br. in Parry Voy. App. 268.

Low perennial herbs with mostly radical entire or toothed somewhat fleshy leaves, and rose-colored or purple flowers. Sepals erect, equal or the lateral ones saccate at base. Petals spatulate unguiculate. Anthers usually linear. Style short; stigma lobes connate. Pods compressed, the valves plane, 1-nerved. Seeds in 1 or 2 rows in the cells, large, somewhat compressed orbicular. Cotyledons various.

**P. Menziesii** Greene Bull. Torr. Club xiii, 143. *Phenacaulis Cheiranthus* Nutt. T. & G. Fl. 1, 89. *Cheiranthus Menziesii* Watson Bot. King, 1. Caudex stout and branching, the branches densely clothed with the persistent petioles of former seasons: radical leaves spatulate or oblanceolate entire, 1-4 inches long, persistent, canescent, with a dense stellate pubescence, the petioles nearly glabrous: scape-like stems several from each branch of the caudex, twice longer than the radical leaves, nearly glabrous, often leafy-bracted below: flowers large dark purple or red, to ochroleucous, rather dense many-flowered racemes: pods spreading, on short, stout pedicels, 1-2 inches long, 1-2 lines broad, not carinate, attenuate to the slender style, glabrous few-seeded. On stony hillsides, northern California and Nevada to Brit. Columbia east of the Cascade Mountains.

**Var. lanuginosa** Watson in Gray's Syn. Fl. 152. Pubescence more loose and woolly. Eastern Washington.

2 CHEIRANTHUS L. Gen. n. 815.

*Cheiranthus* and *Erysimum* of authors.

Biennial or perennial herbs with narrow entire or sparingly toothed leaves and yellow or purple flowers in simple racemes. Sepals erect, oblong to linear-oblong, equal at base or the lateral ones somewhat saccate. Petals commonly large with broad oblong ovate blade and slender elongated claw. Stamens 6, free and unappendaged. Pods strongly compressed, broadly linear with flat 1-nerved valves or narrow and quadrangular with convex and more or less distinctly keeled valves. Seeds numerous, oblong and turgid, or suborbicular and flattened or winged. Cotyledons incumbent or accumbent or the radical very oblique.

\* Petals 2-2½ lines long, yellow: pods subterete, 5-10 lines long; cotyledons incumbent or nearly so.

**C. turritoides** Lam. Encycl. ii. 716. *Erysimum cheiranthoides* L. Stem erect, subterete, simple or with few subterminal branches: leaves lanceolate, acute at each end, entire or remotely and obscurely denticulate, 1-3 inches long, thin, green on both faces, sparsely and finely pubescent: flowers small, yellow: pods obtusely angled, 5-10 lines long, somewhat spreading and rather slender pedicels, glabrous, slenderly short beaked. Along streams, eastern Oregon to Alaska and across the continent.

\*\* Petals 3-12 lines long, yellow or orange, rarely purple. Pods subterete or obviously 4-angled, not strongly compressed, 1-4 inches long; cotyledons incumbent or rarely oblique or somewhat accumbent.

**C. inconspicuus** (1838), not Pers. Pairs: stems erect, lanceolate, mostly glabrous, sepals linear-oblong, yellowish, puberulent, suberect, 1-2 lines long, stout style and slender Minnesota

**C. elatus** Greene Bull. Torr. Club xiii, 143. Pairs: stems erect, lanceolate, mostly glabrous, sepals linear-oblong, yellowish, puberulent, suberect, 1-2 lines long, stout style and slender Minnesota

\*\*\* Flow. erect, 1-nerved

**C. occidentale** (Robt. Gray) Greene Bull. Torr. Club xiii, 143. Pairs: stems erect, lanceolate, mostly glabrous, sepals linear-oblong, yellowish, puberulent, suberect, 1-2 lines long, stout style and slender Minnesota

**C. arenicolus** (Ledeb.) Greene Bull. Torr. Club xiii, 143. Pairs: stems erect, lanceolate, mostly glabrous, sepals linear-oblong, yellowish, puberulent, suberect, 1-2 lines long, stout style and slender Minnesota

**C. capitatus** (Schlecht.) Greene Bull. Torr. Club xiii, 143. Pairs: stems erect, lanceolate, mostly glabrous, sepals linear-oblong, yellowish, puberulent, suberect, 1-2 lines long, stout style and slender Minnesota

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**C. inconspicuus** Greene Pitt. iii. 134. *Erysimum parviflorum* Nutt. (1833), not Pers. (1807). Cinereous and scabrous with appressed forked hairs: stems erect, 10-18 inches high: leaves narrow, oblong-linear or lanceolate, mostly entire, the radical crowded, sometimes repand-dentate: sepals linear-oblong, acute, 3 lines long, little surpassed by the narrow sulphur-yellow petals: pedicels 2-3 lines long, spreading in fruit: pods slender, suberect, 1-2 inches long, scarcely narrowed above, tipped with a short stout style and 2-lobed stigma. Eastern Washington to Alaska, Wyoming and Minnesota.

**C. elatus** Greene l. c. 135. *Erysimum elatum* Nutt. Scabrous and usually canescent with appressed 2-parted hairs: stems erect from a biennial or short-lived perennial root, 1-6 feet high, usually simple, angled; leaves lanceolate to entire or repand-dentate, or the lowest pinnatifid: petals yellow or orange, 6-8 lines long, with broadly obovate suborbicular, blade the very slender claw, much exceeding the oblong or linear sepals: pods 2-5 inches long by a line wide usually sharply angled, erect or spreading on spreading pedicels 2-6 lines long; style 1-2 lines long; stigma somewhat 2-lobed: seeds oblong, brown, often sharply wing-appendaged at the apex. Common on dry hillsides, California to Brit. Columbia.

\*\*\* Flowers large or middle-sized, pods more strongly flattened, 1-nerved or somewhat keeled.

**C. occidentalis** Watson Proc. Amer. Acad. xxiii, 261. *Erysimum occidentale*, Rob. Stems erect, simple or branching from near the base, 2-18 inches high, from an annual or biennial root, becoming stout, angular, finely pubescent with appressed forked hairs: narrowly linear to lance-linear, leaves attenuate to long slender petioles entire or nearly so: racemes at first short, but becoming 4-8 inches long in fruit: pedicels stout, spreading 2-4 lines long: petals light yellow, 8-10 lines long, much exceeding the pale narrowly-oblong strongly saccate calyx: pods 3-4 inches long, 1½ lines broad, rather abruptly beaked; style slender, 2 lines long; stigma small: seeds oblong, rather broadly winged: cotyledons accumbent. On sandy or gravelly banks, Klickitat county, Washington to Nevada.

**C. arenicola** Greene l. c. 131. *Erysimum arenicola* Watson Proc. Am. Acad. xvi, 142. Cespitose perennial: stems several from the densely multicapital caudex, terete, 6-8 inches high: leaves very numerous, chiefly clustered at the base, oblanceolate, repandly denticulate, including the petiole 1½ inches long, 2-3 lines broad, pubescent with white appressed 2-3 pointed hairs: racemes short, rather few-flowered: pedicels spreading, 1 line long: sepals 4 lines long; petals unknown: pods very gradually narrowed to a point: cotyledons oblique-incumbent. Olympic Mountains Washington, 5000 feet altitude. C. V. Piper.

**C. capitatus** Dougl. in Hook. Fl. 1, 38. *Cheiranthus usper* Cham. & Schlecht. in *Linnaea*, 14. Finely pubescent with appressed 2-parted or on the lowest leaves somewhat stellate hairs: stem 3-24 inches high from a perennial root, somewhat angular, stout, simple or less frequently branched, sometimes from the base: leaves oblong to spatulate or linear, attenuate below, entire or more or less deeply repand-dentate: flowers light yellow, in a many-flowered at first subcapitate but elongating raceme: petals 8-12 lines long, with broad rounded blade and slender claw: pods 1-4 inches long, 1-1½ lines broad; valves flattish, 1-nerved: style stout, ½-1 line long: stigma broad: seeds oblong, brown, margined. Common on the coast from Curry county, Oregon to California.

3. NASTURTIUM R. Br. in Ait. Hort. Kew ed. 2, iv, 109.

Perennial herbs with lyrate compound or simple and pinnatifid or undivided leaves and white flowers. Sepals erect. Petals unguiculate. Pods short, turgid, little compressed, nerveless.



Seeds small, rounded, somewhat flattened, impressed punctate.

**N. OFFICINALE** R. Br. l. c. Glabrous; stems stoutish hollow rooting at the decumbent base, the branches  $\frac{1}{2}$ -5 feet long; roots all fibrous; leaves pinnate, leaflets rounded or elongated the terminal one largest; petals white, exceeding the calyx; pods divaricately spreading, 6-10 lines long, acute at each end, equaling the spreading pedicels, style short and thick. Common in brooks and wet places. Introduced from Europe.

4 RORIPA Scop. Fl. Carn. 520.

Annual, biennial, or perennial herbs with yellow flowers in paniculate racemes. Commonly referred to Nasturtium. Sepals greenish yellow, ascending or spreading. Petals short-unguiculate and ascending. Pods terete or nearly so; valves thin, nearly or quite nerveless. Seeds small, turgid and wingless, in 2 rows in each cell, minutely tuberculate.

**R. sinuata** A. S. Hitchck. Spring Fl. Manh. 18. *Nasturtium sinuatum*, Nutt. Stems decumbent to prostrate pale green glabrous or slightly scurily-pubescent; leaves narrowly oblong or oblanceolate, usually deep and regularly pinnatifid, the subequal oblong to deltoid segments entire or with 1 or 2 teeth; pedicels mostly divaricately spreading, slender, 2-5 lines long; pods oblong to linear, mostly 3-5 lines long acute at each end and beaked by a slender style, more or less curved. Eastern Oregon and Washington to the plains of the Saskatchewan. Minnesota and Arkansas.

**Var. pubescens.** *Nasturtium sinuatum* var. *pubescens* Watson in Gray Syn. Fl. i. 174. Pubescent throughout with woolly hairs; stems very slender, decumbent; racemes lax, 4-8 inches long; pedicels 3-6 lines long, very slender; ovary oblong-obovate, pubescent; style long and slender. On sandy ground Sauvie's Island Oregon, at the mouth of the Willamette river. But one plant was found: if not abnormal it is a good species.

**R. Columbiæ.** *Nasturtium Columbiæ* Suksdorf in Herb. distr. 952. Low and spreading, pubescent throughout; leaves rather narrow, deeply and narrowly pinnatifid; pedicels scarcely 2 lines long; pods short-oblong,  $1\frac{1}{2}$ -2 lines long, densely pubescent with short and rather fine somewhat papillose hairs. Low gravelly banks of the Columbia and Snake rivers, which are submerged most of the year.

**R. palustris** Bess. Enum. 27. *Nasturtium palustre* DC. Glabrous or rarely somewhat pubescent; stems erect from a biennial root, 6-18 inches high, branching; lower leaves lyrate; upper more or less deeply pinnatifid or merely toothed, the lobes narrowly to broadly oblong, dentate; pods oblong, turgid, usually obtuse. Oregon to the Sierra Nevada and the Atlantic states.

**R. Pacifica.** *Nasturtium terrestre* var. *occidentale* Watson, in Gray Syn. Fl. i. 148. Glabrous or the auricles of the leaves sometimes ciliate; stems stout, 1-3 feet high from a stout annual or biennial root; more or less freely branching; leaves lanceolate, the lower ones lyrate, petioled, 2-6 inches long; the oblong to ovate segments erose-dentate; pods oblong, turgid acutish at both ends or obtuse above, 4-6 lines long, equaling the spreading pedicels. On alluvial soil lower Columbia valley to Brit. Columbia.

**R. sphaerocarpa** Britton, Mem. Torr. club, v. 170. *Nasturtium sphaerocarpum*, Gray Pl. Fendl. 6. More or less hispid with short spreading hairs; stems erect, 1-3 feet high from a biennial or winter annual root; branched above; lower leaves lyrate with oblong or ovate, dentate segments, upper ones lanceolate, more or less pinnatifid or irregularly dentate; pods short, mostly broadly elliptical or subglobose 1-3 lines long. Oregon and Washington.

**R. curvula** Nutt. (from an annual with oblong yellow in rather slender. On rich, allu

**R. lyrata** decumbent, c pinnatifid, th toothed; pod length of the style. On m ornit.

**R. polym** (6-10 inches deeply pinnate; acute; flower long-linear oblong, Nutt."

**R. tener** cumbent spat few lyrate p cemes almost curved, the a partition bot moist banks, Wyoming.

Glabrous colored stems; colored: the nate on the blade and s tinctly tetra elongated, s Cotyledons

**B. vulgar** bosely bran ally pinnatel apex and var rounded teet tire or tooth claspng at b petals nearly erect upon m cultivated fl

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**R. curvisiliqua** Bessey Mem. Torr. club v. 169. *Nasturtium curvisiliqua*, Nutt. Glabrous, usually erect, diffusely branched 3-12 inches high from an annual root: leaves narrowly oblong or oblanceolate pinnatifid with oblong usually toothed lobes, rarely only sinuate toothed: flowers yellow in rather dense racemes: petals a little exceeding the sepals: pods rather slender, 4-8 lines long, about equaling the pedicels, often curved. On rich, alluvial river bottoms, British Columbia to Lower California.

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**R. lyrata** Greene Man. 20. *Nasturtium lyratum* Nutt. Stems erect or decumbent, commonly diffusely branched from the base: leaves lyrate or pinnatifid, the segments oblong-lanceolate, incisely serrate or angularly toothed: pods linear, compressed, 8-10 lines long, more than twice the length of the pedicel, slightly curved, obtuse, tipped with the very short style. On muddy banks and in wet places, Oregon and northern California.

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p and regu-  
re or with 1  
5 lines long:  
and beaked  
Washington

**R. polymorpha**. *Nasturtium polymorphum* Nutt. T. & G. i, 74. Stems 6-10 inches high from an annual or biennial root: leaves rather narrow, deeply pinnatifid or almost entire, the segments entire, short, linear acute: flowers small; the petals scarcely longer than the calyx: pods oblong-linear compressed: stigma minute, nearly sessile. "Banks of the Oregon, Nutt." Moist places. Willamette and lower Columbia valleys.

son in Gray  
s very slen-  
s long, very  
tender. On  
Willamette  
species.

**R. tenerrima** Greene Eryth. iii, 46. Glabrous: stems weak and decumbent sparingly branched 6-10 inches long from an annual root: leaves few lyrate pinnatifid, the terminal lobe acutish, rachis of the few racemes almost capillary: pods subconical to ovate-lanceolate slightly curved, the apex surmounted by a considerable beak-like style: valves and partition both very thin: seeds many in 2 rows under each valve. On moist banks, eastern California and western Nevada to Washington and Wyoming.

5 BARBAREA R. Br. in Ait f. Kew. ed. 2. iv. 109.

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ers, which

Glabrous erect branching biennial or perennial herbs with angled stems and entire or pinnatifid leaves. Sepals oblong, often colored: the lateral pair often saccate at base and slightly connate on the back near the apex. Petals spatulate or with obovate blade and slender claws. Stamens 6, free and unappendaged, distinctly tetradynamous. Style short: stigma bifid. Pods linear, elongated, somewhat 4-angled. Seeds in one row in each cell. Cotyledons slightly oblique.

Glabrous or  
3-18 inches  
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nd the At-

**B. vulgaris** R. Br. l. c. Stems erect, 1-3 feet high, simple or corymbosely branched, somewhat angled: radical and lower caudate leaves usually pinnately parted, the terminal lobe ovate or orbicular, rounded at the apex and varying from cuneate to cordate at base, entire or with a few rounded teeth or lobes; lateral segments very variable usually oblong, entire or toothed: petioles auriculate at base: upper leaves entire or toothed, clasping at base: flowers in a short dense oblong raceme, bright yellow: petals nearly or quite twice as long as the sepals: pods ascending or suberect upon more or less spreading pedicels. Common along streams and in cultivated fields. Lower California to Alaska and across the continent.

n Gray Syn.  
iate: stems  
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qualing the  
rit. Colum-

**B. stricta** Andrz. Bess. Enum. 72. Stems erect 1-2 feet high, leaves lyrate pinnatifid with a large rounded terminal lobe and 1-5 pairs of lateral ones: flowers pale yellow, during anthesis closely aggregate and subcorymbose: petals usually not over a third or half longer than the calyx: pods mostly appressed to the elongated rachis. Along streams etc., California to Alaska and across the continent.

rtium spha-  
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## 6 ARABIS L. Gen. n. 818.

Annual biennial or perennial herbs, rarely suffrutescent at base with usually simple leaves, stellate or forked pubescence, and white or purple flowers in ebracteate racemes. Sepals equal or the lateral ones saccate at base. Petals entire or emarginate, usually unguiculate. Stamens 6, free and unappendaged. Pods linear compressed parallel to the partition, with flat or subconvex, more or less prominently 1-nerved valves and membranaceous partition. Stigma simple or barely 2-lobed. Seeds in 1-2 rows: elliptical or orbicular, more or less margined or winged. Cotyledons accumbent or oblique.

§ 1 SISYMBRINA Watson in Gray Syn. Fl. i, 159. Biennials or perennials with the pubescence, if any, wholly simple above, but forked upon the lowest leaves.

**A. Nuttallii** Robinson in Gray Syn. Fl. i, 160. *A. spathulata* Nutt. T. & G. Fl. i, 31, not DC. Stems slender simple, 6-10 inches high from a branching biennial or perennial rootstock, erect or ascending, glabrous above, more or less hirsute below: radical leaves spatulate-oblancheolate, obtuse or acutish, entire, an inch or less long: cauline narrowly oblong to elliptical, sessile but not auricled: petals 2-3 lines long, white: pods short, 6-9 lines long by  $\frac{1}{2}$  of a line broad, somewhat attenuate to a rather stout style: valves slightly convex, 1-nerved and faintly veined: seeds elliptical: cotyledons accumbent. On low grounds, mountains of eastern Washington and western Montana.

§ 2 TURRITIS Flowers whitish; pods narrow: seeds in 2 rows in the cells.

**A. perfoliata** Lam. Encycl. i, 219. Glaucons, stems erect, solitary, simple or sparingly branched, usually stout, 1-6 feet high from a biennial root: radical leaves spatulate, 2-4 inches long, sinuate-pinnatifid or toothed, ciliate and more or less hirsute with stellate hairs; cauline leaves entire ovate to ovate-lanceolate, clasping by the sagittate base: raceme long and strict: flowers white or stramineous: petals linear-lanceolate, 2-3 lines long, not more than twice the length of the sepals: pods strictly erect almost terete, 3-4 inches long, less than a line wide, on short pedicels: style short or none, stigma 2-lobed: seeds somewhat in 2 rows narrowly winged or wingless: cotyledons accumbent to incumbent in the same pod. On dry ridges and stony hillsides, Brit. Columbia to California and across the continent to New England and New Jersey.

§ 3 EUARABIS Watson in Gray Syn. Fl. i, 160 in part. Seeds orbicular or broadly elliptical, more or less wing-margined. Cotyledons strictly accumbent.

**A. hirsuta** Scop. Fl. Carn. ed. 2, ii, 30. More or less hirsute at least at the base with spreading simple or forked, rarely stellate hairs: stems often clustered on the crown of the biennial root or branching caudex, 6-20 inches high, simple or with slender strict branches above: radical leaves in a rosulate cluster, ovate to spatulate attenuate to a winged petiole, entire or sparsely dentate; cauline ones ovate to oblong or lanceolate sessile and partly clasping by a somewhat sagittate or cordate base: petals white, spatulate twice as long as the greenish sepals: pods strictly erect 1-2 inches long, less than a line wide on erect slender pedicels; style very short and stout or the stigma nearly sessile: seeds suborbicular, very narrowly winged. In moist places, Sierra Nevadas of California through Oregon and Washington to northern Alaska and across the continent to the

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**A. furcata** Watson Proc. Am. Acad. xvii, 302. Stems several from a slender branching perennial rootstock, slender ascending, 10-18 inches high: lower leaves oblong-ovate, attenuate below to a stout petiole, few-toothed, 1-3 inches long; sparingly pubescent and ciliate with coarse forked hairs; cauline oblong to linear or lanceolate, scarcely auricled: flowers large in a lax few-flowered raceme; petals white broadly spatulate, 6-7 lines long, more than twice as long as the sparingly hirsute sepals: pods 10-20 lines long, less than a line broad, attenuate to a very short style, on slender pedicels 6-10 lines long: seeds oblong-elliptical, winged at the lower end. On bluffs of the Columbia river from the mouth of the Sandy to near Hood river.

**A. Suksdorfii.** *A. furcata* Watson l. c. in part. Stems tufted from a thick perennial root, simple, 3-8 inches high, strictly erect, lower leaves oblong-obovate 1-3 inches long, sparingly pubescent and ciliate with branched hairs, entire or few-toothed; cauline few, oblong to lanceolate: flowers middle-sized, in a strict somewhat dense raceme: petals white, spatulate 3-5 lines long; pods 6-18 lines long by less than a line broad, erect on short erect pedicels. On dry alluvial ridges Mount Adams Washington near the line of perpetual snow.

**A. purpurascens** Howell in Herb. Greene Pitt. i, 161. Usually livid-purple throughout: stems tufted, from a branching perennial root, simple, usually slender, 6-30 inches high, soft-pubescent with simple or forked hairs and a shorter, more branching pubescence beneath: leaves scattered but rather ample, thin sparsely pubescent: the lowest obovate-oblong attenuate below to a petiole, the cauline narrowly-oblong sessile, all with scattered coarse and salient teeth: racemes loose and few-flowered; calyx purple 2-3 lines long: petals 6-9 lines long deep rose purple: pods slender, 2 inches long less than a line wide. On rocky ridges and bluffs, northern base of the Siskiyou Mountains from Ashland to Waldo Oregon.

**A. atrorubens** Suksdorf in Herb. Greene Eryth. i, 223. Pale and glaucous or the herbage becoming purplish in full maturity: stems erect, a foot or more high from a branching perennial root: radical leaves spatulate-oblong, an inch long, stellate-pubescent: cauline ones glabrous, ovate to ovate-lanceolate, sessile and auriculate-clasping, all rather remotely and coarsely serrate-toothed: raceme simple, strict, few-flowered: sepals dark red, sparsely pubescent with branching hairs: petals dark red or almost black about 4 lines long: pods suberect narrowly linear, acute, 3 inches long or more: seeds flattened, narrowly winged. Edge of brushlands on the higher part of the Klickitat hills, Klickitat county, Washington.

**A. sparsiflora** Nutt. T. & G. Fl. i, 81. Stems 1-3 feet high from a biennial or perennial root, sparingly pubescent below with forked or simple hairs: lower leaves numerous, entire oblanceolate, on slender petioles; cauline leaves oblong to linear-lanceolate, entire, sessile and clasping by the auricled base, acute: racemes rather few-flowered; flowers small; petals linear-oblong, bright purple, twice as long as the often colored sepals: pods 2-3 inches long, spreading or suberect on spreading pedicels: seeds narrowly winged. On dry plains, eastern Oregon and Washington to the Rocky Mountains and northern Nevada.

**A. Bolanderi** Watson Proc. Am. Acad. xxii, 467. More or less pubescent throughout with soft stellate hairs: stem solitary, much branched, 1-2 feet high from a biennial root: radical leaves not known; cauline lanceolate, 1-2 inches long, auriculate-clasping entire: flowers small 2-3 lines long, rose-colored: sepals and pedicels pubescent: pods mostly divaricately spreading, glabrous, straight, 6-18 lines long obtuse with a broad sessile stigma: valves 1-nerved to the middle: seeds orbicular to elliptical, narrowly winged. Yosemite Valley, *Bolander*; Washington, *Brandegee*.

**A. Breweri** Watson Proc. Am. Acad. xi, 123. Stems several from a branching perennial caudex 4-12 inches high, more or less villous with spreading simple or branched hairs or stellate pubescent towards the base, lower leaves narrowly oblanceolate, entire or toothed, finely stellate-pubescent, an inch long or less, the petioles often ciliate; upper cauline leaves lanceolate to narrowly oblong, sessile with a cordate base or obtusely auriculate, somewhat villous or pubescent or nearly glabrous; flowers bright rose-color or purplish to nearly white, 3-4 lines long; the pedicels and purplish calyx more or less villous; pods at length spreading and more or less arcuate  $1\frac{1}{2}$ -3 inches long by a line or more broad, acute with a sessile stigma; valves 1-nerved, veined; seeds orbicular, narrowly winged. Southwestern Oregon to middle California.

**A. Lemmonii** Watson Proc. Am. Acad. xxii, 467. Stems several from a branching perennial caudex, slender, 6 inches high or less, glabrous above, hoary below with fine dense stellate pubescence: lower leaves spatulate-oblanceolate, rarely with one or two teeth, 6-9 lines long, the petioles sometimes ciliate; cauline leaves oblong-lanceolate, auriculate, mostly glabrous or nearly so; flowers 2-3 lines long, rose-colored; sepals pubescent; pods ascending or widely spreading, on short pedicels glabrous, curved 1-2 inches long by  $\frac{3}{4}$  of a line broad, more or less attenuated to a sessile stigma or short style: seeds in one row, orbicular, narrowly winged. In the mountains from northern California to Mount Adams Washington, Nevada, Wyoming, Montana and Brit. Columbia.

**A. Koehleri** (In honor of R. Koehler of the S. P. R. R., who has shown me many favors while botanizing in Oregon). Stems slender, 3-6 inches high from a perennial much branched woody caudex; lower leaves densely rosulate at the ends of the branching caudex, persistent, linear-lanceolate to spatulate, narrowed below but scarcely petioled, 6-12 lines long entire, canescent with stellate pubescence; cauline leaves only one or two, broadly subulate, auriculate; racemes few-flowered; flowers scarlet 4-6 lines long; pods 2-3 inches long, a line broad, often arcuate, erect on slender pedicels; style very short or none; seeds small, narrowly winged. On cliffs, etc., in the Coast Mountains of Douglas county, Oregon and along the Umpqua river at Roseburg, flowering early.

**A. Lyallii** Watson Proc. Am. Acad. xi, 122. Glabrous throughout or sometimes stellate-pubescent below: stems several or many from a branched perennial caudex, 2-10 inches high: lower leaves spatulate to linear-oblanceolate, usually 6-12 lines long, sometimes 2-3 inches long: the cauline narrowly lanceolate to oblong, sometimes scarcely auricled: flowers rose-color, 2-3 lines long; sepals glabrous; pods erect or ascending, straight or nearly so, 1-2 inches long by  $\frac{2}{3}$ -1 line broad, narrowed to a short style or sessile stigma; valves 1-nerved, at least to the middle, veined; seeds orbicular narrowly winged in 1 row. On the highest peaks of the Cascade Mountains from Brit. Columbia to California, Montana and Utah.

**A. microphylla** Nutt. T. & G. Fl. i, 82. Stems slender, 2-6 inches high from a slender branching perennial caudex, somewhat hirsute at base with spreading hairs or nearly glabrate: lower leaves stellate pubescent, linear, acutish, 4-6 lines long; cauline leaves few, sessile linear-lanceolate to narrowly oblong: racemes few-flowered: flowers pale rose-color to pink, 2-3 lines long; pods only 2-6 at the ends of the filiform branches, erect, 1-2 inches long by  $\frac{1}{2}$ - $\frac{3}{4}$  of a line wide: seeds small, slightly winged. On rocky banks, eastern Oregon to Wyoming and Utah.

**A. Cusickii** Watson Proc. Am. Acad. xvii, 363. Villous-hirsute with scattered spreading mostly simple hairs. Stems usually several from a biennial (?) root, 6-10 inches high, simple hirsute or glabrate above: radical leaves linear-oblanceolate, hirsute and ciliate, 8-12 lines long; the up-

per ones linearly toothed lines long, the pedicels: acuminate, 5 ridges, Klick county Oregon

**A. platys** wholly glabrous stock, 2-12 inches about an inch rose-colored 1-2 $\frac{1}{2}$  inches valves distinct broadly winged Sierra Nevada

**A. Howell** inches high fraxus, entire, towards the base what clasping 3-4 lines long stigma sessile kiyou Mount

§ 4 PEND  
pendulous.

**A. suffrut** throughout or branching woody rowly oblanceolate and sessile or purple, 3 lines to a short style orbicular winged bluffs of Snake northern line

**A. retrofr** erect from a brous and often reflexed simple lower ones at dentate, an upper ones 1 comes few to icels: petals s as the pubesc with the ped along streams and Brit. Col

**A. secun** woody base 1 about an inch line leaves linear comes many line wide on forming a s dry ridges M

per ones linear-oblong and clasping but not auriculate, all entire or sparingly toothed: petals white with purple veins, linear spatulate, about 3 lines long, twice as long as the sparingly pubescent sepals and exceeding the pedicels: pods ascending, falcate 2-3 inches long by a line, broad acuminate, stigma sessile: seeds acutely margined. On high rocky ridges, Klickitat county to Spokane county, Washington and Union county Oregon.

**A. platysperma** Gray Proc. Am. Acad. vi, 510. Glauous, sometimes wholly glabrous: stems erect or ascending from a branching perennial root-stock, 2-12 inches high, simple or branched: lower leaves oblanceolate, about an inch long; the upper oblong to linear-lanceolate, sessile: petals rose-colored or nearly white 2-3 lines long: pods erect or a little spreading, 1-2½ inches long by 1½-2½ lines wide, attenuate to a short stout style; valves distinctly veined, 1-nerved toward the base: seeds orbicular, broadly winged. From Mount Hood Oregon to the San Bernardino and Sierra Nevada Mountains.

**A. Howellii** Watson Proc. Am. Acad. xxv, 124. Glabrous; stems 1-4 inches high from a much-branched cespitose caudex: lower leaves glaucous, entire, linear-oblanceolate, an inch long, often sparsely ciliate towards the base; the few cauline narrowly oblong obtusish, sessile somewhat clasping but not auriculate at base: flowers few, pale to bright pink, 3-4 lines long: pods erect 1-2 inches long by 2 lines broad acuminate; stigma sessile: seeds orbicular, broadly winged. On Ashland Butte, Siskiyou Mountains, Oregon.

§ 4 PENDULA Flowers nodding, usually pale. Pods usually pendulous. Seeds in 1-2 rows in the cells.

**A. suffrutescens** Watson Proc. Am. Acad. xvii, 362. Glabrous throughout or sparingly stellate pubescent below: stems several from a branching woody perennial caudex, 8-12 inches high: lower leaves narrowly oblanceolate, acute, about an inch long: the cauline more oblong and sessile or shortly auriculate-clasping: racemes few-flowered; sepals purple, 3 lines long: pods 1-2½ inches long by 1½-2 lines wide, attenuate to a short style, straight, pendant, on reflexed pedicels 4-6 lines long: seeds orbicular winged. On dry rocky ridges, Mount Adams Washington to the bluffs of Snake river in Oregon and the Siskiyou Mountains near the northern line of California.

**A. retrofracta** Graham Edinb. New Phil. Journ. 1829, 344. Stems erect from a biennial root, 1-3 feet high, simple or branching above, glabrous and often somewhat glaucous above, minutely pubescent below with reflexed simple or forked hairs: leaves narrowly lanceolate to linear, the lower ones attenuate below to a winged petiole, rather coarsely serrate-dentate, an inch or two long, densely pubescent with stellate hairs; the upper ones linear, sessile deeply sagittate entire 1½-3 inches long: racemes few to many-flowered; flowers nodding on spreading tomentose pedicels: petals spatulate, pale to bright purple, 3-4 lines long, twice as long as the pubescent calyx: pods linear, 2-3 inches long by half a line wide and with the pedicels strongly refracted: seeds obovate, narrowly winged, along streams, eastern Oregon and Washington to the Rocky Mountains and Brit. Columbia.

**A. secunda** Howell Eryth. iii, 33. Stems several from a branching woody base 10-18 inches high, stellate-pubescent: lower leaves lanceolate, about an inch long, narrowed below to a winged petiole, entire, acute; cauline leaves linear, revolute, sessile, distinctly auricled 6-12 lines long: racemes many-flowered, strictly secund: pods 1-2 inches long, less than a line wide on filiform pedicels 2-3 lines long that are all deflexed one way forming a second spike; seeds small, narrowly winged, in 1 row. On dry ridges Mount Adams, Washington.

**A. Columbiana** Macoun Cat. Canada Pl. ii, 304. Winter annual: almost smooth or pubescent below with branching hairs: lower leaves slightly toothed and tapering into a petiole; cauline sessile and often clasping: flowers white: pods exactly sickle-shaped, 3-4 inches long. Common on the lower slopes of mountains, northern Washington to Brit. Columbia.

**A. canescens** T. & G. Fl. i, 83. Finely stellate-pubescent throughout: stems one to several from a perennial or biennial root, 2-8 inches high; simple or branched: lower leaves linear-oblongate, an inch long or less; cauline leaves linear, clasping but hardly auriculate: flowers small 2 lines or less long, pale: pods pendulous, pubescent or glabrate, 1-1½ inches long by less than a line broad, on pedicels 1-3 lines long; valves 1-nerved to the middle: seeds small, orbicular, winged, in 1 or 2 rows. On dry plains, Blue Mountains and Harney valley Oregon, to the Rocky Mountains and Brit. Columbia.

**A. arcuata** Gray Proc. Am. Acad. vi, 187 (?). More or less stellate-pubescent or hirsute: stems erect, 6 inches to 2 feet or more high from a perennial woody caudex, simple or branched, lower leaves spatulate, entire or denticulate acute, 1-2 inches long; cauline oblong-lanceolate, sagittate and clasping at base 6-12 lines long or more; racemes rather few-flowered; flowers pale nodding; petals 3-4 lines long, white or purple, twice as long as the sepals: pods 1-4 inches long by a line or more broad erect and slightly curved or spreading and strongly falcate. On rocky ridges and dry plains, eastern Oregon and Washington to southwestern Oregon.

**A. subpinnatifida** Watson Proc. Am. Acad. xx, 353. Canescent with a very fine and dense stellate pubescence: stems 1 to several from a branching somewhat woody base: lower leaves crowded and persistent, linear-oblongate, entire or sparingly toothed, 9-12 lines long; upper ones lanceolate, coarsely and subpinnatifidly toothed: flowers pale pink, 3-6 lines long; pods strongly reflexed, on pedicels 2-5 lines long, 1½-3 inches long, 1-1½ lines broad, more or less attenuate to the short style, pubescent, slightly curved; valves 1-nerved to the middle and veined; seeds in one row, as broad as the partition, winged. On dry rocky ridges, southwestern Oregon and adjacent California to northwestern Nevada.

