FLORA OF THE BLACK HILLS

Keys to Genera, Species, Subspecies, and Varieties

Robert D. Dorn

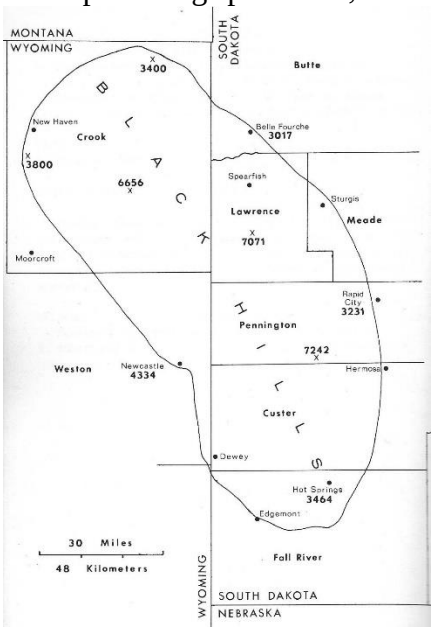
Update of January 2021

It is always desirable to have identification keys available for the smallest area one is working in rather than to have to labor through keys covering a larger area, whether a state, region, or nation. My keys for the Black Hills which appeared in 1977 are long out of date. This update has eliminated about 70 species which were reported earlier for the Black Hills but have never been documented with a specimen or reliable literature source. About 180 species have been added to the Black Hills flora since 1977. A high percentage of recent new reports for which specimens could be examined turned out to be misidentified. There are other reports for which I was unable to examine specimens. Some of these may be valid but are not included here (see Appendix). For this update I have chose not to include any descriptions, habitats, nor locations to keep the treatment compact and easily available to all who wish to use it. Detailed descriptions can be found in "Flora of the Great Plains" and in "Flora North America" which is online. I have not attempted to evaluate name changes that appear in "Flora North America". These are mostly followed but some are not for various reasons which may include nomenclatural problems or a differing use of ranks. The latter names can usually be easily cross-referenced. In addition, I may recognize varieties that these treatments do not. There are plenty of examples of varieties being very distinct in one area and totally and hopelessly intergradient in other areas. If I thought they might be useful, I have included them. If they are not relevant or significant for your purposes, they can simply be ignored. Normally I use the rank of variety for infraspecific taxa and occasionally the rank of subspecies for a related group of varieties. A few species lack a validly published name for their varieties, but have valid subspecies names. Rather than validate new varietal names, I have simply used the subspecies names in these few cases. Collection locations can often be found in herbaria databases online such as that for the Rocky Mountain Herbarium at the University of Wyoming.

Traditionally, keys have used the Family for the base unit or rank, with keys to genera and species under the respective families. Recent genetic work has recircumscribed many traditional families and more of these changes can be expected in the future. I have therefore eliminated all use of families although some of the group keys may correspond to families. Genera and species are a lot simpler to update than are families.

The actual area covered is shown on the map below.

R. Dorn
January 2017
(Updated January 2021, thanks to Ernie Nelson, Mark Gabel, Cheryl Mayer, and Beth Burkhart for searching for or providing specimens, and to Jeff Hansen for bringing records and corrections to my attention.)

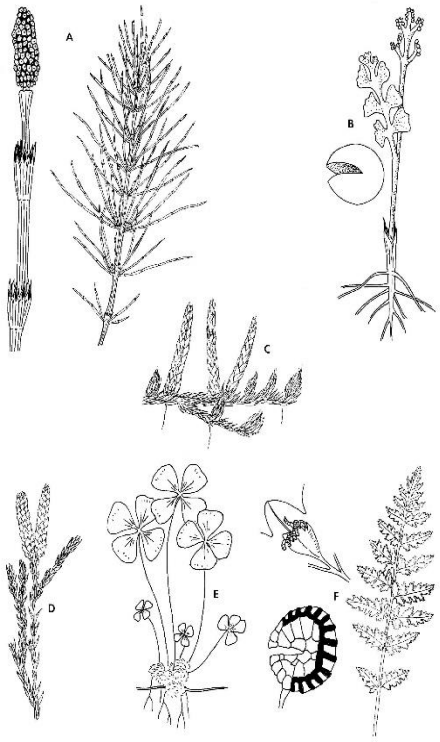


Key to the Major Groups

1. Disseminules spores; plants never having flowers or seeds; ferns, horsetails, club mosses, and other pteridophytes **PTERIDOPHYTES** below
1. Disseminules seeds; plants often having flowers; conifers and flowering plants
  2. Ovules and seeds mostly borne on the surface of scales, the scales aggregated into a cone, occasionally the cone is fleshy and berry-like; evergreen trees and shrubs with needle-like or scale-like leaves; conifers **GYMNOSPERMS** page 2
  2. Ovules and seeds enclosed in an ovary or fruit; trees, shrubs, vines, and herbs; leaves only rarely as above **ANGIOSPERMS** page 2

Keys to Genera

PTERIDOPHYTES



A. *Equisetum arvense*, B. *Botrychium lunaria*, C. *Selaginella densa*, D. *Lycopodium dendroideum*, E. *Marsilea vestita*, F. *Cystopteris fragilis*.

1. Stems jointed and grooved lengthwise, each joint covered by a sheath which surrounds the stem, the sheath and its terminal teeth, if any, representing the leaves **Equisetum**
1. Stems not jointed or grooved lengthwise, sheaths lacking, leaves usually well developed
  2. Leaves like a four-leaf clover, the 4 leaflets on a petiole to 15cm long from a creeping rhizome **Marsilea**
  2. Leaves not as above
    3. Leaves simple, sessile, often scale-like, less than 2cm long; plants mostly moss-like or like young conifers
      4. Strobili 4 sided; leaves usually with ligules **Selaginella**
      4. Strobili cylindrical; leaves without ligules
        5. Leaves of branches mostly in 6-8 longitudinal rows, all alike; upper vegetative branches round **Lycopodium**
        5. Leaves of branches in 4 longitudinal rows, those of the upper and lower surfaces of branch mostly unlike the marginal; upper vegetative branches usually flattened or wing-margined **Diphasiastrum**
    3. Leaves not as above; mostly fern-like plants
      6. Sporangia lacking an annulus, on a specialized branch appearing to be continuous with the main stalk or appearing to arise from near the base of a vegetative leaf; roots thick, fleshy, and radially spreading; stems and petioles lacking scales **Botrychium**
      6. Sporangia with an annulus, usually on the underside of vegetative-like leaves, the leaves sometimes slightly modified, rarely on a different-appearing specialized leaf arising directly from the rhizome; roots not thick, fleshy, and radially spreading; stems and petioles often bearing scales
        7. Leaves with 1-5 linear leaflets at tip and appearing grass-like **Asplenium**
        7. Leaves not as above
          8. Leaves of 2 kinds, the vegetative wider than the fertile, the fertile with bead-like or rolled segments
            9. Vegetative leaves widest at or near base
              10. Fertile leaves with bead-like segments, shorter than the vegetative, the vegetative once compound or nearly so **Onoclea**
              10. Fertile leaves with rolled segments, longer than the vegetative, the vegetative twice compound **Cryptogramma**
            9. Vegetative leaves widest at middle **Matteuccia**
          8. Leaves usually all similar or nearly so
            11. Sori near the leaflet margins, appearing elongate, usually at least partly covered by the rolled or reflexed leaflet margins (lower leaf surface rarely obscured by woolly hairs)
              12. Leaves scattered along a horizontal rhizome, petioles green or yellow, sori mostly continuous around rolled leaflet margin; plants mostly in damp or well-drained soil and over 25cm high, often in large colonies **Pteridium**
              12. Leaves densely clustered, or if scattered along a rhizome, then petioles reddish-brown or purplish and sori discontinuous and covered by reflexed tips of leaflet lobes; plants mainly in rock crevices and mostly less than 25cm high, seldom in large colonies
                13. Sori discontinuous and covered by reflexed tips of leaflet lobes; leaflets glabrous **Adiantum**
                13. Sori appearing continuous around the leaflet margin, covered by the rolled margin; leaflets often hairy
                  14. Ultimate segments of leaves mostly over 5mm long; leaves glabrous or sparsely hairy beneath **Pellaea**

14. Ultimate segments of leaves much less than 5mm long; leaves woolly-hairy beneath **Cheilanthes**

11. Sori on or along veins between leaflet or segment margin and its midrib, mostly round in outline but sometimes elongate; leaflet margins usually flat, rarely rolled

15. Sori round in outline, indusia lacking; leaves simply pinnatifid or once compound with leaflets broadest at very base and nearly confluent **Polypodium**

15. Sori elongate in outline, or if round, then either indusia present or the leaves at least nearly twice compound or both

16. Sori elongate in outline (sometimes curved)

17. Leaves once compound, mostly less than 3cm wide **Asplenium**

17. Leaves at least twice compound, mostly 8cm or more wide **Athyrium**

16. Sori round in outline

18. Indusia present

19. Indusia mostly under the sori and divided into hair-like segments, or else covering sori like hoods from below

20. Indusia attached at center of sori, split into narrow, spreading segments; leaves clustered with persistent, old petiole bases; veins of lowest primary leaflet usually not prominent to margin **Woodsia**

20. Indusia attached toward the side of sori, covering sori like hoods which bend back at maturity; leaves scattered or in small clusters without persisting petiole bases; veins of lowest primary leaflet usually prominent to margin **Cystopteris**

19. Indusia mostly above sori, round or kidney-shaped in outline or nearly so, sometimes with a cleft on one side

21. Indusia with a cleft on one side; leaves at least nearly twice compound, elliptic or lanceolate

22. Leaves densely clustered, glabrous **Dryopteris**

22. Leaves scattered along a creeping rhizome, usually at least slightly hairy beneath **Thelypteris**

21. Indusia without a cleft; leaves once or occasionally twice compound, narrowly elongate **Polystichum**

18. Indusia lacking

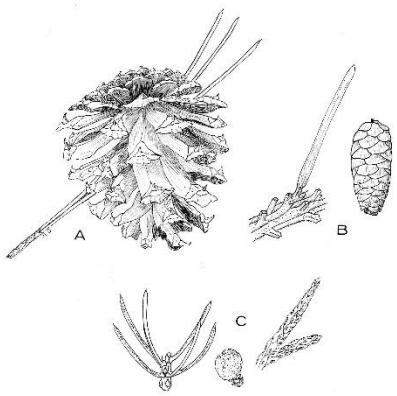
23. Leaf blades broadly triangular; leaves scattered, without persisting petiole bases **Gymnocarpium**

23. Leaf blades elliptic to lanceolate; leaves usually crowded, sometimes with clustered, persistent petiole bases

24. Leaves clustered with persistent, old petiole bases; veins of lowest primary leaflet usually not prominent to margin **Woodsia**

24. Leaves scattered or in small clusters without persisting petiole bases; veins of lowest primary leaflet usually prominent to margin **Cystopteris**

GYMNOSPERMS



A. *Pinus ponderosa*, B. *Picea glauca*, C. *Juniperus communis* at left, *Juniperus scopulorum* at right.

1. Leaves scale-like and opposite, or needle-like and whorled; seed-bearing cones berry-like; trees or shrubs **Juniperus**

1. Leaves linear or needle-like, spirally arranged or in clusters of 2-5; seed-bearing cones woody or subwoody; trees

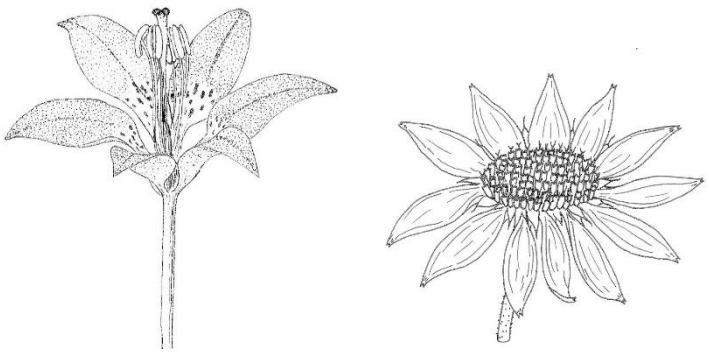
2. Leaves 3cm or more long, borne in clusters of 2-5 **Pinus**

2. Leaves 2.5cm or less long, borne singly

3. Leaves sharp-pointed, somewhat 4 sided; twigs rough with short pegs where leaves have fallen off; ovulate cones without protruding bracts from between scales **Picea**

3. Leaves blunt at tip, flattened; twigs relatively smooth where leaves have fallen off; ovulate cones with 3 lobed bracts protruding from between scales **Pseudotsuga**

ANGIOSPERMS



Lilium philadelphicum left, *Helianthus annuus* right

1. Plants submerged or floating-leaved aquatics, usually limp out of water (avoid temporarily flooded terrestrial or emergent plants) **GROUP I** below
1. Plants emergent aquatics or terrestrial
2. Leaves mostly parallel-veined, simple, usually entire, rarely reduced to sheaths; flower parts in 3's or 6's (rarely 2's or 4's); vascular bundles scattered in stem; root system usually fibrous, rhizomatous, or bulbous; monocotyledonous herbs (rarely shrubby) **GROUP II** below
2. Leaves mostly net-veined (sometimes obscure), simple or compound, entire, toothed, or lobed, rarely lacking; flower parts usually in 2's, 4's, or 5's (rarely 3's) or the parts many; vascular bundles arranged in rings in the stem; root system various, often taprooted; dicotyledonous trees, shrubs, woody vines, or herbs, sometimes parasitic
3. Plants trees, shrubs, or woody vines, woody throughout **GROUP III** p. 4
3. Plants herbaceous or woody only at base (woody plants with flowers will run here also)
4. Calyx or corolla or both lacking (calyx-like involucre sometimes present but this subtends several to many flowers) **GROUP IV** p. 7
4. Calyx and corolla present, rarely intergrading and the parts of each numerous (corolla sometimes deciduous in older flowers)
5. Petals separate to base (rarely united below ovary around a carpophore, or with a single whitish, blue, or purple petal) **GROUP V** p. 9
5. Petals united at least at base **GROUP VI** p. 11

GROUP I, aquatics

1. Plants thallus-like, free floating at water surface or below, mostly less than 10mm long but rarely to 25mm; stems and leaves not differentiated; duckweeds **Lemna**
1. Plants usually not free floating except when fragmented, usually over 10mm long; stems and leaves usually well differentiated
2. Leaves opposite or whorled on an elongate stem
3. Leaves whorled
4. Leaves compound or dichotomously divided **Myriophyllum**
4. Leaves simple
5. Leaves mostly 2-4 per node; flowers on peduncles usually in axillary spathes **Elodea**
5. Leaves mostly over 4 per node; flowers sessile in leaf axils **Hippuris**
3. Leaves opposite
6. Leaves about 1mm wide or less, mostly over 25mm long; stamen 1 **Zannichellia**
6. Leaves mostly wider or shorter or both; stamens 1-9
7. Leaves often 3 at lower nodes or flower nodes, linear; flowers peduncled or in peduncled spathes **Elodea**
7. Leaves 2 per node; flowers sessile or nearly so, rarely pediceled if with suborbicular leaves
8. Submerged leaves linear; floating leaves, if any, club-shaped to oval; fruit 2-4 seeded; stamen 1 **Callitriche**
8. Submerged leaves linear to spatulate or suborbicular; fruit many seeded; stamens 3-8
9. Leaves 10mm or less long, linear to spatulate; corolla of separate petals **Elatine**
9. Leaves mostly over 10mm long, obovate to suborbicular; corolla of united petals **Bacopa**
2. Leaves alternate or basal (rarely clustered and appearing opposite)
10. Leaves compound with thread-like divisions, lace-like
11. Leaves bearing scattered bladders, bladders rarely on leafless branches; corolla irregular **Utricularia**
11. Leaves without bladders; corolla regular **Ranunculus**
10. Leaves not as above
12. Leaves alternate on elongate stem
13. Leaves net-veined, either 3-5 parted, or entire and oval to lanceolate
14. Leaves 3-5 parted; pistils several per flower **Ranunculus**
14. Leaves entire; pistils solitary **Polygonum**
13. Leaves parallel-veined (rarely net-veined and linear), entire or finely toothed
15. Stipules lacking; leaves sheathing stem; staminate and pistillate flowers in separate globose heads **Sparganium**
15. Stipules often present, sometimes sheathing stem; leaves sheathing or not; flowers not as above
16. Flowers solitary in leaf axils, subtended by a spathe-like bract; perianth lobes 6; stamens 3; leaves with broadened blades on narrow petioles **Heteranthera**
16. Flowers 2 or more in a spike; perianth segments 4 or none; stamens 2 or 4; leaves with or without broadened blades
17. Flowers usually more than 2 per spike; stamens 4; fruits sessile or nearly so; leaves often over 1mm wide
18. Stipule sheaths of submersed leaves free from base of leaf blade, or if adnate, then adnate less than 1/2 the length of stipule; leaves linear or broader, (1)3 to many nerved **Potamogeton**
18. Stipule sheaths of submersed leaves adnate to base of leaf for 2/3 or more the length of stipule; leaves all linear, 1(3) nerved **Stuckenia**
17. Flowers often only 2 per spike (4 pistils each); stamens 2; fruits usually each long-stalked; leaves about 0.5mm wide **Ruppia**
12. Leaves mostly basal or nearly so
19. Leaves with lance-elliptic to elliptic-oblanceolate or oblong blades 15mm or less long on slender petioles; pistils solitary **Limosella**
19. Leaves usually not as above; pistils several per flower
20. Rhizomes or runners normally present; leaf blades 0.5-3.5(4)cm long, mostly lobed or toothed **Ranunculus**
20. Rhizomes or runners lacking; leaf blades 4-50cm long, margins usually entire or sagittately lobed
21. Flowers bisexual; ovaries in a circle on a flattened receptacle; leaves not sagittate **Alisma**
21. Flowers often unisexual; ovaries in a spherical head on a rounded receptacle; leaves usually sagittate **Sagittaria**

GROUP II, monocots

1. Flowers unisexual, either in dense cylindrical spikes at tip of stem, or in dense globose heads, the staminate spike or heads well differentiated from and above pistillate; perianth of bristles or 3-6 membranous scales
2. Flowers in cylindrical spikes; cattails **Typha**
2. Flowers in globose heads **Sparganium**
1. Flowers not as above
3. Flowers in axils of 1-4 chaffy bracts; perianth of bristles, minute scales, or none; leaves alternate, linear, sheathing stem, rarely reduced to sheath; grasses, sedges, and bulrushes
4. Flower subtended by 2 or more bracts; stem round or flat; leaf sheaths often split lengthwise **Grasses** p. 18
4. Flower subtended by 1 bract (rarely 2), pistillate flowers sometimes also enclosed in a perigynium; stem often triangular; leaf sheaths normally not split lengthwise **Sedge Group** p. 27
3. Flowers not as above; perianth of 6 scales or not of scales or bristles; leaves various
5. Ovary inferior; stamens 1-3; perianth evident
6. Flowers irregular; stamens 1 or 2 **Orchids** p. 24
6. Flowers regular; stamens 3
7. Leaves whorled at least in part; corolla white or greenish-white (rarely yellowish), mostly less than 5mm long **Galium**
7. Leaves equitant near base of stem; corolla at least partly of some shade of blue or purple, mostly over 6mm long
8. Flowers 5cm or more long **Iris**
8. Flowers much less than 5cm long **Sisyrinchium**
5. Ovary superior; stamens 1 to many; perianth sometimes lacking

9. Leaves opposite, 25mm or less long; flowers axillary; annuals
10. Sepals and petals 3; stamens 3 or 6; fruit a capsule with many seeds **Elatine**
10. Sepals and petals none (sometimes 1 or 2 bracts); stamens solitary; fruit a schizocarp splitting into 2 or 4 segments with 1 seed each **Callitriche**
9. Leaves mostly basal or alternate, rarely whorled or opposite, often over 25mm long; flowers axillary or not; annuals or perennials
11. Leaves along stem, not parallel-veined; styles 3; ovules 1 per ovary; fruit an achene; either leaves with sheathing stipules or flowers subtended by an involucre of united bracts **Buckwheat Group** p. 15
11. Leaves along stem or basal, parallel-veined; styles 0, 1, or 3; ovules often 3 or more per ovary; fruit usually a capsule, berry, or follicle; sheathing stipules and involucres of united bracts lacking
12. Perianth parts united well over half their length
13. Flowers in clusters from below ground, 5cm or more long; leaves all basal **Leucocrinum**
13. Flowers axillary, 4cm or less long; leaves alternate on stems
14. Leaves with long petioles; flowers solitary in leaf axils, subtended by a spathe-like bract; stamens 3 **Heteranthera**
14. Leaves sessile; flowers 1-3 in leaf axils, spathe-like bract lacking; stamens 6 **Polygonatum**
12. Perianth parts free or nearly so
15. Perianth with sepals and petals very different in size, shape, and/or color, the sepals usually green, the petals white to blue, purplish, or rose, the petals sometimes deciduous
16. Pistils mostly 10 to many, in a ring or globose head; flowers sometimes unisexual
17. Flowers bisexual; ovaries in a circle on a flattened receptacle; leaves not sagittate **Alisma**
17. Flowers often unisexual; ovaries in a spherical head on a rounded receptacle; leaves usually sagittate **Sagittaria**
16. Pistils solitary; flowers bisexual
18. Petals white (purplish) with a fringed circular or lunate gland on inner surface toward base; bulbous **Calochortus**
18. Petals blue or purplish to rose (white), lacking glands; fibrous rooted **Tradescantia**
15. Perianth with parts all similar or nearly so
19. Flowers in terminal or axillary umbels, sometimes crowded into a head, especially if most flowers are replaced by bulblets
20. Plants climbing or trailing herbaceous vines bearing tendrils; flowers unisexual; leaves oblong-ovate to suborbicular **Smilax**
20. Plants mostly erect, without tendrils; flowers often bisexual; leaves linear or nearly so **Allium**
19. Flowers not in an umbel, often solitary or paired or in a raceme or panicle, sometimes subcapitate
21. Perianth 3cm or more long, greenish-white, orange, or reddish; fruit a capsule
22. Perianth greenish-white; leaves mostly basal, linear, stiff, sharp-pointed, 10-60cm long **Yucca**
22. Perianth orange or reddish; leaves partly whorled, linear to lanceolate, not stiff and sharp, 4-8cm long **Lilium**
21. Perianth 2cm or less long, variously colored; fruit a capsule, follicle, or berry
23. Perianth segments mostly chaffy and scale-like, greenish to brownish, 7mm or less long; fruit a capsule or follicle
24. Inflorescence a spike-like, bractless raceme; perianth 2mm or less long; anthers longer than filaments; fruit a follice with 1 to 6 seeds **Triglochin**
24. Inflorescence usually not as above; perianth 1.5-7mm long; anthers often shorter than filaments; fruit a capsule with 3 to many seeds
25. Seeds and ovules many; leaf sheaths mostly open **Juncus**
25. Seeds and ovules 3; leaf sheaths closed **Luzula**
23. Perianth segments mostly petal-like, variously colored or white, occasionally over 7mm long; fruit a capsule or berry
26. Styles 3; fruit a capsule
27. Perianth purplish-green to brownish, mottled, flowers nodding; plants with worty-like bulbs **Fritillaria**
27. Perianth white to cream or greenish, flowers usually not nodding; plants with mostly non-warty bulbs **Zigadenus**
26. Styles solitary, or at least the lower half united into 1, sometimes obsolete with sessile stigmas; fruit a berry
28. Leaves, or apparent leaves, needle-like or scale-like, 1-20mm long, about 0.2mm wide; stems much branched **Asparagus**
28. Leaves larger; stems usually simple or few branched
29. Flowers in a terminal raceme or panicle; perianth 1-7mm long **Maianthemum**
29. Flowers mostly 1 or 2 in leaf axils or at ends of branches; perianth 7-15mm long
30. Flowers axillary **Streptopus**
30. Flowers terminal on stem branches **Prosartes**

GROUP III, woody plants

1. Plants vines or twining shrubs
2. Leaves and branches alternate (ignore tendrils and flower stalks)
3. Tendrils present; leaves lobed or compound
4. Leaves simple, palmately lobed **Vitis**
4. Leaves palmately compound with 5-7 leaflets **Parthenocissus**
3. Tendrils lacking; leaves toothed **Celastris**
2. Leaves and branches opposite or whorled
5. Leaves compound **Clematis**
5. Leaves simple
6. Leaves lobed or toothed, long petioled **Humulus**
6. Leaves entire and sessile, or nearly so **Lonicera**

1. Plants trees or shrubs, not twining although sometimes prostrate or scrambling
7. Leaves palmatifid with mostly 3-5 linear, spinulose-tipped segments, also with axillary clusters of often simple linear leaves **Linanthus**
7. Leaves not as above
8. Leaves and branches opposite (rarely subopposite) **Series III-A**
8. Leaves and branches alternate (rarely in fascicles or densely clustered at base)
9. Leaves compound **Series III-B**
9. Leaves simple (rarely with a pair of nearly distinct basal lobes)
10. Leaves scale-like, mostly about 1mm long and overlapping, resembling a juniper **Tamarix**
10. Leaves not as above
11. Plants with spines, thorns, prickles, or spine-tipped branches **Series III-C**
11. Plants lacking spines, thorns, prickles, or spine-tipped branches
12. Leaves or their much divided segments mostly 3mm or less wide, 5-20 times as long as wide **Series III-D**
12. Leaves mostly over 3mm wide, less than 10 times as long as wide
13. Leaf margins entire or nearly so **Series III-E**
13. Leaf margins toothed or lobed, sometimes slightly so **Series III-F**

Series III-A, woody plants, leaves opposite

1. Leaves compound
2. Pith of older (and often younger) stems over half the diameter of stem; leaves pinnately compound; fruit a berry; shrub **Sambucus**

2. Pith of older stems usually less than half the diameter of stem; leaves pinnately or palmately compound; fruit a samara or achene; tree or shrub
3. Plants shrubs to 3dm high; sepals blue, 15-50mm long; fruit an achene **Clematis**
3. Plants trees or shrubs mostly over 3dm high; sepals not blue, less than 15mm long; fruit a samara
4. Leaflets mostly 3 or 5, margins usually lobed or with a few large teeth; bundle scars 3; fruit an asymmetrical samara, usually paired **Acer**
4. Leaflets mostly 5 or 7, margins entire to toothed; bundle scars more than 3; fruit a symmetrical single samara **Fraxinus**

1. Leaves simple
5. Leaves, or some of them, with 3-5 primary lobes **Viburnum**
5. Leaves lacking lobes (rarely sinuately lobed)
6. Leaves toothed
7. Leaves conspicuously hairy on both sides, usually more so beneath
8. Hairs of leaves simple **Philadelphus**
8. Hairs of leaves stellate **Viburnum**
7. Leaves glabrous or with a few scattered hairs especially on margins
9. Leaves mostly over 4cm long, acuminate at tip **Viburnum**
9. Leaves mostly less than 4cm long, not acuminate at tip, rarely short cuspidate
10. Branchlets glabrous or glabrate; plants often upright; flowers axillary **Rhamnus**
10. Branchlets hairy; plants creeping; flowers terminal **Linnaea**
6. Leaves entire or wavy-margined or rarely sinuately lobed
11. Leaves somewhat silvery or gray from scales at least beneath (sometimes dotted with brown scales also)
12. Leaves often dotted with brownish scales; plants usually 1m or more high; branches sometimes spine-tipped **Shepherdia**
12. Leaves lacking brownish scales; plants usually much less than 1m high; branches not spine-tipped **Atriplex**
11. Leaves not silvery or gray from scales
13. Year-old stems red; flowers in a terminal inflorescence; leaves usually with hairs attached near middle with the 2 ends free **Cornus**
13. Year-old stems not red (rarely so); flowers various; leaves without hairs as above
14. Corolla regular or merely bulged on 1 side near middle, 5-10mm long; fruit usually white, with 2 seeds or stones **Symphoricarpos**
14. Corolla irregular, either 2 lipped, or spurred or gibbous at base, (8)10-30mm long; fruit orange or reddish-orange with several seeds **Lonicera**

Series III-B, woody plants, leaves alternate, compound

1. Leaflets with spiny-toothed margins, the spines often about 1mm or more long **Mahonia**
1. Leaflets lacking spiny-toothed margins
2. Leaves divided into many mostly linear segments **Artemisia**
2. Leaves not as above, often with rather broad leaflets
3. Plants with spines or prickles, these sometimes small near base of buds
4. Leaflets lobed or toothed **Rose Group** p. 26
4. Leaflets entire (rarely minutely glandular-toothed) **Pea Group** p. 25
3. Plants lacking spines or prickles
5. Leaflets mostly 3-7
6. Plants trees with 5 or rarely 7 leaflets; fruit a nut **Carya**
6. Plants shrubs with 3-7 leaflets; fruit a drupe or achene
7. Leaflets 3-7, toothed or lobed or with wavy margins; fruit a drupe
8. Leaflets 3 or rarely 5, the lateral ones mostly over 3.5cm long and 2.5cm wide; mature fruits whitish, glabrous; Poison Ivy **Toxicodendron**
8. Leaflets more than 5, or if 3 or 5, the lateral ones mostly less than 3cm long and 2.5cm wide; mature fruits usually red or orange and hairy **Rhus**
7. Leaflets mostly 5, entire; fruit an achene **Dasiphora**
5. Leaflets mostly 9 or more
9. Leaflets entire, midrib usually prolonged to a short bristle **Amorpha**
9. Leaflets toothed, midrib usually not prolonged
10. Plants trees; leaflets minutely glandular-toothed **Gleditsia**
10. Plants shrubs; leaflets more conspicuously toothed
11. Stems somewhat soft, pith 1/2 to 2/3 their diameter; fruit covered with reddish or stellate hairs; leaflets somewhat glaucescent beneath; stamens 10 or fewer **Rhus**
11. Stems hard, pith less than 1/3 their diameter; fruit not covered with reddish or stellate hairs; leaflets usually not glaucescent beneath; stamens mostly (8)15-20(40)
12. Plants large shrubs; young twigs pubescent becoming glabrous; petals 5; fruit pomaceous **Sorbus**
12. Plants large trees; young twigs glandular-pubescent; petals none; fruit a nut **Juglans**

Series III-C, woody plants, spiny, leaves alternate, simple

1. Leaves entire
2. Leaves silvery or gray on 1 or both sides from scales or scale-like hairs
3. Leaves about the same color on both sides; shrubs mostly less than 1m high **Atriplex**
3. Leaves greenish above, silvery beneath; trees mostly well over 1m high **Elaeagnus**
2. Leaves not silvery or gray from scales, sometimes so from definite hairs
4. Leaves prominently palmately veined, lighter beneath than above, hairy **Ceanothus**
4. Leaves obscurely veined, about the same color on both sides or lighter beneath, hairy or glabrous
5. Leaves much lighter beneath than on upper side, oblanceolate to obovate; spines present at base of branches or buds **Berberis**
5. Leaves about the same color on both sides, linear to obovate; spines variable
6. Bundle scars prominent, usually 3; leaves mostly elliptic to obovate; fruit a red berry **Lycium**
6. Bundle scars usually obscure; leaves linear to obovate; fruit a utricle
7. Leaves linear, less than 4mm wide, subterete, fleshy **Sarcobatus**
7. Leaves flattened or wider, fleshy or not **Atriplex**

1. Leaves toothed or lobed
8. Leaves 3-5 palmately lobed; venation palmate **Ribes**
8. Leaves usually not lobed (rarely pinnately lobed); venation pinnate
9. Leaves often doubly toothed or lobed, at least near tip; styles 2-5; spines usually not bearing leaves, buds, or flowers; fruit a pome **Crataegus**
9. Leaves simply toothed; styles solitary; spines usually bearing leaves, buds, or flowers; fruit a drupe **Prunus**

Series III-D, woody plants, leaves alternate, simple, leaves or their segments very narrow

1. Leaves, or many of them, with 3 lobes at tip, silvery or gray hairy on both sides **Artemisia**
1. Leaves not as above

2. Bud scales solitary; mostly wet areas; willows **Salix**
2. Bud scales usually several or buds obscure; mostly dry areas
3. Leaves toothed; flowers solitary in leaf axils **Oenothera**
3. Leaves usually entire or lobed (or margins scabrous or ciliate); flowers terminal or axillary
4. Leaves and stems with long spreading hairs along with short, usually stellate hairs; flowers axillary **Krascheninnikovia**
4. Leaves, stems, and flowers not combined as above
5. Leaves gray or silvery on both sides from minute scales **Atriplex**
5. Leaves not gray or silvery, or if so, then from distinct hairs
6. Leaves somewhat green above, silvery or gray beneath, not filiform; venation on upper leaf surface obscure; flowers pedicelled; ovary superior **Eriogonum**
6. Leaves equally green, silvery, or gray on both sides, or venation on upper leaf surface prominent, or both, sometimes filiform; flowers sessile; ovary inferior **Sunflower Group** p. 28

Series III-E, woody plants, leaves alternate, simple, entire

1. Leaf margins usually rolled, hairy beneath
2. Stems and leaves with many distinct stellate hairs **Krascheninnikovia**
2. Stems and leaves without stellate hairs, the hairs often dense and tangled especially on underside of leaves
3. Hairs on underside of leaves white; petioles lacking or nearly so **Eriogonum**
3. Hairs on underside of leaves rusty; petioles 2-5mm long **Ledum**
1. Leaf margins usually flat, often not hairy beneath
4. Crushed leaves with a sage odor **Artemisia**
4. Crushed leaves lacking a sage odor
5. Bud scales solitary; flowers unisexual, in catkins; mostly wet areas; willows **Salix**
5. Bud scales more than 1 (rarely obscure or lacking); flowers not as above; wet or dry areas
6. Plants mostly woody near base only; stems and leaves covered with minute gray-mealy scales **Atriplex**
6. Plants not as above
7. Leaves with 3 prominent, somewhat parallel veins arising from nearly the same point near base of blade
8. Leaves lighter beneath; fruit a capsule **Ceanothus**
8. Leaves equally green on both sides; fruit an achene **Sunflower Group** p. 28
7. Leaves not as above
9. Leaves sharply acute at tip; plains and foothills, rarely higher
10. Leaves white-tomentose beneath, less so and greenish above, mostly lanceolate to oblanceolate, rarely linear **Eriogonum**
10. Leaves not white-tomentose beneath, or if so, then linear or equally tomentose above
11. Leaf blades broadly elliptic to ovate, lighter and hairy on underside; stamens usually about 20; fruit a pome with usually 2 nutlets **Cotoneaster**
11. Leaf blades usually narrower, color and pubescence variable; stamens usually 5; fruit an achene or berry
12. Leaves and/or twigs canescent or tomentose, or if not, the leaves 1-3mm wide; fruit an achene **Sunflower Group** p. 28
12. Leaves and twigs glabrous, the leaves 5mm or more wide; fruit a red berry **Lycium**
9. Leaves often obtuse or rounded at tip; often at higher elevations
13. Leaves either glandular-puberulent, or canescent or tomentose, about equally green (or silvery) on both sides **Sunflower Group** p. 28
13. Leaves not glandular-puberulent nor canescent or tomentose, or if so, distinctly lighter beneath
14. Leaves white-tomentose beneath, less so and greenish above; plains **Eriogonum**
14. Leaves not as above; often in the hills
15. Plants with linear-lanceolate to elliptic leaves which are silver-scaly on both sides but sometimes more so beneath; calyx 4 parted; fruit fleshy or drupe-like, 1 seeded **Elaeagnus**
15. Plants not as above
16. Leaf blades mostly 3cm or less long; fruit a capsule or berry **Blueberry Group** p. 14
16. Leaf blades mostly well over 3cm long; fruit a drupe **Frangula**

Series III-F, woody plants, leaves alternate, simple, toothed or lobed

1. Crushed leaves with a sage odor; many leaves with 3 lobes or teeth at tip **Artemisia**
1. Crushed leaves lacking a sage odor; leaves lobed or not
2. Leaves with 3 prominent, somewhat parallel veins arising from nearly the same point near base, not lobed, longer than wide **Ceanothus**
2. Leaves not veined as above or else lobed or the blades as wide as or wider than long
3. Plants trees with whitish bark; petioles hairy; leaves usually doubly toothed and nearly twice as long as wide; flowers borne in catkins **Betula**
3. Plants not as above
4. Plants mostly of wet areas (rarely in upland forests); bud scales solitary; flowers unisexual, in catkins; willows **Salix**
4. Plants not as above
5. Plants upright shrubs 0.5-3m high; leaves finely toothed, the teeth terminated by, or reduced to, short bristles (not sessile glands) which may be gland-tipped; leaves lighter beneath than above; young twigs glandular-pubescent **Blueberry Group** p. 14
5. Plants not as above
6. Plants often in moist areas; twigs usually roughened with blister-like resinous bumps; leaves often glandular-dotted; flowers in catkins **Betula**
6. Plants not as above
7. Leaf blades, or many of them, asymmetrical at base, 1 side extending lower than the other; twigs of year often hairy; petioles usually hairy; fruit a samara or drupe
8. Leaves usually with 9 or more pair of prominent lateral veins; flowers bisexual; fruit a samara **Ulmus**
8. Leaves usually with less than 8 pair of prominent lateral veins; some or all flowers unisexual; fruit a drupe **Celtis**
7. Leaf blades symmetrical at base or nearly so (except rarely when lobed); twigs, petioles, and fruit various
9. Leaves cordate or subcordate at base, usually acute at tip, definitely longer than wide, not lobed but often doubly toothed; twigs often hairy; fruit a nut or nutlet
10. Plants usually tree-like; fruit a nutlet 6mm or less long, enclosed in a bladdery involucre; pistillate inflorescence elongate, bearing several to many nutlets **Ostrya**
10. Plants usually shrub-like; fruit a nut usually over 6mm long, enclosed in a tightly appressed, beaked involucre; pistillate inflorescence bearing usually only 1 or 2 nuts **Corylus**
9. Leaves usually not as above; twigs and fruit various
11. Trees bearing catkins; buds often sticky with resin; leaves elliptic or lanceolate to deltoid or suborbicular, not lobed unless white or gray tomentose beneath; aspen and cottonwoods **Populus**
11. Trees or shrubs with or without catkins; buds usually not sticky; leaves never deltoid unless lobed
12. Leaves 5cm or more long, pinnately lobed or parted, not toothed or with broad rounded teeth; fruit an acorn; oaks **Quercus**

12. Leaves often shorter, mostly palmately lobed or not lobed (rarely with a single pair of basal lobes), toothed or not; fruit not an acorn
13. Petals none; fruit a samara; leaves elliptic to lanceolate, doubly toothed; trees **Ulmus**
13. Petals present or rarely none; fruit not a samara; leaves various; trees or shrubs
14. Stamens usually 5; ovary 1 celled; ovules or seeds several to many; fruit a berry; leaves usually 3-5 palmately lobed **Ribes**
14. Stamens either not 5 or plants without above combination of characteristics
15. Leaves sessile or nearly so, linear to oblanceolate, less than 8mm wide, mostly serrulate, usually hairy; flowers solitary, axillary; ovary inferior; plants of rather dry, open areas **Oenothera**
15. Leaves and flowers not as above
16. Plants with leaf blades mostly ovate to obovate,some usually over 4cm long, toothed to near base, not lobed; flowers in axillary inflorescences; fruit usually a drupe or capsule; spur shoots never present; bud scales hairy
17. Leaves with 3 prominent, longitudinally running veins arising from nearly the same point at base of leaf blade (palmately veined), sometimes with lateral veins also; fruit a capsule **Ceanothus**
17. Leaves with a prominent midrib and the other prominent veins lateral ascending from all along midrib (pinnately veined); fruit a drupe **Rhamnus**
16. Plants not as above
18. Buds covered with 2 outer symmetrical scales, these glabrous; leaves not lobed; ovary inferior; fruit a berry **Vaccinium**
18. Buds with more than 2 outer scales, often hairy; leaves lobed or not; ovary inferior or not; fruit various
19. Plants introduced trees; some leaves often lobed and cordate or subcordate at base, crenate-serrate; flowers unisexual in catkins or a dense spike **Morus**
19. Plants not as above **Rose Group** p. 26

GROUP IV, calyx or corolla or both lacking

1. Flowers in dense heads subtended by an involucre, the head usually appearing like a single flower (rarely 1 flower per head); ovary inferior; stamens united by their anthers (rarely free); flowers sometimes unisexual (see figure p. 28) **Sunflower Group** p. 28
1. Flowers not in heads or lacking the other characteristics
2. Plants woody trees or shrubs **Series IV-A**
2. Plants herbs, or semi-shrubs woody only at base, or vines
3. Plants woody vines with alternate, either palmately compound or cordate simple leaves and tendrils
4. Leaves simple, palmately lobed **Vitis**
4. Leaves palmately compound with 5-7 leaflets **Parthenocissus**
3. Plants not as above (herbaceous and some other vines run here)
5. Plants usually with milky juice; inflorescence appearing like a flower, consisting of a cup-shaped involucre with 4 teeth or lobes, each involucre subtending a stalked pistil and several to many stamens (see figure under species key); involucres solitary, or clustered and axillary, or in cymes **Euphorbia**
5. Plants not as above
6. Middle and lower leaves opposite or whorled **Series IV-B**
6. Middle and lower leaves alternate or leaves all basal or nearly so **Series IV-C**

Series IV-A, calyx or corolla or both lacking, woody trees or shrubs

1. Leaves compound
2. Sepals blue, 15-50mm long; shrubs to 3dm high **Clematis**
2. Sepals not blue, less than 15mm long; trees or shrubs mostly over 3dm high
3. Leaves alternate
4. Leaflets 5 or rarely 7 **Carya**
4. Leaflets 11 or more **Juglans**
3. Leaves opposite
5. Leaflets mostly 3 or 5; bundle scars 3 **Acer**
5. Leaflets mostly 5 or 7; bundle scars more than 3 **Fraxinus**
1. Leaves simple
6. Leaves and branches opposite or rarely subopposite
7. Perianth 4 lobed; stamens usually 8 **Shepherdia**
7. Perianth lobes and stamens mostly 5 **Atriplex**
6. Leaves and branches alternate
8. Leaves pinnately lobed; staminate flowers in catkins, pistillate solitary or few in a cluster **Quercus**
8. Leaves not pinnately lobed (rarely some appearing so); flowers various
9. Flowers in catkins or dense spikes
10. Branches spine-tipped; leaves less than 4mm wide, fleshy **Sarcobatus**
10. Branches not spine-tipped; leaves mostly over 4mm wide, not fleshy
11. Ovary becoming a many-seeded capsule; seeds bearing long hairs
12. Bud scale 1; bracts subtending flowers usually entire; catkins mostly erect to spreading; stamens 2-8; trees or shrubs **Salix**
12. Bud scales more than 1; bracts subtending flowers usually fringed (often deciduous); catkins mostly pendulous; stamens 6 to many **Populus**
11. Ovary becoming a 1 seeded achene (sometimes aggregated), nut, nutlet, or samara; seeds without hairs
13. Fruit an aggregation of fleshy achenes; some leaves often lobed **Morus**
13. Fruit a nut, nutlet, or samara; leaves not lobed
14. Leaves usually cordate or subcordate at base; fruit a nut or nutlet enclosed by an involucre; staminate flowers lacking a calyx
15. Plants usually tree-like; fruit a nutlet 6mm or less long, enclosed in a bladdery involucre; pistillate inflorescence elongate, bearing several to many nutlets **Ostrya**
15. Plants usually shrub-like; fruit a nut usually over 6mm long, enclosed in a tightly appressed, beaked involucre; pistillate inflorescence bearing usually only 1 or 2 nuts **Corylus**
14. Leaves cordate or not at base; fruit a samara, not enclosed by an involucre; staminate flowers with a 2-4 parted calyx **Betula**
9. Flowers not in catkins or dense spikes
16. Leaf blades, or some of them, very asymmetrical at base, 1 side extending lower than the other, toothed; fruit a drupe or a samara which is winged all around
17. Leaves usually with 9 or more pair of prominent lateral veins; flowers bisexual; fruit a samara **Ulmus**
17. Leaves usually with less than 8 pair of prominent lateral veins; some or all flowers unisexual; fruit a drupe **Celtis**
16. Leaf blades symmetrical at base or nearly so, toothed or not; fruit various
18. Fruit a nut enclosed by a beaked involucre; leaves cordate or subcordate at base, serrate **Corylus**
18. Fruit and leaves not as above

19. Fruit a samara which is winged all around; some leaves doubly toothed, sometimes obscurely so **Ulmus**
19. Fruit not a samara; leaves not doubly toothed
20. Stamens many; style in fruit elongate, twisted, and plumose; leaves toothed at least toward tip **Cercocarpus**
20. Stamens usually about 5 or fewer; style not as above; leaves various
21. Leaves toothed, green **Rhamnus**
21. Leaves entire, often silvery or gray
22. Sepals and stamens 4; ovary sometimes appearing inferior; leaves silvery-scurfy at least beneath; flowers mostly bisexual **Elaeagnus**
22. Sepals and stamens only rarely 4; ovary superior; leaves various; flowers sometimes unisexual
23. Flowers in involucres; sepals petal-like; leaves hairy, hairs not stellate **Eriogonum**
23. Flowers not in involucres (pistillate sometimes each subtended by 2 at least partly united bracts); sepals not petal-like or lacking; leaves usually scurfy or glabrous or else hairy often with some stellate hairs
24. Leaves linear, less than 4mm wide, subterete, fleshy; some branches spine-tipped **Sarcobatus**
24. Leaves flattened or wider, fleshy or not; branches spine-tipped or not
25. Leaves densely stellate-hairy, linear or slightly wider with revolute margins **Krascheninnikovia**
25. Leaves not as above **Atriplex**

Series IV-B, calyx or corolla or both lacking, lower leaves opposite or whorled

1. Plants succulent annuals, stems jointed, branches opposite or whorled; leaves scale-like, pairs connate; flowers sunken in depressions of spikes **Salicornia**
1. Plants not as above
2. Pistils 2 to many; stamens usually more than 10 **Buttercup Group** p. 15
2. Pistils solitary; stamens mostly 10 or fewer except in a succulent perennial
3. Leaves whorled at least in part
4. Flowers sessile in leaf axils **Hippuris**
4. Flowers not in leaf axils, or if so, distinctly pediceled **Galium**
3. Leaves opposite
5. Plants dioecious, either vines with 3-5 lobed leaves, or annuals with palmately compound leaves
6. Leaves palmately compound; stems erect; annual **Cannabis**
6. Leaves simple, usually 3-5 lobed; stems twining; perennial **Humulus**
5. Plants not as above
7. Ovary at least partly inferior; flowers bisexual or pistillate
8. Ovary superior but appearing inferior by constriction of perianth tube; flower clusters subtended by 4-6 separate or united involucral bracts
9. Involucral bracts united about 1/3 or more their length **Mirabilis**
9. Involucral bracts separate to base or nearly so
10. Fruit with broad membranous wings at least as long as body of fruit; annual **Tripterocalyx**
10. Fruit with stout ribs or wings not extending to tip of fruit; wings usually not membranous; perennial **Abronia**
8. Ovary inferior; flower clusters usually subtended by no more than 2 bracts **Valeriana**
7. Ovary superior; flowers sometimes all staminate
11. Leaf margins conspicuously toothed; plants with sharp stinging hairs **Urtica**
11. Leaf margins mostly entire or wavy, rarely lobed or divided; plants lacking stinging hairs
12. Flowers unisexual
13. Flowers sessile or nearly so, solitary in leaf axils; stamen 1 **Callitriche**
13. Flowers not as above; stamens 3-5
14. Leaves gray or silvery from minute scales; flowers often pistillate; petals none **Atriplex**
14. Leaves not as above; flowers staminate; petals usually present, white or yellowish, rarely pink **Valeriana**
12. Flowers mostly bisexual
15. Flowers about 4mm long or less, each subtended by 3 scarious bracts and covered with dense woolly hairs; annual **Froelichia**
15. Flowers not as above; annual or perennial
16. Flower clusters subtended by 4-6 separate or united involucral bracts
17. Involucral bracts united about 1/3 or more their length **Mirabilis**
17. Involucral bracts separate to base or nearly so
18. Fruit with broad membranous wings at least as long as body of fruit; annual **Tripterocalyx**
18. Fruit with stout ribs or wings not extending to tip of fruit; wings usually not membranous; perennial **Abronia**
16. Flower clusters not subtended as above
19. Sepals separate at least to near base, mostly green or at least herbaceous, sometimes spinulose-tipped; stamens 3-10 **Chickweed Group** p. 16
19. Sepals united (or lacking), green or not, not spinulose-tipped; stamens 0-4
20. Stamens 4; perianth of either sepals or petals usually present **Ammannia**
20. Stamens 1 or none; perianth none (2 bracts sometimes present) **Callitriche**

Series IV-C, calyx or corolla or both lacking, lower leaves alternate or basal

1. Plants dioecious annuals; leaves palmately compound **Cannabis**
1. Plants not as above
2. Plants dioecious annuals, stellate-hairy; leaves simple, entire; sepals 5; stamens 8-12 **Croton**
2. Plants not as above
3. Plants annual, monoecious vines with tendrils; leaves simple, palmately lobed; stamens 3; ovary inferior **Echinocystis**
3. Plants not as above
4. Ovary partly or wholly inferior; some flowers bisexual or pistillate
5. Plants either with leaves all basal or nearly so with ovate, cordate, or reniform blades, or, stamens 10 and styles 2
6. Stamens 10
7. Leaf blades of at least the lower leaves suborbicular in outline **Saxifraga**
7. Leaf blades mostly obviously longer than wide **Micranthes**
6. Stamens 5 **Mitella**
5. Plants not as above
8. Rhizomes present; leaves entire **Comandra**
8. Rhizomes lacking or leaves not entire **Carrot Group** p. 15
4. Ovary superior or flowers all staminate
9. Pistils usually 2 to many (rarely solitary); stamens usually more than 10 (rarely deciduous) **Buttercup Group** p. 15
9. Pistils solitary (carpels rarely partly distinct); stamens 10 or fewer
10. Flowers perigynous; ovary and fruit often 2 lobed at tip

11. Stamens 10
12. Leaf blades of at least the lower leaves suborbicular in outline **Saxifraga**
12. Leaf blades mostly obviously longer than wide **Micranthes**
11. Stamens 5 **Mitella**
10. Flowers not perigynous (sometimes unisexual); ovary and fruit usually not lobed (sometimes slightly notched)
13. Plants with very irregular yellow, orange, or red flowers mostly 1-2.5cm long
14. Leaves dissected **Corydalis**
14. Leaves not dissected, merely toothed **Impatiens**
13. Plants without flowers as above
15. Stamens 2; filaments usually purple or red, 5mm or more long; calyx 2-4 lobed **Synthyris**
15. Stamens and calyx not combined as above
16. Stipules completely sheathing stem at nodes, at least in inflorescence **Buckwheat Group** p. 15
16. Stipules usually lacking
17. Styles and stigmas solitary; calyx 4 lobed or parted
18. Flowers, or some of them, unisexual; ovary 1 celled with 1 ovule **Parietaria**
18. Flowers bisexual; ovary 2 celled with 1 ovule per cell **Lepidium**
17. Styles or stigmas 2 or more (style rarely 1 if stellate-hairy perennial with 3 or 5 sepals); calyx only rarely in 4's
19. Flowers subtended by small involucres of united bracts; calyx often petal-like or with its parts in 2 whorls **Eriogonum**
19. Flowers not subtended by involucres, often subtended by separate bracts (or each flower subtended by 2 united bracts); calyx usually not as above
20. Plants taprooted perennials; petals 5, white or pinkish, 3-7mm long; sepals 2 but deciduous; leaves linear, subterete, clustered near base of plant **Phemeranthus**
20. Plants not as above
21. Perianth (rarely lacking) and usually the bracts scarious at least on margins, often with spinulose tips; annuals; leaves not gray-mealy nor succulent, some usually over 5mm wide, not stellate-hairy **Amaranthus**
21. Perianth (sometimes lacking) and bracts often herbaceous, usually without spinulose tips; annuals or perennials; leaves often gray-mealy or succulent, or all narrower than 5mm, or stellate-hairy
22. Plants perennial, either stellate-hairy or strigose; flowers bisexual; sepals 3 or 5; style 1, or none with 3 plumose stigmas; leaves never fleshy
23. Plants stellate-hairy; petals 5, yellow, conspicuous but deciduous **Crocanthemum**
23. Plants strigose; petals 3, reddish, inconspicuous **Lechea**
22. Plants without the above combination of characteristics **Goosefoot Group** p. 17

GROUP V, calyx and corolla present, petals separate

1. Plants woody trees, shrubs, or vines, woody throughout **Series V-A**
1. Plants herbaceous or sometimes woody only at base
2. Corolla irregular (rarely with a single white to ochroleucous or purple to blue petal) **Series V-B**
2. Corolla regular or nearly so
3. Plants dioecious, stellate-hairy annuals; leaves alternate, simple, entire **Croton**
3. Plants not as above
4. Stamens more than 10 (rarely deciduous but then with more than 10 pistils) **Series V-C**
4. Stamens 10 or fewer or flowers all pistillate **Series V-D**

Series V-A, calyx and corolla present, petals separate, woody plants

1. Leaves compound
2. Leaves opposite
3. Plants vines (rarely shrubby and less than 3dm high) **Clematis**
3. Plants trees over 5dm high (unless seedlings) **Acer**
2. Leaves alternate (ignore tendrils)
4. Plants vines with tendrils **Parthenocissus**
4. Plants not vines with tendrils
5. Leaflets with spine-tipped teeth, the spines mostly over 1mm long **Mahonia**
5. Leaflets without spine-tipped teeth
6. Stamens more than 10 **Rose Group** p. 26
6. Stamens 10 or fewer or flowers all pistillate
7. Leaflets mostly 5 or more, entire or minutely glandular-toothed **Pea Group** p. 25
7. Leaflets 3, or if more, then conspicuously toothed
8. Leaflets 3 or rarely 5, the lateral ones mostly over 3.5cm long and 2.5cm wide; mature fruits whitish, glabrous; Poison Ivy **Toxicodendron**
8. Leaflets more than 5, or if 3 or 5, the lateral ones mostly less than 3cm long and 2.5cm wide; mature fruits usually red or orange and hairy **Rhus**

1. Leaves simple
9. Plants shrubby with scale-like leaves mostly about 1mm long, appearing like a juniper **Tamarix**
9. Plants not as above
10. Plants vines with alternate, cordate leaves and tendrils **Vitis**
10. Plants not as above
11. Leaves opposite or subopposite
12. Stamens 10 or more **Philadelphus**
12. Stamens less than 10
13. Leaves entire; year-old twigs red; flowers in a terminal inflorescence **Cornus**
13. Leaves toothed; year-old twigs not red; flowers on spur shoots **Rhamnus**
11. Leaves alternate (rarely clustered but the branches alternate)
14. Stamens 8 or more (rarely as few as 5 if underside of leaves are densely rusty-lanate)
15. Leaves simple, entire; never mat forming
16. Ovary superior; stamens 5-10; fruit a capsule **Ledum**
16. Ovary inferior; stamens usually about 20; fruit a pome with usually 2 nutlets **Cotoneaster**
15. Leaves compound, lobed, or toothed, or if entire, then plants forming mats
17. Stamens 10 or more, or if fewer, plants spiny **Rose Group** p. 26
17. Stamens 8; not spiny **Oenothera**
14. Stamens 7 or fewer
18. Stamens as many as petals and opposite them
19. Plants spiny; leaves mostly oblanceolate to obovate; stamens 6 **Berberis**

19. Plants not spiny, or if so, leaves narrowly elliptic to orbicular; stamens 4 or 5
20. Leaves with 3 prominent, longitudinally running veins arising from nearly the same point at base of leaf blade (palmately veined), sometimes with lateral veins also; fruit a capsule **Ceanothus**
20. Leaves with a prominent midrib and the other prominent veins lateral ascending from all along midrib (pinnately veined); fruit a drupe
21. Leaves toothed or opposite or subopposite or both **Rhamnus**
21. Leaves entire or essentially so, alternate **Frangula**
18. Stamens not the same number as petals, or if so, alternate with them
22. Stems with thorns, spines, or prickles **Ribes**
22. Stems without thorns, spines, or prickles
23. Leaf blades mostly 3 or 5 lobed or else cordate-orbicular; fruit a berry **Ribes**
23. Leaf blades not lobed, usually longer than wide so not cordate-orbicular; fruit a capsule **Celastris**

Series V-B, calyx and corolla present, petals separate, corolla irregular

1. Ovary inferior, sometimes only partly so
2. Petals 4; stamens 4 or 8 **Evening Primrose Group** p. 17
2. Petals 5; stamens 5 **Heuchera**
1. Ovary superior
3. Stamens more than 10; pistils 3-5 or rarely 1 **Buttercup Group** p. 15
3. Stamens 10 or fewer; pistil 1
4. Sepals 2-4
5. Leaves finely dissected, alternate or basal **Corydalis**
5. Leaves entire, opposite **Elatine**
4. Sepals 5
6. Stamens 5; leaves simple (rarely palmately cleft to base and stamens with broad connectives exceeding anthers in length)
7. Flowers solitary on each peduncle **Viola**
7. Flowers in racemes, spikes, or panicles **Saxifrage Group** p. 27
6. Stamens 9 or 10, or if 5, the leaves compound **Pea Group** p. 25

Series V-C, calyx and corolla present, petals separate, corolla regular, stamens more than 10

1. Pistils more than 1, simple with 1 carpel
2. Flowers hypogynous or nearly so, sepals usually separate; leaves lacking stipules **Buttercup Group** p. 15
2. Flowers usually obviously perigynous or at least sepals united well up from base; leaves often with stipules **Rose Group** p. 26
1. Pistils solitary, usually of 2 or more united carpels which may rarely separate in fruit
3. Ovary superior
4. Flowers hypogynous
5. Leaves opposite **Hypericum**
5. Leaves alternate or basal (rarely whorled)
6. Stamens all united by filaments into a tube which surrounds the style or styles **Mallow Group** p. 21
6. Stamens not all united as above
7. Leaves simple, basal (rarely a few linear ones on stem); sepals 2-9
8. Leaves lobed, 8cm or more wide **Sanguinaria**
8. Leaves entire, less than 1cm wide **Lewisia**
7. Leaves either on stem or compound or both; sepals mostly 3-5
9. Leaves simple and entire
10. Petals 5, yellow, 7-12mm long **Crocanthemum**
10. Petals 3, red or red-purple, 2mm or less long **Lechea**
9. Leaves compound, at least below, or simple and lobed
11. Flowers mostly solitary; petals 3-5cm long **Argemone**
11. Flowers in racemes; petals 1cm or less long
12. Petals 4; annual **Polanisia**
12. Petals 5 or more; perennial **Actaea**
4. Flowers perigynous
13. Filaments united into a tube which surrounds the style or styles **Mallow Group** p. 21
13. Filaments not as above
14. Plants with simple leaves which are entire or nearly so; pistils solitary; petals purple or reddish-purple **Lythrum**
14. Plants not as above **Rose Group** p. 26
3. Ovary inferior
15. Stems thick, green, succulent, and spiny; leaves minute or lacking **Cacti** p. 15
15. Stems not as above; leaves well developed **Mentzelia**

Series V-D, calyx and corolla present, petals separate, corolla regular, stamens 10 or fewer

1. Flowers epigynous, ovary partly or completely inferior
2. Flowers 2- or 4-merous
3. Flowers subtended by 4 white, petaloid bracts mostly 1-2cm long; fruit a red drupe **Cornus**
3. Flowers not subtended by white, petaloid bracts; fruit a capsule or nutlet **Evening Primrose Group** p. 17
2. Flowers 5-merous
4. Inflorescence an umbel or sometimes capitate; styles 2 or 5
5. Styles and carpels 5; fruit a purple berry **Aralia**
5. Styles and carpels 2; fruit a schizocarp **Carrot Group** p. 15
4. Inflorescence not umbellate nor capitate; styles 0-4
6. Plants perennial; leaves often all or mostly basal
7. Stamens 5 or 10, staminodia none; stigmas mostly 2 or 3 **Saxifrage Group** p. 27
7. Stamens 5, alternating with staminodia; stigmas 4 **Parnassia**
6. Plants annual; leaves mostly along stem **Mentzelia**
1. Flowers hypogynous or perigynous, ovary superior or rarely lacking
8. Sepals 3; flowers sometimes unisexual; stipules of at least some leaves completely sheathing stem, rarely deciduous; perennial or rarely annual; leaves simple, alternate **Rumex**
8. Sepals not 3 or plants without the other characteristics
9. Flowers perigynous
10. Leaves compound (rarely simple); pistils 2 or more **Rose Group** p. 26
10. Leaves simple (rarely compound); pistils solitary (carpels sometimes partly separate)
11. Plants scapose or sometimes with 1 to several leaves along scape, or if not, with 2 or more styles; petals often white

12. Stamens 5 or 10, staminodia none; stigmas mostly 2 or 3 **Saxifrage Group** p. 27
12. Stamens 5, alternating with staminodia; stigmas 4 **Parnassia**
11. Plants with leafy stems; styles solitary; petals purplish or reddish-purple
13. Petals 5-7; rhizomatous perennials; stamens mostly 5-14 **Lythrum**
13. Petals usually 4; fibrous-rooted annuals; stamens 4 **Ammannia**
9. Flowers hypogynous
14. Pistils more than 5 **Buttercup Group** p. 15
14. Pistils 1-5 or flowers all staminate
15. Sepals usually 2 or 3
16. Petals as many as sepals, flowers usually solitary in leaf axils **Elatine**
16. Petals more than the sepals, or if the same number, flowers in a definite inflorescence **Purslane Group** p. 26
15. Sepals 4 or 5
17. Leaves, at least the lower, compound
18. Petals 4
19. Lower leaves palmately compound with 3-7 leaflets; ovary 1 celled
20. Stamens 6; plants glabrous or sparsely pilose **Peritoma**
20. Stamens 8 or more; plants glandular-hairy **Polanisia**
19. Lower leaves usually not palmately compound; ovary usually 2 celled **Mustard Group** p. 21
18. Petals 5
21. Leaflets 3, entire with a rounded notch at tip **Oxalis**
21. Leaflets not as above
22. Leaves opposite with 8-16 entire leaflets **Tribulus**
22. Leaves not as above
23. Sepals separate; petals not divided **Erodium**
23. Sepals united; petals deeply divided **Lithophragma**
17. Leaves simple
24. Petals 3 or 4 (upper flowers may have 5)
25. Plants saprophytic, red or pink to white or yellowish, not green **Monotropa**
25. Plants not as above
26. Leaves opposite **Chickweed Group** p.16
26. Leaves alternate or all basal
27. Petals 4, color various; fruit a silique or silicle **Mustard Group** p. 21
27. Petals 3, reddish; fruit a capsule **Lechea**
24. Petals 5
28. Leaves fleshy; pistils (carpels) mostly 4 or 5, separate or nearly so; flowers sometimes greenish-white but not white
29. Petals yellow, occasionally drying pink; most leaves basal along the creeping stems or on sterile shoots **Sedum**
29. Petals greenish-white, pink, or purple; most leaves on flowering stems **Rhodiola**
28. Leaves fleshy or not; pistils rarely as above (or flowers all staminate); flower color various
30. Flowers all staminate or all pistillate
31. Leaves alternate, fleshy
32. Petals yellow, occasionally drying pink; most leaves basal along the creeping stems or on sterile shoots **Sedum**
32. Petals greenish-white, pink, or purple; most leaves on flowering stems **Rhodiola**
31. Leaves opposite or whorled, not fleshy **Silene**
30. Flowers bisexual
33. Leaves palmately lobed or divided; sepals separate **Geranium**
33. Leaves not as above, or if so, sepals united
34. Placentation free-central (at least above) or basal; locule 1
35. Leaves opposite or whorled **Chickweed Group** p. 16
35. Leaves alternate or basal **Saxifrage Group** p. 27
34. Placentation not free-central or basal; locules 2-10, or rarely 1 with parietal placentation
36. Styles 3, or if 4 or 5, then with 10 or more fertile stamens
37. Leaves alternate or basal **Saxifrage Group** p. 27
37. Leaves opposite
38. Leaves with sessile yellowish glands; placentation parietal; styles 3 **Hypericum**
38. Leaves not as above; placentation not parietal; styles 3-5 **Chickweed Group** p. 16
36. Styles 0-2, or if 4 or 5, then with 5 stamens (sometimes alternating with 5 staminodia)
39. Styles 1 **Blueberry Group** p. 14
39. Styles 0, 2, 4, or 5 (rarely with 4 nearly sessile stigmas, or carpels often partly separate)
40. Filaments usually united at least at base, sometimes slightly so; leaves linear or nearly so (rarely narrowly elliptic or lanceolate); styles 5 **Linum**
40. Filaments free; leaves not linear; styles mostly 0-4
41. Stamens 5 or 10, staminodia none; stigmas mostly 2 or 3 **Saxifrage Group** p. 27
41. Stamens 5, alternating with staminodia; stigmas 4 **Parnassia**