7 STREPTANTHUS Nutt. Jour. Acad. Philad. v, 134, t. 7.

Caulicent branching herbs with entire or toothed, or rarely pinnatifid leaves and purple white or yellowish flowers. Sepals ovate or oblong usually colored, equal at base (rarely one or both pair saccate), commonly connivent. Petals often without a dilated blade, more or less twisted or undulate; the claw channeled. Stamens: 6, the longer pair often connate below. Anthers more or less elongated, sagittate at base. Pods sessile upon the enlarged receptacle, oblong to narrowly linear compressed to subterete: valves 1-nerved; partition hyaline: stigma simple. Seeds flat, margined or winged. Cotyledons accumbent. Ours all of

§ **EUKLISIA** T. & G. Fl. i, 67. Petals narrow, the blade but little if any broader than the claw, undulate crisped. Calyx closed or with spreading tips.

**S. orbiculatus** Greene Fl. Francis. 258. Glabrous and glaucous: stems erect from an annual or biennial root, 6-18 inches high, diffusely branched from the base: lowest leaves round obovate, very obtuse or even truncate, crenately or more remotely and repandly toothed, abruptly narrowed to a petiole as long as the blade; middle, cauline obovate-spatulate, auricled and clasping; uppermost orbicular, mostly entire, obtuse, sepals purple,

2-3 lines long, and whitish at part much the ascending pedicel distinctly but, you Mountains to

**S. glandulosus** smooth above lowest leaves ovate, acuminate, entire lines long, so longer: one pair than a line wide you Mountains to

**S. longirostris** Watson Bot. and glaucous: from the base, flowers spread ear, not closed but little short broad, straight pedicels: seeds Washington to

**S. Howellii** cious: the stout what fleshy root repand-dentate racemes elongate ovate, acute, 3 little longer: flowers broad, erect or northern Oregon near

Stout perennial colored flowers usually saccate: undulate-crisped extension of 2-lobed or slightly thick stipe, distinctly 1-nerved or scarcely n

**C. hastatus** high from a perennial, radical ovate, acute, entire, hastate, or loose virgate equaling the seeds obtuse, spreading the Wahsatch



2-3 lines long, acute but not acuminate at length petaloid-dilated undulate and whitish at the recurved tips: stamens in 3 unequal pairs, the upper part much the longest: torus dilated: pods 2 inches long, falcate, on ascending pedicels strongly torulose; seeds wingless, though sometimes distinctly but very narrowly margined. On dry rocky ridges of the Siskiyou Mountains to the Sierra Nevadas.

**S. glandulosus** Hook Ic. t. 40 (?). Sparsely setose-pubescent below, smooth above: stems erect from an annual root, 1-2 feet high, branching: lowest leaves broadly oval or obovate, nearly sessile, dentate; cauline leaves ovate, clasping by a broad base, the uppermost lanceolate and acuminate, entire or denticulate: flowers purple; sepals acuminate 2-3 lines long, somewhat pubescent or glabrate; the purple petals a half longer: one pair of filaments connate below: pods  $1\frac{1}{2}$ -2 $\frac{1}{2}$  inches long, less than a line wide, erect or ascending: seeds margined. Base of the Siskiyou Mountains near Waldo, Oregon.

**S. longirostris** Watson Proc. Am. Acad. xxv, 127. *Arabis longirostris* Watson Bot. King 17, t. 2, Brewer and Watson Bot. Cal. i, 31. Glabrous and glaucous: stems erect 1-4 feet high from an annual root, branching from the base, radical leaves ovate-spatulate, entire or sparingly toothed: flowers spreading or reflexed purplish or white 2-3 lines long: sepals linear, not closed over the ovary 2 lines long, the lower pair saccate at base, but little shorter than the narrow petals: pods 1-2 inches long by a line broad, straight attenuate to a slender style, pendulous on short reflexed pedicels: seeds elliptical, winged. In alkaline or sandy localities, Wallula, Washington to Lower California and Utah.

**S. Howellii** Watson Proc. Am. Acad. xx, 353. Glabrous and glaucous: the stout leafy simple stem 6-30 inches high from a perennial somewhat fleshy root: lower leaves obovate-spatulate, 1-6 inches long coarsely repand-dentate; the upper ones narrowly spatulate, entire not clasping: racemes elongated: pedicels 3-10 lines long not spreading: sepals purple, ovate, acute, 3 lines long more or less saccate; the dark purple petals but little longer: filaments all distinct: pods 2-3 inches long by  $1\frac{1}{2}$ -2 lines broad, erect or spreading on stout pedicels: seeds oblong, winged. Southern Oregon near Waldo, and on Stein's mountain, southeastern Oregon.

#### 8 CAULANTHUS Watson Bot. King, 27.

Stout perennial herbs with mostly pinnatifid leaves and dull-colored flowers in long loose racemes. Sepals large, nearly equally saccate at base. Petals but little longer than the sepals, undulate-crested, the blade only a somewhat dilated rhomboidal extension of the broad claw. Anthers linear spatulate. Stigma 2-lobed or slightly emarginate. Pods sessile or with a short and thick stipe, terete, elongated; valves convexed, more or less distinctly 1-nerved. Seeds in one row oblong flattened emarginate or scarcely margined. Cotyledons more or less incumbent.

**C. hastatus** Watson Bot. King 28, t. 3. Glabrous, stems stout, 3-5 feet high from a perennial root: simple or somewhat branched: leaves very variable, radical ones lyrate or entire the terminal leaflet much the largest, ovate, acute, hastate or truncate at base; cauline leaves ovate-oblong, entire, hastate, rounded or cuneate at base: flowers greenish-yellow, in a loose virgate raceme, reflexed, sepals narrow-lanceolate, distinct: petals equaling the sepals, sublaciniately toothed laterally: pods linear, subterete, obtuse, spreading. On shaded slopes in the Blue Mountains of Oregon to the Wahsatch and Uintah Mountains of Utah.



**C. pilosus** Watson Bot. King, 27. Filosely hispid: stems 2-4 feet high from a biennial root, stout erect branched leaves petioled lyrate pinnatifid, the lobes sparingly angular-toothed: flowers greenish white on spreading pedicels, the oblong petals narrowed above, 4 lines long: pods slender 3-5 inches long by less than a line in diameter, flexuous, widely spreading or recurved. In sandy soil in "sage brush," etc., southeastern Oregon to Nevada and California.

**C. crassicaulis** Watson l. c. Glabrous: stem simple, erect, 1-3 feet high, very thick, fistulous: leaves chiefly clustered at or near the base, oblong-lanceolate in outline, lyrate toothed or pinnatifid, 2-5 inches long; cauline leaves few, much reduced, linear or somewhat hastate: flowers subsessile, large: sepals oblong-lanceolate 5-6 lines long, more or less pubescent, usually densely so, often velvety: pods ascending, slender, terete 4-5 inches long terminated by the conspicuous stigma. On dry foothills and rocky slopes Idaho to Utah and southern California.

9 DENTARIA Tourn. Inst. 225, t. 110; L. Gen. No. 540.

Sepals equal at base, erect or nearly so. Petals much longer with slender claw and ovate blade. Pods linear, straight with stout firm nerveless flat valves that do not separate elastically, and nerveless partition. Stigma short, capitate or rarely 2-lobed. Seeds in one row, wingless; cotyledons often thick more or less unequal and somewhat oblique, petiolate. Low, usually glabrous perennials with commonly simple stems, variously lobed leaves and comparatively large campanulate flowers in very early spring.

**D. tenella** Pursh Fl. ii, 439. Stems slender 3-10 inches high from an irregular branching or tuberiferous rootstock: radical leaves shallowly 3-5 lobed or coarsely toothed, 6-18 lines long, the petioles often bearing bulblets on their underground portion: cauline leaves 1-2, sessile, deeply 3-lobed or 3-foliate with linear or linear-lanceolate entire obtuse segments, 6-12 lines long; racemes few-flowered, terminal and sometimes axillary: flowers rose-purple: pods 1-2 inches long by a line broad, attenuate to a slender style and a broad distinctly 2-lobed stigma. Very common in woods, western Oregon and Washington, flowering in very early spring.

**D. sinuata** Greene Pitt. iii, 123. *Cardamine sinuata* Greene Eryth. i, 148. Stems 6-18 inches high from tuberous roots, simple or sparingly branched: radical leaf simple from round-reniform to almost orbicular, cordate at base 2-3 inches broad, sinuately lobed, the 9-15 lobes obtuse or almost truncate, conspicuously mucronate; cauline leaves 2 or 3, divided 3-5 more or less cuneate leaflets which are lobed or coarsely toothed at the apex: racemes lax, few-flowered: flowers large, rose-purple; pods 2-3 inches long, conspicuously rostrate. Among the "Redwoods" near Crescent City, California, no doubt in adjacent Oregon.

**D. pulcherrima** Greene l. c. *Cardamine pulcherrima*, Greene l. c. Stoutish, stems 4-8 inches high from a rather slender horizontal root; herbage glabrous, somewhat succulent: radical leaf palmately 3-5-lobed-parted-or-divided, with entire lobes or divisions; cauline leaves 1 or 2, when solitary situated near the inflorescence, digitately 3-5 parted into oblong-linear or lanceolate segments an inch long more or less: racemes short, few-flowered; petals 6-10 lines long, lilac-purple veined with dark purple. In shaded places, eastern Oregon and Washington near The Dalles.

**D. quercetorum** Greene l. c. *Cardamine quercetorum*, Howell, Eryth. iii, 33. Glabrous: stems slender, 6-12 inches high from a branching scaly root: radical leaf 3-5-foliate; leaflets elliptical, coarsely dentate, 1-2 inches

long petiolulate lanceolate acute petals rose-purple the creek, Silv

**D. gemmu** stout, 3-8 inch radical leaves toothed; cauline etc, entire or triple, 5-8 lines near Waldo March.

**D. Californ** Pl. Hartw. 4 inches high tri simple or trif cordate at base short-petioled, petiolulate, ov flowers white thick, the radical southwestern

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Annual or pinnate cemes. Sep Petals obovate what thicker Valves flat, 1 row, winged pinning the rad

**C. bellidif** branched, some elliptical, some with one or two uncles 3-24 line a line long; tuse or truncate long, on pedic the middle. Oregon and A

**C. Lyalli** creeping; stem oled undivided the upper tri white, 3-4 line rather shortly Along brooks

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DENTARIA.  
CARDAMINE.

CRUCIFERÆ.

long petiolulate; cauline leaves 1-4, mostly 3-5-lobed or-parted, with oblong-lanceolate acute, mostly entire divisions: racemes densely many-flowered: petals rose-purple, half inch long: fruit not known. Under small oaks along the creek, Silverton, Oregon.

**D. gemmata.** *Cardamine Gemmata Greene Pitt. i, 162.* Stems rather stout, 3-8 inches high from a round or oblong tuber 4-10 lines in diameter: radical leaves ternate, the leaflets broad and somewhat quadrate, coarsely toothed; cauline leaves 1-3, pinnately divided into 5-7 linear-oblong mucronate, entire or toothed segments: racemes short, several-flowered; petals purple, 5-8 lines long. In wet places, eastern base of the Coast Mountains near Waldo Oregon, flowering in very early spring; often in January to March.

**D. Californica** Nutt. T. & G. Fl. i 88. *Cardamine paucisecta Benth. Pl. Hartw. 297.* Smooth or slightly pubescent: stems stoutish, 6-18 inches high from small deep-seated tubers, simple or branched; lower leaves simple or trifoliolate, the leaflets pitiolulate, suborbicular, cuneate to subcordate at base, sinuate or coarsely toothed; cauline leaves 2-4, mostly short-petioled, pinnately 3-5-foliolate, rarely simple or lobed; leaflets mostly petiolulate, ovate to lanceolate or linear, entire or toothed, 1-3 inches long, flowers white or rose-color: pods 1-2½ inches long: seeds oblong; cotyledons thick, the radical decidedly oblique, cleft to the middle. Along streams, southwestern Oregon to southern California.

10 CARDAMINE Tourn. Inst. 224, t. 109, L. Gen. n. 812.

Annual or perennial herbs of moist or wet places with simple or pinnate leaves and mostly small flowers in elongated racemes. Sepals equal at base erect or more or less spreading. Petals obovate or narrowly spatulate. Pods linear, with somewhat thickened margins merely beaked or pointed above. Valves flat, nerveless, opening elastically from the base. Seeds in 1 row, wingless. Cotyledons accumbent or slightly overlapping the radical, more or less petiolate.

**C. bellidifolia** L. Sp. ii. 654. Glabrous perennial: caudex much branched, somewhat fleshy, stems very short, tufted: lower leaves ovate or elliptical, sometimes subcordate usually obtuse, obscurely 3-lobed, or rarely with one or two lateral teeth, 1-6 lines long, on long slender petioles: peduncles 3-24 lines long: flowers few, white or pinkish; sepals white, oblong, a line long; petals spatulate, narrowed below to a slender claw, very obtuse or truncate above twice as long as the sepals: pods erect, 6-15 lines long, on pedicels 2-3 lines long; style very short and stout, radical cleft to the middle. On Mount Shasta and Lassen's Peak California to Crater Lake Oregon and Alaska.

**C. Lyallii** Watson Proc. Am. Acad. xxii, 466. Glabrous: rootstock creeping: stems erect, simple or branched 4-18 inches high: leaves 4-8, petioled undivided, reniform to cordate, the margin sinuate, 1-3 inches broad: the upper triangular, cordate, subacuminate: racemes pedunculate; flowers white, 3-4 lines long: pods erect on spreading pedicels 10-12 lines long, rather shortly attenuate to a very short style: radical cleft to the middle. Along brooks in the Cascade and Sierra Nevada Mountains.

**C. callositerenata** Piper Bot. Gaz. xxi, 488. "Perfectly glabrous throughout; stems erect, purplish below, shining above, coarsely striate, leaves all similar and pinnately trifoliolate, or some of the radical rarely simple; terminal leaflet orbicular, 2-5 lines long and nearly as broad, closely crenate or the uppermost lobed, the crenations tipped with a short blunt cal-

lous point; lateral leaflets ovate, entire, mostly obtuse, 10-18 lines long; raceme ample; flowers white; pods 25-30 lines long, erect on widely spreading pedicels; style stout; seeds light brown, about 20 in each pod. In springy places, Spokane July 2nd and Sept. 27, 1896." *C. V. Piper.*

**C. Brewerii** Watson Proc. Am. Acad. x, 339. Glabrous or slightly pubescent at base; stems erect or decumbent at base, a foot or more high from slender running rootstocks; radical leaves simple or with a pair of small lateral leaflets, round-cordate, entire or coarsely sinuate-toothed, the cauline with rounded and sinuate or lobed leaflets, the upper more oblong or lanceolate; petals 2 lines long white; pods 8-15 lines long, obtuse or scarcely beaked with the short style, ascending on pedicels 2-4 lines long; radical scarcely cleft. In the mountains and along the coast, Brit. Columbia to California and Nevada.

**C. angulata** Hook. Fl. i, 44. Glabrous or sparsely hirsute; stems rather slender, simple, 1-2 feet high from long running rootstocks; leaves all 3-foliolate or sometimes 5-foliolate; leaflets triangular-ovate to oblong, usually cuneate at base and coarsely 3-5 toothed or the lateral ones entire, the terminal ones not greatly larger than the lateral, about an inch long exceeding the petioles; raceme short, few-flowered; petals white, 5-7 lines long; pods about an inch long attenuate to the stout style, spreading on divaricate pedicels. In damp woods, Oregon to Brit. Columbia.

**C. occidentalis.** *C. pratensis* var *occidentalis* Watson in Gray Syn. Fl. i, 158. Minutely hirsute below; stems slender, 4-10 inches high from small oblong tubers, paniculately branched; leaves mostly radical, pinnate; leaflets 3-5 pairs, obovate or oblong to linear, 1-4 lines long sparingly dentate, the terminal one the largest; racemes short, several-flowered; petals white, a line long, but little longer than the sepals; pods filiform an inch long by less than half a line wide, abruptly contracted to the sessile stigma, the length erect on spreading pedicels; seeds minute, oblong. In open wet places about the mouth of the Willamette river.

**C. pratensis** L. Spec. ii, 656. Glabrous or somewhat pubescent below; stems erect from a fibrous-rooted tuber, 10-16 inches high; leaves pinnately 7-13 foliolate; leaflets mostly entire, often petiolulate, those of the radical leaves roundish, of the cauline oblong to linear; flowers white, usually in a broad corymb, 2-6 lines long; pods 2-15 lines long by a line wide, tipped with a short thick style. In wet places, Willamette valley, Oregon to Alaska and the northeastern states and Labrador.

**C. parviflora** L. Syst. Nat. ed. 10, 1131. Very slender, glabrous or sparingly pubescent stem simple, erect or nearly so, 6-18 inches high from a fascicle of delicate fibrous roots; leaves pinnately parted into several pairs of small leaflets, those of the lower leaves oblong to suborbicular, of the upper linear; flowers small; petals oblong-cuneiform, longer than the ovate obtuse sepals; pods about an inch long, erect upon spreading pedicels. In damp woods, Oregon to the New England states.

**C. Pennsylvanica** Muhl. in Willd. Spec. iii, 486. Nearly or quite glabrous; stems a foot or two high from a fascicle of slender fibrous roots, leafy and branching; leaves pinnately 3-15 foliolate; leaflets of the lower leaves roundish or short-oblong; of the upper oblong with rounded apex and narrowed base commonly more or less decurrent upon the rachis, usually half inch or more long and 1-3 lines broad; petals white, a line or two long; pods suberect upon ascending pedicels. California to Alaska and across the continent to the Atlantic states.

**C. oligosperma** Nutt. T. & G. Fl. i, 85. Hirsute to nearly glabrous; stems slender, 3-12 inches high from an annual fibrous root, leaves all pinnate; leaflets 3-5 pairs, roundish, 1-6 lines in diameter, obtusely 3-5-

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lobed, petiolate: petals 1-1½ lines long, twice longer than the sepals: pods few, somewhat corymbd at the end of the branches, 5-9 lines long by half a line erect: style very short. In upland forests central California to Vancouver Island west of the Cascade Mountains.

*Tribe II. Alyssineæ, DC. Fruit short, orbicular elliptical or short-oblong, rarely more elongated lanceolate or linear, always more or less compressed parallel to the partition, 1-2-celled and 1-many-seeded. Valves flat or moderately convex. Cotyledons accumbent or very rarely incumbent.*

\* *Pods strongly compressed parallel to the broad partition.*

2 PLATYSPERMUM Hook. Fl. i, 68 t. 18 fig. B.

Small winter annuals with simple or pinnatifid leaves and small white solitary flowers on simple scapes. Sepals broad, equal, erect. Petals obovate, entire or retuse. Pods sessile orbicular strongly compressed, with flat nerveless and hyaline partition. Stigma sessile, simple. Seeds 4-6 in each cell, in 2 rows reticulated orbicular and broadly winged. Cotyledons accumbent.

**P. scapigerum** Hook l. c. Leaves lyrate pinnatifid with few lobes or reduced to a single rhombic or ovate toothed, or entire blade upon a slender petiole: scapes at length 3-6 inches long ascending: flowers about a line long; petals narrowly obovate to linear-spatulate, short unguiculate, not exceeding the erect sepals: pods orbicular to oblong or obovate 3-4 lines long. Common in moist places Brit. Columbia to California, chiefly east of the Cascade Mountains.

\*\* *Pods very turgid: partition broad, nerved from the top to the middle.*

12 LESQUERELLA Watson Proc. Am. Acad. xxiii, 249.

*VESICARIA* of authors *us* to the American plants.

Low caulescent annual or perennial herbs with stellate, often dense or white-lepidote pubescence, entire or repand-dentate leaves and mostly yellow flowers. Petals spatulate to oblong-obovate entire. Filaments filiform or rarely dilated: anthers sagittate. Stigma flat, capitate entire or lobed. Pods more or less turgid, rounded or ovate or short-oblong with nerveless valves; and a hyaline partition nerved from the apex to the middle, several to many-seeded, sessile or stipitate. Seeds rounded, flat, wingless or rarely narrowly margined. Cotyledons accumbent.

**L. occidentalis** Watson l. c. 251. Canescent with a dense, appressed, scurfy, obscurely stellate, silvery pubescence: stems many from a fleshy branching caudex, decumbent, 4-12 inches long or more: lower leaves oblanceolate, attenuate at base, 1-4 inches long including the petiole, mostly coarsely sinuate-dentate; cauline leaves spatulate-oblongate, mostly entire: petals spatulate, 3-5 lines long; style very slender about 2 lines long: pods compressed-globose, acutish, 2-4 lines long sessile upon a more or less flexuous pedicel 4-8 lines long. Sandy or stony hillsides, Washington to northern California east of the Cascade Mountains.

**L. Douglasii** Watson l. c. 118. Canescent throughout with fine appressed pubescence: stems usually simple, from a simple caudex: leaves ovate to oblanceolate or linear mostly entire: petals spatulate, 3-4 lines long: pods obovate, very obtuse, erect on spreading pedicels; cells 2-ovuled. On the mountains of eastern Oregon and Washington.

\*\*\* *Pods didymous with narrow nerveless partition.*

12 PHYSARIA Gray Gen. III, i, 162.

Low stellately canescent perennial herbs with mostly entire leaves and yellow flowers. Petals spatulate to oblong, entire. Filaments filiform. Anthers sagittate. Pods didymous: with a short narrow partition: cells inflated, nearly globular, membranaceous, nerveless, several-seeded. Seeds not winged. Cotyledons accumbent.

\* Cells of the pods much inflated and longer than the partition.

**P. didymocarpa** Gray l. c. Very canescent, and lepidote with dense white stellate pubescence: radical leaves petiolate, with roundish toothed angled or entire blade, or oblanceolate and more or less sinuately-toothed below: cauline leaves mostly entire, spatulate; racemes dense; pedicels becoming 6-7 lines long spreading or ascending: sepals lanceolate, shorter than the rather pale yellow petals: pods strongly didymous, rather deeply notched above entire or more or less cordate at base, becoming 6-8 lines broad; valves subglobose, with no demarcation between the dorsal and lateral surfaces; walls papery. Eastern Oregon to Brit. Columbia and Nevada.

\*\* Cells more or less compressed and but little exceeding the partition.

**P. Geyeri** Gray l. c. Whitish with dense stellate tomentum: radical leaves with short, broadly ovate, entire, obtusely pointed blade narrowed below to long channeled petioles; cauline leaves small, spatulate: racemes rather dense, 1-2 inches long: pedicels spreading or curved, ascending, 3 lines long: pods small for the genus, broadly and shallowly orbiculate, narrowed towards the base; cells  $2\frac{1}{2}$ -3 lines long at dehiscence; partition ovate much exceeded by the persistent style. Sandy soil and volcanic ashes, upper Spokane valley, Washington.

**P. Oregona** Watson Proc. Am. Acad. xvii, 363. Canescent: stems several from the large woody root, 4-6 inches high: leaves oblanceolate-spatulate, the lower few-toothed below; the upper entire: pods obcompressed 5-10 lines broad, round-reniform; the narrowly linear partition 3-4 lines long; the flattened obtusely rounded cells 3-4 seeded: style very short. Gulches, Union county, Oregon. *Cusick.*

\*\*\*\* *Pods orbicular or nearly so. Filaments often dilated or appendaged near the base.*

14 PSILONEMA C. A. Meyer in Ledeb. Fl. Alt. iii, 50.

Low stellate-pubescent herbs with mostly simple leaves and rather small flowers in slender racemes. Sepals equal. Petals white or yellow, cuneate. Filaments unappendaged. Pods oval or orbicular, compressed with convex nerveless valves, 2-celled, with 2 seeds in each cell. Cotyledons accumbent.

**P. calycinum** C. A. Meyer Bull. Acad. St. Pet. vii, 132. Stellate pubescent: stems branching from near the base, the branches mostly simple, decumbent at base 6-12 inches long: leaves entire, linear-spatulate 6-12

lines long: flowers  
petals but little  
margin, slightly  
persistent sepals  
style half a line  
at Seattle Wash.

\*\*\*\*\*

2-several-seeded

Stellate-petals  
toothed leaves  
equal at base  
Pods oblong  
valves. See

**E. vulgare**  
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17 DR.

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the Gray  
above: leaves  
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\*\* Petals  
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lines long: flowers small, in slender racemes, the white or pale yellow petals but little exceeding the short sepals: pods orbicular, with a thin margin, slightly emarginate,  $1\frac{1}{2}$  lines in diameter, a little exceeding the persistent sepals, pubescent, 4-8 seeded, on spreading pedicels a line long: style half a line long. A native of southern Europe sparingly introduced at Seattle Washington and the eastern states.

\*\*\*\*\* *Pods oblong elliptical or oblanceolate rarely linear 2-several-seeded. Stamens unappendaged.*

16 EROPHILA DC. Syst. ii, 356.

Stellate-pubescent scapose winter-annual with entire or coarsely toothed leaves and white flowers in very early spring. Sepals equal at base. Petals 2-lobed or 2-parted. Style short or none. Pods oblong, compressed, with membranaceous convex 1-nerved valves. Seeds numerous in 2 rows in each cell.

E. VULGARIS DC. l. c. *Draba verna* L. Sp. ii, 342. Scapes naked, 1-6 inches high, filiform: leaves lanceolate, somewhat toothed: pods glabrous, round-oval to oblong, 1-4 lines long, shorter than the spreading pedicels: stigma nearly sessile. Introduced from Europe. Well established at Vancouver Washington.

17 DRABA Dill. Cat. Pl. Giss. App. 122. L. Gen. n. 800.

Low annual or perennial herbs with entire or toothed leaves and white or yellow flowers. Sepals short and broad, equal at the base. Petals commonly obovate, entire (rarely bifid). Filaments mostly flattened, without teeth at the base. Anthers rounded or oval. Style short, or slender and somewhat elongated. Stigma simple or very slightly lobed. Pod oval to oblong or linear, flat, dehiscent. Seeds few-many, in 2 rows, wingless. Cotyledons accumbent or rarely incumbent.

§ 1 DEABELLA, DC. Syst. ii, 332. 351. Stellate-pubescent or more or less villous short caulescent and more or less leafy-stemmed winter-annuals with ascending or spreading pedicels, entire or emarginate petals and smooth seeds.

\* Flowers white: pedicels clustered or approximate at the end of the stem or branches. Early spring species.

D. Caroliniana Walt. Fl. Car. 174. Scape-like stems very slender, often branched. 1-3 inches high, smooth; leaves obovate to oblanceolate, obtuse, mostly entire, hispid with simple or branched hairs: pedicels very short: pods clustered at the end of the stems, linear, 4-6 lines long, 20-30-seeded, glabrous; stigma sessile. Under "Sage-brush" Umatilla Oregon to Ontario New England and Carolina.

D. micrantha Nutt. T. & G. Fl. i, 109. *D. Caroliniana* var. *micrantha* Gray Man. 72. Stems leafy and hispid below, naked and smooth above: leaves cuneate-obovate, hispid, entire: pods hispid, linear, much longer than the pedicels. Open plains and rocky places, Klickitat Washington to Illinois and Texas.

\*\* Pedicels more remotely racemose. Flowers very small, white. Stigma sessile or nearly so.

D. brachycarpa, Nutt. T. & G. Fl. i, 108. Pubescent with minute appressed stellate hairs: stems simple or branched,  $\frac{1}{2}$ -2 inches high, from



an annual root, leafy: radical leaves ovate to ovate-oblong, petioled, 5-7 lines long; upper ones oblong-lanceolate to linear; racemes many-flowered, strict, elongated in fruit: petals obovate, very slightly emarginate: pods narrowly oblong, glabrous, 1-2 lines long, about the length of the pedicels; valves marked with a median nerve and obscurely veined; cells 4-6 seeded. Wet places. Willamette Valley (near Coburg) Oregon, and Missouri to Virginia, Louisiana and Georgia.

\*\*\* High mountain and northern species with entire or few-toothed leaves and small yellow flowers. Stigma sessile.

**D. nemorosa**, L. sp. ii, 643. Pubescent with white branching hairs: stem slender, 4-8 inches high, branching from near the base, leafy: leaves ovate to lanceolate, sparsely toothed: petals emarginate small, yellow: pods narrowly oblong, half the length of the spreading pedicels, minutely pubescent. On moist grassy slopes, Oregon to the Arctic Circle and the Great Lakes.

**D. lutea**, Gilib. Fl. Lithuana, iv, 46. *D. nemorosa* var. *leiocarpa* Lindb. Sparingly hirsute: stems very slender, often nearly or quite leafless: pedicels coarsely exceeding or even shorter than the glabrous pods. In moist places and river banks, valley of the Columbia.

**D. stenoloba**, Ledeb. Fl. Ross. i, 152. Stems slender, simple, or branching below, villous towards the base: leaves mostly subrosulate, oblong-lanceolate or oblanceolate, mostly entire, usually more or less villous and ciliate: pods linear, acute, glabrous, 4-7 lines long, equaling or exceeding the spreading pedicels. Subalpine, from the Sierra Nevadas to Colorado and Oregon, and northwestward to Unalaska.

§ 3 DRABEA Lindb. Linnæa xiii, 318. Perennials with branching leafy-tufted caudex, and soft flat not carinate leaves.

\* Scapose. Leaves entire, less than 6 lines long. Flowers yellow.

**D. Howellii**, Watson, Proc. Am. Acad. xx, 354. Minutely stellate-pubescent throughout: loosely cespitose: scapose stems about 3 inches high: leaves rosulate, broadly spatulate, entire or rarely obtusely toothed, 3-5 lines long: petals oblanceolate, obtuse, 3-4 lines long, much exceeding the oval yellow sepals: pods pubescent, oblong, acute, 3-4 lines long, beaked with the sender style. On high rocky ridges of the Siskiyou Mountains near Preston peak.

**D. Lemmonii** Watson, Bot. Cal. ii, 430. Leaves crowded at the summit of the stout branched caudex, broadly oblanceolate, obtuse or obtusish, 2 to 4 lines long with long branching hairs on the margins and loosely scattered over the surface: scapes and corymbd pedicels pubescent with spreading hairs: flowers nearly 2 lines long: pods ovate-lanceolate, beaked with a very short thick style, sparingly hairy, 3 lines long, rather exceeding the pedicels. Peaks of the Sierra Nevadas to the Yellowa Mountains in eastern Oregon.

**D. ventosa**, Gray, Am. Nat. viii, 212. Cespitose, the slender branches of the caudex more or less densely leafy: leaves oblong-lanceolate, obtuse or acutish, densely stellate-pubescent or glabrate: petals 1-3 lines long, much exceeding the broad obtuse stellate-pubescent or glabrate sepals: pods ovate to oblong-lanceolate, densely pubescent or glabrate, on ascending pedicels: style short and slender. Stein Mountain southeastern Oregon to northwestern Wyoming, Utah and Nevada.

\*\* Scapes rarely with a single leaf: leaves entire or rarely few-toothed: flowers white.

**D. levipis** DC. Syst. ii, 346. Caudex with numerous slender matted

branches: leaves pubescent with white; pods few and stout; stigm Mountains and

\*\*\* Caulis flowers yellow

**D. aureola** throughout: leaves numerous oblong: racemes dense, pubescent the high peaks

§ 4 AIZONIA rigid with midnerve. D

**D. glabella** leaves linear or sometimes ciliate pubescent, 1-4 California and

**D. densiflora** dense tufts: leaves pubescent, 4- the length of the

**D. Douglasii** c. *ovata*, 199. D. lanceolate to linear long: peduncles at each end, only 2, rarely very large. to California.

17 CO

Low glabrous leaves rounded at the base: spatulate. Stems short. Stigmata oblong often distinctly 1-nerved: ledons acute

**C. Anglica** leaves long-petioled and broadly ovate in the middle and rounded by a more or less prominent veins.

Tribe III whole length



branches: leaves oblanceolate, obtuse or acutish, entire, with a stout midnerve, pubescent with short dense stellate pubescence; scapes very slender, pubescent; pods few, on smooth pedicels, 4-8 lines long, glabrous: style short and stout; stigma 2-lobed. On Mount Adams Washington to the Rocky Mountains and Brit. Columbia.

\*\*\* Caulescent: stem few-many-leaved; leaves entire few-toothed: flowers yellow.

**D. aureola** Watson Bot. Cal. ii, 430. Rather densely stellate-pubescent throughout: caudex simple or branched: stem simple,  $\frac{1}{4}$ -4 inches high: leaves numerous, 4-6 lines long, oblanceolate, obtuse, entire; the cauline oblong: racemes short and dense: calyx glabrous: pods broadly oblong, obtuse, pubescent, on short spreading pedicels: style short and stout. On the high peaks of the Cascade and Sierra Nevada Mountains.

§ 4 **Aizopsis** DC. Syst. ii, 332. Leaves linear, entire, becoming rigid with reflexed margins, and carinate by the prominent midnerve. Densely cespitose and scapose perennials.

**D. glabella** Adams Mem. Soc. Nat. Mosc. v. 103. Alpine or subalpine: leaves linear or linear-oblanceolate, more or less densely stellate-pubescent, sometimes ciliate at base, pods ovate to ovate-oblong, acute, usually finely pubescent, 1-4 lines long: style  $\frac{1}{4}$ - $\frac{1}{2}$  line long. In the high mountains of California and eastern Oregon to the Arctic Circle and the Rocky Mt's

**D. densifolia** Nutt. T. & G. Fl. i, 104. Densely cespitose in somewhat globose tufts: leaves closely imbricated, short and rigid, strongly ciliate, glabrous or hirsute with nearly simple hairs: scapes naked, hirsute: pods ovate, pubescent, 4-6-seeded; the valves only moderately convex: style about  $\frac{1}{2}$  the length of the pod. Alpine, Idaho to California, Nevada and Utah.

**D. Douglasii** Gray Proc. Am. Acad. vii, 328. *Braya Oregonensis* Gray l. c. xvii, 199. Densely cespitose,  $\frac{1}{2}$ -2 inches high, very leafy: leaves oblanceolate to linear-spatulate, acute, somewhat rigid, ciliate, sessile, 4-6 lines long: peduncles scarcely exceeding the leaves: pods ovate, subterete, acute at each end, attenuate upwards to the long slender style, pubescent: ovules only 2, rarely 4, in each cell, pendent from near the apex of the cell: seeds very large. On the high hills in wet gravelly places, Klickitat Co. Wash. to California.