GROUP VI, calyx and corolla present, petals united

1. Flowers in dense heads subtended by an involucre, the head usually appearing like a single flower (rarely 1 flower per head); ovary inferior; stamens united by their anthers (rarely free); flowers sometimes unisexual or neutral
2. Stamens 4, free; corolla 4 lobed; leaves opposite; outer involucral bracts linear or nearly so and spine-tipped **Dipsacus**
2. Stamens mostly 5, usually united by the anthers; corolla 5 or rarely 4 lobed; leaves opposite or not; involucral bracts variable **Sunflower Group** p. 28

1. Flowers not in a head, or if so, lacking the other characteristics
3. Plants woody trees, shrubs, or vines
4. Plants vines with tendrils
5. Leaves simple, palmately lobed **Vitis**
5. Leaves palmately compound with 5-7 leaflets **Parthenocissus**
4. Plants not vines with tendrils
6. Leaves palmatifid with mostly 3-5 linear, spinulose-tipped segments, also with axillary clusters of often simple linear leaves **Linanthus**
6. Leaves not as above
7. Leaves compound
8. Leaves alternate; leaflets 5cm or less long, entire or nearly so **Amorpha**
8. Leaves opposite; leaflets mostly 4-9cm long, serrate **Sambucus**

7. Leaves simple (rarely with a pair of nearly distinct lobes at base)
9. Stamens 8-10 **Blueberry Group** p. 14
9. Stamens 4 or 5
10. Leaves opposite; ovary inferior
11. Leaf margins entire, rarely sinuately lobed, lacking sharp-pointed teeth; fruit more than 1 seeded
12. Corolla regular or merely bulged on 1 side near middle, 5-10mm long; fruit with 2 seeds or stones **Symphoricarpos**
12. Corolla irregular, (8)10-30mm long; fruit with several seeds **Lonicera**
11. Leaf margins mostly with sharp-pointed teeth or some 3 lobed; fruit 1 seeded **Viburnum**
10. Leaves usually alternate; ovary superior **Lycium**

3. Plants herbs, rarely woody at base, sometimes vine-like but then not woody
13. Plants parasitic or saprophytic, white, yellow, brown, pink, red, or purple, not green
14. Stamens 10 **Pterospora**
14. Stamens 4 or 5
15. Stamens 5; corolla regular **Cuscuta**
15. Stamens 4; corolla irregular **Orobanche**
13. Plants not parasitic (rarely so but definitely green) nor saprophytic, mostly green
16. Stems thick, green, succulent, and spiny; leaves minute or lacking **Cacti** p. 15
16. Stems not as above; leaves usually well developed
17. Plants with all basal simple leaves (rarely with only 2-3 opposite or whorled linear leaves) and regular flowers with 2 sepals **Purslane Group** p. 26
17. Plants not as above
18. Plants with milky juice (rarely not); ovaries and styles 2, sharing a common stigma to which stamens are adnate; pollen of each anther chamber coalescent in a sac-like mass, the sacs in pairs joined by a slender connective; hood-like structures borne from base of each stamen which often bear a slender horn-like appendage within (see figure under species key) **Asclepias**
18. Plants not as above
19. Perianth subtended by 3 scarious bracts (mistaken for sepals), covered with dense woolly hairs; annual **Froelichia**
19. Perianth not as above; annual to perennial
20. Flowers all unisexual; ovary superior; stamens 10; leaves opposite, entire **Silene**
20. Flowers mostly bisexual, if unisexual, either with whorled or palmately lobed leaves or with 3 stamens and an inferior ovary
21. Stamens (or anthers) more numerous than corolla lobes (or calyx lobes if corolla lobes obscure) **Series VI-A**
21. Stamens not more numerous than corolla lobes or flowers all pistillate
22. Stamens usually as many as corolla lobes (1 rarely vestigial) and opposite them; placentation free-central or basal with 1 locule; ovary not 4 lobed; corolla regular
23. Sepals 2 **Purslane Group** p. 26
23. Sepals mostly 4-7
24. Leaves all basal or nearly so (bracts sometimes subtend inflorescence)
25. Corolla lobes mostly 6mm or more long, over twice as long as tube, sharply reflexed **Primula**
25. Corolla lobes less than twice as long as tube, less than 6mm long, not sharply reflexed **Androsace**
24. Leaves, at least some, on flowering stems
26. Leaves mostly opposite (whorled); rhizomatous perennials **Lysimachia**
26. Leaves mostly alternate; annual **Anagallis**
22. Stamens alternate with corolla lobes (or opposite calyx lobes) or fewer; placentation various; ovary 4 lobed or not; corolla regular or irregular
27. Ovary inferior **Series VI-B**
27. Ovary superior (rarely lacking)
28. Corolla of 1 basal larger petal and 4 usually smaller petals alternating with stamens at tip of filament tube **Dalea**
28. Corolla not as above
29. Corolla irregular **Series VI-C**
29. Corolla regular or nearly so
30. Anther bearing stamens 2-4 or rarely lacking, fewer than corolla lobes **Series VI-D**
30. Anther bearing stamens either as many as corolla lobes or else at least 5 **Series VI-E**

Series VI-A, calyx and corolla present, petals united, stamens more than corolla lobes

1. Flowers regular or nearly so
2. Leaves compound
3. Leaflets 3, obcordate, entire **Oxalis**
3. Leaflets 3 or more, shape various, toothed or lobed
4. Leaves basal and opposite **Adoxa**
4. Leaves alternate
5. Petals yellow or white inside, sometimes purple outside or at base; annual **Hibiscus**
5. Petals red or salmon; perennial **Sphaeralcea**
2. Leaves simple
6. Stamens more than 10, all united by filaments into a tube which surrounds the style or styles **Mallow Group** p. 21
6. Stamens 10 or fewer (rarely 12), free or rarely united at very base
7. Plants annual; sepals 2; ovary half inferior **Portulaca**
7. Plants not as above
8. Leaves opposite; placentation free-central **Chickweed Group** p. 16
8. Leaves usually not opposite; placentation not free-central
9. Pistils (carpels) mostly 5, separate or united at base
10. Petals yellow, occasionally drying pink; most leaves basal along the creeping stems or on sterile shoots **Sedum**
10. Petals greenish-white, pink, or purple; most leaves on flowering stems **Rhodiola**
9. Pistils solitary with fully united carpels **Blueberry Group** p. 14

1. Flowers irregular
11. Stamens more than 10 **Buttercup Group** p. 15
11. Stamens 10 or fewer
12. Anthers 10 or rarely 9 **Pea Group** p. 25
12. Anthers 4-8
13. Anthers 6; locule 1; leaves dissected **Corydalis**
13. Anthers 4 or (7)8; locules 2; leaves various
14. Anthers (7)8; filaments united; corolla usually 3 lobed **Polygala**
14. Anthers 4 (or apparently 8); filaments free; corolla usually (2)4 or 5 lobed **Figwort Group** p. 17

Series VI-B, calyx and corolla present, petals united, ovary inferior

1. Leaves opposite or whorled
  2. Leaves whorled at least in part **Galium**
  2. Leaves opposite
    3. Stamens 3 **Valeriana**
    3. Stamens 4
      4. Flowers mostly paired at tip of stem **Linnaea**
      4. Flowers in a dense head surrounded by an involucre **Dipsacus**
1. Leaves alternate or all basal
  5. Leaves compound with 3 leaflets **Menyanthes**
  5. Leaves simple
    6. Plants bearing tendrils and climbing or scrambling; fruit a weakly spiny or bristly pepo **Echinocystis**
    6. Plants without tendrils, not climbing or scrambling; fruit a capsule, not spiny or bristly
      7. Corolla irregular **Lobelia**
      7. Corolla regular
        8. Flowers usually distinctly pedicelled or sessile in a terminal involucrate glomerule; perennials **Campanula**
        8. Flowers sessile or nearly so in a spike-like inflorescence; annuals **Triodanis**

Series VI-C, calyx and corolla present, petals united, ovary superior, corolla irregular

1. Anther bearing stamens 5
  2. Corolla yellow, orange, or red (rarely white)
    3. Flowers very irregular; annual without basal leaves; calyx of 3 petaloid sepals, the middle one spurred **Impatiens**
    3. Flowers slightly irregular; biennial with some basal leaves; calyx deeply 5 parted, not spurred **Verbascum**
  2. Corolla usually blue, purple, or white
    4. Ovary deeply 4 lobed; fruit 4 nutlets **Echium**
    4. Ovary not lobed; fruit a berry **Solanum**
1. Anther bearing stamens 2-4
  5. Stamens 3; flowers all staminate **Valeriana**
  5. Stamens 2 or 4; flowers not all staminate
    6. Ovules usually 1 or 2 per cell, cells 2 or 4; leaves opposite; ovary usually 4 lobed
      7. Anther bearing stamens 2 **Mints** p. 21
      7. Anther bearing stamens 4
        8. Filaments about as long as anthers or shorter; calyx teeth usually 5 or fewer; corolla merely irregularly 4 or 5 lobed; style terminal on ovary or nearly so; stems usually round
          9. Corolla tube 8mm or more long; calyx 6-10mm long **Glandularia**
          9. Corolla tube 7mm or less long; calyx 2-6mm long **Verbena**
        8. Filaments obviously longer than anthers, or if rarely not, the calyx with 10 hooked teeth; corolla often very irregular and 2 lipped; style often from near base between the 4 ovary lobes; stems usually square **Mints** p. 21
    6. Ovules 1 or more per cell, cells 1 or 2; leaves opposite or alternate or all basal; ovary not 4 lobed
      10. Ovary 1 celled with 1 ovule; corolla 5-10mm long; leaves opposite, petioled **Phryma**
      10. Ovary, if 1 celled, with 2 or more ovules; corolla and leaves various **Figwort Group** p. 17

Series VI-D, calyx and corolla present, petals united, ovary superior, corolla regular, anthers fewer than corolla lobes

1. Anther bearing stamens 4
  2. Flowers either solitary in leaf axils, or primarily in a basal rosette on long pedicels, or if in a terminal inflorescence, with a bearded sterile filament (this rarely glabrous) **Figwort Group** p. 17
  2. Flowers either densely clustered in leaf axils, or in a terminal inflorescence, usually sessile or nearly so, never with a bearded sterile filament
    3. Filaments about as long as anthers or shorter; style terminal on ovary or nearly so; stems usually round
      4. Corolla tube 8mm or more long; calyx 6-10mm long **Glandularia**
      4. Corolla tube 7mm or less long; calyx 2-6mm long **Verbena**
    3. Filaments much longer than anthers; style usually from near base between the 4 ovary lobes; stems usually square **Mints** p. 21
1. Anther bearing stamens 2 or 3 (rarely lacking)
  5. Leaves all basal; corolla scarious **Plantago**
  5. Leaves on stems; corolla not scarious
    6. Stamens 3; flowers all staminate
      7. Plants with tendrils; leaves alternate, simple, palmately lobed **Echinocystis**
      7. Plants not as above **Valeriana**
    6. Stamens 2; flowers not all staminate
      8. Flowers in dense axillary clusters; stems square **Lycopus**
      8. Flowers in loose terminal or axillary racemes or solitary in axils; stems round **Veronica**

Series VI-E, calyx and corolla present, petals united, ovary superior, corolla regular, anthers as many as corolla lobes or at least 5

1. Ovary none, the flowers all staminate; leaves whorled at least in part **Galium**
1. Ovary present; leaves various
  2. Leaves mostly 25mm or less long, palmatifid, pinnatifid, or bipinnatifid with narrowly linear, spinulose-tipped segments **Phlox Group** p. 26
  2. Leaves not as above
    3. Ovaries 2 but with only a single enlarged stigma; juice milky; leaves opposite **Apocynum**
    3. Ovaries solitary (sometimes deeply 4 lobed); juice not milky; leaves opposite or not
      4. Ovary (or at least fruits except when only 1 or 2 nutlets develop) 4 lobed or prominently 4 grooved (rarely capped by an umbrella-like stigma)
        5. Leaves usually alternate, at least in part, rarely opposite; stamens 5; stems round **Borage Group** p. 14
        5. Leaves opposite; stamens 4; stems square **Mentha**
      4. Ovary not 4 lobed or 4 grooved (sometimes 4 nerved)
        6. Ovary 1 celled; placentation parietal; leaves either compound with 3 broad leaflets, or, simple, opposite or whorled, and entire or nearly so
          7. Leaves simple, opposite or whorled
            8. Corolla 4 lobed, with 4 spurs at base of at least some flowers **Halenia**
            8. Corolla 4 or 5 lobed, not spurred
              9. Corolla lobes at least twice as long as tube
                10. Corolla usually purple or blue, the lobes mostly 3-5cm long; style usually at least 8mm long; leaves opposite **Eustoma**
                10. Corolla greenish to white or yellowish, the lobes mostly less than 2.5cm long; style much less than 8mm long; leaves whorled **Frasera**
              9. Corolla lobes rarely longer than tube

11. Corolla plicate at sinuses, the folds often extended into teeth or lobes; corolla lobes without fimbriae at base **Gentiana**
11. Corolla not plicate at sinuses, lacking teeth or lobes between the lobes; corolla lobes with fimbriae at base inside **Gentianella**
7. Leaves compound with 3 leaflets, alternate or basal **Menyanthes**
6. Ovary 2-10 celled, placentation various, or if 1 celled, the leaves not as above
12. Stamens 4 or fewer
13. Flowers sessile in a spike; corolla scarious; leaves mostly basal **Plantago**
13. Flowers pediceled in a few-flowered cyme; corolla not scarious; many leaves alternate on stem **Phacelia**
12. Stamens 5 or rarely more
14. Branches of style 3 or stigma 3 lobed, sometimes obscurely so; locules usually 3 **Phlox Group** p. 26
14. Branches of style 2 or stigma 2 lobed (rarely with 2 styles), or unbranched and unlobed; locules 1-3
15. Ovary 1 celled with 2 parietal placentae which sometimes intrude and meet but do not join (rarely with 1 basal ovule); fruit a capsule
16. Flowers solitary on each peduncle in or opposite the leaf axils, rarely also a few in a lax, terminal inflorescence
17. Calyx lacking auricles at sinuses **Ellisia**
17. Calyx with reflexed or spreading auricles (very short lobes) at the sinuses **Nemophila**
16. Flowers somewhat numerous in definite inflorescences (rarely few per peduncle) **Phacelia**
15. Ovary 2 or more celled (rarely incompletely 2) with axile placentation; fruit a capsule or berry
18. Ovules 4 or fewer
19. Corolla about 0.5-0.6cm long; styles 2, each deeply 2 cleft **Evolvulus**
19. Corolla 1.5-10cm long; style 1
20. Stems not twining or trailing, the plants bushy; leaf blades linear or oblong to narrowly lanceolate or elliptic **Ipomoea**
20. Stems twining or trailing; leaf blades sagittate or hastate
21. Calyx enclosed by 2 bracts, the bracts cordate or ovate **Calystegia**
21. Calyx not enclosed by bracts, the bracts linear and borne much below the calyx **Convolvulus**
18. Ovules usually more than 4
22. Plants stellate-hairy, not spiny; flowers in a dense spike, yellow (rarely white); filaments long-hairy **Verbascum**
22. Plants not as above
23. Plants perennial, rhizomatous **Physalis**
23. Plants annual or biennial
24. Flowers sessile or nearly so in 1-sided spikes or racemes; corolla 2-4.5cm long; fruit a capsule **Hyoscyamus**
24. Flowers pediceled, in small clusters, cymes, or solitary; corolla usually less than 2cm long, rarely longer (to 5cm); fruit a fleshy or dry berry (rarely spiny) or capsule
25. Plants annual with twining stems; fruit a capsule with 6 valves and usually 6 seeds about 5mm long **Ipomoea**
25. Plants annual to perennial without twining stems; fruit a berry with usually more than 6 seeds less than 3mm long
26. Corolla lobes reduced to teeth about 2mm or less long, the whole corolla usually 10mm or more long; plants not spiny **Leucophysalis**
26. Corolla lobes mostly 3mm or more long, or if shorter, the corolla less than 10mm long or the plants spiny **Solanum**

Note: In the groups which follow, some genera that might be expected in a group are not included because they are taken out separately in the previous keys.

Blueberry Group

1. Plants shrubs; petals united; leaves usually alternate
2. Ovary inferior; anthers often dorsally awned; leaves 3-70mm long, toothed (rarely entire and 3-12mm long), often pointed at tip; fruit a juicy berry **Vaccinium**
2. Ovary superior; anthers not awned; leaves 10-35mm long, entire, mostly rounded at tip; fruit a mealy berry **Arctostaphylos**
1. Plants herbaceous or woody toward base; petals separate; leaves mostly on lower third of stem or most of them whorled
3. Leaves mostly whorled, basal leaves none; style barely if at all apparent **Chimaphila**
3. Leaves mostly alternate and on lower third of stem or all basal; style conspicuously elongate
4. Flowers solitary and terminal **Moneses**
4. Flowers several in a raceme
5. Raceme secund; style straight or nearly so **Orthilia**
5. Raceme not secund; style curved **Pyrola**

Borage Group

1. Ovary merely 4 grooved; style terminal or nearly so, or lacking; rhizomatous, glabrous perennial **Heliotropium**
1. Ovary usually deeply 4 parted; style arising from between the nearly distinct lobes; annual to perennial, often hairy
2. Nutlets bearing distinct hooked or barbed prickles at least along margins
3. Prickles completely covering nutlets; corolla purplish-red or blue
4. Stem leafy to the inflorescence; corolla purplish-red; nutlets dorsally flattened, the scar reaching the middle on ventral side **Cynoglossum**
4. Stem naked above; corolla blue; nutlets obovoid, the scar reaching only about 1/4 or less up ventral side **Andersonglossum**
3. Prickles mostly along margins of nutlets; corolla blue or white
5. Pedicels erect or ascending in fruit; inflorescence bracteate; styles often surpassing the mature nutlets **Lappula**
5. Pedicels recurved or deflexed in fruit; inflorescence often bractless or nearly so; styles usually shorter than mature nutlets **Hackelia**
2. Nutlets without hooked or barbed prickles, rarely with minute, distally branched bristles
6. Corolla irregular; stamens and style long-exserted **Echium**
6. Corolla regular or nearly so; stamens and style exserted or not
7. Plants with greenish-white, white, or rarely yellowish corollas 10-16mm long, hairy on outside; corolla lobes mostly erect; style long-exserted from corolla; nutlets broadly attached at base to a flat gynobase; anthers usually about 2mm long **Lithospermum**
7. Plants not with the above combination of characteristics
8. Corolla blue or occasionally pinkish, rarely ochroleucous, tubular to funnelform, rarely salverform, 5mm or more long, the tube often much exceeding calyx
9. Plants hirsute throughout with long, glassy, usually pustulate hairs; fornices hairy or fringed; nutlets basally attached **Anchusa**
9. Plants glabrous or hairy but without hairs as above; fornices not hairy or fringed; nutlets mostly laterally attached **Mertensia**
8. Corolla yellow, orange, or white, or if blue, then usually salverform or rotate and often less than 5mm long, the tube often shorter than, equal to, or little exceeding calyx
10. Corolla yellow or orange; nutlets broadly attached at their base to a flat gynobase **Lithospermum**
10. Corolla white, blue, pink-purple, or ochroleucous; nutlets usually basilaterally to apically attached, occasionally basally attached
11. Corolla blue or pink-purple
12. Fornices hairy; nutlets rugose and often tuberculate, basally attached **Anchusa**
12. Fornices glabrous; nutlets smooth, basilaterally to nearly apically attached **Myosotis**

11. Corolla white or ochroleucous (rarely blue tinged)
13. Nutlets with a groove-scar or slit running most of their length on ventral side (occasionally closed by meeting of edges); annual to perennial **Cryptantha**
13. Nutlets smooth or keeled on ventral side; mostly annuals
14. Nutlets smooth, winged or keeled around tip and lateral edges **Myosotis**
14. Nutlets keeled on ventral side and wrinkled or tuberculate, not winged or keeled around tip and lateral edges
15. Nutlets mostly basilaterally attached leaving a tiny scar; nutlets usually finely hairy **Plagiobothrys**
15. Nutlets broadly attached at base to a flat gynobase leaving a scar nearly as broad as nutlet; nutlets glabrous **Buglossoides**

Buckwheat Group
1. Perianth segments 4; leaf blades reniform to cordate; perennial **Oxyria**
1. Perianth segments usually 5 or 6, rarely 4; leaf blades usually not reniform to cordate; annual or perennial
2. Perianth segments 6, the 3 outer often turned downward, the 3 inner usually enlarging in fruit; stamens 6 **Rumex**
2. Perianth segments usually 5, rarely 4 or 6, all erect, rarely enlarging in fruit; stamens often 8 or 9
3. Stems usually twining, vine-like; outer perianth lobes keeled or winged; leaves sagittate, hastate, or cordate **Fallopia**
3. Stems not twining; outer perianth lobes usually not keeled or winged; leaves not sagittate or hastate, rarely cordate
4. Flowers mostly in crowded terminal inflorescences on the main stem and branches, often also axillary, lacking leafy bracts; leaves not jointed at base; annuals or perennials
5. Plants annual **Persicaria**
5. Plants perennial with usually thick rootstocks or rhizomes
6. Stem simple; leaves basal and on stem; inflorescence a single terminal spike-like raceme with a few bulblets in axils of lower bracts, woods and meadows **Bistorta**
6. Stem usually branched; leaves all on stem; flowers usually in 1 or 2 terminal or subterminal spike-like inflorescences, bulblets lacking; streams, ponds, and shores **Persicaria**
4. Flowers in axils of leaves or bracts, conspicuously bracteate if terminal; leaves jointed at base; annuals **Polygonum**

Buttercup Group
1. Stem leaves opposite or whorled; petals lacking (sepals colored)
2. Stem leaves usually whorled; sepals mostly 5 or more **Anemone**
2. Stem leaves usually opposite; sepals usually 4, rarely 5 or 6 **Clematis**
1. Stem leaves alternate or leaves all basal or nearly so; petals present or lacking
3. Flowers irregular
4. Upper sepal hooded, not spurred; petals usually 2, inside hood **Aconitum**
4. Upper sepal spurred, not hooded; petals 4, usually exposed **Delphinium**
3. Flowers regular or nearly so
5. Petals all prominently spurred; perennials **Aquilegia**
5. Petals not spurred or lacking; annuals to perennials
6. Pistils solitary; fruit a red or white berry **Actaea**
6. Pistils 2 or more or flowers all staminate; fruit an achene or follicle
7. Plants annual; leaves all basal, mostly linear; sepals spurred (often deciduous) **Myosurus**
7. Plants not as above
8. Calyx and corolla present (one or both sometimes early deciduous); flowers bisexual; leaves only rarely ternately compound **Ranunculus**
8. Calyx only present; flowers bisexual or unisexual; leaves 2-3 times ternately compound
9. Ovules 1 per ovary; fruit an achene; sepals mostly green **Thalictrum**
9. Ovules 2 or more per ovary; fruit a follicle; sepals white or cream colored **Enemion**

Cacti
1. Stems flat or cylindrical and jointed; spines not on tubercles or ridges; clusters of short, minutely barbed bristles usually present near base of larger spines **Opuntia**
1. Stems globose or oval or rarely cylindrical, not jointed (clusters at ground level may appear jointed); spines on tubercles or ridges; clusters of short bristles lacking near base of larger spines
2. Flowers arising from the sides of the stem, stem usually longitudinally ribbed; ovary and fruit spiny **Echinocereus**
2. Flowers arising from near the top of the stem, stem with tubercles, not ribbed; ovary and fruit usually not spiny
3. Flowers arising from near base of the spine-bearing tubercles away from base of spines **Coryphantha**
3. Flowers arising from near tip of the spine-bearing tubercles near base of the spines **Pediocactus**

Carrot Group
1. Leaves simple and entire **Bupleurum**
1. Leaves, or some of them, compound, or if simple, then toothed or lobed
2. Basal leaves mostly simple, cordate at base, toothed, 1-6cm wide; stem leaves compound **Zizia**
2. Basal leaves compound, or if simple, not as above
3. Ovary and fruit armed with relatively stout hooked or barbed bristles (may be obscure on young ovaries), the barbs sometimes none; fruits less than 4 times as long as wide
4. Leaves palmately divided into 3-7 mostly rather broad segments, not much dissected; involucral bracts toothed or irregularly lobed **Sanicula**
4. Leaves usually much dissected into narrow segments; involucral bracts pinnately divided into narrow segments or linear or lance-linear and entire
5. Involucral bracts pinnately divided into narrow segments **Daucus**
5. Involucral bracts linear or lance-linear and entire **Torilis**
3. Ovary and fruit not bristly, sometimes pubescent with stiff hairs; fruits various
6. Plants with mature fruits
7. Fruits flattened dorsally (parallel to commissure), sometimes only slightly so (check cross section) **GROUP I**
7. Fruits flattened laterally (at right angle to commissure) or the fruits not flattened **GROUP II**
6. Plants lacking mature fruits
8. Leaves mostly 1-2(3) times compound, some with definite leaflets 15mm or more wide, or if narrower, the primary or secondary leaflets regularly toothed and few lobed or divided, or not lobed; plants all with leafy stems **GROUP III**
8. Leaves mostly dissected, often appearing lace-like or fern-like, the ultimate segments mostly less than 3(10)mm wide, sometimes with leaflets linear or nearly so and some 4cm or more long; plants with leafy stems or the leaves all basal
9. Petals yellow **GROUP IV**

9. Petals white, purple, pink, or greenish **GROUP V**

GROUP I

1. Leaves mostly 1-2(3) times compound, some with definite leaflets 15mm or more wide; caulescent plants mostly over 5dm high
  2. Leaflets mostly 3, often over 10cm wide (some leaves often simple); petals white (purplish) **Heracleum**
  2. Leaflets usually more than 3, less than 10cm wide; petals yellow (reddish) **Pastinaca**
1. Leaves mostly dissected, the ultimate segments mostly less than 3mm wide; caulescent or acaulescent, short or tall plants
  3. Pseudoscape present (rarely obscured by sheath); fruit usually ribbed or winged dorsally **Cymopterus**
  3. Pseudoscape lacking; fruit merely nerved dorsally **Lomatium**

GROUP II

1. Plants rather low, the leaves all basal or near the base **Musineon**
1. Plants tall, with stem leaves (these rarely early deciduous)
  2. Fruits 4 or more times as long as wide, about 2.5mm or less wide **Osmorhiza**
  2. Fruits less than 4 times as long as wide, often over 2.5mm wide
    3. Plants with taproots which may be branched below
      4. Plants perennial, 3dm or less high, rarely higher; calyx teeth evident **Musineon**
      4. Plants biennial, over 3dm high; calyx teeth obsolete
        5. Fruit 2-3mm long; involucre and involucel present; stems purple or purple spotted at least near base **Conium**
        5. Fruit 3-4mm long; involucre and involucel lacking or poorly developed; stems not purple **Carum**
    3. Plants with fibrous or tuberous-thickened or fascicled roots, not taprooted
      6. Plants fibrous-rooted, sometimes stoloniferous, in wet areas; leaflets of non-submersed lower leaves mostly elliptic to ovate and 0.5-3(5)cm long **Berula**
      6. Plants fibrous-rooted or not, not stoloniferous, sometimes in wet areas, if fibrous-rooted, leaflets usually longer, or linear or nearly so
        7. Involucre of well-developed, subfoliaceous bracts; roots fibrous **Sium**
        7. Involucre lacking or of inconspicuous, often scarious bracts; roots tuberous, fleshy fascicled, or fleshy fibrous
          8. Ribs of fruit corky, appearing broadly striped with alternate dark and light brown; leaflets toothed, mostly broader than linear
            9. Leaves pinnately compound; leaflets often over 4 times as long as wide; petals white or greenish **Cicuta**
            9. Leaves predominantly ternately compound; leaflets rarely over 3 times as long as wide; petals yellow **Zizia**
          8. Ribs of fruit thin, not corky; leaflets mostly entire, mostly linear or nearly so **Perideridia**

GROUP III

1. Petals yellow
  2. Plants biennial weeds with a simple taproot; primary rays of umbel mostly 15 or more **Pastinaca**
  2. Plants perennial with fleshy fibrous or fascicled roots, not weedy; primary rays mostly 14 or fewer **Zizia**
1. Petals white, greenish, purple, or pink
  3. Leaflets usually 3, often over 10cm wide (some leaves often simple); plants mostly over 1m high, distinctly hairy **Heracleum**
  3. Leaflets often more than 3, less than 10cm wide (except rarely the terminal one); plant height various, hairy or not
    4. Plants growing in water or very moist areas, from a cluster of fibrous roots
      5. Stolons sometimes present; leaflets of middle leaves usually less than 4 times as long as wide **Berula**
      5. Stolons lacking; some leaflets 6 or more times as long as wide **Sium**
    4. Plants in water or very moist areas or not, usually with fleshy or woody roots
      6. Plants with fleshy fascicled roots, without a taproot or well developed caudex; calyx teeth evident **Cicuta**
      6. Plants with a taproot (rarely branched below) or well developed caudex; calyx teeth obsolete **Osmorhiza**

GROUP IV

1. Inflorescence scaberulous, sometimes minutely so near base of umbel; young fruits flattened at a right angle to commissure **Musineon**
1. Inflorescence often glabrous or otherwise hairy, rarely scaberulous; young fruits often flattened parallel to commissure **Lomatium**

GROUP V

1. Stylopodium lacking; plants often with a pseudoscape or acaulescent
  2. Inflorescence distinctly hairy **Lomatium**
  2. Inflorescence glabrous or merely scaberulous
    3. Leaf blades, or many of them, typically over 10cm long; some leaves borne well up on the stem; pseudoscape lacking **Lomatium**
    3. Leaf blades usually 10cm or less long; leaves all basal or borne on a pseudoscape
      4. Leaves on a pseudoscape **Cymopterus**
      4. Leaves all basal **Musineon**
1. Stylopodium present (do not mistake for tip of ovary); plants lacking a pseudoscape, usually caulescent with well developed stem leaves
  5. Plants with fibrous roots, growing in wet places; leaves once pinnately compound, the leaflets narrowly lanceolate to linear and some usually 6 or more times as long as wide **Sium**
  5. Plants not as above
    6. Plants taprooted biennials, often weedy or in shallow water; leaves pinnately dissected
      7. Stems purple or purple-spotted at least near base; upper and lower leaves similar; involucre and involucel present **Conium**
      7. Stems not purple; upper leaves tending to have longer and narrower ultimate segments than lower; involucre and involucel lacking or poorly developed **Carum**
    6. Plants perennials with tuberous, often fascicled roots, not weedy nor in shallow water; leaves 1-2 times ternately or pinnately divided into mostly linear segments **Perideridia**

Chickweed Group

1. Sepals united
  2. Flowers all staminate **Silene**
  2. Flowers pistillate or bisexual
    3. Styles solitary, cleft above; calyx lobes spine-tipped; petals none **Paronychia**
    3. Styles 2 or more; calyx lobes rarely spine-tipped; petals present or not
      4. Styles 3-5 **Silene**
      4. Styles usually 2, rarely 3 (check several flowers)
        5. Calyx 1-4mm long **Gypsophila**
        5. Calyx usually 5mm or more long
          6. Flowers immediately subtended by 1-3 pair of long-tapering or acuminate bracts; petals not bilobed nor with appendages **Dianthus**
          6. Flowers not immediately subtended by bracts, the bracts lacking or usually at some distance below calyx (flowers rarely sessile but then with petals bilobed and with very short appendages at junction of claw and blade)
            7. Petals with 2 linear appendages at junction of claw and blade; calyx terete **Saponaria**
            7. Petals lacking appendages at junction of claw and blade; calyx 5 angled **Vaccaria**
1. Sepals separate or nearly so
  8. Styles solitary and cleft above, or lacking and with 3 stigmas; calyx lobes spine-tipped; petals lacking or minute

9. Plants perennial; stipules prominent and scarious; fruit a 1 seeded utricle **Paronychia**
9. Plants annual; stipules inconspicuous or lacking; fruit a several seeded capsule **Loeflingia**
8. Styles 2 or more; calyx lobes rarely spine-tipped; petals present or not
10. Leaves with distinct scarious stipules **Spergularia**
10. Leaves lacking stipules (sometimes with secondary leaves in their axils or the bases of opposite pairs connate)
11. Styles usually 5; capsule dehiscent by 10 teeth or valves; petals lobed or notched; calyx 3-8mm long **Cerastium**
11. Styles either 3 or 4, or if 5, the capsule dehiscent by less than 10 teeth or valves, the petals usually entire, and the calyx 1.5-2.5mm long
12. Stems mostly less than 5cm long; basal rosette of leaves present; styles usually 5, rarely 4 **Sagina**
12. Stems often over 5cm long; basal rosette of leaves often lacking; styles usually 3, rarely more
13. Petals deeply lobed; stamens and petals inserted under the ovary; capsules 6 valved **Stellaria**
13. Petals entire to erose or rarely shallowly notched (rarely none if capsule 3 valved); stamens and petals often inserted at the edge of a prominent disc; capsules 3 or 6 valved
14. Leaves oblong to elliptic or lanceolate, some usually 2mm or more wide; rhizomatous perennial **Moehringia**
14. Leaves linear or awl-shaped and less than 2mm wide, or if wider, the plants annual
15. Capsule 6 valved; plants mostly over 10cm high with primary leaves often over 10mm long, or if not, either with sepals mostly 6-8mm long and with a head-like inflorescence or an annual with ovate to lanceolate or oblong leaves
16. Leaves lanceolate or ovate to oblong, some usually 2mm or more wide; annuals **Arenaria**
16. Leaves linear or awl-shaped, less than 2mm wide; perennials **Eremogone**
15. Capsule 3 valved; plants mostly less than 10cm high with primary leaves mostly less than 10mm long; sepals 6mm or less long; inflorescence open; plants annual or perennial with mostly linear leaves **Sabulina**

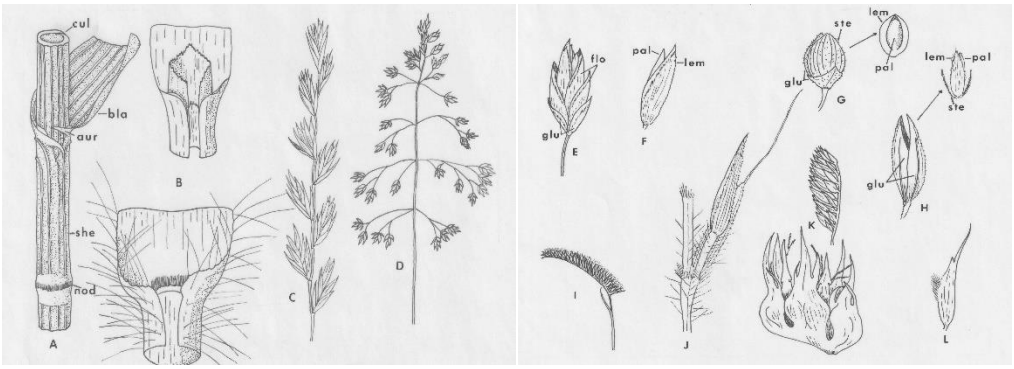
Evening Primrose Group
1. Sepals and petals 2 each; fruits with hooked hairs **Circaea**
1. Sepals and petals 4 each; fruits without hooked hairs
2. Seeds with a tuft of long hairs at upper end, hairs usually longer than seed
3. Floral tube prolonged beyond ovary; petals mostly less than 1cm long; stigma only rarely 4 cleft **Epilobium**
3. Floral tube not prolonged beyond ovary; petals mostly 1-2cm long; stigma 4 cleft **Chamerion**
2. Seeds without a tuft of long hairs at upper end
4. Fruit not splitting, nut-like, 1-4 seeded; claw of petal often nearly as long as blade, the blade not notched or lobed **Oenothera**
4. Fruit splitting at maturity, usually many seeded; petals not clawed, the blade sometimes 2 lobed
5. Ovary 2 celled; floral tube not prolonged beyond ovary; petals mostly 2mm or less long **Gayophytum**
5. Ovary usually 4 celled; floral tube prolonged beyond ovary; petals often over 2mm long
6. Plants annual; petals pink, purplish, or rose, 2-4mm long, bilobed **Epilobium**
6. Plants perennial, or if annual, petals mostly white or yellow, if rarely pinkish, then over 4mm long or not bilobed **Oenothera**

Figwort Group
1. Anther bearing stamens 2
2. Corolla saucer-shaped or shallowly cup-shaped, 4 lobed **Veronica**
2. Corolla tubular, 2 lipped **Gratiola**
1. Anther bearing stamens 4
3. Corolla 2 lipped with the upper lip forming a hood or beak which encloses the anthers
4. Calyx lobes 5; leaves pinnatifid to bipinnatifid, basal and cauline; flowers subtended by green bracts; perennials **Pedicularis**
4. Calyx lobes 2-4; leaves sometimes entire, all cauline; flowers often subtended by colored bracts; annual or perennial
5. Upper hooded lip of corolla usually conspicuously surpassing lower lip; perennials **Castilleja**
5. Upper hooded lip of corolla only slightly or not at all surpassing lower lip; annuals **Orthocarpus**
3. Corolla either not 2 lipped or 2 lipped with the upper lip not forming a hood or beak (central lobe of lower lip rarely enclosing stamens)
6. Corolla spurred at base on lower side
7. Corolla blue or white to pale lavender (throat may be yellow); annuals
8. Corolla 7-13mm long; spur 6-11mm long **Nuttallanthus**
8. Corolla 4.5-6mm long; spur 1.7-2.8mm long **Chaenorhinum**
7. Corolla yellow (brownish in bud); perennials **Linaria**
6. Corolla not spurred although sometimes swollen
9. Sterile filament present, about half as long to as long as the 4 anther bearing filaments **Penstemon**
9. Sterile filament lacking or reduced to a knob or scale on upper lip of corolla
10. Corolla regular or nearly so; flowers and leaves mostly stalked and in a basal rosette **Limosella**
10. Corolla irregular, 2 lipped (rarely nearly regular); flowers and leaves not as above
11. Flowers in a terminal panicle-like inflorescence; sterile filament a knob or scale on upper lip of corolla; perennial **Scrophularia**
11. Flowers mostly axillary; sterile filament lacking; annual to perennial
12. Sepals, or most of them, separate **Bacopa**
12. Sepals united
13. Corolla blue with whitish upper lip and often yellowish throat; central lobe of lower lip of corolla keeled-saccate and enclosing stamens **Collinsia**
13. Corolla yellow, red, pink, or purple; central lobe of lower lip of corolla not keeled-saccate nor enclosing stamens
14. Corolla yellow or reddish, often strongly 2 lipped; anther sacs divergent; calyx usually strongly 5 ribbed; leaves variable **Erythranthe**
14. Corolla pink or purple, not strongly 2 lipped; anther sacs parallel; calyx not strongly 5 ribbed; leaves linear and entire **Agalinis**

Goosefoot Group
1. Plants either shrubs, or subshrubs that are woody below and herbaceous above
2. Leaves densely stellate-hairy, linear or slightly wider with revolute margins **Krascheninnikovia**
2. Leaves not as above **Atriplex**
1. Plants herbaceous, mostly annuals
3. Leaves terete to subterete (rarely flattened), usually fleshy, linear or nearly so (some bracts often lanceolate or ovate), entire, glabrous or nearly so or rarely farinose, less than 3mm wide, sometimes tipped with a bristle or spine
4. Leaves with stiff spinulose tips or weak bristle tips, the spines or bristles often 1mm or more long; perianth segments often membranous **Salsola**
4. Leaves not as above; perianth segments usually fleshy **Suaeda**
3. Leaves not with the above combination of characteristics
5. Perianth lacking or of 1 or rarely 2 or 3 bract-like segments smaller than and not enclosing the fruit, the fruit laterally flattened and subtended by a single bract or no bract (loose pericarp sometimes encloses seed) **Monolepis**

5. Perianth 3-5 lobed or sometimes lacking in pistillate flowers; fruit at least partly enclosed by perianth or 2 large subtending bracts, sometimes dorsiventrally flattened
6. Flowers unisexual, the pistillate usually lacking a perianth and enclosed by 2 partly or wholly united bracts, the staminate with a 3-5 lobed perianth and no bracts
7. Mature fruiting bracts 0.5-2mm long, united to tip, entire; leaves usually green, entire, sessile **Stutzia**
7. Mature fruiting bracts (1)2-15mm long, free at least in upper part, entire to toothed or lobed; leaves green or gray-farinose, entire to toothed or lobed, sessile or petioled **Atriplex**
6. Flowers mostly bisexual (or with some pistillate or sterile) with a regular 3-5 lobed perianth, lacking enclosing bracts
8. Inflorescence usually densely hairy; leaves linear to lanceolate or oblanceolate, 1-8(12)mm wide, hairy, entire **Kochia**
8. Inflorescence glabrous or rarely hairy; leaves often wider or glabrous (or farinose), often lobed or toothed
9. Calyx usually with a broad, horizontal, membranous, circular wing from the middle when mature; leaves with large teeth that are short-spinulose; plants usually hairy and not farinose **Cycloloma**
9. Calyx lacking a wing; leaves usually without short-spinulose teeth; plants usually glabrous or farinose, rarely glandular-hairy
10. Plants glandular and puberulent **Dysphania**
10. Plants not glandular (except inflorescence of *C. simplex*), often glabrous or farinose **Chenopodium**

Grasses



A: portion of grass culm, nod = node, she = sheath, bla = blade, aur = auricle, cul = culm; B: ligule types, top membranous, bottom hairy; C: sessile spikelets; D: spikelets on pedicels; E: spikelet, glu = glumes, flo = florets; F: floret, lem = lemma, pal = palea; G: spikelet compressed dorsally, glu = glumes, ste = sterile lemma, lem = lemma, pal = palea; H: spikelet of *Phalaris arundinacea*, glu = glumes, lem = lemma, pal = palea, ste = sterile lemma; I: spike of *Bouteloua gracilis* with spikelets on one side of rachis only; J: pair of spikelets of *Andropogon gerardii*; K: spikes of *Bouteloua dactyloides*, staminate above, pistillate below; L: floret of *Munroa squarrosa*

1. Plants dioecious or monoecious, to 20cm high, stoloniferous; pistillate spikelets with the thickened rachis and 2nd glumes forming a rigid, yellow-white, globular structure crowned by green-toothed summits of the glumes; staminate spikelets 2 flowered, sessile, in 2 rows on 1 side of rachis **Bouteloua**
1. Plants not as above
2. Plants annual but mat forming by branching, to 10cm high; leaves and spikelets in fascicles, the fascicles separated by mostly naked internodes, the leaves with white margins; lemmas long-pilose toward margin near midlength, awn-tipped **Munroa**
2. Plants not as above
3. Spikelets enclosed by a bur-like involucre bearing coalescent bristles forming spines; sandbur **Cenchrus**
3. Spikelets not enclosed by a bur-like involucre, if bristles present, not coalescent to form spines
4. Spikelets sessile, forming terminal or lateral spikes, occasionally with the lower spikelets short-pediceled but then the glumes usually bristle-like or nearly so
5. Spikes 1 or more, usually lateral or not directly continuous with the main axis; spikelets often on only 1 side of rachis **GROUP I**
5. Spikes single and terminal; spikelets usually on opposite sides of rachis **GROUP II**
4. Spikelets, or most of them, with very short or long pedicels, the inflorescence a raceme or panicle which is sometimes spike-like; rarely with a single spikelet
6. Spikelets of crowded scales subtending bulblets rather than flowers or seeds, the bulblets usually purplish; culms usually bulbous at base, densely tufted; leaf tips boat-shaped **Poa**
6. Spikelets containing flowers or seeds; culms and leaves various
7. Glumes both lacking; spikelets 1 flowered **Leersia**
7. Glumes both present or only 1 lacking; spikelets 1 or more flowered
8. Spikelets mostly in pairs, 1 usually sessile and fertile and the other pediceled and sterile, or staminate, or reduced to only the pedicel (upper spikelets rarely in threes, 1 sessile, 2 pediceled); pedicel with long hairs
9. Inflorescence of 1 or more spike-like racemes on peduncles
10. Racemes solitary on each peduncle; sheaths strongly keeled **Schizachyrium**
10. Racemes 2 or more on each peduncle; sheaths not strongly keeled **Andropogon**
9. Inflorescence an open or somewhat contracted panicle
11. Pediceled spikelet reduced to the hairy pedicel; anthers (2.5)3.2-4.5mm long **Sorghastrum**
11. Pediceled spikelet developed but sterile or staminate; anthers 1.9-2.7(3)mm long **Sorghum**
8. Spikelets not as above; pedicels hairy or not
12. Spikelets usually dorsally flattened and falling entire, with 1 perfect terminal floret and usually 1 sterile lemma (which resembles a glume) or staminate floret below (1st glume sometimes minute) **GROUP III**
12. Spikelets usually flattened from the sides, the florets usually falling individually with the glumes persistent; spikelets with 1 or more perfect florets or the plants rarely dioecious; sterile or staminate florets, if any, above the perfect or with 2 below the perfect
13. Spikelets with 1 perfect terminal floret and 2 sterile lemmas or staminate florets below, the sterile often reduced to linear lemmas with long hairs
14. Lower florets staminate, well developed; spikelets brown and shiny; inflorescence an open panicle **Anthoxanthum**
14. Lower florets reduced to small scale-like or linear and long-hairy lemmas; spikelets green or yellow and dull; inflorescence a spike-like or contracted panicle **Phalaris**
13. Spikelets not as above, the sterile florets, if present, above the fertile, or rarely with 1 staminate floret below the 1 perfect floret
15. Spikelets mostly with 1 floret **GROUP IV**

15. Spikelets with 2 or more florets
16. Glumes, or at least 1 glume, equaling or exceeding the lowest floret, usually equaling the spikelet; lemmas awned from the back or from a bifid tip or awnless **GROUP V**
16. Glumes mostly shorter than the lowest floret; lemmas awned from the tip or from a bifid tip (rarely from back) or awnless **GROUP VI**

GROUP I

1. Ligules hairy
2. Spikelets with 1 or more modified florets above the perfect one, these sometimes merely awns; rhizomes none except when spikes pendulous (rarely with short rhizomes) **Bouteloua**
2. Spikelets without additional modified florets; strongly rhizomatous; spikes erect or ascending **Spartina**
1. Ligules membranous (rarely with a fringe of hairs at tip)
3. Glumes equal, broad and boat-shaped; leaf blades mostly over 3mm wide **Beckmannia**
3. Glumes somewhat unequal, narrow, not boat-shaped; leaf blades mostly about 1-3(4)mm wide
4. Spikelets 1 flowered; lemmas acuminate **Schedonnardus**
4. Spikelets with 1 perfect floret below and 1 reduced floret above; lemmas long awned **Chloris**

GROUP II

1. Spikelets with 1 perfect terminal floret and 2 opposite, sterile lemmas (often linear and hairy) below **Phalaris**
1. Spikelets with all perfect florets, or with only 1 sterile lemma below, or with sterile lemmas all above the fertile
2. Plants with spikelets dorsally flattened and falling entire, with 1 perfect terminal floret and 1 sterile lemma (which resembles a glume) or staminate floret below, awnless **Setaria**
2. Plants not as above
3. Spikelets 1 flowered, the lemma much shorter than the glumes and awnless **Phleum**
3. Spikelets 2 or more flowered, or if 1 flowered, the lemma conspicuously awned
4. Spikelets mostly 1 per node
5. Spikelets placed edgewise to rachis; 1st glume lacking except in terminal spikelet **Lolium**
5. Spikelets placed flatwise to rachis; glumes usually both present
6. Plants annual
7. Inflorescence 1-1.5cm long **Eremopyrum**
7. Inflorescence 3cm or more long
8. Glumes ovate, 3 or more nerved **Triticum**
8. Glumes linear-subulate, 1 nerved **Secale**
6. Plants perennial
9. Spikelets often strongly divergent, much compressed and crowded, some at least 4 times as long as internodes of rachis **Agropyron**
9. Spikelets usually erect or ascending, not much compressed or crowded, mostly 3 times as long as internodes or less
10. Glumes and lower lemmas blunt at tip (sometimes with a short pointed cusp at tip also) **Thinopyrum**
10. Glumes and lower lemmas gradually tapering and sharp-pointed at tip
11. Creeping rhizomes present
12. Glumes rigid, usually widest near base, often as long as 1st lemma, usually 3-5 nerved, awn-tipped to short-awned; leaves blue-green **Pascopyrum**
12. Glumes not rigid, widest at or above middle, shorter than 1st lemma, mostly 5-7 nerved, acute to awned; leaves normally green **Elymus**
11. Creeping rhizomes lacking
13. Anthers 4-6mm long; spikelets shorter to slightly longer than internodes of rachis; glumes acute or awn-tipped; lemmas often with a divergent awn **Pseudoroegneria**
13. Anthers 1-3mm long; spikelets mostly 2-3 times as long as internodes of rachis; glumes and lemmas various **Elymus**
4. Spikelets mostly 2 or more per node, at least at middle of spike, the lateral ones sometimes reduced to awns
14. Spikelets 3 per node, mostly 1 flowered, the lateral ones often pediceled and usually reduced, often to awns **Hordeum**
14. Spikelets 2 or more per node, 2 or more flowered, the lateral ones like the central one and usually sessile
15. Creeping rhizomes present, or if not, awns of lemmas usually less than 0.5cm long or lacking **Leymus**
15. Creeping rhizomes lacking; awns of lemmas mostly 1cm or more long **Elymus**

GROUP III

1. Inflorescence appearing like a simple spike; spikelets subtended by long bristles **Setaria**
1. Inflorescence compound with obvious branching; spikelets not subtended by bristles
2. Second glume awn-tipped; sterile lemma awned **Echinochloa**
2. Second glume and sterile lemma not awned
3. Inflorescence of digitate racemes; ligule membranous **Digitaria**
3. Inflorescence an open panicle; ligule hairy
4. Plants annual, or perennial with rhizomes; sterile lemma usually glabrous and acute at tip **Panicum**
4. Plants perennial without rhizomes (sometimes appearing annual but with old dried leaves at base); sterile lemma often hairy and obtuse at tip **Dichanthelium**

GROUP IV

1. Disjointing below the glumes, the entire spikelet falling (most evident on mature plants but joints near tip of pedicels often apparent in younger plants); ligule membranous
2. Glumes awned
3. Awn of glumes mostly 3mm or more long; anthers 0.4-0.7mm long **Polypogon**
3. Awn of glumes 2mm or less long; anthers 1.1-2.3mm long **Phleum**
2. Glumes not awned
4. Panicle spike-like, cylindrical; keel of glumes long-ciliate **Alopecurus**
4. Panicle open; keel or midnerve of glumes glabrous or scabrous
5. Spikelets about as long as wide; annual **Beckmannia**
5. Spikelets over twice as long as wide; perennial **Cinna**
1. Disjointing above the glumes, the glumes not falling with the florets; ligule hairy or membranous
6. Awn 3 parted **Aristida**
6. Awn simple or lacking
7. Lemma hardened, much more so than glumes at maturity, closely enveloping grain, often without evident nerves, terminally awned or nearly so, the awn sometimes deciduous and sometimes over 2cm long
8. Glumes 15mm or more long; awns mostly over (6)10cm long **Hesperostipa**
8. Glumes 15mm or less long; awns mostly less than 6cm long
9. Awn persistent, strongly twisted and bent, often over 2cm long; callus often sharp pointed, usually acuminate; glumes 6-15mm long
10. Lemma margins strongly overlapping; palea glabrous, less than one third the length of lemma **Nassella**

10. Lemma margins usually slightly if at all overlapping; palea one third as long to as long as lemma, hairy if as short as one third **Achnatherum**

9. Awn often deciduous, usually not strongly twisted, sometimes bent, mostly 2cm or less long; callus usually obtuse; glumes 2.5-8mm long

11. Pubescence on lemma long and silky, hairs mostly 1-3.5mm long, usually conspicuously exceeding lemma **Achnatherum**

11. Pubescence on lemma short and mostly appressed, not conspicuously exceeding lemma, sometimes lacking

12. Spikelets, excluding awn, 6-9mm long; leaf blades 2-15mm wide

13. Leaf blades of fertile stems none or mostly less than 1cm long (at least the uppermost); awn less than 13mm long **Oryzopsis**

13. Leaf blades of fertile stems elongate except lowermost reduced; awn 16-21mm long **Patis**

12. Spikelets, excluding awn, 5.5(6)mm long or less; leaf blades 0.3-2mm wide

14. Ligules 0.5mm or less long; lemmas hairy, conspicuously shorter than glumes **Achnatherum**

14. Ligules mostly 1-4mm long; lemmas usually equaling or exceeding glumes, sometimes slightly shorter especially if lemmas are glabrous or glabrate **Piptatheropsis**

7. Lemma usually not hardened, loose around grain, usually with 1 or more evident nerves, awned or not, the awns, when present, usually less than 2cm long

15. Glumes (excluding awns) longer than lemma

16. Glumes strongly flattened and keeled, stiff ciliate on keel, short awned; panicle spike-like; lemma awnless **Phleum**

16. Glumes not as above; panicle open to spike-like; lemma awned or not

17. Floret lacking hairs at base or with very short hairs; palea often small or lacking

18. Lemma with an awn mostly 5-10mm long; palea well developed; annual **Apera**

18. Lemma awnless or the awn less than 5mm long; palea well developed to lacking; annual or perennial **Agrostis**

17. Floret with a tuft of hairs at base from callus, the hairs usually 1/4 as long to as long as lemma; palea well developed

19. Ligule of hairs **Calamovilfa**

19. Ligule membranous

20. Lemma awned from back **Calamagrostis**

20. Lemma awned from tip **Muhlenbergia**

15. Glumes (excluding awns) mostly shorter than lemma (rarely equaling)

21. Lemma 1 nerved; ligule of hairs (at least upper half)

22. Floret with a tuft of hairs at base from callus **Calamovilfa**

22. Floret lacking a tuft of hairs at base **Sporobolus**

21. Lemma 3 or 5 nerved; ligule membranous

23. Glumes or lemmas or both awned or at least acute at tip **Muhlenbergia**

23. Glumes and lemmas truncate at tip, awnless **Catabrosa**

GROUP V

1. Ligules hairy

2. Lemmas bifid at tip, awned from between the lobes **Danthonia**

2. Lemmas awnless **Eragrostis**

1. Ligules membranous, rarely with a short fringe of hairs at tip

3. Spikelets mostly 9mm or more long; rachilla usually not prolonged beyond terminal floret **Avena**

3. Spikelets 8mm long or less; rachilla often prolonged beyond terminal floret

4. Glumes dissimilar, the 2nd much wider than the 1st; spikelets 2-4mm long; lemmas awnless **Sphenopholis**

4. Glumes usually relatively similar (if not, the lemmas awned or spikelets longer); spikelets (2.5)4-8mm long

5. Lemmas awned from near or below middle **Deschampsia**

5. Lemmas awnless or awned from above middle

6. Lemmas with an exserted, usually geniculate awn **Trisetum**

6. Lemmas awnless or with a very short, straight awn

7. Pedicels mostly less than 3mm long; upper floret rarely exceeding longest glume by more than 1mm **Koeleria**

7. Pedicels, or some of them, usually over 3mm long; upper floret usually exceeding longest glume by 1.5mm or more **Poa**

GROUP VI

1. Plants stout reeds to 4m high with plume-like panicles; at least some leaves 9mm or more wide; rachilla with long silky hairs as long as the lemmas, the hairs often inconspicuous in young flowers; lowest lemmas mostly 9mm or more long; moist areas or in water **Phragmites**

1. Plants not as above

2. Plants dioecious, sometimes with rudiments of the opposite sex in a normally developed flower; lemmas awnless

3. Plants with long creeping rhizomes; sheaths usually long-hairy near throat; ligules usually with a fringe of hairs at tip; spikelets mostly 7-15 flowered **Distichlis**

3. Plants with rhizomes or not; sheaths not long-hairy; ligules mostly membranous; spikelets mostly 3-7 flowered

4. Panicle narrow and congested; some leaf blades often over 3.5mm wide, often glaucous; short-rhizomatous **Leucopoa**

4. Panicle often open; leaf blades rarely over 3.5mm wide, not glaucous; rhizomatous or not **Poa**

2. Plants with perfect flowers, at least the lower florets; lemmas awned or awnless

5. Plants annuals or tufted perennials; ligule membranous; 1st glume much narrower than 2nd; spikelets mostly 2 flowered, 2-4mm long, awnless, falling entire (glumes not persistent) **Sphenopholis**

5. Plants without the above combination of characteristics

6. Ligule a fringe of hairs **Eragrostis**

6. Ligule membranous

7. Lemmas with mostly 3 prominent nerves; spikelets less than 5mm long; lemmas truncate **Catabrosa**

7. Lemmas with 5 or more nerves or appearing nerveless (rarely 3 nerved when spikelets 15-30mm long); lemmas usually obtuse to acuminate

8. Spikelets crowded in 1 sided clusters at ends of stiff, naked panicle branches; glumes usually hispid-ciliate on keel and sometimes on margins and nerves, otherwise mostly glabrous **Dactylis**

8. Spikelets and glumes not as above

9. Callus of florets bearded with straight hairs (except rarely the lowermost one), the lemmas otherwise glabrous or scabrous

10. Lemmas 7mm or more long, the awn 8-15mm long **Schizachne**

10. Lemmas (3.5)4-5.5mm long, the awn 3-6(7)mm long **Trisetum**

9. Callus of florets not bearded (lemmas sometimes cobwebby at base), the lemmas sometimes hairy

11. Stems usually bulbous at base in the soil; spikelets often tawny or purplish tinged, glumes and lemmas with scarious margins; upper floret often sterile and lacking a palea; sheaths usually closed most of their length **Melica**

11. Stems usually not bulbous at base; spikelets often completely green; upper florets perfect, or if not, with paleas, or the floret reduced to a rudiment; sheaths often split most of their length

12. Lemmas mostly obtuse and scarious at tip, not awned, 5-9 nerved; glumes mostly 3mm or less long; leaves not boat-shaped at tip or slightly so in drying

13. Second glume 1 nerved; styles well developed; nerves of lemmas prominent **Glyceria**
13. Second glume usually 3 nerved; styles lacking or nearly so; nerves of lemmas prominent or obscure
14. Nerves of lemmas mostly obscure; ligules rarely over 3mm long; mostly in alkaline areas **Puccinellia**
14. Nerves of lemmas prominent, usually raised from surface; ligules 3mm or more long; mostly in fresh water areas **Torreyochloa**

12. Lemmas sometimes acute at tip, scarious or not, often awned, if not awned, rarely over 5 nerved; glumes often over 3mm long; leaves sometimes boat-shaped at tip
15. Lemmas awned or awn-tipped from a minutely or strongly bifid tip (except sometimes a species with inflated spikelets); spikelets usually 15mm or more long **Bromus**
15. Lemmas often entire, pointed or obtuse, awnless or awned usually from the tip; spikelets mostly less than 15mm long
16. Lemmas awned, or if awnless, not rhizomatous nor with boat-shaped leaf tips or else with well developed auricles, lemmas mostly with slender pointed tips and mostly rounded on back
17. Leaf blades involute, or if flat, less than 3mm wide
18. Plants perennial **Festuca**
18. Plants annual **Vulpia**
17. Leaf blades flat, mostly over 3mm wide
19. Lemmas with awns over 4mm long; auricles none **Festuca**
19. Lemmas awnless or with awns 2mm or less long; auricles usually well developed **Schedonorus**
16. Lemmas awnless (midnerve rarely slightly extended), often keeled and blunt and scarious at tip; rhizomatous or not; leaves often with boat-shaped tips, auricles none **Poa**

Mallow Group

1. Stigmas filiform; leaves mostly toothed, or lobed to about halfway to base
2. Petals 3-7cm long; involucel of (3)6-10 united bractlets **Alcea**
2. Petals 3cm or less long; involucel of 3 or fewer mostly distinct bractlets or lacking **Malva**

1. Stigmas capitate; leaves mostly deeply cleft to compound
3. Petals yellow or white at least on inner surface, sometimes purple on back or at base; annuals **Hibiscus**
3. Petals red or salmon; perennials **Sphaeralcea**

Mints

1. Anther bearing stamens 2
2. Corolla nearly regular, 4 lobed, 5.5mm or less long; flowers in dense axillary clusters **Lycopus**
2. Corolla 2 lipped, usually 5 lobed, (3)6mm or more long; flowers axillary or terminal
3. Calyx bilabiate; connective of anther elongate, jointed to the relatively short and similar filament, usually a single pollen sac at tip **Salvia**
3. Calyx teeth usually 5, subequal or with 2 long and 3 shorter; connective of anther short, merely expanded at end of filament, 2 pollen sacs at tip placed end to end
4. Corolla 3-12mm long; calyx teeth of 2 lengths; leaf blades 5mm or less wide, usually entire **Hedeoma**
4. Corolla 12-40mm long; calyx teeth about equal; leaf blades 10mm or more wide, usually toothed **Monarda**

1. Anther bearing stamens 4
5. Calyx teeth 10, hooked at tip; stems usually densely white-woolly **Marrubium**
5. Calyx teeth 5 or fewer, rarely hooked at tip; stems usually not densely white-woolly
6. Corolla regular or nearly so, often 4 lobed, 1.5-7mm long; leaves mostly twice or more as long as wide **Mentha**
6. Corolla irregular (rarely obscurely so but 5 lobed and longer than above and leaves about as long as wide), mostly 2 lipped, 3-30mm long
7. Calyx 2 lipped, the lips entire, with a gibbosity or appendage on the upper side near middle **Scutellaria**
7. Calyx, if 2 lipped, with evident teeth on at least 1 lip, lacking a gibbosity or appendage on upper side
8. Upper calyx tooth twice or more as wide as the other 4 **Dracocephalum**
8. Upper calyx tooth little if at all wider than the other 4, rarely strongly bilabiate with some teeth obscure
9. Plants annuals; leaves toothed or very shallowly lobed; flowers mostly axillary
10. Leaf blades mostly over twice as long as wide; calyx 7-15mm long with spine-like tips **Galeopsis**
10. Leaf blades mostly about as long as wide; calyx 5-7mm long with triangular tips **Lamium**
9. Plants perennials (sometimes with many fibrous roots and appearing annual but some leaves moderately to deeply lobed); flowers axillary or terminal or both
11. Inflorescences axillary, all flowers overtopped by leaves; leaves, at least the lower, about as long as wide
12. Leaves 1-4cm long, toothed; calyx lobes acute, not prickly **Glechoma**
12. Leaves, or some of them, 5-10cm long and lobed; calyx lobes spinulose and prickly **Leonurus**
11. Inflorescences terminal, not overtopped by leaves, axillary inflorescences sometimes also present; leaves usually obviously longer than wide
13. Ovary merely 4 lobed, the style not basal; corolla apparently 1 lipped, the lip 5 lobed; nutlets laterally attached **Teucrium**
13. Ovary deeply 4 parted, the style usually basal; corolla 2 lipped or nearly so; nutlets basally attached
14. Stamens exserted from corolla well over 1mm; upper corolla lip not hooded **Agastache**
14. Stamens not exserted or barely so, often closely subtended by the usually hooded upper lip of corolla
15. Leaves entire or nearly so; calyx bilabiate **Prunella**
15. Leaves toothed; calyx usually not bilabiate or obscurely so
16. Calyx with 15 raised nerves and non-glandular hairs much less than 1mm long (sessile glands may be present); calyx teeth slightly unequal; leaves mostly petioled **Nepeta**
16. Calyx with 5-10 primary nerves, not raised, some hairs glandular and some usually over 1mm long; calyx teeth about equal; primary leaves mostly sessile or subsessile, lowermost sometimes with short petioles **Stachys**

Mustard Group

FRUIT KEY

1. Mature fruit less than 4 times as long as wide (exclude style)
2. Fruits flattened except sometimes where extended by the seeds **GROUP I**
2. Fruits terete, subterete, or quadrangular in cross section **GROUP II**

1. Mature fruit over 4 times as long as wide
3. Pubescence, at least in part, of stellate or branched hairs **GROUP III**
3. Pubescence all of simple hairs or plants glabrous (at least check base of plant for hairs)
4. Fruit stalked at base, the stalk usually extending 7mm or more beyond the receptacle (do not confuse this with pedicel); petals yellow **Stanleya**
4. Fruit not stalked at base, the valves extending all the way to base, or, the stalk less than 3mm long; petals yellow or not
5. Plants glandular-hairy **Chorispora**

5. Plants not glandular-hairy (rarely papillose)
6. Fruits usually broader than linear, rarely as much as 8 times as long as wide **GROUP IV**
6. Fruits linear, often over 8 times as long as wide
7. Fruits definitely flattened **GROUP V**
7. Fruits terete or 4 angled, not flattened (rarely with a flattened beak) **GROUP VI**

GROUP I

1. Fruits flattened at a right angle to the septum
2. Seeds solitary in each of the 2 chambers of fruit **Lepidium**
2. Seeds 2 or more in each of the 2 chambers of fruit
3. Plants glabrous **Thlaspi**
3. Plants hairy at least at base
4. Fruit triangular, widest at top **Capsella**
4. Fruit not triangular **Lepidium**

1. Fruits flattened parallel to septum
5. Seeds 1 or 2 in each chamber of fruit, fruit about as long as wide **Alyssum**
5. Seeds more than 2 in each chamber of fruit, fruit longer than wide
6. Seeds often minutely winged; plants weedy annuals, erect, mostly over 3dm high; petals white; styles 1.5mm or more long **Berteroa**
6. Seeds not winged; plants often less than 2dm high; petals yellow or white; styles usually much less than 1.5mm long **Draba**

GROUP II

1. Hairs simple or lacking
2. Fruits subglobose or oval in outline; leaves entire or toothed, the upper ones auriculate; rhizomatous **Lepidium**
2. Fruits not subglobose or oval, distinctly longer than wide, or if oval, the leaves either lobed or divided or not auriculate or the plants not rhizomatous
3. Petals white; root very thick **Armoracia**
3. Petals yellow; root slender **Rorippa**

1. Hairs, or some of them, branched or stellate (at least check base of plant for hairs)
4. Stem leaves compound or deeply divided **Descurainia**
4. Stem leaves simple and entire or merely toothed (rarely none)
5. Stem leaves numerous and auriculate or clasping stem; basal leaves few or lacking **Camelina**
5. Stem leaves few, not auriculate or clasping stem; basal leaves many **Physaria**

GROUP III

1. Hairs 2 branched from near base, the branches appressed to plant surface or nearly so (sometimes with appressed 3 branched hairs also); flowers yellow or rarely reddish or purplish **Erysimum**

1. Hairs more than 2 branched or 2 branched from above and the branches not appressed to plant surface (rarely 2 branched and appressed in the nearly glabrous *Boechera stricta* with white or pink petals); flowers various
2. Leaves compound or nearly so **Descurainia**
2. Leaves simple
3. Fruits usually not linear (sometimes broadly so), usually strongly flattened, mostly less than 8 times as long as wide **Draba**
3. Fruits usually about as wide as deep, or if flattened, then narrowly linear, usually over 8 times as long as wide
4. Fruits distinctly flattened
5. Fruiting pedicels mostly erect or nearly so; seeds in 1 row in each locule; mature fruits mostly 3-6cm long; lower stem hirsute **Arabis**
5. Fruiting pedicels ascending to descending, or if erect, without the other characteristics above **Boechera**
4. Fruits terete or subterete
6. Plants perennial; petals 16-25mm long **Hesperis**
6. Plants annual or biennial; petals less than 6mm long
7. Seeds in 2 rows in each chamber, at least in part; pedicels erect or ascending; fruit 4-10cm long **Turritis**
7. Seeds in 1 row in each chamber; pedicels spreading; fruit 1-2cm long **Arabidopsis**

GROUP IV

1. Fruits flattened **Draba**
1. Fruits terete or nearly so
2. Petals white; leaves, or some of them, pinnately compound; plants glabrous, often rooting at nodes **Nasturtium**
2. Petals yellow; leaves often not compound; plants glabrous or hairy, usually not rooting at nodes **Rorippa**

GROUP V

1. Leaves, or some of them, pinnately compound **Cardamine**
1. Leaves all simple, entire or toothed
2. Fruiting pedicels mostly erect or nearly so; seeds in 1 row in each locule; mature fruits mostly 3-6cm long; lower stem hirsute **Arabis**
2. Fruiting pedicels ascending to descending, or if erect, without the other characteristics above **Boechera**

GROUP VI

1. Styles beak-like, usually sharply differentiated from body of fruit, 1.5mm or more long on at least some fruits; fruits 10mm or more long
2. Valves nerveless; petals white (pink) **Cardamine**
2. Valves with 1 or more somewhat raised nerves; petals white or not
3. Beaks mostly 3mm or less long, the leaves all compound or else deeply lobed or divided **Erucastrum**
3. Beaks usually over 3mm long, if shorter, some or all leaves simple and not deeply lobed or divided
4. Petals white to rose or purple; leaves entire or nearly so, not auriculate **Thelypodium**
4. Petals yellow, often fading to white; leaves usually toothed or lobed or else auriculate
5. Sepals 3-5mm long; annual
6. Beak of fruit usually with a single seed at base, the beak and valves with usually 3 raised parallel nerves **Sinapis**
6. Beak of fruit usually lacking a seed at base, usually 1 nerved, the valves with 1 raised nerve **Brassica**
5. Sepals 2-3mm long; biennial or perennial **Barbarea**

1. Styles very short or lacking, not beak-like (rarely to 1.5mm on fruits 12mm or less long)
7. Petals yellow or rarely cream colored (sometimes drying white)
8. Leaves entire or nearly so **Conringia**
8. Leaves dentate to pinnatifid or pinnate
9. Fruits mostly 12mm long or less, spreading to ascending **Rorippa**
9. Fruits mostly over 15mm long when mature, mostly ascending to erect
10. Stem leaves auriculate or cordate-clasping **Barbarea**
10. Stem leaves not auriculate or cordate-clasping **Sisymbrium**
7. Petals white, pink, or purple
11. Fruits conspicuously constricted between the seeds, or with a stipe at base, or both **Thelypodium**
11. Fruits not conspicuously constricted between the seeds, without a stipe

12. Fruiting pedicels mostly erect or nearly so; leaves entire or toothed or rarely slightly lobed **Turritis**
12. Fruiting pedicels ascending to descending, or if erect, the leaves pinnately compound or pinnatifid
13. Leaves entire or nearly so, mostly auriculate **Conringia**
13. Leaves, at least the basal ones, dentate or sinuate to pinnatifid or pinnate, usually not auriculate
14. Seeds in 2 rows in each chamber, at least in part; fruits sometimes less than 15mm long **Nasturtium**
14. Seeds in 1 row in each chamber; fruits over 15mm long
15. Lower leaves mostly reniform and coarsely toothed **Alliaria**
15. Lower leaves pinnately lobed to compound
16. Styles in fruit 0.5mm or less wide; petals white, pink, or rose; plants mostly of wet areas **Cardamine**
16. Styles in fruit 0.6mm or more wide or lacking; petals yellowish, sometimes drying white; plants mostly of dry areas **Sisymbrium**

FLOWER KEY

1. Hairs branched at least in part
2. Hairs 2 branched, the branches appressed to the plant surface (rarely with a few 3 branched hairs, these also appressed)
3. Petals yellow or rarely reddish or purplish **Erysimum**
3. Petals white or pink, sometimes bluish tinged **Boechera**
2. Hairs not as above
4. Stem leaves, at least the upper ones, auriculate or clasping the stem
5. Plants biennial or perennial
6. Stem leaves well developed, 1.5-7(15)cm long, 0.5-4cm wide
7. Seeds in 1 row in each locule, rarely with 2 imperfect rows **Arabis**
7. Seeds in 2 rows in each locule **Turritis**
6. Stem leaves often poorly developed, 0.4-3.5(8)cm long, mostly 0.1-0.7(1)cm wide **Boechera**
5. Plants annual
8. Basal leaves rosulate and lobed **Capsella**
8. Basal leaves not rosulate, entire or minutely toothed **Camelina**
4. Stem leaves not auriculate or clasping stem
9. Leaves pinnately compound or nearly so **Descurainia**
9. Leaves simple and entire or toothed or rarely a few pinnatifid
10. Petals yellow, rarely tinged with red or purple or drying white
11. Plants annual or biennial, the leaves mostly along the stem; petals 2.5-4mm long
12. Leaves linear to oblanceolate, 1-6mm wide, entire; sepals 1.5-3.5mm long **Alyssum**
12. Leaves ovate to obovate, 1-15mm wide, entire or toothed; sepals 1-2mm long **Draba**
11. Plants perennial, or if not, the leaves mostly basal and rosulate and the petals usually longer
13. Styles of young fruits averaging 1.5mm or less long **Draba**
13. Styles of young fruits averaging over 1.5mm long **Physaria**
10. Petals white, purple, pink, or rose (rarely none)
14. Plants perennial; petals mostly 16-25mm long **Hesperis**
14. Plants not both perennial and with petals 16-25mm long
15. Plants annual or biennial, the leaves mostly along stem and 1-6mm wide, entire; petals 2-4mm long **Alyssum**
15. Plants not as above (basal rosette sometimes deciduous)
16. Plants annual
17. Petals 4-6mm long, often notched at tip; sepals 2-3mm long **Berteroa**
17. Petals 1-4(5)mm long, not notched; sepals 1-2mm long
18. Young fruits linear, essentially terete **Arabidopsis**
18. Young fruits usually linear-elliptic or broader, flattened **Draba**
16. Plants biennial or perennial
19. Young fruits linear; petals and sepals of various length **Boechera**
19. Young fruits usually linear-elliptic or broader; petals 2-5mm long; sepals 1-3mm long **Draba**

1. Hairs all simple or lacking
20. Plants glandular-hairy **Chorispora**
20. Plants not glandular-hairy
21. Petals lacking or less than 0.5mm long **Lepidium**
21. Petals present, 0.5mm or more long
22. Petals about 1mm long, white; annual with stem leaves **Lepidium**
22. Petals, if white, (1.5)2mm or more long or without stem leaves; annual to perennial
23. Petals yellow (sometimes drying white) **GROUP A**
23. Petals white, purple, pink, or rose **GROUP B**

GROUP A

1. Upper leaves auriculate or clasping stem
2. Leaves all entire or merely toothed
3. Petals 0.5-4mm long **Rorippa**
3. Petals 5mm or more long **Conringia**
2. Leaves, or some of them, lobed to compound
4. Leaves dimorphic, the lower much divided into linear segments, the upper mostly entire and strongly cordate-clasping or perfoliate; petals about 1.5mm long **Lepidium**
4. Leaves not as above; petal length various
5. Petals 0.5-3mm long; sepals 0.5-2(2.5)mm long **Rorippa**
5. Petals 3-5mm long; sepals 2-4mm long
6. Plants rhizomatous perennials **Rorippa**
6. Plants biennial, without rhizomes **Barbarea**

1. Upper leaves not auriculate or clasping stem
7. Sepals 8-16mm long; ovary and young fruit on a stalk usually 5mm or more long **Stanleya**
7. Sepals less than 8mm long, or if not, the ovary and young fruit without a stalk
8. Petals 0.5-5mm long
9. Leaves all entire or merely toothed
10. Leaves mostly basal **Draba**
10. Leaves mostly along stem **Rorippa**
9. Leaves, or some of them, lobed to compound
11. Petals 4-5mm long; sepals 2-4mm long
12. Plants rhizomatous perennials **Rorippa**

12. Plants annual or biennial, not rhizomatous **Erucastrum**
11. Petals 0.5-4mm long; sepals 0.5-2.5mm long
13. Petals mostly 0.5-1.8mm long; plants sometimes prostrate or glabrous **Rorippa**
13. Petals about 3mm long; plants mostly erect and hirsute at base **Sisymbrium**
8. Petals 5mm or more long
14. Leaves all entire or merely toothed **Sinapis**
14. Leaves, or some of them, lobed to compound
15. Styles of young fruits lacking or nearly so; petals 5-8mm long **Sisymbrium**
15. Styles of young fruits usually apparent; petals 4-15mm long
16. Leaves all compound or deeply lobed or divided; petals 4-7mm long **Erucastrum**
16. Leaves, or some of them, often simple and not deeply lobed or divided; petals 6-15mm long
17. Plants often glabrous or nearly so; petals pale yellow with dark veins **Brassica**
17. Plants hirsute at least below; petals bright yellow without dark veins **Sinapis**

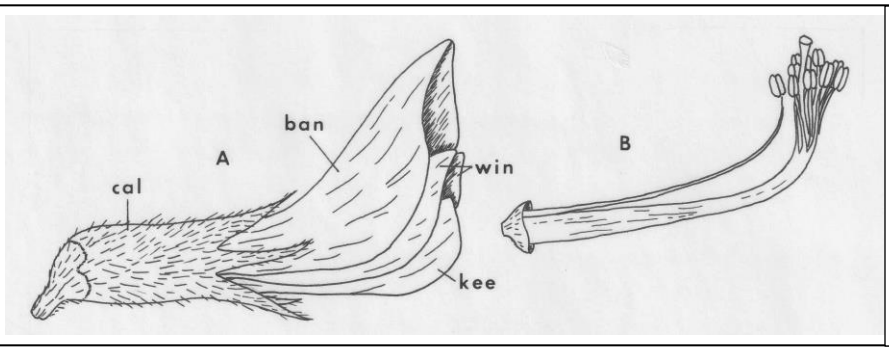
GROUP B

1. Upper leaves auriculate or clasping the stem
2. Petals 2-7mm long; sepals 1-5mm long
3. Sepals 1-2mm long
4. Plants hairy **Lepidium**
4. Plants glabrous **Thlaspi**
3. Sepals 2-5mm long
5. Plants glabrous; sepals 1-3mm long **Thlaspi**
5. Plants hairy, or if glabrous, the sepals 3-5mm long
6. Seeds in 2 rows in each locule **Turritis**
6. Seeds in 1 row in each locule, rarely with 2 imperfect rows **Arabis**
2. Petals 7-12mm long; sepals 6-8mm long **Conringia**
1. Upper leaves not auriculate or clasping stem
7. Plants glabrous perennials, usually rooting at nodes, in wet places, the leaves mostly pinnately compound; petals 3-5mm long; sepals 2-3mm long **Nasturtium**
7. Plants not as above
8. Petals 4mm long or less; sepals 0.5-2mm long
9. Young fruits linear; petals at least 2mm long; stamens 6 **Cardamine**
9. Young fruits not linear; petals often less than 2mm long; stamens sometimes 2 or 4 **Lepidium**
8. Petals 4mm or more long; sepals (1)3-6mm long
10. Plants glabrous perennials with a very thick root; leaves coarsely and irregularly crenate or some divided **Armoracia**
10. Plants annual to perennial, root usually slender; leaves various
11. Leaves all entire or merely toothed
12. Leaf blades reniform below to deltoid above, little if at all longer than wide, coarsely toothed, mostly distinctly petioled **Alliaria**
12. Leaf blades oblong or lanceolate to oblanceolate or linear, mostly obviously longer than wide, often entire, some usually sessile
13. Plants glabrous biennials **Thelypodium**
13. Plants either perennial or hairy or both **Boechera**
11. Leaves, or some of them, lobed to compound
14. Petals 2-4mm long **Cardamine**
14. Petals 6-8mm long **Sisymbrium**

Orchids

1. Leaves reduced to sheaths or scales, not green; plants saprophytic **Corallorhiza**
1. Leaves well developed, green; plants not saprophytic
2. Lip petal 7-30mm long, forming an inflated pouch; flowers 1-4 per stem
3. Leaves along stem, 3 to several; lip usually white or yellow, without an expanded lamina on front **Cypripedium**
3. Leaves solitary at base; lip usually white, yellow, and pink or purplish in various combinations of spotting and streaking, with an expanded lamina on front **Calypso**
2. Lip petal 2-12(20)mm long, usually flat or rolled, rarely saccate at base; flowers mostly 2 to many per stem
4. Lip petal with a saccate to cylindrical spur from the lower side which is not beaked
5. Leaves mostly 1-4, basal or nearly so
6. Sepals 1 nerved; leaves usually 2-4, often withered by flowering **Piperia**
6. Sepals 3 or more nerved; leaves mostly 1 or 2 **Platanthera**
5. Leaves several along the stem
7. Lip petal 2-3 toothed at tip; bracts much longer than flowers **Coeloglossum**
7. Lip petal entire; bracts longer or shorter than flowers **Platanthera**
4. Lip petal not spurred from lower side, sometimes slightly saccate and the sac tipped with an elongate beak
8. Leaves 2, usually opposite or subopposite near middle of stem **Listera**
8. Leaves more than 2, basal or along stem
9. Leaves mostly basal or nearly so, less than 3 times as long as wide, the midvein sometimes white **Goodyera**
9. Leaves along stem, or if basal, mostly over 3 times as long as wide and the midvein not white
10. Flowers scattered, the bracts foliaceous; petals brownish-purple to greenish-yellow **Epipactis**
10. Flowers crowdd, the bracts usually not foliaceous; petals white to cream **Spiranthes**

Pea Group



A:typical pea flower, cal = calyx, ban = banner, win = wings, kee = keel; B: stamens enclosing pistil

1. Leaflets 2 or 3, or if more, palmately attached, rarely with leaves apparently simple and linear to oblanceolate
  2. Stamens all separate or nearly so; petals yellow **Thermopsis**
  2. Stamens, or most of them, united by filaments usually well above base; petals yellow or not
    3. Filaments all united at about the same level
      4. Leaves often glandular-dotted under magnification; ovules and seeds 1
        5. Calyx usually 3mm or less long, barely if at all enlarging in fruit; flowers mostly 4-7mm long **Psoralidium**
        5. Calyx (at least the older ones) usually over 3mm long, becoming enlarged in fruit; flowers mostly (6)7mm or more long **Pediomelum**
      4. Leaves not glandular-dotted; ovules and seeds 2 or more **Lupinus**
    3. Filaments united in a group of 9 and 1 solitary, the solitary one united to the rest near or below middle of filament tube or completely free
      6. Leaflets toothed, sometimes only slightly so at tip
        7. Petiole not prolonged beyond lateral leaflets, all leaflets attached at same point, short subequal petiolules often present which differ in color and/or width from petiole; terminal leaflet sometimes toothed to near base; calyx teeth sometimes unequal and often longer than tube; flowers in heads or short spike-like racemes; petal color variable but not yellow; fruits not curved or coiled **Trifolium**
        7. Petiole prolonged beyond lateral leaflets to attachment of petiolule of terminal leaflet, the terminal leaflet not attached at same point as lateral leaflets; terminal leaflet usually not toothed to near base; calyx teeth mostly subequal and about as long as tube; flowers in oblong to elongate racemes, or if rarely in heads, the petals usually yellow or blue-purple; fruits sometimes curved or coiled
          8. Fruits curved or coiled; inflorescence a tight raceme or head not over 5cm long, the petals yellow or blue-purple (rarely pink or white); leaflets usually toothed only above middle **Medicago**
          8. Fruits straight (ovoid); inflorescence a loose raceme usually over 5cm long, the petals white or yellow; leaflets usually toothed to below middle **Melilotus**
      6. Leaflets entire (rarely glandular-margined)
        9. Plants annual, either twining or sprawling or erect with flowers solitary in upper leaf axils; leaflets 3
          10. Plants twining or sprawling, upper flowers in axillary racemes **Amphicarpaea**
          10. Plants erect with flowers solitary (rarely 2) in upper leaf axils **Lotus**
        9. Plants perennial, erect or caespitose, flowers solitary or not; leaflets (1)3-5(7)
          11. Plants acaulescent and usually forming dense mats or cushions; leaflets 3 or with apparently simple leaves **Astragalus**
          11. Plants caulescent with erect stems; leaflets 3-5(7)
            12. Flowers yellow, often tinged with red, in head-like umbels of 3-8 flowers **Lotus**
            12. Flowers reddish-purple to blue, purplish, or white, mostly in racemes which may be spike-like
              13. Leaflets 3, lanceolate or ovate, venation prominent; fruit a loment; stems usually with some uncinate hairs **Desmodium**
              13. Leaflets 3-5(7), rarely lanceolate or ovate, venation often obscure; fruit a legume; uncinate hairs lacking
                14. Flowers mostly 4-7mm long; calyx usually 3mm or less long, barely if at all enlarging in fruit **Psoralidium**
                14. Flowers mostly (6)7mm or more long; calyx (at least the older ones) usually over 3mm long, becoming enlarged in fruit **Pediomelum**

1. Leaflets 4 or more, pinnately attached
  15. Terminal leaflet modified into a tendril or bristle-like structure
    16. Styles cylindrical, with a ring of hairs just under stigma **Vicia**
    16. Styles flattened, at least the upper 1/4, hairy along 1 side only **Lathyrus**
  15. Terminal leaflet normal or rarely lacking
    17. Plants woody trees or shrubs
      18. Plants shrubby without spines or prickles; petals blue-purple **Amorpha**
      18. Plants trees, often with spines or prickles, at least at base of buds; petals white, greenish, or creamy to rose, pink, or lavender
        19. Flowers slightly irregular, not papilionaceous, less than 1cm long; leaves even pinnate; leaflets slightly glandular-toothed **Gleditsia**
        19. Flowers very irregular, papilionaceous, over 1cm long; leaves odd pinnate; leaflets entire **Robinia**
    17. Plants mostly herbaceous (subshrub)
      20. Fertile stamens 5 (alternating with 4 petals which are sometimes staminode-like) **Dalea**
      20. Fertile stamens 9 or 10
        21. Petals solitary, only the banner present, blue-purple; stamens united at very base; mostly subshrubs **Amorpha**
        21. Petals not solitary, blue-purple or not; stamens usually united well above base or free or nearly so; herbs
          22. Stamens all distinct or nearly so; petals yellow or white to ochroleucous
            23. Leaves trifoliolate but stipules leaflet-like; petals yellow **Thermopsis**
            23. Leaves pinnately compound; petals white to ochroleucous **Sophora**
          22. Stamens, or most of them, united by their filaments usually well above base; petal color various
            24. Filaments all united at about the same level **Dalea**
            24. Filaments united in a group of 9 and 1 solitary, the solitary one united to the rest near or below middle of filament tube or completely free
              25. Flowers 3-20 in head-like umbels; plants caulescent
                26. Petals yellow, often tinged with red; leaflets mostly 5 **Lotus**
                26. Petals pink to lavender or white; leaflets mostly 9-21 **Coronilla**
              25. Flowers mostly in racemes which are sometimes spike-like or head-like; plants caulescent or acaulescent

27. Plants caulescent; leaves conspicuously glandular-dotted under magnification; petals white or yellowish; keel shorter than banner and wings; pod with hooked prickles **Glycyrrhiza**
27. Plants not as above
28. Plants twining; keel brownish-red, spirally twisted **Apios**
28. Plants not as above
29. Keel petal narrowed at tip to a definite slender beak; plants acaulescent or nearly so **Oxytropis**
29. Keel petal not beaked (except caulescent *Astragalus miser*); plants caulescent or acaulescent
30. Plants with 1 seeded pods; petals pink to lavender with reddish-purple lines; wings less than half as long as keel; keel equaling or exceeding banner; calyx lobes awl-shaped, longer than tube **Onobrychis**
30. Plants not as above
31. Fruit a loment; keel usually exceeding or equaling banner and wings **Hedysarum**
31. Fruit a legume; keel usually not exceeding or equaling both banner and wings **Astragalus**

Phlox Group
1. Leaves opposite (at least below), simple, and entire (or ciliate-margined), sometimes densely crowded in mat forming species; filaments attached to corolla at different levels
2. Calyx tube of nearly uniform texture; calyx lobes somewhat triangular **Collomia**
2. Calyx tube usually with green costae alternating with hyaline intervals; calyx lobes slender-acicular
3. Plants annual; upper leaves usually alternate **Microsteris**
3. Plants perennial; leaves often all opposite or densely crowded **Phlox**
1. Leaves alternate or basal, or if opposite, then lobed or compound; filaments attached to corolla at same level or different levels
4. Plants annual with flowers in leafy-bracted heads; calyx lobes usually somewhat unequal in length; leaves mostly pinnatifid to bipinnatifid with spinulose, linear segments that usually gradually taper into the spinulose tips so that the spinulose tips are not abruptly differentiated from rest of segment **Navarretia**
4. Plants not as above (an annual with some trifid or pinnatifid leaves has spinulose tips abruptly set off from leaf proper)
5. Leaves sessile, palmately divided to near base (except some fascicled in axils of main leaves)
6. Plants annual; calyx 2-4mm long; corolla 2.5-6mm long **Leptosiphon**
6. Plants perennial; calyx 7mm or more long; corolla 12mm or more long **Linanthus**
5. Leaves not both sessile and palmately divided to near base
7. Calyx tube of nearly uniform texture (rarely with linear alternating white segments); calyx lobes without needle-like tips (may be sharply acute)
8. Leaves pinnately compound; perennial **Polemonium**
8. Leaves simple and mostly entire; annual **Collomia**
7. Calyx tube with green costae alternating with hyaline intervals, the hyaline intervals often as wide as or wider than the green costae; calyx lobes sometimes with sharp, but short, needle-like tips **Ipomopsis**

Purslane Group
1. Petals yellow; capsule circumscissile; annual **Portulaca**
1. Petals white, pink, rose, or lavender; capsule valvate or circumscissile; annual or perennial
2. Plants annual; cauline leaves usually perfoliate **Claytonia**
2. Plants perennial; cauline leaves none or not perfoliate
3. Plants with a subglobose corm; capsule valvate; stem leaves 2 (rarely none), usually lanceolate or oblanceolate or broader **Claytonia**
3. Plants with a taproot; capsule circumscissile or valvate; stem leaves mostly linear or bract-like when present
4. Plants with a thick fleshy taproot; flowers usually 1 per scape; capsule circumscissile **Lewisia**
4. Plants with a slender taproot; flowers usually several to many in an inflorescence; capsule valvate **Phemeranthus**

Rose Group
1. Plants trees or shrubs, not low and mat-forming
2. Leaves compound
3. Stems spiny or prickly, the prickles or spines sometimes rather sparse
4. Stipules attached to petiole most of their length; leaflets mostly 5 or more **Rosa**
4. Stipules lacking or free most of their length; leaflets mostly 3 **Rubus**
3. Stems not spiny or prickly
5. Leaflets 10-30mm wide, toothed; petals white or cream; fruit pomaceous **Sorbus**
5. Leaflets 1-6mm wide, entire; petals yellow; fruit an achene **Dasiphora**
2. Leaves simple
6. Leaves palmately veined, some of them 7cm or more wide **Rubus**
6. Leaves pinnately veined, or if palmately veined, less than 7cm wide
7. Branches with spines or thorns
8. Leaves often doubly toothed or lobed, at least near tip; styles 2-5; spines usually not bearing leaves, buds, or flowers **Crataegus**
8. Leaves simply toothed; styles solitary; spines usually bearing leaves, buds, or flowers **Prunus**
7. Branches without spines or thorns
9. Leaves 3 lobed or parted at tip, otherwise entire, mostly less than 20mm long and wide, tomentose beneath; petals yellow **Purshia**
9. Leaves not 3 lobed or parted at tip, or if so, then larger, toothed or not, usually not tomentose beneath; petals white to pink or red or none
10. Leaves palmately 3-5 lobed **Physocarpus**
10. Leaves not lobed or sometimes shallowly pinnately lobed
11. Leaf blades mostly ovate to orbicular and somewhat rounded at base, or if occasionally broadly elliptic, then with acute to acuminate tips and serrate to serrulate margins throughout (rarely entire); ovary superior or inferior
12. Leaves acute to acuminate at tip, serrate or serrulate throughout, glabrous except sometimes along veins **Prunus**
12. Leaves not as above
13. Leaves with mostly 5-8 pair of prominent lateral veins, glabrous or nearly so; pistils 3 or more; plants rarely over 1m high; ovary superior **Spiraea**
13. Leaves with mostly 8-12 pair of prominent lateral veins, or if fewer, then prominently hairy at least beneath; pistils solitary; plants often over 1m high; ovary inferior
14. Leaf blades mostly rounded at tip (rarely somewhat pointed), not toothed on lower third, glabrous or hairy **Amelanchier**
14. Leaf blades mostly acute at tip, usually toothed throughout (rarely entire), hairy at least beneath **Malus**
11. Leaf blades mostly obovate or narrowly elliptic, rarely ovate, tapering to base, often obtuse to rounded at tip, usually coarsely toothed or lobed or entire, the teeth often not extending to base of leaf; ovary superior

15. Leaves either minutely glandular-toothed to near base or conspicuously toothed with the teeth not extending to base (rarely nearly so); pistil and style 1; petals present; fruit a drupe **Prunus**
15. Leaves conspicuously toothed, the teeth usually not extending to near base; pistils usually 3 or more, if 1, the petals lacking; fruit an achene or follicle
16. Leaves glabrous or nearly so; fruit a follicle; petals white (purple or pinkish tinged) **Spiraea**
16. Leaves conspicuously hairy; fruit a hairy achene with elongate plumose style; petals none **Cercocarpus**

1. Plants herbaceous, or sometimes woody at base and usually forming low mats
17. Leaves simple, entire or toothed, rarely with shallow rounded lobes
18. Leaves mostly 1-15mm long, 4mm or less wide; usually forming mats on rocks or in rock crevices **Petrophytum**
18. Leaves mostly over 15mm long and 10mm wide; plants not mat-forming **Spiraea**
17. Leaves compound, or simple and deeply lobed or cleft into narrow segments
19. Leaves with 3 broad leaflets
20. Calyx lobes usually 5 or 6, not alternating with bracteoles; petals white **Rubus**
20. Calyx lobes usually 5, alternating with bracteoles; petals yellow or white
21. Plants with stolons; petals white **Fragaria**
21. Plants without stolons; petals yellow or white
22. Ovary and achene hairy; style usually persistent, straight or with a hook toward tip, often with a deciduous terminal segment, apically attached (rarely laterally attached) **Geum**
22. Ovary and achene glabrous or nearly so; style usually deciduous, straight, of 1 segment, apically, laterally, or nearly basally attached **Potentilla**
19. Leaves with more than 3 leaflets or divided into narrow divisions many times longer than wide
23. Hooked bristles present near base of calyx lobes; rhizomatous **Agrimonia**
23. Hooked bristles lacking near base of calyx lobes; rhizomatous or not
24. Calyx lobes not alternating with bracteoles **Rubus**
24. Calyx lobes alternating with bracteoles
25. Leaves palmately compound **Potentilla**
25. Leaves pinnately compound or dissected
26. Ovary and achene hairy; style usually persistent, straight or with a hook toward tip, often with a deciduous terminal segment, apically attached (rarely laterally attached) **Geum**
26. Ovary and achene glabrous or nearly so; style usually deciduous, straight, of 1 segment, apically, laterally, or nearly basally attached
27. Plants annual to perennial; stamens mostly 10-20; flowers solitary or several to many per stem, petals usually yellow; style often tapering from base or filiform, usually attached near top of ovary **Potentilla**
27. Plants perennial; stamens usually 25; flowers several to many per stem, petals yellow, white, or cream colored; style fusiform, usually roughened at least below, attached near or below middle of ovary, rarely near top **Drymocallis**

Saxifrage Group

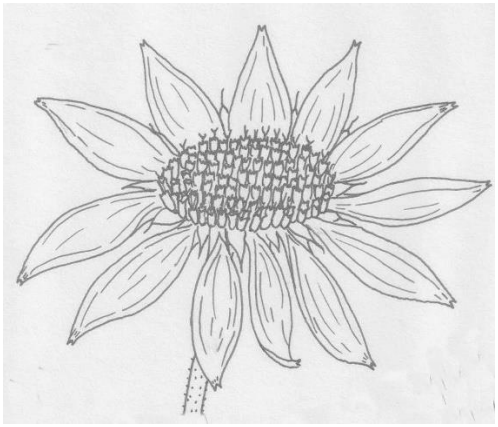
1. Stamens 10
2. Styles usually 3; petals deeply 3-7 parted **Lithophragma**
2. Styles 1 or 2; petals entire or slightly lobed
3. Petals reddish or purplish; calyx 9-12mm long **Telesonix**
3. Petals white or rarely pinkish; calyx 2-5mm long
4. Leaf blades of at least the lower leaves suborbicular in outline **Saxifraga**
4. Leaf blades mostly obviously longer than wide **Micranthes**

1. Stamens 5
5. Petals divided into linear divisions, the base also linear, often early deciduous; inflorescence an open raceme **Mitella**
5. Petals entire, the base sometimes clawed, usually persistent or rarely lacking; inflorescence usually a panicle or thyrse **Heuchera**

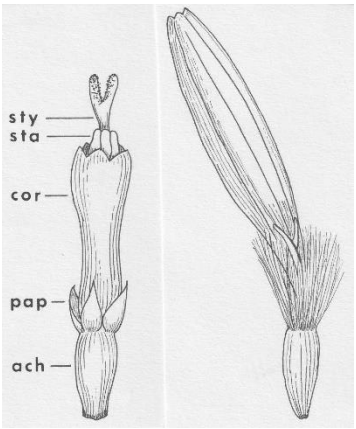
Sedge Group

1. Ovary and fruit enclosed in a sac (perigynium) with a tiny opening at tip; flowers unisexual **Carex**
1. Ovary and fruit not enclosed in a sac; flowers bisexual (stamens often deciduous)
2. Spikelets flattened, the scales in 2 ranks; perianth lacking **Cyperus**
2. Spikelets not flattened, the scales spirally arranged; perianth of 1 to several scales or bristles, rarely lacking
3. Perianth bristles more than 10, long-exserted and cotton-like at maturity **Eriophorum**
3. Perianth bristles 0-9, not exserted (except 1 species) nor cotton-like
4. Base of style often enlarged, forming a cap at tip of ovary; spikelet solitary at tip of a bladeless stem, leaves reduced to sheaths **Eleocharis**
4. Base of style not enlarged; spikelets sometimes appearing lateral along stem, usually at least 3, rarely solitary; stems leafy or not
5. Inflorescence subtended by a single, well developed, green involucral bract, often appearing like a prolongation of stem so the inflorescence appears lateral rather than terminal (other bracts often present but these scale-like and not green); leaves various but rarely over 5mm wide; culms terete to triangular **Schoenoplectus**
5. Inflorescence usually subtended by 2 or more green involucral bracts, the inflorescence definitely terminal; leaves flat, some often over 5mm wide; culms triangular, rarely obscurely so
6. Spikelets usually 10mm or more long, often sessile or nearly so in a crowded cluster, sometimes a few terminal ones on a stalk **Bolboschoenus**
6. Spikelets usually less than 8mm long, in an open or branched inflorescence **Scirpus**

Sunflower Group



Head of flowers of Helianthus



Left: disc flower, ach = achene, pap = pappus of scales, cor = corolla, sta = stamens, sty = style; Right: ray flower with pappus of bristles

1. Plants shrubs **GROUP I**
1. Plants herbs or woody only at base (shrubs with flowers will also run here)
  2. Heads of all ray flowers; juice milky
    3. Rays yellow or orange (sometimes drying whitish or purplish, or reddish on outside only) **GROUP II**
    3. Rays white, blue, purple, pink, or rose **GROUP III**
  2. Heads of both ray and disk flowers or of all disk flowers, the ray flowers, when present, marginal in the head (occasional cultivars may have all ray flowers); juice watery
    4. Ray flowers lacking, only disk flowers present
      5. Pappus of capillary bristles **GROUP IV**
      5. Pappus either of scales which are sometimes fringed with hairs, 2-8 awns which may be retrorsely barbed, a short crown, small teeth, or lacking **GROUP V**
    4. Ray flowers and disk flowers both present
      6. Pappus partly or entirely of capillary bristles
        7. Rays yellow or orange when fresh **GROUP VI**
        7. Rays white, pink, blue, purple, or rose when fresh **GROUP VII**
      6. Pappus of scales, 2-8 awns (which may be retrorsely barbed), a short crown, small teeth, or entirely lacking
        8. Receptacle with bristles (hairs) or chaffy scales or bracts among the disk flowers, sometimes reduced to a single row of scales between ray and disk flowers **GROUP VIII**
        8. Receptacle naked **GROUP IX**

GROUP I

1. Leaves toothed, lobed, or cleft usually from the tip, or else dissected **Artemisia**
1. Leaves mostly entire or with wavy margins
  2. Leaves and stems glabrous, glandular, or puberulent; pappus of scales **Gutierrezia**
  2. Leaves or stems or both somewhat canescent or tomentose, the tomentum sometimes closely appressed to stem and not readily apparent (scrape stem under magnification); pappus of capillary bristles or lacking
    3. Leaves and twigs somewhat canescent **Artemisia**
    3. Leaves and twigs not canescent, twigs usually closely tomentose **Ericameria**

GROUP II

1. Pappus of plumose bristles, sometimes with a scale-like base
  2. Involucral bracts uniseriate, subequal; achenes long beaked at tip; leaves entire **Tragopogon**
  2. Involucral bracts generally in 2 or more unequal series; achenes truncate at tip, not beaked; leaves entire to pinnatifid **Microseris**
1. Pappus of barbellate bristles, slender scales, or none
  3. Heads 1 per stem
    4. Stem leafy, the leaves rarely much reduced
      5. Pappus white; leaves lobed **Crepis**
      5. Pappus tawny or brown; leaves entire or minutely toothed **Hieracium**
    4. Stem without leaves, the leaves basal or nearly so (rarely with 1 or 2 much reduced stem leaves)
      6. Outer series of involucral bracts prominently shorter and often spreading or reflexed, the inner series ascending **Taraxacum**

6. Outer series of involucral bracts about the same size as the inner (rarely shorter), all of them ascending
7. Pappus bristles broader and flattened toward base; achenes not beaked **Nothocalais**
7. Pappus bristles not flattened or broader toward base; achenes often beaked
8. Achenes often beaked at tip; involucre 10mm or more long **Agoseris**
8. Achenes not beaked at tip; involucre 5-10mm long **Hieracium**

3. Heads usually 2 or more per stem
9. Pappus none; annual **Lapsana**
9. Pappus present; annual to perennial
10. Achenes usually flattened; plants sometimes prickly at least on leaf margins or veins
11. Involucres cylindrical, mostly about twice as long as wide or more; either the achenes beaked or the pappus brownish **Lactuca**
11. Involucres bell-shaped or hemispherical, little if at all longer than wide; achenes not beaked, the pappus white **Sonchus**
10. Achenes not flattened; plants usually not prickly
12. Pappus white; leaves often lobed or coarsely toothed, or if not, the plants usually glabrous **Crepis**
12. Pappus often tawny or brown; leaves entire or slightly toothed (rarely slightly lobed); plants usually with long hairs (rarely glabrous or with stellate hairs) **Hieracium**

GROUP III

1. Pappus bristles plumose, at least above
2. Involucral bracts 2cm or less long; pappus bristles with a narrow scale at base; perennial **Microseris**
2. Involucral bracts over 2cm long; pappus bristles lacking a scaley base; annual or biennial **Tragopogon**

1. Pappus bristles not plumose or the pappus of scales
3. Heads 1 per stem; leaves all basal or nearly so; rays yellow but sometimes drying purplish **Nothocalais**
3. Heads 2 or more per stem, or rarely 1 but then the rays white or the stems definitely leafy, the leaves sometimes much reduced or deciduous
4. Pappus of minute scales **Cichorium**
4. Pappus of capillary bristles
5. Achenes flattened, 1mm or more wide, mostly 4 times or more as wide as deep, often beaked; leaves often pinnatifid and somewhat prickly margined, rarely entire
6. Fruiting involucres 9-15(17)mm long; upper leaves usually clasping stem; flowers normally yellow but often drying blue; achene beak usually filiform and 2mm or more long, lacking or stubby when involucre less than 12 mm long; annual or biennial **Lactuca**
6. Fruiting involucres mostly 15-20mm long; upper leaves usually not clasping; flowers blue; achene beak less than 2mm long, not filiform; perennial **Mulgedium**
5. Achenes not flattened, often less than 1mm wide and rarely over twice as wide as deep, usually not beaked; leaves pinnatifid or not, usually not prickly margined
7. Leaves linear or linear-lanceolate, 5mm or less wide, entire, often deciduous
8. Plants perennial; leaves alternate **Lygodesmia**
8. Plants annual; lowest leaves opposite **Shinnersoseris**
7. Leaves broader, mostly well over 1cm wide, sometimes toothed, rarely deciduous
9. Stem leaves clasping **Prenanthes**
9. Stem leaves lacking or not clasping **Hieracium**

GROUP IV

1. Leaves opposite or whorled
2. Involucral bracts with conspicuous, resinous, yellow or orange dots mostly 0.3-1mm long; leaves mostly dissected **Dyssodia**
2. Involucral bracts lacking yellow or orange dots or these minute; leaves not dissected
3. Achenes 5 angled; leaves usually whorled **Eutrochium**
3. Achenes not 5 angled, usually 10 or more ribbed; leaves usually opposite **Brickellia**

1. Leaves mostly alternate or all basal (rarely fascicled)
4. Leaves with spines often 2mm or more long on their margins; involucre usually spiny at least at tips of outer bracts
5. Pappus bristles plumose, at least on the inner flowers **Cirsium**
5. Pappus bristles barbellate
6. Receptacle not fleshy or honeycombed, densely bristly, the bristles much longer than the achenes **Carduus**
6. Receptacle naked or sometimes fleshy or honeycombed, or if slightly bristly, the bristles shorter than the achenes
7. Corollas 15mm or more long, usually purple **Onopordum**
7. Corollas 8mm long or less, usually yellow or white **Xanthisma**
4. Leaves without spiny margins or the spines usually less than 1mm long; involucres spiny or not
8. Receptacle densely bristly; involucral bracts spiny or with hooked tips or strongly fimbriate or fringed toward tip (outer ones sometimes merely with broad scarious tips)
9. Involucral bracts with hooked tips forming a bur; leaves ovate, deltoid, or cordate, entire or merely toothed **Arctium**
9. Involucral bracts without hooked tips, the spines, if present, straight; leaves not as above
10. Pappus mostly 6mm long or more; outer involucral bracts obscurely if at all fimbriate: deep creeping rhizomes present **Acroptilon**
10. Pappus mostly less than 4(6)mm long or lacking; outer involucral bracts conspicuously fimbriate, at least toward tip; rhizomes usually lacking **Centaurea**
8. Receptacle naked or rarely short hairy or with a few woolly bracts (very rarely bristly); involucral bracts usually not spiny nor with hooked tips nor strongly fimbriate or fringed
11. Flowers unisexual in separate heads (staminate sometimes with a vestigial ovary and entire style); perennials
12. Involucral bracts in 1 series (excluding a few much reduced ones at base of head); basal leaves cordate or sagittate **Petasites**
12. Involucral bracts in 2 or more series; basal leaves not cordate or sagittate
13. Basal leaves readily deciduous, not much larger than the well developed and numerous stem leaves which are usually less hairy and greenish on upper surface and white-tomentose beneath; stolons lacking **Anaphalis**
13. Basal leaves persistent, usually tufted; stem leaves lacking or usually reduced upward, often about equally hairy on both sides; stolons sometimes present **Antennaria**
11. Flowers perfect, or if unisexual, the pistillate usually marginal and the staminate or perfect central in the same head; annuals to perennials
14. Involucral bracts in 1 series (excluding some occasional short bracts at base)
15. Basal leaves cordate or sagittate, white-tomentose beneath; stem leaves much reduced or lacking; corollas white to purplish or drying yellowish **Petasites**
15. Basal leaves not cordate or sagittate, or if so, usually not tomentose beneath and corollas usually not white to purplish; stem leaves well developed or not
16. Leaves entire or ciliate margined
17. Leaves all less than 14mm wide
18. Plants white-woolly throughout **Logfia**
18. Plants not white-woolly **Erigeron**

17. Leaves, or some of them, 17mm or more wide **Senecio**
16. Leaves toothed or lobed
19. Leaves palmately or ternately divided into mostly linear segments **Erigeron**
19. Leaves not as above **Senecio**
14. Involucral bracts in 2 or more series
20. Involucral bracts entirely scarious and pure white; stems not viscid **Anaphalis**
20. Involucral bracts sometimes scarious but not white (occasionally yellowish or dingy white), or if rarely white, the stems viscid
21. Plants white-woolly at least above, the involucral bracts scarious throughout or sometimes with a green base or midrib; leaves entire
22. Receptacle naked; involucral bracts scarious throughout or sometimes with a green base
23. Heads usually scattered among the leaves through much of plant; involucral bracts brownish or greenish in part; involucre mostly 2-4mm long **Gnaphalium**
23. Heads near top of plant in a definite inflorescence overtopping the leaves; involucral bracts white or yellowish; involucre mostly 4-7mm long **Pseudognaphalium**
22. Receptacle with outer bracts resembling the involucre but with a few pistillate flowers between them and the true involucral bracts, the bracts with a green midrib nearly to tip **Logfia**
21. Plants not as above
24. Plants annual
25. Involucre 2-4mm long, the bracts with scarious margins their entire length and nearly 1/3 their width **Conyza**
25. Involucre 5mm or more long, the bracts mostly herbaceous **Symphyotrichum**
24. Plants perennial or rarely biennial
26. Involucral bracts conspicuously longitudinally striate, greenish and less than 2mm wide **Brickellia**
26. Involucral bracts not longitudinally striate (anastomosing veins sometimes prominent), sometimes not green or wider
27. Corollas purple, pink-purple, or white; heads in a spike-like or head-like inflorescence, or if not, the involucral bracts mostly obovate and not in vertical rows, usually purplish or pink at least at tip
28. Leaves entire or ciliate-margined **Liatris**
28. Leaves toothed **Vernonia**
27. Corollas usually yellow; heads in an open inflorescence (rarely raceme-like or cymose), the involucral bracts not obovate, often in vertical rows, usually not purplish
29. Plants biennial or perennial herbs; involucral bracts linear and usually less than 0.6mm wide, or if wider, the leaves with 3 or more linear divisions toward tip **Erigeron**
29. Plants perennial herbs or shrubs; involucral bracts not linear, usually over 0.6mm wide, the leaves entire or toothed
30. Leaves with coarse teeth which are spinulose-tipped **Xanthisma**
30. Leaves entire or wavy-margined **Ericameria**

GROUP V

1. Anthers not united or only slightly so; flowers all unisexual; pappus none
2. Staminate and pistillate flowers in the same head, the pistillate few and marginal
3. Plants densely white-woolly throughout, less than 10cm high **Diaperia**
3. Plants not white-woolly, or only partly so (not on upper leaf surface), over 10cm high
4. Leaves all alternate or basal, white-woolly beneath **Adenocaulon**
4. Leaves opposite, at least below, not white-woolly
5. Plants perennial; leaves entire; heads axillary **Iva**
5. Plants annual; leaves toothed; heads in a panicle **Cyclachaena**
2. Staminate and pistillate flowers in different heads, the pistillate completely enclosed in an often bur-like involucre
6. Involucral bracts of staminate head separate; spines of pistillate head hooked **Xanthium**
6. Involucral bracts of staminate head united; spines of pistillate head, if present, not hooked **Ambrosia**
1. Anthers united; flowers usually bisexual except sometimes the marginal ones (central ones rarely with ovary aborted); pappus present or not
7. Involucral bracts with conspicuous yellow or orange, resinous dots mostly 0.3-1mm long; leaves mostly opposite and dissected **Dyssodia**
7. Involucral bracts without conspicuous yellow or orange dots; leaves various
8. Involucral bracts mostly 4 in 1 series, each enclosing a marginal flower; annuals **Madia**
8. Involucral bracts usually in 2 or more series (rarely 1), usually more than 4, none enclosing marginal flowers; annuals to perennials
9. Involucral bracts, or some of them, with hooked tips forming a bur **Arctium**
9. Involucral bracts not as above
10. Receptacle with chaffy scales, these sometimes only between marginal and central flowers or rarely densely white-woolly and enclosing entire flower
11. Plants densely white-woolly annuals less than 10cm high **Diaperia**
11. Plants not as above
12. Inner involucral bracts longer than outer, united at least 1/3 their length; perennials **Thelesperma**
12. Inner involucral bracts usually shorter than outer, separate or united only at very base; annuals **Bidens**
10. Receptacle naked or hairy, rarely glandular or with slender almost hair-like scales
13. Involucral bracts with pectinately arranged filiform processes about 1mm long toward tip or the margins strongly fimbriate; receptacle hairy or bristly **Centaurea**
13. Involucral bracts not as above; receptacle naked or hairy
14. Pappus lacking or an obscure crown
15. Leaf blades deltoid-ovate to cordate and white-woolly beneath, entire to very shallowly lobed **Adenocaulon**
15. Leaf blades not as above
16. Heads mostly solitary at ends of branches; plants annual **Matricaria**
16. Heads in a definite inflorescence or solitary on an unbranched stem; plants annual to perennial
17. Heads in a spike, raceme, or panicle **Artemisia**
17. Heads in a corymb **Tanacetum**
14. Pappus of scales
18. Leaf blades entire or essentially so **Tetraneuris**
18. Leaf blades mostly pinnately dissected
19. Involucral bracts mostly over 3 times as long as wide, not scarious-margined **Chaenactis**
19. Involucral bracts mostly broader, usually scarious-margined **Hymenopappus**

GROUP VI

1. Upper leaves mostly opposite
2. Leaves dissected **Dyssodia**
2. Leaves entire or toothed **Arnica**
1. Upper leaves alternate or leaves all basal

3. Involucral bracts in 1 series (excluding the few reduced ones at base), not imbricate
4. Stems leafy, the leaves little if at all reduced upward, basal tuft usually lacking **Senecio**
4. Stems not leafy or the leaves mostly reduced upward, basal tuft usually present
5. Leaves, at least the upper ones, lobed mostly about halfway or more to midrib **Packera**
5. Leaves entire or toothed
6. Stems usually several to many from an often branched caudex; leaves usually white, gray, or silver hairy (not cobwebby), basal usually with long petioles; involucres mostly about as long as wide, the involucral bracts not black-tipped; heads mostly 1-15 per stem **Packera**
6. Stems usually 1 from a simple caudex or rhizome, or if more, without the other characteristics above **Senecio**
3. Involucral bracts in 2 or more series, often imbricate
7. Leaves pinnatifid or bipinnatifid **Xanthisma**
7. Leaves entire or toothed
8. Involucre sticky, appearing varnished when dry, the outer bracts hooked at tip **Grindelia**
8. Involucre not as above
9. Pappus in 2 series, the outer of small, often inconspicuous scales or bristles, the inner of longer barbellate bristles; perennials **Heterotheca**
9. Pappus of subequal bristles in 1 series (do not mistake hairs of achene for part of pappus); annual to perennial
10. Plants often with less than 5 heads per stem; involucre 7-12mm long
11. Stems mostly leafy, the leaves all somewhat similar, little if at all reduced upward; involucral bracts acuminate at tip **Oonopsis**
11. Stems with leaves much reduced upward or the leaves mostly basal; involucral bracts mostly obtuse or rounded at tip **Stenotus**
10. Plants with mostly 5 or more heads per stem; involucre 2-7mm long
12. Leaves punctate, sometimes obscurely so, mostly less than 1cm wide, without a basal cluster; rays mostly 15-30 per head; inflorescence corymbose; rhizomes slender, creeping **Euthamia**
12. Leaves not punctate (rarely so but then with a basal cluster of leaves), some often over 1cm wide; rays mostly 13 or fewer per head, rarely as many as 17; inflorescence mostly racemose, paniculiform, or cymose; rhizomes slender or stout or none, creeping or not **Solidago**

GROUP VII

1. Receptacle bristly; involucral bracts spiny or with pectinately arranged processes about 1mm long toward tip **Centaurea**
1. Receptacle scaly or naked; involucral bracts not as above
2. Basal leaf blades cordate or sagittate, white-tomentose beneath **Petasites**
2. Basal leaves lacking or not as above
3. Rays inconspicuous, little if at all longer than pappus
4. Plants annual; involucre 2-4mm long **Conyza**
4. Plants biennial or perennial, the involucre often over 4mm long **Erigeron**
3. Rays conspicuous and longer than pappus
5. Involucral bracts often somewhat subequal and in 1 or rarely 2 series, long and narrow, entirely green and often with scarious margins or green at base, usually hairy **Erigeron**
5. Involucral bracts mostly imbricate, the outer definitely shorter than the inner, or if not, then usually foliaceous, usually conspicuously broadened at tip or base, entirely green, green at tip, or not green, often glabrous or glabrate
6. Plants with leaves or leaflets and usually at least the lower involucral bracts spinulose-tipped; taprooted, sometimes also with a woody caudex; rays blue, purple, pink, or rose, or if white, usually with an involucre 8-15mm long; heads 1 to many, if 1, with blue, purple, pink, or rose (white) rays and the leaves dissected or coarsely spiny-toothed
7. Leaves mostly 1-2 times pinnatifid **Machaeranthera**
7. Leaves entire or shallowly lobed or toothed
8. Rays white
9. Leaves entire **Xylorhiza**
9. Leaves toothed **Xanthisma**
8. Rays blue or purple **Dieteria**
6. Plants not as above
10. Plants perennial with a taproot or branched caudex; ray and disk flowers both white; leaves less than 1cm wide, some usually over 5cm long, mostly linear to linear-oblanceolate, the basal well developed or with old persisting bases; involucral bracts glabrous except for margins, about 1mm wide, broadest at base, tapering to tip **Solidago**
10. Plants not as above
11. Plants taprooted; pappus bristles stout; leaves entire, rarely over 1cm wide, sometimes mostly all basal with sessile or subsessile heads; hairs of achenes, when present, often glochidiate or forked at tip **Townsendia**
11. Plants rarely taprooted; pappus bristles slender; leaves entire or toothed, sometimes well over 1cm wide; heads not sessile or subsessile; hairs of achenes not glochidiate or forked at tip
12. Tube of disc corollas equaling or slightly longer than the expanded limb (including lobes); leaves mostly less than 4 times as long as wide, some often over 10mm wide, often toothed mostly in upper half, basal tuft lacking; involucral bracts often chartaceous below and somewhat purple-margined or suffused with purple **Eurybia**
12. Tube of disc corollas shorter than the limb (including lobes); leaves and involucral bracts variable
13. Peduncles and involucres glandular
14. Leaves mostly less than 10mm wide
15. Leaves, except sometimes the basal, mostly linear and much reduced upward, some lower ones usually 5cm or more long **Almutaster**
15. Leaves mostly broader or not reduced upward or much shorter **Symphyotrichum**
14. Leaves, or some of them, 13mm or more wide
16. Leaves mostly toothed **Eurybia**
16. Leaves entire **Symphyotrichum**
13. Peduncles and involucres not glandular **Symphyotrichum**

GROUP VIII

1. Cauline leaves, at least the lower (sometimes these deciduous), opposite or subopposite
2. Leaves compound or at least pinnatifid or ternate
3. Involucral bracts with conspicuous, yellow or orange, resinous dots mostly 0.3-1mm long **Dyssodia**
3. Involucral bracts not as above
4. Inner series of involucral bracts shorter than or equal to outer; annual **Bidens**
4. Inner series of involucral bracts longer than the outer; annual or perennial
5. Inner involucral bracts united a third to half their length, outer about half as long as inner **Thelesperma**
5. Inner involucral bracts free or united about a fourth their length, outer sometimes much less than half as long as inner **Coreopsis**
2. Leaves simple, entire or toothed, rarely lobed
6. Plants annual

7. Involucral bracts mostly 4 in 1 series, enclosing achenes of marginal flowers **Madia**
7. Involucral bracts mostly more than 4 in more than 1 series or else not enclosing achenes
8. Involucral bracts in 2 very dissimilar series, the inner usually longitudinally striate **Bidens**
8. Involucral bracts not as above
9. Ray flowers with achenes; disk achenes corky-winged; leaves usually whitish beneath from pubescence **Verbesina**
9. Ray flowers sterile or with aborted achenes; disk achenes not corky-winged; leaves not whitish beneath **Helianthus**
6. Plants perennial
10. Pappus persistent; disk achenes strongly compressed and thin-edged; bracts of receptacle often rounded or flat across tip **Helianthella**
10. Pappus deciduous (at least the 2 main awn-scales); disk achenes usually slightly to moderately compressed, often not thin-edged; bracts of receptacle often pointed at tip **Helianthus**

1. Cauline leaves all alternate or the leaves occasionally all basal
11. Involucral bracts with pectinately arranged processes about 1mm long toward tip; receptacle usually bristly **Centaurea**
11. Involucral bracts not as above; receptacle bristly or not
12. Rays white, purple, pink, rose, or red
13. Leaves mostly pinnately divided or dissected
14. Plants annual; rays white **Anthemis**
14. Plants perennial; rays white to pink, reddish, or purplish
15. Involucral bracts dry and scarious throughout except sometimes for a green midrib; rays white or rarely pink **Achillea**
15. Involucral bracts, at least the outer, herbaceous or scarious only on the margins; rays reddish or purplish **Ratibida**
13. Leaves entire or nearly so, rarely subpinnatifid
16. Receptacle with spine-tipped chaffy bracts; rays drooping **Echinacea**
16. Receptacle with bristles; rays not drooping **Gaillardia**
12. Rays yellow or orange (sometimes purple, red, or brown at base)
17. Leaves all basal or nearly so **Balsamorhiza**
17. Leaves well developed along stem
18. Receptacle bristly; pappus of awned scales **Gaillardia**
18. Receptacle with chaffy bracts or scales, these rarely linear; pappus various or lacking
19. Leaves simple, entire or merely toothed
20. Disk flowers dark purple to brown; pappus none **Rudbeckia**
20. Disk flowers yellow; pappus of 2 deciduous awns **Helianthus**
19. Leaves compound or at least deeply lobed
21. Involucral bracts dry and scarious throughout except sometimes for a green midrib **Cota**
21. Involucral bracts, at least the outer ones, herbaceous or scarious only on the margins
22. Rays subtended by receptacular bracts; heads, excluding rays, about 1cm wide; leaves mostly pinnately divided **Ratibida**
22. Rays not subtended by bracts; heads, excluding rays, mostly 1.5cm or more wide; leaves pinnatifid or palmatifid **Rudbeckia**

GROUP IX

1. Rays white, purple, pink, or rose
2. Pappus conspicuous, of scales, awns, or bristles; leaves entire or slightly toothed
3. Stems mostly decumbent or none; plants less than 2dm high, usually hairy **Townsendia**
3. Stems erect; plants mostly 3-15dm high, glabrous **Boltonia**
2. Pappus lacking or a minute crown; leaves toothed or lobed to dissected
4. Leaves toothed or coarsely lobed **Leucanthemum**
4. Leaves finely dissected into linear segments **Tripleurospermum**

1. Rays yellow or orange, at least in part
5. Leaves opposite at least below
6. Plants annual
7. Leaves dissected or otherwise compound **Dyssodia**
7. Leaves entire or nearly so **Madia**
6. Plants perennial **Picradeniopsis**
5. Leaves alternate or basal
8. Pappus of 2-8 rigid, deciduous, slender awns, not scale-like; involucre sticky, appearing varnished when dry, the outer bracts with hooked tips **Grindelia**
8. Pappus of scales which may be awned from tip, rarely lacking; involucre rarely sticky, the bracts usually not hooked
9. Rays 5mm or less long; involucre glabrous or nearly so **Gutierrezia**
9. Rays mostly over 5mm long; involucre usually hairy
10. Pappus of scales; leaves entire; perennial **Tetraneuris**
10. Pappus none; leaves ternately-pinnately dissected; annual or biennial **Amauriopsis**

Abronia fragrans Nutt. ex Hook.
Acer negundo L. var. **interius** (Britt.) Sarg.
Achillea millefolium L.
Achnatherum
1. Awn usually deciduous, not strongly twisted, mostly straight, mostly 1.2cm or less long; callus obtuse **A. hymenoides** (R. & S.) Barkw.
1. Awn persistent, strongly twisted and bent, often over 2cm long; callus often sharp pointed, usually acuminate
  2. Awns plumose toward base **A. occidentale** (Thurb. ex Wats.) Barkw.
  2. Awns not plumose toward base
    3. Panicle somewhat open, the branches spreading or ascending and spikelet-bearing near tip **A. richardsonii** (Link) Barkw.
    3. Panicle narrow, the branches appressed and often spikelet-bearing near base
      4. Florets somewhat plump, mostly about 1mm or more thick; tuft of hairs usually present at junction of sheath and blade and at lower panicle nodes **A. robustum** (Vasey) Barkw.
      4. Florets slender, mostly about 0.8mm thick; tuft of hairs usually lacking at junction of sheath and blade and at lower panicle nodes **A. nelsonii** (Scribn.) Barkw.
        5. Awns mostly 2.5cm or more long; callus sharp-pointed, usually with a glabrous patch extending back from the glabrous tip on abaxial side var. **nelsonii**
        5. Awns mostly less than 2.5(3)cm long; callus more rounded, usually without a glabrous patch extending back from the glabrous tip var. **dorei** (Barkw. & Maze) Dorn
Aconitum columbianum Nutt.
Acroptilon repens (L.) DC.
Actaea rubra (Aiton) Willd.
Adenocaulon bicolor Hook.
Adiantum
1. Petiole continuous with a single rachis; leaf blades over twice as long as wide **A. capillus-veneris** L.
1. Petiole giving rise to 2 diverging rachises; leaf blades about as long as wide **A. aleuticum** (Rupr.) Paris
Adoxa moschatellina L.
Agalinis tenuifolia (Vahl) Raf. var. **parviflora** (Nutt.) Pennell
Agastache foeniculum (Pursh) Kuntze
Agoseris
1. Corolla orange; achenes with a beak mostly 3/4 to 2 times as long as body **A. aurantiaca** (Hook.) Greene
1. Corolla usually yellow, rarely purple, sometimes drying pinkish or purplish; achenes with a beak less than half as long as body
  2. Leaves mostly laciniate **A. parviflora** (Nutt.) Dietr.
  2. Leaves entire or coarsely toothed **A. glauca** (Pursh) Raf.
    3. Involucre and upper scape glabrous var. **glauca**
    3. Involucre or upper scape hairy var. **dasycephala** (T.& G.) Jeps.
Agrimonia
1. Stem in inflorescence glandular-puberulent and with scattered long hairs **A. gryposepala** Wallr.
1. Stem in inflorescence pilose or hirsute, not glandular **A. striata** Michx.
Agropyron
A. cristatum (L.) Gaertn.
1. Spike often oblong to ovate; spikelets often diverging at a 45 degree angle or more, usually 4-10 flowered; spikelet usually twice or more as long as glumes (including awns) var. **cristatum**
1. Spike narrowly cylindric; spikelets diverging at less than a 45 degree angle, mostly 2 or 3(4) flowered; spikelet less than twice as long as glumes (including awns)
  2. Awn of glumes 1.5-4mm long; body of lemmas mostly 5-6mm long, the awn 1-4mm long var. **desertorum** (Fisch. ex Link) Dorn
  2. Awn of glumes 1.5mm or less long; body of lemmas mostly (5.5)6-8.5mm long, the awn 1mm or less long var. **fragile** (Roth) Dorn
Agrostis
1. Palea evident, usually 2 nerved, about half as long as lemma or more; usually rhizomatous and/or stoloniferous
  2. Ligules mostly 3-6mm long; panicle branches often spikelet-bearing to base **A. stolonifera** L.
  2. Ligules mostly 1-2(3)mm long; panicle branches not spikelet-bearing to base **A. capillaris** L.
1. Palea lacking or a minute nerveless scale; rhizomes and stolons usually lacking
  3. Panicle contracted, at least some lower branches spikelet-bearing near base **A. exarata** Trin.
  3. Panicle open at maturity, the lower branches not spikelet-bearing near base **A. scabra** Willd.
Alcea rosea L.
Alisma
1. Leaf blades usually less than 25mm wide; achenes with 3 ridges and 2 grooves on their edge; inflorescence barely exceeding leaves or shorter **A. gramineum** Lej.
1. Leaf blades mostly over 25mm wide; achenes often with only 2 ridges and 1 groove on their edge; inflorescence much exceeding leaves **A. triviale** Pursh
Alliaria petiolata (Bieb.) Cavara & Grande
Allium
1. Umbel nodding; stamens exserted from perianth **A. cernuum** Roth
1. Umbel erect; stamens included in perianth or rarely exserted
  2. Ovary crested with 6 low knobs; bracts of involucre usually 1 nerved
    3. Tips of inner perianth parts spreading; flowers usually white; bulblets lacking **A. textile** Nels. & Macbr.
    3. Tips of inner perianth parts erect; flowers usually pink, sometimes replaced by bulblets **A. geyeri** Wats.
      4. Flowers normal var. **geyeri**
      4. Flowers largely replaced by bulblets, these clustered at base of inflorescence var. **tenerum** Jones
  2. Ovary crestless; bracts of involucre 1-7 nerved
    5. Flowers replaced by bulblets in whole or part; involucral bracts usually 3-7 nerved **A. canadense** L. var. **fraseri** Ownbey
    5. Flowers not replaced by bulblets; involucral bracts 1 nerved **A. drummondii** Regel
Almutaster pauciflorus (Nutt.) Löve & Löve
Alopecurus
1. Awn scarcely exceeding glumes, arising from near middle of lemma **A. aequalis** Sobol.
1. Awn exserted 2mm or more beyond glumes, arising from near base of lemma
  2. Plants annual; anthers 0.3-0.6mm long; panicle rarely over 5cm long **A. carolinianus** Walt.
  2. Plants perennial; anthers mostly 0.7-2mm long; panicle sometimes over 5cm long **A. geniculatus** L.