17 COCHLEARIA Tourn. Inst. 215, t. 101, L. Gen. n. 803.

Low glabrous and somewhat succulent herbs with mostly entire leaves and small white flowers. Sepals short and broad, rounded at the apex: petals obovate or cuneate very short unguiculate. Stamens straight, free. Style slender, sometimes very short. Stigma simple or nearly so. Pods subglobose to short oblong often somewhat obcompressed, very turgid: valves distinctly 1-nerved. Seeds 2-several, in 2 rows in each cell. Cotyledons accumbent.

**C. Anglica** L. Syst. Nat. ed. 10, 1128 & spec. ed 2, ii, 903. (?) Radical leaves long-petioled, ovate or suborbicular rounded at the base or slightly and broadly cordate, subentire; lower cauline similar, short petioled, the middle and upper ones ovate-oblong sparingly and bluntly toothed, sessile by a more or less auriculate base: pods subglobose reticulated with prominent veins. Shores of bogs, etc., Oregon to Alaska.

Tribe III. *Sisymbriæ* DC. Pods longitudinally dehiscent their whole length, 1-celled, linear to oblong. Seeds in 1 row, not mar-

gined. *Cotyledons plane, incumbent.*

18 SOPHIA L. Syst. ed. 1 Adams Fam. ii, 417.

*SISYMBRIUM* of authors as to our plants.

Erect branching annuals with pinnately multifid leaves and small yellow flowers. Pubescence branched. Sepals oblong to linear, usually spreading. Stamens 6, free and unappendaged. Pods ascending or somewhat spreading, on slender pedicels oblong-linear, subterete, less than an inch long. Style short or none. Stigma entire.

**S. pinnata** *Erysimum pinnatum* Walt. (1788). *Sisymbrium canescens* Nutt. (1818). Canescently pubescent: stems 6-30 inches high: leaves 1-2-pinnatifid, the segments toothed or pinnatifid: petals equaling the sepals, a line long or less: pods oblong or linear-oblong, nearly or quite a line broad, 3-6 lines long, acute at each end, shorter than the slender spreading pedicels: seeds ovate-oblong,  $\frac{1}{2}$  line long, in 2 rows in each cell. Eastern Oregon and Washington to southern California, Florida and Brit. Columbia.

**S. incisa** Greene Pitt. iii, 95. *Sisymbrium incisum* Engelm. Pubescence short, more or less glandular: stems 1-4 feet high: leaves pinnate, the segments from linear to oblong, pinnatifid or sometimes entire: petals about  $1\frac{1}{2}$  lines long: pods nearly linear, often  $\frac{1}{4}$  inch long, usually pointed at each end and 8-12 seeded, sometimes much shorter and few-seeded. Valley of the Snake River to Nevada and Colorado.

**S. Hartwegiana** Greene l. c. *Sisymbrium Hartwegianum* Fourn. Slender, subglabrous or finely glandular-puberulent: leaves pinnate; leaflets lanceolate or narrowly oblong, obtuse and obtusely or acutely toothed: pods  $1\frac{1}{2}$ -3 lines long, erect on ascending or erect pedicels as long: seeds sometimes imperfectly biscriate. Eastern Oregon and Washington to California, Colorado and British Columbia.

**S. longipedicellata**. *Sisymbrium longipedicellatum* Fourn. Slender, 6-8 inches high, nearly or quite glabrous: lower leaves 1-2-pinnatifid, the upper pinnate with few elongated linear nearly or quite entire segments: fruiting racemes lax: pods 5-7 lines long, erect on slender spreading or ascending pedicels 6-10 lines long. Brit. Columbia to Oregon and Nevada. Not common east of the Cascades.

19 ERYSIMUM Tourn. Inst. 228 t. 111, L. Gen. 548.

Pods subsessile, erect, appressed to the rachis, subulate, tapering almost from base to apex. Flowers small and inconspicuous, yellow. Stigma slightly 2-lobed. Pubescence of simple hairs. Leaves pinnatifid.

**E. OFFICINALE** L. Sp. ii, 660. *Sisymbrium officinale* Scop. Annual or biennial, erect, rigid, divaricately branching: leaves runcinate-pinnatifid, the lowest 3-6 inches long: pods subterete, half an inch long, a line wide, subsessile, closely appressed, in a long raceme. Common in waste places. Naturalized from Europe.

20 SMELOWSKIA C. A. Meyer in Ledeb. Fl. Alt. iii, 165.

Low caespitose perennials with pinnatifid or bipinnatifid leaves and small flowers in terminal racemes. Pubescence simple or stellate. Sepals oblong, subequal, somewhat spreading. Petals entire, obovate or spatulate, longer than the sepals. Stamens 6,

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unappendaged. Anthers oblong, slightly sagittate at base. Pods lanceolate or lance-oblong, more or less obcompressed, with sharply keeled valves, few-seeded. Stigma sessile.

**S. calycina** C. A. Meyer l. c. 170. Densely white tomentose to nearly glabrous; caespitose, the thick branching rootstock thickly covered with the sheathing bases of dead leaves, stems erect, 2-6 inches high: leaves mostly radical and with long slender petioles, pinnate or pinnatifid, segments linear to oblong, entire or sparingly lobed: calyx villous, persistent: petals 2 lines long, a half longer than the sepals: pods 3-6 lines long a line wide attenuate to each end and beaked with the short style and broad stigma, ascending, on spreading pedicels: seeds 2-8, a line long. California to the Arctic coast, east to the Rocky Mountains.

**S. Fremonti** Watson Proc. Am. Acad. xi, 123. Pubescent with short spreading scattered hairs, the branching woody base with a few remnants of old leaves: stems 2-4 inches high: leaves less than half an inch long, pinnate with 1-3 pairs of linear leaflets, which are strongly nerved and somewhat revolute: sepals smooth, ovate to broadly oblong, less than a line long, deciduous: the white petals twice longer: pods 2-6 lines long somewhat obcompressed, obtuse at base and scarcely attenuate above, beaked with the short thick style, valves faintly nerved: seeds small, 10 or more in each cell; cotyledons obliquely incumbent. Southeastern Oregon to northern California.

21 SCHENOCRAMBE Greene Pitt. iii, 127.

Glaucous perennial herbs, the stems from horizontal branching rootstocks, often sparingly leafy and the whole plant of a reedy aspect. Sepals equal at base. Petals yellow, the limb small in proportion to the long and broad claw (this much as in *Streptanthus*). Pods slender terete, somewhat torulose, the valves nerveless or faintly 1-nerved. Stigma entire.

**S. linifolia** Greene l. c. *Sisymbrium linifolium* Nutt. Stems numerous slender, branching, erect, 1-2 feet high: lowest leaves somewhat spatulate, often coarsely few-toothed; cauline oblong-linear to narrowly linear, obtuse, entire, 1-2 inches long: racemes rather few-flowered, lax in fruit: flowers 2-3 lines long: fruiting pedicels 4-5 lines long the slender pods about 1½ inches long, ascending or suberect: seeds elongated, scarcely compressed. On clayey bluffs and banks, Oregon and Washington to Montana and Wyoming.

*Tribe IV. Stanleyæ. Pods longitudinally 2-celled dehiscent their whole length, terete or prismatic, borne upon a more or less manifest stipe. Stigma mostly circular in outline, sessile. Cotyledons incumbent.*

22 THELYPODIUM Endl. Gen. 876.

Mostly coarse and succulent biennial or annual herbs with entire or pinnatifid leaves and white purple or rarely yellow flowers in usually dense elongated racemes. Sepals equal or the lateral pair saccate at base, at length somewhat spreading. Petals plane, long and narrow or with a well developed blade. Stamens 6, well exerted; filaments long and slender; anthers narrowly linear, sagittate at base curved or coiled. Stigma usually small. Pods slender, terete or quadrangular, often torulose, borne upon a short thick stipe. Seeds in 1 row somewhat compressed.

Cotyledons more or less oblique.

**T. Howellii** Watson Proc. Am. Acad. xxi, 445. Glabrous and glaucous but the base of the stem and the radical leaves villous with spreading hairs: stems erect, slender, sparingly branched or simple, 6-18 inches high from an annual or biennial root: radical leaves numerous in a rosulate tuft, oblanceolate, obtusish, coarsely toothed or pinnatifid, narrowed at the base, an inch or two long; cauline leaves linear-lanceolate attenuate, sagittate, auriculate erect and usually appressed, 6-12 lines long: racemes rather short and loose, the flowers scattered and ascending on short pedicels; sepals oblong 2-3 lines long the lower pair distinctly sacate at base: petals narrow, crisp twice as long as the sepals: pods ascending 12-15 lines long, slender beaked. In grassy meadows Harney valley Oregon and at Camp Polk on the eastern base of the Cascade Mountains.

**T. eucosmum** Robinson in Gray Syn. Fl. i, 175. Glabrous, stems ascending from an annual or biennial root 6-18 inches high, freely branching: lower leaves ovate, long petioled; cauline leaves oblong or lanceolate entire spreading, 1-3 inches long: racemes very-many-flowered; flowers deep purple usually horizontal on spreading pedicels 2-3 lines long: petals spatulate 4 lines long: pods arcuate ascending 1-2 inches long: mature fruit not known. On moist slopes of the Blue Mountains at Baker City, R. D. Nevius, and near Canyon City, Oregon, Howell.

**T. flexuosum** Robinson l. c. Stems slender weak and subdecumbent, flexuous, nearly naked above: radical leaves numerous lanceolate, including the slender petiole 3-6 inches long: cauline leaves distant, all or at least the upper much reduced, linear-oblong or lance-linear with narrow acutish auricles: racemes rather loose and somewhat few-flowered; flowers usually horizontal on short pedicels; petals spatulate, 3-4 lines long, usually pale: pods arcuate ascending 1-3 inches long. In alkaline soil among "Sage brush," etc. Harney valley southeastern Oregon, Howell, to Nevada and California.

**T. Nuttallii** Watson Bot. King, 26. Glabrous and glaucous: stems stout, branching above, 3-5 feet high: leaves all entire the radical ones ovate, petioled, often 6-8 inches long and half as broad; cauline leaves lanceolate, sagittate-clasping: flowers rather large nearly erect, on pedicels 3-6 lines long: petals ovate-oblong, the claw exceeding the sepals, purple 6-8 lines long: pods 2-3 inches long, nearly erect upon the spreading pedicels, subterete, more or less torulose acuminate with the rather long style. Eastern Washington and Oregon to Idaho, Utah, Nevada and Arizona.

**T. integrifolium** Endl. Gen. 876. Glabrous: stems stout, 2-6 feet high, branching at the summit: radical leaves large oblong-elliptical, long-petioled; cauline leaves mostly narrowly lanceolate 1-2 inches long sessile not auriculate, ascending, the uppermost linear: flowers crowded and almost corymbose at the end of the branches: sepals  $1\frac{1}{2}$ - $2\frac{1}{4}$  lines long: petals spatulate-obovate, pale rose-color: fruiting racemes short and crowded: pods 6-15 lines long, somewhat torulose acuminate with the slender style, curved upwards on divaricate, commonly thickened and rigid pedicels 1-5 lines long. On plains, Washington to southern California, Colorado and Nebraska.

**T. laciniatum** Endl. l. c. Glabrous: stems stout erect 1-6 feet high, simple or branched; leaves all petioled 1-6 inches or more long, lanceolate to broadly oblong, laciniately pinnatifid or coarsely and equally sinuate-toothed: racemes long and crowded: sepals narrowly lanceolate, acuminate 3-4 lines long, about half as long as the linear-spatulate petals: anthers long-exserted: pods 2-3 inches long pointed with the slender style, distinctly stipitate, erect on short stout divaricately spreading pedicels. Among rocks, etc., at the base of cliffs along the Columbia river in Oregon and Washington to California and Nevada.

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**T. lasiophyllum** Nutt. Proc. Am. Acad. xxi, 445. Stems stoutish above: radical leaves sinuate-toothed or pinnatifid: cauline leaves lanceolate: flowers simple: petals simple: pods simple: anthers long: style simple: fruiting racemes long, curved upwards at apex; stipitate at base: California and Utah.

**T. stoutii** Robinson in Gray Syn. Fl. i, 175. Stems stout biennial: leaves and whorls simple: racemes. Calyx spreading. Petals simple. Anthers simple. Style simple. Pods simple: leaves slender: fruiting racemes suberect.

**S. viridiflorum** Robinson in Gray Syn. Fl. i, 175. Simple erect or decumbent: leaves greenish, the lower ones lanceolate: racemes 1-2 feet long: flowers simple: petals simple: pods simple: leaves slender: fruiting racemes suberect.

**S. confertiflorum** Robinson in Gray Syn. Fl. i, 178. Stems stout: leaves obovate or ovate: racemes crowded: pods 8-12 lines long: fruiting racemes suberect: mountain, southern California.

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24 BRAYA

Perennial herb: leaves and whorls simple: racemes 1-2 feet long: flowers simple: petals simple: pods simple: fruiting racemes suberect: mountain, southern California.

**B. humilis** Robinson in Ledeb

**T. lasiophyllum** Greene. Bull. Torr. club xiii, 142. *Sisymbrium re-gram* Nutt. Proc. Acad. Philad. iii, 26. Erect annual, hispid below, often toothlike above; leaves oblanceolate or oblong in outline irregularly sinuate-toothed or pinnatifid with spreading acute or obtuse entire or toothed segments  $1\frac{1}{2}$ -6 inches long, petioled, or the upper sessile by a narrow base; flowers small, roseate or yellowish white; sepals oblong, little more than half as long as the spatulate-oblong petals; fruiting pedicels  $\frac{3}{4}$ - $1\frac{1}{4}$  inches long, curved; pods usually deflexed, slender, slightly curved, attenuate at apex; stigma entire. Sandy and rocky soil, eastern Washington to California and Utah.

23 STANLEYA Nutt. Gen. ii, 21.

Stout biennial or perennial herbs with entire or few-toothed leaves and white to yellow flowers in elongated many-flowered racemes. Calyx long, cylindrical or clavate in bud, at length spreading. Petals long and narrow, slender-clawed; stamens 6, free. Anthers linear, not sagittate, spreading. Stigma sessile entire. Pods terete, or subterete, borne on a slender stipe; valves slender, 1-nerved. Seeds oblong, in 1 row. Cotyledons incumbent.

**S. viridiflora** Nutt. T. & G. Fl. i, 98. Glabrous: stems stout, mostly simple erect or somewhat decumbent, 1-4 feet high, angulate; leaves thickish, the lower ones ovate to oblanceolate sometimes a little angled or minutely 1-2-toothed or even pinnatifid at the base, attenuate below to long flat winged and often somewhat toothed petioles; middle cauline lanceolate-hastate, acute, entire gradually reduced upwards; racemes long, usually simple; pedicels stoutish 3-4 lines long, spreading; buds becoming long and scattered before opening by the rapid growth of the axis flowers greenish, pods very narrow, 3-4 inches long, on stipes 6-10 lines long. Oregon and Nevada to Wyoming and Montana.

**S. confertiflora.** *S. viridiflora* var. *confertiflora*, Robinson in Gray Syn. Fl. i, 278. Glabrous: stems usually simple, terete 1-3 feet high; leaves obovate or lanceolate, usually entire, upper ones clasping and sagittate; racemes densely many-flowered, buds 4-5 lines long densely packed together until they open; sepals and petals linear, white; pods narrow, 8-12 lines long, stipes more than half as long as the pods, on slender varicose pedicels 6-8 lines long. On alkaline plains at the base of Stein's mountain, southeastern Oregon.

Tribe V. *Camelineæ* Pods short, scarcely longer than broad, obcompressed orbicular-obovate to elliptical or linear-oblong. Cotyledons accumbent.

24 BRAYA Sternb. & Hoppe Regensb. Denkschr. i, pt. 1. 65.

Perennial herbs from a usually thickish single root having a multicapital caudex, chiefly tufted, entire or merely dentate leaves and white or purplish flowers in a globular head. Sepals short, rounded at apex, equal at base. Petals exerted, entire, short-clawed. Stamens 6, free and unappendaged. Anthers short-ovate. Style short, persistent. Stigma more or less distinctly 2-lobed. Pods oblong to linear-oblong, with flattish or convex faintly 1-nerved not keeled valves. Cotyledons incumbent.

**B. humilis** Robinson in Gray Syn. Fl. i, 141. *Sisymbrium humile*, C. A. Meyer in Ledeb. Fl. Alt. iii, 137. Pubescent throughout with branched

hairs; root single, not strongly thickened: stems several, spreading ascending simple or branched leafy, 2-10 inches high, terete, slender with leaves linear-oblong or spatulate, subentire to shallowly sinuate pinnatifid chiefly basal, the cauline rather small and remote: flowers small, white or purplish: pods linear, terete, more or less torulose, erect, 5-9 lines long, partition nerveless. Alaska to Oregon and Willoughby Mountain Vermont.

## 25 CAMELINA Crantz Fl, Aust. i, 17.

Erect annuals with sagittate-clasping entire or dentate to pinnatifid leaves and pale yellow or white flowers. Sepals short, oblong, obtuse thin-margined, subequal at base, more or less colored, often villous. Petals spatulate or obovate, unguiculate. Stamens 6, free and unappendaged. Style slender: stigma simple. Pods obovoid 2-celled, many-seeded, with a broad thin obovoid persistent partition and somewhat firm strongly convex valves. Seeds in 2 rows in the cells wingless. Cotyledons incumbent.

C. SATIVA Crantz l. c. Stems simple or sparingly branched about 1-4 feet high leafy, nearly glabrous or somewhat hirsute: leaves erect entire or nearly so: flowers rather small, light yellow: fruiting pedicels spreading, pods obovate, becoming 3-4 lines long three-fourths as broad as long, glabrous, margined, finely reticulate and slightly ribbed upon the face. An introduced weed becoming common from Seattle Washington, to California and across the continent.

## 26 SUBULARIA L. Gen. n. 799.

Dwarf stemless aquatic herbs with tufted subulate leaves and few minute white flowers. Pods small, ovoid, slightly convex, compressed contrary to the partition. Style none, valves convex, 1-nerved. Seeds several in each cell, not margined. Cotyledons incumbent.

S. aquatica L. Sp. ii, 642. Stems slender, 1-3 inches high, from slender running rootstocks with numerous fibrous rootlets; leaves subulate, usually shorter than the scape: flowers scattered, less than a line long, the petals not exerted: pods  $1\frac{1}{2}$  lines long, about equaling the petals, obtuse. Edge of ponds, etc., Vancouver Island to California, Wyoming, Maine, New Hampshire and Canada.

Tribe VI. Brassicæ, DC. Pods elongated, terete or somewhat prismatic, often torulose, usually partially or wholly dehiscent by 2 valves, 2-celled with a longitudinal membranous partition. Seeds in 1 or 2 rows in the cells. Cotyledons conduplicate. Petals well developed.

## 12 BRASSICA Tourn. Inst. 218 t. 106 L. Gen. n. 820.

Coarse erect annual or biennial herbs of European or Asiatic origin with usually (at least the lowest) leaves lyrate and comparatively large yellow flowers. Sepals equal, or one pair often saccate at base. Anthers long, sagittate at base. Pods linear, nearly terete or somewhat 4-sided, pointed with a conical beak or stipitate, with 1-3 nerved valves. Seeds in 1 row globose, not margined.

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B. CAMPESTRIS L. Sp. ii, 606, Annual or sometimes biennial, smooth, 2-3 feet high: lower leaves more or less glaucous pinnately divided with a large terminal lobe, the upper leaves oblong or lanceolate with a broad clasping auriculate base: flowers 3-4 lines long: pods nearly terete 2 inches long or more, 2 lines wide, ascending on spreading pedicels; the stout beak 8-10 lines long. Cultivated fields, etc.,

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B. NIGRA Koch in Roehl. Deutschl. Fl. ed. 3, iv, 713. Glabrous or with some scattered spreading hairs, annual, branching.  $\frac{1}{2}$ -12 feet high: leaves all petioled, the lower lyrate with the terminal segment very large and deeply lobed; upper leaves lobed or entire: petals 3-4 lines long twice the length of the yellowish sepals: pods closely appressed, 4 angled, 6-9 lines long, sharply beaked with the long style; seeds dark brown. In cultivated fields. Introduced from Europe.

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Tribe VII Lipidineæ DC. Pods short, 2-celled, strongly obcompressed, dehiscent. Cotyledons accumbent or incumbent. Pubescence wholly simple.

28 BURSA Weber in Wigg. Fl. Hols. 27, (1780).

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Low annual with oblong or oblanceolate leaves, small white flowers in elongated racemes, and cuneate-obcordate pods. Sepals ovate, obtuse, thin-margined, not saccate at base. Petals small, spatulate. Stamens free and unappendaged. Style almost none. Pods obcordate, the valves carinate, strongly compressed contrary to the narrow, thin and nerveless partition. Cotyledons incumbent.

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B. BURSA-PASTORIS Weber l. c. More or less hirsute at base, otherwise glabrous: stems 6-18 inches high, branching: radical leaves mostly runcinate-pinnatifid, 1-6 inches long; cauline lanceolate, auricled at base, toothed or entire: pods cuneate-triangular or truncate-emarginate above, 1-2 lines long and broad: pedicels widely spreading: seeds numerous. Common everywhere. Introduced from Europe.

29 HUTCHINSIA R. Br. Hort. Kew iv, 85.

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Small annuals with pinnatifid leaves and small white flowers in terminal racemes. Sepals ovate or oblong, obtuse, not saccate at base, at length spreading. Petals small. Stamens free and unappendaged. Stigma sessile. Pods ovate or elliptical. Valves membranaceous, but little compressed contrary to the partition, somewhat tumid, slightly carinate, wingless: cells many-seeded. Cotyledons incumbent.

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H. procumbens Desv. Jour. Bot. iii, 168. *Capsella divaricata* W. Low, weak and spreading, very minutely stellate-pubescent or glabrous throughout: leaves thin, small, spatulate or lanceolate, the lower commonly with a few blunt teeth or more or less deeply pinnatifid: stems nearly filiform, exuons: flowers minute: sepals ovate-elliptic, obtuse, thin-margined, about equaled by the narrow white petals: pods elliptic-oblong 1-2 lines long: entire at the apex. In moist saline places, eastern Oregon and Washington to California, Brit. Columbia and Wyoming.

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30 CORONOPUS Ruellius.

Diffuse prostrate heavy-scented annuals with pinnatifid leaves and small greenish flowers. Sepals equal at base, oval, spreading, often fugacious. Stamens free and unappendaged, all 6 present,



or only 4 or 2. Anthers short, somewhat didymous. Stigma sessile, nearly or quite simple. Pods more or less distinctly didymous, the valves thickish, often sculptured or tuberculate falling off as 1-seeded closed or nearly closed nutlets. Embryo folded above the base of the incumbent cotyledons.

**C. DIDYMUS** Smith Fl. Britt. ii, 691. Annual or biennial: stems numerous and slender: leaves short an inch or less long pinnately parted with 7-9 lanceolate entire or sparingly toothed segments: flowers very small greenish white: petals minute or none: pods small, 1-1½ lines broad, notched at both ends, thus appearing transversely 2-lobed; valves turgid and finely wrinkled. In moist soil and ditches, California to Vancouver land near the coast, and along the Atlantic seaboard. Introduced from Europe.

**C. RUELLII** All. Ped. n. 634. Annual or biennial: stems rather slender leaves an inch or more long pinnatifid with narrow lanceolate entire sparingly toothed segments: pods flattened 1½-2 lines broad, not notched above nor divided into 2 lobes, strongly roughened and somewhat crested by radiating prominences. Roadsides and rubbish heaps, Poriland (Oregon), and the Atlantic States. Introduced from Europe.

31 LEPIDIUM Tourn. Inst. 215, t. 109. L. Gen. n. 801.

Low herbs with small pinnatifid leaves and small white or yellow flowers in terminal racemes. Sepals short, ovate or elliptic-oblong, obtuse, equal at base, more or less spreading. Petals entire, rounded at the apex: sometimes abortive or none. Stamens free, unappendaged, all 6 present or by abortion only 4 or 2 present, these representing the two larger pair. Style slender and more or less elongated, or none. Pods orbicular or ovate, emarginate or deeply notched at the apex, strongly compressed contrary to the narrow partition. Valves acutely carinate; the cells 1-seeded. Seeds not winged. Cotyledons incumbent or rarely accumbent.

§ 1 Style slender, sometimes rather short but distinctly developed and persistent. Cotyledons incumbent.

**L. montanum** Nutt. T. & G. Fl. i, 116. Puberulent or nearly puberulent: stems several from a perennial, somewhat ligneous root, 8-15 inches long, decumbent and spreading in a somewhat circular manner: radical leaves more or less bipinnatifid with short-oblong acute segments; uppermost leaves trifid or linear and entire: petals nearly twice as long as the sepals: sepals: style conspicuous: pods a line broad elliptical, slightly emarginate, wingless or obscurely winged above, with short acutish teeth. Plains and mountain valleys, Washington to California and the Rocky Mountains.

**L. integrifolia** Nutt. l. c. Glabrous or puberulent: stems several from a single stout root, branching from the base: leaves oblong, obovate or spatulate, acute or apiculate, thickish, 1-2 inches long, 2½-3 lines broad, entire: racemes single and terminal, or more commonly several, 1-2 inches long: pedicels spreading, 3-4 lines long: petals oblong white, about twice the length of the broad membranaceous sepals, distinctly and broadly clawed, deciduous with the sepals: stamens 2: capsule ovate-oblong 1½-2 lines long, barely retuse inconspicuously reticulate when quite ripe. Southeastern Washington to the Rocky Mountains.

**L. CAMPESTRE** R. Br. in Ait. f. Kew ed. 2, iv, 88. Pubescent: stem erect, simple and very leafy up to the inflorescence, a foot or more high

leaves oblong, under petioles; the horizontally spreading: petals white: notched. In western United States.

§ 2 Stigma at the apex.

**L. Menziesii** 2-12 inches high: root, simple, or pubescent or scabrous: leaves merely trifid: the pods: petal linear retuse glabrous on one edge. Near the coast,

**L. occidentale** from an annual: puberulent above, trifid with obovate linear bracts: rounded at the apex: the pedicels: winged on the upper side and on cliffs of the coast.

**L. medium** not *A. Richardsonii*: 1-2 inches high, from a single root, long, toothed above: the pods: short: pods rounded: pedicels spreading, British Columbia.

**L. apetalum** colorless; leaves sessile: the fruit: regularly aggregated: the fruit: contracted just above the base: orbicular: the New England.

**L. lasiocarpum** decumbent branched, segments: toothed or entire: the fruit: spreading: with thin white margins: near the edge. Upon R. R. ball.

**L. nitidum** simple or branched: the segments:

leaves oblong, obtuse, denticulate, erect, the lower ones narrowed to slender petioles; the upper sessile by a long sagittate-clasping base: pedicel horizontally spreading, a little shorter than the thickish, papillose capsule: petals white: anthers yellow: style slightly exserted from the narrow notch. In wet places, Waldo Oregon and across the continent. Introduced from Europe.

§ 2 *Stigma* sessile or subsessile. Pods emarginate or retuse at the apex. Cotyledons (in ours) incumbent.

**L. Menziesii** DC. Syst. ii, 539. More or less pubescent: stems slender 2-12 inches high from an annual or biennial long slender perpendicular root, simple, or branched above: radical leaves pinnately parted, pubescent or somewhat hirsute; segments lanceolate, acutish; cauline leaves merely toothed, the upper linear and entire: racemes 1-several, not contracted near the summit; pedicels slender early spreading, longer than the pods: petals 4, white, exceeding the sepals: stamens 2-4: pods orbicular retuse glabrous about  $1\frac{1}{2}$  lines in diameter: seeds narrowly winged on one edge. Cliffs and sandy or rocky banks, Oregon to Brit. Columbia near the coast, not common.

**L. occidentale** Howell Eryth. iii, 32. Stems erect 3-12 inches high from an annual root pubescent below with short simple white hairs, puberulent above, freely branching: leaves 1-3 inches long, the lower pinnatifid with obovate to oblanceolate segments, gradually reduced upwards to linear bracts: petals white, obovate, narrowed below to a short claw, rounded at the apex longer than the obovate sepals: stamens 4, about equaling the petals: pods orbicular,  $1\frac{1}{2}$  lines broad, on long slender divaricate pedicels: style very short: seeds obovate, retuse below, narrowly winged on the outer edge. On rocky hillsides, Umpqua valley, Oregon and on cliffs of Cape Foulweather. Doubtless at other places along the coast.

**L. medium** Greene Eryth. iii, 36. *L. intermedium* Gray Pl. Wright, not A. Richard. Glabrous or puberulent: stems erect, branched 6-18 inches high, from a rather stout annual root: lower leaves 1-2 inches long, toothed or pinnatifid; the upper often entire or but sparingly toothed, oblanceolate or linear: petals wanting, stamens 2; style very short: pods rounded 1- $1\frac{1}{2}$  lines broad, with short and obtuse teeth: pedicels spreading, 3 lines long. Sandy places and hillsides, California to Brit. Columbia and Utah, east of the Cascade Mountains.

**L. apetalum** Willd. Sp. iii, 439. Stems erect 1-2 feet high, slender, odorless; leaves somewhat narrow, dull green, the radical ones more or less incisely toothed or pinnatifid; segments usually acutish: flowers closely aggregate, the pedicels remaining nearly erect in flower, but in fruit regularly and widely spreading, thus making the racemes appear as if contracted just below the summit: petals wanting: stamens 2: pods glabrous, orbicular, retuse on short pedicels. Eastern Oregon to Texas and the New England States.

**L. lasiocarpum** Nutt. T. & G. Fl. i, 115. Hispidly pubescent: stems decumbent branching from or near the base: lower leaves pinnately parted, segments usually rather broad, obtuse or rounded, sparingly toothed or entire: racemes several: pedicels distinctly flattened, horizontally spreading, 1- $1\frac{1}{2}$  lines long: sepals broadly oblong usually purple, with thin white margins: petals minute or none: pods suborbicular, thin margined near the apex, hispid pubescent upon both faces, or at least upon the edge. Southern California to Texas and Colorado. Introduced upon R. R. ballast in Oregon, *Henderson*.

**L. nitidum** Nutt. l. c. 116 Glabrous or somewhat pubescent: stems simple or branched, 3-16 inches high: leaves pinnately cut into linear acuminate segments, the uppermost often entire: pedicels flat, 1-2 lines long:

petals small: pods in a loose raceme, spreading, glabrous and shining rounded, 1-2 lines broad, acutely margined, the teeth short and obtuse seeds often ash-color. On dry hillsides, Washington to California.

\*\* Low annuals: pedicels flat: petals often wanting: stamens 2-4: style none: pods reticulated, the apex produced into 2 distinct teeth.

**L. reticulatum.** Minutely hispid; stems erect, sparingly branched 1-2 inches high, from a slender perpendicular annual root: leaves pinnatifid, with linear entire or toothed segments, including the dilated base of the petiole 6-12 lines long: pedicels approximate, a line long, thin-edged erect: sepals oblong, very acute, with hyaline borders, persistent: stamens 2: pods glabrous, reticulated, a line long, the short obtuse teeth somewhat connivent: seeds oblong-obovate, narrowly margined on the outer edge. Roadsides, southwestern Oregon. Rare.

**L. dictyotum** Gray Proc. Am. Acad. vii, 329. Pubescent throughout with short spreading hairs, or the leaves glabrous: stems 1-3 inches high ascending, slender and branching: leaves narrowly linear, 1-2 inches long entire or pinnatifid with a few linear lobes: sepals scarious-margined, not persistent: petals white, but little exceeding the sepals sometimes wanting: stamens 4: pods rounded, a line broad, the short acutish teeth connivent: finely reticulated and pubescent, exceeding the thick erect pedicels. In sandy saline places under "Sage brush", eastern Washington to California.

**L. acutidens.** *L. dictyotum* var. *acutidens* Gray Proc. Am. Acad. xii, 54. Sparingly pubescent with short spreading hairs: stems 3-10 inches long erect and nearly simple, or decumbent and much branched from the base: leaves linear, 1-3 inches long, entire or sparingly pinnatifid: pods ovate, 3 lines or more broad, deeply notched above, with 2 acuminate divergent teeth, equalling or shorter than the erect or outwardly curved pedicels. In alkaline soil, eastern Oregon to California.

**L. Oregonum** Howell P. C. Pl. Coll. 1887. Finely more or less hispidulous: stems erect, simple or with a few ascending branches, 3-8 inches high: leaves linear, entire or with a few linear attenuate segments: sepals promptly deciduous pods round-ovate,  $1\frac{1}{4}$  lines broad, not reticulated or very faintly so, smooth, the rather prominent teeth divergent. Roadsides southwestern Oregon near Woodville.

**L. oxycarpum** T. & G. Fl. i, 116. Nearly or quite smooth: stems slender, branched from the base; branches ascending, 4-6 inches long, loosely floriferous more than half their length: leaves linear, acute, subentire or pinnatifid with a few narrow acute teeth: pedicels comparatively slender widely spreading or deflexed,  $1\frac{1}{4}$  lines long: flowers small, apetalous; sepals very unequal, half line long: stamens 2: pods suborbicular, glabrate finely reticulated,  $1\frac{1}{4}$  lines broad, tipped with 2 very short widely divergent teeth. In saline soil, central California to Brit. Columbia.

### 32 THLASPI L. Gen. n. 802.

Low glabrous herbs with simple stems entire or toothed leaves and white or pinkish flowers. Sepals short-oval, obtuse, thin margined, erect or slightly spreading. Petals obovate or oblanceolate, entire. Stamens free and unappendaged: anthers short. Style slender or sometimes none. Stigma small, entire or slightly emarginate. Pods cuneate-obovate or oblanceolate, compressed contrary to the partition, few-seeded: valves acutely carinate or winged. Seeds somewhat turgid, not margined. Cotyledons accumbent.

### T. alpestre

the base, from a slender root: radical leaves long, 6-12 lines long, entire, acuminate: stamens 2: style none: petals white: pedicels spreading, 3-4 lines long: seeds oblong, 3-4 lines long: style a line long: umbra and the R.

### Tribe VIII.

hiscent, inarticulate, rarely 2-seeded

donos accumbent

### 33 HETERODRAB.

Slender annuals with branches. Sepals sessile. Petals hiscent, by a long style. Seeds 3-4.