Alyssum
1. Fruits glabrous **A. desertorum** Stapf
1. Fruits stellate-hairy **A. alyssoides** (L.) L.

Amaranthus
1. Plants dioecious; pistillate flowers lacking perianth **A. tuberculatus** (Moq.) Sauer
1. Plants monoecious, rarely dioecious; perianth present
  2. Inflorescences both terminal and axillary
    3. Plants dioecious; bracts of inflorescence mostly ovate and 3mm long or less; flower clusters somewhat loose in a narrow, elongate inflorescence **A. arenicola** Johnston
    3. Plants monoecious but the staminate flowers often few; bracts of inflorescence mostly narrowly lanceolate and 4mm or more long; flowers often densely clustered in a somewhat short and stout inflorescence **A. retroflexus** L.
  2. Inflorescences all axillary clusters
    4. Sepals 4 or 5; seeds 1.3-2mm long; plants prostrate **A. blitoides** Wats.
    4. Sepals 3 (rarely 1); seeds 0.6-1.4mm long; plants erect or prostrate
      5. Plants prostrate; pistillate perianth of 1 normally developed sepal and 2 reduced sepals **A. californicus** (Moq.) Wats.
      5. Plants somewhat erect; pistillate perianth with 3 subequal sepals **A. albus** L.

Amauriopsis dissecta (Gray) Rydb.

Ambrosia
1. Plants annual with a taproot
  2. Leaves 3(5) palmately lobed or not at all lobed **A. trifida** L.
  2. Leaves mostly 1-2 times pinnatifid
    3. Fruiting involucre bearing several series of coarse spines usually over 3mm long; staminate involucral bracts usually connate about half their length, the lobes somewhat regular **A. acanthicarpa** Hook.
    3. Fruiting involucre bearing 1 series of short spines 0.5mm or less long or spines lacking; staminate involucral bracts usually connate most of their length, the lobes, if present, somewhat irregular **A. artemisiifolia** L.
1. Plants perennial with creeping rootstocks, these sometimes deep
  4. Lower surface of leaves usually tomentose; leaves alternate **A. tomentosa** Nutt.
  4. Lower surface of leaves not tomentose; leaves opposite at least below **A. psilostachya** DC.

Amelanchier
1. Leaves somewhat pointed at tip, the blades often somewhat oblong **A. humilis** Wieg.
1. Leaves rounded or truncate at tip, the blades mostly broadly elliptic to suborbicular
  2. Petals often 10-20mm long; styles usually 5, rarely 4, united below; fruit glabrous; leaves usually glabrous or nearly so at maturity (except sometimes on underside) **A. alnifolia** (Nutt.) Nutt. ex Roem.
  2. Petals mostly 5-10mm long; styles mostly 2-4, rarely 5, usually separate to base; fruit often hairy; leaves usually hairy, at least on underside, at maturity **A. utahensis** Koehne

Ammannia robusta Heer & Regel

Amorpha
1. Plants mostly over 1m high; petiole usually longer than width of lowest leaflet; some leaflets 18mm or more long **A. fruticosa** L.
1. Plants mostly less than 1m high; petiole often shorter than width of lowest leaflet; leaflets 20mm or less long
  2. Leaves and calyces conspicuously hairy; racemes usually several in axils of upper leaves forming compound cluster **A. canescens** Pursh
  2. Leaves and calyces glabrous or nearly so; racemes usually solitary at tips of stems and branches **A. nana** Nutt.

Amphicarpaea bracteata (L.) Fern.

Anagallis minima (L.) Krause

Anaphalis margaritacea (L.) Benth. & Hook.

Anchusa arvensis (L.) Bieb.

Andersonglossum boreale (Fern.) Jim.-Mejías et al.

Andropogon
1. Rhizomes short and slender or none; awns of sessile spikelets mostly 10mm or more long; ligules mostly less than 3mm long **A. gerardii** Vitman
1. Rhizomes usually well developed; awns of sessile spikelets mostly less than 8mm long; ligules often more than 3mm long **A. hallii** Hack.

Androsace
1. Involucral bracts lanceolate to linear, usually 4 times or more as long as wide; calyx lobes shorter than tube **A. septentrionalis** L.
1. Involucral bracts broadly elliptic or oblong to obovate, less than 4 times as long as wide; calyx lobes about equaling tube **A. occidentalis** Pursh

Anemone
1. Sepals 2-4cm long; style in fruit plumose, 1.5-3.5cm long **A. patens** L. var. **multifida** Pritzel
1. Sepals mostly less than 2cm long; styles in fruit usually not plumose, less than 1cm long
  2. Stem or involucral leaves sessile or nearly so; basal leaves often over 6cm wide **A. canadensis** L.
  2. Stem or involucral leaves usually petioled, the petiole often quite wide; basal leaves often less than 6cm wide
    3. Receptacle in fruit subglobose, less than twice as long as wide; primary or secondary leaf segments of basal leaves rarely as much as 5mm wide; petioles of involucral leaves rarely over 2cm long **A. multifida** Poiret
    3. Receptacle in fruit cylindrical, 2 or more times as long as wide; primary or secondary leaf segments of basal leaves often over 5mm wide; petioles of involucral leaves sometimes over 2.5cm long
      4. Primary involucre (3)5-9 leaved, usually without secondary involucres on the peduncles; styles usually brownish or reddish **A. cylindrica** Gray
      4. Primary involucre 2-4(5) leaved, often with secondary involucres on some peduncles; styles usually yellowish except sometimes the very tip **A. virginiana** L.

Antennaria
1. Plants usually less than 5cm high; heads solitary, barely if at all exceeding the mostly basal leaves **A. dimorpha** (Nutt.) T.& G.
1. Plants usually over 5cm high; heads generally exceeding the leaves, usually several to many heads per stem
  2. Basal leaves conspicuously less pubescent above than beneath, becoming glabrate and usually green above, white-tomentose beneath
    3. Upper stem leaves with a strap-like, scarious tip mostly 1-3mm long; involucral bracts generally brown in lower half **A. neglecta** Greene
    3. Upper stem leaves with a sharp, hair-like scarious tip or not scarious; involucral bracts generally greenish in lower half, occasionally brown **A. howellii** Greene
      4. Basal leaves glabrous on upper side ssp. **howellii**
      4. Basal leaves pubescent on upper side (or glabrescent with age)
        5. Basal leaves spatulate to narrowly or broadly obovate and sometimes petiolate; leaves along stolons nearly equal to those in rosettes at their ends ssp. **neodioica** (Greene) Bayer
        5. Basal leaves cuneate-oblanceolate, spatulate, or spatulate-obovate without petioles; leaves along stolons smaller than those in rosettes at their ends ssp. **petaloidea** (Fern.) Bayer
  2. Basal leaves about equally pubescent on both sides, usually silvery or gray
    6. Involucres mostly (6)7-11mm long; dry pistillate corollas mostly 5-8mm long **A. parvifolia** Nutt.

6. Involucres mostly 3-7mm long; dry pistillate corollas mostly 2.5-4.5mm long
7. Terminal portion of involucral bracts mostly whitish; clones about equally staminate and pistillate **A. microphylla** Rydb.
7. Terminal portion of involucral bracts, or some of them, partly pinkish, sometimes obscurely so, rarely whitish, yellowish, or brownish; clones entirely pistillate or nearly so **A. rosea** Greene

Anthemis cotula L.

Anthoxanthum hirtum (Schrank) Schouten & Veldkamp

Apera interrupta (L.) Beauv.

Apios americana Medic.

Apocynum

1. Flowers usually (4)5mm long or more; corolla pink, often more than twice as long as calyx; corolla lobes mostly spreading or reflexed; leaves usually spreading or drooping **A. androsaemifolium** L.
1. Flowers usually less than 5mm long; corolla white or greenish, usually less than twice as long as calyx; corolla lobes mostly erect; leaves ascending **A. cannabinum** L.
2. Follicles usually 12cm long or more at maturity; seed coma 2-3cm long; leaves of main stem usually petioled, often not cordate at base var. **cannabinum**
2. Follicles 11cm or less long; seed coma 1-2cm long; lower leaves of main stem usually sessile or nearly so and cordate at base var. **hypericifolium** Gray

Aquilegia

1. Flowers red at least in part (rarely all yellow) **A. canadensis** L.
1. Flowers blue or purple at least in part **A. brevistyla** Hook.

Arabidopsis thaliana (L.) Heynh.

Arabis

1. Petals less than 5mm long; stem leaves mostly crowded; fruits strictly erect **A. pycnocarpa** Hopkins
1. Petals 5-9mm long; stem leaves mostly remote; fruits often slightly divergent **A. eschscholtziana** Andrz.

Aralia nudicaulis L.

Arctium

1. Terminal inflorescence raceme-like or panicle-like and somewhat elongate, the heads mostly sessile or short peduncled; larger leaves tapering at tip **A. minus** (Hill) Bernh.
1. Terminal inflorescence corymb-like and compact, the heads long-peduncled; larger leaves broadly rounded at tip
2. Heads 2.5-4.5cm wide; involucre and corollas usually glabrous, the middle and inner bracts subequal and surpassing corollas **A. lappa** L.
2. Heads 1.5-2.7cm wide; involucre often hairy, the hairs usually cobwebby, the middle and inner bracts successively longer and mostly shorter than corollas, the corollas often minutely glandular-puberulent, especially on lobes **A. tomentosum** Miller

Arctostaphylos uva-ursi (L.) Spreng.

1. Branchlets viscid-villous with spreading, stipitate, multicellular hairs often 0.5mm or more long var. **adenotricha** Fern. & Macbr.
1. Branchlets not viscid-villous, the hairs mostly curled and not spreading nor glandular var. **uva-ursi**

Arenaria serpyllifolia L.

Argemone polyanthemos (Fedde) Ownbey

Aristida

1. First glume 17-30mm long; annual **A. oligantha** Michx.
1. First glume 5-13mm long; annual or perennial
2. Central awn spirally coiled at base, the lateral awns straight; annual **A. dichotoma** Michx. var. **curtissii** Gray
2. Central awn straight like the lateral awns; perennial **A. purpurea** Nutt.
3. Leaves mostly in a short cluster at base of plant; awns 1.5-5cm long var. **fendleriana** (Steudel) Vasey
3. Leaves not conspicuously basal; awns mostly 5-9cm long var. **longiseta** (Steudel) Vasey

Armoracia rusticana Gaertn. et al.

Arnica

1. Stem leaves mostly 5-10 pair, only gradually reduced upward, basal leaves none or early deciduous **A. chamissonis** Less. var. **foliosa** (Nutt.) Maguire
1. Stem leaves, excluding basal cluster if present, mostly 2-4 pair, usually conspicuously reduced upward, basal leaves often present
2. Pappus subplumose, somewhat tawny; flowering stems usually without tufts of basal leaves **A. mollis** Hook.
2. Pappus barbellate, usually white; flowering stems often with tufts of basal leaves
3. Widest leaf blades mostly 1-3 times as long as wide, at least some usually toothed
4. Leaves with 3-7 somewhat parallel, primary veins, the middle and upper blades rarely broader than lance-ovate
5. Leaves all entire or rarely denticulate **A. rydbergii** Greene
5. Leaves, or some of them, usually coarsely toothed **A. lonchophylla** Greene
4. Leaves with mostly pinnate venation, the middle and upper blades often ovate to cordate **A. cordifolia** Hook.
3. Widest leaf blades mostly (3)4-10 times as long as wide, entire or nearly so
6. Heads with mostly 7-10 rays **A. rydbergii** Greene
6. Heads with mostly 10-23 rays
7. Old leaf bases with tufts of long brown wool in axils; disk corollas usually hairy at least below, often also glandular **A. fulgens** Pursh
7. Old leaf bases without tufts of hair, or the hairs few and white; disk corollas glandular, usually not hairy **A. sororia** Greene

Artemisia

1. Flowers usually all perfect; shrubs, rarely appearing like subshrubs
2. Leaves linear, linear-oblanceolate, or linear-elliptic and entire or a few sometimes irregularly once or twice lobed or toothed
3. Leaves all filiform and less than 1mm wide **A. filifolia** Torrey
3. Leaves linear or broader, 1mm or more wide **A. cana** Pursh
2. Leaves, or many of them, 3 toothed or 3-6 parted at tip, often cuneate
4. Leaves mostly deeply cleft into 3-6 linear divisions, the basal part of leaf usually about as wide as the divisions and not broadened **A. filifolia** Torrey
4. Leaves mostly 3 toothed at tip, or if lobed, the basal part of at least some leaves usually obviously broadened below the lobes **A. tridentata** Nutt.
5. Plants often over 1m high, uneven-topped, the flower stalks arising at different levels from among the foliage and not well set off from foliage; leaves averaging narrowly cuneate var. **tridentata**
5. Plants mostly less than 1m high, somewhat flat-topped, the flower stalks arising somewhat evenly from the crown only and usually well set off from foliage; leaves averaging broadly cuneate var. **wyomingensis** (Beetle & Young) Welsh

1. Flowers pistillate at margin of head, these often few and reduced, the middle ones perfect or sometimes the ovary aborted in flowers at very middle; herbs or subshrubs
6. Flowers at middle of head fertile, the ovary normal
7. Receptacle with long hairs between the flowers
8. Plants mostly 4-12dm high; larger cauline leaf blades 3cm long or more, the ultimate segments (1)1.5-4mm wide **A. absinthium** L.

8. Plants mostly 1-4dm high; cauline leaf blades mostly less than 3cm long, the ultimate segments often less than 1.5mm wide **A. frigida** Willd.

7. Receptacle not hairy

9. Plants annual or biennial with a taproot; leaves often glabrous or nearly so

10. Inflorescence dense and spike-like or with spike-like branches, the heads crowded, not conspicuously peduncled; involucre 1.5-4mm long **A. biennis** Willd.

10. Inflorescence loose and paniculiform, the heads not particularly crowded, usually conspicuously peduncled; involucre 1-2(2.5)mm long **A. annua** L.

9. Plants perennial from a rhizome or caudex or rarely a taproot; leaves usually hairy at least beneath

11. Plants with deep creeping rhizomes, the stems loosely clustered or solitary; leaves entire to subbipinnatifid, only occasionally narrow with a gradually tapering tip **A. ludoviciana** Nutt.

12. Leaves mostly entire or lobed upto halfway to midrib; disk (not pistillate) flowers mostly 6-21 var. **ludoviciana**

12. Leaves mostly deeply parted or divided; disk flowers mostly 15-45 var. **incompta** (Nutt.) Cronq.

11. Plants lacking creeping rhizomes, the stems clustered from a woody caudex; leaves mostly entire, narrow with a gradually tapering tip, rarely pinnately lobed **A. longifolia** Nutt.

6. Flowers at middle of head sterile, the ovary aborted

13. Plants subshrubs; involucre canescent **A. filifolia** Torrey

13. Plants herbaceous; involucre often glabrous

14. Leaves mostly entire, the lower rarely with 3-5 narrow segments **A. dracunculus** L.

14. Leaves mostly pinnatifid or dissected except the uppermost ones **A. campestris** L.

15. Plants mostly biennial with 1 stem from root, basal leaves usually none at flowering var. **caudata** (Michx.) Palmer & Steyerm.

15. Plants mostly perennial with often several stems from caudex; basal leaves usually present var. **scouleriana** (Bess.) Cronq.

Asclepias

Flower of *Asclepias speciosa*, hoods ascending, sepals and petals reflexed.

1. Corolla usually orange to red when fresh; stems mostly hirsute **A. tuberosa** L.

1. Corolla white, green, light yellow, rose, pink, or purplish; stems rarely hirsute

2. Leaves linear, 4(5)mm wide or less

3. Leaves mostly 4cm or less long, spirally arranged, very crowded; plants mostly less than 2dm high, with several stems from base **A. pumila** (Gray) Vail

3. Leaves sometimes over 4cm long, mostly opposite, alternate, or whorled; plants mostly over 2dm high, with 1 or several stems from base

4. Hoods lacking horns within; leaves opposite or alternate **A. stenophylla** Gray

4. Hoods with horns within; leaves mostly whorled **A. verticillata** L.

2. Leaves not linear, some usually over 4mm wide

5. Hoods lacking horns within; corolla mostly greenish **A. viridiflora** Raf.

5. Hoods with horns within; corolla pink, purple, rose, green, or yellowish

6. Hoods 10mm or more long **A. speciosa** Torrey

6. Hoods 1-8mm long

7. Hoods about equaling anthers and stigma; horns equaling or surpassing hoods; corolla pink **A. incarnata** L.

7. Hoods surpassing anthers and stigma; horns shorter than hoods; corolla greenish-white **A. ovalifolia** Decne.

Asparagus officinalis L.

Asplenium

1. Leaves with only 1-5 linear leaflets at tip **A. septentrionale** (L.) Hoffm.

1. Leaves with more than 5 non-linear leaflets

2. Rachis reddish-brown; usually on granite **A. trichomanes** L.

2. Rachis green or yellowish; usually on limestone **A. trichomanes-ramosum** L.

Astragalus

1. Leaves reduced to linear or oblanceolate phyllodia and apparently simple **A. spatulatus** Sheld.

1. Leaves compound with 3 or more leaflets

2. Most leaves with only 3 leaflets **GROUP I**

2. Most leaves with 5 or more leaflets

3. Hairs of leaflets attached at or toward middle of hair, not at base (1 free end sometimes very short, use magnification) **GROUP II**

3. Hairs of leaflets attached at base of hair (leaves rarely glabrous)

4. Mature pods present

5. Pods with 2 cells or nearly so **GROUP III**

5. Pods with 1 cell **GROUP IV**

4. Mature pods lacking, flowers present

6. Stipules not united on side of stem opposite petiole (rarely a few very nearly united or the plants acaulescent and densely tufted and this difficult to detect)

7. Banner 14.5mm or less long; calyx tube mostly less than 4.5mm long **GROUP V**

7. Banner 15mm or more long; calyx tube mostly 5mm or more long **GROUP VI**

6. Stipules, at least the lower ones, united on side of stem opposite petiole

8. Banners mostly 14mm or more long **GROUP VII**

8. Banners mostly less than 14mm long **GROUP VIII**

GROUP I

1. Plants with many of the leaves apparently simple **A. spatulatus** Sheld.

1. Plants with essentially all the leaves with 3 leaflets

2. Banner oblanceolate to spatulate, tapering evenly from tip to base; petals glabrous; leaves 1-10cm long; often loosely matted **A. gilviflorus** Sheld.

2. Banner fiddle-shaped, with an oblanceolate blade superimposed on an oblanceolate claw of the same length and width; petals conspicuously hairy; leaves 0.7-3.5cm long; densely matted **A. hyalinus** Jones

GROUP II

1. Stipules, at least the lower ones, connate on side of stem opposite petiole; plants all with leafy stems

2. Pods with 1 locule; calyx tube 2-3.5mm long; keel somewhat beaked **A. miser** Dougl. var. **decumbens** (Nutt. ex T.& G.) Cronq.
2. Pods with 2 locules; calyx tube 4-8.5mm long; keel blunt at tip
3. Stems arising many together from a root crown or branching caudex; corolla usually blue or purple, rarely white **A. laxmannii** Jacq. var. **robustior** (Hook.) Barneby & Welsh
3. Stems arising singly or few together from oblique or creeping rhizomes; corolla greenish-white to ochroleucous **A. canadensis** L.
1. Stipules not connate on side of stem opposite petiole or the plants without stems and the leaves all basal
4. Calyx tube 6.5mm or more long, the teeth half or less as long as tube; corolla pink-purple **A. missouriensis** Nutt.
4. Calyx tube less than 6.5mm long, the teeth about as long as tube; corolla whitish or cream (purple tinged) **A. lotiflorus** Hook.

GROUP III

1. Pods glabrous or nearly so
2. Pods about 2-3mm wide, mostly 6 times or more as long as wide **A. drummondii** Dougl. ex Hook.
2. Pods about 7-20mm wide, mostly less than 3 times as long as wide **A. crassicarpus** Nutt.
3. Herbage somewhat cinereous with hairs mostly 0.5-1.1mm long; inflorescence somewhat pilose; calyx tube usually 5.5-8mm long var. **crassicarpus**
3. Herbage strigulose with hairs mostly 0.3-0.7mm long; inflorescence mostly strigulose; calyx tube usually 7-10mm long var. **paysonii** (Kelso) Barneby
1. Pods hairy
4. Pods mostly about 10mm wide or more, about 1.5-2 times as long
5. Leaflets conspicuously reticulate-veined, some usually over 2cm long **A. cicer** L.
5. Leaflets not reticulate veined, 1.5cm or less long **A. plattensis** Nutt.
4. Pods mostly about 2-5mm wide, often over twice as long
6. Pods in a dense subglobose head **A. agrestis** Dougl. ex G. Don
6. Pods in a somewhat loose raceme, usually pendulous at maturity **A. alpinus** L.

GROUP IV

1. Pods thick woolly-hairy, the hairs concealing the pod surface **A. purshii** Dougl. ex Hook.
1. Pods glabrous or hairy but not thick woolly-hairy with the hairs concealing the pod surface
2. Pods inflated, thin and papery in texture, mostly ovoid to obovoid
3. Pods with a stipe at least as long as calyx tube
4. Pods mostly well over 5mm wide; some leaflets over 25mm long; some stipules usually over 1cm long **A. americanus** (Hook.) Jones
4. Pods mostly 5mm or less wide; leaflets 25mm or less long; stipules less than 1 cm long **A. alpinus** L.
3. Pods without a stipe or the stipe shorter than calyx tube **A. flexuosus** (Hook.) Dougl. ex G. Don
2. Pods not inflated, or if so, then tough-leathery or woody or fleshy, usually elliptic, linear, or oblong and often compressed laterally or dorsiventrally
5. Pod with a stipe as long as or longer than calyx tube
6. Pods compressed laterally
7. Lower stipules lacking a dark band at base; pod usually with a much reduced septum; calyx 4-8mm long, the tube mostly 2.7-6.5mm long; ovules 8-20 **A. australis** (L.) Lam. var. **glabriusculus** (Hook.) Isely
7. Lower stipules usually with a dark band at base; pod lacking a septum; calyx 2.5-5mm long, the tube mostly 2-2.7mm long; ovules 3-9 **A. multiflorus** (Pursh) Gray
6. Pods compressed dorsiventrally or trigonously
8. Pods compressed dorsiventrally, the dorsal side convex, the ventral side depressed or 2 grooved **A. bisulcatus** (Hook.) Gray
8. Pods compressed trigonously, the 3 sides flat or concave **A. racemosus** Pursh
5. Pod without a stipe or stipe shorter than calyx tube
9. Pods compressed laterally, usually strongly so
10. Pods mostly 6-11mm long **A. vexilliflexus** Sheld.
10. Pods mostly 12-21mm long **A. flexuosus** (Hook.) Dougl. ex G. Don
9. Pods terete or subterete or compressed dorsiventrally or trigonously
11. Calyx tube 4.5-10mm long; banner usually 13.5mm or more long
12. Leaflets all decurrent into the rachis on lower side (not jointed or petiolulate) **A pectinatus** (Hook.) Dougl. ex G. Don
12. Leaflets all jointed to rachis
13. Body of pod dorsiventrally compressed, the dorsal side low-convex, the ventral side depressed or 2 grooved **A. bisulcatus** (Hook.) Gray
13. Body of pod trigonously compressed, all 3 sides flat or concave **A. racemosus** Pursh
11. Calyx tube 1.4-4.3mm long; banner 4.5-13mm long
14. Pods 4-9mm long; ovules 5-9 **A. gracilis** Nutt.
14. Pods mostly 12-21mm long; ovules 14-20 **A. flexuosus** (Hook.) Dougl. ex G. Don

GROUP V

1. Leaflets 20-50mm long and 7-15mm wide; most stipules usually 10mm long or more **A. americanus** (Hook.) Jones
1. Leaflets 5-20mm long, 1.5-6mm wide; stipules mostly 2-7mm long **A. australis** (L.) Lam. var. **glabriusculus** (Hook.) Isely

GROUP VI

1. Ovaries and young pods glabrous
2. Stems and leaves hirsute, the longest hairs 1-2mm long **A. drummondii** Dougl. ex Hook.
2. Stems and leaves mostly strigillose or glabrous, the longest hairs less than 1mm long
3. Ovules 40-68; calyx usually not gibbous at base **A. crassicarpus** Nutt.
4. Herbage somewhat cinereous with hairs mostly 0.5-1.1mm long; inflorescence somewhat pilose; calyx tube usually 5.5-8mm long var. **crassicarpus**
4. Herbage strigulose with hairs mostly 0.3-0.7mm long; inflorescence mostly strigulose; calyx tube usually 7-10mm long var. **paysonii** (Kelso) Barneby
3. Ovules 12-22; calyx usually gibbous at base **A. racemosus** Pursh
1. Ovaries and young pods hairy
5. Plants acaulescent or subacaulescent, usually densely tufted; flowers 1-6(8) per raceme **A. purshii** Dougl. ex Hook.
5. Plants caulescent, not densely tufted; flowers (3)6-15 per raceme **A. plattensis** Nutt.

GROUP VII

1. Leaflets confluent with rachis, at least on lower side, not jointed, linear to oblong-oblanceolate, many 2-6cm long, often involute **A. pectinatus** (Hook.) Dougl. ex G. Don
1. Leaflets jointed to rachis, often not linear to oblong-oblanceolate, the length variable, not involute
2. Leaves and stems hirsute with long, spreading, minutely bulbous-based hairs over 1mm long; flowers white to ochroleucous, 14-35 per raceme **A. drummondii** Dougl. ex Hook.
2. Leaves and stems usually not hirsute as above; flowers white, ochroleucous, or purple, 3-80 per raceme
3. Flowers 3-15 per raceme, purplish or at least purple tinged

4. Ovules 14-26; stems and leaves sometimes glabrous or glabrate **A. agrestis** Dougl. ex G. Don
4. Ovules 28-48; stems and leaves hairy **A. plattensis** Nutt.
3. Flowers mostly 16-80 per raceme, or if fewer, then flowers ochroleucous
5. Flowers erect or ascending, ochroleucous **A. cicer** L.
5. Flowers soon drooping, white or ochroleucous to purplish
6. Petals purple, rarely white or ochroleucous; calyx tube 2.8-5.7mm long; ovules 5-15 **A. bisulcatus** (Hook.) Gray
6. Petals white or ochroleucous; calyx tube 4.5-9mm long; ovules 12-22 **A. racemosus** Pursh

GROUP VIII

1. Stems arising from buried points of renewal on an underground root crown or rhizome-like caudex branches
2. Keel slightly longer and nearly twice as wide as the whitish wings **A. alpinus** L.
2. Keel not as above
3. Calyx tube 1.5-2.7mm long; banner 5-8.5mm long **A. gracilis** Nutt.
3. Calyx tube 2.7-6mm long; banner 7.5-14mm long
4. Calyx 3.5-6mm long; leaflets mostly less than 2cm long **A. flexuosus** (Hook.) Dougl. ex G. Don
4. Calyx 6.5-9mm long; some leaflets usually over 2cm long **A. cicer** L.

1. Stems arising together from a root crown or caudex near or above ground surface
5. Calyx tube 1.4-2.2mm long
6. Ovary and young fruit densely hairy, sessile or nearly so; flowers 3-7(11) per raceme **A. vexilliflexus** Sheld.
6. Ovary and young fruit glabrous or nearly so, conspicuously stipitate; flowers 4-20 per raceme **A. multiflorus** (Pursh) Gray
5. Calyx tube 2.3-5.7mm long
7. Racemes mostly 25-80 flowered
8. Leaves 3-14cm long; leaflets 11-35; flowers 25-80; stems to 5dm long **A. bisulcatus** (Hook.) Gray
8. Leaves 1-7cm long; leaflets 7-15; flowers 2-30; stems to 2.5dm long **A. australis** (L.) Lam. var. **glabriusculus** (Hook.) Isely
7. Racemes mostly 2-20(25) flowered
9. Keel 6-10.5mm long
10. Petals often whitish or ochroleucous and purple-tipped; ovules 6-19 **A. australis** (L.) Lam. var. **glabriusculus** (Hook.) Isely
10. Petals purple to reddish-lilac (very rarely whitish); ovules 2-10 **A. alpinus** L.
9. Keel 4-6mm long **A. multiflorus** (Pursh) Gray

Athyrium filix-femina (L.) Roth var. **cyclosorum** Rupr.

Atriplex

1. Plants perennial shrubs or subshrubs
2. Plants mostly woody throughout, often over 5dm high; fruiting bracts usually 4 winged lengthwise, ventral and dorsal pair sometimes irregular **A. canescens** (Pursh) Nutt.
2. Plants usually woody only at base, rarely over 4dm high; fruiting bracts not conspicuously winged although sometimes with irregular appendages **A. gardneri** (Moq.) Dietr.

1. Plants herbaceous annuals
3. Mature fruiting bracts suborbicular, entire, lacking appendages, either 6mm or more wide or of very different sizes
4. Mature fruiting bracts, or some of them, 6-15mm wide; some seeds horizontal and surrounded by a perianth rather than bracts **A. hortensis** L.
4. Mature fruiting bracts 2-5mm wide; seeds all vertical and enclosed by bracts **A. heterosperma** Bunge
3. Mature fruiting bracts not suborbicular and entire, mostly with teeth or appendages, usually less than 6mm wide and mostly similar
5. Leaves mostly green except sometimes when young, some usually with petioles 5mm or more long, often opposite or subopposite below; fruiting bracts mostly somewhat triangular at tip
6. Fruiting bracts rhombic with prominent, sharp, lateral angles, margins united almost to middle **A. patula** L.
6. Fruiting bracts more ovate with obscure lateral angles, margins united only near base **A. subspicata** (Nutt.) Rydb.
5. Leaves mostly gray-farinose, at least beneath, often sessile or subsessile, usually alternate throughout; fruiting bracts various
7. Mature bracts of pistillate flowers mostly 3-4mm long, the upper smooth portion broadly oval or horizontally oblong and tipped with a short tooth; leaves mostly entire (flowers sometimes all staminate) **A. powellii** Wats.
7. Mature bracts of pistillate flowers often 4mm or more long, the shape various, usually several toothed at tip or long-pointed; leaves often somewhat toothed
8. Fruiting bracts free to base, entire **A. oblongifolia** Waldst. & Kit.
8. Fruiting bracts united nearly to middle or more, usually not entire
9. Leaves mostly sinuate-dentate; fruiting bracts united not quite to middle **A. rosea** L.
9. Leaves entire to slightly toothed; fruiting bracts usually united to well above middle **A. argentea** Nutt.

Avena

1. Spikelets mostly 3 flowered; awn bent; lemmas hairy **A. fatua** L.
1. Spikelets mostly 2 flowered; awn usually straight or none; lemmas glabrous **A. sativa** L.

Bacopa rotundifolia (Michx.) Wettst.

Balsamorhiza sagittata (Pursh) Nutt.

Barbarea

1. Fruiting styles mostly 1-1.5mm long; petals 3-5mm long **B. orthoceras** Ledeb.
1. Fruiting styles mostly 1.8-3mm long; petals 3.5-8mm long **B. vulgaris** R. Br.

Beckmannia syzigachne (Steudel) Fern.

Berberis thunbergii DC.

Berteroa incana (L.) DC.

Berula erecta (Huds.) Cov. var. **incisa** (Torrey) Cronq.

Betula

1. Plants trees with relatively smooth, whitish bark (coppery when young); tufts of white hairs usually present in vein axils on underside of leaves **B. papyrifera** Marsh.
1. Plants mostly shrubs without white bark; tufts of white hairs usually lacking in vein axils on underside of leaves
2. Leaves orbicular to oval or obovate, with mostly rounded teeth; plants mostly less than 2m high; wings much narrower than nutlet **B. glandulosa** Michx.
2. Leaves subcordate to ovate with pointed teeth; plants often over 2m high; wings often as wide as or wider than nutlet **B. occidentalis** Hook.

Bidens

1. Primary leaves simple
2. Rays usually well developed, rarely lacking; achenes with a cartilaginous margin along top set off from the body by color or constriction **B. cernua** L.
2. Rays usually lacking, rarely to 4mm long; achenes lacking a cartilaginous margin along top **B. tripartita** L.
1. Primary leaves compound with mostly 3-5 leaflets
3. Outer involucral bracts mostly 5-8(10); disk corollas yellow-orange, 2.5-3mm long **B. frondosa** L.

3. Outer involucral bracts of larger heads mostly 10 or more; disk corollas pale yellow, 2.5-4mm long **B. vulgata** Greene

Bistorta vivipara (L.) Delarbre

Boechera

1. Stem leaves, or most of them, not auriculate **B. pendulocarpa** (A. Nels.) Windham & Al-Shehbaz
1. Stem leaves auriculate
  2. Mature fruits erect to ascending
    3. Hairs of lower leaves mostly simple or forked, often rather sparse, rarely lacking **B. stricta** (Graham) Al-Shehbaz
    3. Hairs of lower leaves mostly 3 or more branched, often dense
      4. Plants long-lived perennials usually with woody caudices; mature fruits 0.8-1.5(2)mm wide; leaves mostly 4mm or less wide **B. microphylla** (Nutt.) Dorn
      4. Plants biennials or short-lived perennials without woody caudices; mature fruits 1-2.5mm wide; some leaves often over 4mm wide
        5. Basal leaves with some hairs with 5 or 6 rays; mature fruits (1.7)2-2.5mm wide; petals purple to lavender; fruiting pedicels 5-10(12)mm long **B. divaricarpa** (A. Nels.) Löve & Löve
        5. Basal leaves with hairs with 2-4 rays; mature fruits 1-1.5(1.8)mm wide; petals usually white; fruiting pedicels (5)8-30mm long **B. grahamii** (Lehm.) Windham & Al-Shehbaz
  2. Mature fruits mostly widely spreading to reflexed
    6. Mature fruiting pedicels, and usually the fruits, predominantly descending to strictly reflexed
      7. Pedicels gradually curved-descending; hairs of basal leaves coarse and somewhat remote **B. pauciflora** (Nutt.) Windham & Al-Shehbaz
      7. Pedicels straight-descending or at least sharply bent near base; hairs of basal leaves fine and dense
        8. Lower stem hirsute with large, simple, spreading hairs, sometimes mixed with branched hairs **B. collinsii** (Fern.) Löve & Löve
        8. Lower stem appressed-hairy with small branched hairs **B. retrofracta** (Graham) Löve & Löve
    6. Mature fruiting pedicels, and sometimes the fruits, predominantly ascending to horizontally spreading, rarely a few lower ones slightly descending
      9. Basal leaves with some hairs with 5 or 6 rays; mature fruits (1.7)2-2.5mm wide; petals purple to lavender; fruiting pedicels 5-10(12)mm long **B. divaricarpa** (A. Nels.) Löve & Löve
      9. Basal leaves with hairs with 2-4 rays; mature fruits 1-1.5(1.8)mm wide; petals usually white; fruiting pedicels (5)8-30mm long **B. grahamii** (Lehm.) Windham & Al-Shehbaz

Bolboschoenus maritimus (L.) Palla var. **paludosus** (A. Nels.) Dorn

Boltonia asteroides (L.) L'Her. var. **latisquama** (Gray) Cronq.

Botrychium

1. Vegetative part of leaf 2-4 times compound, the blade broadly triangular and mostly over 5cm long
  2. Vegetative part of leaf stalked, attached to common petiole near ground level **B. multifidum** (Gmel.) Rupr.
  2. Vegetative part of leaf sessile or nearly so, attached to common petiole well above ground level **B. virginianum** (L.) Sw.
1. Vegetative part of leaf simple to twice compound, the blade sometimes triangular but mostly elongate and mostly less than 7cm long
  3. Primary segments above the basal pair (often elongated) of vegetative part of leaf ovate or elliptic, often pinnately lobed or divided (twice dissected), the middle veins larger and more crowded than outer **B. michiganense** Wagner ex Gilman et al.
  3. Primary segments above the basal pair of vegetative part of leaf fan-shaped, rhombic, or linear, sometimes cleft into segments but not pinnately lobed or divided (once dissected), the veins equal and evenly distributed
    4. Vegetative part of leaf usually arising from near ground level, either ternately compound, or with the basal segments larger and more strongly stalked than the other segments and arising noticeably above ground level **B. simplex** Hitchc.
    4. Vegetative part of leaf usually arising from well above ground level, generally at or above middle of plant, simply pinnate
      5. Primary segments of vegetative part of leaf narrow, the sides spanning an arc less than 60 degrees
        6. Primary segments of vegetative part of leaf narrowly spatulate to wedge shaped, often shallowly cleft into non-spreading lobes, the largest segments usually not basal **B. campestre** Wagner & Farrar ex Wagner & Wagner
        6. Primary segments of vegetative part of leaf linear, often deeply cleft into widely spreading lobes, the basal segments usually the largest **B. lineare** Wagner
      5. Primary segments of vegetative part of leaf broader, the sides spanning an arc greater than 60 degrees
        7. Primary segments of vegetative part of leaf very broadly fan shaped or mushroom shaped, the sides spanning an arc of over 120 degrees
          8. Plants whitish when fresh (drying green); primary segments of vegetative part of leaf broadly attached to rachis, mushroom shaped **B. pallidum** Wagner
          8. Plants green; primary segments of vegetative part of leaf narrowly attached to rachis, fan shaped **B. lunaria** (L.) Sw.
        7. Primary segments of vegetative part of leaf narrowly fan shaped, the sides spanning an arc of 60-120 degrees
          9. Vegetative part of leaf sessile on the common petiole **B. spathulatum** Wagner
          9. Vegetative part of leaf stalked
            10. Stalk of vegetative part of leaf about half or less the length of the spore bearing part of leaf; stalk of spore bearing part of leaf shorter than the average distances between the basal and second vegetative pinnae pairs and between the second and third pinnae pairs **B. gallicomontanum** Farrar & Johnson-Groh
            10. Stalk of vegetative part of leaf half or more the length of the spore bearing part of leaf; stalk of spore bearing part of leaf about equal to or longer than the average of the distances between the basal and second vegetative pinnae pairs and between the second and third pinnae pairs
              11. Plants usually green when fresh; pinnae entire to symmetrically shallowly 3 or 5 lobed; stalks of lower pinnae narrow, about a fourth the pinna width; lower branches of spore bearing part of leaf stalked, sporangia not obscuring the rachis **B. minganense** Vict.
              11. Plants usually pallid, yellow- to white-green to glaucous blue-green when fresh; pinnae entire to crenate to asymmetrically cleft into two main lobes, upper lobe usually larger and more developed; stalks of lower pinnae not appearing narrow, about a third or more the pinna width; lower branches of spore bearing part of leaf usually short stalked to sessile, sporangia partly obscuring the rachis
                12. Plants glaucous blue-green when fresh; pinnae dome shaped in outline, outer margins or lobes entire; stalks of vegetative and spore bearing parts of leaf straight forming a sharp V where they join **B. pallidum** Wagner
                12. Plants glaucous or not, yellow- to white-green when fresh, rarely glaucous blue-green; pinnae fan shaped to spatulate in outline, sometimes somewhat rhombic, pinnae sometimes appearing stubby, truncate, or malformed, outer margins and lobes often irregularly toothed or crenate; stalks of vegetative and spore bearing parts of leaf often bowed forming a rounded V where they join **B. furculatum** Popovich & Farrar

Bouteloua

1. Plants dioecious or monoecious, to 20cm high, stoloniferous; pistillate spikelets with the thickened rachis and 2nd glumes forming a rigid, yellow-white, globular structure crowned by green-toothed summits of the glumes; staminate spikelets 2 flowered, sessile, in 2 rows on 1 side of rachis **B. dactyloides** (Nutt.) Columbus
1. Plants not as above
  2. Spikes of raceme many, to 20mm long, pendulous; rhizomes usually present **B. curtipendula** (Michx.) Torrey
  2. Spikes 1-4(8), often over 20mm long, spreading or ascending; rhizomes none or very short

3. Rachis of spikes prolonged beyond the spikelets as a naked point mostly 4-8mm long; largest glume with long, tubercle-based hairs **B. hirsuta** Lag.
3. Rachis of spikes not prolonged beyond spikelets, or if so, not naked but bearing rudimentary spikelets; largest glume with or without tubercle-based hairs **B. gracilis** (Kunth) Lag. ex Griffiths

Brassica

1. Fruits somewhat appressed-ascending, 1-2.5cm long, midnerve strongly raised from surface **B. nigra** (L.) Koch
1. Fruits mostly spreading-ascending, 2-4cm long, midnerve not strongly raised **B. juncea** (L.) Czern.

Brickelia eupatorioides (L.) Shinners var. **corymbulosa** (T. & G.) Shinners

Bromus

1. Plants perennial
2. Creeping rhizomes present
3. Lemmas awnless or awned, glabrous or sometimes short appressed-hairy; leaf blades, sheaths, and nodes often glabrous or short-hairy **B. inermis** Leyss.
3. Lemmas usually awned, long-hairy especially near margins, the hairs somewhat spreading or ascending, some of them usually 0.8mm or more long; leaf blades, sheaths, and nodes often long-hairy **B. pumpellianus** Scribn.
2. Creeping rhizomes lacking
4. Spikelets flattened, the lemmas somewhat keeled; 1st glume 3-5 nerved, 2nd 5-7 nerved **B. carinatus** H. & A. var. **marginatus** (Steudel) Barkw. & Anderton
4. Spikelets terete or somewhat flattened but the lemmas not keeled; 1st glume 1-3 nerved, 2nd 3-5 nerved
5. Lemmas hairy along margin and sometimes on lower part of back, upper part glabrous or nearly so; glumes usually glabrous except sometimes on midvein **B. ciliatus** L.
5. Lemmas somewhat evenly hairy over back, usually more densely so along lower part of margin, rarely glabrous; glumes usually hairy
6. First glume normally 1 nerved; leaf blades 3-15mm wide
7. Plants with usually 10 or more nodes which are mostly concealed by overlapping sheaths; auricles conspicuous **B. latiglumis** (Scribn. ex Shear) Hitchc.
7. Plants with usually fewer than 10 nodes, many of them visible; auricles none **B. pubescens** Spreng.
6. First glume 3 nerved on many or all spikelets; leaf blades 5(8)mm or less wide
8. Second glume 5 nerved; ligules mostly 0.6mm or less long; spikelets 9-20(24)mm long **B. kalmii** Gray
8. Second glume usually 3 nerved; ligules 0.5-2.5mm long; spikelets 17-30mm long **B. porteri** (Coult.) Nash

1. Plants annual
9. Teeth of lemmas 2-3mm long; awns mostly 10-15mm long; 1st glume 1 nerved **B. tectorum** L.
9. Teeth of lemmas mostly less than 1mm long; awns often less than 10mm long; 1st glume 3-5 nerved
10. Lemmas awnless or with awns mostly less than 1mm long **B. briziformis** Fisch. & Meyer
10. Lemmas with awns mostly over 2mm long
11. Palea subequal to lemma; lemma tending to curl around edges of mature fruit, especially toward base, often exposing rachilla; awn arising within 1.5mm of lemma tip, 2-4(6)mm long **B. secalinus** L.
11. Palea shorter than lemma; lemma usually not curling around edges of mature fruit; awn arising from near tip to over 1.5mm from tip, sometimes over 6mm long
12. Awn usually straight, arising within 1.5mm of lemma tip; panicle branches usually stiffly ascending, usually not flexuous **B. commutatus** Schrad.
12. Awn usually flexuous and divergent when dry, often arising over 1.5mm from lemma tip; panicle branches lax or flexuous
13. Spikelets mostly 5-10mm wide; lemmas 5-7mm wide, rhombic in outline when flattened **B. squarrosus** L.
13. Spikelets mostly less than 6mm wide; lemmas 4-5mm wide, usually elliptic in outline **B. japonicus** Thunb. ex Murray

Buglossoides arvensis (L.) Johnst.

Bupleurum americanum Coult. & Rose

Calamagrostis

1. Callus hairs rarely over half as long as lemma (hairs of rachilla sometimes longer); awn geniculate or straight
2. Awn exserted 1-4mm beyond glumes; glumes mostly 6-8mm long **C. purpurascens** R. Br.
2. Awn either included or scarcely longer than glumes; glumes mostly shorter **C. montanensis** Scribn. ex Vasey
1. Callus hairs mostly 2/3 as long to as long as lemma; awn straight
3. Panicle loose and usually open, mostly over 2cm wide; awn delicate; leaf blades often over 4mm wide, usually flat; callus hairs generally subequal to lemma **C. canadensis** (Michx.) Beauv.
3. Panicle contracted or spike-like, rarely over 3cm wide; awn somewhat stout; leaf blades 1-4mm wide, sometimes involute; callus hairs often shorter than lemma **C. stricta** (Timm) Koeler
4. Ligules of upper leaves 4-8mm long ssp.**inexpansa** (Gray) Greene
4. Ligules of upper leaves 1-3.5mm long ssp. **stricta**

Calamovilfa longifolia (Hook.) Scribn.

Callitriche

1. Fruit winged throughout
2. Wing narrower than seed width **C. stenoptera** Lansdown
2. Wing as wide as or wider than seed **C. hermaphroditica** L.
1. Fruit winged only at tip or unwinged
3. Fruit longer than wide; mericarps not divergent at tip **C. palustris** L.
3. Fruit as wide as or wider than long; mericarps divergent at tip **C. heterophylla** Pursh

Calochortus

1. Anthers apiculate at tip; gland on petals circular or horizontally elongate with a slight arch
2. Gland on petals horizontally elongate with a slight arch **C. gunnisonii** Wats.
2. Gland on petals circular or nearly so **C. apiculatus** Baker
1. Anthers blunt at tip; gland on petals circular or nearly so **C. nuttallii** T.& G.

Calypso bulbosa (L.) Oakes

Calystegia

1. Plants glabrous or with a few scattered hairs mostly on petioles; leaf blades, or some of them, usually over 5cm long, the basal lobes usually each with 2 teeth or angles **C. sepium** (L.) R. Br. var. **angulata** (Brumm.) Holmgren
1. Plants conspicuously hairy nearly throughout; leaf blades mostly less than 5cm long, the basal lobes usually each with a single tooth or angle or merely rounded **C. macounii** (Greene) Brumm.

Camelina

1. Stems somewhat densely hairy below; fruits mostly 5-7mm long; pedicels rarely over 17mm long **C. microcarpa** Andrz. ex DC.
1. Stems glabrous or sparsely hairy below; fruits mostly 7-9mm long; pedicels often over 17mm long **C. sativa** (L.) Crantz

Campanula
1. Flowers mostly more than 7, the pedicels mostly half as long or less than the flowers
  2. Flowers with short pedicels, forming an erect slender raceme **C. rapunculoides** L.
  2. Flowers sessile in an involucrate terminal glomerule **C. glomerata** L.
1. Flowers solitary, or if more, the pedicels mostly as long as or longer than the flowers
  3. Corolla white or very pale blue, mostly 3-8mm long **C. aparinoides** Pursh
  3. Corolla bright blue, 10-25mm long **C. rotundifolia** L.

Cannabis sativa L.

Capsella bursa-pastoris (L.) Medic.

Cardamine pensylvanica Muhl. ex Willd.

Carduus
1. Heads mostly 3-4cm wide; involucral bracts lanceolate or ovate, mostly 2-6mm wide **C. nutans** L.
1. Heads mostly 1-2.5cm wide; involucral bracts linear or lance-linear, about 1mm wide **C. acanthoides** L.

Carex
1. Spikes solitary at tip of stem (rarely appearing like 2 with only 1-3 perigynia slightly separated from upper staminate portion) **GROUP I**
1. Spikes more than 1 per stem, sometimes closely aggregated to appear like 1
  2. Stigmas mostly 2 (rarely a few flowers with 3); achenes lenticular
    3. Lateral spikes sessile or nearly so, usually not much longer than wide; terminal spike usually with both staminate and pistillate flowers, or the plants rarely dioecious **GROUP II**
    3. Lateral spikes peduncled, or if sessile, then elongate; terminal spike usually staminate, rarely both staminate and pistillate **GROUP III**
  2. Stigmas mostly 3; achenes trigonous or rarely nearly terete
    4. Perigynia pubescent, puberulent, or prominently ciliate-scabrous at least on margins (do not mistake for papillate) **GROUP IV**
    4. Perigynia glabrous **GROUP V**

GROUP I

1. Leaves mostly 2-6mm wide; beak of perigynia (0.5)1-3mm long; lower scales usually leaf-like and partly enveloping perigynia
  2. Leaf margins sclerified, the margins conspicuously whitish; perigynium 3.2-4.9mm long, often abruptly tapering to beak, the beak 0.6-1.2mm long, usually minutely serrulate **C. saximontana** Mack.
  2. Leaf margins not sclerified, the margins green; perigynium 4.8-6.6mm long, gradually tapering to beak, the beak 1.9-2.9mm long and smooth **C. backii** Boott
1. Leaves 0.2-1.5(3)mm wide; beak of perigynia 1mm or less long or not obviously differentiated from body; scales not as above
  3. Pistillate scales deciduous; at least the lower perigynia often reflexed at maturity **C. microglochin** Wahl.
  3. Pistillate scales persistent; perigynia not reflexed at maturity
    4. Perigynia rounded and beakless at tip, the tip appearing bluntly 2 toothed from the side **C. leptalea** Wahl.
    4. Perigynia pointed at tip, usually the result of a beak
      5. Stems solitary or few together along a creeping rhizome; leaves 0.8-3mm wide
        6. Perigynium beak 0.5-1mm long; leaves 0.8-1.5mm wide **C. obtusata** Lilj.
        6. Perigynium beak about 0.2mm long; leaves mostly 1.5-3mm wide **C. rupestris** Allioni
      5. Stems densely caespitose, creeping rhizomes lacking; leaves 0.2-0.8mm wide **C. filifolia** Nutt.

GROUP II

1. Culms single or few together from long creeping rhizomes
  2. Perigynia strongly wing-margined, the beak 1-3mm or more long, deeply bidentate; staminate flowers below pistillate **C. siccata** Dewey
  2. Perigynia not wing-margined, the beak rarely over 2mm long, usually obliquely cut dorsally, becoming bidentulate (rarely slightly winged but then the perigynia stipitate); staminate flowers above pistillate
    3. Leaves narrowly involute, at least above; culms obtusely angled, usually smooth **C. duriuscula** Meyer
    3. Leaves flat or channeled; culms usually sharply triangular, often rough above
      4. Spikes usually distant, with mostly 1-4 perigynia **C. disperma** Dewey
      4. Spikes usually crowded, with mostly 6 or more perigynia
        5. Upper sheaths green striate ventrally except near the mouth; scales narrower and shorter than perigynia; perigynium body thin-margined above, nerved ventrally, beak 1/4 length of body or less **C. sartwellii** Dewey
        5. Upper sheaths usually hyaline ventrally; scales covering perigynia and enclosing them; perigynium not thin-margined above, usually nerveless ventrally, beak 1/2 length of body or more **C. praegracilis** Boott
1. Culms caespitose or the rhizomes short with very short internodes and not long creeping
  6. Spikes with staminate flowers above the pistillate, staminate often with only the filaments persisting, rarely lacking
    7. Perigynia gradually tapering into a beak
      8. Perigynia 4-5.2mm long, the beak about as long as body, the sides virtually straight (wedge-shaped), strongly several nerved on both sides; scales about as long as body of perigynia **C. stipata** Muhl. ex Willd.
      8. Perigynia 2-4.5mm long, the beak mostly shorter than body, the sides slightly concave above, often nerved on 1 side only; scales often longer than body of perigynia
        9. Scales acuminate to long-awned, some awns usually 1mm or more long; perigynia nerveless ventrally or essentially so
          10. Inflorescence 3-10cm long; some awns of scales 3mm or more long; mature perigynia 2-2.9(3.3)mm long, 1-1.5(1.8)mm wide **C. vulpinoidea** Michx.
          10. Inflorescence 2-3cm long; awns of scales 2mm or less long; mature perigynia 3-4.5mm long, 1.5-2(3)mm wide **C. alopecoidea** Tuckerman
        9. Scales not awned although sometimes acuminate; perigynia sometimes strongly nerved ventrally
          11. Spikes scattered
            12. Scales about half as long as the spreading or reflexed perigynia **C. radiata** (Wahlenb.) Small
            12. Scales about as long as the ascending perigynia **C. prairea** Dewey
          11. Spikes in a dense head **C. hoodii** Boott
    7. Perigynia somewhat abruptly contracted into a beak
      13. Leaf blades 3.5-6(8)mm wide; sheaths loose, mottled with green and white, usually septate dorsally **C. gravida** Bailey
      13. Leaf blades 0.5-3.5mm wide; sheaths tight, inconspicuously or not at all mottled with green and white, not septate dorsally
        14. Perigynia glabrous on margins except sometimes on beak, achene filling the perigynium; leaf blades 0.5-2mm wide **C. vallicola** Dewey
        14. Perigynia serrulate on upper margins, achene not filling upper part of perigynium; leaf blades mostly 1.5-3.5mm wide
          15. Perigynia ovate, glossy brown with a wide green margin; heads mostly ovate; scales dark chestnut brown **C. hoodii** Boott
          15. Perigynia elliptic, greenish straw colored to brown-centered with a narrow green margin; heads mostly slightly elongate or lower spikes slightly separate; scales greenish-brown **C. occidentalis** Bailey
  6. Spikes with pistillate flowers above the staminate, staminate often with only the filaments persisting
    16. Perigynia lacking winged margins, 1.5-4(5.5)mm long
      17. Mature perigynia widely spreading to descending, the beaks 0.5-2mm long; spikes mostly about as long as wide **C. interior** Bailey
      17. Mature perigynia mostly erect to ascending, the beaks 0.2-0.7(1)mm long (to 2.5mm in *C. deweyana*); spikes mostly longer than wide

18. Scales strongly brown or chestnut tinged; perigynia with mostly 6 or more nerves on each side, the beak 0.2-0.5mm long **C. praeceptorum** Mack.
18. Scales hyaline or greenish, often light brownish tinged at maturity; perigynia often with fewer nerves, the beak sometimes over 0.5mm long
19. Perigynia 3.2-5.5mm long, the beak 0.8-2.5mm long, the body gradually tapering to beak **C. deweyana** Schw.
19. Perigynia 1.7-2.7(3)mm long, the beak 0.2-0.7mm long, the body somewhat abruptly narrowed to beak
20. Beak of perigynium 0.5-0.7mm long; spikes mostly 5-10 flowered; leaves green, 1-2.5mm wide **C. brunnescens** (Pers.) Poiret
20. Beak of perigynium less than 0.5mm long; spikes 9-20 flowered; leaves glaucous, some often over 2.5mm wide **C. canescens** L.
16. Perigynia with conspicuous winged margins (broad thin edges), 2.5-8mm long
21. Perigynia 2.2-3.5mm wide, the body about as long as wide **C. brevior** (Dewey) Mack. ex Lunell
21. Perigynia 1-2mm wide, or if wider, the body about twice as long as wide
22. Spikes densely clustered in a somewhat ovoid head, dark brown at maturity **C. microptera** Mack.
22. Spikes loosely clustered and readily apparent, not in a dense head, greenish, light brown, or straw colored at maturity
23. Perigynia ovate-lanceolate or narrower, 2.5 times or more as long as wide **C. scoparia** Schk. ex Willd.
23. Perigynia mostly ovate, less than 2.5 times as long as wide
24. Perigynia 2.5-3.7mm long, 1-1.5(2)mm wide; achenes 0.6-0.8mm wide **C. bebbii** (Bailey) Olney ex Fern.
24. Perigynia 2.8-8mm long, 1.5-2.8mm wide; achenes 0.9mm or more wide
25. Culms smooth or nearly so on angles; achenes 1.2-1.7mm wide
26. Beak of perigynium flat and somewhat winged at tip, usually serrulate to tip
27. Inflorescence stiff and straight; pistillate scales usually longer than perigynia; perigynia closely appressed to axis, not darkened on lower half **C. xerantica** Bailey
27. Inflorescence often somewhat flexuous; pistillate scales about equaling perigynia; perigynia looser, not closely appressed to axis, somewhat darkened on lower half **C. foenea** Willd.
26. Beak of perigynium slender and subterete, sometimes scarcely winged at tip, the upper 0.2-2mm often little if at all serrulate
28. Perigynia mostly 6-8mm long; achenes 2.2-3mm long **C. petasata** Dewey
28. Perigynia 2.5-6(6.5)mm long; achenes 1.4-2.1(2.7)mm long **C. praticola** Rydb.
25. Culms conspicuously scabrous on angles, at least above; achenes about 1mm wide
29. Leaves mostly 1-3mm wide, dorsal side of sheaths green **C. tenera** Dewey
29. Leaves mostly 3-6mm wide, dorsal side of sheaths white mottled or white hyaline between green nerves **C. normalis** Mack.

GROUP III

1. Lowest bract usually sheathing; perigynia usually whitish-pulverulent or golden-yellow at maturity, often inflated, beak usually obsolete; plants 4dm or less high **C. aurea** Nutt.
1. Lowest bract usually sheathless, occasionally short-sheathing; perigynia not pulverulent nor golden-yellow at maturity, inflated or not, beak often prominent; plant height various
2. Perigynia conspicuously nerved or ribbed ventrally **C. nebrascensis** Dewey
2. Perigynia nerveless ventrally, or with obscure impressed nerves
3. Base of culms often surrounded by many, old, dry leaves; basal sheaths not fringed with fibers, tending to disintegrate all at once; perigynium beak evident, 0.1-0.3mm long
4. Ligule forming an elongate, acute triangle; light central portion of pistillate scales usually much narrower than the outer dark portions on either side **C. aquatilis** Wahl.
4. Ligule truncate or broadly rounded; light central portion of pistillate scales usually about as wide as or wider than the outer dark portions on either side **C. emoryi** Dewey
3. Base of culms often lacking old, dry leaves; basal sheaths usually fringed with fibers, disintegrating from outside inward; perigynium beak obsolete or nearly so
5. Perigynia usually flattened, not inflated at tip, green at maturity, lacking reddish dots; dorsal sheaths sometimes hairy **C. stricta** Lam.
5. Perigynia inflated at tip, brown at maturity, reddish dotted; dorsal sheaths glabrous **C. haydenii** Dewey

GROUP IV

1. Bracts reduced to bladeless sheaths or sometimes with very short, hyaline blades, or rarely spathe-like
2. Pistillate scales abruptly awned; perigynia 3.5-4.5mm long **C. pedunculata** Muhl. ex Willd.
2. Pistillate scales blunt; perigynia 2.5-3mm long
3. Pistillate spikes 4-8mm long when mature, staminate 3-6mm long and sessile or very short peduncled; bracts reduced to sheaths 7mm or less long, green or brown **C. concinna** R. Br.
3. Pistillate spikes mostly 8-22mm long when mature, staminate 10-25mm long and peduncled; bracts reduced to sheaths 10-20mm long, reddish with white-hyaline margins **C. richardsonii** R. Br.
1. Bracts sheathing or sheathless, the blades well developed
4. Perigynium closely enveloping the achene, strongly tapering at base; bracts sheathless or nearly so; pistillate spikes mostly less than 15mm long
5. Fertile culms of two types, some 1-5cm high and partly hidden among the tufted leaf bases and bearing mostly pistillate spikes, others elongate, 5-30cm high and bearing staminate and pistillate spikes or some only pistillate **C. rossii** Boott
5. Fertile culms all alike, elongate, 5-40cm high, bearing staminate and pistillate spikes; basal spikes absent
6. Perigynia inflated, 2.5-4.5mm long, hairy all over, the beak 0.5-1.5mm long
7. Body of perigynium about twice as long as wide; scales usually shorter than perigynia **C. peckii** Howe
7. Body of perigynium barely longer than wide (excluding tapered base); scales generally exceeding perigynia **C. inops** Bailey ssp. **heliophila** (Mack.) Crins
6. Perigynia planoconvex, 1.8-3mm long, hairy only near tip, the beak 0.1-0.6mm long **C. parryana** Dewey
4. Perigynium not as above, the top part empty, or if as above, the lowest bract strongly sheathing (short sheathing in *C. lasiocarpa*); pistillate spikes often over 15mm long
8. Leaf blades flat, 1.5-5mm wide; achene beak usually straight **C. pellita** Muhl. ex Willd.
8. Leaf blades involute-filiform, 2mm or less wide; achene beak usually bent just above body **C. lasiocarpa** Ehrh.

GROUP V

1. Pistillate scales, except sometimes the uppermost, leaf-like or bract-like, concealing and partly enveloping the perigynia, often over twice as long as the perigynia; leaves usually much exceeding the inflorescence; staminate flowers below pistillate in the spike, staminate often with only the filaments persisting
2. Leaf margins sclerified, the margins conspicuously whitish; perigynium 3.2-4.9mm long, often abruptly tapering to beak, the beak 0.6-1.2mm long, minutely serrulate **C. saximontana** Mack.
2. Leaf margins not sclerified, the margins green; perigynium 4.8-6.6mm long, gradually tapering to beak, the beak 1.9-2.9mm long and smooth **C. backii** Boott
1. Pistillate scales not leaf-like or bract-like, mostly not longer than perigynia; leaves usually not exceeding inflorescence; staminate flowers usually above pistillate in a separate spike, rarely below pistillate in same spike

3. Beak of perigynium about as long as or longer than the body, perigynia mostly 5-7mm long, usually strongly 2 nerved or ribbed; rootstocks and base of culms heavily fibrillose **C. sprengelii** Dewey ex Spreng.
3. Beak of perigynium usually much shorter than body, if as long, perigynia 7mm long or more, or less than 5mm long, or strongly many nerved; rootstocks and base of culms usually not fibrillose
4. Beak of achene bent or recurved; perigynia 2.2-4mm long, the beak 0.5mm or less long; scales mucronate to long-awned, white-hyaline with often a narrow greenish center
5. Pistillate scales awned, with broad scarious margins sharply contrasting with green midrib; perigynia strongly narrowed at base, closely enveloping achenes **C. blanda** Dewey
5. Pistillate scales not awned, midrib not strongly contrasting with rest of scale; perigynia not obviously narrowed at base, loosely enveloping achenes **C. granularis** Muhl. ex Willd. var. **haleana** (Olney) Porter
4. Beak of achene usually straight or nearly so, or if not, perigynia and beaks longer or scales different
6. Style continuous with achene, indurated, not withering; body of perigynium (3.5)5mm or more long, the beak (1)1.2-6mm long with prominent teeth 0.5mm or more long; pistillate spikes (0.2)1-2.8cm wide
7. Beak of perigynium with teeth about as long as rest of beak; leaf sheaths hairy; ligule longer than wide **C. atherodes** Spreng.
7. Beak of perigynium with shorter teeth; leaf sheaths usually glabrous; ligule often as wide as or wider than long
8. Beak of perigynium 2mm or more long
9. Scales awned; perigynia 5-7mm long, 1.5-2mm wide **C. hystericina** Muhl. ex Willd.
9. Scales not awned; perigynia 6-17mm long, 2.5-8mm wide
10. Perigynia 6-10mm long, 2.5-3.5mm wide, usually more than 10 per spike **C. retrorsa** Schw.
10. Perigynia 10-16mm long, 3.5-8mm wide; usually 5-10 per spike **C. intumescens** Rudge
8. Beak of perigynium mostly 1-2mm long **C. utriculata** Boott
6. Style jointed with achene, not indurated, finally withering and deciduous; body of perigynium 1.5-4.5(5)mm long, the beak 1.3mm long or less, the teeth very short or none; pistillate spikes 0.2-0.7(1.1)cm wide
11. Lower bracts, or some of them, long sheathing (blades sometimes lacking), the sheaths mostly 0.5-3cm long
12. Leaves mostly 0.5mm or less wide; pistillate spikes mostly 2-6 flowered; strongly rhizomatous **C. eburnea** Boott
12. Leaves 0.5-9mm wide; pistillate spikes often with more flowers; rhizomatous or not
13. Plants with long creeping rhizomes; perigynia 3.3-5mm long; pistillate scales broadly acute to obtuse **C. vaginata** Tausch.
13. Plants densely caespitose; perigynia 2-3.3(4)mm long; pistillate scales sometimes short-cuspidate
14. Pistillate spikes on slender, elongate, usually drooping peduncles, 3-20 flowered; perigynium beak broad and poorly defined **C. capillaris** L.
14. Pistillate spikes usually erect, the peduncles relatively stout and often very short or even lacking, (5)10-45 flowered; perigynium beak slender and sharply defined **C. viridula** Michx.
11. Lower bracts sheathless or only slightly sheathing
15. Beak of perigynium 0.6-1.2mm long; lowest bract usually much exceeding inflorescence **C. viridula** Michx.
15. Beak of perigynium 0.1-0.6mm long; lowest bract usually equaling or shorter than inflorescence
16. Perigynia 3-4.5mm long; terminal spike about half staminate; leaves 3-8mm wide, usually glabrous **C. bella** Bailey
16. Perigynia 2-3.2mm long; terminal spike all staminate or nearly so; leaves 1.5-3.2mm wide, sometimes hairy
17. Perigynia inflated; leaves hairy **C. torreyi** Tuckerman
17. Perigynia flattened or planoconvex; leaves glabrous or merely scabrous **C. parryana** Dewey

Carum carvi L.
Carya glabra (Mill.) Sweet
Castilleja
1. Corolla tube usually 3-4cm long, the entire corolla 3.5-7cm long, arcuate **C. sessiliflora** Pursh
1. Corolla tube mostly less than 1.5cm long, the entire corolla 1.8-3.5 cm long, not strongly arcuate **C. sulphurea** Rydb.
Catabrosa aquatica (L.) Beauv.
Ceanothus
1. Leaves mostly less than 2.5cm long, often entire, at least in lower half; branches usually spiny **C. fendleri** Gray
1. Leaves mostly over 2.5cm long, toothed usually throughout; branches not spiny
2. Leaves mostly lanceolate or narrowly elliptic and less than 2cm wide, upper surface dull like the lower **C. herbaceus** Raf.
2. Leaves mostly ovate or oval and over 2cm wide, upper surface shiny as if varnished **C. velutinus** Dougl. ex Hook.
Celastrus scandens L.
Celtis occidentalis L.
Cenchrus longispinus (Hack.) Fern.
Centaurea
1. Leaves mostly shallowly lobed to entire; annual **C. cyanus** L.
1. Leaves pinnately compound or pinnatifid at least below; perennial **C. stoebe** L. ssp. **micranthos** (Gmel. ex Gugler) Hayek
Cerastium
1. Plants annual, sometimes decumbent but not rooting at nodes
2. Pedicels, at least the lower, mostly over 1cm long, obviously longer than capsules **C. nutans** Raf.
2. Pedicels 1cm or less long, little if at all longer than capsules **C. brachypodum** (Engelm. ex Gray) Robins.
1. Plants biennial or perennial, often rooting at nodes
3. Petals subequal to sepals **C. fontanum** Baumg. var. **vulgare** (Hartm.) Wyse Jacks.
3. Petals 1.5 times as long as sepals or more **C. arvense** L. var. **strictum** (Gaudin) Koch
Cercocarpus montanus Raf.
Chaenactis douglasii (Hook.) H. & A.
Chaenorhinum minus (L.) Lange
Chamerion angustifolium (L.) Holub var. **canescens** (Wood) Holmgren & Holmgren
Cheilanthes feei Moore
Chenopodium
1. Fruit usually flattened laterally; perianth usually 3 or 4 parted; leaves often somewhat triangular or hastate, green on both sides
2. Glomerules mostly globose, often over 4mm wide at maturity, mostly in an interrupted terminal spike, upper 3cm or more of inflorescence usually not bracteate; pericarp tightly adherent to seed **C. capitatum** (L.) Ambrosi
2. Glomerules usually not globose, less than 4mm wide, in many, crowded, axillary, simple or compound spikes, inflorescence usually bracteate to tip; pericarp readily separable from seed **C. rubrum** L.
1. Fruit usually flattened dorsiventrally, or if laterally, the leaves usually white or gray farinose; perianth usually 5 parted
3. Primary leaf blades entire or nearly so, usually ovate, lanceolate, oblong, linear, or elliptic, rarely over 10(13)mm wide, often with 1-3 somewhat parallel veins
4. Leaf blades often 1-3 times as long as wide, elliptic to ovate or rarely deltoid-ovate; perianth often exposing mature fruit laterally and dorsally; fruits maturing unevenly in adjacent parts of inflorescence
5. Mature fruit usually concealed by perianth; pericarp strongly adherent to seed **C. watsonii** A. Nels.

5. Mature fruit exposed dorsally and laterally; pericarp often readily separable from seed **C. atrovirens** Rydb.
4. Leaf blades often over 3 times as long as wide, lanceolate to oblong or linear; perianth largely covering mature fruit except sometimes dorsally; fruits maturing evenly
6. Plants mostly branched from near base and bushy; perianth segments usually closely enclosing fruits **C. desiccatum** A. Nels.
6. Plants little if at all branched, erect and slender; perianth segments usually somewhat reflexed and exposing fruits **C. pratericola** Rydb.
3. Primary leaf blades (sometimes deciduous in fruit) mostly lobed or toothed or else deltoid or deltoid-ovate, or both, often over 10mm wide, usually pinnately veined
7. Leaves white or gray farinose beneath, green above, sinuate-dentate, 12(16)mm or less wide; perianth glabrous **C. glaucum** L. var. **salinum** (Standley) Boivin
7. Leaves only rarely as above; perianth usually farinose
8. Perianth lobes not dorsally keeled in fruit; leaves glabrous; seeds usually 1.5mm or more wide **C. simplex** (Torrey) Raf.
8. Perianth lobes usually dorsally keeled in fruit; some leaves often farinose on at least 1 surface; seeds usually less than 1.5mm wide
9. Leaf blades thin and papery when dry, usually barely if at all longer than wide and hastately lobed, often glabrous or nearly so; pericarp loose **C. fremontii** Wats.
9. Leaf blades somewhat thick, often about twice or more as long as wide and often toothed throughout, often farinose at least beneath; pericarp various
10. Seed and pericarp pitted, the latter usually tightly adherent to seed; style not cleft to base, often less than 0.5mm long
11. Fruits exposed at maturity; style and stigmas mostly less than 0.7mm long; leaves usually toothed **C. berlandieri** Moq. var. **zschackei** (Murr ex Issler) Murr ex Graebner
11. Fruits not exposed at maturity, hidden by perianth; style and stigmas mostly 0.8mm or more long; leaves usually entire except for occasional basal lobes **C. watsonii** A. Nels.
10. Seed and pericarp smooth or nearly so when mature, the latter usually loose around seed; style essentially cleft to base, often nearly 1mm long
12. Seeds mostly 1.1-1.5mm wide; fruits largely covered by perianth when mature **C. album** L.
12. Seeds mostly 0.9-1.2mm wide; fruits not covered by perianth when mature **C. strictum** Roth var. **glaucophyllum** (Aellen) Wahl

Chimaphila umbellata (L.) Bart. var. **occidentalis** (Rydb.) Blake
Chloris verticillata Nutt.
Chorispora tenella (Pallas) DC.
Cichorium intybus L.
Cicuta maculata L. var. **angustifolia** Hook.
Cinna latifolia (Trevir. ex Goepp.) Griseb.
Circaea
1. Leaves mostly about twice as long as wide or more; sepals (2)2.5-4mm long **C. canadensis** (L.) Hill
1. Leaves mostly less than twice as long as wide; sepals 1-2mm long **C. alpina** L.
2. Stem glabrous below uppermost leaves var. **alpina**
2. Stem slightly hairy just below uppermost leaves var. **pacifica** (Asch. & Magn.) Jones

Cirsium
1. Involucre of largest heads 1-1.8(2.2)cm long, 0.5-1(2)cm wide; heads in loose corymbiform clusters, some heads usually with pappus longer than corolla, some with pappus shorter than corolla; plants with deep creeping rhizomes **C. arvense** (L.) Scop.
1. Involucre of largest heads usually over 1.8cm long and 1cm or more wide; heads solitary or in compact terminal clusters or axillary; pappus mostly similar; plants often merely taprooted
2. Plants with involucres of mature heads 3.5-5cm long and about as wide; inner involucral bracts dilated and lacerate at tip, often with a glutinous dorsal ridge; achenes with a yellow apical collar 0.4-0.8mm long **C. drummondii** T.& G.
2. Plants without the above combination of characteristics
3. Leaves somewhat clasping the stem, or if decurrent, the wings mostly less than 12mm long
4. Yellow apical collar of achenes 0.3-0.7mm long, the achenes 3-5mm long; leaves sometimes merely toothed, upper surface usually greenish **C. flodmanii** (Rydb.) Arthur
4. Yellow apical collar of achenes 0.2mm or less long, the achenes (4)5-7mm long; leaves usually deeply lobed, upper surface usually gray **C. undulatum** (Nutt.) Spreng.
3. Leaves decurrent along stem, the wings of middle leaves mostly 15mm or more long
5. Upper leaf surface with many short spines, otherwise glabrous or glabrate; outer involucral bracts reflexed near middle **C. vulgare** (Savi) Tenore
5. Upper leaf surface lacking spines, glabrous or tomentose; outer involucral bracts not reflexed except sometimes the tips
6. Lower leaves often with some lobes 3.5-5.5 times as long as wide and over 2cm long; upper leaf surface slightly tomentose; involucre 2.5-4cm wide, usually as wide as long or wider **C. canescens** Nutt.
6. Lower leaves usually with all lobes 3 times as long as wide or less, or if longer, the upper leaf surface glabrous or glabrate, the lobes often all less than 2cm long; involucre 1-2cm wide, usually longer than wide **C. pulcherrimum** (Rydb.) Schum.

Claytonia
1. Plants with a subglobose corm; stem leaves not perfoliate **C. lanceolata** Pursh
1. Plants with a taproot; stem leaves usually perfoliate
2. Basal leaf blades predominantly ovate-rhomboid, lower leaves and stems seldom reddish tinged **C. perfoliata** Donn ex Willd. var. **intermontana** (Miller & Chambers) Dorn
2. Basal leaf blades predominantly deltoid, lower leaves and stems usually reddish tinged **C. rubra** (Howell) Tidestrom

Clematis
1. Plants herbaceous; flowers terminal on main stem **C. hirsutissima** Pursh
1. Plants usually woody, sometimes vines; flowers axillary or on a naked scape from base of plant
2. Leaves pinnately compound with 3-7 leaflets; sepals white or cream colored, 5-15mm long **C. ligusticifolia** Nutt.
2. Leaves 3 times ternately compound or essentially so; sepals blue or purple, 15-60mm long **C. columbiana** (Nutt.) T.& G. var. **tenuiloba** (Gray) Pringle

Coeloglossum viride (L.) Hartm. var. **virescens** (Muhl. ex Willd.) Luer
Collinsia parviflora Lindl.
Collomia linearis Nutt.
Comandra umbellata (L.) Nutt. var. **pallida** (A. DC.) Jones
Conium maculatum L.
Conringia orientalis (L.) Dumort.
Convolvulus arvensis L.
Conyza
1. Plants erect and simple, or branching above, with a defined central axis; stems usually hirsute with spreading hairs **C. canadensis** (L.) Cronq.
1. Plants bushy-diffuse with branching from near base; stems with appressed hairs **C. ramosissima** Cronq.

Corallorhiza
1. Sepals and petals usually with 3-5 prominent reddish-purple stripes; lip entire, not spotted; sepals mostly (7)10mm long or more **C. striata** Lindl.
1. Sepals and petals not prominently striped, often finely red veined; lip entire, lobed, or toothed, sometimes spotted; sepals usually less than 10mm long
  2. Ovaries usually green; lip petal 2.5-5mm long; lateral sepals 1 nerved
    3. Petals 4-5.5mm long; lip rarely purple spotted; flowers appearing greenish to yellow **C. trifida** Chat.
    3. Petals 3-4mm long; lip blotched with purple; flowers appearing greenish-purple to purple **C. odontorhiza** (Willd.) Poiret
  2. Ovaries usually reddish, purplish, or brownish; lip petal usually over 5mm long; lateral sepals usually 3 nerved
    4. Lip petal entire or crenulate, not lobed **C. wisteriana** Conrad
    4. Lip petal with 2 lateral lobes near base **C. maculata** (Raf.) Raf.
      5. Floral bracts 0.5-1mm long; middle lobe of lip slightly if at all expanded toward tip var. **maculata**
      5. Floral bracts 1-4.5mm long; middle lobe of lip distinctly expanded toward tip var. **occidentalis** (Lindl.) Ames
Coreopsis tinctoria Nutt.
Cornus
1. Plants herbaceous or woody only at base, less than 20cm high; flowers in a dense terminal head-like cluster subtended by 4 white petal-like bracts **C. canadensis** L.
1. Plants shrubby throughout, mostly well over 20cm high; flowers in open cymes without petal-like bracts **C. sericea** L.
Coronilla varia L.
Corydalis aurea Willd.
1. Racemes usually surpassed by leaves; fruits spreading to reflexed var. **aurea**
1. Racemes usually slightly surpassing leaves; fruits mostly erect or ascending var. **occidentalis** Engelm. ex Gray
Corylus cornuta Marsh.
Coryphantha
1. Petals greenish-white or yellowish; spines all white or yellowish, hairy **C. missouriensis** (Sweet) Britt. & Rose
1. Petals reddish-pink or pink-purple, some spines usually brown or reddish, glabrous **C. vivipara** (Nutt.) Britt. & Rose
Cota tinctoria (L.) Gay ex Gussone
Cotoneaster acutifolius Turcz.
Crataegus
1. Fruit usually yellow or orange when mature; teeth of leaves usually with conspicuous red glands at tip, these often extending down along petiole **C. chrysocarpa** Ashe
1. Fruit usually red when mature; teeth of leaves usually without conspicuous red glands at tip **C. macracantha** Lodd. ex Loud. var. **occidentalis** (Britt.) Eggleston
Crepis
1. Stems and leaves glabrous or hispid (rarely tomentulose on upper stem); leaves mostly entire, toothed, or shallowly lobed **C. runcinata** (James) T. & G.
  2. Leaves rarely over 3.5cm wide; heads rarely as many as 10 var. **runcinata**
  2. Leaves, or some of them, 3-8cm wide; heads mostly (6)10-20 or more var. **hispidulosa** Howell ex Rydb.
1. Stems and leaves somewhat tomentose or puberulent at least when young; leaves mostly deeply lobed
  3. Heads mostly 5-10 flowered and with 5-8 inner involucral bracts; plants often with over 40 heads **C. acuminata** Nutt.
  3. Heads mostly 10-60 flowered and with 8 or more inner involucral bracts; plants rarely with over 40 heads
    4. Involucre and/or lower part of stem with black, bristly hairs in addition to the whitish hairs, not glandular; leaf segments often toothed; achenes usually not ribbed **C. modocensis** Greene
    4. Involucre and lower part of stem not black bristly, or if so, either the bristles gland-tipped or the leaf segments entire or the achenes ribbed
      5. Leaf segments mostly linear or lance-linear and entire; achenes usually greenish **C. atribarba** Heller
      5. Leaf segments mostly lanceolate to deltoid, often toothed; achenes mostly yellowish or brownish **C. occidentalis** Nutt.
        6. Involucres, peduncles, and upper leaves with long gland-tipped hairs; largest heads 12-14 flowered, with 8 inner involucral bracts var. **costata** Gray
        6. Involucres, peduncles, and upper leaves lacking long gland-tipped hairs or nearly so; largest heads 18-30 flowered, with 10-13 inner involucral bracts var. **occidentalis**
Crocanthemum bicknellii (Fern.) Janch.
Croton texensis (Klotzsch) Muell.-Arg.
Cryptantha
1. Plants annual; corolla limb usually less than 2.5mm wide
  2. Nutlets of 2 kinds, 1 longer than the other 3, the 3 smaller ones tuberculate or papillate, the longer often smooth or granular
    3. Inflorescence with bracts subtending most of the flowers **C. minima** Rydb.
    3. Inflorescence without bracts or with a few only at the base **C. kelseyana** Greene
  2. Nutlets all alike or nearly so (occasionally 1 or more fail to develop), the nutlets all smooth
    4. Ventral groove of nutlet strongly offset from center **C. affinis** (Gray) Greene
    4. Ventral groove of nutlet in the center of nutlet
      5. Margins of nutlets sharply angled, especially above **C. watsonii** (Gray) Greene
      5. Margins of nutlets rounded or blunt
        6. Nutlets ovate, averaging 0.8-1.2mm wide; plants often few branched or unbranched **C. torreyana** (Gray) Greene
        6. Nutlets lanceolate, averaging 0.5-0.7mm wide; plants usually rather diffusely branched **C. fendleri** (Gray) Greene
1. Plants biennial or perennial; corolla limb usually well over 3mm wide
  7. Dorsal surface of nutlets smooth or nearly so; nutlet margins in fruit separated or else the fruits strongly curved dorsally and appearing depressed from the top **C. cinerea** (Greene) Cronq. var. **jamesii** Cronq.
  7. Dorsal surface of nutlets wrinkled, tuberculate, or spiny; nutlet margins in fruit touching each other or only slightly separated, the nutlets usually not appearing depressed
    8. Caudex much branched, plants mostly somewhat mat-forming and usually 15cm or less high, leaves mostly near base and usually 6mm or less wide **C. cana** (A. Nels.) Payson
    8. Caudex little if at all branched, stems solitary or few, often well over 15cm high, leaves usually conspicuous along stems and some often over 6mm wide
      9. Limb of corolla 4-6(8)mm wide; nutlets with a strong bend near middle of back (hump-backed); inflorescence oval with elongate branches; basal leaves oblanceolate, often deciduous **C. thyrsiflora** (Greene) Payson
      9. Limb of corolla (4)6-12mm wide; nutlets slightly rounded across back; inflorescence often elongate with short branches; some basal leaves usually obovate **C. celosioides** (Eastw.) Payson
Cryptogramma acrostichoides R. Br.
Cuscuta
1. Stigmas long and narrow **C. approximata** Bab.

1. Stigmas capitate **C. pentagona** Engelm.
Cyclachaena xanthiifolia (Nutt.) Fresenius
Cycloloma atriplicifolium (Spreng.) Coulter
Cymopterus
1. Involucre present; bractlets of involucel scarious or with broad scarious margins or whitish **C. montanus** T. & G.
1. Involucre lacking or rarely vestigial; bractlets foliaceous **C. glomeratus** (Nutt.) DC.
Cynoglossum officinale L.
Cyperus
1. Culms with bulbs at base or with thickened rhizomes; perennials; stamens 3; plants of sandy uplands
  2. Mucro of scales 0.3-1.5mm long; culms often scabrous; achene 2.2-2.6mm long **C. schweinitzii** Torrey
  2. Mucro of scales 0.3mm or less long; culms smooth; achene 1.4-2.2mm long **C. lupulinus** (Spreng.) Marcks
1. Culms lacking bulbs at base; annuals; stamens 1-3; plants of wet places
  3. Stamens 3; leaves 1-10mm wide; scales mostly straight at tip
    4. Scales mostly 1-1.5mm long, 3-5(7) nerved in center, sides usually nerveless; spikes about twice as long as wide **C. erythrorhizos** Muhl.
    4. Scales mostly 2-3mm long, 7 or more nerved over most of scale; spikes about as long as wide **C. odoratus** L.
  3. Stamens solitary; leaves 0.5-3mm wide; scales mostly outcurved at tip
    5. Scales 3 nerved **C. acuminatus** Torrey & Hook. ex Torrey
    5. Scales 5-9 nerved **C. squarrosus** L.
Cypripedium
1. Lip yellow **C. parviflorum** Salisb. var. **pubescens** (Willd.) Knight
1. Lip white **C. montanum** Dougl. ex Lindl.
Cystopteris fragilis (L.) Bernh.
Dactylis glomerata L.
Dalea
1. Fertile stamens 9 or 10
  2. Stem and leaves glabrous; petals white or cream **D. enneandra** Nutt.
  2. Stem and leaves hairy; petals yellow **D. aurea** Nutt. ex Pursh
1. Fertile stamens 5, alternating with 4 petals which are sometimes staminode-like
  3. Calyx tube glabrous or sparsely hairy between the prominent ribs; petals white **D. candida** Willd. var. **oligophylla** (Torrey) Shinners
  3. Calyx tube densely villous, the hairs concealing the surface or nearly so; petals purple, pink, white, or ochroleucous
    4. Stems and leaves densely villous; leaflets mostly 11-21 **D. villosa** (Nutt.) Spreng.
    4. Stems and leaves glabrous to sparsely hairy, or if densely hairy, leaflets 3-7
      5. Corolla purple or pinkish; leaflets mostly 3-7 **D. purpurea** Vent.
      5. Corolla white to ochroleucous; leaflets mostly 7-11 **D. cylindriceps** Barneby
Danthonia
1. Lemmas pilose on back, sometimes sparsely so **D. spicata** (L.) Beauv. ex R. & S.
1. Lemmas glabrous on back, pilose on margin only
  2. Panicle narrow, the pedicels mostly appressed to rachis; spikelets mostly 4-10 per panicle **D. intermedia** Vasey
  2. Panicle open, the pedicels mostly spreading or reflexed; spikelets mostly 1-3 per panicle
    3. Panicle usually with a single spikelet, rarely 2 or 3, the lower suberect; plants less than 3dm tall **D. unispicata** (Thurb.) Munro ex Macoun
    3. Panicle with mostly 2-5 spikelets, the lower usually divergent; plants usually over 3dm tall **D. californica** Bolander
Dasiphora fruticosa (L.) Rydb.
Daucus carota L.
Delphinium
1. Inflorescence a narrow elongate raceme, the lowest flower with a short pedicel usually shorter than the flower, the spur ascending to erect and often overlapping the flower above, the flowers whitish, sometimes tinged with blue **D. carolinianum** Walter ssp. **virescens** (Nutt.) Brooks
1. Inflorescence a somewhat pyramidal raceme, the lowest flower with an elongate pedicel mostly much longer than the flower, the spur usually more spreading and widely divergent from the flower above, the sepals usually blue or blue-purple
  2. Lower sepals longer and larger than the upper; lower petals entire or with a sinus less than 1/4 the length of blade; roots not easily separating from stem, usually loosely branched **D. bicolor** Nutt.
  2. Lower sepals often subequal to upper; lower petals usually with a sinus 1/4 to 1/2 the length of blade; roots easily separating from stem, often compactly fascicled **D. nuttallianum** Pritzel ex Walpers
Deschampsia cespitosa (L.) Beauv.
Descurainia
1. Leaves, at least the lower, 2 or 3 times compound; fruits narrowly linear, mostly 1mm wide or less, some usually 15mm or more long, well free of raceme axis on spreading or ascending pedicels; seeds mostly 20-40, uniseriate; valves 1-3 nerved **D. sophia** (L.) Webb ex Prantl
1. Leaves mostly once compound, or if not, the fruits not as above
  2. Fruits linear, usually long-tapering to tip so somewhat pointed, often somewhat torulose, seeds uniseriate
    3. Fruits often strictly appressed to rachis; fruiting pedicels erect or erect-ascending **D. incana** (Bernh. ex Fisch. & Meyer) Dorn
    3. Fruits not appressed to rachis; fruiting pedicels mostly ascending **D. longepedicellata** (Fournier) Schulz
  2. Fruits often clavate or subclavate, usually somewhat abruptly tapering to tip so somewhat blunt, little if at all torulose, seeds often biseriate near middle of fruit **D. pinnata** (Walt.) Britt. var. **brachycarpa** (Richardson) Fern.
Desmodium canadense (L.) DC.
Dianthus armeria L.
Diaperia prolifera (Nutt. ex DC.) Nutt.
Dichanthelium
1. Spikelets 1-2mm long **D. acuminatum** (Sw.) Gould & Clark
1. Spikelets 2.5-3.5(4.5)mm long
  2. Ligules 0.1-0.4mm long, primarily membranaceous; first glume 1.5-2.5mm long **D. leibergii** (Vasey) Freckmann
  2. Ligules 0.4-1.6mm long, primarily a fringe of hairs; first glume 0.6-1.9mm long
    3. Leaf blades mostly about 10 times or less as long as wide, divaricately ascending, some often 6mm or more wide, glabrous to short hairy except sometimes long hairy on margins **D. oligosanthes** (Schultes) Gould var. **scribnerianum** (Nash) Gould
    3. Leaf blades mostly well over 10 times as long as wide, erect to slightly ascending, mostly 5mm or less wide, glabrous to long hairy
      4. Spikelets conspicuously hairy; plants rarely over 20cm high; leaves mostly densely clustered toward base, usually exceeding inflorescence, long pilose **D. wilcoxianum** (Vasey) Freckmann
      4. Spikelets glabrous to sparsely hairy; plants often over 20cm high; leaves scattered along stems, often exceeded by inflorescence, glabrous to long pilose
        5. Culms in large tufts; spikelets 2.7mm or less long, not turgid **D. linearifolium** (Scribn.) Gould
        5. Culms single or few in a tuft; spikelets 2.7-3.2mm long, turgid **D. perlongum** (Nash) Freckmann

Dieteria
1. Leaves and stem below inflorescence glabrous to cinereous-hairy or the leaf margins ciliate, rarely with a few small glandular hairs **D. canescens** (Pursh) Nutt.
  2. Leaves cinereous-hairy, at least on underside var. **canescens**
  2. Leaves mostly glabrous or glabrate except sometimes for margins var. **glabra** (Gray) Morgan & Hartm.
1. Leaves, especially margins, and stem just below inflorescence with many coarse gland-tipped hairs **D. bigelovii** (Gray) Morgan & Hartm.

Digitaria
1. Sheaths pilose; sterile lemma lacking glandular hairs **D. sanguinalis** (L.) Scop.
1. Sheaths glabrous; sterile lemma with minutely glandular hairs **D. ischaemum** (Schreb.) Schreb. ex Muhl.

Diphasiastrum complanatum (L.) Holub

Dipsacus fullonum L.

Distichlis spicata (L.) Greene var. **stricta** (Torrey) Scribn.

Draba
1. Upper stem and usually the pedicels hairy; petals yellow **D. aurea** Vahl ex Hornem.
1. Upper stem and pedicels glabrous or nearly so; petals white or yellow
  2. Leaves mostly entire, usually densely hairy; fruits mostly 1-2mm wide, in a subterminal cluster; pedicels mostly 1-6mm long; petals white **D. reptans** (Lam.) Fern.
  2. Leaves, or some of them, usually toothed, hairy or glabrous; fruits sometimes over 2mm wide, usually scattered along stem; pedicels mostly 5-30mm long; petals sometimes yellow
    3. Pedicels 1-5 times as long as the elliptic to oblong-oblanceolate fruits, the fruits mostly 2-3mm wide, glabrous or finely hairy; basal leaves often not rosulate, usually hairy **D. nemorosa** L.
    3. Pedicels rarely as much as 1.5 times as long as the narrowly oblong fruits, the fruits 1.5-2.3mm wide, usually glabrous; basal leaves usually rosulate, often glabrate **D. albertina** Greene

Dracocephalum
1. Bracts of inflorescence strongly toothed or lobed; calyx tube about equaling lobes **D. parviflorum** Nutt.
1. Bracts of inflorescence entire or nearly so; calyx tube longer than lobes **D. thymiflorum** L.

Drymocallis
1. Lateral branches of inflorescence often erect with the flowers densely clustered; sepals mostly 6-8mm long at flowering; leaflets 5-13
  2. Leaflets 9-13, most lateral leaflets (except upper pair) 2cm or less long; petioles of basal leaves rarely over half as long as rachis **D. fissa** (Nutt.) Rydb.
  2. Leaflets 5-9 or rarely 11, the lateral leaflets mostly over 2cm long; petioles of basal leaves often over half as long as rachis **D. arguta** (Pursh) Rydb.
1. Lateral branches of inflorescence usually spreading to ascending, not strictly erect, the flowers not densely clustered; sepals often less than 6mm long; leaflets 5-9
  3. Petals mostly white to ochroleucous; leaflets somewhat oval, usually little if at all longer than wide, 3(4)cm or less long **D. pseudorupestris** (Rydb.) Rydb.
  3. Petals mostly yellow; leaflets of larger leaves somewhat elliptic to ovate, noticeably longer than wide, the larger mostly 3-6cm long **D. glabrata** Rydb.

Dryopteris filix-mas (L.) Schott

Dysphania botrys (L.) Mosyakin & Clemants

Dyssodia papposa (Vent.) Hitchc.

Echinacea angustifolia DC.

Echinocereus viridiflorus Engelm.

Echinochloa
1. Tip of lemma of fertile floret with a gradual transition to a usually stiff, mucronate tip, without a line of hairs; hairs of panicle branches lacking or shorter than spikelets **E. muricata** (Beauv.) Fern. var. **microstachya** Wieg.
1. Tip of lemma of fertile floret with a sharply differentiated, withering tip with a line of minute hairs at its base; some hairs of panicle branches as long as or longer than the spikelets (excluding awns) **E. crusgalli** (L.) Beauv.

Echinocystis lobata (Michx.) T. & G.

Echium vulgare L.

Elaeagnus angustifolia L.

Elatine rubella Rydb.

Eleocharis
1. Plants annual with fibrous roots; stigmas 2, or 2 and 3 in same spikelet; anthers 0.2-0.8mm long **E. obtusa** (Willd.) Schult.
1. Plants perennial usually with rhizomes; stigmas 2 or 3; anthers often longer than 0.8mm
  2. Stigmas 2; achenes lenticular
    3. Lowest scale of spikelet completely encircling stem, the next scale above with a flower; stems terete **E. erythropoda** Steud.
    3. Lowest scale of spikelet not encircling stem but clasping 2/3 or more of stem, the next scale above with or without a flower; stems sometimes compressed or inflated
      4. Lowest scale of spikelet clasping 3/4 or more of stem, the next scale above with or without a flower; lowest leaf sheaths truncate to slightly obtuse at tip; stems rigid **E. macrostachya** Britt.
      4. Lowest scale of spikelet clasping 2/3 to 3/4 of stem, the next scale above without a flower; lowest leaf sheaths sometimes with a prominent V-shaped sinus at tip; stems sometimes soft and inflated **E. palustris** (L.) R. & S.
  2. Stigmas 3; achenes trigonous or suborbicular in cross section
    5. Tubercle confluent with achene, not set off by a groove or indentation **E. rostellata** (Torrey) Torrey
    5. Tubercle well set off from body of achene by a groove or indentation all around
      6. Achene yellow or gold to dark brown, cellular-roughened and sometimes ribbed on the 3 angles; stems mostly wider than 0.5mm, often over 20cm tall **E. compressa** Sull.
      6. Achene white or gray to ochroleucous, longitudinally many ribbed and with many fine cross ridges; stems 0.1-0.5mm wide, 12(21)cm or less tall **E. acicularis** (L.) R. & S.

Ellisia nyctelea (L.) L.

Elodea
1. Staminate spathes 4mm or less long; styles mostly 2mm or less long; leaves usually less than 1.7mm wide, gradually tapering to a slender point **E. nuttallii** (Planchon) St. John
1. Staminate spathes 6mm or more long; styles mostly more than 2mm long; some leaves usually over 1.8mm wide, often somewhat abruptly tapering to a blunt or acute tip
  2. Middle and upper leaves opposite, the larger often over 17mm long; seeds 4mm or less long; anthers 3-4.5mm long, pollen in monads **E. bifoliata** St. John
  2. Middle and upper leaves mostly whorled, the larger usually less than 15mm long; seeds 4.5-6mm long; anthers 3mm or less long, pollen in tetrads **E. canadensis** Michx.

Elymus
1. Glumes usually subulate, 1 nerved at midlength of body or not nerved, the nerve or center usually lying over the side of lowest lemmas; spikelets mostly 2 or more per node, at least at middle of spike
2. Rachis disarticulating when mature; awns usually over 3cm long (several hybrids might key here but the awns are usually shorter) **E. elymoides** (Raf.) Swezey
3. Awn-like glumes apparently 3 or 4 per spikelet by reduction of lowest floret (5 or 6 per node) var. **elymoides**
3. Awn-like glumes 2 per spikelet (usually 4 per node) var. **brevifolius** (Smith) Dorn
2. Rachis not disarticulating; awns mostly less than 3cm long
4. Awns straight; lemmas about 1.5mm wide across the back **E. villosus** Muhl. ex Willd.
4. Awns mostly flexuous-divergent; lemmas about 2mm wide across back **E. diversiglumis** Scribn. & Ball
1. Glumes usually not subulate, 3-7 nerved at midlength of body, the midvein normally lying over the midvein of lowest lemmas; spikelets 1 or more per node
5. Creeping rhizomes present; anthers 3-5.5mm long
6. Leaf blades mostly flat, some 5-10mm wide; awn, if present, straight **E. repens** (L.) Gould
6. Leaf blades either involute or less than 5mm wide; awn, if present, often divergent
7. Lemmas awnless or with a straight, short, awn-tip **E. lanceolatus** (Scribn. & Sm.) Gould
8. Lemmas scabrous to villous var. **lanceolatus**
8. Lemmas glabrous to scaberulous var. **riparius** (Scribn. & Sm.) Dorn
7. Lemmas with a mostly divergent awn usually 5mm or more long **E. albicans** (Scribn. & Sm.) Löve
9. Lemmas hairy var. **albicans**
9. Lemmas glabrous var. **griffithsii** (Scribn. & Sm. ex Piper) Dorn
5. Creeping rhizomes lacking; anthers 1-3mm long
10. Spikelets mostly 2 or more per node, at least at middle of spike
11. Glumes relatively thin, not indurate at base, closely parallel; lemma awns straight or nearly so **E. glaucus** Buckl.
11. Glumes firm, usually strongly indurate and often curved at base; lemma awns straight or divaricate
12. Awns divergently curved when dry, mostly 2-4cm long; base of glumes rarely terete, nearly straight **E. canadensis** L.
13. Leaves mostly 8 or fewer per culm, usually 13(15)mm or less wide var. **canadensis**
13. Leaves mostly 9-12 per culm, the larger (15)17mm or more wide var. **hirsutus** (Farw.) Dorn
12. Awns straight, mostly less than 1.5cm long; base of glumes somewhat terete, curved
14. Lemmas with awns 8-20mm long; glumes 16-33mm long **E. virginicus** L.
14. Lemmas awnless or awns less than 4mm long; glumes 9-15mm long **E. curvatus** Piper
10. Spikelets mostly 1 per node **E. trachycaulus** (Link) Gould ex Shinners
15. Lemmas awnless or the awn less than 6mm long var. **trachycaulus**
15. Lemmas with an awn 6-30mm long var. **andinus** (Scribn. & Sm.) Dorn

Enemion biternatum Raf.

Epilobium
1. Middle leaves usually alternate; annuals with slender taproot
2. Seeds with a tuft of long hairs at upper end; main leaves of middle stem 2-7cm long **E. brachycarpum** Presl
2. Seeds without a tuft of long hairs at upper end; leaves mostly 1-2.5(3.5)cm long **E. campestre** (Jeps.) Hoch & Wagner
1. Middle leaves usually opposite or subopposite; mostly perennials, usually with rhizomes
3. Plants usually grayish-strigillose, at least above and especially on fruits; leaf blades linear, oblong, or narrowly lanceolate, 2-6cm long, 1-7mm wide; petals white or pink **E. leptophyllum** Raf.
3. Plants not as above
4. Stems rarely over 3dm high, the base usually decumbent to ascending, mostly simple, or branched near base; rhizomes often well developed; leaves rarely over 4cm long; papillae not in rows; plants lacking a sessile basal rosette and turions, sometimes with leafy stolons **E. hornemannii** Reichenb.
4. Stems sometimes well over 3dm high, usually erect at base, often branched above middle; rhizomes short or none; leaves sometimes over 4cm long; papillae (or ridges) of seeds in parallel longitudinal lines; plants often with a sessile basal rosette or turions on rootstocks
5. Plants 0.3-19dm high, often with a basal rosette or the rootstocks with large turions; seeds conspicuously longitudinally ridged, sometimes also papillose **E. ciliatum** Raf.
6. Inflorescence usually branched; petals white to pink or lavender, 1.5-5(8)mm long; seeds 0.6-1.2(1.5)mm long; basal rosette often present; turions often lacking var. **ciliatum**
6. Inflorescence usually simple; petals pink to rose-purple, rarely white, 3.5-10mm long; seeds 1.1-1.6mm long; basal rosette usually none; turions usually present var. **glandulosum** (Lehm.) Dorn
5. Plants 0.2-6dm high, lacking a basal rosette; rootstocks usually with compact turions; seeds distinctly papillose, papillae usually in longitudinal rows, without ridges
7. Capsules subsessile, usually erect; seed collar conspicuous; leaves sometimes subcordate-clasping **E. saximontanum** Hausskn.
7. Capsules mostly on pedicels 0.8-3.8cm long, often divergent; seed collar lacking or inconspicuous; leaves tapering to base **E. halleanum** Hausskn.

Epipactis gigantea Dougl. ex Hook.

Equisetum
1. Strobili sharp-pointed at tip; stems evergreen, all alike, without regularly whorled branches
2. Stems without a central cavity; teeth usually 3 per node; plants slender with wavy stems **E. scirpoides** Michx.
2. Stems with a central cavity; teeth usually more than 3; plant form various
3. Stems 3-12 ridged; central cavity less than half the diameter of stem; teeth mostly persistent **E. variegatum** Schleich. ex Weber & Mohr
3. Stems 14-40 ridged; central cavity over half the diameter of stem; teeth often deciduous
4. Middle sheaths of mature stems with a medial or basal black band and an apical black band; sheaths not much longer than wide **E. hyemale** L. var. **affine** (Engelm.) Eaton
4. Middle sheaths of mature stems with only an apical black band; sheaths about twice as long as wide **E. laevigatum** A. Br.
1. Strobili rounded at tip; stems not evergreen, some with regular whorls of branches; some species with strobili-bearing stems flesh colored or brownish, at least at first, and with vegetative stems green with regular whorls of branches
5. Stems flesh colored or brownish (with little or no chlorophyll), with strobili
6. Teeth of main stem united into 2-5 reddish-brown groups; stems becoming green with whorled branches which are again branched **E. sylvaticum** L.
6. Teeth of main stem brown, rarely more than 2 adjacent teeth united; stems becoming green or not, simple branched or not branched
7. Stems soon withering, without whorled branches; teeth of main stem solid brown at tip **E. arvense** L.
7. Stems becoming green with whorled branches; teeth of main stem with a sharp, brown, lengthwise line to tip **E. pratense** Ehrh.
5. Stems green, with or without strobili
8. Stems without regularly whorled branches, rarely sporadically branched **E. laevigatum** A. Br.
8. Stems with regularly whorled branches

9. Branches again branched; stems upright; teeth of main stem united into 2-5 reddish-brown groups **E. sylvaticum** L.
9. Branches mostly unbranched unless the plant is prostrate; teeth not as above
10. Teeth of lower sheaths solid brown at tip; teeth of branches cuspidate **E. arvense** L.
10. Teeth of lower sheaths with a sharp, brown, lengthwise line to tip; teeth of branches acute **E. pratense** Ehrh.

Eragrostis

1. Plants perennial, erect, sometimes over 5dm tall **E. trichodes** (Nutt.) Wood
1. Plants annual, sometimes decumbent, usually less than 5dm tall
2. Plants with conspicuous glands on panicle branches, or on keel of lemmas, or on margins of leaf blades or keel of sheaths
3. Spikelets mostly 2.5mm or more wide; glands prominent on keel of most lemmas **E. cilianensis** (All.) Vign.-Lut. ex Janchen
3. Spikelets 2mm wide or less; glands mostly on panicle branches and leaves **E. minor** Host
2. Plants not glandular or obscurely so **E. pectinacea** (Michx.) Nees

Eremogone hookeri (Nutt.) Weber

1. Leaves usually all 1.5cm or less long; sepals sometimes about 6mm long; plants forming dense cushions var. **hookeri**
1. Leaves, or many of them, over 1.5cm long; sepals mostly 7mm or more long; plants forming loose mats var. **pinetorum** (A. Nels.) Dorn

Eremopyrum triticeum (Gaertn.) Nevski

Ericameria

1. Heads in a raceme or sometimes a panicle; involucre (6)10-13mm long; some involucral bracts with needle-like tips **E. parryi** (Gray) Nesom & Baird var. **howardii** (Parry ex Gray) Nesom & Baird
1. Heads in a cyme or corymb; involucre 6.5-10(11)mm long; involucral bracts obtuse or acute at tip **E. nauseosa** (Pallas ex Pursh) Nesom & Baird
2. Involucre usually tomentose, at least at base, sometimes sparsely so; stems and/or leaves with a whitish cast from tomentum var. **nauseosa**
2. Involucre mostly glabrous or nearly so; stems and leaves mostly green or yellow-green var. **graveolens** (Nutt.) Reveal & Schuyler

Erigeron

1. Leaves, or some of them, lobed, divided, parted, or coarsely or shallowly toothed
2. Leaves mostly all basal, 1-4 times ternately or palmately lobed or divided, the divisions linear or nearly so **E. compositus** Pursh
2. Leaves mostly cauline and merely toothed
3. Leaves linear or narrowly oblanceolate, the lower rarely broadly oblanceolate, mostly 15mm or less wide
4. Involucre 3-5mm long; rays 4-6mm long **E. bellidiastrum** Nutt.
4. Involucre 5-9mm long; rays 8-18mm long **E. glabellus** Nutt.
5. Stem hairs appressed or ascending var. **glabellus**
5. Stem hairs spreading var. **pubescens** Hook.
3. Leaves much broader than narrowly oblanceolate, some usually well over 15mm wide
6. Pappus of disk flowers of bristles and short outer setae; pappus of ray flowers of short setae, bristles lacking **E. annuus** (L.) Pers.
6. Pappus of disk and ray flowers similar, of bristles **E. philadelphicus** L.

1. Leaves entire or rarely slightly toothed
7. Plants annual, biennial, or short lived perennials, lacking rhizomes or a well developed woody caudex
8. Rays mostly erect, white, pink, or lavender, 8mm or less long, 0.4mm or less wide, usually barely if at all exceeding pappus, sometimes none
9. Rayless pistillate flowers present between outer ray and hermaphroditic disk flowers; inflorescence a corymb or panicle, or head solitary; plants usually glandular-hairy **E. acris** L. var. **kamtschaticus** (DC.) Herder
9. Rayless pistillate flowers lacking; inflorescence a raceme or head solitary; plants hairy but not glandular **E. lonchophyllus** Hook.
8. Rays mostly spreading and well developed, sometimes blue or purple, usually larger than above and conspicuously exceeding pappus
10. Pappus of disk flowers of bristles as well as short outer setae or scales; pappus of ray flowers of only short setae, long bristles lacking **E. strigosus** Muhl. ex Willd.
11. Hairs of involucral bracts terete, 0.1-0.5mm long; stem hairs appressed to ascending, 0.2-0.5mm long var. **strigosus**
11. Hairs of involucral bracts flattened, 0.5-1.2mm long; stem hairs ascending to spreading, 0.5-1mm long var. **septentrioinalis** (Fern. & Wieg.) Fern.
10. Pappus of disk and ray flowers similar, of long bristles or sometimes also with short setae
12. Disk corollas mostly 4-5.5mm long; fibrous-rooted **E. glabellus** Nutt.
13. Stem hairs appressed or ascending var. **glabellus**
13. Stem hairs spreading var. **pubescens** Hook.
12. Disk corollas mostly 3.5mm long or less; taprooted
14. Pappus simple, with only bristles; rays mostly 4-6mm long **E. bellidiastrum** Nutt.
14. Pappus double, with long bristles and usually short, inconspicuous, narrow scales; rays often longer
15. Hairs of stem mostly all spreading; stolons lacking **E. divergens** T.& G.
15. Hairs of stem, or some of them, appressed or closely ascending; leafy stolons often present **E. flagellaris** Gray
7. Plants perennial with a rhizome or well developed caudex
16. Stem leaves usually well developed except sometimes the very uppermost ones, lanceolate or broader, or, plants usually over 3dm high and erect, mostly simple below
17. Upper leaves glabrous or nearly so except for ciliate margins and midrib; stems glabrous or glabrate below
18. Leaves conspicuously reduced upward, the upper mostly linear or lance-linear **E. formosissimus** Greene
18. Leaves little if at all reduced upward, the upper mostly ovate or lanceolate **E. speciosus** (Lindl.) DC.
17. Upper leaves hairy; stems hairy below
19. Upper stem not viscid, the leaves, except the very uppermost, only slightly reduced upward **E. subtrinervis** Rydb. ex Porter & Britt.
19. Upper stem viscid, or if not, the leaves conspicuously reduced upward **E. formosissimus** Greene
16. Stem leaves usually much reduced upward, mostly linear, oblong, or oblanceolate, sometimes broader in a few low species; plants mostly less than 3dm high, often spreading or caespitose
20. Hairs of stem mostly spreading
21. Hairs of leaves usually moderately dense and curved; leaves often well developed upward and usually oblong or linear, the basal often prominently 3 nerved **E. caespitosus** Nutt.
21. Hairs of leaves either sparse, or straight and stiff or appressed, or both; leaves usually much reduced and linear above, the basal only rarely 3 nerved
22. Hairs of leaves mostly spreading or spreading-ascending **E. pumilus** Nutt.
22. Hairs of leaves mostly appressed or appressed-ascending **E. ochroleucus** Nutt.
23. Plants mostly (7)10-40cm high; stem leaves usually several to many and moderately well developed var. **ochroleucus**
23. Plants mostly 1-10(12)cm high; stem leaves few and small var. **scribneri** (Canby ex Rydb.) Cronq.
20. Hairs of stem appressed or occasionally ascending
24. Achenes glabrous or nearly so, 8-14 nerved **E. canus** Gray
24. Achenes usually hairy, 2-5 nerved
25. Lower leaves usually 3 nerved, some often 4mm or more wide **E. caespitosus** Nutt.
25. Lower leaves not 3 nerved, often all much narrower than 4mm

26. Involucre sparsely to moderately hairy; lower part of basal leaves usually with long spreading hairs coarser than the other leaf hairs; caudex usually much branched **E. engelmannii** A. Nels.
26. Involucre mostly densely hairy, often nearly white with hairs; lower part of basal leaves with long hairs mostly appressed or ascending, not conspicuously coarser but usually longer than other leaf hairs; caudex often simple **E. ochroleucus** Nutt.
27. Plants mostly (7)10-40cm high; stem leaves usually several to many and moderately well developed var. **ochroleucus**
27. Plants mostly 1-10(12)cm high; stem leaves few and small var. **scribneri** (Canby ex Rydb.) Cronq.

Eriogonum

1. Plants annual or biennial with a slender taproot **E. annuum** Nutt.
1. Plants perennial with a thick taproot or caudex
2. Perianth yellow (rarely reddish), narrowed to a slender stipe-like base 0.5-3mm long which is jointed to and about the same thickness as the pedicel (sometimes obscure); bracts at base of inflorescence foliaceous **E. flavum** Nutt.
2. Perianth white to pink, narrowed directly to the attachment with the pedicel, without a stipe at base; bracts at base of inflorescence occasionally foliaceous, usually scale-like or lacking **E. pauciflorum** Pursh

Eriophorum angustifolium Honck.

Erodium cicutarium (L.) L'Her. ex Aiton

Erucastrum gallicum (Willd.) Schulz

Erysimum

1. Petals over 11mm long; style usually over 1.5mm long
2. Mature fruits mostly spreading to slightly ascending, some usually over 7cm long; styles usually about same width as fruit and usually hairy like the fruit **E. asperum** (Nutt.) DC.
2. Mature fruits mostly strongly ascending to erect, only occasionally as much as 7cm long; styles often conspicuously narrower than fruit and often glabrous or glabrate **E. capitatum** (Dougl. ex Hook.) Greene var. **purshii** (Durand) Rollins
1. Petals mostly 3.5-11mm long; style rarely over 1.5mm long
3. Plants annual; petals 3.5-5mm long; fruits 1.5-3cm long **E. cheiranthoides** L.
3. Plants biennial or perennial; petals 5-11mm long; fruits mostly 2.5-5cm long **E. inconspicuum** (Wats.) MacM.

Erythranthe

1. Plants annual, lacking rhizomes or stolons
2. Calyx teeth subequal **E. floribunda** (Lindl.) Nesom
2. Calyx teeth unequal, upper one larger than the others **E. guttata** (DC.) Nesom
1. Plants perennial with rhizomes or stolons
3. Corolla throat somewhat open; calyx teeth broadly obtuse; upper leaves usually slightly wider than long **E. geyeri** (Torrey) Nesom
3. Corolla throat nearly closed; calyx teeth often acute; upper leaves usually slightly longer than wide **E. guttata** (DC.) Nesom

Euphorbia

Euphorbia virgata involucre with 1 pistillate and 3 staminate flowers protruding therefrom.

1. Leaves all opposite, asymmetrical at base with one side of blade extending lower than the other, or if symmetrical, the blades 25mm or less long and entire and stipules present which are often divided into linear segments at tip
2. Plants perennial **E. fendleri** T.& G.
2. Plants annual
3. Leaves, at least the larger, mostly asymmetrical at base, one side of blade extending lower than the other
4. Plants hairy
5. Styles slightly notched at most, about 0.2mm long; seeds irregularly mottled or punctate **E. stictospora** Engelm.
5. Styles cleft to form 6 distinct stigmas, often well over 0.2mm long including stigmas; seeds with transverse, parallel ridges **E. prostrata** Aiton
4. Plants glabrous
6. Seeds smooth; leaves entire **E. serpens** Kunth
6. Seeds coarsely punctate, wrinkled, or with transverse ridges; leaves often toothed
7. Seeds with coarse transverse ridges; leaf margins slightly thickened **E. glyptosperma** Engelm.
7. Seeds punctate or slightly wrinkled; leaf margins not thickened **E. serpyllifolia** Pers.
3. Leaves symmetrical at base or nearly so
8. Leaf blades 5-25mm long; involucres 1.5-3mm long **E. missurica** Raf. var. **petaloidea** (Engelm.) Dorn
8. Leaf blades 1.5-8mm long; involucres about 1mm long **E. serpens** Kunth

1. Leaves, at least the lower, alternate, or if all opposite, the leaves symmetrical at base and at least some blades usually over 25mm long and toothed (rarely entire) and stipules lacking or merely sessile glands
9. Leaves all opposite
10. Leaf blades entire; petioles 1-4mm long **E. hexagona** Nutt. ex Spreng.
10. Leaf blades toothed; petioles 5-25mm long **E. davidii** Subils
9. Leaves, at least the lower, alternate
11. Plants perennial with a thick woody base
12. Leaves mostly over 5 times as long as wide, linear or oblong to narrowly elliptic
13. Leaves mostly 3mm or less wide, 2cm or less long **E. cyparissias** L.
13. Leaves, or some of them, over 3mm wide and over 2cm long **E. virgata** Waldst. & Kit.
12. Leaves mostly less than 5 times as long as wide, not linear or oblong, rarely elliptic **E. brachycera** Engelm. var. **robusta** (Engelm.) Dorn
11. Plants taprooted annuals
14. Leaves entire or nearly so; upper leaves and bracts with prominent white margins or almost completely white **E. marginata** Pursh
14. Leaves toothed at least above; upper leaves and bracts normally not white-margined
15. Floral leaves usually rounded or cordate at base; involucre 1-2mm long; capsule tuberculate **E. spathulata** Lam.
15. Floral leaves usually tapering to base; involucre 2-3.5mm long; capsule smooth or nearly so **E. davidii** Subils

Eurybia

1. Peduncles and involucres glandular **E. conspicua** (Lindl.) Nesom

1. Peduncles and involucres not glandular **E. merita** (A. Nels.) Nesom
Eustoma grandiflorum (Raf.) Shinners
Euthamia graminifolia (L.) Nutt.
Eutrochium maculatum (L.) Lamont var. **bruneri** (Gray) Lamont
Evolvulus nuttallianus Schultes
Fallopia
1. Outer perianth segments strongly winged in fruit; mature achenes smooth and shiny **F. scandens** (L.) Holub
1. Outer perianth segments merely keeled in fruit; mature achenes somewhat granular and dull **F. convolvulus** (L.) Löve
Festuca
1. Leaf blades flat, mostly over 3mm wide **F. subulata** Trin.
1. Leaf blades involute, or if flat, less than 3mm wide
  2. Culms either decumbent at the usually red or purple, fibrillose base or from rhizomes **F. rubra** L.
  2. Culms erect, without rhizomes, usually not red, purple, or fibrillose at base
    3. Culms mostly over 30cm high; panicles 10-20cm long, mostly somewhat open; anthers 2-4mm long **F. idahoensis** Elmer
    3. Culms mostly less than 30(40)cm high; panicles mostly less than 10cm long and narrow; anthers 1-1.8mm long **F. saximontana** Rydb.
Fragaria
1. Terminal tooth of leaflet usually not extending as far as the 2 adjacent teeth; achenes sunk in pits of the fruit; flowers mostly surpassed by leaves **F. virginiana** Miller
1. Terminal tooth of leaflet about equaling or exceeding the 2 adjacent teeth; achenes on the surface of the fruit; flowers mostly equaling or surpassing leaves when mature **F. vesca** L.
Frangula alnus Mill.
Frasera speciosa Dougl. ex Griseb.
Fraxinus pennsylvanica Marsh.
Fritillaria atropurpurea Nutt.
Froelichia gracilis (Hook.) Moq.
Gaillardia
1. Plants mostly annual; rays mostly purple; pappus awns about as long as scaly base **G. pulchella** Foug.
1. Plants mostly perennial; rays mostly yellow on upper two-thirds; pappus awns about twice as long as scaly base **G. aristata** Pursh
Galeopsis
1. Corollas usually 1.5cm or less long, central lobe of lower lip of corolla shallowly notched or cleft **G. bifida** Boenn.
1. Corollas mostly 1.5-2.3cm long, central lobe of lower lip nearly square, not notched or cleft **G. tetrahit** L.
Galium
1. Plants annual with a slender taproot **G. aparine** L.
  2. Mature fruit mostly over 3mm long (excluding prickles); flowers mostly 1.5-2mm in diameter var. **aparine**
  2. Mature fruit mostly 1.5-3mm long; flowers mostly 1-1.5mm in diameter var. **echinospermum** (Wallr.) Farw.
1. Plants perennial with usually creeping rhizomes
  3. Leaf tips cuspidate or nearly so **G. triflorum** Michx.
  3. Leaf tips blunt, not cuspidate
    4. Flowers many in a terminal much-branched inflorescence; stems usually erect; corollas 3mm or more wide **G. boreale** L.
    4. Flowers 1 to several together, axillary or terminal; stems usually scrambling; corollas mostly 2mm or less wide **G. trifidum** L.
Gayophytum
1. Petals 0.5-1.8mm long; plants unbranched or branched only in lower half **G. racemosum** T. & G.
1. Petals 1-3mm long; plants much branched above middle **G. diffusum** T. & G. var. **strictipes** (Hook.) Dorn
Gentiana
1. Corolla nearly closed at tip, lobes nearly lacking **G. andrewsii** Griseb.
1. Corolla open at tip, lobes readily apparent
  2. Corolla lobes somewhat erose on margins, often well over twice as long as alternating appendages **G. puberulenta** Pringle
  2. Corolla lobes entire, rarely as much as twice as long as alternating appendages **G. affinis** Griseb.
Gentianella amarella (L.) Boerner
Geranium
1. Petals 8mm or less long; usually annual or biennial
  2. Fertile stamens 5; sepals not bristle-tipped **G. pusillum** L.
  2. Fertile stamens 10; sepals bristle-tipped
    3. Beak of stylar column, including stigmas, 4-7mm long; fruiting pedicel usually much longer than calyx **G. bicknellii** Britt.
    3. Beak of stylar column, including stigmas, mostly under 3mm long; fruiting pedicel usually slightly if at all longer than calyx **G. carolinianum** L.
1. Petals over 8mm long; perennials
  4. Petals white with pink or purple veins; inflorescence pilose-glandular with usually purple-tipped hairs **G. richardsonii** Fisch. & Trautv.
  4. Petals usually pink or purple; inflorescence not glandular, or glandular with yellow or whitish-tipped hairs **G. viscosissimum** Fisch. & Meyer ex Meyer
    5. Petioles of basal leaves and lower stem viscid with at least short glandular hairs var. **viscosissimum**
    5. Petioles of basal leaves and lower stem with mostly retrorse non-glandular hairs var. **incisum** (T. & G.) Holmgren
Geum
1. Stems mostly subscapose, the leaves of the stem all greatly reduced; terminal division of lowest leaves usually not much larger than the lateral divisions, usually less than 3cm wide; styles not conspicuously jointed, the upper part persistent **G. triflorum** Pursh
  2. Persistent lower segment of style to 5mm long; leaflets shallowly lobed at tip var. **triflorum**
  2. Persistent lower segment of style less than 3.5mm long; leaflets divided more than halfway to midrib var. **ciliatum** (Pursh) Fassett
1. Stems leafy, the leaves of lower stem not much smaller than basal leaves; terminal division of lowest leaves often much larger than lateral divisions, often over 3cm wide; styles jointed above middle, the upper part deciduous
  3. Petals pinkish, rarely yellow; sepals purplish, erect to ascending **G. rivale** L.
  3. Petals yellow or white; sepals usually green, reflexed at least in age
    4. Petals white when fresh; lower stem with a few scattered hairs **G. canadense** Jacq.
    4. Petals yellow; lower stem usually moderately to densely hirsute
      5. Persistent part of style glandular-puberulent; terminal leaf division usually much larger then lateral ones **G. macrophyllum** Willd. var. **perincisum** (Rydb.) Raup
      5. Persistent part of style glabrous or pubescent, not glandular; terminal leaf division usually only slightly larger than lateral ones **G. aleppicum** Jacq.
Glandularia bipinnatifida (Nutt.) Nutt.
Glechoma hederacea L.
Gleditsia triacanthos L.

Glyceria
1. Spikelets usually 10mm long or more; lemmas 3-7mm long
  2. Lemmas 3-4mm long, glabrous between nerves **G. borealis** (Nash) Batchelder
  2. Lemmas 4-7mm long, scaberulous between nerves **G. fluitans** (L.) R. Br.
1. Spikelets usually 6mm or less long; lemmas 1.5-2.5mm long
  3. Leaf blades mostly 2-5mm wide; 1st glume 0.5-1mm long **G. striata** (Lam.) Hitchc.
  3. Leaf blades mostly 6mm or more wide; 1st glume about 1mm or more long
    4. Ligules pubescent-scabridulous; 1st glume averaging about 1mm long **G. elata** (Nash ex Rydb.) Jones
    4. Ligules glabrous; 1st glume averaging about 1.5mm long **G. grandis** Wats.

Glycyrrhiza lepidota Pursh
1. Stalked glands only on calyx or lacking var. **lepidota**
1. Stalked glands throughout inflorescence, usually also on petioles and stem var. **glutinosa** (Nutt.) Wats.

Gnaphalium
1. Leaf blades spatulate to oblanceolate-oblong, 3-8(10)mm wide; bracts subtending heads oblanceolate to obovate, the longest 4-12mm long, 1.5-4mm wide, shorter than to slightly surpassing glomerules; inner involucral bracts narrowly oblong with blunt tips **G. palustre** Nutt.
1. Leaf blades linear to narrowly oblanceolate, 0.5-3mm wide; bracts subtending heads linear, oblanceolate, or obovate, 5-25mm long, 0.5-2mm wide, surpassing glomerules; inner involucral bracts narrowly triangular with acute tips
  2. Leaf blades linear; bracts subtending heads linear, 0.5-1mm wide; heads in spike-like axillary glomerules **G. exilifolium** A. Nels.
  2. Leaf blades oblanceolate; bracts subtending heads linear, oblanceolate, or obovate, 1-2mm wide; heads in terminal capitate glomerules or sometimes in axillary glomerules **G. uliginosum** L.

Goodyera
1. Hood formed by perianth usually 5mm or more long; leaves usually with a white midrib **G. oblongifolia** Raf.
1. Hood formed by perianth usually less than 5mm long; leaves without a white midrib **G. repens** (L.) R. Br. ex Aiton

Gratiola neglecta Torrey

Grindelia
1. Leaves closely and evenly toothed **G. squarrosa** (Pursh) Dunal
1. Leaves entire or nearly so or remotely serrulate or serrate **G. hirsutula** H. & A.

Gutierrezia sarothrae (Pursh) Britt. & Rusby

Gymnocarpium dryopteris (L.) Newm.

Gypsophila
1. Plants annual; petals purplish or pinkish **G. muralis** L.
1. Plants perennial; petals white to pink or lavender
  2. Pedicels glabrous; calyx 2mm or less long **G. paniculata** L.
  2. Pedicels glandular-hairy; calyx 3mm or more long **G. scorzonerifolia** Ser.

Hackelia
1. Corolla limb 1.5-3mm wide; mature nutlets 2-3mm long on dorsal side (excluding prickles); annual or biennial
  2. Dorsal side of nutlets with bristles about as long as marginal bristles **H. virginiana** (L.) Johnst.
  2. Dorsal side of nutlets without bristles between the marginal ones or with a few bristles shorter than the marginal ones **H. deflexa** (Wahl.) Opiz var. **americana** (Gray) Fern. & Johnst. ex Fern.
1. Corolla limb mostly over 3mm wide; mature nutlets mostly 3-5mm long on dorsal side; biennial or perennial
  3. Plants biennial or rarely a short-lived perennial, often with a single stem from a taproot and simple crown; corolla limb mostly 3-6mm wide **H. floribunda** (Lehm.) Johnston
  3. Plants perennial, usually with several stems from a taproot and branched caudex; corolla limb mostly 6-11mm wide **H. micrantha** (Eastw.) Gentry

Halenia deflexa (Smith) Griseb.

Hedeoma
1. Calyx teeth all arising from about the same level so the longer 2 exceed the other 3; leaves often strongly hairy, the veins usually obscure or not raised **H. drummondii** Benth.
1. Calyx teeth with the longer 2 arising about 1mm below the shorter 3, at least in fruit, all 5 then reaching about the same distance; leaves usually glabrous or glabrate except on margins, the veins usually prominently raised beneath **H. hispida** Pursh

Hedysarum
1. Calyx 5-8mm long, the lobes subequal; loments conspicuously cross-corrugated **H. boreale** Nutt. var. **pabulare** (A. Nels.) Dorn
1. Calyx 3.5-5mm long, the lobes unequal; loments usually not conspicuously cross-corrugated
  2. Flowers (15)17-22mm long; loments 6-12mm wide **H. occidentale** Greene
  2. Flowers 9-15mm long; loments 3.5-6mm wide **H. alpinum** L. var. **americanum** Michx.

Helianthella quinquenervis (Hook.) Gray

Helianthus
1. Plants annual
  2. Central bracts of receptacle with long, white, multicellular hairs at tip; involucral bracts lanceolate or lance-ovate, gradually tapering to an acute tip **H. petiolaris** Nutt.
  2. Central bracts of receptacle inconspicuously hairy; involucral bracts mostly ovate to ovate-oblong, abruptly contracted above middle with a long filiform tip **H. annuus** L.
1. Plants perennial
  3. Involucral bracts mostly ovate to lance-ovate, abruptly acute or obtuse; lobes of disk corollas red or purple **H. pauciflorus** Nutt. var. **subrhomboideus** (Rydb.) Cronq.
  3. Involucral bracts mostly lanceolate or lance-linear, usually long-attenuate; lobes of disk corollas yellow
    4. Leaf blades mostly broadly lanceolate to ovate; petioles (1)2-8cm long
      5. Upper stems hairy; leaves 7-15cm wide; tuberous rhizomes develop later in season **H. tuberosus** L. var. **subcanescens** Gray
      5. Upper stems usually glabrous; leaves (1.2)4-9cm wide; tubers lacking **H. grosseserratus** Martens
    4. Leaf blades mostly lanceolate or lance-linear; petioles 0-2cm long
      6. Leaves usually folded lengthwise at midrib, strictly pinnately veined **H. maximiliani** Schrad.
      6. Leaves usually not folded, some usually somewhat palmately 3 veined at base in addition to pinnately veined
        7. Stems usually yellow-brown or greenish; petioles not ciliate; underside of leaves hispid to villous or tomentose; anther appendages yellow **H. nuttallii** T.& G.
        7. Stems mostly reddish; petioles ciliate; underside of leaves scabrous or somewhat hirsute; anther appendages brown or black **H. giganteus** L.

Heliotropium curassavicum L. var. **obovatum** DC.

Heracleum sphondylium L. var. **lanatum** (Michx.) Dorn

Hesperis matronalis L.

Hesperostipa
1. Glumes 30-40mm long; lemmas 16-25mm long **H. spartea** (Trin.) Barkw.
1. Glumes 14-28mm long; lemmas 7-14mm long
  2. Awns mostly with a flexuous or coiled terminal segment, the total length 10-21cm **H. comata** (Trin. & Rupr.) Barkw.
  2. Awns mostly with a relatively straight terminal segment, the total length rarely over 10cm long **H. curtiseta** (Hitchc.) Barkw.

Heteranthera limosa (Sw.) Willd.