### H. unilobata

club, ix, 124. Herbs with cuneate branches from the base: flowers nodding and fruiting lines wide, with a maturity twisted when moist placed

Slender annuals with small white petals small and margined, in divisions accumbent

### A. pusillum

ute-tomentose at the base, the filices obovate, entire or finely similar, but by a line broad, broad, hirsute and. Common on Brit. Columbia

### 35 T.

Slender: erect or rose-color sepals equal free, unappendaged. Pods orbicular

**T. alpestre** L. Sp. ed. 2, ii. 903 (?) Stems simple, or branched from the base, from a quite simple or branched perennial rootstock, 1-15 inches high: radical leaves rosulate, elliptical to spatulate, attenuate to a slender petiole, 6-12 lines long or more, entire or sparingly toothed; cauline ovate to oblong, entire, acuminate, clasping at base, 3-6 lines long: flowers 2-3 lines long, crowded in a somewhat capitate cluster; sepals purplish, thin-margined; petals white, or pale purple, 3-4 lines long: peduncle at length elongated: pedicels spreading, in fruit, 2-4 lines long: pods obovate to cuneate-oblong, 3-4 lines long, emarginate or truncate or rounded at the apex 4-8 seeded; style a line long. In mountainous districts, California to Brit. Columbia and the Rocky Mountains.

*Tribe VIII. Isatedæ DC. Pods short, rarely elongated, indehiscent, inarticulate, usually crustaceous or osseous, 1-celled, 1-rarely 2-seeded. Pedicels usually slender, recurved in fruit. Cotyledons accumbent.*

33 HETERODRABA Greene, Bull. Cal. Acad. i. 71.

Slender annual with long horizontal and nearly prostrate branches. Sepals equal at base. Petals minute or wanting. Stigma sessile. Pod short-elliptical, twisted, very tardily if at all dehiscent, by a very filmy partition 2-celled: valves flat, nerveless. Seeds 3-5 in each cell, in two rows. Cotyledons accumbent.

**H. unilaterialis** Greene l. c. 27 *Draba unilaterialis* M. E. Jones Bull. Torr. Club, ix, 124. Hirsute-pubescent with branching hairs: leaves obovate, with cuneate base, 6-12 lines long, sparingly toothed towards the apex, branches from a few inches to more than a foot long, spreading horizontally: flowering and fruiting throughout their whole length: pods 2 lines long, 1½ lines wide, with some stout straight hairs besides the stellate pubescence in maturity twisted: pedicels scarcely a line long, stout and deflexed. In open moist places, southern Oregon, near Ashland and California.

34 ATHYSANUS Greene, l. c, 72.

Slender annual with rosulate usually toothed leaves and small white flowers in long racemes. Sepals equal at base. Petals small or none. Style very short. Pods orbicular, not margined, indehiscent, flat, nerveless, 1-celled, 1-seeded. Cotyledons accumbent.

**A. pusillus** Greene l. c. *Thysanocarpus pusillus* Hook. Inc. t. 52. Hirsute-tomentose with stellate hairs; stems very slender, branching from near the base, the filiform branches 3-12 inches long: lower leaves broadly oblanceolate, entire or remotely denticulate, 3-12 lines long, short-petioled; cauline similar, but smaller, often entire, sessile but not clasping: flowers barely a line broad, the late ones apetalous: pods orbicular, less than a line broad, hirsute with hooked hairs; pedicels 1-2 lines long, at length reflexed. Common on dry hillsides and rocky banks, southern California to Brit. Columbia: flowering in very early spring.

35 THYSANOCARPUS Hook. Fl. i, 69, t. 18. f. A.

Slender erect sparingly branched annuals with minute white or rose-color flowers on slender pedicels in elongated racemes. Sepals equal at base. Petals minute. Stamens 6, subequal, free, unappendaged, with slender filaments and short anthers. Pods orbicular, wing-margined, much compressed, plano-convex,

indehiscent, 1-celled, 1-seeded. Seeds pendulous, somewhat flattened, margined. Cotyledons accumbent to oblique-incumbent.

**T. curvipes** Hook l. c. Somewhat hirsute at base, glabrous above. 6-25 inches high: radical leaves, oblanceolate, 1-3 inches long pinnatifid or sinuately toothed: upper ones lanceolate to linear, sagittate-auriculate and clasping at base, entire or sparingly toothed: pods rounded to obovate or ovate, densely tomentose or glabrous 2-4 lines broad including the entire or crenate, veined and often perforated wing, emarginate at the summit and tipped by the short purple style, usually colored: pedicels 2-4 lines long, at length recurved. Common on dry hillsides Washington to California, Arizona and Idaho. Flowering in early spring.

**T. radicans** Benth. Pl. Hartw. 297. Stems 6-18 inches high simple or with a few simple, elongated ascending branches, glabrous: lowest leaves runcinately toothed or pinnatifid; the cauline ones ovate-lanceolate and auriculate-clasping: racemes long, loosely flowered: pedicels usually ascending but nodding near the apex, 4-8 lines long: petals purple, exceeding the sepals; pods rounded, 4-5 lines in diameter, tomentose or quite smooth, scarcely emarginate with a broad entire translucent wing conspicuously marked by radiating nerves: style short. Southern Oregon (Umpqua valley) to Central California.

*Tribe IX. Raphanæ DC. Pods indehiscent, transversely separated into 1-few-seeded joints. Seeds globose. Cotyledons conduplicate.*

36 **RAPHANUS** Tourn. Inst. 229 t. 114 l. Gen. n. 882.

Coarse annual or biennial herbs with pinnatifid leaves and white or purple flowers. Sepals erect, the lateral somewhat saccate. Petals large, unguiculate. Stamens 6, unappendaged, attenuate to a slender or rather stout beak, indehiscent transversely divided by several false partitions, seeds globular, pendulous.

**R. SATIVUS** L. Sp. ii 669. Stems stout and branching 1-4 feet high from a straight thick annual root: leaves lyrate pinnatifid, hirsute: petals white to purple 6-8 lines long: pods terete 4-6 lines in diameter, gradually narrowed to an elongated beak, usually 2-3-seeded. Escaped from cultivation, Washington to California.

ORDER VIII. CAPPARIDACEÆ Endl. Gen. 889.

Herbs or shrubs with alternate leaves without stipules and perfect hypogynous flowers. Sepals or lobes of the calyx 4. Petals 4, rarely 5-8 or none, usually unguiculate, more or less unequal. Stamens: in ours, 6-12, rarely 4. Ovary often stipitate, composed of two united carpels with two parietal placenta. Styles united into one, often filiform, sometimes short or almost none: stigma often discoid or subcapitate. Fruit one-celled, in ours a two-valved pod-shaped capsule. Seeds campylotropous, reniform, without albumen. Embryo curved. Cotyledons foliaceous, somewhat incumbent.

1 **Jacksonia**. Stamens 8-32: flowers whitish or pinkish: pods elongated, dehiscent from the top downward.

2 **Cleome**. Stamens 6: flowers yellow or purplish: pods oblong or linear, dehiscent from the base upward.

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1 JACKSONIA Raf. Med. Repos. v, 352.

*POLANISIA* Raf. Journ. de Phys. 98. (1819).

Annual, ill-scented and mostly glandular herbs, with simple or 9-foliolate petioled leaves, and yellowish, rose-color or white flowers in leafy-bracted racemes. Sepals 4 deciduous, lanceolate, sometimes connate at base. Petals on claws or sessile, equal or unequal, torus small depressed. Stamens 8-32 inserted below the torus. Pods erect on spreading pedicels, membranaceous, very shortly stipitate, elongated, compressed or cylindrical, many-seeded, dehiscent from the top downward. Seeds round-reniform, glabrous or reticulated.

**J. trachysperma** Greene Pitt. ii, 175. Glandular-pubescent, erect 6-9 inches high: leaves 9-foliolate, leaflets lanceolate  $\frac{1}{2}$ -2 inches long, acute, about equalling the petioles, nearly sessile: floral bracts mostly simple, ovate to lanceolate, shortly petioled petals 3-5 lines long, with slender claws as long as the sepals, and an emarginate blade: stamens 12-19, filaments exserted: style 2-3 lines long: pods 1-2 $\frac{1}{4}$  inches long, very rarely on a short slender stipe: seeds finely pitted and often very. Oregon and Idaho to Brit. Columbia, Kansas and southward to New Mexico and Texas.

2 CLEOME L. Syst. Nat. ed. 1.

Erect branching annuals; with palmately 3-8 foliolate leaves and yellow or purple flowers, in bracteate racemes. Sepals 4, sometimes united at base. Petals with claws or sessile. Stamens 6, upon the small torus. Pods linear to oblong, stipitate, many-seeded: style short or none. Pods pendant on spreading pedicels, dehiscent from the base upward. Seeds globose-reniform to ovate. Ours all of

§ *EUCLÉOME* Gray Syn. Fl. i, 183. Torus little or not at all columnar below the stamens, but commonly thickened, and bearing a glandular projection behind the ovary: this in all our species raised on a slender stipe or carpophore. *Cleome* Endl.

\* Calyx 4-cleft, tardily deciduous, petals indistinctly if at all unguiculate.

**C. serrulata** Pursh. Fl. ii, 441. *C. integrifolia* T. & G. Fl. i, 122. Somewhat glaucous, 2-3 feet high, widely branching; leaves 3-foliolate; leaflets oblong to lanceolate, or the uppermost linear, entire, submucronate: racemes sometimes nearly a foot long: flowers large, showy, reddish-purple, rarely white: sepals united to the middle, persistent; segments triangular- acuminate: petals with very short claws, stamens equal: pods oblong-linear, compressed, much longer than the stipe. On watercourses, from the Columbia river to Colorado, New Mexico and Dakota.

**C. lutea** Hook. Fl. i, 70, t. 25. Glabrous or slightly pubescent; 1-3 feet high: leaves 5-foliolate: leaflets linear to oblong-lanceolate, 1-2 inches long acute, short-petiolulate: equalling the petioles; flowers bright yellow: sepals ovate-lanceolate, acuminate, glabrous; petals broadly lanceolate, very short clawed, 3-4 lines long: pod 9-15 lines long, about 2 lines broad, orbiculate, equalling or longer than the stipe. On sandy banks along the Columbia river, and from Wyoming to Colorado and Nevada.

\*\* Sepals distinct to the base, deciduous. Petals not distinctly unguiculate.



**C. platycarpa** Torr. Bot. Wilkes 235, t. 2. Pubescent and glandular 1-2 feet high: leaves 3-foliolate; leaflets broadly oblong to lanceolate, 6 lines long: flowers very showy, bright yellow: sepals linear-setaceous, villous: petals broadly lanceolate, without claws: pods elliptical, 8-10 lines long, stipe about as long as the pod, equalling the pedicels; style slender about 2 lines long. Hillsides, John Day valley, Oregon to northern California and western Nevada.

ORDER IX. VIOLACEÆ S. F. Gray Nat. Arr. ii, 667.

Sepals 5, persistent, imbricated in the bud. Petals 5, alternate with the sepals, hypogynous, on short claws, commonly unequal. Stamens 5, alternate with the petals, inserted on the torus: anthers adnate, introrse 2-celled, opening longitudinally: filaments broad, elongated beyond the anthers, ovary 1-celled 3-valved, with 3 parietal placentæ, several ovuled. Style usually declined with an oblique cucullate stigma. Seeds anatropous with a straight embryo in the axis of fleshy albumen. Ours are low herbs with watery somewhat acid juice, alternate leaves with persistent stipules and axillary flowers.

1 VIOLA Tourn. Inst. 419, t. 236 L. Gen. n. 1007.

Perennial or annual herbs with alternate stipulate leaves and mostly one-flowered axillary 2-bracteolate peduncles. Early flowers usually showy and often infertile, the later ones often cleistogamous and more fertile. Sepals more or less auricled at base. Petals unequal, the lower one produced at base into a nectariferous sac or spur, the others of about equal length. Filaments very short or none: anthers connivent but distinct, at most lightly coherent, the two anterior each with a dorsal appendage or spur projecting into the spur or sac of the lower petal. Style often flexuous below, enlarged upward. Capsule usually obovoid crustaceous or coriaceous: valves several-seeded. Seeds obovoid or globular, smooth.

Ours are all perennial with part or all of the stipules more or less scarious, never emulating the blade of the leaf. The two upper petals turned backward, and the lateral ones turned forward, toward the lower one, or merely spreading.

\* Strictly acaulescent, the leaves and scapes directly from rootstocks: gibbous-clavate with inflexed or truncate and beardless summit and an introrsely beaked or short-jointed small proper stigma.

+ Rootstock thick and comparatively short, never filiform or producing runners or stolons: spur of the corolla only saccate: cleistogamous flowers abundant and short peduncled.

**V. cognata** Greene Pitt. iii, 145. *V. cucullata* of authors as to plants. Acaulescent; rootstocks short and thick: leaves long-petioled smooth or more or less pubescent, slightly fleshy, cordate with a broad sinus, the earliest often reniform and the later acute or acuminate, coarsely toothed: scapes 2-10 inches high, about equalling the leaves: petals 5-8 lines long, blue or violet, all villous at base, the three lower very strongly so: spur only saccate: style smooth; stigma small, beaked

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**V. occident**  
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short-pointed. In moist places; eastern Oregon and Washington to British Columbia and the Rocky Mountains.

+ + Rootstock thickish and creeping, commonly sending off leafy and floriferous stolons or runners above ground: leaves round-cordate and merely crenulate: lateral petals usually bearded: spur short, and saccate.

**V. Langsdorffii** Fisch. in DC. Prod. i, 206. Glabrous or nearly so: stems weak and declined or ascending 1-12 inches long from a creeping reniform rootstock: leaves reniform to cordate, crenately serrate, the lower ones on petioles that about equal the stems; stipules lanceolate, acuminate, 6-10 lines long: flowers usually pale blue, 9-12 lines long with short saccate spur, lateral petals white with a small bearded spot near the base: stigma small, rounded. In marshes along the coast from Crescent City, California to Alaska.

+ + + Rootstock long and filiform extensively creeping underground: plants low or small: spur saccate.

++ Corolla blue or purple.

**V. palustris** L. Sp. ii, 934 (?). Wholly glabrous: rootstock long and filiform, extensively creeping underground; leaves round-cordate with a broad sinus and rounded summit, 1-2 inches in diameter, obscurely crenate, scapes 2-4 inches high, much longer than the leaves: flowers pale lilac to white, lateral petals sparsely if at all bearded 3-4 lines long, spur short and rounded. In marshes of the high mountains, California to Alaska and east to the New England States and Labrador, Europe and northern Asia.

++ ++ Corolla always white, mostly with purple lines on the lower petal; stigma as if truncate and margined, and antorsely short-pointed.

= Leaves round-cordate or reniform, on slender marginless petioles.

**V. blanda** Willd. Hort. Berol. t. 24. Glabrous or nearly so: stems very short or none, from slender creeping rootstocks with numerous fibrous rootlets: leaves thin, crenulate, from ovate-cordate to round-reniform, 6-18 lines broad, on slender petioles as long: scapes 1-3 inches high: sepals a line long, from oblong to almost ovate-lanceolate scarious-margined: petals white, oblong 3-4 lines long, usually all beardless, the lower ones conspicuously dark-veiny; spur short, saccate, rounded. In wet places in the mountains from California to Alaska and the Atlantic States.

**V. Macloskeyi** F. E. Lloyd Eryth. iii, 74. Whole plant glabrous: rootstock slender, creeping, bearing three or four leaves and at length a few runners: leaves reniform with a shallow sinus; the lamina slightly decumbent down the slender petiole, the margin obscurely crenate-serrate: stipules ovate acute: peduncles 1-3 inches long: petals white, very thin and translucent, the spur very short and saccate; lateral petals bearded. Springy places in the Cascade Mountains about Mt. Hood.

= = Leaves from linear to spatulate or ovate or subcordate, the base decurrent into a margined petiole: sometimes leafy along summer stolons.

**V. occidentalis**. *V. primulaefolia* var. *occidentalis* Gray Bot. Gaz. xi 255. Glabrous throughout: rootstock short, not creeping but propagating by long filiform runners: leaves ovate to spatulate-oblong, attenuate at base to a long slender petiole, obscurely crenate: scapes 3-6 inches high, not exceeding the leaves: petals white the lower ones veined with purple, lateral ones bearded, 4-6 lines long, spur saccate, stigma truncate, margined and antorsely short-pointed. In marshes, eastern base of the Coast

Mountains near the Oregon and California line.

\* \* Subcaulescent by leafy stolons, or caulescent with 2-3 leaved stems. Stigma terminal beardless and beakless.

+ Leaves undivided, at most only cuneate toothed.

**V. sarmentosa** Dougl. in Hook. Fl. 4, 80. Sparingly pubescent; stems weak and decumbent: multiplying by long filliform rootstocks; leaves rounded-cordate, reniform or sometimes ovate,  $\frac{1}{2}$ - $1\frac{1}{2}$  inches broad, finely crenate, usually punctate with numerous dark dots: peduncles mostly exceeding the leaves: flowers yellow, lateral petals with a bunch of long scales at the base of the blade; spur short and saccate. In open forests Brit. Columbia to California.

**V. orbiculata** Geyer Hook. Lond. Jour. Bot. vi, 73. Rootstock short and thick, with few fibrous rootlets: stems at first very short with a pair of scarious acutely triangular stipules at the base of the peduncles, a length sarmentose with a few small leaves and bearing cleistogamous flowers: leaves mostly basal, orbicular to oblong, cordate with deep narrow sinus, crenulate, 1-2 inches broad, glabrous below, pubescent with short stout appressed scattered hairs above, sepals oblong to nearly lanceolate: petals yellow, the lower one purple veined, spurs short and saccate: stigma beakless, bearded on the sides. In open forests, Cascade Mountains in Oregon to Idaho and Alaska.

**V. purpurea** Kell. Proc. Cal. Acad. i, 56. More or less pubescent with more or less spreading hairs, stems clustered from branching perpendicular root 2-6 inches long: leaves semi-orbicular to ovate or lanceolate cuneate or truncate at base 6-12 lines long, entire or coarsely crenate, often purple-veined: peduncles but little longer than the leaves: petals 4-6 lines long, light yellow more or less tinged with dark purple outside: capsule globular, pubescent. On dry open hillsides, Oregon to California.

+ + Leaves 3-parted, with more or less lobed or cleft segments.

**V. Sheltonii** Torr. Pacif. R. R. Rep. iv, 67, t. 2. Glabrous or nearly so: leaves round-reniform to cordate in outline, 3-parted, the divisions lobed and cleft into linear or oblong segments: peduncles shorter than the leaves: petals yellow veined with purple. Wooded mountains, southwestern Oregon to California.

\* \* \* Subcaulescent, first flowering from the ground, from erect or ascending rootstocks, not stoloniferous or creeping: stipules partly and variably adnate: corolla mostly yellow with short saccate spur: stigma beakless, sometimes with a short lip, concave, mostly orbicular, antros-terminal or slightly oblique at the large and gibbous clavate summit of the style; bearded below its margin on each side by a tuft or sometimes by nearly a ring of stiff and reflexed spreading bristles.

+ Leaves undivided, round ovate or subcordate to lanceolate: lateral petals either slightly bearded or beardless.

**V. Nuttallii** Pursh Fl. i, 174. Glabrous or the leaf margins finely and densely ciliate, root thick, perpendicular; stems scarcely any, leaves lanceolate, nearly entire, attenuate to a long petiole, stipules lanceolate; spur very short and saccate: pubescence of the depressed beakless stigma minute. Plains of the Blue Mountains of Oregon to the Rocky Mountains and Kansas.

**V. præmorsa** Dougl. Bot. Reg. t. 1254. Canescent with short spreading hairs, stems short, from thick, perpendicular branching roots: leaves from nearly orbicular to lanceolate, densely pubescent below, sparingly so or quite smooth above, irregularly crenate toothed, 6-30 lines long, gradually or abruptly contracted to a slender petiole: stipules scarious, lanceolate acuminate entire: scapes longer than the leaves, pubescent: sepals linear 4-5 lines long, often minutely ciliate: petals bright yellow, obovate

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8 lines long not bearded: stigma short-apiculate, minutely bearded: capsule oval, sparingly pubescent or glabrous. On open plains about Oregon City and near Vancouver Washington.

+ + Leaves finely dissected, subterranean shoots commonly sending up their scapiform peduncles from under the ground.

\*\* Petals beardless, essentially yellow.

**V. Douglasii** Steud. Nom. ii, 771. *V. chrysantha* Hook. not Schrader. More or less pubescent with short spreading hairs: leaves bipinnatifid with narrow oblong or linear segments; peduncles equalling or exceeding the leaves, 2-5 inches long: petals 5-9 lines long bright yellow, the upper brown-purple on the outside, the others veined: capsule acute 5 lines long. In dry soil, southern Oregon to California.

\*\* \*\* Lateral petals bearded: upper deep violet-purple or blue; lower pale or yellow.

**V. Beckwithii** T. & G. Pac. R. Rep. ii, 119, t. 1. Pubescent or suberulent, leaves palmately about thrice 3-parted into linear or spatulate-linear acutish or obtuse lobes, the primary divisions petiolulate: peduncles about equalling the leaves: upper petals deep violet purple, the others light, blue or bluish with yellow base, lateral ones short, bearded. California and Nevada to southern Oregon.

**V. Hallii** Gray Proc. Am. Acad. viii, 377. Glabrous: leaves bipinnately or pedately about twice parted into lanceolate or linear lobes, the tips obtuse or acutish and callous apiculate: peduncles surpassing the leaves: upper petals deep violet, the others yellow or cream-color 6-8 lines long. Gravelly prairies from Salem Oregon, to northern California.

**V. trinervata** Howell in Gray Syn. Fl. i, 201. Glabrous: leaves pedately parted, the few divisions lanceolate to almost ovate acute or apiculate at maturity almost coriaceous strongly 3-nerved, the lateral nerves intermarginal, peduncles longer than the leaves: upper petals dark blue, the others pale blue to white, with a yellow base. Klickitat county, Washington.

\* \* \* \* Caulicent, the few to several-leaved stems erect from short or creeping rootstocks: no stolons nor radical flowers: spur short and saccate: lateral petals commonly scantily papillose-bearded: stigma beakless, bearded or pubescent at the sides.

+ Petals yellow; stems usually naked at base and few-leaved above.

**V. lobata** Benth. Pl. Hartw. 298. Finely pubescent or glabrous: stems 3-2 inches high from an erect rootstock: leaves reniform to broadly cuneate in outline 1-4 inches broad shortly petioled more or less deeply palmately cleft into 5-9 narrowly oblong to lanceolate lobes, the central lobe usually more elongated, sometimes only coarsely toothed: peduncles not longer than the leaves: petals 6-8 lines long, yellow, the upper brownish purple outside: capsule 5-6 lines long, acute. Southwestern Oregon to southern California.

**V. Brooksii** Kell. Cal. Hort. ix, 281. *V. lobata* var. *integrifolia* Watson Bot. Cal. i, 57. Minutely pubescent: stems erect, 4-8 inches high, few-leaved: leaves deltoid or rhombic-ovate, often long-acuminate, crenate-serrate, 1-3 inches broad: stipules lanceolate, acute, minutely ciliate, entire or lacerate: flowers few, sepals linear, little if at all arched: petals yellow 5-6 lines long. In dry open forests southwestern Oregon and California.

**V. Canadensis** L. Sp. ii, 936. Glabrous or slightly pubescent: stems erect leafy, 6-12 inches high from branching, ascending rootstocks, leaves cordate and mostly acuminate, denticulate-serrate; stipules small, narrow, entire, scarious: petals usually pale violet outside, white with yellow

lowish base and some purple stripes within, the lateral ones with some papillose hairs near the base; spur short and saccate; stigma beak-like bearded on the sides: capsule oval glabrous. Moist woods, Asho, *Sandberg* (N. 218), to the northern Atlantic States and Canada.

*V. glabella* Nutt. T. & G. Fl. i, 142. Minutely pubescent or glabrous; stems slender from a short, fleshy horizontal rhizoma, naked or sparingly leafy below 5-12 inches high: radical leaves on long petioles the upper shortly petioled, reniform-cordate to cordate, acute crenately toothed or crenulate 1-4 inches broad; flowers bright yellow petals 4-8 lines long; capsule ovate-oblong 3-5 lines long, abruptly beaked. In forests, Alaska to northern California.

*V. ocellata* T. & G. Fl. i, 142. Pubescent: stems slender 6-12 inches high from somewhat creeping rootstocks: leaves on very long petioles cordate-triangular crenately toothed, seldom acuminate: stipules lanceolate somewhat ciliate; peduncles shorter than the leaves: sepals linear: petals oblong lanceolate the upper ones violet or with a deep violet spot on the upper face; lower ones white or with some yellow and purple veins; spurs very short: stigma strongly bearded on each side. Southern Oregon to middle California.

*V. cuneata* Watson Proc. Am. Acad. xiv, 290. Glabrous: stems slender and somewhat trailing, 3-12 inches long; from a long running rootstock; leaves rhombic-ovate, acute attenuate into a slender petiole somewhat crenately toothed above: peduncles not exceeding the leaves: upper petals deep purple, the others purple and white, 4-6 lines long. Southern western Oregon and adjacent California among underbrush.

\* \* \* \* \* Caulicent, from more or less creeping rootstocks, or at first flowering nearly caulescent, erect or spreading: leaves cordate, undivided: corolla from blue to white with projecting, oblong to cylindrical spur: style moderately thickened upward, beardless.

*V. adunca* Smith in Bos. Cycl. xxxviii. *V. canina* var. *adunca* Gray. Puberulent or nearly glabrous, usually 3-11 inches high, at length sending out runners that bear cleistogamous flowers: leaves ovate, more or less cordate at base;  $\frac{1}{2}$ -1 $\frac{1}{2}$  inches long obscurely crenate: peduncles usually longer than the leaves: flowers violet or purple to white: petals 6-8 lines long the lateral ones bearded, spur as long as the sepals, rather slender, hooked or curved. Common from Brit. Columbia to California, east to the Rocky Mountains.

*V. puberula*. *V. canina* var. *puberula* Watson in Gray Man. ed. 6, 81. Finely puberulent throughout: low, 2 inches high: leaves shallowly or often not at all cordate, mostly small: peduncles but little exceeding the leaves, flowers small, light blue: spurs cylindrical, more than half the length of the petals. In moist places, Oregon and Washington to the Atlantic States.

*V. Howellii* Gray Proc. Am. Acad. xxii, 308. Stems slender, few-leaved 4-12 inches long: leaves round-reniform to broadly cordate, repandentate and ciliate an inch or more wide, on long slender petioles: peduncles equalling or surpassing the leaves: flowers large, pale blue or violet: spur about half as long as the sepals, straight and blunt. In forests near Portland, Oregon.

#### ORDER X. POLYGALÆÆ Endl. Gen. 1077.

Herbs or shrubs with entire leaves and no stipules. Sepals 5, distinct, usually persistent, very irregular, three of them exterior and smaller; the two lateral or inner ones larger and usually petal-like: imbricated in the bud. Petals hypogynous, irregular; deciduous; usually only 3; of which one is larger

than the rest. Stamens 6-8, which is split the claws of. Seeds anatropous in fleshy albumen.

Sepals persistent their claws beaked. Ovary Capsule 2-celled, obovate bumen. Herbs racemose or solitary.

**P. Californica** slender from a sometimes ovate rose-color on petals nearly so, the rather broadly somewhat ciliate flowers near the base above, nearly what pubescent the length of the

Herbs some juice, regular parts and the times convolvulus many and albumen ovary 1-celled campylotropous bryo coiled usually swollen by a transverse pules. Petals around an anther with the base with the stigma opening by ventral, or in the

TRIBE I. S. Petals commencing within, narrow stamens borne dehiscent at the styles. Flowers

than the rest, the others alternate with the inner sepals. Stamens 6-8 hypogynous: filaments combined into a tube which is split on the upper side and more or less connate with the claws of the petals. Fruit loculicidal or indehiscent. Seeds anatropous with a crustaceous testa. Embryo straight in fleshy albumen.

1 POLYGALA Tourn. L. Gen. n. 851.

Sepals persistent; the wings large and petal-like. Petals 3, their claws coherent with the staminal tube, the lowest one keeled. Ovary 2-celled, ovules solitary in each cell, pendulous. Capsule 2-celled, flattened contrary to the narrow partition, elliptical, obovate, or orbiculate. Seeds carunculate, with copious albumen. Herbs shrubby at base, with simple entire leaves and racemose or spicate flowers.

**P. Californica** Nutt. T. & G. Fl. i, 671. *P. cucullata* Benth. Stems slender from a woody base, 2-8 inches high: leaves oblong-lanceolate or sometimes ovate-elliptical  $\frac{1}{2}$ -1 inch long on very short petioles: flowers rose-color on pedicels 1-3 lines long, without bracts: sepals glabrous or nearly so, the outer  $2\frac{1}{2}$  lines long, rounded-saccate at base; the wings rather broadly spatulate 4-6 lines long: lateral petals linear-lanceolate, somewhat ciliate, about equalling the keel: fruit mostly from apetalous, flowers near the root; capsule glabrous, broadly ovate  $2\frac{1}{2}$ -3 lines long, retuse above, nearly sessile, narrowly margined: seeds 2 lines long somewhat pubescent; the caruncle vesicular and wrinkled, calyptra-like, half the length of the seed. Southwestern Oregon and California.

ORDER XI. CARYOPHYLLACEÆ Juss.

Herbs sometimes suffrutescent at base with bland and inert juice, regular and mostly perfect flowers, persistent calyx; its parts and the petals 4 or 5 and imbricated, or the petals sometimes convolute, in the bud, stamens twice as many, or as many and alternate with them or rarely fewer than the petals, ovary 1-celled with a free central placenta bearing few to several campylotropous ovules, the reniform seeds with a slender embryo coiled around the outside of farinaceous albumen. Stems usually swollen at the nodes. Leaves often united at the base by a transverse line, in one group with interposed scarious stipules. Petals sometimes wanting. Stamens mostly hypogynous around an annular disk, sometimes perigynous by its cohesion with the base of the calyx. Styles 2-5 mostly distinct and with the stigma running down the inner face. Fruit a capsule, opening by valves or by teeth at the summit. Flowers terminal, or in the forks, or in cymes.

TRIBE I. Sepals united into a 4- or 5-toothed or lobed calyx. Petals commonly with an appendage on the base of the blade within, narrowed below into a conspicuous claw; these and the stamens borne on the stipe of the ovary. Styles distinct. Capsule dehiscent at the summit by as many or twice as many teeth as styles. Flowers comparatively large, perfect, or not infrequently

polygamous.

1. **Saponaria.** Calyx 5-angled becoming 5-winged: its teeth short, not foliaceous: styles 2, capsule 4-5 valved.
2. **Silene.** Calyx commonly 9-nerved, styles 3: capsule opening by as many or twice as many teeth.
3. **Lychnis.** Calyx 10-nerved, styles 4 or 5, alternate with the petals when of the same number: capsule opening by as many or twice as many teeth: perennials.
4. **Agrostemma.** Styles 5 opposite the petals: calyx-teeth conspicuously prolonged into foliaceous appendages.

TRIBE II. Sepals free or slightly united at the very base. Petals unappendaged, more or less narrowed below but not to a distinct claw, inserted with the stamens on the margin of the disk at the base of the sessile ovary, not rarely inconspicuous or none.

\* Stipules none.

- + Capsule cylindric more or less elongated, often curved, dehiscent by twice as many teeth as there are carpels.
5. **Cerastium.** Capsule cylindric dehiscent with twice as many equal teeth as styles: petals emarginate or bifid; styles 5, rarely 3 or 4.  
+ + Capsule ovoid or oblong, relatively short, dehiscent by as many or twice as many teeth as there are styles.  
+ Styles usually fewer than the sepals, when of the same number opposite them.
  6. **Alsine.** Capsule globose to oblong, with as many valves as styles, petals bifid or 2-parted: styles 3, rarely 2, 4 or 5.
  7. **Arenaria.** Sepals 5, petals as many, entire or emarginate rarely wanting: styles 3, 4 or 5.  
+ + Styles as many as the sepals and alternate with them.
  8. **Alsinella.** Capsule globose with as many entire valves as styles: sepals 4 or 5, petals entire as many as the sepals or wanting.  
\* \* Stipules present scarious or setiform: petals undivided.  
+ Petals conspicuous, styles distinct.
  9. **Spergula.** Styles 5, alternate with the sepals and with the entire valves of the capsule.
  10. **Tissa.** Styles and valves of the capsule 3, very rarely 5.

*Tribe I. Silenæ DC. Sepals united into a 4- or 5-toothed or 5-lobed calyx. Petals unguiculate, often scale-bearing or appendaged at the junction of the blade and claw, inserted with the stamens on the stipe of the ovary. Stipules none. Flowers usually showy, perfect or polygamous.*

1 SAPONARIA L. Gen. n. 564.

Smooth branching herbs with entire leaves and showy pink or white flowers in terminal clusters or panicles, blooming in summer. Calyx tubular or obovoid, 5-toothed, terete, with numerous faint veins or conspicuously 5-angled. Petals 5. Stamens 10.

Styles 2. Capsule 1-celled or imperfectly 2-4-celled, at base, dehiscent by 4 short teeth. Seeds laterally attached. Embryo curved.

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*S. VACCARIA* L. Sp. 409. Stem solitary from an annual root, erect, 1-4 feet high, widely branching above: leaves ovate to oblong-lanceolate, sessile and somewhat connate at base; flowers in a broad corymb; calyx ovoid, with 5 sharp herbaceous angles, the intervening parts white and scarious: petals rose-color, without appendages. Common in cultivated grounds. Introduced from Europe.

*S. OFFICINALE* L. Sp. 408. Stems numerous from a perennial root, 1-2 feet high, stout: leaves ovate-lanceolate, acute, narrowed at the base, 2-3 inches long, 3-ribbed: flowers clustered at the ends of the short branches, often double; calyx tubular, terete, with numerous faint nerves; petals white or pink, appendaged at the junction of the claws and obovate retuse blade. Roadsides and R. R. embankments. Introduced from Europe.

2 SILENE L. Gen. n. 567.

Annual or perennial herbs with mostly linear entire opposite leaves and white or red flowers in paniculate racemes: (rarely solitary or cymose). Calyx tubular more or less inflated, cylindrical-clavate to campanulate, 5-toothed, 10-nerved. Petals 5, with slender claws, which are usually crowned with scales at their junction with the mostly 2 to many-cleft blade. Stamens 10. Style 3. Ovary stipitate. Capsule dehiscent by 6, rarely 3 short teeth. Seeds opaque, tuberculate or echinate, attached by the margin: embryo peripheral.

\* Annuals, mostly introduced.