Heterotheca
1. Peduncles moderately hairy, the surface usually readily visible, sometimes glandular; outer pappus usually conspicuous and scale-like **H. hispida** (Hook.) Nesom
1. Peduncles often densely hairy obscuring the peduncle surface, not glandular; outer pappus usually inconspicuous and narrowly filiform
  2. Upper leaves usually spreading, the margins toward tip of leaf not long-ciliate **H. villosa** (Pursh) Shinners
    3. Heads sessile or nearly so, subtended by prominent leaves; stem leaves oblong to ovate var. **foliosa** (Nutt.) Harms
    3. Heads peduncled, the upper leaves reduced and grading into the involucral bracts; stem leaves oblanceolate or spatulate var. **villosa**
  2. Upper leaves usually ascending and surpassing heads, the margins toward tip of leaf often long-ciliate **H. angustifolia** (Rydb.) Nesom

Heuchera
1. Calyx 2-3.5mm long at anthesis; hypanthium lined with a thin glandular disk that somewhat covers the nearly completely inferior ovary **H. parvifolia** Nutt. ex T.& G.
1. Calyx usually 4mm long or more at anthesis; glandular disk lacking or not covering top of ovary **H. richardsonii** R. Br.

Hibiscus trionum L.

Hieracium
1. Basal and lowest stem leaves small and early deciduous, middle leaves larger, upper ones reduced; involucre with few or no long hairs **H. umbellatum** L.
  2. Lower stem and leaves with long spreading hairs and sometimes also with short subconic hairs; long spreading hairs often also on involucre var. **scabriusculum** Farwell
  2. Lower stem and leaves lacking long spreading hairs, leaves usually with many short subconic hairs; involucre usually lacking long spreading hairs var. **umbellatum**
1. Basal and lowest stem leaves larger than the progressively reduced middle and upper leaves, or stem leaves lacking; involucre often with many long hairs
  3. Rays white or ochroleucous; stellate hairs lacking; mature achenes about 3mm long **H. albiflorum** Hook.
  3. Rays mostly yellow (sometimes drying whitish or purplish); stellate hairs usually present at least on involucre; achenes 1.5-7mm long
    4. Involucre 10mm or more long; pappus 5mm or more long; achenes 5mm or more long **H. fendleri** Schultz-Bip.
    4. Involucre 5-9mm long; pappus 3-5(6)mm long; achenes 1.5-2mm long
      5. Involucre 5-7(8)mm long; corollas 6-9mm long; pappus 3-4mm long; leaves glabrous or sparsely pilose-hirsute, rarely with a few stellate hairs **H. piloselloides** Vill.
      5. Involucre (6)7.5-9mm long; corollas 8-12mm or more long; pappus 4-5(6)mm long; leaves, especially the smaller ones, with conspicuous stellate hairs, especially near their margins, also pilose-hirsute **H. caespitosum** Dumort.

Hippuris vulgaris L.

Hordeum
1. Plants perennial (hybrids between the following 2 species are not uncommon: **H. x caespitosum** Scribn. ex Pammel)
  2. Awns 1.8-8cm long **H. jubatum** L.
  2. Awns 1.5cm long or less **H. brachyantherum** Nevski
1. Plants annual
  3. Leaf blades mostly 5-12mm wide; awns of lemmas mostly over 4cm long or lacking **H. vulgare** L.
  3. Leaf blades 1-5mm wide; awns of lemmas 0.5-4cm long **H. pusillum** Nutt.

Humulus lupulus L. var. **neomexicanus** Nels. & Cock.

Hymenopappus
1. Plants biennial, the roots with a single crown; corollas white or ochroleucous (sometimes drying yellowish) **H. tenuifolius** Pursh
1. Plants perennial, the roots with usually several crowns; corollas usually yellow **H. polycephalus** Osterh.

Hyoscyamus niger L.

Hypericum
1. Plants annual (rarely perennial with stolons); locule 1 **H. canadense** L.
1. Plants perennial; locules 3 **H. perforatum** L.

Impatiens capensis Meerb.

Ipomoea
1. Plants perennial with decumbent to erect stems; leaf blades linear or lance-linear, entire **I. leptophylla** Torrey
1. Plants annual with twining stems; leaf blades ovate, often 3-5 lobed **I. purpurea** (L.) Roth

Ipomopsis
I. congesta (Hook.) Grant
1. Plants with all the leaves somewhat similar or lacking a basal cluster var. **congesta**
1. Plants with a conspicuous basal cluster of elongate, entire leaves usually twice as long or more as other leaves var. **pseudotypica** (Const. & Rollins) Dorn

Iris
1. Outer tepals glabrous; leaves 10mm or less wide **I. missouriensis** Nutt.
1. Outer tepals yellow-bearded on median line; leaves 15mm or more wide **I. germanica** L.

Iva axillaris Pursh
1. Leaves glabrous or nearly so except sometimes on margins; sessile glands usually colorless; involucral bracts of fruiting heads tending to be free most of their length var. **axillaris**
1. Leaves hairy; sessile glands often glittering yellow when dry; involucral bracts of fruiting heads often united half or more their length var. **robustior** Hook.

Juglans nigra L.

Juncus
1. Plants fibrous-rooted annuals mostly less than 2dm high; flowers scattered along the many branches, inflorescence usually over half the height of plant **J. bufonius** L.
1. Plants perennials, often over 2dm high; flowers usually near top of plant, inflorescence usually less than half the height of plant
  2. Flowers each with a pair of small bracteoles at base of perianth segments in addition to the bract subtending the pedicel
    3. Creeping rhizomes present
      4. Leaf blades developed; inflorescence appearing terminal on stem **J. compressus** Jacq.
      4. Leaf blades reduced to bristles; inflorescence appearing lateral on stem **J. arcticus** Willd. var. **balticus** (Willd.) Trautv.
    3. Creeping rhizomes lacking, the stems densely clustered
      5. Capsule 3 celled; anthers 0.3-0.5(0.6)mm long **J. confusus** Cov.

5. Capsule 1 celled but often with intrusions which are not fused; anthers 0.4-1mm long
6. Auricles prolonged into a membranous or scarious projection (2)3-5mm long; anthers 0.6-0.8mm long **J. tenuis** Willd.
6. Auricles prolonged upto 2mm beyond sheath, submembranous or cartilaginous; anthers 0.4-0.6mm long if auricles submembranous, 0.6-1mm long if auricles cartilaginous
7. Auricles cartilaginous and yellowish; leaf sheaths and auricles not pinkish tinged; bracteoles obtuse; anthers 0.6-1mm long **J. dudleyi** Wieg.
7. Auricles membranous and whitish; leaf sheaths and inner edge of auricles usually pinkish tinged; bracteoles acute to aristate; anthers 0.4-0.6mm long **J. interior** Wieg.

2. Flowers subtended by a single bract at base of pedicel, or perianth if pedicel lacking
8. Leaves flattened and equitant, 1.5-6mm wide, septate, the septae not extending all the way across blade (except rarely a few) **J. ensifolius** Wikst.
9. Stamens mostly 3, anthers shorter than filaments; heads mostly 2-5(10), usually purplish-brown var. **ensifolius**
9. Stamens mostly 6, anthers often equaling filaments; heads sometimes more than 5, often pale brown var. **montanus** (Engelm.) Hitchc.
8. Leaves not equitant, sometimes flat but not folded, mostly 3mm or less wide, septate or not
10. Leaf blades not septate, mostly flattened; perianth 5-6mm long; capsule rounded or depressed at tip **J. longistylis** Torrey
10. Leaf blades septate, terete or subterete, rarely channeled; perianth 2-6mm long; capsule long-tapering to tip or abruptly narrowed to a rounded or depressed tip
11. Perianth 2-2.5(3)mm long; heads 3-12 flowered **J. alpinoarticulatus** Chaix
11. Perianth 3-6mm long; heads sometimes over 12 flowered
12. Capsule usually abruptly narrowed to a flattened tip; anthers 1-2mm long; stems arising from short rhizomes without swollen nodes **J. nevadensis** Wats.
12. Capsule long-tapering to tip; anthers 0.5-1mm long; stems sometimes arising from swollen nodes on a creeping rhizome
13. Perianth 3-4mm long; heads less than 10mm wide; leaf auricles 0.1-1mm long **J. nodosus** L.
13. Perianth 4-6mm long; heads often 10mm or more wide; leaf auricles 2-5mm long **J. torreyi** Cov.

Juniperus
1. Leaves in whorls of 3, needle-like, whitish on upper side **J. communis** L. var. **depressa** Pursh
1. Leaves mostly opposite and scale-like, usually not whitened above
2. Plants shrubby, creeping, rarely over 3dm high; leaves strongly apiculate **J. horizontalis** Moench
2. Plants usually tree-like, mostly over 3dm high; leaves usually not apiculate
3. Scale-like leaves in each row not overlapping, or if so, by not more than 1/5 their length, the tip obtuse to acute; seed cones maturing in 2 years so often of 2 sizes **J. scopulorum** Sarg.
3. Scale-like leaves in each row overlapping by more than 1/4 their length, the tip acute; seed cones maturing in 1 year, of 1 size **J. virginiana** L.

Kochia scoparia (L.) Schrader
Koeleria macrantha (Ledeb.) Schultes
Krascheninnikovia lanata (Pursh) Meeuse & Smit
Lactuca
1. Achenes with a single conspicuous median nerve on each face, occasionally with an additional, less prominent pair; pappus white
2. Heads mostly 10-22 flowered; involucres 8-15mm long; achenes mostly 4-6.5mm long including beak **L. canadensis** L.
2. Heads mostly 20-60 flowered; fruiting involucres mostly 15-22mm long; achenes mostly 7-10mm long **L. ludoviciana** (Nutt.) Riddell
1. Achenes with several evident nerves on each face; pappus white or brownish
3. Pappus brownish; achene often beakless or nearly so **L. biennis** (Moench) Fern.
3. Pappus white; achene with a well developed slender beak **L. serriola** L.

Lamium amplexicaule L.
Lappula
1. Marginal prickles on nutlets in 1 row **L. occidentalis** (Wats.) Greene
1. Marginal prickles on nutlets in at least 2 rows
2. Inner row of nutlet marginal spines 2 times longer than the outer row, longest spines greater than 2mm long, third row of marginal spines lacking; style obscured by mature fruit, exceeded by nutlet apical apines; corolla limb (3)4-7mm wide **L. fremontii** (Torrey) Greene
2. Inner and outer rows of nutlet marginal spines subequal, longest spines less than 1mm long, a third row of reduced marginal spines usually present; style visible in mature fruits, not exceeded by nutlet apical spines; corolla limb 2-3mm wide **L. squarrosa** (Retz.) Dum.

Lapsana communis L.
Lathyrus
1. Flowers 20-30mm long; leaflets 6mm or less wide **L. polymorphus** Nutt.
2. Plants glabrous or glabrate var. **polymorphus**
2. Plants hairy var. **incanus** (Sm. & Rydb. ex Rydb.) Dorn
1. Flowers 12-17mm long; some leaflets usually over 6mm wide
3. Flowers white or cream **L. ochroleucus** Hook.
3. Flowers purplish **L. venosus** Muhl. ex Willd. var. **intonsus** Butters & St. John

Lechea
1. Outer sepals noticeably shorter than inner extending usually to slightly beyond middle of calyx **L. intermedia** Legg. ex Britt.
1. Outer sepals usually equaling to distinctly longer than the inner **L. tenuifolia** Michx.

Ledum groenlandicum Oeder
Leersia oryzoides (L.) Sw.
Lemna
1. Fronds long and narrow, stalked at one end, commonly submersed **L. trisulca** L.
1. Fronds rounded or elongate but not stalked, mostly floating until cold weather
2. Fronds mostly 1-2.5mm long, green, 1 nerved or nerveless **L. minuta** Kunth
2. Fronds mostly (1.5)2.5-6mm long, often reddish on one or both sides, mostly 3-5 nerved (nerves arise above base and merge near tip of frond, light from beneath frond to help see nerves)
3. Lower surface of fronds often red, more so than upper surface; greatest distance between lateral nerves near or above middle of frond; turions (small darker fronds filled with starch grains) sometimes present **L. turionifera** Landolt
3. Lower surface of fronds usually not red (or less than upper), upper surface sometimes reddish; greatest distance between lateral nerves below middle of frond; turions lacking **L. minor** L.

Leonurus cardiaca L.
Lepidium
1. Plants annual or biennial; fruits with a notch at tip
2. Stem leaves auriculate to cordate-clasping or perfoliate **L. perfoliatum** L.
2. Stem leaves not auriculate nor cordate-clasping or perfoliate **L. densiflorum** Schrad.
3. Mature fruits averaging about 2.5mm long, widest near middle var. **densiflorum**

3. Mature fruits averaging nearly 3mm or more long, widest above middle var. **macrocarpum** Mulligan
1. Plants rhizomatous perennials; fruits not notched at tip
4. Mature fruits cordate at base or nearly so, often indented at septum **L. draba** L.
4. Mature fruits not cordate at base, rarely indented at septum **L. chalepense** L.

Leptosiphon septentrionalis (Mason) Porter & Johnson

Leucanthemum vulgare Lam.

Leucocrinum montanum Nutt. ex Gray

Leucophysalis grandiflora (Hook.) Rydb.

Leucopoa kingii (Wats.) Weber

Lewisia

1. Sepals 4 or more; petals 18-35mm long **L. rediviva** Pursh
1. Sepals 2; petals 6-17mm long **L. pygmaea** (Gray) Robins.

Leymus

1. Ligules mostly 2mm or more long; leaf blades mostly flat, some often over 6mm wide **L. cinereus** (Scribn. & Merr.) Löve
1. Ligules mostly less than 2mm long; leaf blades sometimes involute, less than 6mm wide **L. innovatus** (Beal) Pilg.

Liatris

1. Pappus plumose; involucral bracts mostly cuspidate or acuminate at tip **L. punctata** Hook.
1. Pappus barbellate; involucral bracts rounded (rarely acute) at tip **L. ligulistylis** (A. Nels.) Schum.

Lilium philadelphicum L. var. **andinum** (Nutt.) Ker-Gawl.

Limosella aquatica L.

Linanthus pungens (Torrey) Porter & Johnson

Linaria

1. Leaves cordate or ovate to lance-ovate, mostly clasping the stem **L. dalmatica** (L.) Miller
1. Leaves linear to elliptic or oblanceolate, not clasping the stem **L. vulgaris** Miller

Linnaea borealis L. var. **longiflora** Torrey

Linum

1. Petals blue or rarely white **L. lewisii** Pursh
1. Petals yellow to orange
2. Petals 5-9mm long **L. australe** Heller
2. Petals 10-17mm long
3. Sepals deciduous in fruit; fruit of 5 two seeded segments
4. Styles in fruit mostly 4-6mm long; plants sometimes over 3dm high **L. rigidum** Pursh
4. Styles in fruit mostly 2.5-4mm long; plants less than 3dm high **L. compactum** A. Nels.
3. Sepals persistent; fruit of 10 one seeded segments **L. sulcatum** Riddell

Listera convallarioides (Sw.) Nutt. ex Ell.

Lithophragma

1. Bulblets usually present in axils of stem leaves; basal leaves glabrous beneath or nearly so **L. glabrum** Nutt. var. **ramulosum** (Suksd.) Boivin
1. Bulblets lacking; basal leaves usually hairy beneath **L. parviflorum** (Hook.) Nutt. ex T. & G.

Lithospermum

1. Plants with greenish-white, white, or rarely yellowish corollas 10-16mm long, hairy on outside; corolla lobes mostly erect; style long-exserted from corolla; nutlets broadly attached at base to a flat gynobase; anthers usually about 2mm long **L. occidentale** (Mack.) Weakley et al.
1. Plants not with the above combination of characteristics
2. Corolla lobes erose or toothed **L. incisum** Lehm.
2. Corolla lobes entire
3. Leaves somewhat strigose, the tip somewhat acute, hairs with a papillose base **L. caroliniense** (Gmel.) MacM.
3. Leaves soft canescent, the tip obtuse, hairs without a papillose base **L. canescens** (Michx.) Lehm.

Lobelia

1. Corollas 15-30mm long **L. siphilitica** L. var. **ludoviciana** A. DC.
1. Corollas 6-15mm long
2. Middle stem leaves mostly lanceolate to obovate, some over 10mm wide **L. spicata** Lam.
2. Middle stem leaves mostly linear or nearly so, less than 5mm wide **L. kalmii** L.

Loeflingia squarrosa Nutt. var. **texana** (Hook.) Dorn

Logfia arvensis (L.) Holub

Lolium

1. Glume longer than or as long as spikelet or nearly so; lower lemmas mostly 9-10mm long **L. persicum** Boiss. & Hohen ex Boiss.
1. Glume about half as long as spikelet or less, rarely longer; lower lemmas less than 8mm long
2. Lemmas, at least the upper, awned; larger leaves 3-8mm wide **L. multiflorum** Lam.
2. Lemmas awnless; larger leaves mostly 2-4mm wide **L. perenne** L.

Lomatium

1. Ultimate leaf segments few, some usually 1cm or more long, the leaves not appearing lace-like **L. nuttallii** (Gray) Macbr.
1. Ultimate leaf segments numerous, mostly less than 1cm long, the leaves much dissected and often appearing lace-like
2. Plants mostly over 2.5dm high, the leaf blades mostly 13-35cm long **L. dissectum** (Nutt.) Math. & Const. var. **multifidum** (Nutt.) Math. & Const.
2. Plants mostly less than 2.5dm high, the leaf blades usually less than 13cm long
3. Ovaries and fruits hairy all over **L. foeniculaceum** (Nutt.) Coult. & Rose
3. Ovaries and fruits glabrous **L. orientale** Coult. & Rose

Lonicera

1. Terminal leaves usually perfoliate; flowers mostly in terminal clusters; climbing or scrambling shrubs or vines **L. dioica** L. var. **glaucescens** (Rydb.) Butters
1. Terminal leaves not perfoliate; flowers axillary, paired; upright shrubs **L. tatarica** L.

Lotus

1. Flowers yellow, often tinged with red, 3-15 in head-like umbels; perennial **L. corniculatus** L.
1. Flowers mostly white to pink, solitary or rarely 2 per axil; annual **L. unifoliolatus** (Hook.) Benth.

Lupinus

1. Plants annual; ovules 2; cotyledons usually persistent and conspicuous **L. pusillus** Pursh
2. Peduncles often over 1cm long; inflorescence nearly equaling to exceeding leaves; flowers mostly 9-12mm long var. **pusillus**
2. Peduncles rarely over 1cm long; inflorescence exceeded by leaves; flowers mostly 6-10mm long var. **intermontanus** (Heller) Smith
1. Plants perennial; ovules often more than 2; cotyledons usually early deciduous
3. Most of back surface of banner conspicuously hairy (rarely only beneath calyx) **L. sericeus** Pursh
3. Most of back surface of banner glabrous or inconspicuously hairy

4. Banner only slightly reflexed from wings to form a narrow V opening of less than 45 degrees; flowers 4-12mm long **L. argenteus** Pursh
5. Flowers mostly (7)9-12mm long; leaflets hairy or rarely glabrous on upper surface var. **argenteus**
5. Flowers mostly 4-7(10)mm long; leaflets usually glabrous on upper surface
6. Leaflets of lower leaves mostly broadly oblanceolate to obovate, mostly rounded to obtuse at tip var. **rubricaulis** (Greene) Welsh
6. Leaflets of lower leaves narrowly lanceolate or oblanceolate, mostly acute at tip var. **laxiflorus** (Dougl. ex Lindl.) Dorn
4. Banner greatly reflexed from wings to form a wide V opening of about 45 degrees or more; flowers 10-17mm long **L. polyphyllus** Lindl. var. **humicola** (A. Nels.) Barneby

Luzula
1. Flowers mostly solitary or paired at ends of branches in an open panicle
2. Branches of inflorescence often compound; perianth 1.7-2.5mm long; seeds not appendaged **L. parviflora** (Ehrh.) Desv.
2. Branches of inflorescence mostly simple and 1-flowered; perianth 2.6-4.3mm long; seeds conspicuously appendaged **L. acuminata** Raf.
1. Flowers in capitate or semicapitate spikes or spike-like panicles
3. Plants densely caespitose, erect; anthers shorter than or slightly longer than filaments **L. multiflora** (Ehrh.) Lej.
3. Plants with decumbent crowns on short stolons; anthers 2-5 times as long as filaments **L. comosa** Meyer

Lycium barbarum L.

Lycopodium
1. Creeping stem above ground or barely buried, often leafy; upright branches little if at all branched **L. annotinum** L.
1. Creeping stem usually deeply buried, mostly lacking leaves; upright branches much branched **L. dendroideum** Michx.

Lycopus
1. Calyx lobes bluntly acute or obtuse, not surpassing the mature nutlets **L. uniflorus** Michx.
1. Calyx lobes acuminate or subulate, surpassing the mature nutlets
2. Leaves short-petioled, irregularly incised-toothed or pinnatifid, at least the lower ones; calyx lobes somewhat awn-tipped; nutlets mostly less than 1.5mm long **L. americanus** Muhl. ex Barton
2. Leaves sessile or nearly so, mostly with coarsely serrate margins; calyx lobes acute to acuminate; nutlets mostly over 1.5mm long **L. asper** Greene

Lygodesmia juncea (Pursh) D. Don ex Hook.

Lysimachia
1. Flowers solitary in leaf axils **L. ciliata** L.
1. Flowers in dense axillary racemes **L. thyrsiflora** L.

Lythrum alatum Pursh

Machaeranthera tanacetifolia (Kunth) Nees

Madia glomerata Hook.

Mahonia repens (Lindl.) G. Don

Maianthemum
1. Perianth segments and stamens 4 **M. canadense** Desf. var. **interius** Fern.
1. Perianth segments and stamens 6
2. Flowers in a panicle; filaments mostly longer than perianth **M. racemosum** (L.) Link var. **amplexicaule** (Nutt.) Dorn
2. Flowers in a raceme; filaments shorter than perianth **M. stellatum** (L.) Link

Malus pumila Miller

Malva
1. Petals about twice as long as sepals or more; mature mericarps smooth or nearly so on back **M. neglecta** Walllr.
1. Petals little if at all longer than sepals (rarely to 1.5 times as long); mature mericarps reticulate-ridged on back **M. pusilla** Smith

Marrubium vulgare L.

Marsilea vestita Hook. & Grev.

Matricaria discoidea DC.

Matteuccia struthiopteris (L.) Todaro

Medicago
1. Flowers less than 6mm long; annuals, somewhat shallow rooted **M. lupulina** L.
1. Flowers 6-10mm long; perennials, deep rooted **M. sativa** L.
2. Petals usually blue-purple, rarely pink or white; pods spirally coiled; leaflets sometimes over 2cm long var. **sativa**
2. Petals usually yellow, rarely violet; pods often not spirally coiled; leaflets mostly 0.5-2(2.7)cm long var. **falcata** (L.) Doell

Melica
1. Lemmas mostly obtuse, awnless **M. bulbosa** Geyer ex Porter & Coult.
1. Lemmas awned or long-tapering to a pointed tip
2. Lemmas awned from a bifid tip **M. smithii** (Porter ex Gray) Vasey
2. Lemmas acute or acuminate **M. subulata** (Griseb.) Scribn.

Melilotus
1. Corolla white; pods reticulate-veined **M. albus** Medic.
1. Corolla yellow; pods mostly obscurely cross-corrugated **M. officinalis** (L.) Pallas

Mentha arvensis L. var. **canadensis** (L.) Kuntze

Mentzelia
1. Petals 5
2. Petals mostly 3-6mm long; calyx lobes 1.8-4mm long; annual **M. dispersa** Wats.
2. Petals mostly 7mm or more long; calyx lobes 4mm or more long; biennial or perennial **M. oligosperma** Nutt. ex Sims
1. Petals apparently 8 or more
3. Petals over 4cm long; calyx lobes 18mm or more long **M. decapetala** (Pursh) Urban & Gilg ex Gilg
3. Petals less than 4cm long; calyx lobes mostly less than 18mm long **M. nuda** (Pursh) T.& G.

Menyanthes trifoliata L.

Mertensia
1. Plants usually over 4dm high, mostly in moist or shaded areas; cauline leaves with distinct lateral veins, the middle leaves often over 6cm long **M. ciliata** (James ex Torrey) G. Don
1. Plants usually less than 4dm high, often in dry or open areas; cauline leaves usually lacking distinct lateral veins, the middle leaves only rarely over 6cm long
2. Tube of corolla 1.3-2 times as long as the limb **M. oblongifolia** (Nutt.) G. Don
2. Tube of corolla shorter than or equal to the limb **M. lanceolata** (Pursh) DC.

Micranthes occidentalis (Wats.) Small

Microseris nutans (Hook.) Schultz-Bip.

Microsteris gracilis (Hook.) Greene var. **humilior** (Hook.) Cronq.

Mirabilis
1. Leaves ovate, deltoid, or cordate; involucres not glandular-pubescent, with scattered stiff hairs **M. nyctaginea** (Michx.) MacM.

1. Leaves mostly linear or lanceolate; involucres often glandular-pubescent
  2. Stems hirsute below with multicellular hairs, not glaucous **M. albida** (Walt.) Heimerl
  2. Stems glabrous and glaucous below, rarely puberulent **M. linearis** (Pursh) Heimerl

Mitella pentandra Hook.
Moehringia lateriflora (L.) Fenzl
Monarda fistulosa L. var. **menthifolia** (Grah.) Fern.
Moneses uniflora (L.) Gray
Monolepis nuttalliana (Schultes) Greene
Monotropa hypopitys L.
Morus alba L.
Muhlenbergia

1. Plants annual, the culms rarely decumbent and rooting at the nodes and appearing perennial; glumes 1mm long or less
  2. Panicle narrow; pedicels mostly less than 3 times as long as spikelets **M. filiformis** (Thurb. ex Wats.) Rydb.
  2. Panicle open; pedicels mostly over 3 times as long as spikelets **M. minutissima** (Steudel) Swallen
1. Plants perennial; glumes often over 1mm long
  3. Creeping rhizomes lacking
    4. Second glume 1 nerved, acute or short-awned **M. cuspidata** (Torrey ex Hook.) Rydb.
    4. Second glume 3 nerved, usually 3 toothed or 3 awned **M. filiculmis** Vasey
  3. Creeping rhizomes present
    5. Panicle diffuse, spikelets very remote on long pedicels or panicle branches **M. asperifolia** (Nees & Mey. ex Trin.) Parodi
    5. Panicle narrow and condensed, spikelets crowded on short pedicels
      6. Leaf blades mostly involute or sometimes flat, 2mm or less wide
        7. Ligules 0.5-1mm long; culms not nodulose-roughened below nodes **M. cuspidata** (Torrey ex Hook.) Rydb.
        7. Ligules usually 1-3mm long; culms minutely nodulose-roughened below nodes **M. richardsonis** (Trin.) Rydb.
      6. Leaf blades flat, over 2mm wide
        8. Glumes including awns usually less than 4mm long, not exceeding the lemma or barely so **M. mexicana** (L.) Trin.
        8. Glumes including awns over 4mm long, much exceeding the lemma
          9. Culms mostly simple or branching at base; internodes minutely puberulent; sheaths not or scarcely keeled; anthers 0.7-1.5mm long **M. glomerata** (Willd.) Trin.
          9. Culms mostly branching from the middle nodes; internodes smooth and glossy except at summit; sheaths keeled; anthers 0.4-0.9mm long **M. racemosa** (Michx.) B.S.P.

Mulgedium oblongifolium (Nutt.) Reveal
Munroa squarrosa (Nutt.) Torrey
Musineon

1. Leaves all basal, the ultimate divisions narrowly linear **M. tenuifolium** Nutt. ex T. & G.
1. Leaves not all basal, some on flowering stem, the ultimate divisions oblong **M. divaricatum** (Pursh) Nutt. ex T. & G.

Myosotis

1. Calyx tube closely strigose, the hairs not spreading nor uncinate **M. scorpioides** L.
1. Calyx tube with some loose spreading somewhat uncinate hairs
  2. Corolla limb 4-8mm wide, normally blue; perennial **M. sylvatica** Hoffm.
  2. Corolla limb 1-4mm wide, white or blue; annual or biennial
    3. Corolla white; calyx with 3 lobes shorter than other 2; fruiting pedicels equaling or shorter than calyx **M. verna** Nutt.
    3. Corolla blue or white; calyx usually with similar lobes; fruiting pedicels equaling or longer than calyx **M. arvensis** (L.) Hill

Myosurus minimus L.
Myriophyllum sibiricum Kom.
Nassella viridula (Trin.) Barkw.
Nasturtium

1. Mature fruits over 1.5mm wide, 10-15(20)mm long **N. officinale** R. Br.
1. Mature fruits less than 1.5mm wide, 17-26mm long **N. microphyllum** Boenn. ex Reichenb.

Navarretia intertexta (Benth.) Hook. var. **propinqua** (Suksd.) Brand
Nemophila breviflora Gray
Nepeta cataria L.
Nothocalais cuspidata (Pursh) Greene
Nuttallanthus texanus (Scheele) Sutton
Oenothera

1. Fruit not splitting, nut-like, 1-4 seeded; claw of petal often nearly as long as blade
  2. Floral tube mostly over 2 times as long as ovary, filiform, with spreading hairs; petals white; perennial **O. glaucifolia** Wagner & Hoch
  2. Floral tube mostly 1-1.5 times as long as ovary, often conspicuously expanded at tip or near base, glabrous or variously pubescent; petals pink or reddish, or if white, the plants annual
    3. Petals less than 3mm long; tall annual **O. curtiflora** Wagner & Hoch
    3. Petals 3-8mm long; perennial **O. suffrutescens** (Ser.) Wagner & Hoch
1. Fruit splitting at maturity, usually many seeded; petals usually not clawed
  4. Stigma a horizontally flattened disk or peltate, somewhat shallowly 4 toothed, without linear lobes
    5. Leaves entire; petals 13-25mm long; anthers 5mm or more long **O. lavandulifolia** T.& G.
    5. Leaves serrulate; petals 7-13mm long; anthers 3.5mm or less long **O. serrulata** Nutt.
  4. Stigma with 4 linear lobes (rarely these stick together)
    6. Stems lacking or nearly so, the leaves basal
      7. Petals yellow when fresh, rarely purplish, 1-2cm long; sepals 0.8-2cm long **O. flava** (A. Nels.) Garrett
      7. Petals white or pinkish, 2-5cm long; sepals 1.5-6cm long **O. cespitosa** Nutt.
    6. Stems elongate
      8. Petals yellow when fresh, rarely purplish in age, 0.5-2(7)cm long
        9. Leaves mostly pinnatifid; annual **O. laciniata** Hill
        9. Leaves mostly entire to dentate; biennial or perennial **O. villosa** Thunb.
          10. Sepals with mostly appressed, non-glandular hairs var. **villosa**
          10. Sepals with many spreading and often also shorter gland-tipped hairs var. **strigosa** (Rydb.) Dorn
      8. Petals white to pinkish, reddish, or purplish, 0.7-4cm long
        11. Seeds in 2 rows in each cell; hairs non-glandular; seeds pitted-reticulate in vertical rows; annual **O. albicaulis** Pursh
        11. Seeds in 1 or 2 rows in each cell; hairs glandular or not; seeds pitted or not; usually perennials
          12. Floral tube with conspicuous white hairs in throat; seeds with regular rows of pits, in 2 rows in each cell **O. coronopifolia** T.& G.
          12. Floral tube without conspicuous hairs in throat; seeds not pitted, in 1 row in each cell

13. Inflorescence glandular-pubescent **O. nuttallii** Sweet
13. Inflorescence often pubescent but not glandular **O. pallida** Lindl. var. **trichocalyx** (Nutt.) Dorn

Onobrychis viciifolia Scop.

Onoclea sensibilis L.

Onopordum acanthium L.

Oonopsis multicaulis (Nutt.) Greene

Opuntia

1. Stem segments oval to cylindric, about half as thick to as thick as wide, easily detached **O. fragilis** (Nutt.) Haw.
1. Stem segments flattened, much wider than thick, not easily detached
2. Mature fruit juicy, red, usually spineless or nearly so; spine clusters on largest pads mostly 15-30mm apart **O. tortispina** Engelm. & Bigel.
2. Mature fruit dry, green or brown, often spiny; spine clusters on largest pads often 12mm or less apart **O. polyacantha** Haw.

Orobanche

1. Flowers sessile or some on pedicels to about 2cm long, with 1 or 2 bractlets just below calyx in addition to the subtending bract **O. ludoviciana** Nutt.
1. Flowers all somewhat long-pediceled, without bractlets
2. Pedicels 1-3(4); calyx lobes sometimes longer than the tube **O. uniflora** L. var. **occidentalis** (Greene) Taylor & MacBryde
2. Pedicels mostly 4-10; calyx lobes equal to or shorter than the tube **O. fasciculata** Nutt.

Orthilia secunda (L.) House

Orthocarpus luteus Nutt.

Oryzopsis asperifolia Michx.

Osmorhiza

1. Involucel present; styles 1.5-3mm long **O. longistylis** (Torrey) DC.
1. Involucel lacking or early deciduous; styles 0.5mm or less long
2. Fruits averaging cylindric or nearly so, appearing beaked at tip; primary and secondary rays mostly ascending **O. berteroi** DC.
2. Fruits averaging club-shaped, appearing rounded at tip; primary and secondary rays usually widely divaricate or spreading **O. depauperata** Phil.

Ostrya virginiana (Miller) Koch

Oxalis

1. Leaves all basal from a scaly bulb; corolla usually blue, pink, or lavender **O. violacea** L.
1. Leaves on stems from a taproot or rhizome; corolla yellow
2. Hairs on stems and petioles relatively sparse, some with cross-partitions and crinkly; stems often solitary; capsules glabrous or nearly so **O. stricta** L.
2. Hairs on stems and petioles relatively dense, usually lacking cross-partitions and stiff and straight with very sharp tips; stems often several to many; capsules rather densely appressed-hairy **O. dillenii** Jacq.

Oxyria digyna (L.) Hill

Oxytropis

1. Petals white, cream, or yellow
2. Flowers 18-27mm long; keel 13-19mm long; leaflets mostly 11-19 per leaf; pod walls thick and fleshy or bony **O. sericea** Nutt.
2. Flowers 12-20mm long; keel 9-15mm long; leaflets mostly 7-33 per leaf; pod walls somewhat membranous, thin **O. campestris** (L.) DC. var. **spicata** Hook.
1. Petals blue, purple, pinkish, or reddish
3. Hairs of leaflets in large part attached along body of hair, not at base, one free end sometimes rather short **O. lambertii** Pursh
3. Hairs of leaflets basally attached
4. Calyx usually with a mixture of short blackish hairs and long white hairs; leaves 10cm or less long; leaflets mostly 2-12(15)mm long; peduncles 13cm or less long; bracts usually shaggy-pilose on back **O. lagopus** Nutt. var. **atropurpurea** (Rydb.) Barneby
4. Calyx usually with all white hairs; leaves often over 10cm long; leaflets often over 15mm long; peduncles often over 13cm long; bracts often appressed-pilose on back **O. besseyi** (Rydb.) Blank.

Packera

1. Plants somewhat woolly or tomentose nearly throughout at flowering
2. Leaves mostly all entire or subentire, only the upper ones lobed **P. cana** (Hook.) Weber & Löve
2. Leaves usually all toothed or lobed **P. plattensis** (Nutt.) Weber & Löve
1. Plants glabrous or essentially so at flowering, rarely with a few persisting patches of tomentum
3. Basal leaf blades predominantly subtruncate or subcordate at base, mostly toothed **P. pseudaurea** (Rydb.) Weber & Löve
3. Basal leaf blades predominantly tapering at base, sometimes lobed
4. Basal leaves subentire to coarsely dentate especially above middle, often long-tapering to base, mostly oblanceolate; plants taprooted **P. tridenticulata** (Rydb.) Weber & Löve
4. Basal leaves various; plants fibrous rooted or subrhizomatous
5. Basal leaves thickish and subsucculent at least when fresh; stem leaves often entire to coarsely toothed; plants fibrous rooted **P. streptanthifolia** (Greene) Weber & Löve
5. Basal leaves thin, not subsucculent; stem leaves mostly dissected, incised, or lobed; plants subrhizomatous **P. paupercula** (Michx.) Löve & Löve

Panicum

1. Plants perennial with rhizomes **P. virgatum** L.
1. Plants annual
2. Spikelets 3.5-5mm long; 1st glume 2-3.5mm long **P. miliaceum** L.
2. Spikelets 2-3.5mm long; 1st glume 1-1.5(2)mm long **P. capillare** L.

Parietaria pensylvanica Muhl. ex Willd.

Parnassia

1. Stem leaf (bract) often clasping or the base somewhat rounded or truncate; petals 7 or more veined, often over 7mm long **P. palustris** L. var. **montanensis** (Fern. & Rydb. ex Rydb.) Hitchc.
1. Stem leaf not clasping, tapering at base; petals mostly 5 veined, mostly 4-7mm long **P. parviflora** DC.

Paronychia

1. Plants mostly over 10cm high, not mat forming; some leaves over 10mm long **P. jamesii** T. & G.
1. Plants mostly 10cm or less high, usually mat forming; leaves mostly all less than 10mm long
2. Flowers usually clustered; some leaves often over 6mm long, often widest at or above middle **P. depressa** (T.& G.) Nutt. ex A. Nels.
2. Flowers mostly solitary or paired; leaves mostly less than 6mm long, usually widest near base **P. sessiliflora** Nutt.

Parthenocissus

1. Tendrils with adhesive disks; inflorescence with a central axis, not forked **P. quinquefolia** (L.) Planch.
1. Tendrils lacking adhesive disks; inflorescence forked **P. vitacea** (Knerr) Hitchc.

Pascopyrum smithii (Rydb.) Barkw. & Dewey

Pastinaca sativa L.
Patis racemosa (Sm.) Romasch et al.
Pedicularis procera Gray
Pediocactus simpsonii (Engelm.) Britt. & Rose
Pediomelum
1. Roots thick and tuberous; flowers mostly over 1cm long; leaves glandular-punctate or not
  2. Stems and petioles with somewhat soft, long, spreading hairs **P. esculentum** (Pursh) Rydb.
  2. Stems and petioles with stiff, appressed or ascending hairs **P. cuspidatum** (Pursh) Rydb.
1. Roots generally not thick and tuberous; flowers mostly less than 1cm long; leaves usually glandular-punctate
  3. Leaves and stems somewhat silvery hairy; flowers sessile or subsessile **P. argophyllum** (Pursh) Grimes
  3. Leaves and stems greenish, hairy but not silvery; flowers sessile or with pedicels to 4mm long **P. digitatum** (Nutt. ex T.& G.) Isely
Pellaea
1. Lowest primary leaflet usually divided into more than 3 secondary leaflets with a prominent, hairy petiolule which diverges from rachis at more than a 45 degree angle and lacks a decurrent base
  2. Rachis on upperside of leaf with dense, short, curly, appressed hairs; largest ultimate leaf segments usually over 3cm long **P. atropurpurea** (L.) Link
  2. Rachis on upperside of leaf with sparse, long, divergent hairs; largest ultimate leaf segments usually less than 3cm long **P. gastonyi** Windham
1. Lowest primary leaflet divided into 3 or fewer secondary leaflets with a very short, often glabrous petiolule, or if with more than 3 secondary leaflets, the lowest petiolule diverges from rachis at less than a 45 degree angle and has a slightly decurrent base **P. glabella** Mett. ex Kuhn
  3. Spores 64 per sporangium; lowest primary leaflet mostly divided into 3 or fewer secondary leaflets on a very short petiolule var. **occidentalis** (E. Nels.) Butters
  3. Spores 32 per sporangium; lowest primary leaflet mostly divided into more than 3 secondary leaflets and/or with a prominent petiolule var. **simplex** Butters
Penstemon
1. Inflorescence glandular-pubescent, sometimes rather sparsely so
  2. Corolla glandular-puberulent near mouth within, white or the tube sometimes pinkish or bluish **P. albidus** Nutt.
  2. Corolla either glabrous within or bearded on the palate, not glandular, usually blue or violet
    3. Ovary and capsule often glandular-puberulent near the top; calyx mostly (5)7-13mm long; corolla 16-38mm long, 6-14mm wide at throat; staminode usually somewhat exserted from corolla **P. eriantherus** Pursh
    3. Ovary and capsule usually glabrous; calyx rarely over 7mm long; corolla often narrower or shorter or both; staminode usually included **P. gracilis** Nutt.
1. Inflorescence usually glabrous, at least not glandular
  4. Anthers conspicuously hairy on side away from dehiscence, the sacs usually not dehiscing their full length **P. glaber** Pursh
    5. Sepals ovate to suborbicular, predominantly broadly rounded and erose at tip, sometimes with a short acute tooth at middle, little if at all longer than wide var. **glaber**
    5. Sepals lanceolate to ovate, predominantly acute to acuminate at tip, often not erose, usually about 2 or more times as long as wide var. **alpinus** (Torrey) Gray
  4. Anthers glabrous on side away from dehiscence (rarely minutely puberulent), the sacs often dehiscing their full length
    6. Leaves conspicuously short-hairy **P. eriantherus** Pursh
    6. Leaves glabrous or nearly so
      7. Corolla 3.5-5cm long; upper leaves ovate or cordate or suborbicular **P. grandiflorus** Nutt.
      7. Corolla less than 2.5cm long; upper leaves various
        8. Leaves all linear to narrowly lanceolate or oblanceolate, many of them over 7 times as long as wide, rarely as much as 1cm wide **P. angustifolius** Nutt. ex Pursh
        8. Leaves mostly broadly lanceolate to ovate at least on stem, rarely as much as 7 times as long as wide, often over 1cm wide **P. nitidus** Dougl. ex Benth.
Perideridia montana (Blank.) Dorn
Peritoma serrulata (Pursh) DC.
Persicaria
1. Plants annual
  2. Stipules mostly terminally fringed with bristly hairs **P. maculosa** Gray
  2. Stipules mostly not bristly fringed
    3. Veins of outer perianth segments somewhat prominent, branched and recurved at tip and somewhat resembling an anchor; peduncles without gland-tipped hairs, sometimes with sessile glands **P. lapathifolia** (L.) Gray
    3. Veins of outer perianth segments not especially prominent nor branched and recurved at tip; peduncles with gland-tipped hairs
      4. Styles or stamens or both exserted from at least some perianths **P. bicornis** (Raf.) Nieuwland
      4. Styles and stamens included in perianth **P. pensylvanica** (L.) Gomez
1. Plants perennial with usually rhizomes or stolons
  5. Perianth usually greenish or white; styles less than 2mm long
    6. Tepals all glandular-punctate **P. punctata** (Ell.) Small
    6. Tepals not glandular or only the inner ones glandular **P. hydropiperoides** (Michx.) Small
  5. Perianth rose or dark pink; styles mostly 2-4mm long **P. amphibia** (L.) Delarbre
    7. Inflorescence 1-4(6)cm long, oblong-ovoid; peduncles usually glabrous; leaf blades predominantly oblong-lanceolate with short-pointed or rounded tips var. **stipulacea** (Coleman) Hara
    7. Inflorescence (3)4-15cm long, narrow-cylindric; peduncles mostly glandular-hairy; leaf blades predominantly lanceolate with long-pointed tips var. **emersa** (Michx.) Hickman
Petasites frigidus (L.) Fries var. **sagittatus** (Banks ex Pursh) Chern.
Petrophytum caespitosum (Nutt.) Rydb.
Phacelia
1. Ovules 6 or more per ovary; annual **P. linearis** (Pursh) Holz.
1. Ovules 4 per ovary; perennial **P. hastata** Dougl. ex Lehm.
Phalaris
1. Panicle 2-4cm long; annual **P. canariensis** L.
1. Panicle 6cm or more long; perennial **P. arundinacea** L.
Phemeranthus parviflorus (Nutt.) Kiger
Philadelphus pubescens Loisel.
Phleum
1. Panicle long-cylindric, usually over 5 times as long as wide; culms usually bulbous at base **P. pratense** L.
1. Panicle ovoid or oblong, usually not over 4 times as long as wide; culms not bulbous at base **P. alpinum** L.

Phlox
1. Leaves elliptic to lanceolate or oblanceolate, the larger averaging (1.5)2-5mm wide, mostly 2cm or less long, the margins strongly thickened and with marginal cilia which tend to disappear toward tip; calyx glandular-hairy; style 6-12mm long **P. alyssifolia** Greene
1. Leaves mostly linear, lance-linear, oblong, or acicular, often narrower or longer; margins, calyx, and styles variable
  2. Corolla usually 10(12)mm or less in diameter; leaves mostly 3-10(13)mm long and averaging about 0.5mm wide near middle, usually stiff and pungent, and often loosely pubescent with somewhat cobwebby hairs; mostly mat forming plants **P. hoodii** Richardson
  2. Corolla usually (12)15mm or more in diameter; leaves usually not as above; mat forming or not
    3. Leaves averaging 1mm or less wide at middle; base of leaves and usually the internodes somewhat white hyaline; calyx and leaves usually with long crinkly hairs, not glandular **P. andicola** E. Nels.
    3. Leaves 1-2.5mm wide, the leaf base and internodes usually not hyaline; calyx and leaves variable, often glabrous or glabrate or glandular **P. kelseyi** Britt.

Phragmites australis (Cav.) Trin. ex Steudel

Phryma leptostachya L.

Physalis
1. Peduncles in flower mostly 3-10mm long; leaf blades rarely over 5cm long; stem hairs rarely over 0.5mm long, glandular **P. hederifolia** Gray var. **comata** (Rydb.) Waterfall
1. Peduncles in flower mostly 10-20mm long; leaf blades sometimes over 5cm long; stem hairs usually over 1mm long or not glandular or lacking
  2. Pubescence somewhat dense, glandular; leaf blades mostly deltoid-ovate **P. heterophylla** Nees
  2. Pubescence moderate to lacking, not glandular; leaf blades mostly lanceolate or elliptic or rhombic-ovate
    3. Hairs of middle stem predominantly retrorse **P. virginiana** Miller
    3. Hairs of middle stem antrorse, spreading, or none
      4. Flowering calyx and often the stems with long spreading hairs mostly 1mm or more long **P. hispida** (Waterfall) Cronq.
      4. Flowering calyx and stems with short hairs mostly 0.5mm or less long or glabrous **P. longifolia** Nutt.

Physaria
1. Fruits notched at tip, often appearing like 2 parts grown together **P. brassicoides** Rydb.
1. Fruits rounded or pointed at tip
  2. Pedicels in fruit sigmoid or uniformly curved upward, or rarely straight; fruits not globose
    3. Petals 7-9mm long; plants not mat-forming; mature fruits mostly 5.5-8mm long, the styles 3-6mm long **P. montana** (Gray) Greene
    3. Petals 4.5-7(8)mm long; plants often mat-forming; mature fruits mostly 4-5.5mm long, the styles 2-4mm long
      4. Outer leaves linear-oblanceolate or narrowly spatulate, inner leaves linear; plants densely caespitose, stems many, usually less than 10cm tall **P. reediana** O'Kane & Al-Shehbaz
      4. Outer leaves oblanceolate usually with an obovate blade, inner leaves linear-oblanceolate or narrower; stems few to many, slender and often weak, some usually over 10cm tall **P. spatulata** (Rydb.) Grady & O'Kane
  2. Pedicels in fruit uniformly recurved, not sigmoid; fruits mostly globose or nearly so
    5. Stems often over 20cm long; fruiting racemes not secund; petals yellow; leaves commonly all narrowly linear and entire **P. ludoviciana** (Nutt.) O'Kane & Al-Shehbaz
    5. Stems rarely over 20cm long; fruiting racemes usually secund; petals sometimes reddish or purplish tinged; leaves, or some of them, usually broader than linear, sometimes toothed **P. arenosa** (Richardson) O'Kane & Al-Shehbaz
      6. Rays of hairs on fruit somewhat spreading var. **arenosa**
      6. Rays of hairs on fruit appressed var. **argillosa** (Rollins & Shaw) Turner

Physocarpus
1. Pistils mostly 3-5, united only at base; some leaves usually well over 3cm long **P. opulifolius** (L.) Maxim. var. **intermedius** (Rydb.) Robins.
1. Pistils 1, if 2 or 3, united about half or more their length; leaves usually less than 3cm long **P. monogynus** (Torrey) Coult.

Picea glauca (Moench) Voss

Picradeniopsis oppositifolia (Nutt.) Rydb. ex Britt.

Pinus
1. Leaves mostly 5 in a cluster **P. flexilis** James
1. Leaves mostly 2 or 3 in a cluster
  2. Leaves mostly over 7cm long, in clusters of 2 and 3; cones mostly over 6cm long **P. ponderosa** Laws. & Laws.
  2. Leaves mostly less than 6cm long, mostly in clusters of 2; cones mostly less than 6cm long **P. contorta** Dougl. ex Loud. var. **latifolia** Engelm. ex Wats.

Piperia unalascensis (Spreng.) Rydb.

Piptatheropsis
1. Lemmas glabrous or rarely puberulent; glumes 2.5-3.5mm long **P. micrantha** (Trin. & Rupr.) Romasch et al.
1. Lemmas hairy; glumes 4-8mm long **P. pungens** (Torrey ex Spreng.) Romasch et al.

Plagiobothrys scouleri (H. & A.) Johnston var. **hispidulus** (Greene) Dorn

Plantago
1. Plants annual; leaves 7mm or less wide
  2. Inflorescence glabrous except sometimes at base; corolla lobes less than 1mm long **P. elongata** Pursh
  2. Inflorescence hairy; corolla lobes mostly 1.5-2mm long **P. patagonica** Jacq.
    3. Bracts about as long as flowers or shorter, barely if at all extending out from spike var. **patagonica**
    3. Bracts mostly twice or more as long as flowers, conspicuously extending out from spike var. **spinulosa** (Decne.) Gray
1. Plants perennial; some leaves usually over 7mm wide
  4. Sepals next to bract connate most or all their length; bracts mostly acuminate or caudate-acuminate **P. lanceolata** L.
  4. Sepals all free; bracts obtuse to acute
    5. Plants usually with dense, brown, woolly hairs at base; ovules 2-4 per ovary **P. eriopoda** Torrey
    5. Plants lacking dense hairs at base; ovules 4-22 per ovary
      6. Capsules mostly about twice as long as wide, dehiscing near middle; bracts usually broadly ovate **P. major** L.
      6. Capsules mostly 3-4 times as long as wide, dehiscing about 1/3 up from base; bracts usually narrowly lance-triangular **P. rugelii** Dcne.

Platanthera
1. Leaves mostly 1 or 2 at or near base **P. orbiculata** (Pursh) Lindl.
1. Leaves several along the stem
  2. Flowers white; lip petal prominently broadened at base **P. dilatata** (Pursh) Lindl. ex Beck
    3. Spur on middle flowers mostly as long as or longer than lip var. **dilatata**
    3. Spur on middle flowers mostly 1/2 to 2/3 length of lip var. **albiflora** (Cham.) Ledeb.
  2. Flowers greenish; lip petal very slightly broadened at base
    4. Lip 2.5-6mm long, rhombic-lanceolate to lanceolate, yellowish-green; pollinia often free of anther sacs **P. aquilonis** Sheviak
    4. Lip 5-12mm long, lanceolate to linear, whitish-green; pollinia remaining within anther sacs **P. huronensis** (Nutt.) Lindl.

Poa
1. Creeping rhizomes present, sometimes short, the culms often densely tufted also

2. Culms strongly flattened, 2 edged **P. compressa** L.
2. Culms terete or slightly flattened, not 2 edged
3. Lemmas with tangled cobwebby hairs at base
4. Panicle open; leaves scattered along stem **P. pratensis** L.
4. Panicle somewhat contracted; leaves mostly toward base **P. arida** Vasey
3. Lemmas lacking cobwebby hairs at base
5. Plants often dioecious, mostly pistillate; lower sheaths minutely retrorsely hairy and usually purplish **P. wheeleri** Vasey
5. Plants usually perfect flowered; lower sheaths not retrorsely hairy, usually green
6. First glume 2.5-3.5mm long, 1 nerved; anthers mostly about 1.5mm long; leaves mostly clustered near base **P. arida** Vasey
6. First glume 3.5-5mm long, usually 3-5 nerved; anthers mostly 1.8-2.3mm long; leaves somewhat scattered along stem **P. glaucifolia** Scribn. & Wms. ex Wms.
1. Creeping rhizomes normally lacking (culms sometimes decumbent and rooting)
7. Florets usually converted into bulblets with a dark purple base; culms bulbous at base **P. bulbosa** L.
7. Florets normal; culms not bulbous at base
8. Plants annual but often densely caespitose, lacking remains of old culms, mostly 25cm or less high; anthers 0.7-1.1mm long **P. annua** L.
8. Plants perennial, usually with remains of old culms, often over 25cm high; anthers sometimes longer
9. Lemmas with tangled cobwebby hairs at base (sometimes scant or obscure in *P. interior* which has glumes only 2-3mm long)
10. Lemmas glabrous or only the keel hairy (some of the cobwebby hairs may arise from base of marginal nerves); spikelets mostly 3mm or less long **P. trivialis** L.
10. Lemmas hairy on keel and marginal nerves; spikelets often over 3mm long
11. Culms 2-5dm high, densely tufted; ligule 0.5-1.5mm long; panicle 5-15cm long **P. interior** Rydb.
11. Culms 3-12dm high, loosely tufted; ligule 1.5-5mm long; panicle 12-30cm long **P. palustris** L.
9. Lemmas not cobwebby at base
12. Spikelets compressed, appearing flattened-oblong or ovate, the glumes and lemmas usually keeled to base, the lemmas usually short and broad with short obtuse tips
13. Leaf blades usually folded or involute, firm, rather stiff; lemmas 4-6mm long **P. fendleriana** (Steudel) Vasey
13. Leaf blades flat, or if involute, rather lax or soft; lemmas 2-4(4.5)mm long **P. glauca** Vahl var. **rupicola** (Nash ex Rydb.) Boivin
12. Spikelets little compressed, appearing long-cylindric, the lemmas convex on back, mostly elongate and narrow with long pointed tips, the keels often lacking or obscure **P. secunda** Presl
14. Plants averaging less than 3dm high; leaves mostly basal in a dense cluster, often narrowly involute, mostly less than 1.5mm wide and 5cm long, culm largely naked between basal leaves and the 2-7(10)cm long panicle ssp. **secunda** var. **secunda**
14. Plants averaging over 3dm high; leaves more scattered and less clustered, often flat and 1-3mm wide, or if clustered at base, then mostly over 5cm long; panicle 4-20cm long
15. Ligules of middle or upper leaves mostly 3-7mm long ssp. **secunda** var. **elongata** (Vasey) Dorn
15. Ligules of middle and upper leaves 1-2(3)mm long ssp. **juncifolia** (Scribn.) Soreng

Polanisia dodecandra (L.) DC. var. **trachysperma** (T. & G.) Iltis

Polemonium brandegeei (Gray) Greene

Polygala

1. Plants annual; stems usually solitary
2. Inflorescence 6-15mm wide; flowers often pink or purple; leaves alternate **P. sanguinea** L.
2. Inflorescence 5mm or less wide; flowers usually white; leaves whorled at least below **P. verticillata** L.
1. Plants perennial; stems usually several to many from base
3. Upper stem puberulent; leaves mostly over 3mm wide **P. senega** L.
3. Upper stem glabrous; leaves rarely over 3mm wide **P. alba** Nutt.

Polygonatum biflorum (Walt.) Ell.

Polygonum

1. Pedicels of oldest flowers recurved or reflexed; plants mostly erect; flowers not crowded
2. Achenes usually well over 2.5mm long; perianth rarely less than 3mm long, usually exceeding achene; plants moderately branched at most **P. douglasii** Greene
2. Achenes 2-2.5mm long, often exceeding the 1.5-2.5(3)mm perianth; plants usually diffusely branched from near base **P. engelmannii** Greene
1. Pedicels erect to spreading (rarely a few reflexed); plants sometimes prostrate; flowers often crowded
3. Leaves plicate with 2 longitudinal folds, minutely spinulose-serrulate **P. tenue** Michx.
3. Leaves flat or rolled, entire or nearly so
4. Flowers in terminal spike-like racemes, crowded, sometimes also axillary, the subtending bracts often much longer than the flowers; leaves rarely over 2mm wide, the lateral veins never plainly visible; stems usually sharply angled **P. polygaloides** Meisner ssp. **confertiflorum** (Nutt. ex Piper) Hickman
4. Flowers mostly in leaf axils or axils of bracts which are sometimes shorter than the flowers; leaves often over 2mm wide, the lateral veins sometimes visible; stems often terete and longitudinally striate
5. Achenes black, smooth and shiny; perianth usually connate for 1/4 to 1/3 the length, the segments not yellow-margined **P. sawatchense** Small
5. Achenes greenish to brown, often roughened, not shiny, or if black and shiny, the perianth connate for half its length or the segments yellow-margined
6. Stems erect or ascending; perianth segments often with yellow margins
7. Leaf blades elliptic, oblanceolate, or obovate, mostly 2-3 times as long as wide; achene papillate, papillae in vertical rows **P. erectum** L.
7. Leaf blades linear to lance-elliptic, mostly over 4 times as long as wide; achenes smooth or irregularly roughened **P. ramosissimum** Michx.
6. Stems mostly decumbent or prostrate; perianth segments with white or pink margins
8. Outer perianth segments longer and wider than the inner 2; leaves elliptic to obovate, less than 3 times as long as wide **P. achoreum** Blake
8. Outer perianth segments slightly if at all longer and wider than the inner 2; leaves narrowly elliptic, oblong, or oblanceolate, mostly over 3 times as long as wide **P. aviculare** L.

Polypodium saximontanum Windham

Polypogon monspeliensis (L.) Desf.

Polystichum

1. Lower leaflets about as long as wide **P. lonchitis** (L.) Roth
1. Lower leaflets 2 or more times as long as wide **P. munitum** (Kaulf.) Presl

Populus

1. Leaves white-tomentose beneath, margins coarsely toothed or lobed **P. alba** L.
1. Leaves usually glabrous or glabrate beneath, margins entire or toothed

2. Leaf blades suborbicular or cordate to deltoid; petioles strongly laterally flattened below blade
3. Leaf blades suborbicular or cordate; bark smooth, whitish-green **P. tremuloides** Michx.
3. Leaf blades mostly deltoid; bark rough, usually dark **P. deltoides** Bartr. ex Marsh. var. **occidentalis** Rydb.
2. Leaf blades lanceolate or ovate; petioles usually not flattened
4. Petioles mostly less than 1/3 the blade length; blades mostly lanceolate **P. angustifolia** James
4. Petioles mostly over 1/3 the blade length; blades mostly ovate
5. Leaf blades about as green beneath as above, the base usually cuneate; petiole often channeled at end near blade **P. acuminata** Rydb.
5. Leaf blades much lighter beneath than above, the base usually rounded to subcordate; petiole usually terete or nearly so at end near blade **P. balsamifera** L.

Portulaca oleracea L.

Potamogeton

1. Leaves all 5mm wide or less, mostly linear with nearly parallel sides, all submersed
2. Leaves finely serrulate, at least upper half, 3-5mm wide **P. crispus** L.
2. Leaves entire, 1-3.5mm wide
3. Leaf blades usually lacking glands at base; fruit with a toothed or undulate keel down the back **P. foliosus** Raf.
3. Leaf blades often with a pair of glands at base; fruit usually not undulate-keeled **P. pusillus** L.

1. Leaves, or some of them, over 5mm wide, these often elliptic or ovate and often floating
4. Leaves all submersed and similar, cordate or subcordate at base and abruptly sessile or clasping (rarely tapered to base if toothed)
5. Leaves finely serrulate, at least upper half, 3-12mm wide **P. crispus** L.
5. Leaves entire, mostly over 12mm wide
6. Tip of leaves shaped like the bow of a boat, the blades mostly 10cm or more long; achene 4-5mm long **P. praelongus** Wulf.
6. Tip of leaves flat, the blades mostly less than 10cm long; achene 2.5-3.5mm long **P. richardsonii** (Bennett) Rydb.
4. Leaves usually of 2 kinds, submersed and floating, the floating sometimes not developed, the submersed tapered to base or petioled
7. Submersed leaves thread-like or ribbon-like with nearly parallel sides
8. Submersed leaves 3-10mm wide **P. epihydrus** Raf.
8. Submersed leaves 0.5-2mm wide **P. diversifolius** Raf.
7. Submersed leaves broader, the sides curved and not parallel
9. Floating leaf blades lacking, or if present, reddish tinged, usually long-tapering to base, 7-15 nerved, the petioles 2cm or less long **P. alpinus** Balbis
9. Floating leaf blades usually greenish, often rounded at base, 13-29 nerved, the petioles often over 2cm long
10. Submersed leaves 1-15mm wide, 5-30 times as long as wide, mostly 3-9 nerved; petioles of floating leaves often longer than blades; achene about 2-3mm long **P. gramineus** L.
10. Submersed leaves often 15mm or more wide, 3-5(9) times as long as wide, mostly 9-19 nerved; petioles of floating leaves mostly shorter than blades; achene about 3.5mm long **P. illinoensis** Morong

Potentilla

1. Plants annual or biennial or rarely a short-lived perennial with a taproot; leaves never white-tomentose beneath; stamens mostly 10-20
2. Lower leaves with mostly 5-11 leaflets; mature achenes with a lateral wedge-shaped appendage about as large as the achene **P. supina** L. var. **nicolletii** Wats.
2. Lower leaves mostly with 3 or rarely 5 leaflets; mature achenes lacking a conspicuous appendage
3. Lower part of stem stiffly hirsute with unicellular hairs; stamens usually 20, rarely as few as 15 **P. norvegica** L.
3. Lower part of stem somewhat soft-pubescent often with some multicellular hairs; stamens usually 10 or 15
4. Lower part of stem usually with unicellular, non-glandular hairs; calyx not glandular **P. rivalis** Nutt.
4. Lower part of stem with some multicellular, often glandular hairs; calyx glandular **P. biennis** Greene

1. Plants perennial with usually well developed rootstocks; leaves often white-tomentose beneath; stamens usually 20 or more
5. Basal leaves pinnately compound, some with 5 or more leaflets
6. Plants with stolons; flowers solitary on naked peduncles **P. anserina** L.
6. Plants lacking stolons; flowers usually several on somewhat leafy flowering stems, rarely solitary
7. Styles thickened and usually glandular-roughened at base; stipules usually deeply cleft **P. pensylvanica** L.
7. Styles usually not thickened or glandular-roughened at base; stipules mostly entire or very shallowly toothed
8. Leaflets mostly oblong-elliptic or oblanceolate, 1-5cm long, often gray-tomentose beneath and gray-strigose above, rarely lobed over halfway to midrib; plants mostly over 2dm high
9. Leaves subpalmately compound, usually green above; anthers often over 0.7mm long
10. Leaflets white to silver hairy beneath, rarely divided as much as halfway to midrib **P. pulcherrima** Lehm.
10. Leaflets green to less frequently grayish hairy beneath, mostly divided about halfway or more to midrib **P. gracilis** Dougl. ex Hook. var. **fastigiata** (Nutt.) Wats.
9. Leaves usually definitely pinnately compound, often silvery hairy above; anthers mostly 0.5-0.7mm long **P. hippiana** Lehm.
11. Calyx primarily sericeous, sometimes mixed with tomentum; leaflets usually greenish above var. **hippiana**
11. Calyx primarily tomentose, sometimes with a few coarse hairs intermixed; leaflets mostly about equally gray or white on both sides var. **effusa** (Dougl. ex Lehm.) Dorn
8. Leaflets often less than 2cm long or else not as above or the plants less than 2dm high
12. Leaflets mostly 5-7, tomentose beneath **P. concinna** Richardson
12. Leaflets mostly 9-17, usually not tomentose beneath **P. plattensis** Nutt.
5. Basal leaves trifoliolate or palmately compound with more than 3 leaflets
13. Leaves white-tomentose beneath
14. Petals 2-4mm long; stems elongate and leafy **P. argentea** L.
14. Petals 4-12mm long; stems various
15. Leaf blades 1-3cm long **P. concinna** Richardson
15. Leaf blades (2)3-10cm long **P. pulcherrima** Lehm.
13. Leaves not white-tomentose beneath
16. Plants with mostly cauline leaves; mature achenes reticulate; stamens usually 25, the anthers mostly 1mm or more long **P. recta** L.
16. Plants sometimes with mainly basal leaves; mature achenes smooth or reticulate; stamens usually 20, the anthers often less than 1mm long
17. Leaflets mostly 1-4cm long; anthers mostly 0.4-0.7mm long **P. glaucophylla** Lehm.
17. Leaflets mostly 3-10cm long; anthers mostly 0.6-1.3mm long
18. Leaflets silver hairy beneath, rarely divided as much as halfway to midrib **P. pulcherrima** Lehm.
18. Leaflets green to less frequently grayish hairy beneath, mostly divided about halfway or more to midrib **P. gracilis** Dougl. ex Hook. var. **fastigiata** (Nutt.) Wats.