+ Inflorescence simply racemose or subspicate; pedicels solitary.

*S. GALLICA* L. Sp. 417. Stems hirsute with white jointed hairs: leaves spatulate, mucronate, hirsute-pubescent on both sides 8-18 lines long: racemes terminal one-sided, 2-4 inches long: flowers more or less pedicellate: calyx 10-nerved, villous-hirsute, slender, subcylindric in anthesis, becoming in fruit broadly ovoid with contracted orifice and short narrow spreading teeth: petals usually little exceeding the calyx; the blade obovate, somewhat bifid, toothed or entire. Along the coast from Brit. Columbia to Lower California.

VAR. *QUINQUEVULNERA*, Koch. Syn. Fl. Germ. et. Helv. 100. Petals more showy, subentire, deep crimson with a white or pink border. With the typical form.

+ + Inflorescence cymose or paniculate, not distinctly racemose.

+ + Smooth or nearly so, a part of the upper internodes glutinous.

*S. antirrhina* L. Sp. 419. Stems slender, 6-36 high: leaves oblong-lanceolate or linear, commonly acute: flowers small in a compound cyme, on long filiform pedicels: calyx oblong-cylindric, smooth, in fruit ovoid with short teeth; petals obcordate, about equalling the calyx-teeth expanding only at night or in cloudy weather; scales minute: ovary scarcely stiped. On dry hillsides, California to Brit. Columbia and across the continent.

\*\* Very low and densely matted subcaulescent perennials.

*S. acaulis* L. Sp. ed. 2. 603. Closely caespitose, an inch or two high: leaves linear, crowded on the branching caudex: flowers small, 2-3 lines in diameter, subsessile or raised on naked curved peduncles: calyx narrowly campanulate glabrous, the teeth short and rounded: petals purplish or white, minutely appendaged, obcordate, exserted: flowers dioecious by abortion. Arctic America to the Cascade and Rocky Mountains.

\*\*\* Caulescent perennials.



+ Flowers large rather few: calyx cylindrical or clavate: petals 5-7 lines long, 4-several-cleft: stems leafy: seedcoat more or less roughened but firm.

**S. Californica** Durand Pl. Pratt. 83. Glandular-pubescent or puberulent: stems several from the simple root,  $\frac{1}{4}$ -4 feet high, lax, leafy, simple, or branched above: leaves oblanceolate to ovate 1-4 inches long, acute or acuminate: flowers large, deep scarlet, few at the ends of the branches: pedicels short, the lower deflected in fruit: calyx 7-10 lines long: petals deeply parted with bifid segments, the lobes 2-3 toothed or entire; scales oblong-lanceolate: capsule ovate 6 lines long rather shortly stipitate. California, reaches the southwest corner of Oregon.

**S. Hookeri** Nutt. T. & G. Fl. i, 193. White-tomentose, especially above: stems leafy 3-10 inches high, from a deep perpendicular root: leaves spatulate or lanceolate, acute, an inch or so long, attenuate below to a winged petiole: flowers large and showy, on erect pedicels 1-2 inches long; calyx oblong-clavate, 8-10 lines long; petals pale pink, twice longer than the calyx, the broad claw not auricled, the cuneate blade 1-6 parted with lanceolate or linear entire or bifid segments; scales lanceolate, decurrent upon the claw, ovary roundish, nearly sessile. Prairies and wooded hillsides, Willamette valley to California.

+ + Flowers smaller, 6-8 lines in diameter.

+ + Flowers borne in the forks of the branches forming a leafy inflorescence.

**S. campanulata** Watson Proc. Am. Acad. x. 341. Finely glandular pubescent: root thick, simple, caudex branching, somewhat woody: stem 6-10 inches high, simple or dichotomously branched at the summit; leaves lanceolate, 1-1½ inches long, acute or acuminate; flowers solitary or few, on short deflexed pedicels; calyx campanulate, 5-6 lines long, the teeth broad, obtuse or acutish, and finely net-veined; petals pale flesh-color, 9 lines long, with pubescent scarcely auriculate claws, the limb 4-parted nearly to the base, the lobes bifid to the middle, or the lateral ones entire or notched; appendages oblong, fleshy, entire; filaments pubescent, exerted; ovary suborbicular, shortly stipitate. In mountains of southern Oregon and northern California.

**S. Greenii** *S. campanulata* var. *Greenii* Watson in Robinson Proc. Am. Acad. xxviii, 137. Pubescent and viscid-glandular throughout: root simple; rootstock branching: stems slender declined or ascending; leaves ovate; calyx green, open campanulate, deeply toothed; petals rather broad, cleft into 4 or more greenish or yellow segments: capsule globular. In the mountains from the Cow Creek country to northern California.

**S. Menziesii** Hook. Fl. i, 90 t, 30. *S. stellarioides* Nutt. T. & G. i, 193. Finely glandular-pubescent: stems weak, dichotomously branched above: leaves ovate-lanceolate, acuminate at each end: flowers small: calyx 2-4 lines long: petals 2-cleft commonly unappendaged: capsule ovate-oblong, 2 lines or less broad. Common from Vancouver Island to southern California and the Rocky Mountains and New Mexico.

+ + Flowers few, rather small, white or nearly so, nodding, borne in a lax naked panicle: petals cleft into 4 or more narrowly linear almost filiform segments; styles long exerted.

**S. longistylis** Engelm. in Herb. Watson Proc. Am. Acad. xxii 469. Cespitose with a slender much-branched caudex: finely pubescent throughout, with very short spreading subglandular hairs: stems slender, 6-12 inches high: leaves linear-lanceolate or oblanceolate, acute an inch long or less, mostly radical, the cauline only 1 or 2 pairs: calyx ovate cylindrical soon becoming ovoid, the teeth broad ovate, petals white, the narrow claw scarcely auricled and very pubescent, the blade cleft nearly to the base,

into four lines  
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into four linear or filiform segments; appendages linear, entire: stamens and style long exerted, capsule sessile: seeds small, dark red. Siskiyou Mountains, near Ashland, Oregon, to Scott's Mountain, California.

+ + + Flowers scattered or variously paniculate: style included or somewhat exerted: capsule distinctly stipitate: calyx cylindrical or in fruit clavate or obovate, usually distinctly contracted about the stipe of the capsule.

**S. Oregona** Watson Proc. Am. Acad. x, 343. Viscidly pubescent: stems strict, erect, simple, few to several from a deep perpendicular root 1-2 inches long: flowers in an open dichotomous panicle, somewhat nodding, upon slender pedicels 3-6 lines long: petals white, 10 lines long, the narrow limb parted to the base and the lobes deeply bifid with filiform segments, the narrow naked claw with the auricles produced upward into lanceolate teeth: scales linear entire: ovary oblong, long stipitate. Oregon and Washington in mountainous districts.

**S. montana** Watson l. c. 343. Finely pubescent: stems erect from a more or less decumbent base 4-14 inches high: linear-lanceolate or narrowly oblanceolate, acuminate 1-2½ inches long mostly radical; the cauline 3-4 pairs, inflorescence varying from subspicate to paniculate; flowers rarely solitary: calyx 6-9 lines long: petals greenish white to rose-color 2-4 lines longer than the calyx, stamens and style about equalling the petals: ovary long-stipitate: capsule acutish. Near Carson City, Nevada, to Mariposa, Cal. Specimens collected in the Siskiyou Mountains near the Oregon line are doubtfully referred to this species.

**S. Gormanii**. Finely puberulent with minute crisp hairs, glandular above; stems slender, simple, 1-2 feet high: leaves lanceolate to linear, the lower ones narrowed below to a long slender petiole, acute or acuminate: flowers rather few, erect, in a strict elongated panicle, or sometimes contracted to a several-flowered cyme, pedicels very unequal 3-12 lines long, slender; calyx oblong-cylindrical, 6-8 lines long, truncate at base, somewhat costate with 10 green ribs, the intervening spaces scarious; the subulate teeth very acute; petals well exerted; the blade 2-parted with deeply 2-lobed segments: stamens and styles well exerted: capsule oval, abruptly contracted below to a short stipe. In forests, Hunt's Ranch, Jackson Co. Oregon, 4400 feet elevation: Aug. 13th, 1896: *M. W. Gorman*.

+ + + ++ Calyx oblong, campanulate, or rarely obovate, rather loosely surrounding the ovary sometimes narrowed downward, but not distinctly contracted about the stipe.

**S. Suksdorfii** Robinson Bot. Gaz. xvi 4 t. 6. Low, densely matted: stems 2-5 inches high, simple, 1-3 flowered, minutely pubescent below, glandular above: stem leaves about 2 pairs, linear 3-7 lines long, a line wide: radical leaves numerous, crowded, similar or somewhat spatulate: calyx broadly cylindrical or campanulate seldom exceeding 5 lines in length; nerves conspicuous, simple below, anastomosing above, petals white, little exceeding the calyx; shallowly bifid, lobes entire: appendages oblong, retuse: stipe of capsule 1½ lines long. On the snowy peaks, Washington to California.

**S. Lyallii** Watson l. c. xxviii, 144. Glabrous excepting the inflorescence which is subglandular-puberulent: stems slender ascending: leaves linear-oblanceolate, 1-2 inches long, the lower attenuate to a slender petiole: flowers in dichotomous few-flowered cymes, the slender pedicels 3-4 lines long, not deflexed; calyx 4 lines long, campanulate, net-veined above, the teeth obtuse, broadly triangular; petals 7 lines long, brownish purple, with an oblong shortly bifid limb, oblong entire appendages, and naked scarcely auricled claw; anthers purple, included; styles very short; ovary small, narrowly oblong. Cascade Mountains lat. 49 *Lyall* to California.

"This doubtful species is to be distinguished from some forms of *S. Douglasii* only by its smaller flowers, more leafy habit and darker petals." Robinson Proc. Am. Acad. xxviii, 144.

**S. Douglasii** Hook Fl. i, 88. Finely puberulent throughout and rarely somewhat glandular above: stems numerous erect or ascending from a branching decumbent rootstock, slender 6-15 inches high, simple few-flowered: leaves narrowly oblanceolate to linear, an inch or two long: flowers erect on slender pedicels: calyx oblong-cylindric, often somewhat inflated, 5-7 lines long: petals 8-10 lines long, with broad obtuse lobes, a narrow auricled claw and narrow scales: claws, filaments and stipe of the ovary, more or less villous: capsule oblong-ovate equalling the calyx, rather long stipitate seeds strongly tubercled on the back. Rocky places and cliffs, Washington to California and the Rocky Mountains.

**Var. viscida** Robinson Proc. Am. Acad. xxviii, 144. Glandular-viscid especially above: stems erect, rigid, mostly simple from a branched, slightly woody base: calyx broadly oblong or almost campanulate relatively short: leaves narrowly lanceolate to linear-oblong, thickish. Washington to Brit. Columbia.

**S. macrocalyx.** *S. Douglasii* var. *macrocalyx* Robinson Proc. Am. Acad. xxviii, 145. Puberulent or nearly smooth, scarcely viscid: stems; several from the fleshy root, rather stout 1-2 feet high: leaves narrowly lanceolate to linear, attenuate to each end: flowers mostly in 3-flowered long-peduncled cymes: calyx long-cylindrical, 8-10 lines long, 3-5 lines in diameter, the ends of the teeth surrounded by an obtuse inflexed membrane: petals pink or purplish, 2-lobed: segments obtuse: claw auricled, appendages oblong, obtuse. On dry ridges, Mount Adams Washington to the Humboldt Mountains in Nevada.

**S. Columbiana.** *S. Douglasii* var. *brachycalyx* Robinson l. c. Smooth or puberulent, but not viscid: root thick and branching: stems many from the much branched caudex, slender, erect, or decumbent at base, 1-2 feet high: leaves distant, spreading, narrowly oblanceolate the lower ones attenuate at both ends, 2-4 inches long: flowers borne in 1-5 flowered long-peduncled cymes: calyx campanulate: 6-10 lines long, in fruit 4-8 lines in diameter, strongly 10-nerved, the intervening spaces scarious, the short triangular teeth scarious margined: petals white or pale pink 2-lobed reticulate veined, the blade half as long as the calyx, the claw conspicuously auricled, the prominent scales oblong, shallowly 2-lobed: capsule ovoid, 5-6 lines long on a stout stipe half as long: seeds dark brown with a prominent pectinate border. On cliffs and rocky banks along the lower Columbia and Willamette rivers.

**S. monantha** Watson l. c. x, 340. Glabrous: stems very weak, elongated, ascending, branched: leaves narrowly oblanceolate  $1\frac{1}{2}$ -3 inches long, acuminate, shortly ciliate at base: flowers terminal on elongated peduncles, not reflexed: calyx 6 lines long, slightly puberulent: petals 9 lines long, the naked claw very narrowly auricled, limb bifid with broad rounded lobes: scales lanceolate entire, half as long as the limb: filaments naked; style short: ovary oblong, rather long-stipitate. Collected by Kellogg & Harford near the headwaters of the Columbia: not since found.

**S. Macounii** Watson l. c. xxvi, 124. Stems very slender from a slender branching rootstock a foot high, minutely pubescent, glandular above: leaves linear-oblanceolate, 3 inches long or less: flowers few, on pedicels 6-12 lines long: calyx inflated, oblong-campanulate, 4-5 lines long, with short obtuse teeth: petals little exerted, with a broadly auricled glabrous claw and large thin quadrate and nearly entire appendages the flabelliform bifid blade with a linear tooth on each side: capsule equalling the calyx, oblong-ovate, on a stipe  $1\frac{1}{2}$  lines long. Washington to Brit. Columbia.

**S. multica** numerous, erect: flowers acute: calyx slightly inflated with a stipe and Idaho.

**S. scaposa** somewhat viscid: high, rather rigid: flowers somewhat glaucous: calyx to 1-2 pairs of small erect: calyx petals white: seeds with somewhat stipited. Blue

thyrses: style

**S. Scouleri** especially above: large roots, 1-4 feet high: flowers crowded: calyx bifid, the lobes obovate as well as longer than the lobes.

**S. Spauldingii** stout, a foot high: leaves lanceolate to oblanceolate: strict, racemose: calyx 6 lines long; petals 4 lines long: limb very short: lanceolate scales: capsule shortly stipitate.

2 LY

Erect herb or clavate, 5-6 feet high: leaves entire: blade entire: flowers rarely 4, alternate: Ovary 1-celled: Capsule dehiscent: Seeds lateral.

**L. Drummondii** above: stems simple: two high: leaves on stout strictly oblong-ovate, 5 lines long: slightly exerted: more than the auricled: Oregon to Colorado.

**L. Coronaria** throughout: stems with filiform, light crimson.

**S. multicaule** Nutt. T. & G. Fl. i, 192. Grayish tomentulose: stems numerous, erect, rigid, about a foot high: leaves linear-oblancoelate: rather acute: flowers in threes, few, on shortish peduncles: calyx ovate-cylindrical, slightly inflated with obtuse teeth: petals bifid: seeds brown, margined with a scaly crest. Eastern Oregon and Washington to Montana and Idaho.

**S. scaposa** Robinson Proc. Am. Acad. xxviii, 145. Finely puberulent, somewhat viscid above: stems erect, subsimple almost naked 12-18 inches high, rather rigid: radical leaves thickish, oblanceolate, acute, 3-nerved, somewhat glaucous 2-3 inches long. 3-5 lines broad, cauline leaves reduced to 1-2 pairs of distant bracts: inflorescence a narrow rigid panicle: flowers small erect: calyx oblong or elliptical in outline, with simple green nerves: petals white scarcely exceeding the calyx; the blade short, retuse, the claw with somewhat saccate auricles: appendages short, obtuse: ovary shortly stiped. Blue Mountains of Oregon, *Neivius*; Cold Camp, Oregon, *Howell*.

+ + + + + Inflorescence subspicate or forming an elongated thyrses: styles included or moderately exserted.

**S. Scouleri** Hook. Fl. i, 88. More or less pubescent and glandular, especially above: stems stout, erect, few or solitary from deep perpendicular roots, 1-4 feet high, leaves oblanceolate 2-6 inches long: flowers somewhat crowded in the axils of the bracts: calyx oblong clavate: petals bifid, the lobes oblong emarginate; the claws with acute auricles woolly-ciliate as well as the filaments; scales obtuse; capsule ovate-oblong 3-4 times longer than the stipe. Oregon and Washington, east to the Rocky Mountains.

**S. Spauldingii** Watson l. c. x, 344. Viscidly tomentose: stems erect, stout, a foot high or more, simple or branched, very leafy: leaves lanceolate to oblong-lanceolate, 1-2 inches long, acutish; flowers in a short-strict, racemose panicle, nodding or erect: calyx oblong-cylindric, 7-8 lines long; petals scarcely exserted, the broad auricled claw naked, the limb very short and triangular, notched at the apex and with four small lanceolate scales at the base; filaments and style included: ovary oblong, shortly stipitate. Eastern Oregon and Idaho.

2 LYCHNIS Tourn. Inst. i, 333 t. 175, L. Gen. n. 584.

Erect herbs with the aspect of *Silene*. Calyx ovoid, obovate, or clavate, 5-toothed, 10-nerved, usually inflated, its teeth short and not foliaceous. Petals with or without appendages; the blade entire or variously lobed or cleft. Stamens 10. Styles 5, rarely 4, alternating with the petals when of the same number. Ovary 1-celled or divided at the base into 4 or 5 partial cells. Capsule dehiscent by as many or twice as many teeth as styles. Seeds laterally attached: embryo curved.

**L. Drummondii** Watson Bot. King 37. Finely glandular pubescent above: stems several from thick rootstock, strict and rather stout a foot or two high: leaves narrowly oblanceolate 2-3 inches long, erect: flowers few, on stout strictly erect often elongated pedicels: calyx cylindrical becoming oblong-ovate, 5-6 lines long, with short acutish teeth: petals rarely slightly exserted, white or purple, the narrow emarginate blade narrower than the auricled claw, scales minute, capsule nearly sessile. Eastern Oregon to Colorado.

**L. CORONARIA** Desr. in Lam. Dict. iii, 643. Densely woolly-tomentose throughout: stems 1-3 feet high: leaves oval or oblong: calyx ovoid, its teeth filiform, twisted, the alternating ribs more prominent: petals large, light crimson. Escaped from gardens, in several places from Seattle

Washington to California.

4 AGROSTEMMA L. Gen. n. 379.

Erect annuals or biennials with linear leaves and showy, usually red, flowers. Calyx ovoid; with 10 strong ribs, its lobes conspicuously prolonged into foliaceous appendages. Petals 5, unappendaged. Stamens 10. Styles 5, opposite the petals. Capsule 1-celled. Seeds laterally attached: embryo curved.

A. GITHAGO L. Sp. 435. *Lychnis Githago Scop.* Hirsute annual: stems 1-6 feet high, dichotomously branched: leaves linear: flowers on long peduncles: calyx cylindrical campanulate, with very long teeth, coriaceous: petals large, purple, the blade obcordate; scales none, capsule sessile. Cultivated fields.

Tribe II. *Alsineæ DC.* Sepals free or slightly united at the very base. Petals more or less contracted at base, but not unguiculate, unappendaged, inserted on the outside of the hypogynous or more or less perigynous disk. Flowers mostly small; styles distinct to the base. Ovary sessile.

\* *Stipules none: petals entire or 2-lobed.*

5 CERASTIUM L. Gen. n. 585.

Low herbs with white flowers in terminal bracteate dichotomous cymes. Sepals 5, not carinate. Petals 5, emarginate orbifid. Stamens 10. Styles 5, rarely 3 or 4. Capsule cylindrical or cylindrical-conic, often incurved, 1-celled, many-seeded, dehiscent by twice as many teeth as styles. Seeds subreniform-globose, usually granulate.

\* Viscid pubescent annuals.

C. longipedunculatum Muhl. Cat. 46 *C. nutans Raf. Prec. Dec. 36.* Erect, usually branching from the base, 4-10 inches high: leaves narrowly oblong or linear-lanceolate, acute, clasping  $\frac{1}{2}$ -1 $\frac{1}{2}$  inches long: cymes often many-flowered; pedicels often nodding or deflexed in fruit; calyx  $1\frac{1}{2}$ -2 lines long, the petals slightly longer: capsule 4-6 lines long curved. Sandy river bottoms, eastern Oregon to the Atlantic.

C. viscosum L. Sp. 437. Suberect, 3-12 inches high, dichotomously branched above, leaves ovate or obovate or oblong-ovate 6-12 lines long: flowers in close clusters on very short pedicels: sepals 4, lanceolate, acuminate, with narrow scarious margins  $1\frac{1}{2}$ -2 lines long: petals notched with rounded lobes, about equalling the sepals: capsule narrow, at length much exserted. Throughout temperate North America in cultivated fields, etc.

\*\* Perennials.

C. vulgatum L. Sp. ed. 2, 327. Prostrate and rooting at the nodes or suberect, 4-12 inches high; pubescent with spreading hairs: leaves spatulate or oblanceolate to broadly lanceolate, 6-15 lines long: flowers in clusters at the ends of the branches, on slender pedicels 1-2 lines long: sepals lanceolate acute with scarious tips, 2-8 lines long: petals oblong 2-toothed, about equalling the sepals. Common everywhere, introduced from Europe.

C. pilosum Ledeb. Mem. Acad. Petr. v, 539 (?). Erect, rather stout, more or less densely pilose, glandular-pubescent above, leaves oblong-lanceolate 6-12 lines long, 1-6 lines broad, acute, almost sheathing at base: flowers large, few: calyx 3-4 lines long, the petals half longer: capsule 6-10 lines long, the slender teeth at length circinate. Alaska and Siberia to

California.

C. arvense L. pubescent: stems erect: bracts small: calyx or more long: cymes

Var. angustifolium L. pubescent, hoary or glaucous: bracts small: calyx or more long: cymes

C. alpinum L. pubescent and matted: bracts small: calyx or more long: cymes scarious-matted: calyx. Wyo.

Low spreading in places, with many small white flowers, somewhat unisexual, ways more or less on base, thus appearing abortion 3-8, sepals. Capsule from the middle with 5 seeds numerous

§ 1 Myosotis ternate with the

A. AQUATICUM L. glanded and somewhat acute, the upper viscid deflexed glandular-pubescent: numerous dark-colored, perhaps Wyo.

§ Petals deflexed narrow.

A. medium L. pubescent or nearly marked by a pubescence on hairy petioles deflexed in fruit than the pubescent long, equalling the sepals and cultivated garden

A. nitens Griseb. 185. Smooth or slightly high erect or spreading: leaves large: bracts small: anthers

California.

**C. arvense** L. Sp. 438. More or less pubescent with reflexed hairs: cespitose: stems erect, rather slender, 3-16 inches high: leaves linear or linear-lanceolate 6-18 lines long, acute, clasping, those of the stem distant: bracts small: cyme few-flowered, usually narrow: pedicels half to an inch or more long: calyx 2-3 lines long, lanceolate,

**Var. angustifolium** Fenzl in Ledeb. Fl. Ross. i, 413 (?) Stems pubescent, hoary or glandular: leaves elongated, linear or narrowly linear-lanceolate, attenuate at base; those of the stem approximate: lobes of the petals oblong-ovate. Oregon.

**C. alpinum** L. Sp. 438. Densely silky-hirsute: stems weak, decumbent and matted: leaves elliptic-ovate, 4-6 lines long: flowers few, on more or less elongated pedicels; petals bifid, twice the length of the rather obtuse scarious-margined and hairy sepals: capsule nearly twice as long as the calyx. Wyoming to Alaska, perhaps in Idaho.

6 ALSINE L. (not Wahl. Fl. Lap. 127.)

Low spreading herbs, usually preferring shaded or moist places, with mostly 4-angled stems, flat, rarely acerose; leaves and small white flowers in cymes or solitary. Sepals 5, rarely 4, somewhat united at base. Petals as many, rarely wanting, always more or less deeply 2-cleft, often divided almost to the base, thus appearing as 10, often perigynous. Stamens 10, or by abortion 3-8, styles 3, sometimes 2, 4 or 5, opposite to as many sepals. Capsule globose to oblong, 1-celled, dehiscent to below the middle with twice as many membranous valves as styles. Seeds numerous, reniform-globose or laterally compressed.

§ 1 MYOSOTON Monch Method. 225, (as genus). Styles 5, alternate with the sepals. Leaves ovate, acute.

**A. AQUATICA.** *Stellaria aquatica* Scop. Perennial: stems strongly angled and somewhat pubescent: leaves large ovate or ovate-lanceolate, acute, the upper sessile, cordate; the lower petiolate: pedicels glandular-viscid deflexed in fruit: petals  $1\frac{1}{2}$ -2 times as long as the campanulate glandular-pubescent calyx: styles 5, alternate with the sepals: seeds numerous dark-colored tuberculately roughened. At Nanaimo, Brit. Columbia, perhaps Washington; introduced from Europe.

§ 2 EUSTELLARIA Fenzl. Styles 3 or 4.

\* Petals deeply 2-parted, sometimes minute or wanting: segments narrow.

+ I never leaves contracted to slender petioles.

**A. media** L. Sp. i. 272. *Stellaria media* Cyr. Char. Comm. 36. Glabrous or nearly so: stems weak and spreading, rooting at the lower joints, marked by a pubescent line: leaves ovate to oblong-ovate, 3-9 lines long on hairy petioles or the uppermost sessile: pedicels slender, 4-6 lines long, deflexed in fruit: bracts foliaceous: petals oblong, deeply divided, shorter than the pubescent sepals: stamens 3-10: capsule oblong-ovate 2-3 lines long, equalling or exceeding the calyx. A common weed in shady places and cultivated grounds. Said to be introduced from Europe.

**A. nitens** Greene Bot. Bay. Reg. 33. *Stellaria nitens* Nutt. T. & G. Fl. i. 185. Smooth and shining, often hairy at base: stems slender, 3-8 inches high erect or spreading, dichotomously branched with the flowers in the forks: leaves lanceolate, 3-6 lines long, acute, the lower shortly petiolate: bracts small and scarious: pedicels not deflexed in fruit: petals narrow,



acuminate, 3-nerved, 2 lines long, twice longer than the deeply lobed petals which are sometimes wanting: capsule oblong, shorter than the sepals. Common in moist open places, Washington to California, east to Utah.

+ + Leaves all sessile or subsessile, sometimes narrow but not acroese.

+ + Bracts small and scarious.

= Flowers small: petals minute or none.

**A. baicalensis** Coville Contr. Nat. Herb. iv, 70. *Stellaria umbellata* Turcz. Glabrous, stems very slender, ascending from slender rootstock which are clothed with orbicular scale-like, colorless bracts: leaves spreading, elliptical or oblong-lanceolate, acute at each end, 4-8 lines long: flowers in a simple or compound open umbel-like few-rayed cyme: pedicels elongated: sepals ovate-lanceolate, 1-nerved, 1-2½ lines long: petals none: mature capsule twice longer than the calyx. Rocky Mountains to Union county, Oregon, *Cusick*.

= Flowers of medium size: petals equalling or exceeding the calyx.

a Seeds essentially smooth.

**A. longifolia** Britton Mem. Torr. Club v. 150. *Stellaria longifolia* Muhl. Stems sharply 4-angled, commonly 8 inches or more in height: leaves linear or linear-oblong, somewhat narrowed at each end, thickish, often acute toward the base; the larger ones 1-2 inches long: flowers rather numerous in a lateral long-peduncled open cyme; pedicels spreading, horizontal or deflexed: petals and capsule exceeding the sepals: seeds smooth. Idaho to Canada and Maryland. (Europe and Asia).

**A. longipes** Coville Contr. Nat. Herb. iv, 70. *Stellaria longipes* Gold. Smooth and shining or glaucous, erect or ascending, 2-18 inches high: leaves linear to linear-lanceolate, 6-12 lines long, 1-1½ lines wide acute, rather rigid and usually ascending: flowers few, on long slender pedicels: sepals scarcely nerved 1½-2½ lines long: petals about equalling the calyx: mature capsule longer than the calyx. About springs of eastern Washington to California, east to the Atlantic.

b Seeds distinctly rugose-roughened under a lens.

**A. GRAMINEA** L. Sp. 422. Stems ascending, smooth and shining 1-2½ inches high, sharply 4-angled; internodes usually elongated: leaves sessile, lanceolate or linear-lanceolate, thickish, attenuate, furrowed above and with midrib prominent beneath, inflorescence a broad terminal peduncled cyme, often with one or two smaller cymes at its base; pedicels elongated, spreading or deflexed: capsule exceeding the calyx: seeds rugose, roughened. Introduced from Europe.

**A. uliginosa** Britton l. c. *Stellaria uliginosa* Murr. Low, weak, diffuse: stems numerous, leafy: leaves lanceolate or elliptical-lanceolate, 6-8 lines long: seeds rugose roughened. Mount Rainier, *Piper*, to the Eastern States.

+ + Bracts more or less foliaceous.

**A. brachypetala**. *Stellaria brachypetala* Bong. *S. alpestris* Fries *S. collina* Fenzl. Glabrous: stems weak and slender, usually erect, 6 inches high dichotomously branched above: leaves lanceolate, attenuate the middle cauline the largest, 1-2 inches long, 1-nerved: pedicels in the forks of the dichotomous branches, slender, spreading, 8-12 lines long: sepals lanceolate, acute, scarious margined about a line long: petals shorter than the sepals, 2-parted, the segments lanceolate, acute: capsule oblong-ovoid exceeding the sepals, seeds smooth. In wet places, Oregon to Alaska and the Eastern States.

+ + Bracts foliaceous.

**A. borca**  
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**A. humif**  
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petals somewi

**A. crispa**  
& *Schlecht*. C  
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lines long, 3-n  
lobes: capsule

**A. obtusa**.  
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Colorado.

**A. Simcoe**  
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Simcoe Moun

\* \* Petal  
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**A. Jamesi**  
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or reniform



**A. borealis** Britton Mem. Torr. Club v, 149. *Stellaria borealis* Bigel. Glabrous: stems usually weak, erect or spreading, branching  $\frac{1}{2}$ -2 feet high: leaves linear-lanceolate to ovate-oblong,  $\frac{1}{2}$ -2 inches long, 1-5 lines wide, acute, flowers in dichotomous cymes: sepals ovate to lanceolate, a line long or more: petals 2-parted, shorter than the calyx, 2-5 or wanting: capsule ovate  $1\frac{1}{2}$ -2 lines long, on spreading or deflexed peduncles: seeds smooth. Along streams, Oregon, etc., to the Atlantic.

**A. humifusa.** *Stellaria humifusa* Roth. Low, densely matted, smooth: stems prostrate or ascending, angulate, shining: leaves elliptic-ovate or oblong, acutish, 2-5 lines long, marcescent: bracts foliaceous: peduncles axillary, 4-7 lines long: sepals ovate-oblong acute, narrowly margined, petals somewhat exceeding the calyx: seeds smooth.

**A. crispata** Holzinger Contr. Nat. Herb. iii, 116. *Stellaria crispata* Cham. & Schlecht. Glabrous: stems very slender, weak and decumbent, 6-12 inches long, simple or sparingly branched: leaves thin, ovate to oblong-ovate, acuminate, commonly crisp on the edges, 4-6 lines long: pedicels solitary, 3-10 lines long: sepals scarious-margined, lanceolate, acute,  $1\frac{1}{2}$ -2 lines long, 3-nerved: petals when present, deeply cleft, with linear acute lobes: capsule acute, longer than the calyx.

**A. obtusa.** *Stellaria obtusa* Engelm. Bot. Gaz. vii, 5. Smooth: stems weak, nearly simple, 2-6 inches long: leaves thin, ovate to broadly lanceolate, acute, 3-10 lines long: flowers solitary, appearing axillary: sepals ovate obtuse, hardly at all scarious on the margins: petals none: capsule  $1\frac{1}{4}$ - $1\frac{1}{2}$  times as long as the calyx, obtuse: seed brown, covered with minute lighter colored oblong tubercles with fringed edges. In wet places on mountains, Blue Mountains, Oregon to British Columbia and Colorado.

**A. Simcoe.** Pubescent throughout with spreading hairs: densely caespitose: stems filiform erect, simple or sparingly branched, 4-8 inches high: leaves oblong to elliptical, acute, 4-6 lines long, 1-nerved: pedicels solitary, filiform, 10-12 lines long: sepals oblong, acutish, broadly margined, less than a line long: petals 2-parted; segments oblong, about half as long as the calyx: capsule and seeds not seen. In springs on top of the Simcoe Mountains, Washington.

\* \* Petals retuse or shortly bifid, divided but  $\frac{1}{4}$ - $\frac{1}{2}$  the way to the base, commonly considerably exceeding the calyx.

**A. Jamesii** Holzinger l. c. *Stellaria Jamesii* Torr. Viscid above: stems strongly angled, rather stout and ascending, branched, 1-2 feet high: leaves linear to ovate-lanceolate, attenuate, 1-3 inches long, 2-9 lines wide, acuminate, dark green: pedicels spreading, rather short, at length deflexed: sepals oblong, acute, 2-3 lines long, the bifid petals mostly twice longer: capsule ovate shorter than the calyx: seeds smooth. Woodlands and creek bottoms, northern California to Washington, Colorado, New Mexico and Arizona.

#### 7 ARENARIA L. Gen. n. 569.

Mostly low, often tufted annual or perennial herbs with sessile subulate and more or less rigid leaves without stipules and small white flowers in paniculate or capitate cymes in spring and summer. Sepals 5, rarely 4. Petals as many as sepals, rarely wanting, entire or emarginate. Stamens twice as many as petals. Styles 3, rarely 2, 4 or 5, opposite as many sepals. Capsule globose or short-oblong, dehiscent into as many 2-cleft valves as styles, few to many-seeded. Seeds laterally compressed or reniform-globose.

§ 1 MÆHRINGIA Fenzl. in Endl. Gen. 968. Seeds at least when young provided with a spongy appendage at the hilum.

**A. lateriflora** L. Sp. 423. Minutely pubescent: stems erect, slender 4-12 inches high, simple or branched: leaves oblong or oval obtuse, 3-4 lines long, punctate, hairy on the margin and midrib: peduncles lateral and terminal, 2-flowered, one of the pedicels bibracteolate near the middle: sepals oblong-ovate obtuse,  $1\frac{1}{2}$  lines long: petals oblong, obtuse twice longer than the sepals. In damp shady places, western Oregon to the Atlantic Coast.