Prenanthes racemosa Michx. var. **multiflora** (Cronq.) Dorn

Primula pauciflora (Greene) Mast & Reveal

1. Plants usually glabrous; pollen sacs usually maroon var. **pauciflora**

1. Plants glandular-puberulent or minutely glandular; pollen sacs yellow var. **distola** (Reveal) Mast & Reveal
Prosartes
1. Ovary broadly ovoid, obovoid, obconic, or obpyriform, becoming 3 lobed after anthesis, papillose; ovules 6-15; leaf margins pubescent with mostly spreading hairs **P. trachycarpa** Wats.
1. Ovary ellipsoid, not 3 lobed nor papillose; ovules 4-6; leaf margins glabrous or pubescent with mostly forward pointing hairs **P. hookeri** Torrey
Prunella vulgaris L.
Prunus
1. Flowers many in elongate racemes **P. virginiana** L. var. **demissa** (Nutt.) Torrey
1. Flowers 1-12 in umbels or corymbs
  2. Branches, or some of them, usually spine-tipped; calyx lobes hairy inside; fruit 15mm or more long, the stone usually flattened **P. americana** Marsh.
  2. Branches not spine-tipped; calyx lobes glabrous inside; fruit often less than 15mm long, the stone subglobose
    3. Plants low, often prostrate shrubs rarely over 1.5m high; leaves glaucescent beneath, entire toward base; petals glabrous; fruit 8mm or more in diameter **P. pumila** L. var. **besseyi** (Bailey) Waugh
    3. Plants usually upright shrubs or trees mostly over 1.5m high; leaves usually green on both sides, toothed to base or nearly so; petals hairy outside near base or glabrous; fruit usually 4-7mm in diameter **P. pensylvanica** L. f.
Pseudognaphalium
1. Plants glandular-hairy, sparsely if at all tomentose below inflorescence **P. macounii** (Greene) Kartesz
1. Plants not glandular, somewhat tomentose throughout **P. stramineum** (H. B. K.) Anderb.
Pseudoroegneria spicata (Pursh) Löve
Pseudotsuga menziesii (Mirb.) Franco var. **glauca** (Beissn.) Franco
Psoralidium
1. Corolla white or the keel blue; calyx lobes mostly half as long as tube or less **P. lanceolatum** (Pursh) Rydb.
1. Corolla blue or purple; calyx lobes nearly as long as tube or longer **P. tenuiflorum** (Pursh) Rydb.
Pteridium aquilinum (L.) Kuhn
1. Leaflets glabrous beneath except sometimes on margins and midrib var. **latiusculum** (Desv.) Underw. ex Heller
1. Leaflets evenly hairy beneath var. **pubescens** Underw.
Pterospora andromedea Nutt.
Puccinellia
1. Lower panicle branches erect to spreading at maturity; lemmas mostly 2mm or more long; anthers 0.7-1mm long **P. nuttalliana** (Schultes) Hitchc.
1. Lower panicle branches usually reflexed at maturity; lemmas mostly 2mm or less long; anthers 0.5-0.8mm long **P. distans** (L.) Parl.
Purshia tridentata (Pursh) DC.
Pyrola
1. Petals pink to purplish **P. asarifolia** Michx.
1. Petals white or greenish-white to yellowish
  2. Leaves prominently white-mottled or white-streaked along the veins on upper surface **P. picta** Smith
  2. Leaves usually not white-mottled or white-streaked
    3. Sepals about twice as long as wide **P. americana** Sweet
    3. Sepals (free portion) about as long as wide
      4. Leaf blades usually less than 3cm long; sepals rounded to acute **P. chlorantha** Sw.
      4. Leaf blades, or some of them, usually over 3cm long; sepals acute to acuminate **P. elliptica** Nutt.
Quercus macrocarpa Michx.
Ranunculus
1. Plants aquatic, mostly submerged or floating; most leaves finely dissected with the segments less than 1mm wide **R. aquatilis** L. var. **diffusus** With.
1. Plants terrestrial, or if aquatic, the leaves not finely dissected as above
  2. Stems creeping and rooting at nodes or the plants with stolons
    3. Leaves entire or merely shallowly rounded-toothed **R. cymbalaria** Pursh
    3. Leaves compound or simple and lobed or divided at least to near middle
      4. Leaves 3-5 lobed about halfway to base, the lobes usually round and entire; petals 3-5 **R. hyperboreus** Rottb.
      4. Leaves compound or lobed more than halfway to base, the lobes usually sharply toothed; petals usually more than 5 **R. repens** L. var. **pleniflorus** Fern.
  2. Stems upright or rarely rooting at lower nodes only; stolons lacking
    5. Basal leaves mostly simple and entire or merely toothed or very shallowly lobed (some, but not all, rarely divided or compound)
      6. Basal leaf blades mostly cordate or truncate at base
        7. Petals 8-15mm long; achenes finely puberulent **R. cardiophyllus** Hook.
        7. Petals 1.5-3.5mm long; achenes glabrous **R. abortivus** L.
      6. Basal leaf blades mostly rounded to cuneate or acute at base (rarely a few cordate in *R.inamoenus*)
        8. Basal leaves usually entire, rarely notched once or twice **R. glaberrimus** Hook.
          9. Basal leaves usually entire, elliptic to oblanceolate, longer than wide; stem leaves entire to 3-lobed, middle lobe largest var. **ellipticus** (Greene) Greene
          9. Basal leaves often shallowly lobed, usually ovate to obovate, sometimes wider than long; stem leaves often entire var. **glaberrimus**
        8. Basal leaves with large rounded teeth or conspicuously lobed
          10. Petals 1.5-3.5mm long; achene beak 0.3mm or less long
            11. Leaves and stems glabrous **R. abortivus** L.
            11. Leaves and stems with scattered long hairs **R. micranthus** Nutt.
          10. Petals 2-9mm long; achene beak 0-0.9mm long
            12. Fruiting head about twice as long as wide; achene beak 0.4-0.9mm long **R. inamoenus** Greene
            12. Fruiting head about as long as wide; achene beak 0.3mm or less long **R. rhomboideus** Goldie
    5. Basal leaves either compound or divided usually halfway or more to base
      13. Leaves all basal, 0.5-4cm long, the flowers on naked stalks from the base; achenes woolly, the beaks somewhat spiny; annual **R. testiculatus** Crantz
      13. Leaves basal and on stem or at least bracts present on stem; achenes not woolly, the beaks often not spiny; mostly perennials
        14. Petals mostly 8-18mm long, usually conspicuously exceeding the sepals
          15. Basal leaves 4-5 times cleft but not with leaflets nor petiolules; stems not rooting at nodes; petals 5 **R. acris** L.
          15. Basal leaves, or some of them, usually compound and the leaflets with petiolules; stems often rooting at lower nodes; petals usually more than 5 **R. repens** L. var. **pleniflorus** Fern.
        14. Petals mostly 1.5-6(7)mm long, little if at all exceeding the sepals
          16. Basal leaf blades, or some of them, compound with usually stalked leaflets

17. Plants glabrous or with sparse appressed or curled hairs **R. abortivus** L.
17. Plants conspicuously long-hairy with spreading hairs
18. Petals shorter than sepals; achene beaks 0.5-0.9mm long; stems erect, not rooting at lower nodes **R. pensylvanicus** L. f.
18. Petals usually subequal to or slightly exceeding the sepals; achene beaks 1-1.5mm long; stems often somewhat decumbent, occasionally rooting at lower nodes **R. macounii** Britt.
16. Basal leaf blades simple although occasionally cleft about to base but without stalked leaflets
19. Achene beaks 1-2mm long, styles relatively long **R. uncinatus** D. Don ex G. Don
19. Achene beaks about 0.2mm long or less, the styles accordingly very short or lacking
20. Basal leaves, or some of them, simple and merely toothed, or lobed about to middle, or rarely compound and the leaflets merely toothed or very shallowly lobed; receptacle in fruit 5mm or less long; achene beak 0.1-0.2mm long **R. abortivus** L.
20. Basal leaves usually all simple and deeply 3-5 lobed; receptacle in fruit usually over 5mm long; achene beak about 0.1mm long **R. sceleratus** L. var. **multifidus** Nutt.

Ratibida
1. Head 2 or more times as long as wide excluding rays, usually well over 5cm above uppermost leaf; rays mostly 7-35mm long **R. columnifera** (Nutt.) Wooton & Standley
1. Head 1-1.5 times as long as wide excluding rays, 1-3(5)cm above uppermost leaf; rays 3-8mm long **R. tagetes** (James) Barnh.

Rhamnus
1. Leaves opposite or subopposite; prominent lateral leaf veins mostly 3-5 pair **R. cathartica** L.
1. Leaves alternate; prominent lateral leaf veins mostly 6 or more pair **R. alnifolia** L'Her.

Rhodiola integrifolia Raf.

Rhus
1. Leaflets more than 5 **R. glabra** L.
1. Leaflets 3 or 5 **R. trilobata** Nutt.

Ribes
1. Spines or prickles present at least at nodes
2. Hypanthium shallowly cup-shaped or saucer-shaped; pedicels often jointed below ovary **R. lacustre** (Pers.) Poiret
2. Hypanthium campanulate, tubular-campanulate, or cylindric; pedicels not jointed below ovary
3. Stamens about equaling petals **R. oxyacanthoides** L.
4. Hypanthium less than 4mm long, subequal to sepals var. **oxyacanthoides**
4. Hypanthium usually 4-6mm long, longer than sepals var. **setosum** (Lindl.) Dorn
3. Stamens twice or more as long as petals
5. Stamens 4 or more times as long as petals in at least some flowers **R. missouriense** Nutt.
5. Stamens about twice as long as petals **R. hirtellum** Michx.

1. Spines or prickles lacking
6. Flowers bright yellow or the petals sometimes reddish, glabrous, not glandular **R. aureum** Pursh
7. Hypanthium usually less than 9(10)mm long, twice or less as long as sepals; largest leaves tending to be 3 lobed with relatively shallow and obtuse teeth var. **aureum**
7. Hypanthium usually (8)10mm or more long, mostly over twice as long as sepals; largest leaves tending to be 5 lobed with relatively prominent and pointed teeth var. **villosum** DC.
6. Flowers, or at least the petals, white, pinkish, or cream, not yellow, often hairy or glandular
8. Leaf lobes sharply pointed; leaf blades with sessile yellow glands beneath **R. americanum** Miller
8. Leaf lobes rounded or blunt; leaf blades usually lacking sessile yellow glands
9. Hypanthium usually 2 or more times as long as calyx lobes; calyx lobes 1.5-3mm long **R. cereum** Dougl. var. **pedicellare** Brewer & Wats.
9. Hypanthium less than twice as long as calyx lobes; calyx lobes 3-7mm long **R. hirtellum** Michx.

Robinia pseudoacacia L.

Rorippa
1. Plants perennial with rhizomes; petals (2)3.5-5mm long **R. sinuata** (Nutt.) Hitchc.
1. Plants annual or biennial or short-lived perennials without rhizomes; petals mostly 0.5-3.5mm long
2. Pedicels mostly 3-13mm long, usually as long as or longer than fruits; stems mostly erect, (1.5)3-10dm long **R. palustris** (L.) Besser
2. Pedicels mostly 1-5mm long, usually shorter than fruits; stems often spreading to decumbent, rarely over 5dm long
3. Valves of fruit minutely papillate; pedicels spreading to ascending **R. tenerrima** Greene
3. Valves of fruit smooth; pedicels spreading to strongly recurved **R. curvipes** Greene

Rosa
1. Stems conspicuously bristly with slender prickles
2. Leaflets mostly 5-7; flowers solitary or rarely 2 on lateral branches of year **R. acicularis** Lindley var. **sayi** (Schwein.) Rehder
2. Leaflets often 9-11; flowers 1 to several at end of main branches of year **R. arkansana** Porter
1. Stems nearly without bristles or with bristles rather sparse
3. Infrastipular prickles present **R. woodsii** Lindl.
3. Infrastipular prickles lacking **R. blanda** Aiton

Rubus
1. Leaves simple **R. parviflorus** Nutt.
1. Leaves compound
2. Plants not bristly or prickly **R. pubescens** Raf.
2. Plants bristly or prickly **R. idaeus** L. var. **aculeatissimus** Regel & Tiling

Rudbeckia
1. Leaves all toothed or entire; disk flowers dark purple to brown **R. hirta** L. var. **pulcherrima** Farwell
1. Leaves mostly laciniate-pinnatifid or palmatifid; disk flowers yellow, sometimes fading grayish **R. laciniata** L. var. **ampla** (A. Nels.) Cronq.

Rumex
1. Flowers all or nearly all unisexual, the plants usually dioecious; leaves hastate; perianth in flower about 1.5mm long or less **R. acetosella** L.
1. Flowers all or nearly all bisexual; leaves not hastate; perianth in flower often over 1.5mm long
2. Valves, or some of them, bearing grains or callosities
3. Valves entire or only slightly toothed near base
4. Stems with axillary shoots below the inflorescence
5. Mature valves rarely over 3mm long **R. triangulivalvis** (Danser) Rechinger f.
5. Mature valves 4-7mm long **R. altissimus** Wood
4. Stems without axillary shoots below the inflorescence
6. Grain about half or more as long as valve **R. crispus** L.
6. Grain much less than half as long as valve **R. patientia** L.
3. Valves prominently irregularly toothed or dissected
7. Valves coarsely irregularly toothed, about 4mm long in fruit **R. stenophyllus** Ledeb.

7. Valves mostly dissected, the segments very narrow, the valves 3mm long or less **R. fueginus** Phil.
2. Valves not bearing grains
8. Plants with well developed, sometimes deep, rhizomes **R. venosus** Pursh
8. Plants without rhizomes, usually with a well developed taproot or fascicled roots
9. Stems with axillary shoots below the inflorescence **R. utahensis** Rech. f.
9. Stems without axillary shoots below the inflorescence **R. occidentalis** Wats.

Ruppia cirrhosa (Petagna) Grande

Sabulina

1. Pedicels usually glandular-hairy **S. rubella** (Wahl.) Dillenb. & Kadereit
1. Pedicels glabrous or nearly so
2. Petals 1.3-2 times as long as sepals; capsules shorter than to slightly exceeding sepals; seeds 0.8-0.9mm long **S. michauxii** (Fenzl) Dillenb. & Kadereit
2. Petals shorter than or barely equaling sepals, rarely none; capsules usually exserted well beyond sepals; seeds 0.5-0.6mm long **S. dawsonensis** (Britt.) Rydb.

Sagina saginoides (L.) Karsten

Sagittaria

1. Beak of achene, or mature style, less than 0.5mm long and pointing upward roughly parallel to achene or pistil axis **S. cuneata** Sheld.
1. Beak of achene, or mature style, usually over 0.5mm long and pointing at a right angle to the achene or pistil axis **S. latifolia** Willd.

Salicornia rubra A. Nels.

Salix

1. Leaves linear or linear-elliptic, 6 or more times as long as wide, usually less than 1(1.2)cm wide, remotely denticulate or serrulate to entire, petioles rather short and thick (rarely to 7mm) or none; branchlets not tomentose; flower bracts yellowish, greenish, or tan, the pistillate deciduous in fruit; styles 0-0.4mm long **S. exigua** Nutt.
2. Capsules 3-5(6)mm long, sessile or occasionally with a short stipe; leaves often persistently hairy, sometimes entire or nearly so, not especially veiny, thickish ssp. **exigua** var. **exigua**
2. Capsules mostly 5-8mm long, mostly on stipes 0.3mm or more long; leaves usually glabrous or glabrate when expanded, regularly serrulate, often spinulosely so, prominently veiny, thin ssp. **interior** (Rowlee) Cronq.

1. Leaves not linear (rarely not expanded in fruit), the width variable, usually less than 6 times as long as wide, or if more, without the other characteristics
3. Plants introduced trees with elongate pendulous branchlets; expanded leaves narrowly lanceolate or lance-linear, 0.9-1.8cm wide, spinulose-serrate; Weeping Willow **S. babylonica** L.
3. Plants trees or shrubs, branchlets spreading or ascending, not especially elongate; leaves often broader, entire or variously toothed
4. Plants with mature pistillate catkins **GROUP I**
4. Plants with mature staminate catkins or lacking catkins
5. Plants with mature staminate catkins **GROUP II**
5. Plants lacking catkins, with mature leaves **GROUP III**

GROUP I

1. Capsules glabrous
2. Flower bracts yellow, green, or whitish, deciduous in fruit
3. Leaves about equally green on both sides or slightly more pale on underside but not glaucous
4. Capsules mostly (6)7-12 mm long when mature, somewhat shiny, maturing in summer; catkins (1)1-5.5cm long; leaves glabrous even when young (except the first one emerging from the bud); stipules lacking or merely glands; shrub of boggy places **S. serissima** (Bailey) Fern.
4. Capsules mostly 7mm or less long (rarely to 11mm), usually dull, maturing in spring; catkins 1.7-10cm long; young leaves often hairy; stipules usually developed, occasionally deciduous, rarely reduced to glands; trees or shrubs often in better drained places or along streams
5. Plants introduced trees; expanded leaves bright shiny green on upperside, pale on underside, usually glabrous from emergence **S. pentandra** L.
5. Plants native shrubs (small trees); leaves dull green on both sides or slightly paler on underside, often hairy at least when young
6. Expanded leaves mostly lanceolate, usually gradually tapering to the long-attenuate or acute tip, often relatively bluntly serrate or serrulate **S. lasiandra** Benth. var. **caudata** (Nutt.) Sudw.
6. Expanded leaves mostly lance-ovate to ovate, usually somewhat constricted before the long-attenuate tip (cuspidate-acuminate), relatively sharply serrate **S. lucida** Muhl.
3. Leaves obviously lighter beneath than above from glaucescence
7. Bud scales split down the side toward branchlet with free overlapping margins; leaf tips acuminate **S. amygdaloides** Anderss.
7. Bud scales cap-like, not split down the side; leaf tips variable
8. Margins of leaves of floriferous branchlets often lacking glands; capsules 4-5.5mm long, maturing in spring; introduced tree **S. fragilis** L.
8. Margins of leaves of floriferous branchlets usually strongly glandular; capsules 6-12mm long, maturing in summer; shrub **S. serissima** (Bailey) Fern.
2. Flower bracts usually brown or black, persistent in fruit
9. Styles averaging 0.7mm or less long **S. eriocephala** Michx. var. **famelica** (Ball) Dorn
9. Styles averaging over 0.7mm long **S. pseudomonticola** Ball

1. Capsules hairy
10. Leaf blades narrowly elliptic, oblong, or oblanceolate, entire or remotely crenulate, usually white-tomentose beneath, mostly glabrous or glabrate and green above; stipes 1.2mm or less long **S. candida** Flügge ex Willd.
10. Leaf blades not as above (rarely not expanded in fruit); stipes 0-5mm long
11. Leaf blades mostly 5 or more times as long as wide, usually sharply serrate at least in part; styles 0.1-0.3mm long **S. petiolaris** Smith
11. Leaf blades, if as much as 5 times as long as wide, not sharply serrate and styles 0.3-1.8mm long
12. Stipes mostly 2-5mm long; styles 0.4mm or less long; flower bracts tawny (or greenish-yellow); branchlets of year usually red-purple and appressed-hairy; bark of 2-year old branchlets cracked giving a white-streaking appearance; mature buds with depressed margins **S. bebbiana** Sarg.
12. Stipes 2mm or less long, or if as long as 3mm, the styles often over 0.4mm long, the flower bracts mostly brown or black, and the branchlets and buds not as above
13. Stipes 0-1mm long; leaves, if present, elliptic or narrowly oblanceolate and often entire; branchlets of previous year often chestnut to red or red-purple and usually shiny; stigmas usually less than 0.5mm long; capsules not strongly beaked **S. planifolia** Pursh
13. Stipes (0.8)1-3mm long; leaves, if present, obovate to broadly oblanceolate, or if elliptic, then usually with coarsely toothed or undulate margins; branchlets of previous year yellowish to reddish-brown, dull; stigmas usually over 0.5mm long; capsules usually strongly beaked, the beak forming a full curl or more after dehiscence
14. Branchlets of previous year glabrous; leaves, if present, often with undulate or toothed margins, soon becoming glabrous (glabrate), at least beneath; wet habitats **S. discolor** Muhl.

14. Branchlets of previous year sometimes hairy; leaves, if present, often entire or nearly so, usually persistently hairy with at least some sparse, often reddish hairs beneath, especially near midrib; dryer upland habitats **S. scouleriana** Barratt ex Hook.

GROUP II

1. Stamens 3-12
2. Bud scales split down the side toward branchlet, the free margins overlapping; leaf tips acuminate; trees **S. amygdaloides** Anderss.
2. Bud scales cap-like, not split down the side; leaf tips variable; trees or shrubs
3. Catkins (1)1-5.5cm long; leaves glabrous even when young (except the first one emerging from the bud); stipules lacking or merely glands; shrub of boggy places **S. serissima** (Bailey) Fern.
3. Catkins 1.7-10cm long; young leaves often hairy; stipules usually developed, occasionally deciduous, rarely reduced to glands; trees or shrubs mostly in better drained places or along streams
4. Plants introduced trees; expanded leaves bright shiny green on upperside, pale on underside, usually glabrous from emergence **S. pentandra** L.
4. Plants native shrubs (small trees); leaves dull green on both sides or slightly paler on underside, often hairy when young
5. Expanded leaves mostly lanceolate, usually gradually tapering to the long-attenuate or acute tip, often relatively bluntly serrate or serrulate **S. lasiandra** Benth. var. **caudata** (Nutt.) Sudw.
5. Expanded leaves mostly lance-ovate to ovate, usually somewhat constricted before the long-attenuate tip (cuspidate-acuminate), relatively sharply serrate **S. lucida** Muhl.

1. Stamens 2
6. Floral bracts yellowish, greenish, whitish, or tawny; catkins on leafy branchlets; branchlets of previous 3 years each very brittle and easily broken off at base; introduced tree **S. fragilis** L.
6. Floral bracts often blackish or brownish, rarely yellowish, greenish, or tawny; catkins on leafy branchlets or sessile; branchlets not especially brittle; native shrubs (tree)
7. Leaf blades narrowly elliptic, oblong, or oblanceolate, entire or remotely crenulate, usually white-tomentose beneath, mostly glabrous or glabrate and green above **S. candida** Flügge ex Willd.
7. Leaf blades not as above (rarely not expanded in flower)
8. Branchlets of year usually red-purple and appressed-hairy; bark of 2-year old branchlets cracked giving a white-streaking appearance; mature buds with depressed margins; flower bracts tawny (or greenish-yellow) **S. bebbiana** Sarg.
8. Branchlets, buds, and flower bracts not combined as above
9. Plants with mostly oblanceolate to obovate leaf blades; freshly stripped bark of living branchlets of previous year usually with a "skunky" odor; shrub or small tree usually over 2m high; mostly in dryer upland habitats **S. scouleriana** Barratt ex Hook.
9. Plants not as above
10. Leaves mostly elliptic, dark green and shiny above, often entire; year-old branchlets usually reddish and shiny **S. planifolia** Pursh
10. Leaves mostly lanceolate to ovate or obovate, if elliptic, usually with toothed or undulate margins and not shiny above and the year-old branchlets not reddish and shiny
11. Leaf midrib and/or petiole often red, the blades usually ovate, obovate, or broadly elliptic; branchlets of year hairy **S. pseudomonticola** Ball
11. Leaf midrib and petiole usually green, the blades sometimes lanceolate, elliptic, or oblanceolate; branchlets of year often glabrous
12. Leaf blades mostly 5 or more times as long as wide, usually sharply serrate at least in part, 2(3)cm wide or less; year-old branchlets reddish-brown, brown, or purplish **S. petiolaris** Smith
12. Leaf blades, if as much as 5 times as long as wide, not sharply serrate, or wider, or year-old branchlets yellow-green or yellowish
13. Leaves usually distinctly and sharply serrate, often long-attenuate at tip, the middle ones on branchlet mostly narrowly elliptic or lance-elliptic to lanceolate; catkins coetaneous or subprecocious; year-old branchlets yellow-green **S. eriocephala** Michx. var. **famelica** (Ball) Dorn
13. Leaves mostly serrulate to undulate, mostly acute to rounded at tip, often broader; catkins precocious; year-old branchlets usually reddish-brown but sometimes yellowish **S. discolor** Muhl.

GROUP III

1. Leaves about equally green on both sides or slightly more pale on underside but not glaucous
2. Plants introduced trees; expanded leaves shiny green on upperside, pale on underside, usually glabrous from emergence **S. pentandra** L.
2. Plants native shrubs (small trees); leaves mostly dull green on both sides or slightly paler on underside, often hairy when young
3. Leaves glabrous even when young (except the first one emerging from the bud); stipules lacking or merely glands; shrub of boggy places **S. serissima** (Bailey) Fern.
3. Leaves often hairy at least when young; stipules usually developed, occasionally deciduous; shrubs (small trees) mostly in better drained places or along streams
4. Expanded leaves mostly lanceolate, usually gradually tapering to the long-attenuate or acute tip, often relatively bluntly serrate or serrulate **S. lasiandra** Benth. var. **caudata** (Nutt.) Sudw.
4. Expanded leaves mostly lance-ovate to ovate, usually somewhat constricted before the long-attenuate tip (cuspidate-acuminate), relatively sharply serrate **S. lucida** Muhl.

1. Leaves obviously lighter on underside from glaucescence or dense hairs
5. Bud scales split down the side toward branchlet, the free margins overlapping; leaf tips acuminate; trees **S. amygdaloides** Anderss.
5. Bud scales cap-like, not split down the side; leaf tips variable; trees or shrubs
6. Leaf blades narrowly elliptic, oblong, or oblanceolate, entire or remotely crenulate, usually white-tomentose beneath, mostly glabrous or glabrate and green above **S. candida** Flügge ex Willd.
6. Leaf blades not as above
7. Branchlets of year usually red-purple and appressed-hairy; bark of 2-year old branchlets cracked giving a white-streaking appearance; mature buds with depressed margins **S. bebbiana** Sarg.
7. Branchlets and buds not as above
8. Plants with mostly oblanceolate to obovate leaf blades; freshly stripped bark of living branchlets of previous year usually with a "skunky" odor; shrub or small tree usually over 2m high; mostly dryer upland habitats **S. scouleriana** Barratt ex Hook.
8. Plants not as above
9. Leaf blades mostly elliptic, dark shiny green above, often entire; year-old branchlets usually reddish and shiny **S. planifolia** Pursh
9. Leaf blades mostly lanceolate to ovate or obovate, if elliptic, the leaves usually toothed and not shiny above and the year-old branchlets not reddish and shiny
10. Leaf midrib and/or petiole often red, the blades usually ovate, obovate, or broadly elliptic; branchlets of year hairy **S. pseudomonticola** Ball
10. Leaf midrib and petiole usually green, the blades often lanceolate, elliptic, or oblanceolate; branchlets of year often glabrous
11. Branchlets of previous 3 years each very brittle and easily broken off at base; leaves mostly narrowly elliptic, lance-elliptic, or lanceolate, with prominent, somewhat coarse, gland-tipped teeth; introduced tree **S. fragilis** L.
11. Branchlets not especially brittle; leaves usually wider or with less prominent or finer teeth or undulate; native shrubs

12. Leaf blades mostly 5 or more times as long as wide, usually sharply serrate at least in part, 2(3)cm wide or less; year-old branchlets reddish-brown, brown, or purplish **S. petiolaris** Smith
12. Leaf blades, if as much as 5 times as long as wide, not sharply serrate, or wider, or year-old branchlets yellow-green or yellowish
13. Petioles usually with glands near base of leaf blade; leaves glabrous even when young (except the first one emerging from the bud); stipules lacking or merely glands **S. serissima** (Bailey) Fern.
13. Petioles usually without glands; leaves often hairy at least when young; stipules usually present but sometimes deciduous
14. Mature leaves usually distinctly and sharply serrate, generally acute to long-attenuate at tip, the middle ones on branchlet mostly narrowly elliptic or lance-elliptic to lanceolate; year-old branchlets yellow-green **S. eriocephala** Michx. var. **famelica** (Ball) Dorn
14. Mature leaves mostly serrulate to undulate, mostly acute to rounded at tip, often broader; year-old branchlets usually reddish-brown but sometimes yellowish **S. discolor** Muhl.

Salsola
1. Plants much branched near base; upper flower bracts mostly spreading at greater than a 45 degree angle when mature; perianth segments prominently membranous-winged when mature **S. tragus** L.
1. Plants mostly branched above with 1 main stem; upper flower bracts mostly erect or spreading at less than a 45 degree angle when mature; perianth segments wingless or obscurely winged **S. collina** Pallas

Salvia
1. Leaf blades mostly somewhat truncate or cordate at base, crenate or crenate-dentate; perennial **S. pratensis** L.
1. Leaf blades mostly tapering to base, entire to remotely serrate; annual **S. reflexa** Hornem.

Sambucus racemosa L. var. **pubens** (Michx.) Koehne

Sanguinaria canadensis L.

Sanicula
1. Leaves, or some of them, over 5cm wide, the lower palmately compound **S. marilandica** L.
1. Leaves 2-5cm wide, the lower pinnately or ternately compound **S. graveolens** Poepp. ex DC.

Saponaria officinalis L.

Sarcobatus vermiculatus (Hook.) Torrey

Saxifraga cernua L.

Schedonnardus paniculatus (Nutt.) Trel.

Schedonorus
1. Auricles ciliate-margined; glumes 3-7mm long; lemmas 7-10mm long **S. arundinaceus** (Schreb.) Dumort.
1. Auricles not ciliate; glumes mostly 2-4mm long; lemmas 4-7mm long **S. pratensis** (Huds.) Beauv.

Schizachne purpurascens (Torrey) Swallen

Schizachyrium scoparium (Michx.) Nash

Schoenoplectus
1. Culms triangular, usually less than 1m high; spikelets sessile or nearly so, the inflorescence not branched
2. Bracts 2 or 3, the largest mostly 3-10cm long, the smaller resembling large scales but not subtending flowers; achenes 2.2-3.3mm long, 1.6-2.3mm wide **S. pungens** (Vahl) Palla var. **polyphyllus** (Boeckler) Dorn
2. Bracts solitary, mostly 1-3cm long; achenes 1.8-2.5mm long, 1.4-1.7mm wide **S. americanus** (Pers.) Volk.
1. Culms terete, usually about 1m high or more; spikelets in a branching inflorescence which is sometimes compact
3. Stigmas mostly 3; spikelets mostly all individually peduncled **S. heterochaetus** (Chase) Soják
3. Stigmas usually 2; spikelets often sessile in small clusters
4. Middle and lower scales mostly 3.5-4mm long; red-brown striolae usually prominent on the gray-white background of the scales; inflorescence rarely over 6cm long and 4cm wide **S. acutus** (Muhl. ex Bigelow) Löve & Löve var. **occidentalis** (Wats.) Smith
4. Middle and lower scales mostly 2.5-3mm long; red-brown striolae usually not prominent on the dark reddish-brown background of many scales; inflorescence sometimes over 6cm long or 4cm wide **S. tabernaemontani** (Gmelin) Palla

Scirpus
1. Stigmas usually 2; achenes lenticular; sheaths of basal leaves usually reddish tinged **S. microcarpus** J. & K. Presl
1. Stigmas usually 3; achenes trigonous; sheaths of basal leaves usually not reddish tinged
2. Perianth bristles much exceeding scales
3. Spikelets sessile or in subsessile glomerules; scales reddish-brown to dark brown (blackish) **S. cyperinus** (L.) Kunth
3. Spikelets solitary and pedicelled; scales greenish-black **S. atrocinctus** Fern.
2. Perianth bristles mostly shorter than scales **S. pallidus** (Britt.) Fern.

Scrophularia lanceolata Pursh

Scutellaria
1. Flowers 14mm or more long, solitary in leaf axils **S. galericulata** L.
1. Flowers less than 9mm long, in axillary or terminal racemes **S. lateriflora** L.

Secale cereale L.

Sedum
1. Leaves of flowering stems 3-5mm long, oval or ovate to obovate or spatulate **S. acre** L.
1. Leaves of flowering stems 7-20mm long, linear to lanceolate, often deciduous **S. lanceolatum** Torrey

Selaginella
1. Vegetative leaves on lower or convex side of branch longer than the others at the same level, the branches thus curved-ascending; broadest sporophylls about 2 times as broad as leaves; megaspores and microspores both normally present, megaspores in lower sporangia **S. densa** Rydb.
1. Vegetative leaves about equal in length at same level on branch, the branches mostly straight; broadest sporophylls about 3-4 times as broad as leaves; microspores usually lacking, only megaspores present **S. rupestris** (L.) Spring

Senecio
1. Rays lacking or minute
2. Plants annual weeds with some pinnately lobed leaves which are little if at all reduced upward **S. vulgaris** L.
2. Plants native perennials; leaves entire or toothed, usually reduced upward
3. Leaves sharply and irregularly toothed **S. rapifolius** Nutt.
3. Leaves entire or nearly so **S. hydrophilus** Nutt.
1. Rays present
4. Stems leafy, the leaves little if at all reduced upward, basal tuft usually lacking
5. Plants with a woody base, the leaves mostly linear or divided into linear segments
6. Leaves mostly simple and linear, sometimes with a pair of lobes toward base, the blades sometimes over 3mm wide **S. spartioides** T.& G.
6. Leaves mostly pinnately divided into linear segments, the segments rarely over 3mm wide **S. riddellii** T.& G.
5. Plants usually without a woody base; leaves lanceolate, elliptic, or ovate, lobed to once pinnatifid **S. eremophilus** Richardson
4. Stems not leafy or the leaves usually reduced upward, basal tuft usually present
7. Plants somewhat woolly or tomentose at flowering time, at least in inflorescence or toward base **S. integerrimus** Nutt.

8. Involucral bracts obscurely if at all black tipped var. **integerrimus**
8. Involucral bracts conspicuously black tipped var. **exaltatus** (Nutt.) Cronq.
7. Plants glabrous or nearly so at flowering time
9. Heads mostly (15)25 or more per stem **S. hydrophilus** Nutt.
9. Heads less than 15 per stem **S. crassulus** Gray

Setaria
1. Bristles subtending spikelets retrorsely scabrous **S. verticillata** (L.) Beauv.
1. Bristles subtending spikelets antrorsely scabrous
2. Bristles below each spikelet 5 or more; 2nd glume about half the length of spikelet; spikelets 2.8-3.4mm long **S. pumila** (Poiret) R. & S.
2. Bristles below each spikelet 1-6; 2nd glume as long as spikelet or nearly so; spikelets 2-2.7mm long **S. viridis** (L.) Beauv.

Shepherdia
1. Leaves usually somewhat silvery on both surfaces; spiny spur branches present **S. argentea** (Pursh) Nutt.
1. Leaves green above, silvery or brownish dotted beneath; not spiny **S. canadensis** (L.) Nutt.

Shinnersoseris rostrata (Gray) Tomb

Silene
1. Flowers all staminate
2. Calyx 5-8mm long; perennial **S. menziesii** Hook.
2. Calyx usually 15-30mm long; annual, biennial, or perennial
3. Plants annual; calyx teeth 5-9mm long **S. noctiflora** L.
3. Plants biennial or perennial; calyx teeth mostly 2-5mm long **S. latifolia** Poiret
1. Flowers pistillate or bisexual
4. Styles usually 5 (rarely 4 but then the flowers all pistillate or the petal blade shallowly 2 lobed at most without lateral teeth and 1-3mm long); valves of capsule usually 5 or 10
5. Flowers pistillate; blades of petals over 7mm long **S. latifolia** Poiret
5. Flowers mostly bisexual; blades of petals less than 5mm long **S. drummondii** Hook.
6. Petals about equaling calyx; seeds about 0.7mm long and wide var. **drummondii**
6. Petals about 1.5 times as long as calyx; seeds about 1mm long and wide var. **striata** (Rydb.) Bocquet
4. Styles usually 3 (rarely 4 or 5 but then the flowers bisexual and the petal blade prominently 2 or 4 lobed with lateral teeth and 3-7mm long); valves of capsule usually 3 or 6
7. Plants annual (or biennial), weedy
8. Plants glabrous above, often glandular in bands beneath nodes; blade of petals 2-4(7)mm long; calyx 4-12mm long
9. Cauline leaves mostly linear or oblanceolate; calyx 4-10mm long; annual **S. antirrhina** L.
9. Cauline leaves mostly elliptic, lanceolate, or lance-ovate; calyx 9-12mm long; biennial **S. cserei** Baumg.
8. Plants glandular-hairy throughout; blade of petals mostly 5-10mm long; calyx 15-30mm long **S. noctiflora** L.
7. Plants perennial, often not weedy
10. Calyx 5-8mm long; petals 6-10mm long **S. menziesii** Hook.
10. Calyx 9-18(20)mm long; petals 12-18mm long
11. Calyx 20 nerved at least below middle **S. vulgaris** (Moench) Garcke
11. Calyx faintly 10 nerved **S. nivea** (Nutt.) Muhl. ex DC.

Sinapis
1. Fruiting pedicels 3-7mm long, ascending or erect; body of fruit 1.5-3.5cm long; anthers about 1.7mm or more long **S. arvensis** L.
1. Fruiting pedicels 6-13(18)mm long, widely spreading; body of fruit 0.7-1.5cm long; anthers about 1.5mm long **S. alba** L.

Sisymbrium
1. Pedicels nearly as thick as fruits, the fruits mostly 5-10cm long **S. altissimum** L.
1. Pedicels usually much thinner than fruits, the fruits mostly 3.5cm or less long
2. Fruits mostly 1-2cm long, on pedicels 2-3mm long, closely appressed to rachis; petals about 3mm long **S. officinale** (L.) Scop.
2. Fruits mostly 2-3.5cm long, on pedicels 5-10mm long, not appressed to rachis; petals 5-8mm long **S. loeselii** L.

Sisyrinchium
1. Outer bract nearly twice or more the length of inner, usually united basally for no more than 3.5(4)mm; stem often wider than leaves
S. montanum Greene
1. Outer bract usually much less than twice the length of inner, united for (2)4-7mm; stems usually equal to or narrower than leaves
S. angustifolium Miller

Sium suave Walt.

Smilax lasioneura Hook.

Solanum
1. Plants spiny; pubescence of leaves stellate **S. rostratum** Dunal
1. Plants not spiny; pubescence lacking or not stellate
2. Leaves pinnately lobed or divided **S. triflorum** Nutt.
2. Leaves entire, toothed, or wavy-margined **S. ptychanthum** Dunal

Solidago
1. Plants with well developed, slender, creeping rhizomes; basal leaves not well developed in most species
2. Stems glabrous below inflorescence (rarely hairy and with a basal cluster of leaves); leaf surfaces usually glabrous
3. Largest leaves at middle of stem, predominantly elliptic or lance-elliptic, sharply acute or acuminate at tip, usually serrate; lower leaves deciduous **S. gigantea** Aiton
3. Largest leaves toward base, predominantly oblanceolate, broadly acute or obtuse at tip, entire to serrulate; lower leaves often persistent
4. Rays mostly 5-8mm long; stems hairy below inflorescence **S. multiradiata** Aiton
4. Rays mostly 3-5mm long; stems rarely hairy below inflorescence **S. missouriensis** Nutt.
2. Stems hairy at least between middle and inflorescence; basal cluster of leaves usually lacking; leaf surfaces hairy to subglabrous
5. Rays usually about 8 or fewer per head, 3-6mm long; largest leaves often 4 times or less as long as wide, obtuse or broadly acute at tip, entire to serrulate
6. Involucral bracts mostly broadest near middle and obtuse at tip; leaves often moderately hairy **S. mollis** Bartl.
6. Involucral bracts mostly broadest at base and acute at tip; leaves often sparsely hairy **S. velutina** DC. var. **nevadensis** (Gray) Taylor & Taylor
5. Rays usually about 13 per head, 1-4mm long; largest leaves mostly over 4 times as long as wide, sharply acute or acuminate at tip, usually sharply serrate
7. Leaves glabrate, especially on upper surface, rarely moderately hairy especially on veins of lower surface and on margins; stems becoming glabrate at lowermost persistent leaves **S. lepida** DC. var. **salebrosa** (Piper) Semple
7. Leaves moderately to densely hairy on both surfaces; stems usually moderately hairy even at lowermost persistent leaves **S. altissima** L. var. **gilvocanescens** (Rydb.) Semple
1. Plants with usually a short, stout rhizome or a caudex, rarely with slender rhizomes; basal leaves usually well developed

8. Ray and disk flowers white **S. ptarmicoides** (T. & G.) Boivin
8. Ray and disk flowers yellow
9. Leaves glabrous although sometimes with ciliate margins
10. Achenes glabrous **S. speciosa** Nutt. var. **pallida** Porter
10. Achenes hairy
11. Lower leaves with strongly ciliate-margined petioles; rays mostly about 13 per head **S. multiradiata** Aiton
11. Lower leaves without the petioles ciliate-margined; rays mostly about 8 per head **S. simplex** Kunth
9. Leaves pubescent with short spreading hairs or puberulent
12. Involucral bracts somewhat longitudinally striate; achenes glabrous or nearly so; basal leaves mostly 2-8cm wide **S. rigida** L. var. **humilis** Porter
12. Involucral bracts not striate; achenes hairy throughout; basal leaves mostly 0.3-2cm wide
13. Disk flowers mostly 5-9 per head, the rays about as many or more; inflorescence elongate, mostly 3 or more times as long as wide **S. nemoralis** Aiton var. **longipetiolata** (Mack. & Bush) Palmer & Steyerm.
13. Disk flowers mostly 8-16 per head, the rays usually fewer; inflorescence usually relatively broad, rarely over twice as long as wide **S. nana** Nutt.

Sonchus
1. Plants perennial with deep, horizontal, rhizome-like roots; heads mostly 2.5-5cm wide in flower including rays **S. arvensis** L.
1. Plants annual; heads mostly 1.5-2.5cm wide in flower including rays
2. Auricles at base of leaves acute; mature achenes transversely tuberculate-rugulose and several nerved **S. oleraceus** L.
2. Auricles at base of leaves rounded; mature achenes not rugulose, merely several nerved **S. asper** (L.) Hill

Sophora nuttalliana Turner
Sorbus scopulina Greene
Sorghastrum nutans (L.) Nash
Sorghum halepense (L.) Pers.
Sparganium
1. Stigmas usually 2; mature achenes somewhat truncate at tip, abruptly narrowed to beak; perianth almost as long as achene body **S. eurycarpum** Engelm. ex Gray
1. Stigmas mostly single; mature achenes narrowed gradually to beak; perianth usually much shorter than achene body
2. Leaves mostly 5mm or more wide, often scarious-margined near base; achene beak including stigma over 2mm long; mature pistillate heads sometimes over 2cm wide **S. emersum** Rehm.
2. Leaves mostly 2-6mm wide, not scarious-margined; achene beak including stigma about 2mm long; mature pistillate heads usually 2cm or less wide **S. angustifolium** Michx.

Spartina
1. Ligules about 1mm long; leaf blades mostly less than 5mm wide; spikelets 6-10mm long; awn of 2nd glume 1mm or less long **S. gracilis** Trin.
1. Ligules 1.5-3mm long; leaf blades mostly 5-15mm wide; spikelets 10-16mm long; awn of 2nd glume 2-7mm long **S. pectinata** Link
Spergularia
1. Seeds slightly pappilose, wingless; capsules mostly 3-5mm long **S. rubra** (L.) J. & K. Presl
1. Seeds smooth, usually broadly winged; capsules 5.5-7mm long **S. media** (L.) Presl

Sphaeralcea coccinea (Nutt.) Rydb.
Sphenopholis
1. Panicle dense, usually spike-like; 2nd glume about 1.5 times as long as wide or less **S. obtusata** (Michx.) Scribn.
1. Panicle loose, not spike-like; 2nd glume almost 3 times as long as wide **S. intermedia** (Rydb.) Rydb.
Spiraea
1. Inflorescence elongate **S. alba** DuRoi
1. Inflorescence somewhat flat-topped, broad **S. lucida** Dougl. ex Greene

Spiranthes romanzoffiana Cham.
Sporobolus
1. Plants annual; inflorescence contracted **S. neglectus** Nash
1. Plants usually perennial; inflorescence open or contracted
2. Spikelets mostly over 3mm long
3. Glumes acuminate; panicle somewhat open **S. heterolepis** (Gray) Gray
3. Glumes somewhat acute; panicle contracted **S. compositus** (Poiret) Merr.
2. Spikelets 2-2.5mm long
4. Margins of lower sheaths long-hairy or conspicuously ciliate, the collars usually long-hairy also; spikelets tending to be appressed to panicle branches, appearing crowded; not clump-forming, often appearing like an annual **S. cryptandrus** (Torrey) Gray
4. Margins of lower sheaths not long-hairy or conspicuously ciliate except sometimes at very summit, the collars glabrous or hairy only on the margins; spikelets tending to diverge from panicle branches, appearing scattered; usually forming large clumps **S. airoides** (Torrey) Torrey

Stachys palustris L. var. **pilosa** (Nutt.) Fern.
Stanleya pinnata (Pursh) Britt.
Stellaria
1. Plants annual weeds; stems with longitudinal lines of hairs **S. media** (L.) Vill.
1. Plants usually perennial; stems glabrous or the hairs uniformly distributed
2. Leaf margins finely tuberculate-scaberulous under magnification; pedicels spreading or reflexed **S. longifolia** Muhl. ex Willd.
2. Leaf margins mostly smooth; pedicels ascending to erect **S. longipes** Goldie

Stenotus armerioides Nutt.
Streptopus amplexifolius (L.) DC.
Stuckenia
1. Stipule sheath of lower leaves inflated and much wider than stem, green, 4cm or more long **S. vaginata** (Turcz.) Holub
1. Stipule sheath of lower leaves not as above
2. Stipule sheaths of lower leaves 20mm or more long, open to base; leaves usually sharp-pointed at tip; achenes usually with a beak about 0.5mm long **S. pectinata** (L.) Börner
2. Stipule sheaths of lower leaves 22mm or less long, usually fused into a tube at base; leaves often blunt at tip; achenes essentially unbeaked **S. filiformis** (Pers.) Börner
3. Plants 2-10dm long; lower stipules inflated, 0.2-5mm wide, disintegrating in age; fruits often lacking var. **occidentalis** (Robbins) Dorn
3. Plants 1-3dm long; lower stipules slightly if at all inflated, 1mm or less wide, persistent; fruits common var. **alpina** (Blytt) Dorn

Stutzia dioica (Nutt.) Zacharias
Suaeda
1. Perianth lobes horned at most when mature; branches somewhat stout **S. calceoliformis** (Hook.) Moq.
1. Perianth lobes broadly thin-winged when mature; branches somewhat slender and flexuous **S. occidentalis** (Wats.) Wats.

Symphoricarpos
1. Corolla evidently longer than wide, usually long tapering to base, not bulged on one side, the lobes mostly 1/4 to 1/2 as long as tube
S. oreophilus Gray var. **utahensis** (Rydb.) A. Nels.
1. Corolla little if at all longer than wide, rather abruptly tapering to base, often bulged on one side, the lobes mostly 1/2 as long to exceeding the tube
2. Style over 3mm long, usually hairy near middle, projecting from corolla; anthers mostly 1.5-2mm long **S. occidentalis** Hook.
2. Style 3mm or less long, glabrous, included; anthers mostly 1-1.5mm long **S. albus** (L.) Blake
Symphyotrichum
1. Plants annual; rays lacking or rudimentary **S. ciliatum** (Ledeb.) Nesom
1. Plants perennial; rays well developed
2. Peduncles and involucres glandular
3. Leaves strongly clasping the stem, little if at all reduced upward; plants often over 5dm high **S. novae-angliae** (L.) Nesom
3. Leaves barely or not at all clasping, usually much reduced upward; plants mostly less than 4dm high but occasionally more **S. oblongifolium** (Nutt.) Nesom
2. Peduncles and involucres not glandular
4. Plants hairy throughout with stiff, straight hairs, the outer involucral bracts and some leaves spinulose-tipped, the main leaves 7cm or less long and often with fascicles of smaller leaves in their axils; rays white
5. Involucre mostly 4.5mm or more long; heads mostly few at ends of erect or ascending branches; pappus 4.5-6mm long **S. falcatum** (Lindl.) Nesom
6. Rhizomes very short or none; hairs of stem and branches appressed or appressed-ascending var. **falcatum**
6. Rhizomes long-creeping; hairs of stem and branches spreading or spreading-ascending var. **commutatum** (T. & G.) Nesom
5. Involucre mostly 2.5-4.5mm long; heads usually many on drooping elongate branches; pappus 3-4mm long **S. ericoides** (L.) Nesom var. **stricticaule** (T. & G.) Nesom
4. Plants not as above
7. Lower leaves usually ovate to cordate, petioled, usually conspicuously toothed, rarely deciduous **S. ciliolatum** (Lindl.) Löve & Löve
7. Lower leaves mostly oblanceolate, lanceolate, or linear, sometimes sessile or entire or nearly so
8. Plants with slender rhizomes and stems mostly less than 2mm thick, without a tuft of basal leaves; leaves all linear or lance-linear, usually 8mm or less wide and mostly 6 or more times as long as wide **S. boreale** (T. & G.) Löve & Löve
8. Plants not as above
9. Leaves with appressed silvery silky hairs on both sides, entire **S. sericeum** (Vent.) Nesom
9. Leaves glabrous or hairy but not silvery silky, entire or toothed
10. Peduncles glabrous to sparsely hairy, usually glaucous; involucral bracts linear or lance-linear, acute; some bracts often cordate-clasping; achenes glabrous or nearly so **S. laeve** (L.) Löve & Löve var. **geyeri** (Gray) Nesom
10. Peduncles hairy or glabrous, usually not glaucous; involucral bracts usually broader, often obtuse; bracts various; achenes often hairy
11. Stems mostly with coarse, stiff, whitish hairs; leaves usually toothed, long-tapering to tip, mostly auriculate-clasping; involucres 5-12mm long **S. puniceum** (L.) Löve & Löve
11. Stems and leaves not as above; involucre often shorter
12. Pubescence of stems mostly in lines from leaf bases; inflorescence usually long, broad, and leafy with many heads **S. lanceolatum** (Willd.) Nesom var. **hesperium** (Gray) Nesom
12. Pubescence of stems only rarely in lines, usually somewhat uniform or lacking; inflorescence often compact and sparingly leafy with few heads **S. ascendens** (Lindl.) Nesom
Synthyris wyomingensis (A. Nels.) Heller
Tamarix chinensis Loureiro
Tanacetum
1. Leaves merely crenate-serrate or lobed at very base **T. balsamita** L.
1. Leaves compound **T. vulgare** L.
Taraxacum
1. Achenes red, purple, or reddish-brown at maturity; leaves usually deeply cut throughout, without an enlarged terminal segment; inner involucral bracts often corniculate **T. laevigatum** (Willd.) DC.
1. Achenes olive to brown at maturity; leaves mostly moderately cut, sometimes with an enlarged terminal segment; inner involucral bracts usually not corniculate **T. officinale** Wiggers
Telesonix heucheriformis (Rydb.) Rydb.
Tetraneuris acaulis (Pursh) Greene
Teucrium canadense L. var. **occidentale** (Gray) McClint. & Epl.
Thalictrum
1. Leaflets leathery or occasionally thin, prominently reticulate-veined and often hairy beneath, the major veins raised from the surface all or most of their length, mostly acutely 3 lobed, the lobes usually entire at least on upper leaves **T. dasycarpum** Fisch. & Ave-Lall.
1. Leaflets thin, not leathery, often not veined as above, mostly glabrous or glandular-puberulent and more than 3 lobed, if 3 lobed, the lobes usually rounded or toothed
2. Leaf subtending lowest flowering branch with a petiole mostly 3cm or more long; early spring flowering **T. dioicum** L.
2. Leaf subtending lowest flowering branch with a petiole usually about 2cm or less long; summer flowering
3. Achenes mostly 3-4mm long; veins of leaflets often conspicuously raised on lower surface; leaves often much reduced upward, often lacking in inflorescence; filaments (1.8)3-5.5mm long **T. venulosum** Trel.
3. Achenes 4-7(9)mm long; veins of leaflets not especially prominent; leaves not much reduced upward; filaments 4-10mm long
4. Mature achenes usually spreading to reflexed, usually over twice as long as wide, slightly if at all laterally compessed; leaflets 1-4cm long **T. occidentale** Gray
4. Mature achenes, at least some, usually erect or ascending, about twice as long as wide or less, strongly laterally compressed; leaflets mostly 0.5-2.5cm long **T. fendleri** Engelm. ex Gray
Thelesperma megapotamicum (Spreng.) Kuntze
Thelypodium integrifolium (Nutt.) Endl. ex Walpers
Thelypteris palustris Schott
Thermopsis rhombifolia (Nutt. ex Pursh) Richardson
1. Leaflets glabrous or glabrate on upper surface var. **rhombifolia**
1. Leaflets hairy on upper surface var. **annulocarpa** (A. Nels.) Wms.
Thinopyrum
1. Lower internodes of rachis 14-30mm long, much longer than upper ones; larger spikelets mostly 17-25mm long, not long-hairy **T. ponticum** (Podp.) Barkw. & Dewey
1. Lower internodes of rachis usually shorter and often about equal to upper ones; spikelets mostly 9-18mm long, sometimes long-hairy
T. intermedium (Host) Barkw. & Dewey

Thlaspi arvense L.
Torilis japonica (Houtt.) DC.
Torreyochloa pallida (Torrey) Church var. **pauciflora** (Presl) Davis
Townsendia
1. Involucral bracts strongly long-acuminate, lanceolate to ovate, with broad scarious margins; stems often over 5cm long, erect or spreading **T. grandiflora** Nutt.
1. Involucral bracts mostly acute, linear to lanceolate, scarious or not; stems often lacking or prostrate
  2. Pappus usually over 8mm long; midveins of leaves usually conspicuous **T. exscapa** (Richardson) Porter
  2. Pappus usually less than 8mm long; midveins of leaves often obscure **T. hookeri** Beaman
Toxicodendron rydbergii (Small ex Rydb.) Greene
Tradescantia
1. Plants somewhat glaucous; uppermost leaves without cilia or with obscure cilia on margins; sepals 4-10(12)mm long; petals 7-16(18)mm long; pedicels moderately pubescent to glabrate, the hairs usually much less than 1mm long **T. occidentalis** (Britt.) Smyth
1. Plants not glaucous; uppermost leaves with ciliate margins; sepals mostly (8)10-13mm long; petals mostly 15-20mm long; pedicels densely pubescent, the hairs often 1mm or more long **T. bracteata** Small ex Britt. & Brown
Tragopogon
1. Rays purple **T. porrifolius** L.
1. Rays yellow
  2. Outer ray flowers usually exceeding involucral bracts; achenes mostly 15-25mm long including beak **T. lamottei** Rouy
  2. Outer ray flowers exceeded by involucral bracts; achenes mostly 25-36mm long including beak **T. dubius** Scop.
Tribulus terrestris L.
Trifolium
1. Plants annual
  2. Leaflets 2 times or less as long as wide; corolla 8mm or more long, usually red **T. incarnatum** L.
  2. Leaflets 3 times or more as long as wide; corolla 4-6mm long, white to pinkish (fading brown) **T. arvense** L.
1. Plants perennial
  3. Flowers subtended by a false involucre of stipules from a leaf or leaves **T. pratense** L.
  3. Flowers not subtended by an involucre
    4. Stems creeping and rooting at nodes, the peduncles arising from at or near ground level; calyx usually glabrous **T. repens** L.
    4. Stems not creeping, the peduncles, or some of them, arising well above ground level; calyx usually with a few hairs especially near base of teeth **T. hybridum** L.
Triglochin
1. Carpels and stigmas 3; mature fruit over 4 times as long as wide **T. palustris** L.
1. Carpels and stigmas usually 6; mature fruit usually 3 times as long as wide or less **T. maritima** L. var. **elata** (Nutt.) Gray
Triodanis
1. Bracts of flower lanceolate to linear, mostly over 5 times as long as wide **T. leptocarpa** (Nutt.) Nieuwl.
1. Bracts of flower ovate to orbicular or cordate, mostly less than 4 times as long as wide **T. perfoliata** (L.) Nieuwl.
Tripleurospermum inodorum (L.) Schultz-Bip.
Tripterocalyx micranthus (Torrey) Hook.
Trisetum spicatum (L.) Richt.
Triticum aestivum L.
Turritis glabra L.
Typha
1. Staminate and pistillate parts of spike usually contiguous or nearly so; stigmas oblanceolate to obovate **T. latifolia** L.
1. Staminate and pistillate parts of spike usually separated by at least 5mm; stigmas linear **T. angustifolia** L.
Ulmus
1. Leaf blades mostly subequal at base, the margins simple serrate **U. pumila** L.
1. Leaf blades mostly very unequal at base with 1 side extending down further than the other, the margins doubly serrate
  2. Fruit margin hairy; buds lacking long red hairs **U. americana** L.
  2. Fruit margin naked; buds with long reddish hairs **U. rubra** Muhl.
Urtica dioica L. var. **procera** (Muhl. ex Willd.) Wedd.
Utricularia
1. Leaves mostly 3 parted at base, each segment mostly 1-3 times dichotomously further parted, the segments flat; flowers mostly 4-8(12)mm long **U. minor** L.
1. Leaves mostly 2 parted or not parted at base, then several to many times further parted, the segments somewhat terete; flowers mostly 10-20mm long **U. vulgaris** L. var. **americana** Gray
Vaccaria hispanica (Miller) Rauschert
Vaccinium
1. Corolla deeply 4 parted with reflexed linear lobes; leaves 3-12mm long; anthers not awned **V. macrocarpon** Aiton
1. Corolla ovoid to urceolate with very short lobes which may be reflexed; leaves 7-70mm long; anthers dorsally awned
  2. Plants usually less than 3dm high; branches numerous and crowded, most of them green; pedicels usually less than 3mm long **V. scoparium** Leiberg ex Cov.
  2. Plants usually over 3dm high; branches not very crowded, most of them brown; some pedicels usually over 5mm long **V. membranaceum** Dougl. ex Torrey
Valeriana
1. Plants with a taproot and short, branched caudex; basal leaf blades gradually tapering to petiole **V. edulis** Nutt. ex T.& G.
1. Plants with a stout rhizome or caudex and often many fibrous roots; basal leaf blades often somewhat abruptly tapering to petiole or compound
  2. Corolla mostly 4mm or more long, the lobes about half as long as the tube or shorter **V. acutiloba** Rydb.
  2. Corolla mostly 1.5-4mm long, the lobes about half as long as to longer than the tube
    3. Plants mostly 1-4dm high; lateral lobes of stem leaves mostly less than 5mm wide; achenes lanceolate to oblong, glabrous **V. dioica** L. var. **sylvatica** Wats.
    3. Plants mostly 3-9dm high; lateral lobes of some stem leaves often over 5mm wide; achenes mostly lance-ovate, usually hairy **V. occidentalis** Heller
Verbascum thapsus L.
Verbena
1. Plants branched at base, branches mostly prostrate or decumbent; leaf blades mostly lobed or divided **V. bracteata** Lag. & Rodr.
1. Plants usually not branched at base, the stems erect or nearly so; leaf blades mostly coarsely toothed and not lobed or divided
  2. Leaves mostly about twice as long as wide, the middle and upper leaves sessile or with petioles 5mm or less long; fruiting spike often over 7mm wide **V. stricta** Vent.

2. Leaves, or some of them, usually about 3 or more times as long as wide, some middle and upper ones with petioles 10mm or more long; fruiting spike less than 7mm wide **V. hastata** L.

Verbesina encelioides (Cav.) Benth. & Hook. ex Gray

Vernonia fasciculata Michx.

Veronica

1. Flowers either in a terminal inflorescence or solitary and axillary, the upper bracts usually alternate
  2. Plants perennial with rhizomes **V. serpyllifolia** L. var. **humifusa** (Dickson) Vahl
  2. Plants annual with a slender taproot or fibrous roots
    3. Pedicels mostly 1-2mm long; corolla 2-3mm wide; ovules or seeds 5 or more per locule
      4. Main leaves 3-10 times as long as wide; corolla whitish; seeds many **V. peregrina** L. var. **xalapensis** (Kunth) Pennell
      4. Main leaves mostly 1-3 times as long as wide; corolla blue or violet when fresh; seeds 5-11 per locule **V. arvensis** L.
    3. Pedicels mostly 4mm or more long; corolla either larger or the ovules or seeds fewer than above
      5. Corolla 2-4mm wide; fruiting pedicels mostly 0.4-1.5cm long **V. biloba** L.
      5. Corolla 5-11mm wide; fruiting pedicels mostly 1.5-4cm long **V. persica** Poiret
1. Flowers all in axillary racemes, the upper leaves opposite
  6. Middle and upper leaves short petioled
    7. Plants glabrous or glabrate **V. americana** Schwein. ex Benth.
    7. Plants moderately to densely hairy **V. officinalis** L.
  6. Middle and upper leaves sessile
    8. Leaves 1.5-3 times as long as wide; corolla blue or violet; fruiting pedicels ascending or upcurved **V. anagallis-aquatica** L.
    8. Leaves 3-5 times as long as wide; corolla white, pink, or pale blue; fruiting pedicels mostly spreading **V. catenata** Pennell

Viburnum

1. Leaves, or some of them, 3 lobed
  2. Leaves lacking stipules; flowers all perfect and alike **V. edule** (Michx.) Raf.
  2. Leaves with linear stipules at base of petioles; marginal flowers neutral and enlarged **V. opulus** L. var. **americanum** Aiton
1. Leaves not lobed
  3. Leaf blades stellate-hairy **V. lantana** L.
  3. Leaf blades glabrous **V. lentago** L.

Vicia

1. Flowers mostly 10 or fewer per raceme or cluster; calyx not gibbous at base
  2. Flowers 1-3 per axil, sessile or nearly so **V. sativa** L.
  2. Flowers 2-10 in peduncled axillary racemes **V. americana** Muhl. ex Willd.
    3. Flowers mostly 5-9 per raceme; leaflets mostly broadly elliptic to ovate, some often well over 7mm wide, glabrous to sparsely hairy; tendrils usually well developed, often 3 or more branched var. **americana**
    3. Flowers mostly 2-4(5) per raceme; leaflets mostly linear to oblong or narrowly oblanceolate, rarely over 7mm wide, mostly moderately hairy; tendrils usually poorly developed, often unbranched var. **minor** Hook.
1. Flowers mostly more than 10 per raceme (some often deciduous); calyx usually gibbous at base
  4. Plants rather densely hirsute-villous; flowers mostly over 15mm long; annual or biennial **V. villosa** Roth
  4. Plants glabrous or appressed hairy; flowers 10-15mm long; perennial **V. cracca** L.

Viola

1. Petals predominantly blue, purple, or white on inner surface
  2. Leaf blades several times divided nearly to base **V. pedatifida** G. Don
  2. Leaf blades entire or merely toothed
    3. Petals predominantly white on inner surface, sometimes tinged with blue or lavender
      4. Plants with leaf-bearing stems **V. canadensis** L.
      4. Plants without leaf-bearing stems, the leaves all basal or nearly so
        5. Plants without stolons; leaf blades often pilose beneath especially near petiole **V. renifolia** Gray var. **brainerdii** (Greene) Fern.
        5. Plants with stolons; leaf blades usually glabrous
          6. Leaf blades predominantly reniform and broadly rounded at tip; petals often tinged with blue or purple on back **V. palustris** L.
          6. Leaf blades usually cordate and slightly pointed at tip; petals usually pure white on back **V. macloskeyi** Lloyd var. **pallens** (Banks ex DC.) Hitchc.
    3. Petals predominantly deep blue or purple on inner surface
      7. Leaf-bearing stems usually present but very short in depauperate plants; stipules usually toothed or lobed; head of style bearded **V. adunca** Smith
      7. Leaf-bearing stems lacking; stipules entire; head of style not bearded
        8. Rhizome slender and elongate; petals beardless **V. selkirkii** Pursh ex Goldie
        8. Rhizome short and stout; some petals usually bearded toward base
          9. Spurred petal bearded **V. nephrophylla** Greene
          9. Spurred petal beardless
            10. Leaf blades and petioles glabrous **V. pratincola** Greene
            10. Leaf blades and petioles pubescent (except sometimes those first developing) **V. sororia** Willd.
1. Petals predominantly yellow on inner surface
  11. Most leaf blades cordate, cordate-orbicular, or reniform, about as long as wide **V. pubescens** Aiton
  11. Most leaf blades ovate or lanceolate to elliptic or deltoid and longer than wide
    12. Leaf blades predominantly narrowly lanceolate to elliptic-lanceolate, usually averaging 3 or more times as long as wide, only rarely over 15mm wide, mostly cuneate at base **V. nuttallii** Pursh
    12. Leaf blades predominantly deltoid, ovate, or broadly lanceolate or elliptic, usually averaging less than 3 times as long as wide, often over 15mm wide, truncate to cuneate at base
      13. Leaf blades, or some of them, deltoid or deltoid-ovate and somewhat truncate at base, usually less than 5cm long **V. vallicola** A. Nels.
      13. Leaf blades mostly ovate, lanceolate, or elliptic and cuneate at base, sometimes over 5cm long **V. praemorsa** Dougl. ex Lindl. var. **altior** Blank.