**A. macrophylla** Hook. Fl. i, 102 t. 37. Stems ascending 3-8 inches high, mostly simple, leafy, puberulent above: leaves 3-4 pairs, narrowly lanceolate, acute at each end, 1-2 inches long, thin, bright green, the upper largest: flowers few on slender pedicels; sepals ovate-oblong, acuminate,  $1\frac{1}{2}$ - $2\frac{1}{2}$  lines long, 1-nerved: petals obovate, longer or shorter than the sepals: capsule ovoid, nearly equalling the calyx: seeds rather large, smooth. Open forests, Brit. Columbia to California, east to the Rocky Mountains.

§ 2 AMMADENIA B. & H. Gen. i, 151. Flowers axillary. Sepals united at base; styles 3-5: ovary more or less 3-5 celled, disk conspicuous 10-lobed and glanduliferous: capsule globose, somewhat baccate. Seeds not appendaged.

**A. peploides** L. Sp. 423. Glabrous perennial: stems 6-8 inches high, stout, angled: leaves thick, ovate or obovate 1-nerved, shortly pointed, clasping at the broad base: sepals ovate-lanceolate, acuminate,  $3\frac{1}{2}$  lines long, about equalling the petals. Sandy seashore from the Columbia river northwards and on the northern Atlantic Coast, (northern Europe and Asia).

**A. Sitchensis** Dietr. Syn. Pl. ii, 1565. *A. peploides* var. *major*. Hook. l. c. 102. Glabrous and succulent: 6-12 inches high from thick creeping rootstocks: leaves oblong to short-spatulate, obtuse or acute, short-apiculate, fleshy, with narrow, scarious, crenulate margins: flowers axillary, on short peduncles: lobes of the calyx lanceolate-ovate, acute about a line long: petals oblong, narrowed below to a short claw about half as long as the lobes of the calyx, sometimes wanting. Salt marshes, coast of Oregon to Alaska.

§ 3 MERCKIA B. & H. Gen. i, 151. Styles 3-5. Ovary 3-5-celled: capsule large, depressed-globose, somewhat inflated: many-seeded, seeds not appendaged.

**A. physodes** Fisch. in DC. Prod. i, 413. Cespitose perennial: stems weak, decumbent, 3-6 inches long: leaves ovate, cuspidately pointed 4-6 lines long: flowers solitary at the summit of the stem or becoming lateral: sepals lance-oblong, acute, 3 lines long equalling or slightly exceeding the petals: capsule 4 lines in diameter. Brit. Columbia to northern Alaska, perhaps northern Washington.

§ 4 EUARENARIA Robinson l. c. 219. Styles normally 3, capsule ovoid, dehiscent by 3 2-toothed or parted valves: seeds not appendaged.

\* Leaves ovate elliptic or linear, not acerose.

**A. SERPYLLIFOLIA** L. Sp. 423. Diffuse, 3-10 inches high, retrorsely pubescent: leaves ovate, acute, minutely ciliate: sepals lanceolate, acuminate hairy 3-5 nerved, nearly twice the length of the petals: capsule ovate, as long as the sepals. Fields and roadsides, western Oregon and Washington, also in the Atlantic States.

VAR. TENUIOR Koch. Synop. 117. More delicate, leaves reduced: flowers

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+ Sepals  
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**A. formos**  
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**A. aculeat**  
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petals.

**A. congest**  
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**A. Burkel**  
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**A. Fendler**  
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\* \* \* Fl

**A. Frankli**  
branches erect,  
very pungent,

smaller, in a nearly naked racemose panicle, capsule more oblong. Portland, Oregon and vicinity, (Europe).

\* \* Leaves very narrowly linear commonly acerose, often rigid and pungent.

+ Sepals broadly ovate obtusish, sometimes apiculate: flowers not densely aggregate.

*A. capillaris* Poir. in Lam. Encycl. vi. 380. Leaves chiefly grouped at the base in fascicles upon a multicapital caudex,  $\frac{1}{2}$ - $2\frac{1}{2}$  inches long, somewhat pungent, little spreading; the cauline few pairs, much reduced: stems 4-8 inches in height: petals obovate, considerably exceeding the short obtuse sepals. Idaho to the Rocky Mountains.

*A. formosa* Fisch. in DC. Prodr. i. 402. More or less glandular-pubescent above, erect, 2-12 inches high: leaves linear subulate, half to two inches long, pungent: the cauline few, short and erect: flowers few in the open cyme; bracts small, lanceolate: sepals ovate, acute, 1-2 lines long: inner-veined, membranously margined: petals half longer: capsule somewhat exceeding the calyx. In the higher mountains from British Columbia to California.

*A. aculeata* Watson Bot. King 40. Leaves fasciated and stems of numerous barren shoots, glaucous, rigid, subulate and stems nearly naked, somewhat scabrous above: flowers few, long slender erect pedicels: sepals ovate acute: capsule becoming twice longer than the calyx, splitting into 3 2-toothed valves: seeds smooth. High hills, south-east Oregon to Nevada.

+ + Sepals ovate or ovate-lanceolate acuminate, shorter than the petals.

*A. congesta* T. & G. Fl. i. 178. Smooth, glaucous, 4-12 inches high: leaves very narrowly subulate, scabrous on the margin, often pungent, the lower 1-3 inches long; cauline 6-12 lines long: flowers in 1-3 dense subumbellate fascicles, with large dilated membranaceous bracts: sepals ovate-oblong, strongly concave with scarious margins, 1-3 lines long, acute: petals narrowly oblong, nearly twice as long as the calyx: capsule equalling the calyx. In the mountains from Washington to California, Nevada and Colorado.

+ + + Sepals lanceolate to lance-linear attenuate, equalling or exceeding the petals.

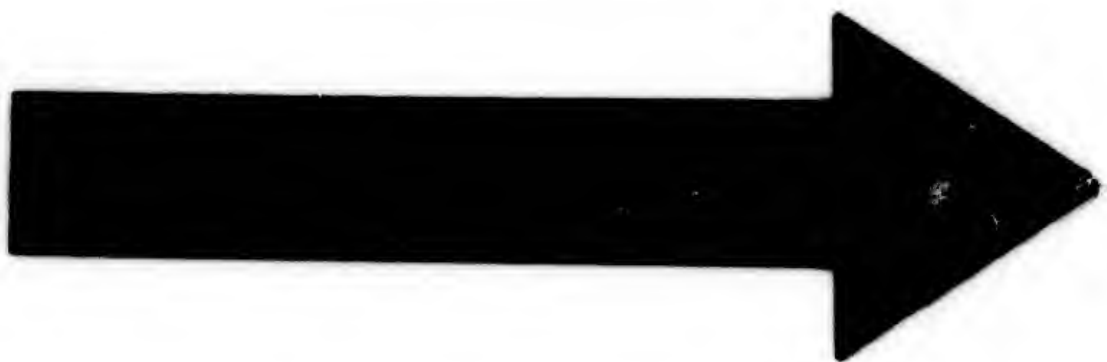
+ + Flowers cymose, not densely aggregated.

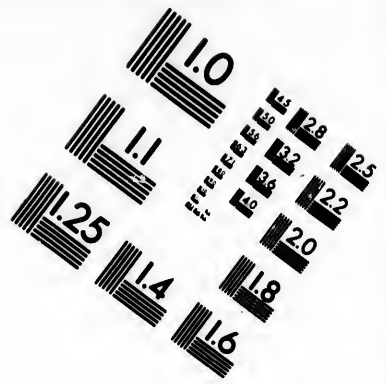
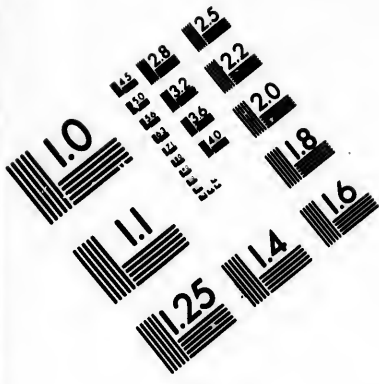
*A. Burkel.* *A. Fendleri* var. *subcongesta* Watson Bot. King 40. Stems several from a more or less ligneous caudex, smooth or glandular, 4-6 inches high, many-leaved at base: leaves setaceous, somewhat flattened, glabrous: flowers more or less clustered upon short pedicels or the lateral ones sessile: bracts broad and scarious: petals but little exceeding the ovate acuminate scarious sepals. On bleak hilltops, eastern Oregon and Nevada to Brit. Columbia and the Rocky Mountains.

*A. Fendleri* Gray Pl. Fendl. 13. Stems simple, 6-15 inches high glabrous below, more or less glandular-pubescent above, imbricately many-leaved at base, leaves long, erect setaceous somewhat flattened scarious-serulate glabrous: cym: strict, few-flowered: pedicels slender: sepals glandular pubescent, ovate-lanceolate, cuspidate-acuminate, green with a broad scarious margin, nearly equalling the white obovate petals: capsule about equalling the calyx. New Mexico, etc., to eastern Oregon.

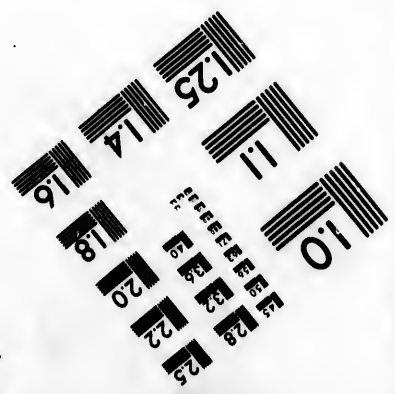
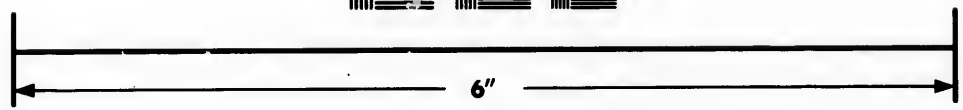
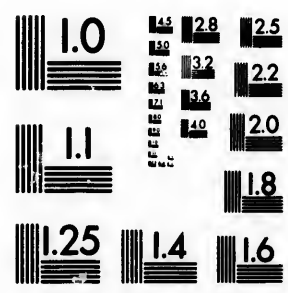
+ + + Flowers densely fasciated at the end of the stem.

*A. Franklinii* Dougl. in Hook. Fl. i. 101 t. 35. A span or less in height: branches erect, fastigiate, numerous fragile: leaves smooth subulate-setaceous, very pungent, an inch long: flowers fasciated: sepals subulate scarious,





**IMAGE EVALUATION  
TEST TARGET (MT-3)**



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broadly 1-nerved, about equalling the oblong obtuse petals: flowers on short pedicels in dense fascicles, crowded with bracts similar to the leaves. On sandy banks along the Columbia river.

§ 5. *ALSINE* Wahl. (as genus, not Linn.). Capsule ovoid, 3-valved; valves entire; seeds not strophiolate: matted perennials or delicate annuals, usually with narrow linear subulate or acerose leaves.

\* Palustrine perennial with weak elongated stems, narrow linear or lance-linear leaves and axillary long-peduncled flowers.

*A. paludicola* Robinson l. c. 208. Glabrous, flaccid: stems several, subsimple, procumbent, rooting at the lower joint, sulcate, shining, leafy throughout: leaves uniform, flat, 1-nerved, acute, spreading,  $\frac{3}{4}$ -1 $\frac{1}{2}$  inches long, 1-3 lines in breadth, often punctate, somewhat connate, slightly scabrous upon the margins: peduncles solitary in the axils, 1-2 inches long, spreading or somewhat deflexed: sepals nerveless not at all indurated, acutish, about half the length of the obovate petals. In swamps along the Coast, San Francisco to Seattle, Washington.

\*\* Terrestrial annuals: sepals neither indurated nor very strongly nerved.

= Seeds much flattened, and margined.

*A. Douglasii* T. & G. Fl. i, 674. Sparingly pubescent with spreading hairs or glabrous, slender, much branched, 3-10 inches high: leaves filiform, half to an inch or more long: flowers rather large on long filiform pedicels: sepals oblong-ovate obtusish or acute, obscurely 3-nerved,  $1\frac{1}{2}$  lines long: petals obovate, 2-2 $\frac{1}{2}$  lines long: capsule globose, equalling the calyx: seeds large, flat, smooth, acutely margined. Dry hillsides, southwestern Oregon and California.

+ + Seeds not flattened nor winged.

*A. Howellii* Watson Proc. Am. Acad. xx, 354. Glandular hispid but the internodes usually glabrous: widely branching, 6-12 inches high: leaves thick, narrowly lanceolate or linear, with base 6-9 lines long, blunt, spreading: flowers small on slender pedicels: sepals a line long, nerveless: petals twice longer, narrowly oblong: capsule ovate, a little exceeding the sepals: seeds black, turgid, with several rows of minute tubercles along the rounded margins. On dry foothills, eastern base of the Coast Mountains in Josephine county, Oregon.

*A. Californica* Brewer in Bol. Cat. 6, Brew. & Wats. Bot. Cal. i, 69. Glabrous, very slender, 2-6 inches high: leaves lanceolate, 1-2 lines long, obtusish: flowers small on slender pedicels: sepals oblong-ovate, acute, 3-nerved, 1-2 lines long: petals spatulate, 2-3 lines long: capsule oblong: seeds small, sharply muriculate. Moist places, southwestern Oregon and California.

*A. pusilla* Watson l. c. xvii, 367. Very slender, an inch or two high: glabrous: leaves lanceolate, thick and bluntish, a line or two long: sepals lanceolate, acute, obscurely 1-nerved: petals very small or wanting: capsule oblong-ovate, not exceeding the sepals: seeds turgid and smooth. Near The Dalles, eastern Oregon and Washington, in dry prairies: also on the plains about Yreka, northern California.

\*\* Annuals or loosely matted perennials: sepals lanceolate, acuminate or attenuate, strongly 3-5 nerved.

*A. tenella* Nutt. T. & G. Fl. i, 179. Slender, 2-4 inches high, smooth: leaves filiform-subulate, acute: peduncles minutely glandular: sepals ovate lanceolate, acute, 3-nerved  $1\frac{1}{2}$  lines long: petals oblong, 2-2 $\frac{1}{2}$  lines long

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capsule but little longer than the sepals: seeds turgid minutely rugose tuberculate. On rocks, Columbia river below the Cascades.

**A. stricta** Michx. Fl. i, 274. Diffusely caespitose, glabrous, branching from the base: stems 3-15 inches high: leaves subulate-setaceous, 1-3-nerved, many, fascicled in the axils: petals oblong-obovate twice the length of the ligid, ovate, very acute 3-ribbed sepals: capsule about as long as the calyx. On rocks and sandy ridges, Columbia river below the Cascades: also on the Atlantic coast.

\*\*\* Closely tufted perennials: sepals acuminate but not strongly nerved, except in *A. propinqua*.

**A. propinqua** Richardson in Franklin Journ. 738. *A. verna* var. *hirta* Watson Bot. King 41. Closely tufted: stems, peduncles and calyx finely glandular-pubescent: leaves nearly or quite smooth: stems tufted, numerous, slender, ascending or erect, 1-5 inches high, 1-several-flowered; leaves linear-subulate, flat, obtuse, 3-nerved, usually erect, not squarrose: peduncles filiform: sepals ovate-oblong, acutish to acuminate, 1½-2 lines long exceeding the obovate or oblanceolate petals: capsule surpassing the sepals, on the highest mountains, Oregon to Alaska and the Rocky Mountains.

**A. Nuttallii** Pax in Engler, Jahresh. xviii. 30. *A. pungens* Nutt in T. & G. Fl. i, 179 (not of Clem.). Pubescent throughout: extensively caespitose stems numerous 2-4 inches high. leaves linear-subulate, half to two inches long, pungent, crowded: flowers in an open cyme, leafy bracted: sepals lanceolate, acuminate, pungent 1-3 lines long 3-nerved: petals about equalling the calyx: the capsule shorter: seeds very few, smooth. In mountainous districts, California and Nevada to Oregon and Colorado.

\*\*\*\* Densely caespitose perennials with acicular or subulate leaves and oblong or linear-oblong, very obtuse sepals.

+ Petals oblong or narrowly obovate.

**A. Sajanensis** Willd. in Schlecht. Berl. Mag. Natf. (1816) 200. Glabrous, or the inflorescence glandular: stems simple, usually 1-flowered: leaves linear subulate, obtuse thickish, 3-nerved: petals obtuse, about half longer than the oblong sepals. Alpine, Mounts Hood, and Adams to the Rocky Mountains and Alaska.

+ + Petals broadly obovate, much exceeding the calyx.

**A. arctica** Stev. in D. C. Prodr. i. 404. Stems 1-3 inches high, often scarcely exceeding the leaves: leaves linear-subulate, obtuse fleshy, minutely filiate; peduncles glandular-pubescent 1-rarely 2 or 3 flowered; petals about twice longer than the very obtuse 1-nerved sepals. Arctic Coast, perhaps in our northern border.

3 ALSINELLA Dill.

*SAGINA* L. Gen. n. 176.

Low herbs with subulate or filiform leaves without stipules, and small terminal usually long-peduncled flowers. Sepals 4-5, petals as many as sepals, entire or slightly emarginate, often minute or wanting. Stamens as many as petals, rarely twice as many or fewer. Ovary 1-celled, many-ovuled. Styles as many as sepals and alternate with them. Capsule dehiscent to the base by as many entire valves as sepals and alternate with them.

**A. occidentalis** Greene Fl. Francis. 125. *Sagina occidentalis* Watson. Annual: glabrous or nearly so: diffusely branched from the base: stems very tender, 1-6 inches long, decumbent at base or ascending: well developed,

several-flowered: the lowest flowers distinctly axillary: leaves not fasciated, 3-6 lines long, pungent flowers 5-merous on long pedicels that are erect in fruit: sepals a line long: petals nearly as long: stamens 10: capsule exceeding the calyx. Moist places and along the Coast, California to Alaska.

**A. saginoides** Greene l. c. *Sagina Linnæi* Presl. Biennial or perennial, glabrous, densely matted and decumbent, 1-3 inches long, rooting and often forming lateral rosettes: leaves somewhat fasciated, 3-7 lines long, pungent: flowers on long pedicels, at length nodding: sepals a line long, obtuse, exceeding the petals: stamens 10: capsule at length nearly twice longer than the calyx. In wet places on high mountains, Arctic America to California.

**A. crassicaulis** Greene l. c. *Sagina crassicaulis* Watson. Smooth perennial stems several to many, branching 1-5 inches long: leaves linear, pungent thickish, 2-7 lines long or more, the basal forming a rosette which may persist or not; the cauline connate by broad scarious membranes: pedicels numerous, straight: flowers 5-parted, petals and sepals subequal  $\frac{1}{2}$  line long: capsule  $\frac{1}{2}$ - $\frac{1}{4}$  longer. Near the sea, mouth of the Columbia river to Monterey, Cal.

#### 9 SPERGULA L. Gen. n. 586.

Dichotomously or fasciculately branched annuals with subulate fasciated or apparently whorled leaves with small scarious stipules and small white flowers on slender pedicels in dichotomous cymes. Sepals 5, entire. Stamens 10, rarely 5. Ovary 1-celled, many-ovuled; styles 5, alternate with the sepals. Capsule 5-valved, the entire valves opposite to the sepals. Seeds laterally compressed, acutely margined or winged: embryo spiral.

**S. ARVENSIS** L. Sp. 440. Smooth: stems several, a foot or two high: leaves filiform, numerous in apparent whorls, 1-2 inches long: stipules small: pedicels at length reflexed: sepals oblong to ovate 2 or 3 lines long, equalling the petals, a little shorter than the broadly ovoid capsule: seeds rough, acutely margined. Sandy fields, especially near the Coast, Washington to California; naturalized from Europe.

#### 10 TISSA Adanson Fam. des Pl. ii, 507.

Low, more or less succulent herbs, usually depressed, with setaceous or linear fasciated leaves with scarious stipules and small white or pink flowers in subracemose cymes. Sepals 5. Petals 5, rarely few or wanting. Stamens commonly 10. Styles 3, very rarely 5. Ovary 1-celled. Capsule often as many valves as styles, when 5, alternate with the sepals. Seeds often margined.

\* Perennials with fusiform fleshy roots.

**T. macrothecum** Brit. Bull. Torr. Club xvi, 129. *Lepigonum macrothecum* F. & M. Perennial, rather stout, 4-12 inches high: decumbent at base, sparingly pubescent, at least above: leaves linear, fleshy, 1-2 inches long; with large ovate stipules: flowers large, subracemose; pedicels 4-12 lines long becoming reflexed: sepals ovate-lanceolate, 3-5 nerved, more or less torulose, 3 lines long or more, equalling or exceeding the petals: capsule ovoid, about equalling the calyx. In salt marshes, Washington to Southern California.

\*\* Annuals: flowers axillary.

**T. salina** Britton l. c. 123. *Lepigonum marinum* Wahl. *spergula salina* Presl. More or less pubescent or often nearly glabrous; much

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lbranched, 8-9 inches high; leaves linear, fleshy, ½-1 inch long or more; sti-  
pules short; pedicels 1-9 lines long, reflexed: calyx 1-2 lines long; capsule a  
ittle longer than the calyx. Along the Coast, Puget Sound to California,  
and the Atlantic Coast.

\* \* \* Procumbent or decumbent winter annuals, scarcely at all  
fleshy; flowers small or of medium size; stipules conspicuous.

**T. rubra** Britton l. c. 127. *Spargularia rubra* Presl. Stems spread  
ing; wiry, 1-10 inches long, smoothish below, fine glandular-pubescent  
above; leaves flat above, narrowly linear, cuspidate 4-9 lines long 1-1  
line broad; stipules white, attenuate 2-3 lines long; inflorescence racemi-  
form; pedicels filiform, exceeding the bracts and about twice as long as the  
oblong-lanceolate scarious-margined acutish glandular-pubescent sepals:  
flowers magenta, 1¼ lines in diameter, petals scarcely equalling the calyx:  
capsule equalling the calyx: seeds minutely crested but not winged. Road-  
sides and sandy places, Washington to California and the Atlantic States  
(Europe).

\* \* \* \* Slender spreading or erect annuals scarcely fleshy; stipules  
short, deltoid.

**T. diandra** Britton l. c. 128. *Spergularia diandra* Boiss. Viscid pubescent  
to nearly glabrous; leaves not fascicled, linear-filiform; pedicels  
slender, about two lines long, spreading or deflexed: sepals in fruit 1½ lines  
long but little exceeding the capsule: stamens usually only 2 or 3. Sandy  
places from the Columbia valley to Texas.

ORDER XII. ILLECEBRACEÆ Lindl. Nat. Syst. ed. 2, 127:

Herbaceous or rarely suffrutescent branching plants with op-  
posite or fascicled entire mostly sessile leaves and scarious sti-  
pules, closely related to Amarantaceæ. Sepals 5, persistent:  
petals reduced to mere filaments alternate with the sepals or  
wanting. Stamens as many as the sepals and opposite them,  
fixed by the middle introse. Ovary 1-celled by the obliteration  
of the dissepiments. Style 2-cleft. Fruit an utricle with  
a solitary or geminate ovule borne on slender funiculi rising  
from the base of the cell. Seeds campylotropous. Embryo  
more or less curved around the outside of mealy albumen.

1. PENTACÆNA Bartling.

Low densely tufted perennial, with the subulate leaves densely  
crowded on the branches, dry and silvery stipules and axillary  
clusters of sessile flowers. Sepals 5, nearly distinct, hooded,  
unequal, terminating in a short divergent spine, the inner  
more shortly awned. Petals minute, scale-like. Stamens 3-5,  
inserted at the base of the sepals: style very short, bifid. Utricle  
included in the rigid connivent calyx.

**P. ramosissima** Hook. & Arn. Bot. Misc. iii, 338. Prostrate and mat-  
ted, 2-18 inches long, somewhat woolly: leaves 3-5 lines long, pungently  
awned, at length recurved: stipules lanceolate, acuminate, shorter than  
the leaves, 1-nerved: calyx tube a line long, the divergent outer lobes  
nearly twice longer: stamens usually 5: stigmas subsessile: utricle apiculate.  
On the seashore, Oregon to southern California.

## ORDER XIII. PORTULACACEÆ Reichb. Consp. 161.

More or less succulent herbs with simple entire leaves and regular perfect flowers. Sepals only 2 (sometimes more in *Lewisia*). Petals 5 and definite or indefinite, imbricated in aestivation. Stamens opposite the petals when of the same number or fewer; filaments all fertile, distinct; anthers fixed by the middle, versatile or introse. Ovary 1-celled by the obliteration of the dissepiments, with few or many campylotropous or amphitropous ovules on a free central placenta, in fruit becoming a capsule with transverse or loculicidal dehiscence. Embryo curved or coiled on the outside of mealy albumen. Flowers axillary or terminal, mostly ephemeral.

\* Capsule dehiscing transversely near the middle: sepals united to near the middle, and in ours adnate to the ovary, the upper portion at length deciduous.

1. *Portulaca*. Petals 4-6 perigynous: stamens 9-20.

\*\* Capsule dehiscing transversely at the very base: sepals persistent.

2. *Lewisia*. Sepals 6-8; marcescent-persistent: petals 10-16: scapes 1-flowered, jointed and bracteolate near the middle.

3. *Oreobroma*. Sepals 2: petals 3-10, usually 7; stems scape-like with a pair of (at least when young) opposite bracts below the inflorescence, 1-many-flowered.

\*\*\* Capsule loculicidally 3-valved: sepals 2, ovary several-ovuled: petals 3-several.

4. *Calandrinia*. Sepals 2, persistent: petals 3-7: stamens 3-10, seldom of the same number as the petals.

5. *Talinum*. Sepals 2, deciduous: petals 5.

\*\*\*\* Capsule loculicidally 3-valved: sepals 2, persistent: petals 5.

6. *Claytonia*. Capsule several-seeded: stamens 10, inserted on the claw of the free and equal petals.

7. *Montia*. Petals 5, more or less distinctly united at the base, unequal: stamens mostly 3, inserted on the claws of the 3 smaller petals.

\*\*\*\*\* Capsule 2-valved: sepals 2, broad, more or less scarious, persistent.

8. *Spraguea*. Sepals emarginate at base and apex: petals 4: stamens 3, exserted, opposite the 3 larger petals.

9. *Calyptroidium*. Sepals mostly unequal, petals 2-4; stamens 1, 2 or 3, shorter than the petals and alternate with them.

§ 1 *Capsule circumscissile*.

1 PORTULACA Tourn. Inst. 236.

Low succulent diffuse or ascending herbs with alternate or opposite leaves scarious or setaceous stipules and axillary or terminal ephemeral yellow or rose-color flowers in summer. Sepals 2, coherent at base into a tube and adnate to the base of the ovary, the free upper portion at length deciduous. Petals 4-6. Stamens 4-20, perigynous with the petals. Style 1, deeply 3-8-cleft. Capsule circumscissile near the middle, many-seeded.

**P. oleracea**  
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**L. rediviva**  
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**O. Leana** F  
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**O. Columbi**  
*Proc. Am. Aca*  
inches long, no  
or truncate, a  
less truncate,  
apex, 5-6 lines  
basaltic rock  
Mountains lat.

**O. Cotyledo**  
*Acad. 22, 355.*  
12 lines broad,  
12 inches high  
panicle: sepals

**P. oleracea** L. Sp. 445. Glabrous and usually purplish: stems prostrate, 2-20 inches long: leaves flat, fleshy, obovate to spatulate, rounded at the summit: stipules minute: sepals acute, carinate: petals yellow, 1-2 lines long: stamens 5: capsule 3-5 lines long: seeds dull, black, finely tuberculate: flowers sessile, axillary. Cultivated grounds and waste places throughout North America, Europe, etc.

## 2 LEWISIA Pursh. Fl. 368.

Low acaulescent succulent perennials with thick fleshy roots, short 1-flowered scapes that are joined and bracteolate near the middle, and large usually pink flowers. Sepals 6-8 distinct, marcescent-persistent. Petals 8-16, large and showy. Stamens numerous. Style 5-8 parted nearly to the base. Capsule circumscissile at the very base then bursting irregularly, many-seeded. Seeds black and shining. Cotyledons accumbent.

**L. rediviva** Pursh. l. c. Leaves densely clustered at the crown of the thick caudex, linear-oblong, subterete 1-2 inches long, smooth and glaucous: scapes but little longer than the leaves, sepals broadly ovate, unequal, partly scarious 6-9 lines long, petals narrowly oblong 9-16 lines long, pink or rose-color to white: capsule broadly ovate, 3 lines long. On top of the highest hills and mountains east of the Cascade Mountains from California to British Columbia and the Rocky Mountains.

## 3 OREOBROMA Howell Eryth. i, 31.

Low acaulescent perennials with fleshy roots with or without a multicapital caudex bearing tufted leaves and scapose stems which are jointed at the base and 2-bracteolate below the inflorescence. Sepals 2, rarely apparently 4, persistent. Petals 3-10 or more. Stamens 5-20 or more usually not of the same number as the petals. Style deeply 2-7-cleft. Capsule membranaceous, circumscissile at the base, thence splitting upwards irregularly, many seeded. Cotyledons incumbent.

\* Root branching, the caudex at the surface of the ground: nerves of bracts and sepals excurrent and gland-tipped: stems terminating in open paniculate many-flowered bracted racemes.

**O. Leana** Howell l. c. *Calandrinia Leana* Porter Bot. Gaz. i, 33. Leaves numerous, terete or some of the other ones subspatulate, acute, 1-2 inches long, smooth and glaucous: scapose stems, 3-6 inches high; sepals rounded a line long by  $1\frac{1}{2}$  lines broad: petals 6-8, obovate, bare retuse or entire 3 lines long, red to white with darker veins. In beds of talc on high exposed ridges of the Siskiyou Mountains.

**O. Columbiana** Howell l. c. 32. *Calandrinia Columbiana* Howell Gray Proc. Am. Acad. xxii, 277. Leaves numerous, linear-spatulate flat  $1\frac{1}{2}$ -3 inches long, not glaucous: scapose stems 5-12 inches high: sepals rounded or truncate, a line long  $1\frac{1}{2}$ -2 lines broad: petals 4-7, oblong, more or less truncate, deeply emarginate to entire, rarely several-toothed at apex, 5-6 lines long, white or pink with dark red veins. On bare exposed basaltic rock along the Columbia river below the Cascades. Cascade Mountains lat. 49, Lyall.

**O. Cotyledon** Howell l. c. 32. *Calandrinia Cotyledon* Watson Proc. Am. Acad. xx, 355. Leaves flat, spatulate or oblanceolate 1-2 inches long by 6-12 lines broad, imbricated in a dense rosulate tuft: stems rather stout, 6-12 inches high, sometimes with 2 pairs of bracts below the short cymose panicle: sepals  $1\frac{1}{2}$ -2 lines long ovate or orbicular; petals 5-10, 6-8 lines

long oblanceolate, deep rose-color with orange stripe in the centre: stamens about 7, filaments dilated below, coherent in a tube around the 2-4 parted style capsule obscurely 2-4 valved, 12-20 ovuled. On high exposed peaks of syenitic rock near Preston's peak, Siskiyou Mountains.

**O. Howellii** Howell l. c. *Calandrinia Howellii* Watson l. c. xxxiii, 262. Leaves flat, oblong to ovate, attenuate to a margined petiole, 5-7 lines wide, with narrow hyaline crisped margins: stems 4-6 inches high with one or two pairs of bracts below the short racemose cymes: sepals  $1\frac{1}{2}$ -2 lines long, orbicular to broadly ovate: petals 7-10, oblong-oblanceolate, emarginate or entire, 6-8 lines long, deep rose-color, stamens 7. On high exposed ridges, Josephine county, southwestern Oregon.

\*\*\* Long thick root branching below: the 2-3-divided caudex not reaching the surface of the ground: nerves of the calyx excurrent, but not gland-tipped: stems terminating in a few-flowered umbel.

**O. oppositifolia** Howell l. c. *Calandrinia oppositifolia* Watson. Radical leaves linear-oblanceolate, attenuate to the scarious-margined subterranean base  $1\frac{1}{2}$ -3 inches long: the lower cauline 1-3 pairs, opposite and similar with occasionally scattered entire bracts above: stems 5-10 inches high bearing a terminal 1-5 flowered umbel: flowers white or pale pink on elongated pedicels 1-3 inches long: sepals orbicular, 2-3 lines long: petals 10, 6-10 lines long: stamens 8-12 or more: style deeply 3-cleft: capsule oblong, 3 lines long, 5-10-seeded. On wet hillsides about Waldo, Josephine county, Oregon, flowering in April and May.

**O. Tweedyi** Howell l. c. *Calandrinia Tweedyi* Gray Proc. Am. Acad. xxii, 277. Caudex and root very thick: leaves obovate fleshy 2-4 inches long, an inch or two wide, scapes a little longer than the leaves 1-3 flowered: sepals and bracts entire, the former orbicular: petals an inch long: stamens 10-11: capsule 20-30-seeded: seeds with a large and loose orbicular arillus. Wenatchee Mountains, Washington, alpine.

\*\*\* Root fusiform or conical; wholly underground: scapes 1-3 flowered, not surpassing the radical leaves.

**O. pygmaea** Howell l. c. 33. *Talinum pygmaum* Gray Sillim. Journ. xxxiii, 407. Leaves narrowly lanceolate or linear 1-2 inches long, with broad scarious margined underground petioles: bracts scarious glandular-ciliate: sepals orbicular, glandular-dentate 2 lines long: petals red, about twice the length of the sepals: capsule obtuse, nearly equalling the calyx, 16-20-seeded. On Mount Adams, Washington to the Rocky Mountains, Nevada and California.

**O. Nevadensis** Howell l. c. *Calandrinia Nevadensis* Gray Leaves linear 2-4 inches long by a line or two wide, the underground portion dilated, scapes 1-3 inches high with a pair of foliaceous linear bracts near the middle 1-3 flowered: sepals ovoid, more or less apiculate entire, 3-4 lines long: petals 3-10, white, twice as long as the sepals: capsule elliptical, a little longer than the calyx: ovules 3-50. Wet alpine meadows and rivulets, Washington to California and Nevada.

\*\*\*\* Root glandular, comparatively deep-seated: radical leaves few or none: scape-like stems with a pair (or sometimes 3 or 4 in a whorl) of opposite fleshy linear leaves near the middle: several-flowered.

**O. triphylla** Howell l. c. *Claytonia triphylla* Watson l. c. x, 345. Stems 1-3 inches high: radical leaves, when present, narrowly lanceolate to linear 6-12 lines long: cauline 1-4 in a whorl narrowly lanceolate attenuate below: 1-2 inches long, inflorescence a several-flowered bracteate umbel: bracts minute: petals oblong, 2 lines long exceeding the rounded sepals. In wet places on high mountains, California to Brit. Columbia.

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§ 2. Capsule 3-valved, 3-several-seeded. Sepals 2, green herbaceous, becoming more or less colored.

4 CALANDRINIA HBK. Nov. Gen. vi, 77 in part.

Succulent herbs with alternate leaves and ephemeral flowers in bracted racemes. Sepals 2, subequal, persistent. Petals 3-7. Stamens 3-10, seldom of the same number as the petals, apparently always hypogynous. Capsule 3-valved from the summit, persistent, several-seeded. Seeds black, minutely tuberculate. *Qu.* species annuals.

*C. caulescens* HBK. l. c. Glabrous or slightly pubescent; stems diffusely branching from the base, decumbent, 3-8 inches long; leaves linear to lanceolate, 1-3 inches long, the lower slender petioled; racemes simple; peduncles erect or ascending; buds 4-angled; sepals ovate acute, strongly carinate, the keel ciliate; petals broadly obovate, 2-6 lines long; capsule ovate, acute or acuminate, the valves becoming somewhat indurated, about equalling the sepals. Roadsides and moist places, Brit. Columbia to South America.

*C. micrantha* Schl. Linnæa xiii, Lit. Ber. 97. Diffusely branched from the base; stems slender, decumbent or ascending, 2-6 inches long; leaves linear, ciliate on the margins and midrib; racemes simple; pedicels ascending; sepals broadly lanceolate, acuminate, 1½-2 lines long; petals 3-7, about a line long; capsule ovate, acute, equalling the sepals. Moist sandy places along the Columbia river.

5 TALINUM Adanson Fam. des Pl. ii, 145.

Low glabrous herbs, rarely suffrutescent at base with mostly linear leaves without stipules and usually white or red flowers in paniculate racemes. Sepals 2, deciduous. Petals 5, sessile, hypogynous, stamens 10-30, adherent to the base of the petals. Style trifid. Capsule globose, 3-valved from the top, many-seeded. Seeds smooth.

*T. spinescens* Torr. Bot. Wilkes xvii, 250. Caudex short, succulent, beset with small subulate spines which are the indurated and persistent, midribs of former leaves: leaves terete, 6 lines long; scapiform, peduncles slender, surpassing the leaves: flowers in terminal paniculate naked cymes; petals rose-red; stamens 20-30. Wenatchee Mountains, Washington.

6 CLAYTONIA L. in Gronov. Fl. Virg. 25.

Low glabrous acaulescent succulent perennial herbs with scapose stems from a fleshy tuber or roots bearing a pair of, at least when young, opposite leaf-like bracts subtending the loose terminal naked racemes or umbels of delicate white or rose-color flowers that open for more than one day. Sepals 2, persistent. Petals 5, equal. Stamens 5, inserted on the claws of the petals. Ovary free, several-ovuled. Capsule loculicidally 3-valved. Seeds compressed, shining.

\* Stems and leaves from a deep-seated corm.

*C. lanceolata* Pursh. Fl. 175. Scapose stems 3-6 inches high; leaves narrowly lanceolate, 1-2 inches long, usually wanting on flowering specimens; involucrel leaves sessile, from narrowly lanceolate to oblong, 1 or 2 inches long; racemes few-flowered and cymose with a single scarious bract at



the base of the lowest pedicel: sepals ovate, acutish or obtuse, 1-1½ line long: petals 3-4 lines long, pale rose color with darker veins: roots glabrous. Eastern Washington and Oregon to the Rocky Mountains, Nevada and California, in mountainous districts.

**C. umbellata** Watson Bot. King 43, t. 6. Scapose stems an inch or two high: radical leaves orbicular to oblong or ovate on long slender petioles (often wanting on flowering specimens): involucre leaves orbicular to ovate or rhomboidal, on slender petioles: flowers 3-5 in a subsessile umbel, subtended by a broad scarious bract: petals 3-4 lines long, a little longer than the rounded, obtuse, somewhat scarious sepals: root of various shape, usually oblong or fusiform, ½-2 inches long. In gravelly ground, Stein's Mountain, southeastern Oregon to Nevada.

\* \* Stems and leaves from the crown of a fleshy root.

**C. Megarrhiza** Parry Watson Bib. Ind. 118. Leaves numerous cuneate with rounded apex, attenuate below to a margined petiole with scarious dilated base 1-6 inches long, 2-18 lines wide; scapose stems not exceeding the leaves: involucre leaves lanceolate or linear sessile raceme secund, subsessile, with comparatively large acutish scarious bract at base; sepals oblong 2-3 lines long, petals obovate submarginate; a third longer than the sepals. High alpine, growing in crevices of rocks, its large purple tap-root penetrating to a great depth. Blue Mountains of eastern Oregon to the Rocky Mountains.

7 MONTIA Micheli Nova Plantarum Gen. 17 t. 13.

Low glabrous and succulent herbs with delicate pale or white flowers in loose axillary or terminal simple or compound racemes. Sepals 2, rarely 3, persistent. Petals usually 5, rarely 4 or wanting; more or less united at base, usually unequal, 3 of them a little smaller than the other 2. Stamens 3-5, inserted at the base of the corolla, opposite its lobes. Ovary 3-ovuled: capsule 3-valved, 3-seeded.

\* Leafy-stemmed annuals: petals unequal.

+ At least the lower leaves opposite.

**M. minor** Gmelin Fl. Bad. i, 301, (?). Stems weak and filiform, forming dense mats 2-10 inches in diameter rooting at the lower nodes: leaves spatulate or obovate to narrowly oblanceolate, 3-9 lines long: flowers 1 line long or less: petals conspicuous a little longer than the calyx: seeds dull black, tuberculate. In wet places and ditches, Washington to northern California.

+ Leaves all alternate.

\*\* Stamens 2 or 3: opposite the 3 smaller petals.

**M. Howellii** Watson Proc. Am. Acad. xviii, 191. Stems slender, diffusely branched ½-3 inches long, procumbent and rooting at the nodes: leaves narrowly spatulate 2-4 lines long with a dilated scarious clasping base, rarely opposite, usually opposite to a triangular scarious clasping bract which subtends a few-flowered raceme: pedicels shorter than the leaves, reflexed in fruit: flowers very small: sepals less than a line long: petals 2, rarely 3-5 or wanting; the 2 larger a little exserted: seeds black smooth and shining. Willamette valley: flowers in very early spring.

**M. dichotoma** Howell l. c. 36. *Claytonia dichotoma* Nutt. T. & G. 202. Erect, 1-3 inches high, branching from the base and compact leaves all linear 6-12 lines long: flowers in dense terminal racemes; sepals broadly elliptical, about a line long, usually colored: petals but little longer: distinctly united at base: seeds thick-lenticular minutely tuberculate, small.

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**M. parviflora**  
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ulate, small, dull black. In wet places, Columbia river valley from The Dalles westward.

**M. linearis** Greene Fl. Francis. 181. *Claytonia linearis* Dougl. Stems erect or spreading 2-6 inches long, branching from the base: leaves linear, sessile by a clasping base, 1-3 inches long, flowers in lax terminal often secund racemes: stamens 3, (rarely 2 or 5): sepals broadly elliptical, 2 lines long, often partly scarious and colored; petals a little longer: seeds black and lustrous, a line broad, the largest in the genus, flat and sharply margined. In moist or wet places, Vancouver Island to northern California.

\* \* \* Stamens 5, seeds closely striate and transversely lineolate.

**M. diffusa** Greene l. c. Annual, stems procumbent diffusely branched: 2 inches to a span long: leaves broadly ovate or deltoid, abruptly attenuate into a petiole,  $\frac{1}{2}$ -1 inch broad: racemes very numerous, terminal and lateral, subcorymbose; pedicels slender, at length recurved, the lowest one and often several of the upper ones bracteate: petals emarginate, 2 lines long, a little longer than the calyx. In forests and shady or rocky places near the mouth of the Willamette river to northern California.

\* \* Leafy-stemmed perennials, stoloniferous or bulbiferous; racemes terminal and axillary, not involucre-bracted: petals 5, scarcely unequal: stamens 5.

+ Stems filiform: leaves alternate; racemes terminal.

**M. parvifolia** Greene l. c. Stems filiform 2-10 inches long: leaves fleshy, lower clustered, oblanceolate or spatulate, 5-18 lines long; cauline much smaller, usually with leafy bulblets in their axiles: racemes terminal, few-flowered: some or all of the pedicels subtended by scarious bracts: sepals broadly ovate obtuse, a line long; petals oblanceolate, emarginate. About springs and wet places, California to Alaska.

+ + Leaves opposite: racemes axillary.

**M. Chamissonis** Greene l. c. 180. Stems weak and slender, erect or decumbent, a foot or less high, stoloniferous and rooting at the joints: leaves oblanceolate or spatulate  $\frac{1}{2}$ -1 $\frac{1}{4}$  inches long; often with bulblets in their axiles: racemes few-flowered with a scarious bract at base; flowers on slender pedicels: sepals orbicular 1 $\frac{1}{2}$  lines wide: petals white, 3 or 4 lines long. In wet places, Alaska to California, east to the Rocky Mountains.

**M. Hallii** Greene l. c. A span high, destitute of stolons or bulblets: leaves only 2 or 3 pairs: pedicels in fruit ascending: calyx barely a line long: seeds muriculate. Wet ground, Willamette valley.

\* \* \* Leaves all radical: stems scapiform: racemes involucre, petals and stamens 5 each.

+ Involucral bracts more or less united into a disk, other and smaller bracts above them: annuals, apparently confluent in a series.

**M. perfoliata** Howell l. c. 38. *Claytonia perfoliata* Donn Willd. Sp. ii, 1186. Scapose stems 6-12 inches high: leaves long petioled, ovate to deltoid usually acute  $\frac{1}{2}$ -3 inches broad: light green: involucre bracts completely joined: together forming a perfoliate shallow-funnelform disk: flowers in short or long peduncled interrupted elongated racemes: sepals ovate 1-1 $\frac{1}{2}$  lines long; petals a half longer: seeds rather small, black and lustrous, lenticular. Common in shady moist places, Vancouver Island to California and the Rocky Mountains, also Mexico and Chile.

**M. parviflora** Howell l. c. *Claytonia parviflora* Dougl. Leaves light green, spatulate to filiform, including the petiole 2-6 inches long: scapose stems 2-8 inches long, involucre bracts joined together on one or both sides into a perfoliate or clasping or shallow disk: flowers in sessile or short-peduncled racemes; sepals ovate, a line long: petals but little longer:

seeds small lenticular, black and shining. Common in moist shady places Washington to California.

**M. rubra** Howell l. c. Whole plant usually livid red, spreading; leaves deltoid or rhomboid, abruptly narrowed to a margined petiole 1-2 inches long; scapes 1-3 inches long, more or less depressed; involucre bracts completely united (or slightly open on one side) into an orbicular perfoliate disk; flowers in short sessile racemes; sepals orbicular, less than a line long, about half the length of the petals. In dry open woods Washington to northern California.

**M. spatulata** Howell l. c. *Claytonia spatulata* Dougl. Succulent and glaucous or pale, scape stems 1-8 inches long, spreading or erect; leaves slender, terete or some of the outer ones becoming spatulate and flattish; involucre bracts either wholly united and the disk shorter on one side, or joined together on one side only and that throughout or only in part; racemes short, nearly or quite sessile; the slender and mostly alternate pedicels 3-4 lines long; sepals ovate, a line or more long, about half the length of the white or rose-color petals; seeds minutely tuberculate. In wet soil, southern Oregon and California.

**M. humifusa**. Depressed and spreading in a circular manner, forming a rosette 1-4 inches in diameter, pale green or yellowish; leaves rather few, thin, orbicular or rhombic to oblong or broadly spatulate the blades 2-6 lines long, abruptly or gradually contracted below to a slender petiole  $\frac{1}{2}$ -2 inches long; scape stems numerous,  $\frac{1}{2}$ -2 inches long; involucre bracts large, completely united on one edge and little or not at all on the other, forming a broad somewhat angular reniform sessile leaf; flowers glomerate in the axils of the involucre and not surpassing it; pedicels about a line long; calyx orbicular to broadly obovate, a line long, petals not seen; seeds small, very black and lustrous, turgid, with a distinct white appendage at the hilum. In moist places, valley of the Walla Walla river near Milton, May 18, 1896, *Howell*. This may be *Claytonia parviflora* var. *depressa* Gray Proc. Am. Acad. xxii, 181.

**M. tenuifolia** Howell l. c. *Claytonia tenuifolia* T. & G. Fl. i, 201. Stems numerous, filiform; leaves narrowly linear or filiform  $\frac{1}{2}$ -2 inches long, insensibly decumbent into long petioles; involucre bracts linear, somewhat dilated at base and then slightly connate on one side, much longer than the sessile 1-bracteate subumbellate raceme; petals oblong longer than the calyx, rose-color. In damp places about cliffs, etc., southern Oregon and California.

**M. arenicola**. *Claytonia arenicola* Henderson Bull. Torr. Club xvii, 49. "Annual with delicate fibrous roots, 2-6 inches high: radical leaves linear-spatulate, the broadest not over  $2\frac{1}{2}$  lines wide (generally about line wide) 1-2 inches long, tapering from near the obtuse apex into a delicate petiole; cauline leaves a single pair, similar to the radical but shorter opposite and distinct; racemes numerous and prolifically flowered, the flowers on pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  inch long; petals pink-white, 3 lines long, emarginate; seeds  $\frac{1}{2}$  line long shining and resembling those of *C. Siberica*, but only half as large. Dry sandy banks along streams as well as dry pine woods, Idaho and eastern Washington."

-- Involucre bracts distinct; petals subequal.

-- Perennial with creeping rootstocks: racemes without bractlets.

**M. asarifolia** Howell l. c. *Claytonia asarifolia* Bong. Veg. Sitch. 4 (1) *C. cordifolia* Watson Proc. Am. Acad. xvii, 365. Scape stems 4-6 inches high from a creeping caudex; radical leaves subcordate or somewhat reniform to rhombic-ovate, on long slender pedicels; involucre leaves ovate acute,  $\frac{1}{2}$ -1 $\frac{1}{2}$  inches long; flowers few upon slender pedicels in long pedunculate naked (or with a single scarious bract) raceme; petals 4 lines long, thrice longer than the rounded sepals. Alpine and alpestris from Alaska to California, east to the northern Rocky Mountains.

**M. Siberica**  
Stems 6-15  
radical leaves  
long,  $\frac{1}{2}$ -2 inches  
ovate,  $\frac{1}{2}$ -2 inches  
racemes  
to a short  
and, 3-6 lines long  
of the Cascade

**M. bulbifer**  
rather slender,  
bulblets that ar  
lar or rhombic  
petiole 2-4 inch  
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§ IV. Sepals  
2-valved.

Herbs with  
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Sepals 2, c  
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**S. umbellat**  
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**S. multiceph**  
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ball ephemer

## CALYPTRIDIMUM.

Perennials with a thickened crown and fibrous roots.

*M. Sibirica* Howell l. c. 38. *Claytonia Sibirica* L. Sp. 204 (1). Scapose stems 6-15 inches high from a thickened crown with fibrous roots: radical leaves rhombic-ovate or nearly orbicular to lanceolate, 1-3 inches long,  $\frac{1}{2}$ -2 inches wide: involueral leaves ovate or spatulate-ovate to lanceolate,  $\frac{1}{2}$ -2 inches long: flowers on slender pedicels in elongated bracted racemate racemes; sepals ovate, acute, 1-1 $\frac{1}{2}$  lines long; petals oblong, narrowed to a short claw below, somewhat truncate and notched at the upper end, 3-6 lines long. Common in moist ground, Alaska to California, west of the Cascade Mountains.

*M. bulbifera* Howell l. c. *Claytonia bulbifera* Gray l. c. xii, 54. Stems rather slender, 4-12 inches high, erect or ascending from a cluster of bulblets that are the fleshy persistent bases of former leaves: leaves orbicular or rhombic to lanceolate, 5-18 lines long, narrowed below to a slender petiole 2-4 inches long: involueral leaves orbicular to obovate or elliptical, sessile but not connate: raceme solitary and terminal, rarely with a second one in the axil of a bract below the terminal one; bracts foliaceous; pedicels filiform, 1-2 inches long: sepals cordate, 1-2 lines long, about as broad, acutish; petals oblong, emarginate to 2-lobed, 4-6 lines long, white with red or purple veins; stamens about half as long as the petals: capsule globose: seeds moderately compressed, ovate, with a conspicuous white appendage at the hilum. Along streams and damp places in forests, southwestern Oregon and adjacent California.

§ IV. *Sepals 2, broad, more or less scarious, persistent: capsule 2-valved.*

## 9. SPRAGUEA Torr. Pl. Frem. 4 t. 1.

Herbs with rosulate tufts of fleshy leaves from the crown of a fleshy root, or on densely-leafy stems, and ephemeral flowers in dense scorpioid spikes umbellate-clustered on a scape-like peduncle. Sepals 2, orbicular, emarginate at both ends, scarious-hyaline, persistent. Petals 4, somewhat unequal. Stamens 3, opposite the 3 larger petals, exserted. Ovary 8-10-ovuled; style long, bifid at the apex. Capsule 2-valved, membranaceous. Seeds black and shining.

*S. umbellata* Torr. l. c. Stems several from a thickened biennial root, simple, erect or ascending 2-12 inches high: radical leaves spatulate or oblanceolate, on thick petioles 1-4 inches long; the cauline similar but smaller, frequently scarious-stipulate, often reduced to a few bracts; involucre of broader scarious bracts subtending the dense capitate umbel of nearly sessile spikes: sepals very conspicuous, 2-4 lines in diameter, about equalling the oblong-ovate petals: stamens and style conspicuously exserted. In damp sandy places from the Siskiyou to the Sierra Nevada mountains.

*S. multiceps* Howell Eryth. i, 39. Depressed freely branching perennial: stems 1-6 inches long with densely leafy branches: leaves 3-6 lines long or on young plants 2 or 3 inches long: peduncle solitary, terminating the short lateral bractlets, usually with 1 or 2 scarious bracts below the involucre: flowers in dense capitate clusters: sepals scarious, 2-4 lines in diameter, about equalling the oblong-ovate petals: stamens and style conspicuously exserted. In volcanic sand, etc., on the snowy peaks of the Cascade Mountains.

## 9 CALYPTRIDIMUM Nutt. T. &amp; G. Fl. i, 198.

Smooth depressed annuals with alternate fleshy leaves and small ephemeral flowers in dense axillary and terminal clusters

or compound scorpioid spikes. Sepals 2, mostly unequal, ovate or orbicular, more or less scarious. Petals 2-4. Stamens 1-3, shorter than the petals and alternate with them. Capsule membranaceous 2-valved, 6-12-seeded. Seeds black and shining, circinate, compressed, on filiform funiculi of unequal length, rising from the base of the cell.

**C. roseum** Watson Bot. King 44 t. 6. figs. 6-8. Diffusely branched: stems decumbent, 1-3 inches long: leaves oblong-spatulate, attenuate at the base: sepals very unequal, nearly orbicular, 1-3 lines broad: petals minute, rounded-oblong: capsule oblong-ovate, shorter than the calyx: style very short. Southeastern Oregon to Nevada and California.

ORDER XIII. ELATINACEÆ Lindl. Nat. Syst. ed. 2, 88.

Low annuals with opposite dotless membranous stipulate leaves, regular and symmetrical flowers with hypogynous petals and stamens and distinct styles bearing capitate stigmas. Sepals 2-5 distinct, persistent. Petals as many as the sepals and alternate with them. Stamens as many or twice as many as the petals. Ovary 2-5-celled. Capsule 2-5-valved, crowned with the persistent styles or stigmas: placentæ in the axis. Seeds anatropous cylindrical with crustaceous coat and little or no albumen.

1. **Elatine.** Parts of the flowers each 2-4, sepals obtuse.
2. **Bergia.** Parts of the flowers each 5, sepals acute.

1 ELATINE L. Gen. n. 502.

Small prostrate glabrous annuals, growing in water or wet places with entire leaves and solitary flowers. Sepals 2-4, membranaceous, obtuse, nerveless. Petals as many as sepals. Stamens as many or twice as many as petals. Styles 2, 3 or 4. Ovary globose, with the placentæ in the axis, many-ovuled. Capsule membranaceous 2-4-celled, the partitions remaining attached to the axis or evanescent.

**E. Americana** Arnott Edinb. Journ. Sci. i, 430. Low and depressed, 1-6 inches in diameter, rooting at the nodes: leaves obovate, very obtuse flowers sessile, purplish: seeds cylindrical, slightly curved, about one-third of a line long, very minutely pitted in 9 or 10 longitudinal lines. Lower Columbia river bottoms; also in the Eastern States.

**E. Californica** Gray Proc. Am. Acad. xiii, 361. Floating: leaves obovate, attenuate at base, the lower with a petiole not longer than the blade: flowers shortly pedicellate, with 3 or 4 sepals and petals and twice as many stamens: seeds circinate-incurved nearly one-third of a line long, minutely pitted in 10 or 12 lines. In Sierra valley, California; Spokane Falls, Washington.

2 BERGIA L. Mant. n. 1309.

Branching and often pubescent nearly erect annuals with entire or serrate leaves and fascicled or solitary flowers. Sepals 2 with a strong midnerve or herbaceous in the middle, acute. Ovary ovoid. Capsule subcrustaceous, 5-valved, more or less of the partitions in dehiscence remaining with the axis.

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**B. Texana** Seubert in Walp. Rep. i, 285. Glandular pubescent, branching from the base, 2-10 inches high: leaves oblanceolate, acute, serrate,  $\frac{1}{2}$ - $1\frac{1}{2}$  inches long, attenuate to a short petiole: flowers fasciated, shortly pedicelled: sepals carinate,  $1\frac{1}{2}$  lines long exceeding the petals and stamens: capsule globose: seeds smooth and shining. Moist or very wet places along rivers and ditches, Columbia river to Nevada, California and Texas.

ORDER XIV. HYPERICACEÆ Lindl. Nat. Syst. ed. 2, 77.

Herbs or shrubs with opposite entire leaves, punctate with immersed pellucid resinous glands and often sprinkled with black glandular dots or lines, without stipules. Calyx of 4 or 5 persistent sepals imbricated in the bud. Petals as many, convolute in the bud, deciduous or withering, usually glandular-punctate. Filaments mostly in 3 sets or bundles. Styles 2-5, usually distinct or becoming so. Stigmas terminal. Ovary and capsule with 2-5 parietal placentæ, or 2-5-celled by their union in the axis. Seeds anatropous, with a somewhat crustaceous coat, filled by the straight cylindraceous embryo. Only one genus in our range.

1 HYPERICUM L. Gen. n. 902.

Herbs or shrubs with simple entire opposite leaves without stipules and yellow flowers in cymes. Sepals 5, rarely 4, similar. Petals as many, oblique. Stamens numerous, sometimes few, in 3-5 clusters: filaments united at base into 3-8 phalanges or distinct. Ovary 1-celled with parietal placentæ or 3-5-celled with placentæ in the axis. Styles 3-5 distinct or united: stigma often capitate: capsule conical to globose.

\* Stamens numerous, distinct or united into sets: styles 3, long and distinct: capsule ovate, 3-celled, more or less glandular: tall perennials with opposite leaves.

**H. PERFORATUM** L. Much branched, 1-4 feet high: leaves linear to oblong, obtuse, mostly tapering at base, 6-12 lines long, 1-5 wide: flowers numerous in loose cymes, about an inch in diameter: sepals narrowly lanceolate, very acute or acuminate: petals bright yellow, black dotted along the margin: capsule conical-ovate 2-3 lines long. Very common in fields and along roadsides. Introduced from Europe.

**H. Scouleri** Hook. Fl. i, 111. Simple or sparingly branched above, often with numerous small branchlets from running rootstocks, 1-2 feet high: leaves thin, shorter than the internodes, about an inch long mostly obtuse, more or less clasping, usually black dotted along the margin on the under side: flowers 6-12 lines in diameter, in more or less panicle cymes: sepals oval or oblong, obtuse, 2 lines long, or less: petals 6 lines long, obovate: stamens numerous in 3 fascicles, 3-celled. In wet meadows and by streams throughout the Pacific States and Territories, flowering in summer.

\*\* Stamens 15-20, mostly in 3 clusters; styles 3 or 2, short and distinct, stigmas capitate: small slender annuals with small flowers: petals shorter than the sepals.

**H. anagalloides** Cham. & Schlect. Linnæa iii, 127. Proeumbent, diffusely branching, often forming dense mats: stems 1-12 inches long: leaves oblong to broadly ovate, obtuse, 5-7 nerved at base, 2-6 lines long, almost as broad: flowers 3 or 4 lines in diameter, in few-flowered naked or



leafy cymes: sepals foliaceous, unequal, lanceolate to broadly ovate, 1-3 lines long, longer than the ovate 1-celled capsule: stamens 15-20. In wet places, Brit. Columbia to California.

**H. Canadense var. major** Gray Man. 86. Stems rather stout and strict, almost simple, 12-18 inches high: leaves lanceolate, 1-2 inches long, 4-6 lines broad, more or less clasping, often very acute, glandular dotted beneath: flowers in somewhat crowded cymes: sepals linear-lanceolate long-pointed; stamens 5-10: capsule very acutely conical, 3-4 lines long: seeds yellow, more or less striate and pitted. Green Lake, King county, Washington and the Eastern States.

ORDER XVI. MALVACEÆ Neck. Act. Ac. Theod. Palat. 2, 488.

Herbs or shrubs with alternate stipulate mostly palmately veined leaves and usually showy flowers. Flowers regular, hermaphrodite or rarely dicecious or polygamous. Sepals 5, rarely 3 or 4, valvate in the bud, more or less united at base, often having an external calyx or involucre. Petals hypogynous, equal in number to the sepals, twisted in the bud. Stamens hypogynous, commonly indefinite in number, rarely as few as the petals, united below into a monadelphous tube or ring: anthers 1-celled, reniform, bursting transversely. Ovary formed of several carpels around a common axis, either distinct or cohering. Styles as many as carpels, united or distinct. Fruit capsular or rarely baccate: carpels 1 to many-seeded sometimes closely united, sometimes separate or separable. Seeds campylotropous or heterotropous with little or no albumen. Embryo curved: cotyledons foliaceous, twisted and doubled up.

\* Styles stigmatic on the inner face: carpels indehiscent: ovules solitary, ascending.

1. **Malva.** Bractlets 1-3, distinct: axis broad, shorter than the numerous carpels, filaments in 1 series.
2. **Sidalcea.** Bractlets none. Filaments in 2 series; those of the outer series united into 5 clusters: carpels 5-10, covering the axis.  
\*\* Stigmas capitate: carpels mostly dehiscent, at least at the apex.
3. **Sphæralcea.** Bractlets 1-3, ovules 2, the lower ascending, the upper pendulous.
4. **Sida.** Bractlets usually none: ovule solitary.
5. **Abutilon.** Bractlets none: ovuled 3-4 in each cell.

1 MALVA L. Gen. n. 841.

Hirsute or glabrate herbs with angularly lobed or dissected leaves and mostly showy flowers solitary in the axils of the leaves or rarely in terminal racemes. Calyx 5-cleft, with an involucre of usually 3 oblong or setaceous bractlets or rarely none. Petals 5, obovate. Staminal column divided above into numerous filaments. Styles filiform, stigmatic on the inner side. Carpels numerous with a single ascending ovule in each. Fruit depressed, the numerous free carpels separating from the broad and not projecting axis, indehiscent, beakless.

M. BOREALIS Wall. in Liljebl. Sv. Fl. ed. 2, 218. Annual, erect some-

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more or less  
1-3 lines long  
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what decumbent, hairy or nearly glabrous: leaves round-cordate, crenate, more or less strongly 5-7 lobed; peduncles axillary, solitary or clustered, 1-3 lines long: calyx lobes acute, becoming very broad and enlarged in fruit: petals 2-3 lines long: capsule transversely reticulate-rugose. A weed from Europe, on the Coast from Puget Sound to Lower California.

*M. ROTUNDIFOLIA* L. Stems prostrate from a perennial root, 6-20 inches long, leaves cordate-orbicular, obtusely 5-lobed and crenate on elongated pubescent petioles: pedicels axillary, 1-flowered involucre bracts oblong-linear: calyx lobes acutely triangular: petals 4-6 lines long, pale purple: carpels numerous, wrinkled. Roadsides and waste grounds; introduced from Europe.

2 SIDALCEA Gray Pl. Fendl. 18.

Herbs with more or less deeply lobed leaves and purple or white flowers in a terminal raceme or spike: involucre none: calyx 5-parted. Staminal column double, the filaments of the outer series united usually into 5 sets opposite the 5 petals, of the inner distinct. Styles filiform, stigmatic on the inner face. Carpels 5-9, with a single ascending seed in each, separating at maturity from the short axis, sometimes beaked, indehiscent. Ours all perennials.

\* Pubescence not hirsute.

*S. glaucescens* Greene Bull. Cal. Acad. 3, 77. Minutely stellate-pubescent, and somewhat glaucous throughout: stems numerous and decumbent, 2 feet high, rather slender: leaves, even the lowest, palmately 5-7-parted, the crenate divisions 3-5 lobed or toothed, those of the uppermost entire: raceme simple, loosely flowered: divisions of the calyx attenuate-acuminate: petals deep purple, obtuse or at most only truncate: carpels with distinct longitudinal reticulations. Oregon, *Hall*; station not noted to Mount Shasta and the Sierra Nevada Mountains, California.

*S. malviflora* Gray Pl. Wright i, 16. Stems 2-4 feet high, erect or a little decumbent, mostly solitary from a fusiform root: hirsute below and on the calyx and pedicels; short, stellate pubescence wanting: leaf margins ciliate: radical leaves orbicular with open sinus and 5-9 shallow, crenate-incised lobes: the uppermost cauline 5-7-parted into linear, entire segments: raceme usually solitary, virgate: pedicels erect, twice the length of the calyx, the lobes of which are broadly ovate, acuminate: carpels smooth, depressed. Idaho to Colorado, New Mexico and Arizona.

*S. virgata*. Stellate pubescent throughout: stems numerous from the thick somewhat woody root, spreading or ascending, sparingly branched, 6-24 inches high: leaves orbicular in outline, 1-4 inches in diameter all petioled, the lower more or less deeply 5-7 lobed, the obtuse, oblong lobes coarsely toothed at the apex, densely stellate-pubescent beneath, more sparsely so with more simple appressed hairs above: upper more deeply lobed or parted with linear-acute or acutish entire or sparingly toothed segments: flowers bright purple in virgate racemes: bracts setaceous. calyx lobes lanceolate, acuminate, 2-3 lines long, rounded, or retuse and minutely erose-dentate at the apex. Common on dry hillsides, Willamette valley to the northern boundary of California.

\*\* Pubescence of two kinds, hirsute and stellate.

*S. spicata* Greene l. c. 76. Equably hispid-hirsute throughout, the hairs simple and not deflexed, stellate pubescence sparse, mostly confined to the under surface of the leaves and the calyx where it is minute: stems 2 feet high, strict and simple, or with a few short branches above: lowest leaves orbicular, lobes and teeth shallow, rounded; cauline parted into 7,

variously incised, or the uppermost linear and entire segments: racemes short, spicate-crowded: petals deeply notched, half inch long: pedicels very short: calyx thin, very hairy, its lobes ovate acute or acuminate: carpels small, smooth. Southwestern Oregon to California.

**S. campestris** Greene l. c. Bristly hairs of the stem abundant, forked from the very base and deflexed: leaves soft beneath with stellate pubescence which becomes dense on the pedicels and calyx: stems erect, 2-6 feet high simple or slightly branched above: lower leaves orbicular, about 9-lobed, the middle and upper 7-9-parted, their segments with 3-5 linear spreading lobes: racemes short: petals emarginate, an inch long: calyx lobes lanceolate acuminate, 3-nerved; carpels papillose-hirsute. In moist places, Willamette valley.

**S. Oregana** Gray Pl. Fendl. 20. Slender, 1-3 feet high, merely pubescent or glabrous up to the simple or paniculate racemes: foliage as in the preceding, but the segments narrower; lobes of the calyx anescent, broadly deltoid: petals 6-9 lines long: carpels obscurely rugulose-reticulated, at least on the dorsal angles and sides, the back smoothish. Common in wet meadows and swales, British Columbia to California, east to Idaho.

**S. Hendersoni** Watson Proc. Am. Acad. xxiii, 262. "Tall and apparently perennial (3 or 4 feet high), glabrous throughout, the stem simple or nearly so: leaves palmately 7-cleft to below the middle, the mostly broad segments coarsely lobed and toothed, the upper leaves 3-5-parted and the segments narrower: flowers large (9-12 lines long), in a loose raceme, the pedicels (1-3 lines long), shorter than the linear bracts: calyx large ( $\frac{1}{2}$  inch long in fruit), the leaves ovate-lanceolate, shortly acuminate: carpels few (8), smooth and glabrous, 2 lines long including the conspicuous linear beak. Near the shore of Clatsop Beach, *Henderson*," to Seattle, Washington, *Piper*.

### 3 SPHÆRALCEA St. Hil. Pl. Us. t. 51.

Herbs or shrubs with angular or lobed leaves and mostly showy flowers, solitary or fascicled in the axils of the leaves or bracts, or in terminal racemes. Involucre 2-3-leaved, setaceous, often deciduous. Calyx 5-parted, staminal column simple; free filaments terminal and distinct, numerous. Styles 5 or more, with capitate stigmas. Ovules 1-3, one ascending and maturing, the others pendulous and abortive. Fruit conical. Carpels 2-valved above, the upper portion where the seed is wanting thin-walled and smooth, the lower half rugose-reticulated on the sides. Seeds reniform.

\* Carpels 1-2, ovulate, the upper ovule when present abortive, at length directly deciduous from the axis, *Malvastrum Gray, in part*.

**S. Munroana** Spach. Hist. Veg. iii, 353. *Malvastrum Munroanum Gray*. Grayish or hoary with dense stellate pubescence, branching from the base, 1-2 feet long, usually spreading or ascending: leaves broadly ovate, usually cordate at base, more or less deeply 3-5-lobed, crenately or acutely toothed, 1-2 inches long, equalling or exceeding the slender petiole; calyx lobes acute or acuminate, 2-4 lines long: petals scarlet, broadly obovate, 6-10 lines long: carpels oblong 2 lines long, pubescent on the back. On gravelly banks along rivers, eastern Oregon and Washington to Nevada and Utah.