Vitis riparia Michx.

Vulpia octoflora (Walt.) Rydb.

Woodsia

1. Leaf blades and petioles glabrous and somewhat glandular **W. oregana** Eaton
  2. Margins of leaves with rounded teeth or sometimes lobes; spores averaging less than 45µm across var. **oregana**
  2. Margins of leaves with somewhat acute teeth or lobes; spores averaging over 45µm across var. **cathcartiana** (Robins.) Morton
1. Leaf blades and petioles with white hairs and glandular **W. scopulina** Eaton ssp. **laurentiana** Windham

Xanthisma
1. Leaves, at least the lower, 1-2 times pinnatifid **X. spinulosum** (Pursh) Morgan & Hartm.
1. Leaves coarsely spinulose-toothed **X. grindelioides** (Nutt.) Morgan & Hartm.
Xanthium strumarium L.
Xylorhiza glabriuscula Nutt.
Yucca glauca Nutt.
Zannichellia palustris L.
Zigadenus
1. Perianth segments mostly 6-11mm long, adnate to base of ovary; stamens shorter than perianth segments **Z. elegans** Pursh
1. Perianth segments mostly 3-5.5mm long, free from ovary; stamens often longer than perianth segments **Z. venenosus** Wats. var. **gramineus** (Rydb.) Walsh ex Peck
Zizia
1. Basal leaves mostly simple and crenate **Z. aptera** (Gray) Fern.
1. Basal leaves usually compound and sharply serrate **Z. aurea** (L.) Koch

Checklist

Abronia
  fragrans
Acer
  negundo
    interius
Achillea
  millefolium
Achnatherum
  hymenoides
  nelsonii
    dorei
    nelsonii
  occidentale
  richardsonii
  robustum
Aconitum
  columbianum
Acroptilon
  repens
Actaea
  rubra
Adenocaulon
  bicolor
Adiantum
  aleuticum
  capillus-veneris
Adoxa
  moschatellina
Agalinis
  tenuifolia
    parviflora
Agastache
  foeniculum
Agoseris
  aurantiaca
  glauca
    dasycephala
    glauca
  parviflora
Agrimonia
  gryposepala
  striata
Agropyron
  cristatum
    cristatum
    desertorum
    fragile
Agrostis
  capillaris
  exarata
  scabra
  stolonifera
Alcea
  rosea
Alisma
  gramineum
  triviale
Alliaria
  petiolata
Allium
  canadense
    fraseri
  cernuum
  drummondii
  geyeri
    geyeri
    tenerum
  textile
Almutaster
  pauciflorus
Alopecurus
  aequalis
  carolinianus
  geniculatus
Alyssum
  alyssoides
  desertorum
Amaranthus
  albus
  arenicola
  blitoides
  californicus
  retroflexus
  tuberculatus
Amauriopsis
  dissecta
Ambrosia
  acanthicarpa
  artemisiifolia
  psilostachya
  tomentosa
  trifida
Amelanchier
  alnifolia
  humilis
  utahensis
Ammannia
  robusta
Amorpha
  canescens
  fruticosa
  nana
Amphicarpaea
  bracteata
Anagallis
  minima
Anaphalis
  margaritacea
Anchusa
  arvensis
Andersonglossum
  boreale
Andropogon
  gerardii
  hallii
Androsace
  occidentalis
  septentrionalis
Anemone
  canadensis
  cylindrica
  multifida
  patens
    multifida
  virginiana
Antennaria
  dimorpha
  howellii
    howellii
    neodioica
    petaloidea
  microphylla
  neglecta
  parvifolia
  rosea
Anthemis
  cotula
Anthoxanthum
  hirtum
Apera
  interrupta
Apios
  americana
Apocynum
  androsaemifolium
  cannabinum
    cannabinum
    hypericifolium
Aquilegia
  brevistyla
  canadensis
Arabidopsis
  thaliana
Arabis
  eschscholtziana
  pycnocarpa
Aralia
  nudicaulis
Arctium
  lappa
  minus
  tomentosum
Arctostaphylos
  uva-ursi
    adenotricha
    uva-ursi
Arenaria
  serpyllifolia
Argemone
  polyanthemos
Aristida
  dichotoma
    curtissii
  oligantha
  purpurea
    fendleriana
    longiseta
Armoracia
  rusticana
Arnica
  chamissonis
    foliosa
  cordifolia
  fulgens
  lonchophylla
  mollis
  rydbergii
  sororia
Artemisia
  absinthium
  annua
  biennis
  campestris
    caudata
    scouleriana
  cana
  dracunculus
  filifolia
  frigida
  longifolia
  ludoviciana
    ludoviciana
    incompta
  tridentata
    tridentata
    wyomingensis
Asclepias
  incarnata
  ovalifolia
  pumila
  speciosa
  stenophylla
  tuberosa
  verticillata
  viridiflora
Asparagus
  officinalis
Asplenium
  septentrionale
  trichomanes
  trichomanes-ramosum
Astragalus
  agrestis
  alpinus
  americanus
  australis
    glabriusculus
  bisulcatus
  canadensis
  cicer
  crassicarpus
    crassicarpus
    paysonii
  drummondii
  flexuosus
  gilviflorus
  gracilis
  hyalinus
  laxmannii
    robustior
  lotiflorus
  miser
    decumbens
  missouriensis
  multiflorus
  pectinatus
  plattensis
  purshii
  racemosus
  spatulatus
  vexilliflexus
Athyrium
  filix-femina
    cyclosorum
Atriplex
  argentea
  canescens
  gardneri
  heterosperma
  hortensis
  oblongifolia
  patula
  powellii
  rosea
  subspicata
Avena
  fatua
  sativa
Bacopa
  rotundifolia
Balsamorhiza
  sagittata
Barbarea
  orthoceras
  vulgaris
Beckmannia
  syzigachne
Berberis
  thunbergii
Berteroa
  incana
Berula
  erecta
    incisa
Betula
  glandulosa
  occidentalis
  papyrifera
Bidens
  cernua
  frondosa
  tripartita
  vulgata
Bistorta
  vivipara
Boechera
  collinsii
  divaricarpa
  grahamii
  microphylla
  pauciflora
  pendulocarpa
  retrofracta
  stricta
Bolboschoenus
  maritimus
    paludosus
Boltonia
  asteroides
    latisquama
Botrychium
  campestre
  furculatum
  gallicomontanum
  lineare
  lunaria
  michiganense
  minganense
  multifidum
  pallidum
  simplex
  spathulatum
  virginianum
Bouteloua
  curtipendula
  dactyloides
  gracilis
  hirsuta
Brassica
  juncea
  nigra
Brickellia
  eupatorioides
    corymbulosa
Bromus
  briziformis
  carinatus
    marginatus
  ciliatus
  commutatus
  inermis
  japonicus
  kalmii
  latiglumis
  porteri
  pubescens
  pumpellianus
  secalinus
  squarrosus
  tectorum
Buglossoides
  arvensis
Bupleurum
  americanum
Calamagrostis
  canadensis
  montanensis
  purpurascens
  stricta
    inexpansa
    stricta
Calamovilfa
  longifolia
Callitriche
  hermaphroditica
  heterophylla
  palustris
  stenoptera
Calochortus
  apiculatus
  gunnisonii
  nuttallii
Calypso
  bulbosa
Calystegia
  macounii
  sepium
    angulata
Camelina
  microcarpa
  sativa
Campanula
  aparinoides

glomerata
rapunculoides
rotundifolia
Cannabis
sativa
Capsella
bursa-pastoris
Cardamine
pensylvanica
Carduus
acanthoides
nutans
Carex
alopecoidea
aquatilis
atherodes
aurea
backii
bebbii
bella
blanda
brevior
brunnescens
canescens
capillaris
concinna
deweyana
disperma
duriuscula
eburnea
emoryi
filifolia
foenea
granularis
haleana
gravida
haydenii
hoodii
hystericina
inops
heliophila
interior
intumescens
lasiocarpa
leptalea
microglochin
microptera
nebrascensis
normalis
obtusata
occidentalis
parryana
peckii
pedunculata
pellita
petasata
praeceptorum
praegracilis
prairea
praticola
radiata
retrorsa
richardsonii
rossii
rupestris
sartwellii
saximontana
scoparia
siccata
sprengelii
stipata
stricta
tenera
torreyi
utriculata
vaginata
vallicola
viridula
vulpinoidea
xerantica
Carum
carvi
Carya
glabra
Castilleja
sessiliflora
sulphurea
Catabrosa
aquatica
Ceanothus
fendleri
herbaceus
velutinus
Celastrus
scandens
Celtis
occidentalis
Cenchrus
longispinus
Centaurea
cyanus
stoebe
micranthos
Cerastium
arvense
strictum
brachypodum
fontanum
vulgare
nutans
Cercocarpus
montanus
Chaenactis
douglasii
Chaenorhinum
minus
Chamerion
angustifolium
canescens
Cheilanthes
feei
Chenopodium
album
atrovirens
berlandieri
zschackei
capitatum
desiccatum
fremontii
glaucum
salinum
pratericola
rubrum
simplex
strictum
glaucophyllum
watsonii
Chimaphila
umbellata
occidentalis
Chloris
verticillata
Chorispora
tenella
Cichorium
intybus
Cicuta
maculata
angustifolia
Cinna
latifolia
Circaea
alpina
alpina
pacifica
canadensis
Cirsium
arvense
canescens
drummondii
flodmanii
pulcherrimum
undulatum
vulgare
Claytonia
lanceolata
perfoliata
intermontana
rubra
Clematis
columbiana
tenuiloba
hirsutissima
ligusticifolia
Coeloglossum
viride
virescens
Collinsia
parviflora
Collomia
linearis
Comandra
umbellata
pallida
Conium
maculatum
Conringia
orientalis
Convolvulus
arvensis
Conyza
canadensis
ramosissima
Corallorhiza
maculata
maculata
occidentalis
odontorhiza
striata
trifida
wisteriana
Coreopsis
tinctoria
Cornus
canadensis
sericea
Coronilla
varia
Corydalis
aurea
aurea
occidentalis
Corylus
cornuta
Coryphantha
missouriensis
vivipara
Cota
tinctoria
Cotoneaster
acutifolius
Crataegus
chrysocarpa
macracantha
occidentalis
Crepis
acuminata
atribarba
modocensis
occidentalis
costata
occidentalis
runcinata
hispidulosa
runcinata
Crocanthemum
bicknellii
Croton
texensis
Cryptantha
affinis
cana
celosioides
cinerea
jamesii
fendleri
kelseyana
minima
thyrsiflora
torreyana
watsonii
Cryptogramma
acrostichoides
Cuscuta
approximata
pentagona
Cyclachaena
xanthiifolia
Cycloloma
atriplicifolium
Cymopterus
glomeratus
montanus
Cynoglossum
officinale
Cyperus
acuminatus
erythrorhizos
lupulinus
odoratus
schweinitzii
squarrosus
Cypripedium
montanum
parviflorum
pubescens
Cystopteris
fragilis
Dactylis
glomerata
Dalea
aurea
candida
oligophylla
cylindriceps
enneandra
purpurea
villosa
Danthonia
californica
intermedia
spicata
unispicata
Dasiphora
fruticosa
Daucus
carota
Delphinium
bicolor
carolinianum
virescens
nuttallianum
Deschampsia
cespitosa
Descurainia
incana
longepedicellata
pinnata
brachycarpa
sophia
Desmodium
canadense
Dianthus
armeria
Diaperia
prolifera
Dichanthelium
acuminatum
leibergii
linearifolium
oligosanthes
scribnerianum
perlongum
wilcoxianum
Dieteria
bigelovii
canescens
canescens
glabra
Digitaria
ischaemum
sanguinalis
Diphasiastrum
complanatum
Dipsacus
fullonum
Distichlis
spicata
stricta
Draba
albertina
aurea
nemorosa
reptans
Dracocephalum
parviflorum
thymiflorum
Drymocallis
arguta
fissa
glabrata
pseudorupestris
Dryopteris
filix-mas
Dysphania
botrys
Dyssodia
papposa
Echinacea
angustifolia
Echinocereus
viridiflorus
Echinochloa
crusgalli
muricata
microstachya
Echinocystis
lobata
Echium
vulgare
Elaeagnus
angustifolia
Elatine
rubella
Eleocharis
acicularis
compressa
erythropoda
macrostachya
obtusa
palustris
rostellata
Ellisia
nyctelea
Elodea

- bifoliata
- canadensis
- nuttallii

Elymus
- albicans
  - albicans
  - griffithsii
- canadensis
  - canadensis
  - hirsutus
- curvatus
- diversiglumis
- elymoides
  - brevifolius
  - elymoides
- glaucus
- lanceolatus
  - lanceolatus
  - riparius
- repens
- trachycaulus
  - andinus
  - trachycaulus
- villosus
- virginicus

Enemion
- biternatum

Epilobium
- brachycarpum
- campestre
- ciliatum
  - ciliatum
  - glandulosum
- halleanum
- hornemannii
- leptophyllum
- saximontanum

Epipactis
- gigantea

Equisetum
- arvense
- hyemale
  - affine
- laevigatum
- pratense
- scirpoides
- sylvaticum
- variegatum

Eragrostis
- cilianensis
- minor
- pectinacea
- trichodes

Eremogone
- hookeri
  - hookeri
  - pinetorum

Eremopyrum
- triticeum

Ericameria
- nauseosa
  - graveolens
  - nauseosa
- parryi
  - howardii

Erigeron
- acris
  - kamtschaticus
- annuus
- bellidiastrum
- caespitosus
- canus
- compositus
- divergens
- engelmannii
- flagellaris
- formosissimus
- glabellus
  - glabellus
  - pubescens
- lonchophyllus
- ochroleucus
  - ochroleucus
  - scribneri
- philadelphicus
- pumilus
- speciosus
- strigosus
  - septentrionalis
  - strigosus
- subtrinervis

Eriogonum
- annuum
- flavum
- pauciflorum

Eriophorum
- angustifolium

Erodium
- cicutarium

Erucastrum
- gallicum

Erysimum
- asperum
- capitatum
  - purshii
- cheiranthoides
- inconspicuum

Erythranthe
- floribunda
- geyeri
- guttata

Euphorbia
- brachycera
  - robusta
- cyparissias
- davidii
- fendleri
- glyptosperma
- hexagona
- marginata
- missurica
  - petaloidea
- prostrata
- serpens
- serpyllifolia
- spathulata
- stictospora
- virgata

Eurybia
- conspicua
- merita

Eustoma
- grandiflorum

Euthamia
- graminifolia

Eutrochium
- maculatum
  - bruneri

Evolvulus
- nuttallianus

Fallopia
- convolvulus
- scandens

Festuca
- idahoensis
- rubra
- saximontana
- subulata

Fragaria
- vesca
- virginiana

Frangula
- alnus

Frasera
- speciosa

Fraxinus
- pennsylvanica

Fritillaria
- atropurpurea

Froelichia
- gracilis

Gaillardia
- aristata
- pulchella

Galeopsis
- bifida
- tetrahit

Galium
- aparine
  - aparine
  - echinospermum
- boreale
- trifidum
- triflorum

Gayophytum
- diffusum
  - strictipes
- racemosum

Gentiana
- affinis
- andrewsii
- puberulenta

Gentianella
- amarella

Geranium
- bicknellii
- carolinianum
- pusillum
- richardsonii
- viscosissimum
  - incisum
  - viscosissimum

Geum
- aleppicum
- canadense
- macrophyllum
  - perincisum
- rivale
- triflorum
  - ciliatum
  - triflorum

Glandularia
- bipinnatifida

Glechoma
- hederacea

Gleditsia
- triacanthos

Glyceria
- borealis
- elata
- fluitans
- grandis
- striata

Glycyrrhiza
- lepidota
  - glutinosa
  - lepidota

Gnaphalium
- exilifolium
- palustre
- uliginosum

Goodyera
- oblongifolia
- repens

Gratiola
- neglecta

Grindelia
- hirsutula
- squarrosa

Gutierrezia
- sarothrae

Gymnocarpium
- dryopteris

Gypsophila
- muralis
- paniculata
- scorzonerifolia

Hackelia
- deflexa
  - americana
- floribunda
- micrantha
- virginiana

Halenia
- deflexa

Hedeoma
- drummondii
- hispida

Hedysarum
- alpinum
  - americanum
- boreale
  - pabulare
- occidentale

Helianthella
- quinquenervis

Helianthus
- annuus
- giganteus
- grosseserratus
- maximiliani
- nuttallii
- pauciflorus
  - subrhomboideus
- petiolaris
- tuberosus
  - subcanescens

Heliotropium
- curassavicum
  - obovatum

Heracleum
- sphondylium
  - lanatum

Hesperis
- matronalis

Hesperostipa
- comata
- curtiseta
- spartea

Heteranthera
- limosa

Heterotheca
- angustifolia
- hispida
- villosa
  - foliosa
  - villosa

Heuchera
- parvifolia
- richardsonii

Hibiscus
- trionum

Hieracium
- albiflorum
- caespitosum
- fendleri
- piloselloides
- umbellatum
  - scabriusculum
  - umbellatum

Hippuris
- vulgaris

Hordeum
- brachyantherum
- jubatum
- pusillum
- vulgare

Humulus
- lupulus
  - neomexicanus

Hymenopappus
- polycephalus
- tenuifolius

Hyoscyamus
- niger

Hypericum
- canadense
- perforatum

Impatiens
- capensis

Ipomoea
- leptophylla
- purpurea

Ipomopsis
- congesta
  - congesta
  - pseudotypica

Iris
- germanica
- missouriensis

Iva
- axillaris
  - axillaris
  - robustior

Juglans
- nigra

Juncus
- alpinoarticulatus
- arcticus
  - balticus
- bufonius
- compressus
- confusus
- dudleyi
- ensifolius
  - ensifolius
  - montanus
- interior
- longistylis
- nevadensis
- nodosus
- tenuis
- torreyi

Juniperus
- communis
  - depressa
- horizontalis
- scopulorum
- virginiana

Kochia
- scoparia

Koeleria
- macrantha

Krascheninnikovia
- lanata

Lactuca
- biennis
- canadensis
- ludoviciana
- serriola

Lamium
- amplexicaule

Lappula
- fremontii
- occidentalis
- squarrosa

Lapsana
- communis

Lathyrus
- ochroleucus
- polymorphus
  - incanus
  - polymorphus
- venosus
  - intonsus

Lechea
intermedia
tenuifolia
Ledum
groenlandicum
Leersia
oryzoides
Lemna
minor
minuta
trisulca
turionifera
Leonurus
cardiaca
Lepidium
chalepense
densiflorum
densiflorum
macrocarpum
draba
perfoliatum
Leptosiphon
septentrionalis
Leucanthemum
vulgare
Leucocrinum
montanum
Leucophysalis
grandiflora
Leucopoa
kingii
Lewisia
pygmaea
rediviva
Leymus
cinereus
innovatus
Liatris
ligulistylis
punctata
Lilium
philadelphicum
andinum
Limosella
aquatica
Linanthus
pungens
Linaria
dalmatica
vulgaris
Linnaea
borealis
longiflora
Linum
australe
compactum
lewisii
rigidum
sulcatum
Listera
convallarioides
Lithophragma
glabrum
ramulosum
parviflorum
Lithospermum
canescens
caroliniense
incisum
occidentale
Lobelia
kalmii
siphilitica
ludoviciana
spicata
Loeflingia
squarrosa
texana
Logfia
arvensis
Lolium
multiflorum
perenne
persicum
Lomatium
dissectum
multifidum
foeniculaceum
nuttallii
orientale
Lonicera
dioica
glaucescens
tatarica
Lotus
corniculatus
unifoliolatus
Lupinus
argenteus
argenteus
laxiflorus
rubricaulis
polyphyllus
humicola
pusillus
intermontanus
pusillus
sericeus
Luzula
acuminata
comosa
multiflora
parviflora
Lycium
barbarum
Lycopodium
annotinum
dendroideum
Lycopus
americanus
asper
uniflorus
Lygodesmia
juncea
Lysimachia
ciliata
thyrsiflora
Lythrum
alatum
Machaeranthera
tanacetifolia
Madia
glomerata
Mahonia
repens
Maianthemum
canadense
interius
racemosum
amplexicaule
stellatum
Malus
pumila
Malva
neglecta
pusilla
Marrubium
vulgare
Marsilea
vestita
Matricaria
discoidea
Matteuccia
struthiopteris
Medicago
lupulina
sativa
falcata
sativa
Melica
bulbosa
smithii
subulata
Melilotus
albus
officinalis
Mentha
arvensis
canadensis
Mentzelia
decapetala
dispersa
nuda
oligosperma
Menyanthes
trifoliata
Mertensia
ciliata
lanceolata
oblongifolia
Micranthes
occidentalis
Microseris
nutans
Microsteris
gracilis
humilior
Mirabilis
albida
linearis
nyctaginea
Mitella
pentandra
Moehringia
lateriflora
Monarda
fistulosa
menthifolia
Moneses
uniflora
Monolepis
nuttalliana
Monotropa
hypopitys
Morus
alba
Muhlenbergia
asperifolia
cuspidata
filiculmis
filiformis
glomerata
mexicana
minutissima
racemosa
richardsonis
Mulgedium
oblongifolium
Munroa
squarrosa
Musineon
divaricatum
tenuifolium
Myosotis
arvensis
scorpioides
sylvatica
verna
Myosurus
minimus
Myriophyllum
sibericum
Nassella
viridula
Nasturtium
microphyllum
officinale
Navarretia
intertexta
propinqua
Nemophila
breviflora
Nepeta
cataria
Nothocalais
cuspidata
Nuttallanthus
texanus
Oenothera
albicaulis
cespitosa
coronopifolia
curtiflora
flava
glaucifolia
laciniata
lavandulifolia
nuttallii
pallida
trichocalyx
serrulata
suffrutescens
villosa
strigosa
villosa
Onobrychis
viciifolia
Onoclea
sensibilis
Onopordum
acanthium
Oonopsis
multicaulis
Opuntia
fragilis
polyacantha
tortispina
Orobanche
fasciculata
ludoviciana
uniflora
occidentalis
Orthilia
secunda
Orthocarpus
luteus
Oryzopsis
asperifolia
Osmorhiza
berteroi
depauperata
longistylis
Ostrya
virginiana
Oxalis
dillenii
stricta
violacea
Oxyria
digyna
Oxytropis
besseyi
campestris
spicata
lagopus
atropurpurea
lambertii
sericea
Packera
cana
paupercula
plattensis
pseudaurea
streptanthifolia
tridenticulata
Panicum
capillare
miliaceum
virgatum
Parietaria
pensylvanica
Parnassia
palustris
montanensis
parviflora
Paronychia
depressa
jamesii
sessiliflora
Parthenocissus
quinquefolia
vitacea
Pascopyrum
smithii
Pastinaca
sativa
Patis
racemosa
Pedicularis
procera
Pediocactus
simpsonii
Pediomelum
argophyllum
cuspidatum
digitatum
esculentum
Pellaea
atropurpurea
gastonyi
glabella
occidentalis
simplex
Penstemon
albidus
angustifolius
eriantherus
glaber
alpinus
glaber
gracilis
grandiflorus
nitidus
Perideridia
montana
Peritoma
serrulata
Persicaria
amphibia
emersa
stipulacea
bicornis
hydropiperoides
lapathifolia
maculosa
pensylvanica
punctata
Petasites
frigidus
sagittatus
Petrophytum
caespitosum
Phacelia
hastata
linearis

Phalaris
arundinacea
canariensis
Phemeranthus
parviflorus
Philadelphus
pubescens
Phleum
alpinum
pratense
Phlox
alyssifolia
andicola
hoodii
kelseyi
Phragmites
australis
Phryma
leptostachya
Physalis
hederifolia
comata
heterophylla
hispida
longifolia
virginiana
Physaria
arenosa
arenosa
argillosa
brassicoides
ludoviciana
montana
reediana
spatulata
Physocarpus
monogynus
opulifolius
intermedius
Picea
glauca
Picradeniopsis
oppositifolia
Pinus
contorta
latifolia
flexilis
ponderosa
Piperia
unalascensis
Piptatheropsis
micrantha
pungens
Plagiobothrys
scouleri
hispidulus
Plantago
elongata
eriopoda
lanceolata
major
patagonica
patagonica
spinulosa
rugelii
Platanthera
aquilonis
dilatata
albiflora
dilatata
huronensis
orbiculata
Poa
annua
arida
bulbosa
compressa
fendleriana
glauca
rupicola
glaucifolia
interior
palustris
pratensis
secunda
juncifolia
secunda
elongata
secunda
trivialis
wheeleri
Polanisia
dodecandra
trachysperma
Polemonium
brandegeei
Polygala
alba
sanguinea
senega
verticillata
Polygonatum
biflorum
Polygonum
achoreum
aviculare
douglasii
engelmannii
erectum
polygaloides
confertiflorum
ramosissimum
sawatchense
tenue
Polypodium
saximontanum
Polypogon
monspeliensis
Polystichum
lonchitis
munitum
Populus
acuminata
alba
angustifolia
balsamifera
deltoides
occidentalis
tremuloides
Portulaca
oleracea
Potamogeton
alpinus
crispus
diversifolius
epihydrus
foliosus
gramineus
illinoensis
praelongus
pusillus
richardsonii
Potentilla
anserina
argentea
biennis
concinna
glaucophylla
gracilis
fastigiata
hippiana
effusa
hippiana
norvegica
pensylvanica
plattensis
pulcherrima
recta
rivalis
supina
nicolletii
Prenanthes
racemosa
multiflora
Primula
pauciflora
distola
pauciflora
Prosartes
hookeri
trachycarpa
Prunella
vulgaris
Prunus
americana
pensylvanica
pumila
besseyi
virginiana
demissa
Pseudognaphalium
macounii
stramineum
Pseudoroegneria
spicata
Pseudotsuga
menziesii
glauca
Psoralidium
lanceolatum
tenuiflorum
Pteridium
aquilinum
latiusculum
pubescens
Pterospora
andromedea
Puccinellia
distans
nuttalliana
Purshia
tridentata
Pyrola
americana
asarifolia
chlorantha
elliptica
picta
Quercus
macrocarpa
Ranunculus
abortivus
acris
aquatilis
diffusus
cardiophyllus
cymbalaria
glaberrimus
ellipticus
glaberrimus
hyperboreus
inamoenus
macounii
micranthus
pensylvanicus
repens
pleniflorus
rhomboideus
sceleratus
multifidus
testiculatus
uncinatus
Ratibida
columnifera
tagetes
Rhamnus
alnifolia
cathartica
Rhodiola
integrifolia
Rhus
glabra
trilobata
Ribes
americanum
aureum
aureum
villosum
cereum
pedicellare
hirtellum
lacustre
missouriense
oxyacanthoides
oxyacanthoides
setosum
Robinia
pseudoacacia
Rorippa
curvipes
palustris
sinuata
tenerrima
Rosa
acicularis
sayi
arkansana
blanda
woodsii
Rubus
idaeus
aculeatissimus
parviflorus
pubescens
Rudbeckia
hirta
pulcherrima
laciniata
ampla
Rumex
acetosella
altissimus
crispus
fueginus
occidentalis
patientia
stenophyllus
triangulivalvis
utahensis
venosus
Ruppia
cirrhosa
Sabulina
dawsonensis
michauxii
rubella
Sagina
saginoides
Sagittaria
cuneata
latifolia
Salicornia
rubra
Salix
amygdaloides
babylonica
bebbiana
candida
discolor
eriocephala
famelica
exigua
exigua
exigua
interior
fragilis
lasiandra
caudata
lucida
pentandra
petiolaris
planifolia
pseudomonticola
scouleriana
serissima
Salsola
collina
tragus
Salvia
pratensis
reflexa
Sambucus
racemosa
pubens
Sanguinaria
canadensis
Sanicula
graveolens
marilandica
Saponaria
officinalis
Sarcobatus
vermiculatus
Saxifraga
cernua
Schedonnardus
paniculatus
Schedonorus
arundinaceus
pratensis
Schizachne
purpurascens
Schizachyrium
scoparium
Schoenoplectus
acutus
occidentalis
americanus
heterochaetus
pungens
polyphyllus
tabernaemontani
Scirpus
atrocinctus
cyperinus
microcarpus
pallidus
Scrophularia
lanceolata
Scutellaria
galericulata
lateriflora
Secale
cereale
Sedum
acre
lanceolatum
Selaginella
densa
rupestris
Senecio
crassulus
eremophilus
hydrophilus
integerrimus

Glossary

A-. A prefix meaning without.
Abortive. Imperfectly formed or a mere rudiment.
Acaulescent. Appearing to lack a leafy stem, the leaves all basal.
Accrescent. Enlarging after flowering.
Achene. A dry, 1-seeded, indehiscent fruit like a sunflower "seed."
Acicular. Needle-shaped.
Acuminate. With a long tapering tip and concave sides.
Acute. Tapering to a pointed tip with the sides nearly straight.
Adaxial. The side toward the axis.
Adnate. Union of unlike parts.
Adventitious. In an unusual or unexpected place.
Alkaline. Salty.
Alternate. One leaf, stem, or other structure per node.
Ament. See catkin.
Amphibious. Capable of growing in water or on land but usually not far from surface water.
Anastomosing. Interconnected network.
Androgynous. With staminate flowers at tip and pistillate at base.
Annual. A plant that lives only 1 growing season and usually has a slender taproot or few fibrous roots.
Annulus. A crest on the sporangium of ferns consisting of a single row of thick-walled cells.
Anther. Pollen-bearing, usually terminal part of stamen.
Anthesis. Time of flower opening.
Antrorse. Directed forward.
Apex. Tip.
Apical. At the tip or top.
Apiculate. With a short, sharp, flexible point at tip.
Appressed. Lying close and flattened to surface.
Aquatic. Growing in water.
Arachnoid. With cobwebby, tangled hairs.
Arcuate. Curved like a bow.
Areole. Spine-bearing area on stem of cactus; a small pit or raised spot.
Aristate. With a stiff bristle-like awn; tapered to a very long and narrow tip.
Armed. With spines, thorns, or prickles.
Aromatic. With a strong, usually somewhat pleasant, odor.
Articulation. Natural separation point or joint.
Ascending. Rising gradually upwards.
Attenuate. With a long-tapering tip or base.
Auricle. Ear-shaped or sometimes pointed lobe or appendage usually at the junction of a leaf sheath and blade or at the base of a leaf blade.
Auriculate. With auricles, usually at base.
Awl-shaped. Gradually tapering from base to a sharp point.
Awn. A slender, stiff bristle.
Axile placentation. Ovules borne along central axis in a 2 or more celled ovary.
Axillary. In axil of leaf, branch, or other structure (between petiole or branch and the stem).
Axis. The central part of a structure or organ, usually running lengthwise.
Banner. The upper, usually largest petal of the flower in legumes (Fabaceae).
Barbellate. With barbs along the main axis.
Basilateral. Midway between base and middle of side.
Beak. A long, slender tip or projection.
Bearded. Hairy with usually stiff hairs.
Berry. Pulpy or fleshy fruit containing more than 1 seed, like a grape or blueberry.
Bi-. Prefix meaning two or twice.
Biennial. A plant that lives for two growing seasons, usually forming a basal rosette of leaves the first season but not flowering until the second.
Bifid. Cleft and with 2 lobes or segments.
Bifurcate. With 2 branches; forked or Y shaped.
Bilabiate. With 2 lips; in the case of a corolla, with petals or corolla lobes in 2 distinct groups.
Bilobed. Notched, cleft, or parted at middle forming 2 lobes.
Bipinnatifid. Pinnatifid with the primary divisions also pinnatifid.
Biseriate. In 2 series or rows.
Bisexual flower. With both stamens and pistil.
Bladder. Inflated, usually thin-walled structure.
Blade. Flat, expanded portion of leaf.
Bract. Reduced or modified leaf often in the inflorescence.
Bracteate. With bracts.
Bracteole. A secondary bract or small bract.
Bud. Growth area at tip of stem or branch or in leaf axils, often dormant and covered with scales; unopened flower.
Bulb. Underground bud covered with fleshy scales like an onion.
Bulbil. Small bulb-like structure usually in leaf axil or in place of a flower.
Bulblet. See bulbil.
Bundle scar. Dot-like scar on leaf scar representing where vascular bundle passed from stem or branch to petiole.
Caespitose. Growing in tufts.
Callosity. A hard projection or raised area.
Callus. Hardened downward extension of base of lemma (actually part of rachilla).
Calyptrate. Cap-like, closed all around.
Calyx. Outermost series of flower parts, often, but not always, green; the sepals collectively.
Campanulate. Bell-shaped.
Canaliculate. With lengthwise channels or grooves (sometimes only 1).
Canescent. With dense, very short, gray or white hairs.
Capillary. Slender and thread-like.
Capillary bristle. Thread-like bristle, often with many very short or long branches throughout its length; bristles at base of corolla or tip of achene in flowers of the sunflower group.
Capitate. In a dense head-like cluster.
Capsule. Dry dehiscent fruit with more than 1 carpel.
Carpel. Foliar, ovule-bearing unit of an ovary; number of carpels is usually the same as number of locules or number of placentae, whichever is greater.
Carpophore. Prolongation of receptacle above point of perianth attachment; in the carrot group a slender stalk supporting half of the fruit.
Cartilaginous. Hard and tough but somewhat flexible.
Caryopsis. One-seeded, indehiscent fruit (grain) of grasses.
Catkin. Flexible, bracteate, spike or compact raceme of usually unisexual flowers as in willows.
Caudate. With a slender tail-like appendage.
Caudex. The persistent base of an otherwise annual stem from which new stems or leaves arise each year, at or below ground level.
Caulescent. With a stem which is leafy.
Cauline. On the stem, not basal.
Cell of ovary. Compartment or chamber of ovary.
Chaffy. With dry membranous scales or bracts.
Chartaceous. With the texture of stiff writing paper.
Chasmogamous flower. Flower which opens normally for fertilization.
Ciliate. Fringed with hairs.
Ciliolate. Slightly ciliate, the hairs minute.
Cinereous. Light gray or ashy.
Circinate. Coiled at tip in 2 dimensions; rolled inwards from the top.
Circumscissile. Dehiscing by a horizontal, circular line all around and the top coming off like a lid.
Clasping. Partly surrounding the stem.
Clavate. Club-shaped, widest near tip; shaped somewhat like a baseball bat.
Claw. The narrowed base or stalk of some petals.
Cleft. A cut to about the middle.
Cleistogamous flower. Flower which never opens and is self-fertilized, usually borne near ground level.
Cm. Centimeter; about 2.5cm = 1 inch.
Coetaneous. Appearing with the leaves.
Coma. Tuft of hairs.
Commissure. Surface along which 1 carpel joins another.
Compound leaf. A leaf which is divided into leaflets; a leaf constitutes everything beyond the axillary bud; when leaflets are opposite, there is usually a solitary terminal leaflet (sometimes modified to tendrils).
Concave. With a hollowed out surface like the inside of a hollow ball.
Cone. An axis bearing closely arranged sporophylls or seed-bearing structures like a pine cone.
Confluent. Continuous or running together without interruption.
Conifer. Cone-bearing tree or shrub usually with evergreen, needle-like or scale-like leaves, including pines, spruces, firs, junipers, etc.
Connate. Union of like structures.
Connective. Structure connecting 2 halves of an anther.
Connivent. In close contact but not joined.
Convex. With a surface that curves outward like the outer surface of a ball.

Convolute. Rolled up lengthwise.
Cordate. Heart-shaped with the point at the tip; with an ndentation and the lobes on each side rounded as the top part of a heart.
Coriaceous. Leathery.
Corm. Bulb-like enlargement of stem base.
Corniculate. With a terminal, small, horn-like process.
Corolla. Inner series of the perianth; the petals collectively.
Corrugated. With many folds or wrinkles.
Corymb. Short and broad, somewhat flat-topped inflorescence with the outer flowers opening first.
Costa. A rib or raised or thickened area.
Cotyledon. Embryonic leaf in the seed, often persisting in the seedling as lowermost leaves or leaf-like structures (2 in dicots, 1 in monocots, several in conifers).
Crenate. With rounded teeth.
Crenulate. With very small, rounded teeth.
Crisped. Ruffled; curled and wavy.
Crown. Pappus of flower of the sunflower group which is very short, scale-like, and usually continuous around corolla; top of root.
Cruciform. Cross-shaped; sometimes loosely used for any branched hairs.
Cucullate. Hooded.
Culm. The stem of the grass and sedge families.
Cuneate. Wedge-shaped, the pointed end at base.
Cushion mat. Plants with stems very short and dense forming a carpet-like growth.
Cuspidate. Tapering to an elongate point with the sides concave.
Cyme. Short and broad, somewhat flat-topped inflorescence with the central or terminal flower opening first.
Deciduous. Falling off, especially at end of each growing season.
Decumbent. Lower part on ground, the tip ascending.
Decurrent. Extending downward along stem or branch from the point of insertion.
Deflexed. Bent abruptly downward or backward.
Dehiscent. Splitting open along regular lines.
Deltoid. Triangular.
Dendritic. With a central axis and shorter branches coming off on both sides (tree-form).
Dentate. With sharp teeth directed outward at a right angle to the margin.
Denticulate. Dentate but with very small teeth.
Diadelphous. Filaments united into 2, often unequal, sets.
Dichotomous. Forked with 2 equal branches.
Didymous. In a twin-like pair or appearing so.
Diffuse. Loosely spreading or branching.
Digitate. With similar structures radiating from the same point.
Dilated. Expanded or widened.
Dimorphic. With 2 forms.
Dioecious. With staminate and pistillate flowers borne on separate plants; in gymnosperms, the pollen and seed cones borne on separate plants.
Disarticulate. Separate or break apart.
Disjoint. Separate or break apart.
Disk flower. Flower of the sunflower group with slender tubular corolla, these usually occupying most of head except in heads with only ray flowers.
Dissected. Divided into many segments and lobes.
Disseminule. Spore, seed, fruit, or other detached plant part by which the plant species spreads.
Distal. Toward tip or at end opposite attachment point.
Divaricate. Spreading; sticking out away from axis.
Dm. Decimeter; 1dm = 10cm = about 4 inches.
Dolabriform. Apparently attached at or toward middle, not at base, the 2 ends free.
Dorsal. The back or outer surface; side away from axis.
Dorsiventral. From dorsally to ventrally as opposed to laterally.
Doubly toothed. Large teeth alternating with smaller teeth.
Drupe. Fleshy, indehiscent, 1-seeded fruit, the seed enclosed in a stony endocarp (pit) as in a cherry.
Drupelets. Small drupes like the individual parts of a raspberry fruit.
Elliptic. Longer than wide, widest at middle and tapered toward both ends.
Emarginate. Tip shallowly notched.
Emergent. Lower part in water, upper extending out of the water.
Endocarp. Innermost part of pericarp.
Entire. With a smooth margin; lacking teeth, lobes, or segments.
Epidermis. Outermost covering or layer of cells.
Epigynous. Floral tube adnate to ovary so that sepals, petals, and stamens appear to arise from top of ovary.
Equitant leaves. Leaves in 2 ranks with each one folded in half and subtending those to the inside.
Erose. Irregularly fringed or cut; ragged.
Evergreen. Remaining green all year or merely folding up and becoming dormant between growing seasons.
Exfoliate. Peel off in thin layers or strips.
Exocarp. Outermost layer of pericarp.
Exserted. Projecting beyond the surrounding organ, like stamens exserted from a corolla.
Eye of corolla. Colored or marked center of a corolla usually near or at throat.
Falcate. Flat, curving, and tapering to a point like a sickle.
Farinose. With a mealy, usually whitish covering.
Fascicle. Cluster.
Fertile. Bearing reproductive structures that are normally eveloped, not sterile or aborted.
Fibrillose. Made up of stringy fibers.
Fibrous roots. Roots with several to many branches all about the same size, without a larger central axis.
Filament. The stalk of a stamen which supports the anther.
Filamentose. Thread-like or with thread-like structures.
Filiform. Long, slender, and terete, almost thread-like.
Fimbriate. Fringed.
Fistulose. Hollow and cylindrical.
Flabellate. Fan-shaped.
Flabelliform. Fan-shaped.
Fleshy. Soft, thickened, and juicy.
Flexuous. Bending in a wavy manner.
Floccose. With scattered tufts of woolly hair.
Floral tube. Tube from base or tip of ovary to point of apparent attachment of sepals, petals, and stamens, found only in epigynous and perigynous flowers.
Floret. The grass flower consisting of lemma and palea with included stamens and pistil (if present).
Floriferous. Bearing flowers.
Foliaceous. Leaf-like.
-foliolate. With leaflets; trifoliolate is with 3 leaflets.
Follicle. Dry fruit with 1 carpel and more than 1 seed, splitting down 1 side only.
Fornix. Small crest or bump in throat of corolla, as many present as number of corolla lobes.
Free-central placentation. Ovules borne on a central stalk which is only basally attached in a 1-celled ovary.
Frond. The thallus-like stem of *Lemna* which functions as a leaf; the leaf of a fern.
Fruit. Mature ovary with enclosed seeds; external structures which are often fleshy are sometimes also attached.
Funiculus. The stalk attaching the ovule to the ovary wall.
Funnelform corolla. With the tube gradually widening upward and grading into the limb.
Fusiform. Widest at middle, tapering gradually to both ends, and round in cross-section.
Galea. Hood formed by part of perianth, usually the upper lip of corolla.
Geniculate. Bent abruptly.
Gibbous. Swollen on 1 side.
Glabrate. Nearly glabrous or becoming glabrous in age.
Glabrous. Without hairs.
Gland. Organ secreting tiny droplets, often at tips of hairs.
Glandular. With secreting organs which produce small droplets of secretion, often at tips of hairs.
Glaucescent. Slightly glaucous.
Glaucous. With a white or bluish waxy covering that easily rubs off.
Globose. Spherical, shaped like a globe.
Glochidiate. Barbed at tip.
Glomerule. Dense cluster of flowers.
Glume. Chaff-like bract, usually in pairs, at base of grass spikelet, subtending a floret or florets.
Glutinous. Covered with a sticky substance.
Gynaecandrous. With staminate flowers at base and pistillate at tip.
Gynobase. Enlargement or prolongation of receptacle.
Gynophore. Stalk of pistil.
Hairy. Bearing hairs.
Hastate. Arrowhead-shaped but with the basal lobes extending outward instead of downward.

Head. A dense cluster of sessile or nearly sessile flowers on a very short axis, often nearly spherical in outline.
Helicoid. Coiled in 2 dimensions.
Herb. Plant with above-ground portion non-woody.
Herbaceous. Not woody; leaf-like in color or texture.
Hermaphroditic. Bisexual with stamens and pistil.
Hirsute. With coarse, somewhat stiff hairs which are usually spreading.
Hispid. With stiff, bristly hairs.
Hispidulous. Minutely hispid.
Hyaline. Thin, whitish, and easily transmitting light.
Hypanthium. Tube or cup from base or tip of ovary to point of apparent attachment of sepals, petals, and stamens, found only in epigynous and perigynous flowers.
Hypogynous. Without a floral tube so that sepals, petals, and stamens appear to arise beneath ovary.
Imbricate. Overlapping like shingles on a roof.
Incised. Cut sharply, usually irregularly, with sharp-pointed sinuses.
Indehiscent. Not normally splitting or opening or at least not along regular lines.
Indurated. Hard.
Indusium. A thin, membranous outgrowth of a fern leaf which covers a sorus.
Inferior ovary. Ovary that is adnate to floral tube so that sepals, petals, and stamens appear to be attached to top of ovary.
Inflated. Appearing as if pumped full of air.
Inflorescence. Flowering part of plant.
Infrastipular prickle. Prickle just beneath stipule or closest to stipule.
Innovation. Basal shoot of a perennial grass or sedge.
Internode. The part of stem or branch between adjacent joints or points of attachment for leaves or branches.
Involucel. A secondary involucre above the primary one.
Involucre. Whorl of bracts or small leaves subtending a flower or flower cluster (bracts may be completely united with each other).
Involute. Rolled, not flat.
Irregular flower. Flower which can be divided into 2 equal parts in only 1 plane; bilaterally symmetrical; size or shape of similar parts unequal.
Jointed. With well set off nodes or articulation points.
Keel. A raised ridge along the outside of a fold or midrib; the 2 united inner petals in the pea group which are shaped like a boat.
Lacerate. Cut into narrow, pointed segments.
Laciniate. See Lacerate.
Lacuna. A cavity or gap.
Lamellate placentation. With ovules borne on thin plates in the ovary.
Lamina. A flat, expanded, plate-like structure.
Lanate. With tangled, long, woolly hairs.
Lanceolate. Lance-shaped, broadest near base and tapering to a pointed tip.
Leaflet. A division of a leaf blade which is completely separated by a space and the rachis or other major axis from other expanded, herbaceous tissue of the leaf blade.
Leaf scar. Scar left on stem or branch after a leaf drops off, just beneath a bud.
Legume. Dry fruit of pea group formed from 1 carpel but dehiscent on both margins (suture and midrib); member of pea group.
Lemma. Lower of usually 2 bracts which enclose the stamens and pistil in a grass flower; the bract immediately above the pair of glumes.
Lenticular. Lens-shaped with both sides rounded.
Ligulate. With a ligule; with ray flowers in the sunflower group.
Ligule. A short, flat projection from the upper surface of a leaf near its base, or in grasses or sedges and related plants, a fringe of hairs or a membranous projection at the junction of blade and sheath on inner side.
Limb. Expanded and spreading part above the throat in a corolla with united petals.
Linear. Long and narrow with nearly parallel margins.
Lip of corolla. Group of usually 2 or 3 corolla lobes set off from the others by size or a cleft on each side.
Lobe. A part of a leaf blade, leaflet, or other plant part with sinuses on both sides of it; any projection.
Locule. Compartment or chamber of ovary.
Loment. Fruit of pea group with constrictions between the seeds, at maturity breaking into somewhat circular, 1-seeded segments.
Lunate. Crescent-shaped like the first quarter moon.
Lyrate. Pinnatifid with the terminal segment larger than the rest.
M. Meter; 1m = about 39 inches.
Maculate. Mottled or with blotches or spots.
Megasporangium. Sporangium containing megaspores.
Megaspore. The larger of 2 spore sizes produced by some plants.
Membranous. Thin, usually whitish, and transmitting light.
Mericarp. Portion of fruit that splits away as an apparent separate unit.
-merous. Number of parts; a 5-merous flower would have 5 sepals, 5 petals, 5 or 10 stamens, and usually 5 carpels.
Microsporangium. Sporangium containing microspores.
Microspore. The smaller of 2 spore sizes produced by some plants.
Midrib. Central axis or vein of a leaf blade, leaflet, or leaf segment.
Mm. Millimeter; 10mm = 1cm; about 25mm = 1 inch.
Monads. Individuals free from each other rather than attached in groups.
Monadelphous. Filaments all united into a single tube.
Moniliform. With constrictions, so resembling a string of beads.
Monochasium. A cyme with a single flower on each axis.
Monoecious. Flowers unisexual and borne on same plant; in gymnosperms the pollen and seed cones borne on the same plant.
Mucronate. With a short, sharp spine- tip.
Multicellular hair. A hair consisting of 2 or more cells, the cell walls usually readily apparent with slight magnification.
Muricate. Roughened with short, hard, pointed structures.
Nectary. Gland which secretes nectar.
Nerve. Vein.
Net venation. With many veins all interconnected in a net-like manner, or when contrasted with parallel, the main veins not parallel with the midrib.
Neutral flower. Lacking functional stamens and pistil.
Node. A joint or point of attachment for leaves or branches.
Nodulose. With small swellings.
Nut. Indehiscent fruit with 1 seed and a hard wall like a walnut.
Nutlet. Hard, small, indehiscent, 1-seeded fruit.
Ob-. Prefix meaning upside-down.
Obcompressed. Dorsiventrally compressed.
Obcordate. Heart-shaped with the pointed end at base.
Oblanceolate. Lance-shaped, broadest near tip and tapering to a somewhat pointed base.
Oblong. Longer than wide with nearly parallel margins.
Obovate. Egg-shaped, widest near tip.
Obtuse. Blunt or with the sides forming an angle greater than 90 degrees.
Ochroleucous. Cream colored.
Operculate. Opening by the splitting off of a cap or lid leaving a circular opening at top.
Opposite. Two leaves or branches at each node.
Orbicular. Round in outline.
Oval. Broadly elliptic and less than twice as long as wide.
Ovary. Part of pistil containing ovules.
Ovate. Egg-shaped, widest near base.
Ovoid. Ovate in outline.
Ovulate. Bearing ovules.
Ovule. Structure in ovary which develops into a seed.
Palate. Broad rounded hump on inside lower lip of bilabiate corolla at the throat.
Palea. Uppermost bract which encloses stamens and pistil in grass flower, usually lacking a midnerve.
Palmate. With leaflets, lobes, or veins arising from the same point at tip of petiole (lobes projected to this point).
Palmatifid. Palmately divided halfway or more to base.
Panicle. A compound raceme, that is, with more than 1 flower on each stalk that arises from each node of main axis, the central and terminal flowers the youngest.
Papilionaceous. The flower type in the pea group with banner, wings, and keel.
Papillate. With small, rounded bumps.
Papillose. Papillate.
Pappus. Modified calyx in flowers of the sunflower group, consisting of bristles, scales, awns, or a short crown at tip of achene.
Parallel venation. With the main veins running parallel or nearly so to the midrib and to each other.
Parasitic. Attached to and obtaining nutrients from another plant; the parasite is usually not green.
Parietal placentation. Ovules borne on the walls or on incomplete partitions of an ovary with 1 chamber.

Parted. Cut halfway or more to base or midrib.
Pectinate. Resembling a comb with very narrow pinnately arranged segments.
Pedicel. Stalk of a single flower or grass spikelet.
Peduncle. Stalk of strobilus or inflorescence (cluster of flowers); stalk of a flower when only 1 per plant.
Peltate. With stalk attached toward the center rather than on an edge, like a mushroom.
Pendant. Hanging downward.
Pendulous. Hanging downward.
Pepo. Fleshy, indehiscent fruit with a hard or leathery rind like a cucumber or melon.
Perennial. A plant that lives more than 2 years.
Perfect flower. With both stamens and pistil.
Perfoliate. With base of leaf completely surrounding stem so stem appears to be passing through leaf.
Perianth. Calyx and corolla collectively.
Pericarp. Wall of fruit.
Perigynium. Sheath or sac which encloses ovary and fruit in *Carex*.
Perigynous. With a floral tube which is not adnate to ovary so that sepals, petals, and stamens appear to arise above base of ovary and removed from it.
Petal. One member of the corolla or series of parts inside the outermost series in the flower; petals are usually, but not always, colored.
Petaloid. Appearing like petals.
Petiole. Stalk of a leaf.
Petiolule. Stalk of a leaflet.
Phyllodia. Broadened petioles which appear like narrow leaf blades.
Pilose. With long, soft hairs.
Pinnate. With leaflets, lobes, or veins arising from several different points along an axis.
Pinnatifid. Pinnately divided halfway or more to base or midrib.
Pinnatilobate. On borderline between pinnately lobed and pinnatifid.
Pistil. Organ of flower containing ovules, consisting of ovary, style, and stigma; female part of flower.
Pistillate. With pistils but lacking stamens.
Pith. Spongy center of a stem.
Placenta. Part of ovary where ovules are attached.
Placentation. Pattern of attachment of ovules within ovary.
Plait. A flattened fold as in cloth doubled back on itself.
Planoconvex. Flat on 1 side, rounded on the other.
Plicate. Folded into plaits as in a fan.
Plumose. With fine hairs attached along the main axis somewhat like a feather.
Pod. Legume, a fruit of the pea group.
Pollen. Dust-like, spherical, usually yellowish structures produced in anthers, or in microsporangia of gymnosperms.
Polygamodioecious. Mostly dioecious but with a few flowers of opposite sex or a few bisexual flowers also present.
Polygamous. With unisexual and bisexual flowers on the same plant.
Pome. A fleshy, indehiscent fruit formed from an inferior ovary with more than 1 locule like an apple.
Precocious. Appearing before the leaves.
Primary leaflet. Leaflet of a once compound leaf or first division of a twice or more compound leaf.
Procumbent. Creeping or lying on ground but not rooting at nodes.
Prostrate. Lying flat on the ground.
Pruinose. With a bluish-white bloom on the surface that can be easily rubbed off.
Pseudoscape. A false, naked scape between the roots and leaves, usually underground or barely above ground.
Puberulent. With minute hairs.
Pubescent. Bearing hairs.
Pulverulent. Powdery.
Punctate. Dotted with depressions or colored or translucent glands or dots.
Puncticulate. Minutely punctate.
Pungent. Sharp-pointed; prickly to touch.
Pustulate. With wart-like elevations; hairs with an expanded or wart-like base.
Pyriform. Pear-shaped.
Pyxis. Capsule with circumscissile dehiscence.
Quinate. With 5 similar structures or divisions.
Raceme. Inflorescence with stalked flowers all arising from the main axis individually, the youngest flower at tip.
Rachilla. Axis of grass spikelet; secondary axis; floret-bearing axis.
Rachis. Central axis of inflorescence or central axis or vein of leaf blade.
Ray. A branch or stalk; flower of sunflower group with a strap-shaped corolla, usually on margins of head when disk flowers also are present; length of ray is measured from top of achene to tip of ray.
Receptacle. The expanded or elongated end of the flower stalk which bears all or some of the flower parts.
Recurved. Curved downward or backward.
Reflexed. Bent abruptly downward or backward.
Regular flower. All members of each set of parts alike in shape and size; radially symmetrical; divisible into 2 equal halves in more than 1 plane.
Reniform. Kidney-shaped.
Repand. Wavy.
Replum. Partition in fruit of mustard group.
Resin duct. Minute tube which transports resin.
Resinous. Sticky or appearing varnished.
Reticulate. Net-like with many inter-connections.
Retrorse. Directed downward or backward.
Retuse. With a rounded tip which is shallowly notched or indented.
Revolute. Margin rolled toward underside.
Rhizomatous. With rhizomes.
Rhizome. Underground stem or rarely creeping along ground surface; see stem.
Rhombic. Diamond-shaped.
Ribbed. With prominent, raised veins or nerves.
Root. Underground portion of plant lacking nodes, internodes, leaves, and scales.
Rosette. Cluster of leaves radiating out in all directions from stem, usually at base of plant.
Rosulate. With a rosette.
Rotate. With a round, horizontally flattened limb at a right angle to the short tube.
Rotund. Round.
Rugose. Wrinkled.
Rugulose. Slightly wrinkled.
Runcinate. Cleft or pinnatifid with segments directed backward or toward base.
Runner. Slender stem creeping along ground and rooting at nodes.
Saccate. In shape of a sac or pouch.
Sagittate. Arrowhead-shaped with the basal lobes extending downward.
Salverform corolla. Long slender tube abruptly expanded into horizontally flattened or saucer-shaped limb.
Samara. Dry, indehiscent, winged fruit as in maple, elm, and ash.
Saprophytic. Living on dead organic matter and usually lacking chlorophyll (green pigment).
Scaberulous. Slightly scabrous.
Scabridulous. Slightly scabrous.
Scabrous. Rough to the touch like sandpaper, usually from very short, stiff hairs.
Scale. Thin, short, often membranous structure.
Scape. Flowering stem without leaves.
Scapose. With a scape.
Scarious. Dry, thin, membranous, and translucent, not green.
Schizocarp. Dry fruit which splits into 2 or more 1-seeded, indehiscent segments at maturity as in the carrot or mallow groups.
Scorpioid. Coiled at tip in 2 dimensions.
Scurfy. Covered with tiny scale-like particles.
Secund. On only 1 side of axis.
Seed. Mature ovule which after germination gives rise to a new plant.
Sepal. One member of calyx or outermost series of flower parts, usually, but not always, green.
Septate. Divided by partitions; in leaves, the septae can often be detected as regular bumps or cross-ridges by running a fingernail the length of the leaf.
Septum. Partition or cross wall.
Sericeous. With many long, straight, soft, appressed hairs giving a silky appearance.
Serrate. With sharp, forward-pointing teeth.
Serrulate. Serrate with very small teeth.
Sessile. Without a stalk.
Seta. A bristle.
Setaceous. Bristle-like.
Setulose. With a small bristle.

Sheath. Tubular structure surrounding a plant part; in the grass, rush, and sedge families, the lower part of a leaf which surrounds the stem.
Shrub. Woody plant with usually several stems from the base, or else much-branched and bushy.
Sigmoid. In the shape of the letter S.
Silicle. A short fruit in the mustard group, usually not more than 3 times as long as wide, and usually containing a single, membranous partition with the ovules borne at its points of attachment to the fruit wall.
Silique. Elongate fruit in the mustard group usually containing a single, membranous partition with the ovules borne at its points of attachment to the fruit wall.
Simple leaf. A leaf not divided into leaflets.
Sinuate. Wavy-margined.
Sinus. Depression or space between 2 lobes or segments.
Sorus. Cluster of sporangia.
Spathe. Large bract sheathing or enclosing an inflorescence.
Spatulate. Broad and rounded at tip and long tapering to base; often not differentiated from oblanceolate or obovate.
Spicate. With a spike or resembling a spike.
Spiculate. Covered with small, pointed structures.
Spike. A mostly elongate, usually unbranched inflorescence with sessile flowers, the upper flowers the youngest.
Spikelet. The small spike of a grass consisting of glumes and enclosed florets; bracteate inflorescence or portion of inflorescence in the sedge group.
Spinulose. With small spines.
Sporangium. Receptacle containing spores.
Spore. Simple, usually 1-celled, reproductive body capable of giving rise to a new individual.
Sporocarp. Receptacle containing sporangia.
Sporophyll. Leaf which bears sporangia and spores.
Spur. A tubular or sac-like extension of a petal or sepal; any long, narrow appendage.
Spur shoot. A very short branch with leaves that appear to be whorled.
Stamen. Organ of flower containing pollen and consisting of filament and anther; male part of flower.
Staminate. With stamens but lacking a pistil.
Staminode. A sterile stamen usually without an anther; some may be modified and nearly petal-like.
Stellate. With 3 or more branches radiating out from the center.
Stem. Main axis of plant; it may be upright or prostrate, underground or above ground; it is distinguished from a root by presence of nodes, buds, or scales.
Sterile. Lacking reproductive parts.
Stigma. Tip of pistil, receives the pollen and is usually sticky.
Stipe. Stalk of some pistils or fruits above base of perianth; any stalk.
Stipitate. With a stipe.
Stipule. Appendage at base of petiole, from gland-like to leaf-like, usually paired with one on each lateral side of petiole base.
Stolon. Stem which grows along ground and roots at the nodes.
Stoloniferous. With stolons.
Stramineous. Straw colored.
Striate. With fine lines, grooves, or streaks parallel to each other.
Strigillose. Strigose but hairs very short.
Strigose. With somewhat short, appressed and straight hairs.
Strigulose. Strigose but hairs very short.
Striolae. Longitudinal lines, grooves, or streaks.
Strobilus. Cone-like structure containing reproductive parts.
Style. Stalk-like part of pistil between ovary and stigma.
Stylopodium. Swollen base of style in the carrot group.
Sub-. Prefix meaning almost or nearly.
Subulate. Narrow and gradually tapering to a sharp point.
Succulent. Thick and fleshy.
Superior ovary. Ovary with the perianth parts inserted below it.
Suture. A seam or line of dehiscence.
Talus. Rock slide.
Taproot. Primary root along main axis of plant which is larger than any branches of root system, similar to a carrot.
Teeth. Short, pointed or rounded projections.
Tendril. A slender outgrowth of a leaf or stem usually twisting and clinging to objects it contacts.
Tepal. Unit of perianth when perianth is not clearly differentiated into calyx and corolla.
Terete. Cylindrical, round in cross-section.
Ternate. In threes, or with 3 parts.
Terrestrial. Growing on land.
Tetrad. Group of four.
Thallus. A flat, leaf-like structure not differentiated into stem and leaves.
Throat of corolla. The opening into a corolla with united petals, at junction of tube and limb; the throat is sometimes slightly elongate and a little wider than the tube.
Thyrse. A densely flowered panicle with the terminal flower of main axis the youngest but the terminal flowers of branches older than others of the branch.
Tomentose. With dense, short, usually whitish, wool-like, tangled hairs.
Tomentulose. Sparingly tomentose.
Toothed. Bearing teeth.
Torulose. Alternately swollen and constricted, sometimes irregularly so.
Translucent. Easily transmitting light but not thin enough to see through.
Transverse. Crosswise; horizontal.
Tree. Woody plant with usually 1 or a few stout trunks and usually rather tall.
Trifid. With 2 clefts and 3 lobes or segments.
Trifoliolate. With 3 leaflets like a clover.
Trifurcate. With 3 branches.
Trigonous. Three angled.
Triquetrous. Three angled; triangular in cross-section.
Truncate. Horizontal as if cut off.
Tuber. Short, thick, underground stem such as a potato.
Tubercle. Small, rounded bump; nipple-like structure on stem of some cacti; enlarged base of style in *Eleocharis*.
Tubular. Cylindrical.
Turbinate. Top-shaped.
Turgid. Swollen as if pumped full of air or fluid.
Turion. A scaly, short, usually succulent shoot arising from a bud on an underground stem.
Twining. Part creeping and part coiling and climbing on other objects.
Ultimate segment. Segment that bears no smaller segments.
Umbel. Inflorescence with pedicels and/or peduncles arising from the same point and ascending in all directions.
Uncinate. Hooked at tip.
Undulate. Slightly wavy.
Uniseriate. In 1 series or row.
Unisexual flower. With either stamens or pistil but not both.
Urceolate. Urn-shaped.
Urn shape. Ovoid and with a small opening at tip.
Utricle. Small, 1-seeded, usually indehiscent fruit with a thin pericarp often separated from the seed.
Vallecular cavity. Lengthwise canal of stem in *Equisetum* located between center and outside of stem and opposite a groove in the stem.
Valvate. Splitting open along regular vertical lines.
Valve. Segment of fruit that splits at maturity; inner perianth segments of *Rumex* which enclose the achene.
Vascular bundle or tissue. Group of cells specialized for conducting water and nutrients and providing structural support.
Vegetative. A non-reproductive part of a plant.
Vein. Thread of vascular tissue in a leaf or flower part.
Venation. Arrangement of veins.
Ventral. Lower or inner side or side toward axis.
Vernal pool. With water in spring, drying later.
Verticil. A whorl.
Villous. With long, soft hairs.
Vine. Plant which climbs or clings on other objects or plants.
Viscid. Sticky usually from glands.
Whorled. Three or more leaves or branches attached at the same level on stem.
Wing. A thin, flat expansion, extension, or appendage of an organ; one of the two lateral petals in a flower of the pea group.
Woolly. With long, interwoven hairs.

Appendix

The following have recently been reported for the Black Hills but I have seen no specimens. Some are likely misidentified. Others are likely cultivated and not naturalized. Cultivars are not included in this treatment unless documented as naturalized. Many additional species have been reported but the specimens could not be found in the herbaria where they were supposedly deposited.

Artemisia tridentata vaseyana
Carex athrostachya
Carex cristatella
Centaurium exaltatum (Zeltnera exaltata)
Ceratophyllum demersum
Cyperus bipartitus
Dichanthelium depauperatum
Draba cana
Dryopteris carthusiana
Eleocharis coloradoensis
Eleocharis quinqueflora
Epilobium glaberrimum fastigiatum
Eragrostis spectabilis
Erigeron vetensis
Erysimum repandum
Festuca thurberi
Heterotheca villosa minor
Hieracium aurantiacum
Hypericum majus
Juncus articulatus
Knautia arvensis
Leptochloa fusca
Linanthus watsonii
Lythrum salicaria
Najas guadalupensis
Oenothera rhombipetala
Papaver rhoeas
Poa reflexa
Potamogeton zosteriformis
Potentilla ambigens
Potentilla rubricaulis
Ranunculus hispidus
Rorippa curvisiliqua
Rumex pseudonatronatus
Salvia aethiopis
Scirpus atrovirens
Strigosella africana (Malcolmia africana)
Trichostema brachiatum
Verbascum blattaria
Vitis vulpina

There have been many segregate genera proposed in recent years but most lack sufficient supporting data to accept and some have no supporting data at all.