\*\* Carpels 2-3 ovulate, 1-3 seeded: when separating from the axis cohering by their sides and at base held by a kind of thread which at length either tears away from the back of the carpel or else is carried away with it. Tall perennial herbs.

**S. aceriflora** Steud. Stems 5-7 lobed, lobes the flowers angular acute back. On the axis to the o

**S. leptostachya** Steud. Peduncles see either a

Pubescence solitary fascicled Staminal tube Styles 5 or more ovuled, inclined to the axis.

**S. hederifolia** Steud. Perennial root broad, very axillary panicle or 2 setaceous bescent external smooth. From Mexico.

**S. spinosa** Steud. Branched, leaves rather long petiole, flowers beaks. On

Herbs, stems leaves and involucre. each cell. rarely 4-6 in pairs, 1 per leaf but the fo

A. Avicennia with spread 6 inches in solitary on branches with 3-seeded, in diate manner

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**S. acerifolia** Nutt. T. & G. Fl. i, 228. Scabrous with stellate pubescence: stems stout, much branched, 3-6 feet high: leaves cordate, deeply 5-7 lobed, lobes acute, coarsely serrate: racemes leafy below, naked above, the flowers clustered on short peduncles: lobes of the calyx broadly triangular acute or acuminate: petals 9-15 lines long, carpels hirsute on the back. On the Columbia river and its tributaries from the Rocky Mountains to the ocean.

**S. leptosepala** Torr. Bot. Wilkes 255, of the upper Columbia has slender peduncles and caudate-attenuate calyx lobes. I have been unable to see either a specimen or a description of it.

4 SIDA L. Gen. n. 837.

Pubescent or tomentose herbs with white or yellow axillary solitary fascicled flowers. Calyx usually without bractlets. Staminal tube simple antheriferous at the summit. Petal sloblique. Styles 5 or more with capitate stigmas. Carpels as many, 1-ovuled, indehiscent or 2-valved, at length separating from the axis.

**S. hederacea** Torr. in Gray Pl. Fendl. 23. Stems decumbent from a perennial root, leafy, a foot long or less: leaves reniform, about an inch broad, very oblique, serrate or crenate, shortly petioled: flowers in short axillary panicles or solitary, the pedicels at length deflexed: calyx with 1 or 2 setaceous bractlets at base, the lobes acuminate: petals yellowish, pubescent externally, 4-6 lines long, carpels 6-10, triangular, 1 1/2 lines long, smooth. From Washington (near Walla Walla) to Arizona and New Mexico.

**S. spinosa** L. Sp. 683. Annual: minutely and softly pubescent, much branched, 10-20 inches high: leaves ovate-lanceolate or oblong, serrate, rather long petioled: peduncles axillary, 1-flowered, shorter than the petiole, flowers yellow, small: carpels 5, each splitting at the top into 2 beaks. On the ballast ground at Portland, Oregon.

5 ABUTILON Tourn.

Herbs, shrubs, or trees, with cordate, rarely somewhat lobed, leaves and solitary axillary flowers. Calyx 5-cleft, without an involucre. Ovary 5-many-celled with 3, rarely more, ovules in each cell. Capsule composed of 5 or more 2-valved, 3-seeded, rarely 4-6-seeded, carpels. Peduncles axillary, solitary or rarely in pairs, 1-many-flowered, sometimes by the abortion of the upper leaves apparently in terminal racemes. None indigenous but the following one introduced and liable to become common.

**A. AVICENNÆ** Gært. Fr. ii, 251, t. 135. Annual: stem 2-5 feet high with spreading branches: leaves orbicular-cordate, abruptly acuminate, 4-6 inches in diameter, velvety tomentose, crenately toothed: flowers usually solitary on axillary peduncles, sometimes 3 or more on short flowering branches which bear 1 or 2 small leaves, orange-yellow: carpels about 15, 3-seeded, inflated, truncate, hirsute, the long beaks spreading in a radiate manner. Waste places and roadsides. Introduced from India.

ORDER XVI. LINACEÆ Dumort. Comm. Bot. 61.

Annual or perennial caulescent herbs or low shrubs. Leaves alternate sometimes opposite or subverticillate below: simple, generally entire, sessile or nearly so, mostly estipulate. Inflorescence usually cymose. Flowers hermaphrodite, 4-5-mer-

ous, hypogynous. Sepals valvate and petals convolute in the bud, distinct or nearly so. Stamens as many as petals and alternate with them, united at base, sometimes with intermediate processes persistent: anthers oblong, introrse more or less versatile, 2-celled, dehiscent longitudinally. Styles 2-5. Ovary slightly 4-10-lobed its cells equal in number to the styles or twice as many from the intrusion of a false partition from the back of each cell, the cells 2-ovuled. Seeds oily with a little albumen.

1 LINUM L. Gen. n. 389.

Leaves estipulate. Flowers 5-merous, symmetrical, except that the carpels are fewer than the other parts in one section. Sepals persistent or at length deciduous. Petals fugacious. Capsule splitting through the false partitions and also septicial in most species.

\* Pedicels elongated: flowers large blue.

**L. Lewisii** Pursh. Fl. 210. Perennial, glabrous and glaucous 2-3 feet high: stems mostly cespitously clustered, striate: leaves often somewhat crowded, oval-linear, acute or obtusish, 3-5-nerved: flowers somewhat corymbose: sepals broadly oval mostly pointless, the inner scarious margined: petals 5-8 lines long, thrice the length of the calyx: stamens equal to or twice the length of the sepals, appendages slender: capsule two or three times as long as the calyx ovoid, obtuse, incompletely 10-celled and 10-valved, the valves dehiscent widely above and separating nearly to the centre below, the septa ciliate. Alaska to Saskatchewan and the Great Plains, south to Arkansas and Texas, west to the Cascade and Siskiyou Mountains.

\* \* Pedicels often elongated, flowers of medium-size or mostly small, yellow, white or rose-purple: sepals usually glandular-ciliate, persistent: petals commonly with lateral teeth and 1-3 ventral appendages at base: filaments without intervening appendages but sometimes 2-toothed at base: carpels 2-3 without cartilaginous insertions: styles distinct: stigmas small, oblique or subcapitate: capsule with firm septa, long, ciliate at base, the false partitions mostly incomplete seeds mostly plump: annuals.

**L. digynum** Gray Proc. Am. Acad. vii, 334. About a span high, glabrous, stems slender, several times forked, rather prominently angled above: leaves mostly opposite elliptical-spatulate, the lower obtuse and entire, the upper acute or mucronate and remotely serrulate, flowers at length corymbose or subracemose, small, yellow: pedicels short about equal to the flowers: sepals ovate-oblong rather obtuse, minutely serrulate, glandular and lacerate below, two of them mostly conspicuously longer and very blunt: petals spatulate-oblong, truncate or emarginate not appendaged about a line long, one half longer than the sepals: stamens and pistils a little shorter than the calyx: carpels 2: capsule a little shorter than the calyx, completely 4-celled. Washington to northern California.

**L. micranthum** Gray l. c. 333. A span to a foot high, glaucous, somewhat soft-pubescent, loosely dichotomous with slender terete branches: leaves spatulate-oblong, obtuse or acutish, entire, 1-nerved: pedicels slender, longer than the minute white flowers: sepals ovate-lanceolate to oblong the inner slightly glandular ciliate: petals obovate, about twice the length of the calyx, not toothed and without lateral appendages, the median appendage ligulate and loosely hairy: filaments round-toothed and slightly hairy at base: capsule ovoid, acute about equal to the calyx, the false

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septa incomplete extending half way to the axis below the middle, narrowed above. California and Oregon.

ORDER XVII. GERANIACEÆ J. St. Hil. Expos. Fam.ii, 51.

Herbs or shrubs with toothed, lobed or compound leaves, perfect regular or irregular but commonly symmetrical flowers on axillary peduncles. Sepals 5, imbricated in the bud. Petals 5, generally imbricated in the bud. Stamens mostly in two sets, those alternate with the petals sometimes sterile: filaments either dilated or monadelphous at base. Ovary formed of 5 1-celled carpels around a central axis with 2 anatropous ovules in each cell of which only 1 matures, separating elastically at maturity from the long-beaked and indurated central axis from below upward, the styles forming long tails which become revolute upward, or spirally twisted. Embryo filling the seed. Cotyledons convolute pleated and incumbent on the radicle.

1. *Geranium*. Fertile stamens 10; tails of the carpels not bearded.

2. *Erodium*. Fertile stamens 5, tails of the carpels bearded.

1 GERANIUM L. Gen. n. 832.

Usually caulescent herbs with simple radiately-divided, petioled stipulate leaves and 1-3 flowered peduncles with a 4-bracted involucre at the base of the pedicels. Sepals 5, imbricated in the bud, persistent. Petals 5, deciduous. Stamens 10, all antheriferous (except in *G. pusillum*), mostly united a little at base; filaments slender in 2 sets, with a gland behind the base of each of the shorter ones. Ovary 5-lobed, 5-celled: style 5-lobed at the summit, the lobes stigmatic on the inner face. Carpels at maturity separating from the long-beaked axis and borne on the recurving persistent beardless styles, (except in *G. pusillum*).

\* Annuals with small flowers, the petals not exceeding the sepals: perhaps introduced, but now thoroughly naturalized.

+ Sepals awned: carpels hairy, at maturity detached from the axis and borne on the recurved style.

*G. Carolinianum* L. Sp. ii, 682. Erect, diffusely much branched from the base or nearly simple 4-20 inches high, pubescent: leaves 1-2½ inches in diameter, palmately 5-7-lobed or parted, the divisions cleft into oblong-linear lobes: pedicels short, crowded at the end of branchlets: petals orbiculate, pale flesh-color, equalling the awned sepals: carpels pubescent: seeds obscurely reticulated. Common from Brit. Columbia to California and across the continent.

*G. DISSECTUM* L. Amœn. iv, 282. Decumbent or ascending, 6-20 inches long, dichotomously branched, pubescent: leaves 5-7-parted; the divisions deeply and unequally cleft into linear lobes: peduncles elongated usually solitary in the forks of the branches: petals rose-color, a little longer than the ovate acuminate sepals: carpels hairy: seeds strongly reticulated. Cultivated grounds about the mouth of the Willamette river:

+ + Sepals not awned, mature carpels detached from the axis and some on the recurved style.

*G. MOLLE* L. Sp. Pl. ii, 682: Low, slender, diffuse; the branches a few

inches to a foot long, the herbage softly and somewhat clammy villous; leaves an inch broad or more, cleft into oblong obtusish lobes: sepals ovate-oblong, not awn-pointed: petals very small, rose-color: carpels glabrous, transversely rugose: seeds minutely striate. Plentiful northward, from northwestern California to Brit. Columbia.

+ + + Sepals not awned: carpels rugose, not hairy, at maturity remaining on the axis, not borne on the recurved style.

**G. pusillum** L. Sp. ed. 2, 957. Soft-pubescent or the pedicels and calyx villous and usually glandular: stems slender or ascending, 3-6 inches long: lower leaves orbicular an inch or less in diameter equally cleft into 7-9 linear or oblong lobes, each more or less regularly 3-toothed at the apex; cauline round-reniform, 5-7-parted, the divisions cleft into linear lobes: peduncles often in the axils of bracts opposite the leaves, short: sepals ovate, acute or acuminate not awned: petals pale purple, about equalling the calyx, usually only 5 of the filaments antheriferous: carpels fine, canescent, keeled, not wrinkled: seeds smooth. Common in open places throughout the Willamette valley; introduced from Europe.

\* \* \* Perennials: flowers large: stems naked below, dichotomously branched with opposite leaves above: sepals shortly aristate, scarious on one side, the scarious portion often extending lobe-like beyond the apex: filaments and petals pilose at base.

**G. Fremonti** Torr, in Gray Pl. Fendl. 26. Rather stout, more or less pubescent throughout with a close glandular pubescence, sparsely intermixed with longer pilose hairs: radical leaves 7-cleft, the segments 3-lobed or incised; cauline 3-5 cleft, the divisions 3-lobed: petals obovate twice the length of the sepals: villous at base. Dry open hillsides, Idaho to the Rocky Mountains.

**G. Richardsoni** F. & M. Ind. Sem. Petr. iv, 37. Erect with slender branches  $1\frac{1}{2}$ -3 feet high: pubescence usually fine and appressed: leaves deeply 5-7-cleft, lobes sharply incised: pedicels and sepals glandular pilose: petals entire, hirsute at base. In the mountains from Brit. Am. to Mexico and westward, perhaps on our eastern border.

**G. incisum** Nutt. T. & G. Fl. i, 206. Densely pilose with short white spreading or deflexed hairs to nearly glabrate: stems stout, numerous from the crown of a large somewhat woody perennial root, 1-3 feet high dichotomously branched above with a long 2-flowered peduncle or branch in the forks or at length a pair of opposite sessile leaves, with a peduncle in the axil of each, appearing compact and many-flowered: lower leaves very long petioled, ample, round-reniform in outline, primarily deeply 3-lobed or 7-parted, the broad cuneiform lateral segments deeply 2-lobed, the oblong lobes coarsely incised and serrate; the upper ones similar but very short petioled or sessile: flowers purple, on slender pedicels  $\frac{1}{2}$ -2 inches long somewhat abruptly contracted above to the rather stout awn, outer ones somewhat pubescent and more or less glandular-ciliate; inner ones minutely pubescent, with rather broad scarious margins; petals broadly ovate 6-8 lines long, more or less retuse, conspicuously veined, densely bearded at base; filaments about equalling the style, dilated and ciliate at base; styles minutely hispid, the free tips 1-2 lines long and spreading recurved. Along small streams, eastern Oregon and Washington to Brit. Columbia and Dakota.

**G. Oregonum.** Pilose with short white deflexed hairs or that of the pedicels spreading and gland-tipped, stems several from the crown of a thick perennial root, erect, 1-2 feet high comparatively slender with internodes, dichotomously branched: leaves all rather long petioled, deeply 5-7-cleft, the cuneate segments irregularly incised and toothed: flowers bright purple on long slender ascending peduncles thus appearing long 2-flowered, pedicels 1-2 inches long slender: sepals oblong-ovate, outer

5 lines long, the slender awn abruptly awned; edges at base dilated and ciliate. Carpel and open places

Herbs, rarely veined stipules, axils of the mostly equal, sterile, or red and perfect, filaments. Style spirally twisted or lobed, peduncles terminate of the small contracted involucre pointed below, hardly if at all sculptured.

\* Leaves or toothed: p

**E. cicutarium** from the base. acutely pinnae bearing bright rose-color throughout spring.

**E. moschatum** stems a few inches long and lines long: white Oregon and Ca

\* \* \* Leave

**E. macropetalum** cent with shining, entire, 2 lines long, shorter than the prominently keeled on clayey soil



5 lines long, glandular ciliate and minutely pilose, gradually contracted to the slender awn, inner ones with rather broad purple margins and abruptly awned; petals obovate entire, 6-8 lines long densely bearded on the edges at base inside, obscurely veined; filaments longer than the styles dilated and ciliate at base; styles pilose, the free tips  $\frac{1}{2}$ -1 line long, confluent. Carpels minutely pubescent; beak 2 inches long. Edge of woods and open places throughout the Willamette valley.

2 ERODIUM L'Her. Geran. t. 1-6.

Herbs, rarely shrubby with pinnately parted or palmately veined stipulate leaves and 1-3-flowered peduncles usually in the axils of the upper leaves. Sepals 5, equal, regular. Petals 5, mostly equal. Stamens 10, the 5 opposite the petals short and sterile, or reduced to scales, the 5 alternate with the petals longer and perfect, with nectariferous glands at the base of the filaments. Styles persistent, bearded on the inner side, at length spirally twisted below. Leaves often pinnate and bipinnately parted or lobed, when opposite more or less unequal in size: peduncles terminal or lateral (opposite the leaves or in the axil of the smaller one), umbellately 2-several-flowered with a 4-bracted involucre at the base of the pedicels. Carpels very sharply pointed below, covered with obliquely ascending appressed hairs, hardly if at all dehiscent. Seeds obconical or oblong, not sculptured.

\* Leaves mostly opposite, pinnate or pinnatifid, the divisions lobed or toothed: pedicels at length deflexed, the fruit remaining erect.

*E. cucurbitarium* L'Her. Ait. Hort. Kew. ii, 414. Hairy, much branched from the base, an inch to 2 feet long: leaves opposite, pinnate, the leaflets acutely pinnatifid with narrow acute lobes: peduncles exceeding the leaves bearing a 4-8-flowered umbel: sepals 1-3 lines long, acute: petals bright rose-color, a little longer: tail of the carpels 1-2 inches long. Common throughout the Pacific States and Territories. Flowers in very early spring.

*E. moschatum* Willd. Sp. iii, 631. More or less glandular pubescent: stems a few inches to a foot long: leaves pinnate, the oblong-ovate leaflets unequally and doubly serrate: flowers pale on short pedicels: sepals 3-4 lines long: whole plant exhaling a musky odor. Roadsides, southwestern Oregon and California.

\*\* Leaves mostly radical, round-ovate: pedicels erect in fruit.

*E. macrophyllum* H. & A. Bot. Beechy 327 (?). Somewhat canescent with short spreading hairs that are often gland-tipped: subcaudexcent, with a straight perpendicular annual root: leaves round reniform to triangular ovate with a broad shallow sinus, crenately dentate, 6-18 lines broad, on petioles 1-3 inches long: peduncles stout, 1-6 inches long 1-several-flowered: involucre bracts lanceolate, acuminate, 1-2 lines long: sepals broadly lanceolate shortly acuminate scarious margined, prominently 5-nerved: petals white, obovate, entire, 2-3 lines long exceeding the calyx: stamens 5, subtended by a broad appendage that is attached to them half way up or more: style shorter than the stamens, 5-lobed: carpels densely hispid 5-7 lines long, prominently keeled, acuminate below: seed oblong, smooth, 3 lines long. On clayey soil near Ashland, Oregon.



## ORDER XVIII. LIMNANTHACEÆ Lindl. Nat. Syst. ed. 2. 14

Glabrous annual herbs with pungent juice, pinnately dissected alternate leaves without stipules and pale flowers. Sepals 3-5, valvate in the bud, united at base, persistent. Petals 3-5, withering-persistent. Stamens twice as many as petals and inserted with them upon a somewhat perigynous disk, antheriferous, filaments distinct, those opposite the sepals having a small gland at the base on the outside: those opposite the petals usually shorter: anthers roundish introrse. Ovary consisting of 2-5 distinct 1-cvuled carpels opposite the sepals, the styles rising from the centre of each carpel and united into one nearly to the top: stigmas simple. Carpels becoming semi-drupaceous tuberculate nutlets. Seeds erect, anatropous, without albumen. Embryo with very large cotyledons and very short radicle.

1. *Limnanthes*. Sepals, petals and carpels normally 5: stamens 10.
2. *Flerkea*. Sepals, petals and carpels normally 3: stamens 6.

1 LIMNANTHES R. Br. Lond. & Edinb. Phil. Mag. 1833 ii, 70.

Low annuals with estipulate pinnatifid leaves and showy white yellowish or rose-color flowers, solitary on lateral and terminal peduncles: growing in water or wet places. Calyx deeply parted. Petals 5, persistent. Glands 5, alternating with the petals. Stamens 10. Style 5-cleft at the apex. Ovary with solitary ascending ovules. Carpels distinct, subglobose, at first fleshy, length hard and indehiscent, separating from the axis.

**L. Douglasii** R. Br. 1. c. Glabrous throughout, diffusely branched from the base: the succulent stems 6-8 inches long: leaves pinnate, leaflets incisely lobed or parted into linear acute lobes: peduncles length 2-4 inches long: sepals lanceolate acute, 3 or 4 lines long: petals obovate, emarginate, 6-8 lines long, white, with yellow base: style slender 3-4 lines long: seeds densely covered with coarse obtusish tubercles. Umpqua valley, Oregon.

**L. gracilis**. Glabrous throughout, branching from the base, the slender stems 6-18 inches long: leaves pinnate, the ovate to ovate-lanceolate or linear acute, leaflets entire or 3-parted: sepals lanceolate, acuminate, 3 lines long: petals oblanceolate, truncate or emarginate 6-7 lines long, white with yellowish base: fruit smooth or sparsely tuberculate. Wet rocks, Rogue River Valley and southward.

**L. rosea** Hart in Benth. Pl. Hartw. 301. Glabrous, petals obovate and emarginate or obcordate, light rose-color or purplish below, villous within near the base: fruit strongly tuberculate. California, to be looked for on our southwest border.

**L. pumila**. Glabrous, simple or sparingly branched near the base, 1-2 inches high: leaves commonly bipinnate with trifoliolate pinnae: pinnae lanceolate to oblanceolate acute: sepals lanceolate acuminate 3-4 lines long: petals white, oblong entire, little if at all longer than the sepals: stamens about half the length of the petals: carpels ovoid, rugose below crowned with short-conic processes. On top of Table Rock, Jackson County, Oregon.

**L. floccosa**. Floccose-villous, stems simple or sparingly branched

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at the base, 1-3 inches high, recurving; leaves pinnate with linear or pedunculate pinnæ: flowers white on short slender peduncles fasciated at the end of the stem or branches: sepals broadly lanceolate, acuminate and densely villous within: petals oblong, 3-4 lines long not exceeding the sepals: stamens not more than  $\frac{1}{2}$  the length of the petals: carpels obovoid upper half beset with white acuminate processes. On gravelly plains, Jackson county, Oregon to northern California.

2 FLORUKIA Willd. Neue Schr. Ges. Nat. Fr. Berl. iii, 448.

Low smooth annual herbs with alternate dissected leaves with stipules and small flowers on axillary peduncles. Calyx simply 3-parted, persistent. Petals 3, alternate with as many sepals, open in the bud, withering-persistent. Stamens 6, styles united to near the apex. Ovaries 3, opposite the sepals, 1-lobed, distinct, fleshy, becoming indehiscent 1-seeded nutlets, separating from the axis.

*proserpinacoides* Willd. Act. Berol. iii, 448: Glabrous: stems weak, 1-2 inches high sparingly branched from the base: leaves pinnate, the stem trifoliolate with lanceolate leaflets: the upper with more numerous or filiform leaflets; sepals ovate-acute, about a line long, a little longer than the white petals: carpels globose, densely tuberculate. Under Ash Grove in moist places about the mouth of the Willamette river, Oregon to California, Illinois, Canada and the New England States.

DRER XIX. OXALIDACEÆ Lindl. Nat. Syst. ed. 2, 140.

Herbs, rarely shrubby, with acid juice, trifoliolate or pinnate leaves and variously disposed regular flowers. Sepals 5, distinct or nearly so, persistent, imbricate in the bud. Petals 5, hypogynous, equal, unguiculate deciduous, spirally twisted in the bud. Stamens 10, hypogynous, more or less monadelphous: filaments subulate, those opposite the petals longer than the others: anthers short, attached by the middle, imbricate, often reflexed and appearing extrorse, Ovary of 5-celled carpels with distinct styles and capitate or penicillate stigmas. Capsule usually membranaceous, 5-lobed and 5-celled, the capsule at length mostly separating from the axis, opening by the dorsal suture, 1-12-seeded. Testa anatropous, with a loose fleshy testa which bursts elastic when the seeds are ripe. Embryo straight, as long as the fleshy albumen with a rather long radicle. Cotyledons flat and foliaceous.

1 OXALIS L. Gen. n. 582.

Herbs, rarely shrubby, with trifoliolate or pinnate leaves with stipules and perfect, regular flowers. Sepals 5, distinct or nearly so at the very base, imbricate in the bud. Petals 5, convolute and twisted in the bud. Stamens 10, the filaments somewhat dilated and united below in 2 sets of unequal length, all monadelphous. Capsule columnar or ovoid, beaked with the 5-celled, dehiscing loculicidally, the valves remaining attached by the partitions to the axis. Seeds 2-several in each cell, pendulous the outer fleshy aril-like coat at length split-

ting and elastically recurved upon the raphe. Low acaulescent herbs with a sour watery juice: leaves alternate, mostly digitate-trifoliate, rarely stipulate: peduncles umbellately or cymose 1-many-flowered. Ours all perennials with trifoliate leaves.

\* Acaulescent: leaves and scapes from the end of a slender perennial scaly rootstock: flowers white or pinkish, somewhat yellow at base and mostly red-veined: leaves palmately trifoliate.

**O. Oregana.** Nutt. T. & G. Fl. i, 211. Villous with spreading hairs: leaves and scapes clustered at the end of the short lateral scaly branchlets of long creeping rootstocks: petioles 2-6 inches high: leaflets broadly obovate 1-2 inches wide, smooth above: scapes not longer than the petioles, 2-bracted above the middle, 1-flowered: sepals oblong-ovate rounded at the apex: petals oblong-obovate entire or emarginate, 6 lines long, white with purple veins: capsule globose, 2 or 3 lines in diameter, its cells 1-2-seeded. In moist places and along streams in dense forests, Puget Sound to California.

**O. trillifolia** Hook. Fl. i, 118. Glabrous or the underside of the leaves and inflorescence minutely pubescent: scapes and few leaves from the end of a short, branching, fleshy-scaly rhizome: petioles 4-12 inches high: leaflets broadly obovate,  $\frac{1}{2}$ -2 inches broad: scapes longer than the petioles, terminating in a few-flowered umbel of white flowers on short peduncles: sepals oblong-lanceolate, acute, 2 lines long: petals broadly obovate, deeply emarginate, 6 lines long: capsule linear, 6-8 lines long with an acuminate beak half its length: carpels about 6-seeded. Along mountain streams in dense forests: Puget Sound to California.

\*\* Caulescent perennials, with trifoliate leaves and yellow flowers.

**O. Suksdorffii** Trelease Mem. Bost. Nat. Hist. Soc. iv, 89. More or less villous throughout: stems erect, slender, 4-12 inches high: leaflets digitate-obovate with unequal lobes: peduncles scarcely longer than the petals: 1-3-flowered: sepals oblong-lanceolate, acute, densely villous at the base: petals yellow, 6-8 lines long, thrice as long as the sepals, attached to the other near the base: wavy-margined, not emarginate: styles shorter than the inner stamens: capsule nearly smooth, about twice the length of the sepals. On dry wooded hillsides, Oregon and Washington.

#### ORDER XX. BALSAMINACEÆ Dumort. Anal. Fam. 4

Succulent herbaceous plants with bland colorless juice, simple opposite or alternate leaves without stipules and imbricate axillary flowers. Sepals 5, imbricate in the bud, deciduous the two upper usually connate, the lowest spurred or gibbous. Petals hypogynous, usually 4, and united by pairs, rarely 5, and distinct. Stamens 5, hypogynous; with subulate filaments and 2-celled anthers. Ovary 5-celled with the placentae in the axis, ovules few to many in each cell, suspended. Stigma sessile, distinct or more or less united. Capsule 5-celled, the dissepiments usually disappearing, 5-valved, with several or many tropous seeds in each cell. Seeds without albumen. Embryo straight: cotyledons plano-convex.

1 IMPATIENS L. Gen. n. 1008.

Ours glabrous annuals with alternate leaves and transverse stems. Sepals apparently only 4 from the union of the two

per ones. Petals the lower to the united at the projections of and are connate often 1-celled

**I. pallida** Nutt. leaves oval or cordate peduncles 2-4-flowered petals, broader yellow sparingly northward and

**I. fulva** Nutt. ovate coarsely 5-lobed: lower sepal broad) with a numerous reddish

#### ORDER XXI.

Shrubs or trees with or no stipules: petals 4-5, united at the base. Petals inserted by a long beak in the bud with them imbricate fleshy disk. The disk, 2-5 lines long, each cell. Seeds numerous.

1. **Eunonymus** colored: seeds

2. **Pachystima** colored. E

1

Shrubs with succulent stipuloidous stipules. Sepals many, very short. Capsule 2-6-celled, often without aril.

**E. occidentalis** 7-15 feet high, oblong-lanceolate peduncles slender the parts in five Puget Sound to

per ones. Petals 4, apparently only 2 from the union of each of the lower to each of the lateral ones. Filaments 5, more or less united at the apex. Cells of the ovary formed by membranous projections of the placenta which occupy the axis of the ovary and are connected with its apex by 5 slender threads. Capsule often 1-celled by the disappearance of the dissepiments.

1. *pallida* Nutt. Gen. 1, 146. Stems 2-5 feet high, much branched: leaves oval or ovate, coarsely and obtusely serrate with mucronate teeth: peduncles 2-4-flowered: lower sepal obtusely conic, dilated, shorter than the petals, broader than long with a very short recurved spur: flowers pale yellow sparingly punctate. Near the Coast from the Columbia river northward and east to the Atlantic States.

1. *fulva* Nutt. l. c. Smaller, with smaller flowers: leaves rhombic-ovate coarsely and obtusely serrate, teeth mucronate: peduncle 2-4-flowered: lower sepals acutely conic, longer than the petals, (longer than broad) with a rather long resupinate spur: flowers deep orange with numerous reddish-brown spots. Same range as the preceding.

ORDER XXI. CELASTRACEÆ Lindl. Nat. Syst. ed. 2, 119.

Shrubs or trees with simple or undivided leaves with small or no stipules and small, usually perfect regular flowers. Sepals 4-5, united at base imbricate in the bud, usually persistent. Petals as many as the sepals and alternate with them, inserted by a broad base under the margin of the disk, imbricate in the bud. Stamens as many as the petals and alternate with them inserted on the margin or upper surface of the flat, fleshy disk. Ovary more or less immersed in and adhering to the disk, 2-5-celled with 1-several erect or ascending ovules in each cell. Styles and stigmas 2-5; distinct or combined into one. Seeds anatropous, often arilled.

1. *Euonymus*. Flowers rather conspicuous. Ovary 3-5-celled: fruit colored: seeds in a bright red arill: deciduous shrubs.
2. *Pachystima*. Flowers very small: ovary 2-celled: fruit small, not colored. Evergreen undershrubs.

1 EUONYMUS Tourn. Inst. t. 388 L. Gen. n. 271.

Shrubs with 4-angled branches, opposite leaves with small, deciduous stipules and small flowers in axillary 1-many-flowered cymes. Sepals and petals 4 or 5, widely spreading. Stamens as many, very short, on a broad angular disk. Style short or none. Capsule 2-6-lobed and 3-5-valved. loculicidal, coriaceous, colored, often warty. Seeds 1-4 in each cell, covered with a fleshy red arill.

*E. occidentalis* Nutt. T. & G. Fl. i, 258. A smooth straggling shrub 7-15 feet high, with slender greenish branches: leaves smooth, ovate to oblong-lanceolate, acuminate, serrulate, 2-4 inches long, on short petioles: peduncles slender 1-4-flowered: flowers dark brown, 4-6 lines in diameter, the parts in fives: fruit smooth, deeply lobed. Along mountain streams, Puget Sound to California.

## 2 PACHYSTIMA Raf. Am. Month. Mag. 1818.

Low evergreen shrubs with opposite leaves, and small flowers in 1-few-flowered axillary cymes. Calyx with a short obconical tube and four rounded lobes. Petals 4. Stamens 4, inserted at the edge of the broad disk which lines the calyx-tube. Ovary free, 2-celled: style very short: capsule 2-valved, 1-2-seeded. Seeds enclosed in a white, many-cleft membranous aril.

**P. Myrsinites** Raf. l. c. Densely branched to nearly simple, 1-3 feet high: leaves smooth, ovate to lanceolate, cuneate at base, the upper half serrate or serrulate,  $\frac{1}{2}$ -1 in. h long on very short peduncles: flowers a line or two long: fruit 2 lines long, smooth. In the mountains, from Brit. Columbia to California and the Rocky Mountains.

## ORDER XXII. RHAMNACEÆ Dumort. Fl. Belg. 102.

Trees or shrubs, the branches often thorny. Leaves simple with minute stipules. Flowers small, sometimes by abortion dioecious, monoecious or polygamous. Calyx 4-5-cleft, valvate in the bud. Petals distinct, cucullate, (each wrapped around a stamen) narrowed at base, inserted upon the throat of the calyx, sometimes wanting. Stamens as many as the lobes of the calyx and alternate with them. Ovary 2-4, united carpels, 2-4-celled, free from or usually cohering with the tube of the calyx or more or less immersed in the fleshy perigynous disk: ovules solitary, erect. Styles more or less connate: stigmas simple usually distinct. Fruit free or commonly more or less cohering with the calyx, fleshy and indehiscent or with the carpels dry and at length separable. Seeds erect, anatropous, with a large, straight embryo in sparing fleshy albumen.

1. **Rhamnus.** Calyx and disk free from the ovary: calyx-lobes erect or spreading: fruit berry-like.
2. **Ceanothus.** Calyx and disk adnate to the base of the ovary: calyx-lobes connivent. Fruit dry or nearly so.

## 1 RHAMNUS L. Gen. n. 265 in part.

Shrubs or small trees with alternate petioled pinnately veined leaves, small deciduous stipules and axillary cymose or racemose flowers. Flowers perfect or polygamo-dioecious. Calyx 4-5-cleft, with erect or spreading lobes, the campanulate tube lined with the disk and persistent. Petals 4 or 6 or more, inserted on the margin of the disk: claws short. Stamens 4 or 5: filaments very short. Ovary free, 2-4-celled: style short, 3-4-cleft. Fruit baccate, containing 2-4 cartilaginous 1-seeded nutlets, mostly indehiscent.

§ 1 RHAMNUS Brongn. Ann. Sc. Nat. x, 360. Seeds and nutlets deeply sulcate or concave on the back, the raphe in the hollow: flowers mostly dioecious, solitary or fascicled in the axils.

**R. alnifolia** L'Her. Sert. Angl. 5. Shrub 2-4 feet high: leaves deciduous, ovate-oblong, acute at each end or acuminate, 2 or 3 inches long, crenately serrate, the slender petioles slightly puberulent: lobes of the



**MYSTIMA.**  
**AMNUS.**

Small flowers  
obconical  
inserted at  
base. Ovary  
1-2-seeded.  
fil.

Simple, 1-3 feet  
at base, the  
peduncles:  
mountains,

g. 102.

Leaves simple  
obovate in the  
(a stamen)  
calyx, some-  
calyx and  
lobes, free  
or more or  
erect, erect.  
ly distinct.  
the calyx,  
length sep-  
ht embryo

lobes erect or  
ovary: calyx.

Leaves veined  
or racemose  
x 4-5-cleft.  
lined with  
erect on the  
ments very  
Fruit bac-  
ostly inde-

lobes and nut-  
lobes in the  
lobes in the

leaves decid-  
inches long,  
lobes of the



